नेपाल सरकार
सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)
Local Development Training Academy
(Established under the Local Development Training Academy Act, 2049)
LDTA>>>

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

प्रशिक्षकका लागि

स्थानीय तहका लागि तयार पारिएको प्रशिक्षण सामग्री

सडक ठेगाना र भौगोलिक सूचना प्रणाली

प्रशिक्षण सामग्रीको बनावट:

१. प्रशिक्षण मार्गदर्शन

२. प्रशिक्षण योजना

३. सत्र योजना (अभ्यास पत्र समेत)

४. प्रस्तुति सामग्री (पावरप्वाइन्ट स्लाइड)

५. सहभागीका लागि अध्ययन सामग्री

६. मूल्याङ्कनका औजारहरू

मोड्युल १६

नेपाल सरकार
सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)
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प्रशिक्षकका लागि

स्थानीय तहका लागि तयार पारिएको प्रशिक्षण सामग्री

सडक ठेगाना र भौगोलिक सूचना प्रणाली

२०७८ असार

मोड्युल १६

प्रशिक्षण सामग्री निर्माणमा संलग्न सदस्यहरू

श्री पीतकुमार श्रेष्ठ, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

श्री जयकृष्ण श्रेष्ठ, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

श्री योग माया सापकोटा, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

लेखन तथा प्राविधिक सहयोग

श्री सरिता मास्के श्रेष्ठ, डा. भोला नाथ ढकाल र श्री दिपक न्यौपाने, परामर्शदाता

भाषा सम्पादन:

सम्पर्कका लागि:

मन्तव्य

दुई शब्द

स्थानीय विकास प्रशिक्षण प्रतिष्ठानले भौगोलिक सूचना प्रणाली (Geographical Information System-GIS)को प्रयोग गरी सडक ठेगाना र खुला सडक नक्सांकन गर्नसक्ने ज्ञान र सीपको अभिवृद्धि गर्नका लागि स्थानीय तहहरुमा प्रशिक्षणको आवश्यकता लाई मध्यनजर गरी **सडक ठेगाना र भौगोलिक सूचना प्रणाली** विषयक पाँच दिने प्रशिक्षणको पाठ्यक्रम तयार गरेको छ । यस पाठ्यक्रमको उपयोग गरी सहभागीहरुले GIS को बारेमा सैध्दान्तिक ज्ञान हासिल गर्नुका साथै नेपाल सरकार, नापी विभागले तयार गरेको विभिन्न **GIS Data Layer** हरुको बारेमा जानकारी प्राप्त गरी त्यसलाई **Software** मा **Load** गर्ने प्राविधिक सीप सिक्दछन् । यसका साथै **Open Street Maps** को प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु **Digitize** गर्ने र **Digitize** गरी तयार पारिएका **Line Feature (Street Addressing and Mapping** को हकमा बाटो) को लम्बाई GIS Application द्वारा गणना गर्न सक्नेछन् ।

यस पाठ्यक्रमको कार्यान्वयनबाट सडक ठेगाना प्रणाली सम्वन्धी सैद्धान्तिक तथा व्यवहारिक ज्ञान र सिपमा अभिवृद्धि हुने र गाउँपालिका तथा नगरपालिका क्षेत्रभित्रको भौगोलिक सूचना प्रणालीको प्रयोग गरी सडक ठेगाना र खुला सडक नक्सांकन गर्नसक्ने ज्ञान र सिपमा अभिवृद्धि हुने अपेक्षा गरिएको छ ।

प्रतिष्ठानलाई उक्त कार्यको महत्वपूर्ण जिम्मेवारी दिनुहुने सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालयका सचिवज्यू, सह–सचिवज्यूहरू, उप–सचिवज्यूहरूलगायत सम्पूर्ण मन्त्रालय परिवारप्रति हार्दिक आभार व्यक्त गर्दछु । प्रतिष्ठानलाई वर्तमान स्थितिमा ल्याइपुन्याउनमा प्रतिष्ठानमा कार्यरत कर्मचारीहरूको लगनशीलता, मिहिनेत, दूरदृष्टि पनि उत्तिकै महत्वपूर्ण छ, म यसका लागि प्रतिष्ठानका सम्पूर्ण कर्मचारीहरूलाई धन्यवाद दिन्छु । सङ्घीय संरचनाअन्तर्गत स्थानीय तहको क्षमता अभिवृद्धि गर्न प्रतिष्ठान सधैं प्रतिबद्ध रहने र मागमा आधारित उपयोगी कार्यक्रमहरूका साथ निरन्तर अगाडि बढ्ने कुरामा विश्वास दिलाउँदै प्रतिष्ठानले पाएको स्नेह, सहयोग र सद्भाव निरन्तर रूपमा सबै क्षेत्रबाट पाइरहने अपेक्षा गरेको छ ।

अन्त्यमा, यो पाठ्क्रम निर्माण गर्न उल्लेख्य भूमिका खेल्नुहुने विज्ञहरु श्री सरिता मास्के श्रेष्ठ, डा. भोला नाथ ढकाल र श्री दिपक न्यौपाने र स्थानीय विकास प्रशिक्षण प्रतिष्ठानका निर्देशक श्री जयकृष्ण श्रेष्ठ र व्यवस्थापन अधिकृत श्री योग माया सापकोटालगायत अन्य सहयोगी कर्मचारीह?लाई हार्दिक धन्यवाद व्यक्त गर्दै प्रशिक्षणको सफलता, प्रशिक्षण सामग्रीको सार्थकता र लक्ष्य प्राप्तिका लागि समेत हार्दिक शुभकामना व्यक्त गर्दछु ।

<div align="right">

पीतकुमार श्रेष्ठ
कार्यकारी निर्देशक
स्थानीय विकास प्रशिक्षण प्रतिष्ठान

</div>

विषयसूची

प्रशिक्षण मार्गदर्शन

प्रशिक्षण सामग्रीबारे

स्थानीय विकासको कार्यसँग सम्बन्धित स्थानीय तहहरूको प्रशासनिक एवं व्यवस्थापनसम्बन्धी दक्षता अभिवृद्धि गर्ने उद्देश्यले त्यस्ता निकायहरूमा संलग्न जनप्रतिनिधिहरू एवम् कार्यरत कर्मचारीहरूलाई योजनाबद्ध 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 सङ्गठित संस्थाका रूपमा रहेको छ । प्रतिष्ठानको मुख्य उद्देश्य प्रशिक्षण स्थानीय विकास कार्यसँग सम्बन्धित स्थानीय तहका व्यक्तिहरूका लागि आवश्यक पर्ने प्रशिक्षणको व्यवस्था गर्ने, प्रशिक्षण केन्द्रद्वारा सञ्चालन गरिने प्रशिक्षण कार्यक्रमसम्बन्धी अनुसन्धान गर्ने र प्रशिक्षण केन्द्रद्वारा सञ्चालन गरिने प्रशिक्षण कार्यक्रमलाई बढी उपयोगी तुल्याउन तथा प्रशिक्षण सामग्री तयार गर्नका लागि समस्यामूलक अनुसन्धान, परामर्श सेवा तथा सूचना सेवासम्बन्धी कार्यक्रमहरू सञ्चालन गर्ने रहेको छ ।

यो प्रशिक्षण सामग्री सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालयको निर्देशनमा स्थानीय विकास प्रशिक्षण प्रतिष्ठानबाट तयार पारिएको हो । यस **५ दिने** प्रशिक्षण सामग्रीले **सडक ठेगाना र भौगोलिक सूचना प्रणाली** प्रशिक्षणलाई प्रभावकारी बनाउन प्रशिक्षकहरूलाई महत्त्वपूर्ण मार्गदर्शन हुने अपेक्षा गरिएको छ ।

प्रशिक्षण सामग्रीको उद्देश्य
यस प्रशिक्षण सामग्रीको उद्देश्य गाउँपालिका/नगरपालिकाहरूमा कार्यान्वयन गरिने **सडक ठेगाना र भौगोलिक सूचना प्रणाली** प्रशिक्षण कार्यलाई प्रभावकारी र गुणस्तरीय बनाउनुका साथै प्रशिक्षण कार्यमा एकरूपता ल्याई प्रशिक्षणलाई सहभागितामूलक बनाउनु हो ।

प्रशिक्षण सामग्रीको बनावट
यस प्रशिक्षण सामग्रीलाई चार खण्डमा विभाजन गरिएको छ । पहिलो खण्डमा प्रशिक्षण सामग्री र यसको प्रयोग गर्ने तरिका (Instsruction to user) उल्लेख गरिएको छ । दोस्रो खण्डमा प्रशिक्षण योजना, प्रशिक्षण तालिका समावेश गरिएको छ । तेस्रो खण्डमा प्रशिक्षणका प्रत्येक सत्रका विषयवस्तुहरूको पाठयोजना, पावरप्वाइन्ट स्लाइडहरू र विषयवस्तुसँग सम्बन्धित अध्ययन सामग्री समेटिएको छ भने अन्तिम खण्डमा प्रशिक्षण मूल्याङ्कनका औजारहरू समावेश गरिएको छ । यसका विषयवस्तुहरूलाई सङ्क्षिप्तमा तल उल्लेख गरिएको छ ।

१. प्रशिक्षण सामग्रीको प्रयोग गर्ने तरिका (Instsruction to User)
यसमा प्रशिक्षण सामग्रीको पृष्ठभूमि, यसको उद्देश्य, प्रशिक्षण सामग्रीमा समावेश गरिएका विषयवस्तुहरू, प्रशिक्षण सामग्री प्रयोग गर्ने तरिका, प्रशिक्षणका विधिहरू र तिनको सञ्चालन प्रक्रिया, अध्ययन सामग्री, प्रशिक्षण मूल्याङ्कनका औजारहरू, प्रशिक्षणका प्रयोगकर्ता आदि समावेश गरिएको छ ।

२. प्रशिक्षण योजना
प्रशिक्षण योजना प्रशिक्षण सञ्चालनका लागि तयार पारिएको प्रशिक्षणको समग्र खाका हो । यसमा प्रशिक्षणका साधारण र निर्दिष्ट उद्देश्य, प्रशिक्षणका विषयवस्तु, प्रशिक्षण सञ्चालन विधि र प्रशिक्षण सामग्री उल्लेख गरिएको छ ।

३. प्रशिक्षण दैनिक तालिका

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

४. पाठयोजना

पाठयोजना हरेक सत्र सञ्चालनका लागि मार्गदर्शन हो । यसमा सत्रका साधारण र निर्दिष्ट उद्देश्य, सत्रका विषयवस्तु, प्रशिक्षण क्रियाकलापको विस्तृत विवरण, प्रशिक्षण विधि, प्रशिक्षण सामग्री र आवश्यक समय उल्लेख गरिएको छ । यसमा सत्रका निर्दिष्ट उद्देश्य हासिल भए वा भएनन् थाहा पाउनका लागि सत्र मूल्याङ्कन विधिसमेत उल्लेख गरिएको छ ।

५. पावरप्वाइन्ट स्लाइड

प्रशिक्षण सत्र सञ्चालनका लागि आवश्यक पावरप्वाइन्ट स्लाइडहरू यस सामग्रीमा क्रमबद्ध रूपमा समावेश गरिएका छन् । सत्रका साधारण र निर्दिष्ट उद्देश्य, सत्रका विषयवस्तुहरू, समूह कार्य वा अभ्यास र सो अभ्यास सञ्चालनका लागि गर्नुपर्ने क्रियाकलाप पनि पावरप्वाइन्ट स्लाइडमा उल्लेख गरिएको छ ।

६. अध्ययन सामग्री

प्रशिक्षणका विषयवस्तु र प्रस्तुतीकरणसँग सम्बन्धित सामग्रीहरूको विस्तृत विवरण अध्ययनसामग्रीका रूपमा यस सामग्रीभित्र समावेश गरिएको छ । यी सामग्रीहरूलाई प्रशिक्षण सत्रका आधारमा छुट्ट्याई क्रमबद्ध रूपमा व्यवस्थित गरिएको छ ।

७. प्रशिक्षण मूल्याङ्कनका औजारहरू

प्रशिक्षणको प्रभावकारिता मापनका लागि निम्नलिखित औजारहरू समावेश गरिएका छन् ।

(क) प्रशिक्षणपूर्व र प्रशिक्षणपश्चात् जानकारी

यसअन्तर्गत प्रशिक्षणका विषयवस्तुहरूमा सहभागीहरूको बुझाइको अवस्था थाहा पाउन प्रशिक्षणका विषयवस्तुहरूसँग सम्बन्धी प्रश्नहरू निर्धारण गरी प्रशिक्षणको सुरुमा पूर्व जानकारी र अन्तमा पश्चात् जानकारी लिइन्छ। यसले प्रशिक्षणका कारण सहभागीहरूको ज्ञान र सिपमा आएको परिवर्तन मापन गर्न सहयोग गर्दछ ।

(ख) दैनिक पृष्ठपोषण फाराम

हरेक दिनको अन्तमा दिनभरि भएका छलफलहरूमा सहभागीहरूको सिकाइ थाहा पाउन दैनिक पृष्ठपोषण फारामको प्रयोग गरिन्छ । यसबाट सहभागीहरूले सिकेका र सिकेका कुरालाई कहाँ र कसरी प्रयोग गर्ने भन्ने बारेमा र प्रशिक्षणलाई अझ प्रभावकारी सुधार गर्नुपर्ने सुझाव पाउन सकिन्छ ।

(ग) प्रशिक्षण सुधारका लागि प्रश्नावली

यो प्रश्नावली प्रशिक्षणको अन्त्यमा सहभागीलाई वितरण गरी उनीहरूको प्रतिक्रिया लिन प्रयोग गरिन्छ । यसबाट (१) प्रशिक्षणको समग्र मूल्याङ्कन, (२) सहजकर्ताप्रतिको दृष्टिकोण, (३) प्रशिक्षणमा उपलब्ध गराइएका पाठ्यसामग्रीको प्रभावकारिता, (४) प्रशिक्षणका विषयवस्तुको उपयुक्तता र (५) प्रशिक्षणमा प्रयोग भएका प्रशिक्षण विधिहरूको सान्दर्भिकता जाँच गरिन्छ ।

प्रशिक्षण कार्यक्रमको मूल्याङ्कन

प्रशिक्षण कार्यक्रमको प्रभावकारितालाई मुख्यतः चारवटा तहमा मूल्याङ्कन गरिनुपर्दछ । सहभागीहरूको प्रशिक्षणप्रतिको प्रतिक्रिया, उनीहरूको सिकाइको स्तर, प्रशिक्षण कार्यक्रमले सहभागीहरूको दैनिक व्यवहार र उनीहरूको दैनिक कार्यसम्पादनमा ल्याएको परिवर्तन र सो परिवर्तनको परिणामस्वरूप समग्र संस्थाको कार्यसम्पादनमा आएको परिवर्तनलाई प्रशिक्षण प्रभावकारिता मूल्याङ्कनका आधार बनाइनु पर्दछ ।

प्रशिक्षण सामग्रीको प्रयोग विधि

सडक ठेगाना र भौगोलिक सूचना प्रणाली प्रशिक्षणको प्रस्तुतिलाई व्यवस्थित र पूर्ण गराउनका लागि पाठयोजनाको अनुसरण गर्नुपर्दछ । यस सामग्रीमा व्यवस्था गरिएको पाठयोजनालाई अनुसरण गरी सहज तरिकाले सत्र सञ्चालन गर्न क्रियाकलाप शीर्षकअन्तर्गत विषयवस्तुलाई विस्तृत रूपमा प्रस्तुत गरिएको छ । विषयप्रस्तुति अगाडि विषयप्रति रुचि जगाउने, विषयको महत्त्व दर्साउने जस्ता कार्य प्रशिक्षक आफैँले विकास गरी सत्र सञ्चालन गर्न सक्ने छन् । प्रशिक्षकले विषयवस्तुको अध्ययन सामग्री राम्रोसँग अध्ययन गरी विषयको प्रभावकारी प्रस्तुतीकरणका लागि आवश्यक दृश्य सामग्रीको तयारी/सङ्कलनसमेत गर्न सक्ने छन् । यसका साथै प्रशिक्षकले प्रशिक्षण सामग्रीमा उल्लेख गरिएका पावरप्वाइन्ट स्लाइड र अध्ययन सामग्रीमा समावेश गरिएका चित्र, चार्ट, ग्राफ आदिलाई आवश्यकताअनुसार तिनको आकार विस्तार गरी प्रस्तुत गर्न सक्ने छन् । सत्रहरूको प्रस्तुतीकरणका लागि सिलसिलेबार रूपमा पावरप्वाइन्ट स्लाइडहरू समावेश गरिएको छ । प्रशिक्षणको प्रभावकारिता र प्रशिक्षण प्रभावकारिताको मापनका लागि प्रशिक्षण मूल्याङ्कनका औजारहरूसमेत सामग्रीमा समावेश गरिएका छन् । तिनलाई उपयुक्त तरिकाले प्रयोग गरिनु आवश्यक छ ।

अध्ययन सामग्री

प्रस्तुत सामग्रीमा समावेश गरिएका अध्ययन सामग्रीहरू **सडक ठेगाना र भौगोलिक सूचना प्रणाली** प्रशिक्षणसँग सम्बन्धित विभिन्न निकायहरूका प्रकाशन, प्रशिक्षण सामग्री, नेपाल सरकारले गरेका नीतिगत व्यवस्थाहरू आदिलाई आधार मानी तयार गरिएको छ । यी अध्ययन सामग्रीहरू केवल सन्दर्भ सामग्री मात्र हुन् । यिनलाई समय समयमा अद्यावधिक गराउनु पर्दछ ।

प्रशिक्षण सामग्रीको प्रयोगकर्ता

यो प्रशिक्षण सामग्री **सडक ठेगाना र भौगोलिक सूचना प्रणाली** प्रशिक्षणमा रुचि राख्ने जोसुकैका लागि उपयोगी हुने छ । यो विशेष गरी **सडक ठेगाना र भौगोलिक सूचना प्रणाली** प्रशिक्षण सहजकर्ताहरूलाई ध्यानमा राखी तयार पारिएको छ तर यस सामग्रीको उपयुक्तताको ठहर गर्ने जोसुकैले पनि यसको प्रयोग गर्न सक्ने छन् । यसका प्रयोगकर्ताले यसमा उल्लिखित विधि, प्रक्रिया, समय, सामग्री जस्ता पक्षहरूलाई हुबहु उतार्नुभन्दा यसमा उल्लिखित मार्गदर्शन र स्थानीय परिवेशअनुसार यसलाई सहयोगी सामग्रीका रूपमा बुझेर प्रयोग गर्नु उपयुक्त हुने छ । स्थानीय परिवेशअनुसार यस निर्देशिकाको मूल मर्मलाई ध्यानमा राखी सहजकर्ता/प्रशिक्षकले अन्य रचनात्मक गतिविधिसमेत अँगाल्न सक्ने छन् ।

प्रशिक्षण विधि र प्रयोग तरिका

प्रशिक्षकको सहजीकरणलाई व्यवस्थित गर्नका लागि पाठयोजनामा प्रशिक्षण विधिहरू उल्लेख गरिएका छन् । प्रशिक्षण कार्यक्रमलाई सहभागितामूलक र प्रभावकारी बनाउन निम्न विधिहरू प्रयोग गर्न सकिने छ ।

क) समूह छलफल

सहभागितामूलक प्रक्रियाबाट प्रशिक्षण सञ्चालन गर्नका लागि समूह छलफल एक महत्त्वपूर्ण विधि हो । समूह छलफलका लागि निम्न प्रक्रिया अपनाउनुपर्ने हुन्छ:

- समूह विभाजन गर्दा सकभर सहभागी सङ्ख्या बराबर बनाउने, सहभागीको स्तरलाई ध्यान दिने ।
- समूह छलफलका लागि विषयवस्तु किटानी गर्ने ।
- छलफलको विषयअनुसार स्थान र समय निर्धारण गर्ने ।
- सहजकर्ताले छलफल प्रक्रिया बताउने । जस्तै:
    - समूहमा संयोजक, प्रतिवेदक चयन गर्ने ।
    - समूहमा सबैको भनाइ समेटिनुपर्ने ।
    - समूहको निचोड ठुलो कागजमा तयार गर्ने ।
    - संयोजकले समूहकार्य प्रस्तुत गर्ने आदि ।
- समूहमा खुल्ला छलफल चलाउन प्रेरित गर्ने ।
- सहजकर्ताले छलफलको सन्दर्भ र विषयवस्तुलाई आधार मानी आफ्नो निष्कर्ष दिने ।

ख) खेल

खेल विधिले विषयवस्तुलाई सजिलै प्रस्ट पार्न सहयोग गर्दछ । खेल विधिबाट सिकेका सिकाइहरू चिरस्थायी हुन्छन् ।

सञ्चालन प्रक्रिया

- खेलको प्रकृतिअनुसार सहभागी सङ्ख्या छनोट गर्ने । शारीरिक शक्ति प्रयोग गर्नुपर्ने खेल भए शारीरिक रूपमा अशक्त व्यक्तिलाई उसको अनुमतिमा बाहिर राख्ने ।

- लैङ्गिक संवेदनशीलताका पक्षमा ध्यान दिने ।
- समय निर्धारण गर्ने । खेललाई २० मिनेटभन्दा बढी समय दिनु उपयुक्त हुँदैन ।
- खेलमा पालना गर्नुपर्ने नीतिनियम प्रस्ट पार्ने ।
- खेलका लागि आवश्यक सामग्री तयार गर्ने ।
- खेल सकिएपछि खेलबाट भएका सिकाइहरू छलफल गर्ने ।
- खेलका लागि सबैलाई धन्यवाद दिने ।

ग) प्रश्नोत्तर

कुनै विषयवस्तुबारे सहभागीहरूको बुझाइ थाहा पाउनका लागि प्रश्न गर्ने, उत्तर लिने र सोअनुसार सहजकर्ताले विषयवस्तु प्रस्ट पार्ने प्रक्रिया नै प्रश्नोत्तर विधि हो । यसले सहभागीहरूको ध्यान विषयवस्तुप्रति आकर्षित गर्न मदत गर्दछ । सहजकर्ताले प्रश्नोत्तर सिपमा विशेष ध्यान पुर्‍याउनु पर्दछ ।

घ) साना समूह छलफल

यो विधि प्रशिक्षण कार्यका सन्दर्भमा छिट्टै छलफल गरी तत्कालै विषयवस्तुको निष्कर्षमा पुन्याउन उपयोगी हुन्छ । २/३ जना सहभागीबिच बसेकै स्थानमा आमनेसामने भई यो विधिमार्फत विषयवस्तुको निचोड निकाल्न सकिन्छ । यस विधिले सिकाइलाई मूर्त रूप दिन मदत गर्दछ ।

सञ्चालन प्रक्रिया

- सहजकर्ताले छलफलको विषय र समय निर्धारण गर्ने ।
- नजिकैका २/३ जना सहभागीलाई आमनेसामने 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 प्रस्तुतिपश्चात् सहजर्ताले विषयवस्तुको सन्दर्भ र तात्पर्य मिलाई निष्कर्ष निकाल्ने ।

ङ) मस्तिष्क मन्थन

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

सञ्चालन प्रक्रिया

- छलफलको विषय / प्रश्न प्रस्ट रूपमा राख्ने ।
- सोच्नका लागि समय दिने ।
- सहभागीहरूका विचारलाई सङ्गठित गर्दै टिपोट गर्ने, छलफल चलाउने ।
- भनाइलाई निष्कर्षमा पुन्याउने ।

च) अभ्यास

सहभागीको प्रत्यक्ष संलग्नतामा सिकाइ आर्जन गर्न यो विधि महत्त्वपूर्ण हुन्छ । यो विधि जीवन र जगतसँग सम्बन्धित घटनामा आधारित कुराहरू प्रस्ट पार्न प्रयोग गरिन्छ ।

सञ्चालन प्रक्रिया

- सहजकर्ताले घटना वा सवाल समूहबिच राख्ने ।
- विषयअनुसार समय निर्धारण गर्ने ।
- सवालका निष्कर्ष निकाल्न लगाउने ।
- अभ्यासबाट निकालिएको निष्कर्षलाई सहजकर्ताले छलफल चलाई अन्तिम निष्कर्ष निकाल्ने ।

ज) लघु प्रवचन

यो प्रशिक्षणको सबैभन्दा महत्त्वपूर्ण विधि हो । यसमार्फत विषयवस्तुलाई सहभागीहरूसमक्ष सहज रूपमा प्रस्तुत गर्न सकिन्छ । नामअनुसार नै यो विधिमार्फत गरिने प्रस्तुतीकरण छोटो र सहभागितामूलक हुनु पर्दछ । प्रशिक्षकले एकोहोरो रूपमा लामो समयसम्म प्रस्तुतीकरण गर्नु हुँदैन । प्रस्तुतीकरणका सिलसिलामा सहभागीहरूलाई पनि संलग्न गराउँदै जानु पर्दछ ।

प्रशिक्षकलाई प्रश्न:

१. सत्रका विषयवस्तुको राम्ररी अध्ययन गर्नुभएको छ ?

२. सत्र सञ्चालनका लागि पाठयोजनाको अध्ययन गर्नुभएको छ ?

३. सहभागीहरूको पृष्ठभूमि तथा स्तरका बारेमा सोच्नुभएको छ ?

४. सत्रका लागि चाहिने आवश्यक प्रशिक्षण सामग्रीहरू जुटाउनुभएको छ ?

५. प्रस्तुतीकरणका बुँदाहरूको राम्ररी अध्ययन गर्नुभएको छ ?

६. प्रस्तुतीकरणमा बढी महत्त्व दिनुपर्ने बुँदाहरूको निक्र्योल गर्नुभएको छ ?

७. प्रस्तुतीकरणमा विशेष जोड दिनका लागि आवश्यक उदाहरणहरूको चयन गर्नुभएको छ ?

८. प्रशिक्षण सारांशका बुँदाहरू तय गर्नुभएको छ ?

९. सत्रप्रति रुचि जगाउन तथा सहभागिता बढाउन आवश्यक पर्ने विधिहरूको चयन गर्नुभएको छ ?

१०. समयभित्र सत्र पूरा गर्न राम्ररी योजना गर्नुभएको छ ?

११. सत्र सञ्चालनका लागि आवश्यक पर्ने भौतिक सामग्रीहरू, जस्तैः सेतो पाटी, फ्लिपचार्ट, खैरो कागज, मेटाकार्ड, मार्कर, मास्किङ टेप, कागज, कलम, कैंची, चित्रहरूको व्यवस्था गर्नुभएको छ ?

१२. प्रशिक्षण हल, बसाइ व्यवस्थापन, कोठाको तापक्रम, हावा, प्रकाश इत्यादिका बारेमा सोच्नुभएको छ ?

प्रशिक्षण योजना

प्रशिक्षण योजना

मोड्युल/विषय	सडक ठेगाना र भौगोलिक सूचना प्रणाली
मिति	
स्थान	नगरपालिका र गाउँपालिका
सहजकर्ता	

लक्षित सहभागीहरु

- गाउँपालिका तथा नगरपालिकाका कर्मचारीहरू

साधारण उद्देश्य

- सहभागीहरुको ठेगाना प्रणाली सम्वन्धी सैद्धान्तिक तथा व्यवहारिक ज्ञान र सिपमा अभिवृद्धि भएको हुनेछ ।

- सहभागीहरुको गाउँपालिका तथा नगरपालिका क्षेत्रभित्रको भौगोलिक सूचना प्रणालीको प्रयोग गरी सडक ठेगाना र खुला सडक नक्सांकन गर्नसक्ने ज्ञान र सिपमा अभिवृद्धि भएको हुनेछ ।

निर्दिष्ट उद्देश्यहरू यस प्रशिक्षणको अन्तमा सहभागीहरूले

- नेपालको शहरी योजना तथा व्यवस्थापन सम्वन्धमा ज्ञान हुने ।

- शहर र सडक ठेगानाको अन्तरसम्बन्ध बारे बुझ्ने ।

- ठेगाना प्रणालिहरुको ऐतिहासिक पक्ष तथा सडकवारे विस्तृत ज्ञान हुने ।

- सडक संजाल र सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसका लाभ बारे बुझ्ने ।

- उपलब्ध नीतिहरु, दृष्टिकोण र विकास, कार्यान्वयन चुनौतीहरू बारे बुझ्ने ।

- बैज्ञानिक ठेगाना प्रणालीको आवश्यकता तथा विकासको ज्ञान हुने ।

- बैज्ञानिक ठेगाना प्रणालीको वैधानिकता बारे बुझ्ने ।

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको ज्ञान हुने ।

- अन्य स्थानीय तह स्तरमा भईरहेको वा भईसकेको ठेगाना प्रणालीको बारे बुझ्ने ।

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको बारे अरुलाई प्रस्तुतीकरण गर्न सक्ने ।

- यस प्रणाली स्थानीय तहहरुमा लागु गर्न र गराउन आवश्यक पूर्वाधार बारे ज्ञान हुने ।

- उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगका ज्ञान हुने ।

- स्थानीय तह स्तरको डाटाबेसबारे बुझ्ने ।

- GIS को बारेमा सैद्धान्तिक ज्ञान हासिल गरेको हुनेछन् ।

- नेपालको विभिन्न निकायहरुमा GIS प्रणालीको प्रयोग र यस बाट सँस्थाले प्राप्त गरेको उपलब्धताको बारेमा जानकरी प्राप्त गर्नेछन् ।

- नेपाल सरकार, नापी विभागले तयार गरेको विभिन्न GIS Data Layer हरुको बारेमा जानकारी प्राप्त गरी त्यसलाई Software मा कसरी Load गर्ने ? सिक्दछन् ।

- QGIS Browser को बारेमा जानकारी प्राप्त गरी यसबाट Polyline, Polygon तथा Point Feature हरु बनाउन तथा माथी उल्लेखित स्रोतहरु बाट प्राप्त GIS Data लाई QGIS Browser मा Import गर्न जान्दछन् ।

- बिभिन्न निकायहरुले प्रकासनमा ल्याएका नक्साहरुमा देखाइएको अक्षाँस र देशान्तर नम्बरहरु QGIS Desktop

Software मा रजिष्टर गरी Analogue Map लाई Geo Reference गर्न जानेको हुनु पर्नेछ ।

- GPS Device को माध्यमबाट संकलन गरिएका तथ्याँकहरुलाई GIS को प्रयोगबाट कसरी Download गर्ने र विभिन्न नक्शाहरु तयार पार्ने कुराको जानकारी पाउँदछन् ।

- Open Street Maps को प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु Digitize गर्ने बारे जान्दछन् ।

- Digitize गरी तयार पारिएका Line Feature (Street Addressing and Mapping को हकमा बाटो) को लम्बाई GIS Application द्वारा कसरी गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।

- GIS मा रहेको Buffering को प्रयोग गरी पहुँच (दुरी) विश्लेषण गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्राप्त गर्दछन ।

विधिः

- मस्तिष्क मन्थन, समूह अभ्यास, प्रश्नोत्तर, चित्र छलफल, मामिला अध्ययन, श्रव्यदृश्य आदि। हरेक दिनको अन्तमा दिनभर छलफल भएका विषयवस्तुको सङ्क्षेपीकरण गर्ने ।

- दोस्रो दिन पहिलो दिन सञ्चालन भएका गतिविधिको पुनरवलोकनबाट सत्र सुरुआत गर्ने ।

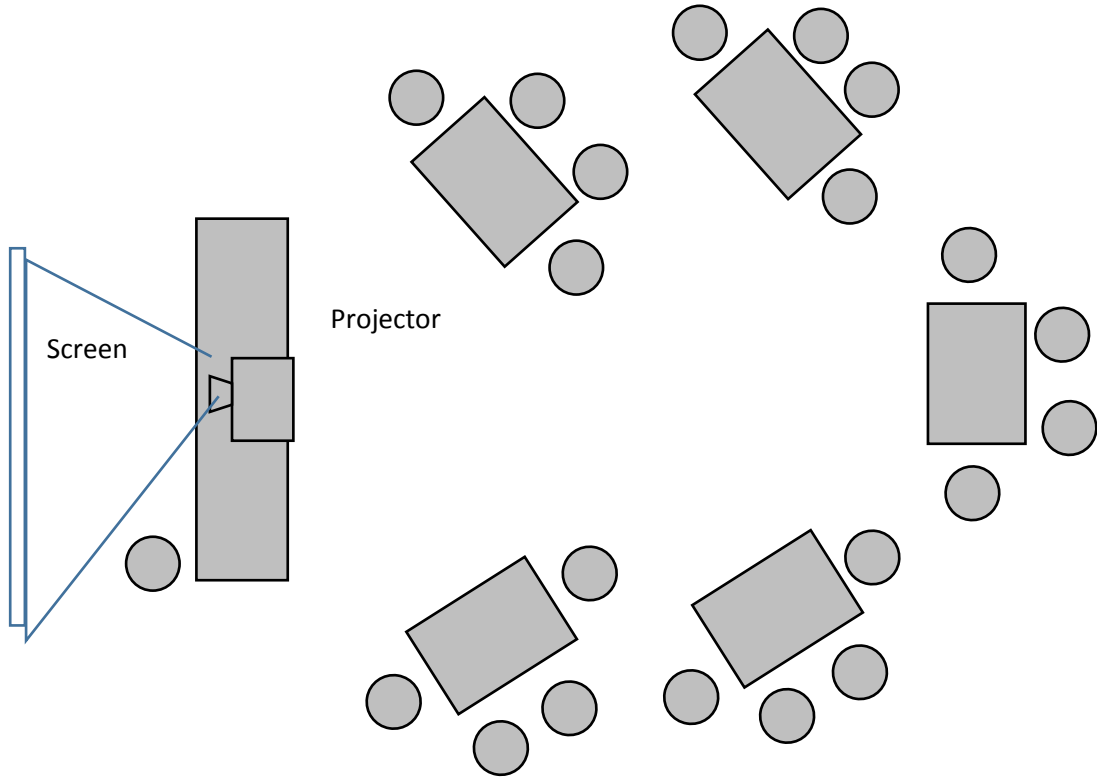- व्यावहारिक अभ्यासका लागि आवश्यक फाराम अभ्यासिटहरू तयार गर्ने ।

आवश्यक सामग्री, उपकरण र स्रोतसाधनः

ल्यापटप, प्रोजेक्टर, ह्वाइटबोर्ड, स्क्रिन, प्वाइन्टर, पिनबोर्ड, क्यामरा, प्रिन्टर, फारामहरू, हाजिरी रजिस्टर, ब्राउनसिट, न्युजप्रिन्ट, बोर्डमार्कर, परमानेन्ट मार्कर, मेटा कार्ड, मास्किङ टेप, कैँची, स्केल, स्ट्यापलर, थमपिन, पेपर क्लिप, सादाकागज, चक्लेट आदि ।

सहभागीहरूका लागि आवश्यक सामग्रीॉ:

नोटबुक, डटपेन, रेकर्ड फाइल, सिसा कलम, मेटाउ, पेन्सिल कटर

सहभागीहरूको प्रशिक्षण हलमा बसाइ व्यवस्था:

विविधः

१. प्रशिक्षण कोठाको उपलब्धता र सहभागी सङ्ख्याका आधारमा सहभागीहरूको बसाइ व्यवस्था मिलाउने।

२. पहिलो दिन सञ्चालन भएका गतिविधिको पुनरवलोकनबाट दोस्रो दिनको सत्र सुरुआतगर्ने।

३. व्यावहारिक अभ्यासका लागि आवश्यक फाराम/सिटहरू तयार गर्ने।

४. हरेकदिनको अन्त्यमादिनभर छलफल भएका विषयवस्तुको सङ्क्षेपीकरण गर्ने।

५. प्रशिक्षणका अन्त्यमा प्रशिक्षण अवधिभर छलफल भएका विषयवस्तुहरूको सारसङ्क्षेप प्रस्तुतगर्ने।

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)

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LDTA >>>

नेपाल सरकार
सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

सडक ठेगानारभौगोलिक सूचना प्रणाली प्रशिक्षण कार्यतालिका

समय मिति	पहिलो सत्र ०९०० — १०३०	१०३० — १०४५	दोश्रो सत्र १०४५ — १२१५	१२१५ — १३१५	तेश्रो सत्र १३१५ — १४४५	१४४५ — १५००	चौथो सत्र १५०० — १६३०
पहिलो दिन	▪ शुभारम्भ, परिचय, अपेक्षासङ्कलन र प्रशिक्षणपूर्व परीक्षण ▪ शहरीकरण, शहरी योजनातथाशहर व्यवस्थापन, शहरीकरणका चुनौतिहरु (पूर्वाधार तथा सेवा सुविधाहरु) तथापहलहरु ।	चिया	▪ ठेगानाहरुको सँक्षिप्त ऐतिहासिक समीक्षा, सडक र ठेगाना प्रणालीको अवधारणा, अध्ययन र कार्यान्वयनपक्ष, सडक ठेगानामाभौगोलिक सुचना प्रणालीको प्रयोग, सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसकालाभ ।	खाना	▪ काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) एक सफलपहल, दृष्टिकोण र विकासनीति, कार्यान्वयनचुनौतीहरु, प्रतिकृति, डक्मेन्टेसन तथाव्यवस्थापन, वर्तमान स्थिति र सिफारिशहरु ।	चिया	▪ नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा उपलब्ध सन्दर्भ सामग्रीकामुख्यमुख्यविषयसूचीबारे जानकारी, बैज्ञानिक ठेगाना प्रणालीको आवश्यकतातथाविकास र कार्यान्वयन र वैज्ञानिकताबारे ।
दोस्रो दिन	▪ ठेगाना प्रणालीको कार्यान्वयनप्रकियाहरु, तथातत्वहरु, ठेगाना क्षेत्र विभाजन, सडक ठेगाना प्रणाली, सडक नाम र सिमानानिर्धारण, घर ठेगाना प्रणाली, नम्वर तथानामपाता, ठेगाना लेख्ने विधिआदि ।		▪ केसहरुको सँक्षिप्तविवरण, समूह गठन र कामः ▪ केस नम्वर १, २ र ३ ▪ समूहगत प्रस्तुतिकरण तथामूल्याँकन		▪ फ्रन्टियर टेक्नोलेजिको प्रयोग, उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगकाअनुभवहर, नगरपालिका स्तरको डाटाबेसर म्यापिङ,गुगलनक्शाप्लस कोड प्रणाली ।		▪ मोडुल १ देखि ७ सम्मको छोटो समिक्षा, पोस्ट टेस्टको तयारीको रुपमा सहभागिहरु बीचअन्तरक्रियाकार्यक्रमअतिरिक्त शिक्षा सामग्रीबीर्फिङ
तेस्रो दिन	▪ Introduction and Concept to Arc GIS (Concept and Demo on Software and Database)		▪ Exploring Arc GIS Tools		▪ GIS Database Concepts and Management		▪ Concept of Geo-referencing
चौथो दिन	▪ GPS and GIS Data Integration		▪ Google Earth and GIS Data Integration		▪ Spatial and Attribute Data Integration in GIS		▪ Calculation and Measurement of Spatial Features
पाँचौ दिन	▪ Geo-Processing		▪ Output Designing (Map Layout)		▪ Geographic Information System		▪ Geographic Information System ▪ प्रशिक्षण मूल्याङ्कन,समापन

सत्र योजना

सत्र योजना

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः १क

समय ९० मिनेट

विषयः शुभारम्भ, परिचय, उद्देश्य, अपेक्षा सङ्कलन, समूह मान्यता, प्रशिक्षण पूर्व जानकारी

साधारण उद्देश्यः यस सत्रको अन्तमा सहभागीहरू प्रशिक्षणको उद्देश्यबारे प्रष्टहुनेछन् ।

निर्दिष्ट उद्देश्यः 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 विषयवस्तुः

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

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ शुभारम्भ • सहभागीहरु र अतिथिहरूको उपस्थितिसंगै राष्ट्रियगानका लागि अनुरोध गर्नुहोस् । • स्वागतसहित कार्यक्रमको उद्देश्यबारे प्रकाश पार्नुहोस् । • प्रमुख अतिथिबाट ब्यानर पढी कार्यक्रमको औपचारिक शुभारम्भ गर्नुहोस् । • अतिथिहरुबाट कार्यक्रमको सफलताको शुभकामना मन्तव्यका लागि अनुरोध गर्नुहोस् । • कार्यक्रमको अध्यक्षबाट शुभारम्भ मन्तव्यसहित सत्र विसर्जनका लागि अनुरोध गर्नुहोस् ।	२५मिनेट	मेटाकार्ड, ब्यानर,	अतिथिहरू र अतिथिहरूको मन्तव्य व्यवस्थापन अवश्यकता अनुसार गर्नुहोस् ।

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप २ परिचय ▪ 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 ▪ सहभागीहरूलाई 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 पार्नुहोस ।	१५ मिनेट	मेटाकार्ड, मार्कर, पुस पिन, ग्लु स्टीक, मास्किड टेप, ब्राउन पेपर	यदि सहभागीबाट विषयवस्तु भन्दा भिन्न अपेक्षाकार्ड आएमा अलग राख्नुहोस् ।
क्रियाकलाप ४ विषयवस्तुको जानकारी ▪ सहभागीहरुले ल्याएका अपेक्षाहरुलाई मिलान गर्दै प्रशिक्षणमा छलफल गरिने विषयवस्तुहरु जानकारी गराउनुहोस ।	५ मिनेट	ब्राउन पेपर, मार्कर, न्यूजप्रिन्ट पेपर	
क्रियाकलाप ५ समुह मान्यता, जिम्मेवारी आदि ▪ प्रशिक्षण प्रभावकारीताको लागि हरेक दिनको प्रशिक्षण अवधिमा समूह मान्यतालाई सहभागीहरुसंग छलफल गरी न्यूज प्रिन्टमा लेख् िपालना गर्न लगाउनुहोस । ▪ आवश्यकता परेमा विभिन्न जिम्मेवारी बाँडफाँड (रिपोटिङ, समय व्यवस्थापक, मनोरञ्जनकर्ता आदि) गराउनुहोस ।	५ मिनेट	ब्राउन पेपर, मार्कर, न्यूजप्रिन्ट पेपर, पावरप्वाइन्ट स्लाइड	

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ६ प्रशिक्षण पूर्व जानकारी • 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 भन्नुहोस ।	१० मिनेट	प्रशिक्षण पूर्व परीक्षण फाराम	
क्रियाकलाप ७ प्रशिक्षणको साधारण उद्देश्य, निर्दिष्ट उद्देश्यहरु, प्रशिक्षण विधि र प्रशिक्षण तालिका • 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	
क्रियाकलाप ८ सत्र संक्षेपीकरण र अग्रसम्वन्ध • समग्र प्रशिक्षण सहभागितामूलक ढंगबाट अगाडि बढ्ने कुराको अवगत गराउनुहोस् । • दोश्रो सत्र सम्वन्धी जानकारी गराउनुहोस् ।	५ मिनेट		

सत्र योजना

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः १ख

समयः ९० मिनेट

सत्रविषयः शहरी योजनाशहर व्यवस्थापनतथा सडक ठेगाना

साधारण उद्देश्यः नेपालकाशहर र त्यसकाविविध पाटोहरुको साथै सडक ठेगानाको जानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- नेपालको शहरी योजनातथाव्यवस्थापन सम्वन्धमा ज्ञान हुने ।

- शहर र सडक ठेगानाको अन्तरसम्बन्ध बारे बुझ्ने ।

सत्रका मुख्य विषयवस्तुः

- शहरीकरण, शहरीविकास योजनार शहर व्यवस्थापन

- शहरी पूर्वाधार तथा सेवा सुविधाहरु, सडक ठेगाना र शहरी व्यवस्थापन

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको परिचयसहितध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २: सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने ■ सहभागीहरुलाई यसतालिमको सत्रहरुको बोरेमा छोटो जानकारी पश्चात यस सत्रको परिचयविस्तृतरुपमागराउने ■ मोडुलको उद्देश्यहरु ■ मोडुलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमाभन्न र लेख्न लगाउने (प्रिटेष्ट)	१०	प्रिटेष्टफाराम	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप४: नेपालकाशहरी क्षेत्रको विकास तथा योजनातर्जुमा ■ काठमाण्डौ उपत्यकाकानगरहरु ■ अन्यउपत्यका,नगरहरुतथावस्ती	१२	पावर प्वाइटमा देखाउने मल्टीमेडिया	(स.त.हुने)
क्रियाकलाप५:.सहभागीहरुको बुझाईजाँच ■ शहरको चुनौती ■ शहरका अवसर	८	मेटाकार्ड र चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप६:शहरी सँरचनाहरु र सोको पहुँच (ठेगाना प्रणालिको अन्तर सम्वन्ध) ■ भवनआवास तथाअन्य ■ पूर्वाधारहरु -भौतिक, सामाजिक र आर्थिक ■ सहरी प्राकृतिक सँपदाहरु	१५	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप७:नीतिनियमतथानिर्देशिकाहरु ■ सँक्षेपमाजानकारी -विशेष गरी शहरी क्षेत्रको ■ सहभागहरुलाई डिजिटल कपीवितरण गर्ने	१०	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलापद: सत्रकोमूल्याङ्कनतथा संक्षेपीकरण **सत्रमूल्याङ्कन** ▪ सँक्षेपमा सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने (सहयोग सहित) शहरीकरण, योजना, व्यवस्थापनबारे र ठेगाना प्रणालीसंगको सम्वन्ध संक्षिप्तमा लेख्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र २ ठेगाना प्रणालीका अवधारणा तथाजि.आइ.यस.को बारेमा छलफल गरिनेछ भनिसत्रको अन्तगर्ने ।	१५ ५	मेटाकार्ड र चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमातयार गरी राख्ने

मोड्युलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः २

समयः ९० मिनेट

सत्रविषयः ठेगाना प्रणालीको अवधारणा र नगरपालिकाहरुको अवस्था

साधारण उद्देश्यः ठेगाना प्रणालिहरुको सँक्षिप्त ऐतिहासिक समीक्षा, सडक र ठेगाना प्रणालीकाअवधारणा विकास र लाभ सम्वन्धीजानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- ठेगाना प्रणालिहरुको ऐतिहासिकपक्षतथा सडकवारे विस्तृतज्ञान हुने ।

- सडक संजाल र सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसकालाभबारे बुझ्ने ।

सत्रकामुख्यविषयवस्तुः

- ठेगाना प्रणालिको ऐतिहासिक पृष्ठभूमी

- सडक संजाल र ठेगाना प्रणालीको अवधारणा र यसकालाभ

- सडक ठेगानामाभौगोलिक सुचना प्रणालीको प्रयोग।

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोड्युल १ को महत्वपूर्ण पक्ष संम्कन प्रयास गराउने वा गर्ने। सहभागिहरुको मोड्युल १ र २ को सम्मन्धबारे ध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने - सहभागीहरुलाई यस श्रतको परिचयविस्तृतरुपमा गराउने - मोड्युलको उद्देश्यहरु - मोड्युलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३:विषयवस्तु सम्वन्धीजानकारी भएमान्यूनतम ६ सहभागीलाई भन्नलगाउने	१०	लागु हुँदैन	(स.त.हुने)
क्रियाकलाप४ठेगाना प्रणालिको ऐतिहासिक पृष्ठभूमी ■ संसारमा यस प्रणालीको सुरुवात र कारणहरु ■ पुराना प्रणाली लागु भएका:उपत्यकाका र बाहिरका नगरहरु	८	पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५:सडक संजाल र ठेगाना प्रणालीको अवधारणा र यसकालाभ ■ सडकको क्रियाकलाप र यसको लाभ ■ वस्तीका सडक तथा सडक संजाल ■ सडकका विविध ढाँचा	१३	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६:ठेगाना प्रणालीको अवधारणा र यसकालाभ ■ भौतिक, सामाजिक र आर्थिक लाभ ■ सेवावितरणमा प्रभावकारीतातथाप्रविधिप्रयोग जाचँ	१४	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप७सडक ठेगानामाभौगोलिक सुचना प्रणालीको प्रयोग ■ सँक्षेपमाजानकारी -विशेष गरी नगर क्षेत्रको नक्सातयारीको सन्दर्भ तथा -डाटा वेस बारे	१०	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलापद: सत्रकोमूल्याङ्कनतथा संक्षेपीकरण **सत्रमूल्याङ्कन** ■ सँक्षेपमा सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने (सहयोग सहित) बस्तीहरुको संरचनाविशेष गरी सडक संजालतथा ठेगाना प्रणालीको अन्तर सम्बन्धअभ्यास	१५	मेटाकार्ड र चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमातयार गरी राख्ने
सत्र संक्षेपीकरण ■ सत्रमूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ३-के.भि.एम.पि.परियोजनाबारेमा छलफल गरिनेछ भनिसत्रको अन्तगर्ने ।	५		

सत्र योजना

मोड्युलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः ३
समयः ९० मिनेट

सत्रविषयः काठमाण्डौ उपत्यका मानचित्रण परियोजना (के.भि.एम.पि)

साधारण उद्देश्यः सफल परियोजनाबाट सिक्न सक्ने सकारात्मकतथाचुनौतीपूर्ण पाटाहरु सम्वन्धीजानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) वारे ज्ञान हुने ।

- उपलव्धनीतिहरु, दृष्टिकोण र विकास, कार्यान्वयनचुनौतीहरुबारे बुझ्ने ।

सत्रकामुख्यविषयवस्तुः

- काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) एक सफलपहल

- दृष्टिकोण र विकास नीति

- कार्यान्वयनचुनौतीहरु र उपलब्धी

प्रशिक्षण – सिकाई क्रियाकलाप	अव धि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोड्युल २ को महत्वपूर्ण पक्ष संक्षन प्रयास गराउने वा गर्ने। सहभागिहरुको मोड्युल २ र ३ को सम्बन्धबारे ध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने ■ सहभागीहरुलाई यस शत्रको परिचयविस्तृतरुपमा गराउने ■ मोड्युलको उद्देश्यहरु ■ मोड्युलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३:विषयवस्तु सम्वन्धीजानकारी भएमान्यूनतम १० सहभागीलाई भन्नलगाउने	१०	लागु हुँदैन	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप४:काठमाण्डौ उपत्यका मानचित्रण परियोजना पृष्ठभूमी ■ राजधानीशहरमा यस प्रणालीको सुरुवातहुनुको मुख्य उदेश्य र अवस्थाको चित्रण ■ यस प्रणाली लागु भएपछिको अवस्था	८	मौखिक, पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५:परियोजनाको दृष्टिकोण र विकास नीति ■ सडकतहको महत्व र यसको नामाकरण ■ भवनतथाआवासको व्यवस्थीत ठेगाना	१३	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६:परियोजनाकार्यान्वयनचुनौतीहरु र उपलब्धी ■ अपनत्वमाकमी र न्यूनजन सहभागिता ■ प्रविधितथामानव संसाधनको कमी	१४	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप७:परियोजनाकार्यान्वयनकाउपलब्धीहरु ■ विस्तृत सडक एटलास प्रकाशन र वितरण ■ भौगोलिक सूचना प्रणालीको स्थापना	१०	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलापः परियोजनाबाट सिकाई ■ सँक्षेपमा सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने (सहयोग सहित) व्लकतथाठेगाना प्रणालीको फाईदा वेफाईदाको चित्रण गर्दै पहाडीतथाहिमालीपालिकाहरुकालगिउपयुक्तताभएवानभएको जवाफ सहितको अभ्यास गनुहोस् ।	१५	मेटाकार्ड र चार्ट पेपर र मार्कर, पावर प्वाइन्ट	सहजकर्ताले पहिला नै प्रश्नहरु पावर प्वाइन्ट वा मेटाकार्डमातयार गरी राख्ने
सत्र संक्षेपीकरण ■ सत्रमूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ४- उपलब्ध सन्दर्भ सामग्रीकाबारेमा छलफल गरिनेछ भनिसत्रको अन्तगर्ने ।	५	उपलब्ध सन्दर्भ सामग्रीवितरण हुनवाभईसक्ने	स.त.हुने वाव्यवस्थापनले गरिसक्ने

सत्र योजना

मोडुल: सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्र: ४
समय: ९० मिनेट

सत्रविषय: नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा

साधारण उद्देश्य: उपलब्ध सन्दर्भ सामग्रीकाविषयसूचीबारे जानकारी गराउने ।
निर्दिष्ट उद्देश्यहरु: सहभागीहरुले यस सत्रको अन्त्यमा,

- बैज्ञानिक ठेगाना प्रणालीको आवश्यकतातथाविकासकोज्ञान हुने ।
- बैज्ञानिक ठेगाना प्रणालीको वैधानिकताबारेबुझmने ।

सत्रका मुख्य विषयवस्तु:

- नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा
- उपलब्ध सन्दर्भ सामग्रीका मुख्य मुख्य विषयसूची
- ठेगाना प्रणालीको वैधानिकता पक्ष

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोडुल ३ को महत्वपूर्ण पक्ष संम्कन प्रयास गराउने वा गर्ने। सहभागिहरुको मोडुल ३ र ४ को सम्बन्धबारे ध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने - सहभागीहरुलाई यस शत्रको परिचयविस्तृतरुपमा गराउने - मोडुलको उद्देश्यहरु - मोडुलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३:विषयवस्तु सम्बन्धीजानकारी भएमान्यूनतम ५ सहभागीलाई भन्नलगाउने	१०	लागु हुँदैन	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ४: नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा ■ राजधानीशहरमा यस प्रणालीको सुरुवातहुनुको मुख्य उदेश्य र अवस्थाको चित्रण ■ यस प्रणाली लागु भएपछिको अवस्था	८	मौखिक, पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५: सन्दर्भ सामग्रीकामुख्यमुख्यविषयसूची ■ आधार नक्शातयारी ■ घर नम्बरको लागि परिभाषितक्षेत्र ■ पहुँच तरीकापहिचान र नामाकरण	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: सन्दर्भ सामग्रीकामुख्यमुख्यविषयसूची ■ भवन, घर पहिचान र ढोकानम्वर ■ नम्वर र नामप्लेट ■ ठेगानालेख्ने तरिका	१०	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप ७: ठेगाना प्रणालीको वैधानिकपक्ष ■ स्थानीय सरकार संचालन ऐन २०७४ को परिच्छेद १५ ■ नगरपालिकामासूचना प्रणाली सुबिधा सहितको ठेगाना प्रणाली शाखाखडा गरिनेछ तथाअन्यप्रावधानहरु	१२	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलापद: ठेगाना प्रणाली निर्देशिकाकोसिकाई ■ सँक्षेपमा सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने (सहयोग सहित) ३ नगरपालिकाहरुका ठेगाना प्रणाली निर्देशिकाको अवधारणा सामग्रीअध्ययन र छलफल गर्नुकासाथैअन्यपालिकाहरुमालागु गर्न परिमाजनवाठेगाना प्रणालीका थपतत्वहरु आवश्यक पर्ने बारेनिष्कर्ष निकाल्नु होस् ।	१५	मेटाकार्ड र चार्ट पेपर र मार्कर, पावर प्वाइन्ट	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा वापावर प्वाइन्ट तयार गरी राख्ने
सत्र संक्षेपीकरण ■ सत्रमूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ५-मेट्रिक ठेगाना प्रणालीको कार्यान्वयनपक्षबारेमा छलफल गरिनेछ भनिसत्रको अन्तगर्ने ।	५	उपलब्ध सन्दर्भ सामग्रीवितरण भईसक्ने	स.त.हुने वाव्यवस्थापनले गरिसक्ने

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली **सत्रः ५**

समयः ९० मिनेट

सत्रविषयः ठेगाना प्रणालीको कार्यान्वयन पक्ष

साधारण उद्देश्यः ठेगाना प्रणालीको कार्यान्वयन पक्ष बारे विस्तृतरुपमा जानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको ज्ञान हुने ।
- अन्य नगरपालिका स्तरमा भईरहेको वा भईसकेको ठेगाना प्रणालीको बारे बुझ्ने ।

सत्रका मुख्य विषय वस्तुः

- ठेगाना क्षेत्र विभाजन
- सडक तथा घर ठेगाना प्रणाली
- व्यवहारिक पक्ष (३ टोलीले ३ फरक ठेगाना प्रणाली निर्देशिकाको अवधारणा सामग्री अध्ययन, छलफल तथा विश्लेषण गर्नेछ) ।

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
■ **क्रियाकलाप १ः** सहभागीलाई मोडुल ४ को महत्वपूर्ण पक्ष संझन प्रयास गराउने वा गर्ने । सहभागिहरुको मोडुल ४ र ५ को सम्बन्धबारे ध्यानाकर्षण गर्न नगरपालिका तथा शहरको सडक तथा घर ठेगाना प्रणाली देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने ▪ सहभागीहरुलाई यस शत्रको परिचय विस्तृतरुपमा गराउने ▪ मोडुलको उद्देश्यहरु ▪ मोडुलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३:विषयवस्तु सम्वन्धी जानकारी भएमा न्यूनतम ७ सहभागीलाई भन्न लगाउने	१०	लागु हुदैन	(स.त.हुने)
क्रियाकलाप४: ठेगाना प्रणालीको कार्यान्वयन चरणहरु ▪ ठेगाना क्षेत्र विभाजन ▪ सडक ठेगाना प्रणाली ▪ घर ठेगाना प्रणाली	१२	मौखिक, पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५: सडक ठेगाना प्रणालीको विस्तृत विवरण ▪ सडकहरुको वर्गिकरण तथा सँकेत नम्वर ▪ सडक नामाकरण तथा नेम प्लेट आदि	१०	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: घर ठेगाना प्रणालीको विस्तृत विवरण ▪ विभिन्न किसिमका सडकहरुमा घर नम्वर प्रवाह ▪ चौक जस्ता सामुहिक वा सार्वजनिक खुल्ला ठाँउहरुमा घर नम्वर प्रवाह तथा नेम प्लेट	१०	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप ७ : व्यवहारिक पक्ष ▪ तीन वटा टोली गठन गरी कार्य विभाजन ▪ ठेगाना प्रणाली निर्देशिकाका अध्ययन छलफल	१६	पावर प्वाइन्टमा देखाउने मल्टिमेडिया, फोटोकपि	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ८: ठेगाना प्रणालीमा निर्देशिका सम्वन्धी ३ वटा टोलीको धारणा प्रस्तुतिकरण ▪ निम्न प्रश्नको जवाफ पाप्त गर्ने ठेगाना प्रणाली निर्देशिकाहरु अन्य पालिकाहरुमा लागु गर्न परिमाजन आवश्यक पर्ने वा हुवहु लागु गर्न सकिने वा नसकिने बारे टोलीको धारणा पाप्त हुने ।	१२	मेटाकार्ड र चार्ट पेपर र मार्कर, पावर प्वाइन्ट	टोलीले मेटाकार्ड, चार्ट पेपर वा पावर प्वाइन्टमा प्रस्तुती गर्ने
सत्र संक्षेपीकरण ▪ सत्र मूल्याङ्कनपश्चात् यस पछ्राडिको सत्र ६ मा समूहगतरुपमा केसहरुको अध्ययन, छलफल तथा प्रस्तुतिकरण गरिनेछ भनिसत्रको अन्त गर्ने ।	५	मौखिक	

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः ६

समयः ९० मिनेट

सत्रविषयः मामला अध्ययन तथा विश्लेषण

साधारण उद्देश्यः ठेगाना प्रणालीको कार्यान्वयनको व्यवहारिक ज्ञान र कौशलतापाप्तगराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- ठेगाना प्रणालीको कार्यान्वयनप्रकियाहरुको बारे अरुलाई प्रस्तुतीकरण गर्न सक्ने ।
- यस प्रणाली पालिकाहरुमालागु गर्न र गराउनआवश्यकपूर्वाधार बारे ज्ञान हुने ।

सत्रकामुख्यविषयवस्तुः

- केसहरुको सँक्षिप्त विवरण
- समूहगत छलफल तथा विश्लेषण
- प्रस्तुतीकरण

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोडुल ५ को महत्वपूर्ण पक्ष संमन प्रयास गराउने वा गर्ने। सहभागिहरुको मोडुल ५ र ६ को सम्बन्धबारे ध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	५	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने - सहभागीहरुलाई यस शत्रको परिचयविस्तृतरुपमा गराउने - मोडुलको उद्देश्यहरु - मोडुलको प्रारुप	५	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: समूह गठन र कामतोक्ने: सहभागीहरुलाई ३ समूहमाविभाजन गरी आवश्यक सामाग्री सहितमामलाअध्ययनकार्यको सुभारम्भको तयारी गराउने ।	१०	मेटाकार्ड, चार्ट पेपर, मार्कर, कलर पेन, तथा नोट बुक आदि	(स.त.हुने)
क्रियाकलाप४:केसहरुको सँक्षिप्तविवरण ■ केस नम्बर १:आवास परिसर ■ केस नम्बर १:कार्यालय भवन परिसर ■ केस नम्बर १: घना वस्ती क्षेत्र	१०	पावर प्वाइटमा देखाउनुका साथै केसको हार्ड प्रतिलिपिवितरण गर्ने	(स.त.हुने)
क्रियाकलाप ५:समूहगतअध्ययनतथा छलफल ■ ठेगानाक्षेत्रविभाजन ■ बाटो ठेगाना प्रणाली ■ सडक नाम र सिमानानिर्धारण ■ घर ठेगाना प्रणाली ■ घर नम्बर प्रणालीआदि	३०	नक्सा र चार्ट पेपर	सहजकर्ताले सहयोग गरेको हुन
क्रियाकलाप ६ :प्रस्तुतीकरणको तयारी ■ आवास एकाइहरु,भवनतथा घरहरुको नम्बर प्रवाह ■ वर्गिकृत सडक बाटो नामप्रवाह ■ निष्कर्ष रसिफारिसहरु	१५	पावर प्वाइट वा चार्ट पेपर	सहजकर्ताल सहयोग गरेको हुने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: प्रस्तुतीकरण पश्चातप्रश्नउत्तर ■ सँक्षेपमाप्रस्तुतीकरण सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने : सन्दर्भ सामग्रीहरु जस्तै ठेगाना प्रणाली निर्देशिकाहरु तथातालिममापाप्त ज्ञानको आधारमा केसहरुको सँक्षिप्तअध्ययन गर्न सहजभयो भएन?व्यवहारिकरुपमाठेगाना प्रणाली कार्यान्वयनप्रक्रीयामामुख्यभूमिका खेल्न सकिने वानसकिने पृष्ठपोषण गर्नुहोस् ।	१०	मेटाकार्ड र चार्ट पेपर र मार्कर, पावर प्वाइन्ट	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा वापावर प्वाइन्ट तयार गरी राख्ने
सत्र संक्षेपीकरण ■ सत्रमूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ७-नयाँप्रविधिबारेमा छलफल गरिनेछ भनिसत्रको अन्तगर्ने ।	५	उपलब्ध सन्दर्भ सामग्रीवितरण भईसक्ने	स.त.हुने वाव्यवस्थापनले गरिसक्ने

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   **सत्रः ७**

समयः ९० मिनेट

सत्रविषयः नयाँप्रविधिको आधारमा ठेगाना प्रणालीको विकास

साधारण उद्देश्यः ठेगाना प्रणालीमानयाँप्रविधिको प्रयोग बारे जानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

☐ उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगकाज्ञान हुने ।

☐ नगरपालिका स्तरको डाटाबेसबारे बुझ्ने ।

सत्रका मुख्य विषयवस्तुः

☐ ड्रोन आधारित ठेगाना प्रणालीको चरणहरु

☐ नगरपालिका स्तरको डाटाबेस र म्यापिङ्ग

☐ गुगल नक्शाप्लस कोड प्रणाली

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोडुल ६ को महत्वपूर्ण पक्ष संम्कन प्रयास गराउने वा गर्ने। सहभागिहरुको मोडुल ६ र ७ को सम्बन्धबारे ध्यानाकर्षण गर्न शहरको चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने ▪ सहभागीहरुलाई यस शत्रको परिचयविस्तृतरुपमा गराउने ▪ मोडुलको उद्देश्यहरु ▪ मोडुलको प्रारुप	८	स्लाइड, मेटाकार्ड, चार्ट पेपर र मार्कर	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३:विषयवस्तु सम्वन्धीजानकारी भएमान्यूनतम १० सहभागीलाई भन्नलगाउने	१०	लागु हुँदैन	(स.त.हुने)
क्रियाकलाप४:ड्रोनआधारितठेगाना प्रणालीको चरणहरु ■ उपलब्धदोस्रोतहको सूचना सँकलन ■ हवाई छविहरुको अधिग्रहण	१२	मौखिक, पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५:ठेगाना प्रणालीको लागि डाटा तयारी ■ भवनहरु, सडकहरुको लागि डाटा तहहरुको डिजिटाईजेसन ■ हाई रिजोलुसन इमेजरि ओवरले गर्ने ■ हाउसहोल्ड डाटा तयारी आदि	१२	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै मेटाकार्डहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६:ठेगाना प्रणालीमा नयाँप्रविधि ■ एक अवसरका साथै ■ चुनौतिपनिहो	९	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप ७:गुगलनक्साप्लसकोड प्रणाली ■ गुगलनक्साको आधारमा बाटो घर ठेगानाथाहापाउने ■ गुगलनक्सामार्फत बाटो घर ठेगानाथाहापाउनप्लसकोडको प्रयोगतथाअन्यप्रकियाहरु	१२	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ८: ठेगाना प्रणालीमानयाँप्रविधिको प्रयोगको सँभावना ■ सँक्षेपमा सत्रको महत्वपूर्ण चित्रको स्लाइड पुण देखाउने र निम्नप्रश्नको जवाफपाप्त गर्ने पालिकाहरुका ठेगाना प्रणाली प्रक्रीयामाविद्यमानप्रविधिहरुको प्रयोग व्यवहारिक भएनभएको अध्ययन, छलफल तथाविश्लेषण गरी निष्कर्ष निकाल्नु होस् ।	१५	मेटाकार्ड र चार्ट पेपर र मार्कर, पावर प्वाइन्ट	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा वापावर प्वाइन्ट तयार गरी राख्ने
सत्र संक्षेपीकरण ■ सत्रमूल्याङ्कनपश्चात् सत्रको छोटकरीमा छलफल भएकाविषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ८-सम्पूण मोडुलहरुको समिक्षा र पोष्ट टेष्ट गरिनेछ भनिसत्रको अन्तगर्ने ।	५	मौखिक	

सत्र योजना

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   **सत्रः** ८

समयः ९० मिनेट

सत्रविषयः मोडुल १ देखि ७ सम्मको समिक्षा

साधारण उद्देश्यः ठेगाना प्रणालीका सबै मोडुल बारे छोटो जानकारी गराउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

- सबै सत्रका मुख्य मुख्य विषय समेटेको पोष्ट टेष्ट मा सफलता हासिल गरेको हुने ।

सत्रका मुख्य विषयवस्तुः

- मोडुल १ देखि ७ सम्मको सबै सत्रका मुख्य मुख्य विषयगत समिक्षा

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १:सहभागीलाई मोडुल ७को महत्वपूर्ण पक्ष संझन प्रयास गराउने वा गर्ने। सहभागिहरुको मोडुल १ देखि ७ सम्मको सम्बन्धबारे ध्यानाकर्षण गर्न चित्रम्यापआदि देखाउँदै छलफल गर्ने ।	७	चित्रको स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने (स.त.हुने)
क्रियाकलाप २:सत्रको परिचयतथाउद्देश्यहरु र प्रारुपको जानकारी गराउने - सहभागीहरुलाई यस शत्रको परिचयविस्तृतरुपमा गराउने - मोडुलको उद्देश्यहरु - मोडुलको प्रारुप	८	स्लाइड	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३:सहभागीहरुलाइसबै सत्रकामुख्यमुख्यवषयवस्तु सँझन र लेख्न लगाउने	१०	स्लाइडतथामेटाकार्ड	(स.त.हुने)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप४:मोडुल १ र २ सत्रकामुख्यमुख्यविषयगत समिक्षा ▪ काठमाण्डौ उपत्यका मानचित्रण परियोजना ▪ नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा	१२	मौखिक, पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ५:मोडुल ३ र ४ सत्रकामुख्यमुख्यविषयगत समिक्षा ▪ काठमाण्डौ उपत्यका मानचित्रण परियोजना ▪ नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा	१२	पावर प्वाइटमा देखाउने मल्टीमेडिया	(स. त.हुने)
क्रियाकलाप ६:मोडुल ५ र ६ सत्रकामुख्यमुख्यविषयगत समिक्षा ▪ ठेगाना प्रणालीको कार्यान्वयनप्रकियाहरु ▪ केसहरुको सँक्षिप्तविवरण	१२	पावर प्वाइटमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप ७: मोडुल ७ सत्रकामुख्यमुख्यविषयगत समिक्षा ▪ ठेगाना प्रणालीमा फ्रन्टियर टेक्नोलेजिको प्रयोग	६	पावर प्वाइन्टमा देखाउने मल्टिमेडिया	(स.त.हुने)
क्रियाकलाप ८: पोष्ट टेष्ट ▪ सँक्षेपमा सबै सत्रको महत्वपूर्ण विषयहरु समावेश गरिएको प्रश्नपत्रकोजवाफपाप्त गर्ने । **सत्र संक्षेपीकरण** ▪ पोष्ट टेष्टमूल्याङ्कनपश्चात् मोडुलहरुको समिक्षाप्रतिकिया, समग्र पृष्ठपोषण र समापनगर्ने ।	३० १८	प्रश्नपत्रवितरण गर्ने मौखिक	सहजकर्ताले पहिला नै प्रश्नहरु निश्चित फरम्याटमा तयार गरी राख्ने

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः ९

समयः ९० मिनेट

सत्रविषयः Introduction and Concept to GIS (Concept and Demo on Software and Database)

साधारण उद्देश्यः GIS को बारेमा सैध्दान्तिक ज्ञान दिने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. GIS को बारेमा सैध्दान्तिक ज्ञान हासिल गरेको हुनेछन् ।

२. नेपालको विभिन्न निकायहरुमा GIS प्रणालीको प्रयोग र यस बाट सँस्थाले प्राप्त गरेको उपलब्धताको बारेमा जानकरी प्राप्त गर्नेछन् ।

३. Street Addressing and Mapping कार्यमा GIS को महत्व तथा प्रयोगको बारेमा जान्नेछन्।

४. GIS प्रणाली सँचालनको लागि प्रयोग गरिने Software (QGIS) को बारेमा थाहा पाउनेछन्

५. सहभगी आफैंले GIS Software आफ्नो कम्प्युटरमा install गर्न सक्नेछन्

सत्रका मुख्य विषयवस्तुः

▪ Introduction to GIS
▪ GIS Development in Nepal
▪ Importance and Advantage of using GIS in Street Addressing
▪ GIS Software Introduction (QGIS)
▪ Software installation (QGIS)

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न विभिन्न नक्शाहरु देखाई छलफल गर्ने ।	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Introduction to GIS • GIS Development in Nepal • Importance and Advantage of using GIS in Street Addressing • QGIS Software Introduction	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ४: GIS Software Installation ▪ हरेकलाई सफ्टवेयर **Install** गर्न लगाउने	१ घण्टा	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ५: सत्रको मूल्याङ्कन तथा संक्षेपीकरण सत्र मूल्याङ्कन ▪ Software Install गर्दा आईपरेको समस्याको बारेमा सहभागीहरुलाई सोध्ने । सत्र संक्षेपीकरण ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्छाडिको सत्र २ मा Exploring QGIS Tools **को बार**ेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

समयः ९० मिनेट

सत्रविषयः Exploring QGIS Tools

साधारण उद्देश्यः QGIS Software मा उपलब्ध विभिन्न **Tools** हरुको बारेमा ज्ञान दिने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. QGIS Desktop Software सँचालन गरी GIS Data बारेमा परिचित हुनेछन्।
२. नेपाल सरकार, नापी विभागले तयार गरेको विभिन्न GIS Data Layer हरुको बारेमा जानकारी प्राप्त गरी त्यसलाई Software मा कसरी Load गर्ने ? सिक्दछन् ।
३. QGIS Desktop Interface मा उपलब्ध Menu Bar, Tool Bar, Shortcut Keys, Icon हरुको बारेमा सिकि त्यसलाई प्रयोग गर्न जान्दछन् ।
४. QGIS Browser को बारेमा थाहा पाउनेछन् ।
५. QGIS ProcessingTool Box को बारेमा थाहा पाउनेछन् ।

सत्रका मुख्य विषयवस्तुः

- Getting started
- Touring to QGIS Desktop with introduction and demonstration of different tools
- Working with existing data and preparing maps
- Introduction of QGIS Browser
- Introduction of QGIS Processing Tool Box

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ः सहभागीको ध्यानाकर्षण गर्न QGIS Desktop Software संचालन गरी विभिन्न नक्शाहरु देखाउने ।	१०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २ः सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: विषयवस्तु सम्बन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Getting started • Touring to QGIS Desktop with introduction and demonstration of different tools	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Working with existing data and preparing maps ▪ हरेकला सहभागीहरुलाई सफ्टवेयर संचालन गर्न लगाई त्यसमा **GIS Data** हरु **Load** गर्न लगाउने ▪ **GIS Data** हरुको बारेमा सहभागीहरुलाई परिचित गराउने ।	३०	कम्प्युटरमा देखाउने	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Working QGIS Browser and QGIS Processing Tool Box ▪ हरेकला सहभागीहरुलाई सफ्टवेयर संचालन गर्न लगाई QGIS Browser and QGIS Processing Tool Box प्रयोग गर्ने लगाउने।	३०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ▪ Software संचालन गर्दा आईपरेको समस्याको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्राडिको सत्र **3** मा GIS Database Concepts and Management को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५	प्रयोगात्मक	सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

	सत्र योजना

मोड्युलः सडक ठेगाना र भौगोलिक सूचना प्रणाली **सत्रः ११**

समयः ९० मिनेट

सत्रविषयः GIS Database Concepts and Management

साधारण उद्देश्यः GIS Database को विभिन्न स्रोतहरुको बारेमा जानकारी गराई यसलाई कसरी व्यवस्थापनग गर्ने बारेमा ज्ञान दिने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. GIS Data को बिभिन्न स्रोतहरु जस्तैः विभिन्न निकायले प्रकासनमा ल्याएको नक्सा (Analogue Map), सेटलाईट ईमेज, नापी विभाग तथा अन्य सँस्थाहरुले तयार पारेका Digital Data, Remote Sensing Image, Global Positioning System (GPS) Device, Digitization of Paper Maps, आदिको बारेमा जान्नेछन् ।

२. माथी उल्लेखित विभिन्न स्रोतहरुबाट प्राप्त GIS Data लाई QGIS Browser को प्रयोग गरी व्यवस्थापन गर्न सिक्नेछन् ।

३. QGIS Browser को बारेमा जानकारी प्राप्त गरी यसबाट Polyline, Polygon तथा Point Feature हरु बनाउन तथा माथी उल्लेखित स्रोतहरु बाट प्राप्त GIS Data लाई QGIS Browser मा Import गर्न जान्दछन् ।

सत्रका मुख्य विषयवस्तुः

- Data sources and capturing methods
- GIS Database management using QGIS Browser
- Creating Feature Dataset using QGIS Browser
- Concept of Geo-database

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न GIS Data QGIS Desktop मा Load गरी विभिन्न नक्शाहरु देखाउने ।	५	कम्पयुटरमा देखाउने	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Data sources and capturing methods • GIS Database management using QGIS Browser • Creating Feature Dataset using QGIS Browser • Concept of GIS Database	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Working with existing data and preparing maps ▪ हरेक सहभागीहरुलाई QGIS Browser सफ्टवेयर संचालन गर्न लगाई त्यसबाट **GIS Data** हरु व्यवस्थापनग गर्न लगाउने ▪ **GIS Data** हरुको बारेमा सहभागीहरुलाई परिचित गराउने ।	२०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Creating Feature Dataset using QGIS Browser ▪ हरेकला सहभागीहरुलाई QGIS Browser सफ्टवेयर संचालन गर्न लगाई त्यसबाट **Point, Poly Line, Polygon Feature** हरु बनाउन सिकाउने	२५	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: Concept of Geodatabase ■ हरेक सहभागीहरुलाई Geodatabase सम्बन्धी व्यवहारिक रुपमा सिकाई त्यसबाट GIS Data हरु व्यवस्थापनग गर्न लगाउने	१०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ■ Software संचालन गर्दा आईपरेको समस्याको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ■ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्राडिको सत्र ४ मा **Concept of Geo-referencing** को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   सत्रः १२

समयः ९० मिनेट

सत्रविषयः Concept of Geo-referencing

साधारण उद्देश्यः उपलब्ध नक्शा (Ajalogue Map) लाई Geo-Referencing गरी Coordinate Register गर्न सिकाउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. बिभिन्न निकायहरुले प्रकासनमा ल्याएका नक्साहरुमा देखाइएको अक्षाँस र देशान्तर नम्बरहरु QGIS Desktop Software मा रजिष्टर गरी Analogue Map लाई Geo Reference गर्न जानेको हुनु पर्नेछ ।

२. Geo Reference गरिएको नक्सालाई नेपाल सरकार, नापी विभागले अवलम्बन गरेको Map Projection System (Projection System: Modified Universal Transverse Mercator, Datum: Everest1830) मा Projection गर्न जान्ने हुनु पर्छ ।

३. यसरी Geo Reference र Projection गरिएको नक्सालाई आधार बनाई त्यसमा देखाइएका आफ्नो उद्देश्य सँग सम्बन्धित तथ्याँकहरु (उदाहरणको लागी Topo Map मा देखाइएको सडक सन्जाल, नदी, खोला, खोल्सी, वस्तीहरु, भू-उपयोग, आदी) Digitize गर्न सक्ने हुनेछन् ।;

सत्रका मुख्य विषयवस्तुः

- Exercise on Geo-referencing spatial data from scanned Topo Sheet
- Projection and transformation of geo-referenced data
- Creation of Point, Line and Polygon feature from digitizing geo-referenced Topo Sheet

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ः सहभागीको ध्यानाकर्षण गर्न बिभिन्न निकायहरुले प्रकासनमा ल्याएका नक्साहरु देखाउने ।	५	कम्प्युटरमा देखाउने	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २ः सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: विषयवस्तु सम्बन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Concept of Coordinate System • Nepal Coordinate System • Google Earth Coordinate Sytem • Map Projection System	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Exercise on Geo-referencing spatial data from scanned Topo Sheet ▪ हरेक सहभागीहरुलाई **Scanned Topo Sheet** दिई GIS मा **Coordinate Register** गर्न लगाउने ।	२०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Projection and transformation of geo-referenced data ▪ **Geo-Reference** गरिएको **Scanned Topo Sheet** लाई नापी विभागको **Projection System**मा **Projection** तथा **Transformation** गर्न सिकाउने ।	२५	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: Creation of Point, Line and Polygon feature from digitizing geo-referenced Topo Sheet ● **Projectin and Tranformation** गरिएको **Scanned Topo Sheet** लाई आधार बनाई **Point, Poly Line, Polygon Feature** हरु **Digitize** गर्न सिकाउने ।	१०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ▪ Projection and Tranformation, Coordinate Value Registration गर्दा आईपरेका समस्याको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्राडिको सत्र ५ मा **GPS and GIS Data Integration** को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोड्युलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   सत्रः १३

समयः ९० मिनेट

सत्रविषयः GPS and GIS Data Integration

साधारण उद्देश्यः Global Positioning System (GPS) को बारेमा सैद्धान्तिक ज्ञान प्रदान गर्ने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. Global Positioning System (GPS), यसको आविस्कार, यसका विभिन्न कम्पोनेन्टहरु, सिद्धान्त तथा यसमा आधारित रही तयार पारिएका विभिन्न Application हरु, आजको युगमा यसको नविनतम प्रयोग, फाईदा तथा बेफाईदाका बारेमा सैद्धान्तिक जानकारी हासिल गर्दछन् ।

२. GPS प्रणालीको Space Segment, Control Segment र User Segment को सहायताबाट पृथ्बीको कुनै सतहमा रहेको वस्तुको भौगोलक अवस्थिति (अक्षाँस, देशान्तर, उचाई) संकलन गर्ने विधि जान्दछन् ।

३. GPS Device को माध्यमबाट संकलन गरिएका तथ्याँकहरुलाई GIS को प्रयोगबाट कसरी Download गर्ने र विभिन्न नक्शाहरु तयार पार्ने कुराको जानकारी पाउँदछन् ।

४. GPS को तथ्यांकहरु प्रयोग गरी तयार पारिएका विभिन्न नक्शाहरुलाई नापी विभाग तथा अरु निकायहरुले पहिलेदेखी नै बनाईरहेका नक्शाहरुमा कसरी आबद्ध गर्ने भन्ने बारेमा प्रयोगात्मक जानकारी पाउँदछन् ।

सत्रका मुख्य विषयवस्तुः
- GPS Theoretical Concept
- Capturing real world data using GPS
- Downloading GPS data and plotting
- Integration of GPS Data to existing Spatial Features

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ः सहभागीको ध्यानाकर्षण गर्न बिभिन्न GPS Devices हरु देखाउने ।	५	GPS Devices देखाउने	सहजकर्ताले पहिला नै GPS Devices हरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २ः सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • GPS Theoretical Concept	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Capturing real world data using GPS ▪ **GPS Device** प्रयोग गरी **real world data capture** गरी देखाउने ▪ सहभागीहरुलाई समेत **GPS Device** प्रयोग गरी **real world data capture** गर्न लगाउने	३०	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Downloading GPS data and plotting ▪ **GPS Device** प्रयोग गरी संकलनग गरीएको **Data** लाई **GIS System** मा **Download** गरी **Plotting** गर्न सिकाउने ।	१५	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: Integration of GPS Data to existing Spatial Features • **Download and Plotting** गरीइको **GPS** बाट लिइएको **GIS Data** लाई पहिला नै तयार पारि राखिएको विभिन्न **Spatial Feature (Point, Line, Polygon)** संग आबद्ध गर्न सिकाउने ।	१०	प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ▪ GPS Device पर्योग गर्दा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्छाडिको सत्र ६ मा **Google Earth, Open Street Mapping and GIS Data Integration को बारे**मा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*
- https://en.wikipedia.org/wiki/Global_Positioning_System

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः १४

समयः ९० मिनेट

सत्रविषयः Google Earth. Open Street Mapping and GIS Data Integration

साधारण उद्देश्यः Google Earth, Open Street Maps तथा अन्य Satellite Images, Remote Sensing को बारेमा सैद्धान्तिक ज्ञान प्रदान गर्ने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. Google Earth प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु (उदाहरणको लागी, महत्वपुर्ण स्थानहरुको भौगोलिक अवस्थिति, बाटोको रेखाँकन, ताल, जँगल, आदी) Digitize गर्ने बारे जान्दछन ।

२. Open Street Maps को प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु Digitize गर्ने बारे जान्दछन ।

३. Street Addressing and Mapping कार्यमा बढी भन्दा बढी आवस्यक हुने तथ्यांकहरु जस्तै: घर रहेको स्थान, त्यस स्थान सम्म पुग्ने बाटो आदि Google Earth मा हेरिकन ति स्थानहरुलाई Digitize गरी अरु निकायहरुले पहिलेदेखी नै बनाईरहेका नक्शाहरुमा कसरी आबद्ध गर्ने भन्ने बारेमा प्रयोगात्मक जानकारि पाउँदछन् ।

४. Google Earth प्रयोग बाट लिईएको तथ्यांकहरु KML Format मा हुने भएको हुँदा उक्त KML Format लाई GIS का विभिन्न Application हरुले पढ्न सक्ने Format (Shape File / Geodatabase) मा कसरी रुपान्तरण गर्ने भन्ने बारे जानकारी प्राप्त गर्दछन ।

सत्रका मुख्य विषयवस्तुः
- Concept and Demo on Google Earth
- Concept and Demo on Open Street Map
- GIS Data Capturing using Google Earth and Open Street Maps
- Conversion from and to KML - Shape File/Geodatabase

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न Google Earth, Open Street Maps बाट नेपालको विभिन्न भागहरु हरु देखाउने ।	५	कम्प्युटरमा देखाउने	सहजकर्ताले पहिला नै कम्प्युटर हरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Concept and Demo on Google Earth • Concept and Demo on Open Street Maps	१५	Demo तथा पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: GIS Data Capturing using Google Earth and Open Street Map • Google Earth and Open Street Map प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु (उदर्हरणको लागी, महत्वपुर्ण स्थानहरुको भौगोलिक अवस्थिति, बाटोको रेखाँकन, ताल, जँगल, आदी) Digitize गर्ने सिकाउने।	३०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Conversion from and to KML - Shape File/Geodatabase ▪ Google Earth बाट Catpure गरीएका Point, Polyline and Polygon Feature हरुको Format बाट GIS System को Data Format (Shapefile/Geodatabase) मा रुपान्तर गर्ने सिकाउने।	१५	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ▪ Google Earth Download and Installation मा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछ्याडिको सत्र ७ मा **Spatial and Attribute Data Integration in GIS को बारेमा** छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*
- https://www.google.com/earth/versions/

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

सत्रः १५

समयः ९० मिनेट

सत्रविषयः Spatial and Attribute Data Integration in GIS

साधारण उद्देश्यः Spatial Data, Attribute Data को बारेमा सैद्धान्तिक ज्ञान प्रदान गरी यी दुबै Data लाई एक आपसमा आबद्ध गर्ने बारेमा ज्ञान प्रदान गर्ने ।

निर्दिष्ट उद्देश्यहरूः सहभागीहरूले यस सत्रको अन्त्यमा,

१. GIS Data (Point, Line and Polygon) र ती GIS Data को बर्णात्मक विवरण (Attribute Data) हरु रहेको File हरु अलग अलग हुन सक्दछन् । त्यस्तो अवस्थामा ती २ वटै File हरुमा रहेको तथ्यांकलाई जोडी ऐकिकृत गर्नु पर्ने हुन्छ ।

२. उदाहरणको लागि सँघिय नेपालमा रहेका ७५३ स्थानिय निकायहरु देखाउने नक्शा को GIS Data (Polygon) Format मा रहेको हुन्छ भने ती स्थानीय निकायको अरु बर्णात्मक विवरणहरु (जस्तै, जनसँख्या, घरधुरि सँख्या, परिवार सँख्या, आदी) Attribute Data Spreadsheet Format मा रहेको हुन सक्छ। प्रशिक्षार्थिहरुले यो सत्रमा यी दुवै Format मा रहेको तथ्यांकहरुलाई एक आपसमा जोड्न जान्ने भएको हुनु पर्नेछ ।

३. Street Addressing and Mapping को हकमा घर तथा बाटोको भौगोलिक अवस्थिति GIS Data (Point and Polyline) हो भने घर सम्बन्धि अन्य विवरणहरु (जस्तै: घरमुलिको नाम, परिवार सँख्या, मुख्य पेशा, बार्षिक आम्दानि तथा खर्च र बाटो सम्बन्धि बिबरणहरु) Attribute Data (Spreadsheet) हो ।

४. प्रशिक्षार्थिहरुले Attribute Data को आधारमा GIS Data Selection गर्ने विधिबारे जान्दछन् । जस्तै घरहरुको बारेमा तयार पारिएको तथ्यांकमा Attribute Query प्रयोग गरी जम्मा तथ्यांक मध्ये परिवार सँख्या ७ देखी माथी रहेका घरहरु छान्न सक्ने हुनेछन् ।

सत्रका मुख्य विषयवस्तुः
- Joining Data in GIS
- (Spatial and attribute)
- Query Building
- Exercise on Selection of Spatial Features using Attribute Query

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न बिभिन्न Attribute Query प्रयोग गरी थरी थरीको नक्शाहरु देखाउने ।	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Spatial Dtaa Concept • Vector Data • Raster Data • Attribute Data Concept • Socio-economic Data	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Joining Data in GIS (Spatial and attribute) ▪ **GIS System** प्रयोग गरी **Spatial Data (Point, Line, Polygon)** मा **Attribute Data Join** गरी देखाउने ▪ सहभागीहरुलाई समेत सोही अभ्यास गर्न लगाउने	२०	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Query Building ▪ **GIS System** मा उपलब्ध विभिन्न Query Building प्रयोग गर्न सिकाउने ।	१५	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: Exercise on Selection of Spatial Features using Attribute Query ● **GIS System** मा उपलब्ध विभिन्न Query Building प्रयोग गरी यसको आधारमा **Spatial Feature (Point, Line, Polygon) Selection** गर्न सिकाउने ।	२०	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्न** ▪ **Query Building** पर्योग गर्दा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्न पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ८ मा **Calculation and Measurement of Spatial Features को बारेमा** छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   सत्रः १६

समयः ९० मिनेट

सत्रविषयः Calculation and Measurement of Spatial Features

साधारण उद्देश्यः Spatial Features (Polyline Length, Polygon Area मापन गर्न सिकाउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१.   Digitize गरी तयार पारिएका Line Feature (Street Addressing and Mapping को हकमा बाटो) को लम्बाई GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।

२.   त्यस्तै Digitize गरी तयार पारिएका Polygon Feature (Street Addressing and Mapping को हकमा घर तथा त्यसले चर्चेको क्षेत्र) को क्षेत्रफल GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।

३.   Summarization Tool प्रयोग गरी GIS Data हरुको जम्मा क्षेत्रफल तथा लम्बाई गणना गर्ने विधि जान्दछन् । उदाहरणको लागी कुनै एउटा मुल सडक (एकता मार्ग) भित्र रहेका विभिन्न सहायक सडक खण्डहरु (एकता मार्ग भित्र रहेका सडकहरु मात्र) को कुल लम्बाई गणना गर्न सक्ने हुनु पर्नेछ ।

सत्रका मुख्य विषयवस्तुः
- Management of Attribute table
- Length Calculation
- Area Calculation
- Summarization

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न Spatial Data को Length and Area Calculation गरी **देखाउने** ।	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Management of Attribute table • Unit of Length • Unit of Area • Summarization	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Length Calculation ▪ Digitize गरी तयार पारिएका Line Feature (Street Addressing and Mapping को हकमा बाटो) को लम्बाई GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे अभ्यास गर्न लगाउने	२०	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Area Calculation ▪ Digitize गरी तयार पारिएका Polygon Feature (Street Addressing and Mapping को हकमा घर तथा त्यसले चर्चेको क्षेत्र) को क्षेत्रफल GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे अभ्यास गर्न लगाउने	१५	**Demo** तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ७: Summarization • Summarization Tool प्रयोग गरी GIS Data हरुको जम्मा क्षेत्रफल तथा लम्बाई गणना गर्ने विधिको बारेमा अभ्यास गराइनेछ । उदाहरणको लागी कुनै एउटा मुल सडक (एकता मार्ग) भित्र रहेका विभिन्न सहायक सडक खण्डहरु (एकता मार्ग भित्र रहेका सडकहरु मात्र) को कुल लम्बाई गणना गर्ने लगाईनेछ ।	२०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ८: सत्रको मूल्याङ्कन तथा संक्षेपीकरण सत्र मूल्याङ्कन ▪ **Length and Area** को **Unit Conversion** प्रयोग गर्दा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । सत्र संक्षेपीकरण ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र ९ मा **Geo-Processing** को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

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- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोड्युलः सडक ठेगाना र भौगोलिक सूचना प्रणाली

समयः ९० मिनेट

सत्रविषयः Geo-Processing

साधारण उद्देश्यः दुरी विष्लेशण, **Bufering and Clipping Analysis of Spatial Features** गर्न सिकाउने ।

निर्दिष्ट उद्देश्यहरुः सहभागीहरुले यस सत्रको अन्त्यमा,

१. GIS मा रहेको Buffering को प्रयोग गरी पहुँच (दुरी) विष्लेशण गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्राप्त गर्दछन् ।

२. उदाहरणको लागी कुनै वडा केन्द्रको २ कि.मि. परिधिभित्र पर्ने घरधुरिहरु छानी सँख्या पत्ता लगाउनको लागि Buffering Tool प्रयोग गरिन्छ ।

३. यसका साथै सडकको दायाँ बायाँ ३० मी. को क्षेत्र रेखाँकन गर्नु परेमा समेत यो Tool को प्रयोग गर्न सकिन्छ ।

४. Clipping Analysis Tool को मद्दतबाट कुनै स्थानको पहिचान गरी त्यस स्थानमा रहेका थप Spatial Feature (जस्तै, नदि, बाटो, भु-उपयोग, आदी) छान्न सक्ने हुनेछन् । उदाहरणको लागि गाउँपालिका तथा नगरपालिकामा रहेका विभिन्न Spatial Feature हरु मध्ये कुनै निश्चित वडाको मात्रै Spatial Feature हरु छुट्याउनु परेमा यो Analysis Tool को प्रयोग गरिन्छ ।

सत्रका मुख्य विषयवस्तुः
- Select and Clipping Analysis
- Proximity Analysis using Buffering
- Overlay Analysis using Intersect and Identity

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १: सहभागीको ध्यानाकर्षण गर्न Accessibility Maps देखाउने ।	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २: सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३: विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Select and Clipping Analysis • Proximity Analysis using Buffering • Overlay Analysis using Intersect and Identity	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Select and Clipping Analysis ▪ Clipping Analysis Tool को मद्दतबाट कुनै स्थानको पहिचान गरी त्यस स्थानमा रहेका थप Spatial Feature (जस्तै, नदि, बाटो, भु-उपयोग, आदी) छान्न लगाउने ।	२०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Proximity Analysis using Buffering • GIS मा रहेको Buffering को प्रयोग गरी पहुँच (दुरी) विष्लेशण गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्रदान गर्ने ।	१५	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: Overlay Analysis using Intersect and Identity • Spatial Features (Point, Line, Polygon) लाई एक आपसमा Overlya गरी Intersection and Identity विष्लेशण गर्ने गर्ने लगाईनेछ ।	२०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ८: सत्रको मूल्याङ्कन तथा संक्षेपीकरण **सत्र मूल्याङ्कन** ▪ **Overlay Analysis using Intersect and Identity** पर्योग गर्दा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । **सत्र संक्षेपीकरण** ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र १० मा **Output Designing (Map Layout)** को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

मोडुलः सडक ठेगाना र भौगोलिक सूचना प्रणाली   सत्रः १८

समयः ९० मिनेट

सत्रविषयः Output Designing (Map Layout)

साधारण उद्देश्यः Cartographic Elements को बारेमा जानकारि प्रदान गरी Standard Color and Symology को बारेमा प्रशीक्षण गर्ने ।

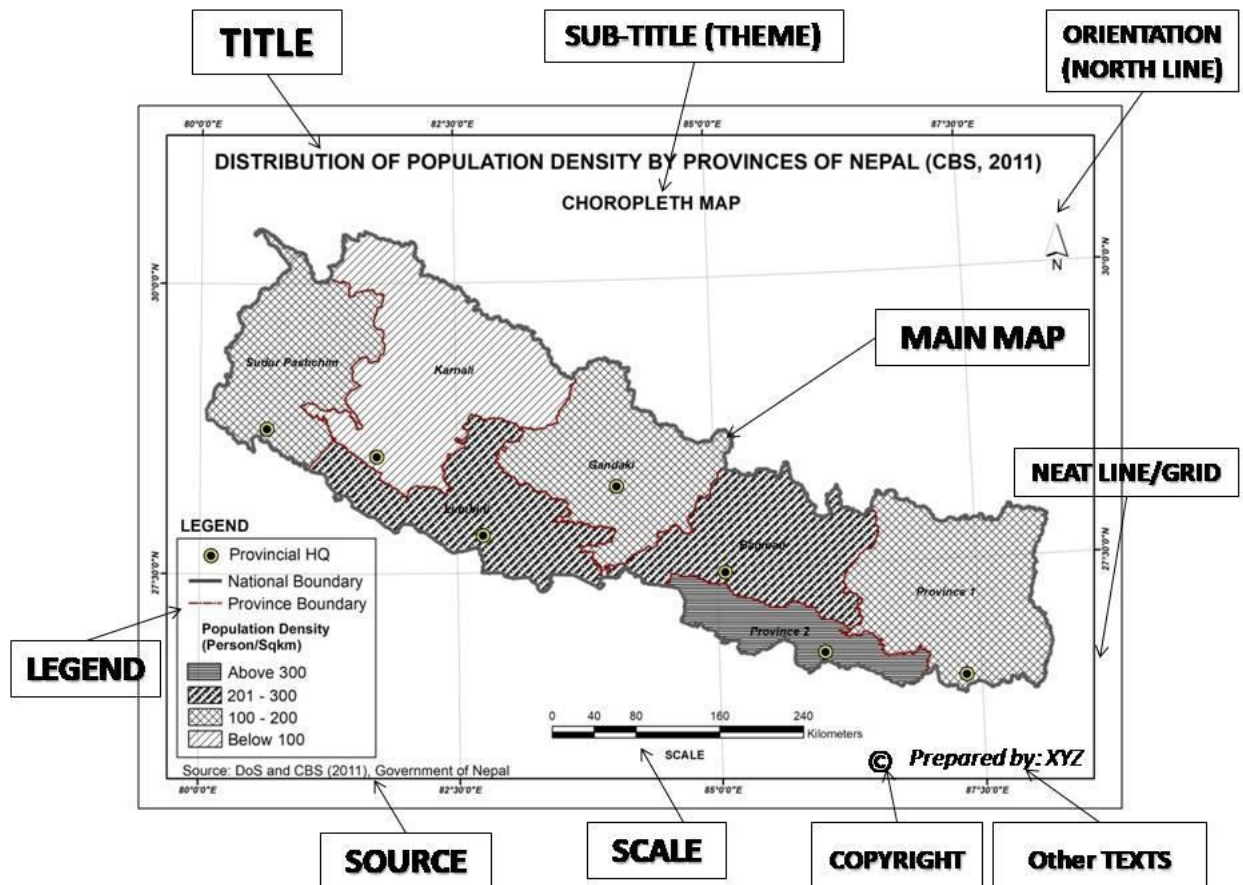**निर्दिष्ट उद्देश्यहरुः** सहभागीहरुले यस सत्रको अन्त्यमा,

१. Cartographic Elements को बारेमा जानकारि प्राप्त गर्दछन । उदाहरणको लागी GIS नक्शामा अनिवार्य देखाउनु पर्ने Map Scale, Direction, आदिको बारेमा जानकारि प्राप्त गर्दछन् ।

२. त्यसै गरी Map Symbology, Standard Colors for Specific Features को बारेमा जानकारी पाउनेछन् ।

३. विभिन्न Map Symbology बिधिहरु (Single Symbol, Symbol by quantities, Symbol by Categories, Dot Density, Chart Symbology) को उचित प्रयोगको बारेमा जानकारी प्राप्त गर्दछन् ।

४. Map Layout तथा Symbology, संकेत, Map Title प्रयोग गरी प्रकाशनको लागि तयार गर्ने बारे प्रयोगात्मक जानकारी पाउनेछन् ।

सत्रका मुख्य विषयवस्तुः

*   Concept of Mapping and Cartographic Elements
*   Working on Field Properties
*   Labeling and Symbology
*   Layout Designing
*   Change into Reporting Format

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ः सहभागीको ध्यानाकर्षण गर्न Cartography Elements सहित प्रकाशन भएका बिभिन्न नक्शाहरु देखाउने ।	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप २ः सत्रको परिचय तथा उद्देश्यहरु र प्रारुपको जानकारी गराउने	५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै तयार गरी राख्ने
क्रियाकलाप ३ः विषयवस्तु सम्वन्धी सहभागीलाई जानकारी भएमा भन्न लगाउने	५		

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ४: सत्रको मुल विषयवस्तु सम्बन्धी प्रस्तुतिकरण • Concept of Mapping and Cartographic Elements	१५	पावर प्वाइटमा देखाउने मल्टीमेडिया	सहजकर्ताले पहिला नै चेक गरी मल्टीमेडिया तयार गरी राख्ने
क्रियाकलाप ५: Working on Field Properties ▪ Field Properties को प्रयोग गरी बिभिन्न Symbology, Coloring गर्ने अभ्यास गराउने ।	२०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ६: Labeling and Symbology • GIS नक्शामा देखाउनु पर्ने विभिन्न Labeling (परिचयात्मक नामहरु) गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्रदान गर्ने ।	१५	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ७: Layout Designing • Map Layout तथा Symbology, संकेत, Map Title, North Arrow, Scale प्रयोग गरी प्रकाशनको लागि तयार गर्ने बारे प्रयोगात्मक जानकारी गराउने ।	२०	Demo तथा प्रयोगात्मक	सहजकर्ताले पहिला नै कम्प्युटरहरु क्रमसंग तयार गरी राख्ने
क्रियाकलाप ८: सत्रको मूल्याङ्कन तथा संक्षेपीकरण सत्र मूल्याङ्कन ▪ **Map Scale, Map Layout र Map Export** मा आई परेका समस्याहरुको बारेमा सहभागीहरुलाई सोध्ने । सत्र संक्षेपीकरण ▪ सत्र मूल्याङ्कन पश्चात् सत्रको छोटकरीमा छलफल भएका विषयवस्तु स्पष्ट गर्दै अब यस पछाडिको सत्र **Project Work** को बारेमा छलफल गरिनेछ भनिसत्रको अन्त गर्ने ।	५		सहजकर्ताले पहिला नै प्रश्नहरु मेटाकार्डमा तयार गरी राख्ने

TITLE

SUB-TITLE (THEME)

ORIENTATION (NORTH LINE)

DISTRIBUTION OF POPULATION DENSITY BY PROVINCES OF NEPAL (CBS, 2011)

CHOROPLETH MAP

MAIN MAP

NEAT LINE/GRID

LEGEND

- ⊙ Provincial HQ
- —— National Boundary
- —·— Province Boundary

Population Density
(Person/Sqkm)
- Above 300
- 201 - 300
- 100 - 200
- Below 100

Source: DoS and CBS (2011), Government of Nepal

LEGEND

0 40 80 160 240 Kilometers

SCALE

© Prepared by: XYZ

SOURCE

SCALE

COPYRIGHT

Other TEXTS

Reference Materials:

- Training Manual prepared for GIS Training
- *https://docs.qgis.org/3.16/en/docs/training_manual/index.html*

परियोजना कार्य:

मोडुल: सडक ठेगाना र भौगोलिक सूचना प्रणाली

समय: १८० मिनेट

निर्दिष्ट उद्देश्यहरु: सहभागीहरुले यस सत्रको अन्त्यमा,

१. GPS Device प्रयोग गरी प्रशिक्षार्थीहरुले आफ्नो परियोजना अन्तर्गतको क्षेत्रमा रहेका घर, बाटो, सँस्थागत संरचनाहरु, मठ, मन्दीर आदिको तथ्यांक सँकलन गर्नु पर्नेछ।

२. प्रशिक्षार्थीहरुले Google Earth प्रयोग गरी आफ्नो परियोजना अन्तर्गत क्षेत्रको Image हेर्न सक्नेछन् र Google Earth मा उपलब्ध रहेको Tool को मद्दतबाट आफ्नो परियोजना सँग सम्बन्धित तथ्याँकहरु (घर, बाटो, आदि) Digitize गर्नु पर्ने हुन्छ । यसरी Digitize गर्दा आफुले Digitize गरेको Feature प्रष्ट हुने गरी नामाकरण गरी Save भए नभएको यकिन गर्नु पर्दछ ।

३. GIS मा उपलब्ध Calculate Geometry Tool प्रयोग गरी प्रत्येक सडक खण्डको अलग अलग लम्बाई गणना गर्नु पर्दछ ।

४. घर धुरीहरुको सामाजिक-आर्थिक तथ्यांकहरुलाई प्रत्येक घरलाई प्रदान गरिएको Unique ID र घरको GIS Data मा रहेको Unique ID को आधारमा जोडी एकिकृत GIS Database for Street Addressing and Mapping तयार गर्नु पर्दछ ।

    यसरी एकिकृत GIS Database तयार भए पश्चात उचित Symbology, Layout Design गरी प्रकाशन गर्न मिल्ने अवस्थामा नक्शा तयार गर्नु पर्दछ ।

सत्रका मुख्य विषयवस्तु:
- Capture location of houses and other structures using GPS
- Capture location of house and other structures using Google Earth and Open Street Map
- Conversion of captured spatial data and integration to GIS Data
- Joining Attribute or Socio-economic data to GIS Data
- Preparation of Street Map with Addressing

Project Work

1. Capture location of houses and other structures using GPS

Figure 1. Examples of Handheld GPS Receivers.
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माथी देखाइएको जस्तै GPS Device प्रयोग गरी प्रशिक्षर्थीहरुले आफ्नो परियोजना अन्तर्गतको क्षेत्रमा रहेका घर, बाटो, सँस्थागत संरचनाहरु, मठ, मन्दीर आदिको तथ्यांक सँकलन गर्नु पर्नेछ । यसरी तथ्यांक संकलन गर्दा एउटा Standard Form तयार पारी संकलन गरिएका प्रत्येक तथ्यांक हरुलाई Unique ID प्रदान गर्नु पर्ने हुन्छ ताकि पछि यसै Unique ID को आधारमा तथ्यांक व्यवस्थापन गर्नु पर्दछ । आफुले संकलन गरेको तथ्यांकहरु GPS Device मा Store भईरहेको बारेमा यकीन हुनु पर्दछ ।

2. Capture location of house and other structures using Google Earth
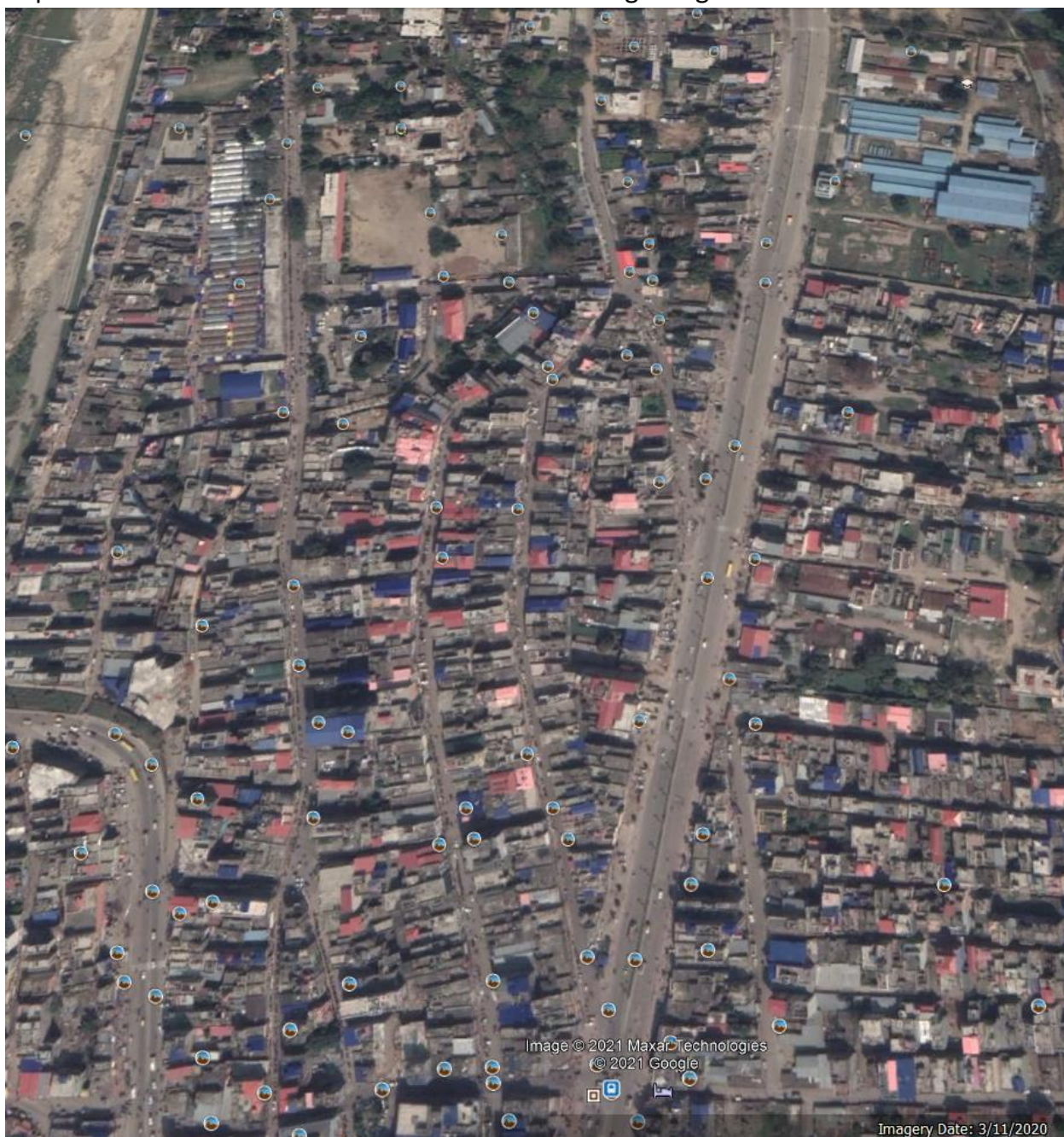
माथी देखाइएको Image Google Earth बाट लिईएको बुटवल उप महानगरपालिकाको कुनै एक क्षेत्रको हो । प्रशिक्षार्थिहरुले Google Earth प्रयोग गरी आफ्नो परियोजना अन्तर्गत क्षेत्रको यस्तै Image हेर्न सक्नेछन् र तल देखाइऐ बमोजिम Google Earth मा उपलब्ध रहेको Tool को मद्दतबाट आफ्नो परियोजना सँग सम्बन्धित तथ्याँकहरु (घर, बाटो, आदि) Digitize

गर्नु पर्ने हुन्छ । यसरी Digitize गर्दा आफुले Digitize गरेको Feature प्रष्ट हुने गरी नामाकरण गरी Save भए नभएको यकिन गर्नु पर्दछ ।


- Conversion of captured spatial data and integration to GIS Data
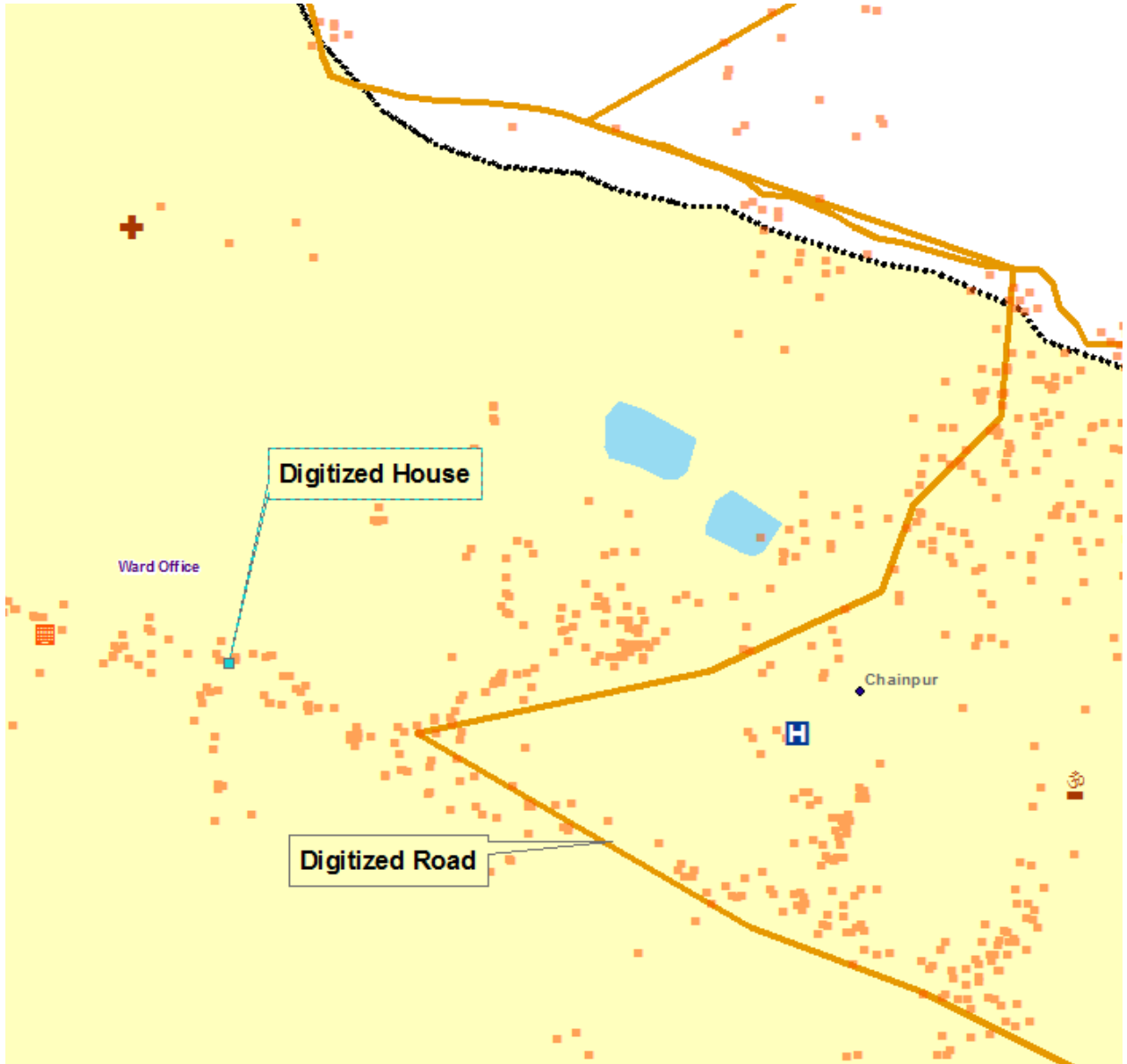
GPS अथवा Google Earth प्रयोग गरि संकलन तथा Digitize गरिएका GIS Data (घर तथा बाटो) लाई download गरि पहिला GIS Format (Shape File or Geodatabase) मा रुपान्तरण गर्नु पर्ने हुन्छ। यसका साथै Projection System पनि मिलाउनु पर्ने हुन्छ । नेपाल सरकार, नापी विभागले अवलम्बन गरेको Projection System

(Modified Universal Transverse Mercator System) मा सबै GIS Data लाई Project गर्नु पर्ने हुन्छ । अन्य स्रोतबाट प्राप्त GIS Data मा हामीले Digitize गरी तयार परेको GIS Data Overlay गरी माथी देखाईए जस्तै एकिकृत नक्शा तयार पार्नु पर्ने हुन्छ

- Calculate Length of the Road
  Metric System अवलम्बन गरी गरिएको Street Addressing and Mapping मा सडक को लम्बाई र दुरीको आधारमा घर नम्बर प्रदान गर्ने गरिन्छ । यसको लागी हामिले Digitize गरी तयार पारेको सडकको लम्बाई गणना गर्नु आवश्यक हुन्छ ।
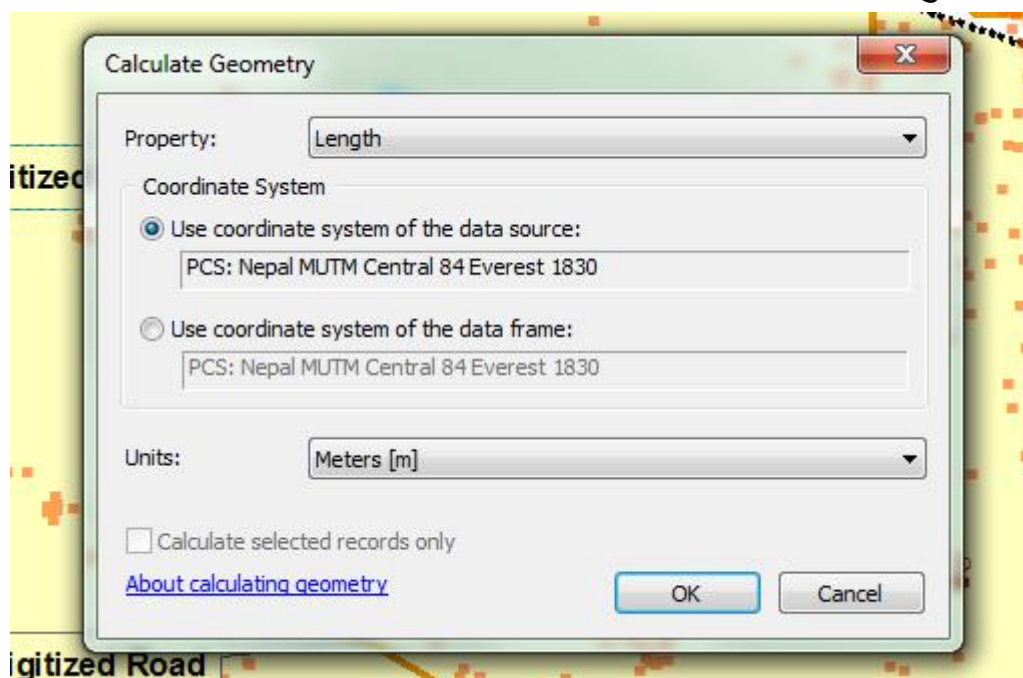
GIS मा उपलब्ध Calculate Geometry Tool प्रयोग गरी प्रत्येक सडक खण्डको अलग अलग लम्बाई गणना गरिन्छ ।

- Creation of Attribute Data related with Street Addressing

Street Addressing and Mapping सन्दर्भमा प्रत्येक घरधुरीको सामाजिक आर्थिक विवरण संकलन गरिएको हुन्छ । यसका साथै प्रत्येक घरलाई अलग अलग नम्बर प्रदान गरिएको हुन्छ । यसरी Street Addressing को लागी आवश्यक तथ्यांकहरु व्यवस्थीत गरिएको हुन्छ ।

- Joining Attribute or Socio-economic data to GIS Data

माथी उल्लेख गरिए बमोजिमका घर धुरीहरुको सामाजिक आर्थिक तथ्यांक हरुलाई प्रत्येक घरलाई प्रदान गरिएको Unique ID र घरको GIS Data मा रहेको Unique ID को आधारमा जोडी एकिकृत GIS Database for Street Addressing and Mapping तयार गर्नु पर्दछ ।

- Preparation of Street Map with Addressing

यसरी एकिकृत GIS Database तयार भए पश्चात उचित Symbology, Layout Design गरी प्रकाशन गर्न मिल्ने अवस्थामा नक्शा तयार गर्नु पर्दछ ।

TITLE

SUB-TITLE (THEME)

ORIENTATION (NORTH LINE)

DISTRIBUTION OF POPULATION DENSITY BY PROVINCES OF NEPAL (CBS, 2011)

CHOROPLETH MAP

MAIN MAP

NEAT LINE/GRID

LEGEND

⊙ Provincial HQ
— National Boundary
-·- Province Boundary
Population Density (Person/Sqkm)
Above 300
201 - 300
100 - 200
Below 100

Source: DoS and CBS (2011), Government of Nepal

LEGEND

0 40 80   160   240
                         Kilometers
SCALE

© *Prepared by: XYZ*

SOURCE

SCALE

COPYRIGHT

Other TEXTS
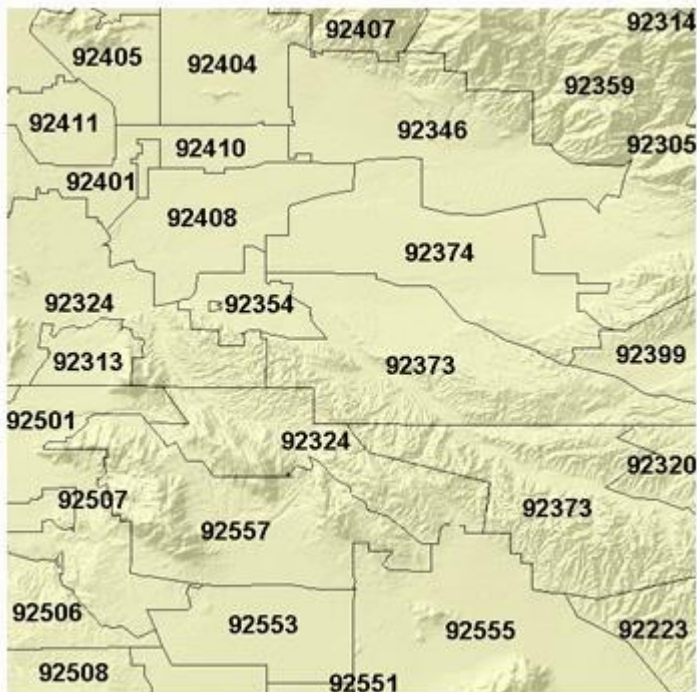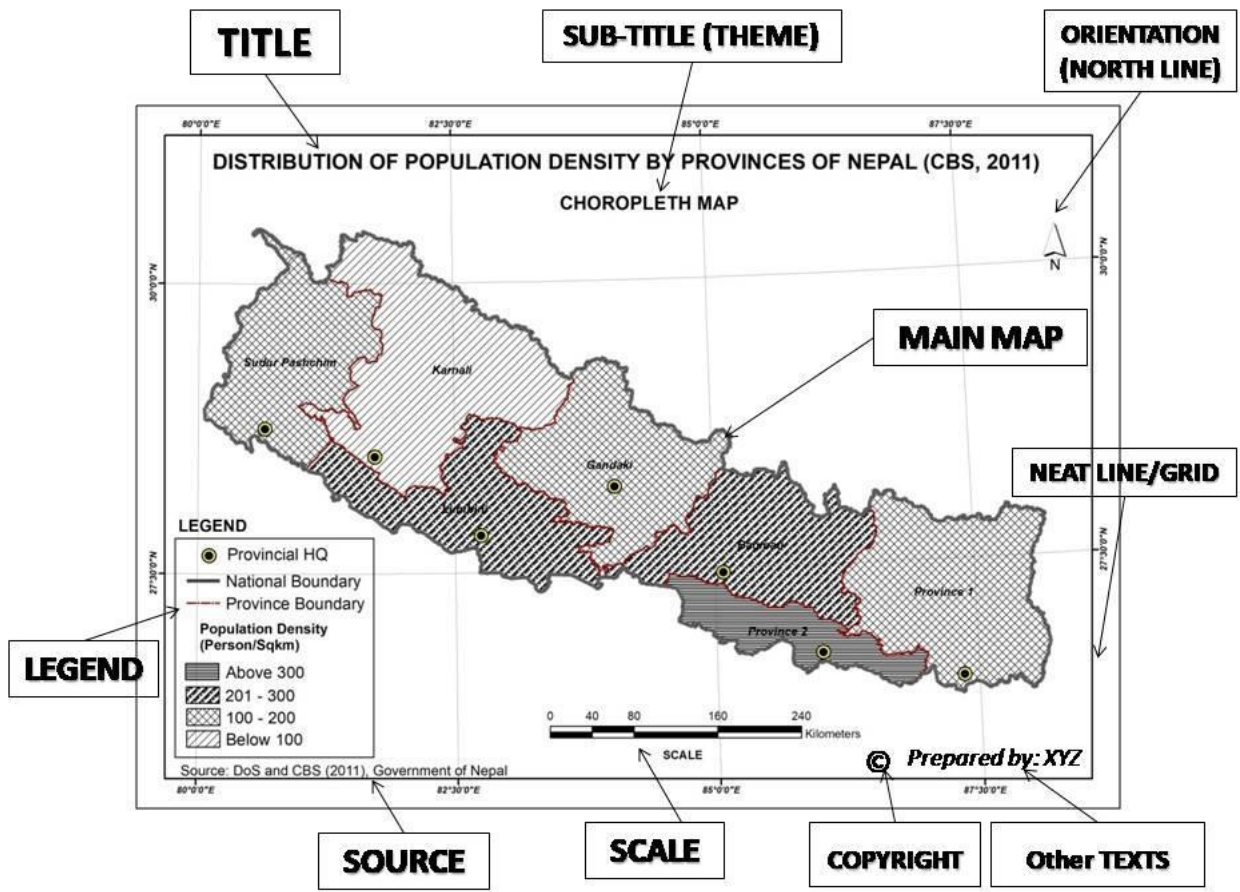
विषयः कार्य योजना, प्रशिक्षण मूल्याङ्कन तथा समापन

साधारण उद्देश्यः यस सत्रको अन्तमा सहभागीहरुले सिकेका कुरालाई आफ्नो कार्यक्षेत्रमा कसरी कार्यान्वयन गर्ने बारे कार्ययोजना तयार भएको हुनेछ ।

निर्दिष्ट उद्देश्यः सत्रको अन्तमा सहभागीहरुले

- सिकाई कार्यान्वयन गर्ने बारे कार्ययोजना तय गर्न सक्नेछन् ।
- समग्र प्रशिक्षणको सिकाई उपलव्धी मूल्याकङ्न गर्न सक्नेछन् ।
- प्रशिक्षण कार्यक्रमको औपचारिक रुपमा समापन हुनेछ ।

सत्रका मुख्य विषयवस्तुः

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

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ सहभागीहरुको ध्यानाकर्षण - सहभागीहरु सवैलाई उठ्न लगाउनुहोस् । - सवैलाई ताली वजाउन लगाउनुहोस् र ध्यानाकर्षण गर्नुहोस् ।	५मिनेट		
क्रियाकलाप २ सत्रको नाम, उद्देश्य र विषयवस्तु - सत्रको नाम, उद्देश्य, विषयवस्तु र समय अवधि वताउनुहोस् ।	५मिनेट	स्लाइड प्रस्तुति	पावर प्वाइन्ट स्लाइड
क्रियाकलाप ३ विषयवस्तु सम्बन्धी सहभागीहरुको बुझाई - सहभागीहरुलाई तपाईहरुले कार्य योजना तयार गर्नुभएको छ कि छैन भनी सोध्नुहोस् । - कार्य योजनामा के के राख्नुपर्छ भनी सोध्नुहोस् । - सहभागीहरुबाट आएका कुराहरुलाई मिलान गर्दै विषयवस्तु अगाडि बढाउनुहोस् ।	५मिनेट	प्रश्न उत्तर	

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ४ कार्ययोजना तयारी • सहभागीबाट आएको बुँदालाई समेट्दै अब हामी कार्य योजना वनाउंछौ भनी कार्य योजनाको फाराम प्रस्तुत गर्नुहोस् । • प्रत्येक सहभागीले आ आफ्नो कार्ययोजना तयार गर्न लगाउने । • कार्य योजना वनाउंदा कम्तिमा ६ महिनाको लागि गर्न सकिने योजना वनाउनुहोस् भनी भन्नुहोस् । • यस कार्य योजनाको अनुगमन हुने छ भनी वताउनुहोस् ।	१५मिनेट	समूह छलफल	न्यूज प्रिन्ट, मार्कर, मास्किङ टेप, कार्ययोजना फाराम (अभ्यास पत्र)
क्रियाकलाप ५ कार्ययोजना प्रस्तुतिकरण • कार्ययोजना प्रस्तुत गर्न लगाउनुहोस् । • प्रस्तुतिकरणमा केही थपघट गर्नु पर्ने भए गर्न लगाउनुहोस् । • यो योजना लेख्न मात्र नभै कार्यान्वयन गर्नुपर्छ भनी वताउनुहोस् ।	१५मिनेट	लघु प्रवचन	
क्रियाकला ६ सत्र संक्षेपीकरण • सहभागीहरुको केही जिज्ञासाहरु भए समेट्दै यस सत्रमा गरिएका कार्यहरुलाई समेट्दै संक्षेपीकरण गर्नुहोस् ।	५मिनेट	लघु प्रवचन	

क्रियाकलाप ७ सत्र मूल्यांकन
• यस सत्रमा राखिएका निर्दिष्ट उद्देश्यहरु हासिल भए कि भएनन् भनेर थाहा पाउनको लागि सहभागीहरुलाई
• निम्न प्रश्नहरु गर्नुहोस् ।
  ▪ 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
क्रियाकलाप ८ प्रक्षिणको पश्चात जानकारी र मूल्याङ्कन ■ सहभागीहरुलाई प्रशिक्षण पश्चात्को फाराम वितरण गरी भर्न अनुरोध गर्नुहोस् । ■ सहभागीहरुलाई प्रशिक्षणको मूल्याङ्कनको लागि तयार गरिएको प्रशिक्षण मुल्याङ्कन फाराम वितरण गरी भर्न लगाउनुहोस् । ■ सहभागीहरुलाई आवश्यकता परेमा फारामहरु भर्न सहजीकरण गर्नुहोस् । **प्रक्षिणको संक्षेपीकरण र अग्रसम्वन्ध** ■ प्रशिक्षकले प्रशिक्षण अवधिभर छलफल भएका विषयवस्तुहरुलाई संक्षिप्त रुपमा स्मरण गराउनुहोस् । ■ सहभागीहरुबाट आएको अपेक्षाहरुको पुनरावलोकन गर्दै प्रशिक्षणमा समेटिएका र नसमेटिएका विषयवस्तुहरुको जानकारी गराउनुहोस् । ■ सहभागीहरुलाई सक्रिय सहभागिताको लागि धन्यवाद दिदै प्राविधिक सत्रहरु समाप्त भएको भन्दै अव यस पछि समापन कार्यक्रम हुनेछ भनी सत्र अन्त्य गर्नुहोस् ।	१५मिनेट		फारामहरु

प्रस्तुति सामग्री (पावरप्वाइन्ट स्लाइड)

Slide 1

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(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)
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सडक ठेगाना र भौगोलिक सूचना प्रणाली

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F >>> +977(1) - 5521521
E >>> ldta.org.np@gmail.com
W>>> www.ldta.org.np

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सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

प्रशिक्षण शुभारम्भ

P >>> +977 (1) -5522004, -5521051
F >>> +977(1) - 5521521
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Slide 3

प्रशिक्षण औपचारिकता

- **परिचय**
- **नामः**
- **ठेगानाः**
- **पदः**
- **कार्य अनुभवः**

Slide 4

साधारण उद्देश्य

- सहभागीहरुको ठेगाना प्रणाली सम्वन्धी सैद्धान्तिक तथा व्यवहारिक ज्ञान र सिपमा अभिवृद्धि भएको हुनेछ ।
- सहभागीहरुको गाउँपालिका तथा नगरपालिका क्षेत्रभित्रको भौगोलिक सूचना प्रणालीको प्रयोग गरी सडक ठेगाना र खुला सडक नक्सांकन गर्नसक्ने ज्ञान र सिपमा अभिवृद्धि भएको हुनेछ ।

1

निर्दिष्ट उद्देश्यहरु

- नेपालको शहरी योजना तथा व्यवस्थापन सम्वन्धमा ज्ञान हुने ।
- शहर र सडक ठेगानाको अन्तरसम्बन्ध बारे बुझ्ने ।
- ठेगाना प्रणालिहरुको ऐतिहासिक पक्ष तथा सडकवारे विस्तृत ज्ञान हुने ।
- सडक संजाल र सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसका लाभ बारे बुझ्ने ।
- उपलव्ध नीतिहरु, दृष्टिकोण र विकास, कार्यान्वयन चुनौतीहरु बारे बुझ्ने ।
- बैज्ञानिक ठेगाना प्रणालीको आवश्यकता तथा विकासको ज्ञान हुने ।
- बैज्ञानिक ठेगाना प्रणालीको वैधानिकता बारे बुझ्ने ।

निर्दिष्ट उद्देश्यहरु

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको ज्ञान हुने ।
- अन्य स्थानीय तह स्तरमा भईरहेको वा भईसकेको ठेगाना प्रणालीको बारे बुझ्ने ।
- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको बारे अरुलाई प्रस्तुतीकरण गर्न सक्ने ।
- यस प्रणाली स्थानीय तहहरुमा लागु गर्न र गराउन आवश्यक पूर्वाधार बारे ज्ञान हुने ।
- उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगका ज्ञान हुने ।
- स्थानीय तह स्तरको डाटाबेसबारे बुझ्ने ।

निर्दिष्ट उद्देश्यहरु

- GIS को बारेमा सैद्धान्तिक ज्ञान हासिल गरेको हुनेछन् ।
- नेपालको विभिन्न निकायहरुमा GIS प्रणालीको प्रयोग र यस बाट सँस्थाले प्राप्त गरेको उपलब्धताको बारेमा जानकरी प्राप्त गर्नेछन् ।
- नेपाल सरकार, नापी विभागले तयार गरेको विभिन्न GIS Data Layer हरुको बारेमा जानकारी प्राप्त गरी त्यसलाई Software मा कसरी Load गर्ने ? सिक्दछन् ।
- QGIS Browser को बारेमा जानकारी प्राप्त गरी यसबाट Polyline, Polygon तथा Point Feature हरु बनाउन तथा माथी उल्लेखित स्रोतहरु बाट प्राप्त GIS Data लाई QGIS Browser मा Import गर्न जान्दछन् ।
- बिभिन्न निकायहरुले प्रकासनमा ल्याएका नक्साहरुमा देखाएको अक्षाँस र देशान्तर नम्बरहरु QGIS Desktop Software मा रजिष्टर गरी Analogue Map लाई Geo Reference गर्न जानेको हुनु पर्नेछ ।

निर्दिष्ट उद्देश्यहरु

- GPS Device को माध्यमबाट संकलन गरिएका तथ्याँकहरुलाई GIS को प्रयोगबाट कसरी Download गर्ने र विभिन्न नक्शाहरु तयार पार्ने कुराको जानकारि पाउँदछन् ।
- Open Street Maps को प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु Digitize गर्ने बारे जान्दछन् ।
- Digitize गरी तयार पारिएका Line Feature (Street Addressing and Mapping को हकमा बाटो) को लम्बाई GIS Application द्वारा कसरी गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।
- GIS मा रहेको Buffering को प्रयोग गरी पहुँच (दुरी) विष्लेशण गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्राप्त गर्दछन् ।

अपेक्षा संकलन

प्रशिक्षणका विषयवस्तु

- शहरीकरण, शहरी योजनातथाशहर व्यवस्थापन, शहरीकरणका चुनौतिहरु
- ठेगानाहरुको सँक्षिप्त ऐतिहासिक समीक्षा, सडक र ठेगाना प्रणालीको अवधारणा, अध्ययन र कार्यान्वयनपक्ष, सडक ठेगानामाभौगोलिक सुचना प्रणालीको प्रयोग, सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसकालाभ
- काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) एक सफलपहल, दृष्टिकोण र विकासनीति, कार्यान्वयनचुनौतीहरु,
- नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा उपलब्ध सन्दर्भ सामग्रीकामुख्यमुख्यविषयसूचीबारे जानकारी, बैज्ञानिक ठेगाना प्रणालीको आवश्यकतातथाविकास र कार्यान्वयन र वैद्यानिकताबारे।
- ठेगाना प्रणालीको कार्यान्वयनप्रकियाहरु, तथातत्वहरु, ठेगाना क्षेत्र विभाजन, सडक ठेगाना प्रणाली, सडक नाम र सिमानानिर्धारण, घर ठेगाना प्रणाली, नम्बर तथानामपाता, ठेगाना लेख्ने विधिआदि।
- केसहरुको सँक्षिप्तविवरण, समूह गठन र कामः
- फ्रन्टियर टेक्नोलेजिको प्रयोग, उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगकाअनुभवहरु, नगरपालिका स्तरको डाटाबेसर म्यापिङ्ग,गुगलनक्शाप्लस कोड प्रणाली।

प्रशिक्षणका विषयवस्तु

- Introduction and Concept to Arc GIS (Concept and Demo on Software and Database)
- Exploring Arc GIS Tools
- GIS Database Concepts and Management
- Concept of Geo-referencing
- GPS and GIS Data Integration
- Google Earth and GIS Data Integration
- Spatial and Attribute Data Integration in GIS
- Calculation and Measurement of Spatial Features
- Geo-Processing
- Output Designing (Map Layout)
- Project work on Geographic Information System

प्रशिक्षण विधि

- मष्तिस्क मन्थन, समुह अभ्यास, लघुप्रवचन, प्रश्रोत्तर 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।

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	दोश्रो 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

समूह मान्यता

- समय तालिकाको पालना ....
- मोबाईल साईलेन्ट मोडमा ....
- ....
-

पूर्व जानकारी

धन्यवाद

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Slide 1

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)
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Slide 2

Contents: Modules 1 to 8

- Urbanization and urban planning/management challenges-1
- Addressing system-2
- Kathmandu Valley Mapping Projects-3
- Guidelines and reports on Addressing System -4 &5
- Case Studies -6
- New Technology -7
- Review of the modules-8

Slide 3

यस सत्रको निर्दिष्ट उद्देश्यहरु र मुख्य विषयवस्तु

निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले
- नेपालको शहरी योजना तथा व्यवस्थापन सम्बन्धमा ज्ञान हुने ।
- शहर र सडक ठेगानाको अन्तरसम्बन्धबारे बुझ्ने ।

सत्रका मुख्य विषय वस्तु :
- शहरीकरण,शहरीविकास योजनार शहर व्यवस्थापन
- शहरी पूर्वाधार तथा सेवा सुविधाहरु, सडक ठेगाना र शहरी व्यवस्थापन

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Slide 4

Module 1: Urbanization , Urban Planning/ management Challenges

- Urbanization and
- Urban planning/management challenges
- Urban Built environment
- Characteristic of Urban Areas/Urban Structure
- Challenges and Initiatives
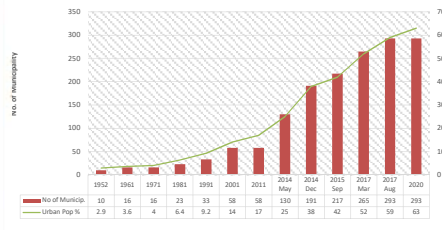- Street Addressing way to urban management (Practical)

80

5

Municipalities

Growth of Municiality and Urban Population

	1952	1961	1971	1981	1991	2001	2011	2014 May	2014 Dec	2015 Sep	2017 Mar	2017 Aug	2020
No of Municip.	10	16	16	23	33	58	58	130	191	217	265	293	293
Urban Pop %	2.9	3.6	4	6.4	9.2	14	17	25	38	42	52	59	63

Bhimdatta Municipality

62.37% municipal population

Overview of Bharatpur Metropolitan city

Traditional settlement vs. New Urban Development

Map of Bhaktapur Municipality

Map of Bhaktapur Municipality

1 Dattatreya Square
2 Wakupati Narayan Temple
3 Suryamadhi Square
4 Chyamshinga
5 Garud Kunda

1 Kamalvinayak Ganesh Temple
2 Garud Kunda (Water Spout)
3 Chyamshinga
4 Degayina Temple
5 Bramhayani Temple Complex
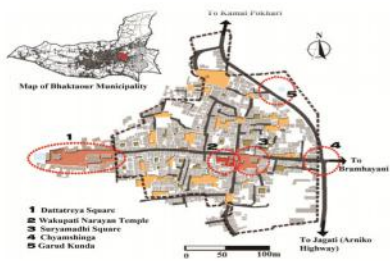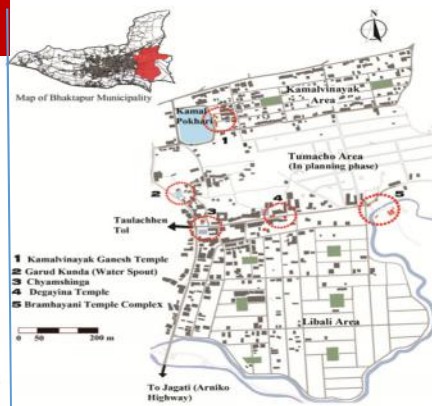
Urbanization Challenges

- Lacking of basic infrastructure and services:
- Water supply/Big projects like Melamchi water supply project
- Drainage/flooding
- Trasportation/parking
- Solid waste management
- Dust/pollution/air quality
- Open spaces/parks
- Protection of cultural heritage sites
- Visible urban mess: electrical poles and its wires
- Physically finding a specific areas and city structures

Initiatives: Coping with Urbanization Issues

Development of Urban Infrastructure and services
- street escapes
- Dedicated cycle lane
- Use of public spaces
- Acknowledgement of traditional architecture in modern built environment
- Use of proper Planning Tools – Land pooling/ Housing pooling
- Implementing addressing system in a number of municipalities

Dedicated Cycle Lane

Source Cycle Society Nepal

"The new cycle lanes help mitigate conflict between cyclists, pedestrians, and motorists"

In the proposed 65-km cycle lane in Lalitpur, the five-km Jawlakhel-Kupondole stretch is only a pilot project,

World cycle day 2019

Adaptation of traditional Architecture

Electrical Incineration within the premises of Pashupati Temple

Reconstruction of 17th Centuries Pond called Rani Pokhari

- Total Area : 31500 sq m. about 3 hectares
- Temple opens: Light Festival, Chhat Pooja
- Different from original Recharge system: ground/rain water and stone conduit

Source: Report on Ranipokhari reconstruction and conflict settlement, NRA

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Module 1 Practical Part: Street Addressing and Urban Management

- Write short notes about municipality on:
  - Urbanization and planning and management;
  - Infrastructures ;
  - And relation with addressing system

    Participants will write down based on their experience, instructor presentation on the subject and reading materials

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धन्यवाद

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Module 2: Concept of Street Addressing and Municipal Status

- Brief historical Review of addresses
- Concept of street/network and Street address system (SAS/MSAS}
- Benefit of AS
- Use of GIS
- Study the map and learn Implementation aspect (Practical)

यस सत्रको निर्दिष्ट उद्देश्यहरु र मुख्य विषयवस्तु

निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले
- ठेगाना प्रणालिहरुको ऐतिहासिकपक्षतथा सडकवारे विस्तृतज्ञान हुने ।
- सडक संजाल र सडक ठेगाना सम्वन्धी डाटाबेस विकास र यसकालाभबारे बुभ्नेे .

सत्रका मुख्य विषय वस्तु :
- ठेगाना प्रणालिको ऐतिहासिक पृष्ठभूमी
- सडक संजाल र ठेगाना प्रणालीको अवधारणा र यसकालाभ
- सडक ठेगानामाभौगोलिक सुचना प्रणालीको प्रयोग।

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Historical Review

- 18th-century : development of house numbering (technology)
- was not introduced to facilitate orientation for the cities' inhabitants or to be helpful to foreigners
- But for the facilitation of its origin can be located in the border areas of early modern police, military and tax administration
- It aimed to give the state access to the riches and resources of every house, and to make it easier to control, tax or recruit their inhabitants, or to lodge soldiers
- the different systems of house numbering (consecutive numbering of all the houses in the city or in a district, block numbering, the 'clockwise schemes', the even/odd system etc), arguing that it was difficult to make people accept the difference between the address and the physical data (the house).

Source: Addressing the Houses: The Introduction of House Numbering in Europe
Anton Tantner, 2009

Why Street? Is it only means of communication?

- Place to meet people and exchange ideas
- Celebrates a number of events : social/economic and political space
- Diversity in Users including Utilities service providers
- Rescue and Security Services
- Delivery of good and services
- Movements problems due to Roads all are not linked in Google maps
- More information about the streets (SAMS) power/CCTV/Street naming
- Structured streets

Street Activities

Importance of Streets

Source Cycle Society Nepal

Streets of Urban Sprawl

Thantipokhari 2017

Kathmandu 2017
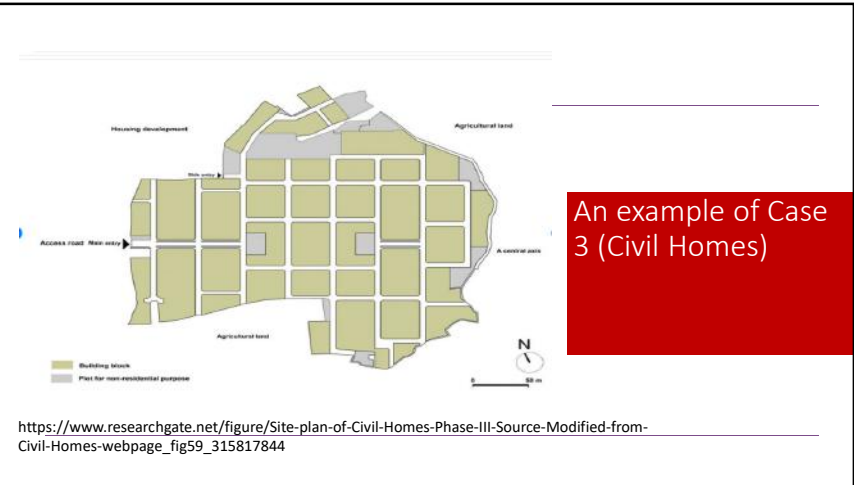
An example of Case 3 (Civil Homes)

https://www.researchgate.net/figure/Site-plan-of-Civil-Homes-Phase-III-Source-Modified-from-Civil-Homes-webpage_fig59_315817844

Grid Pattern Street

PROXIMITY   ACCESS   ENCOUNTER

Streets are big chunk of the areas (25 % to 50% of land is streets excludes high ways

https://www.youtube.com/watch?v=DZPMkXTOz8Q

Benefits of Street Addressing System

Street naming and addressing project has the following benefits

- Allows utilities providers to manage and improve service delivery to effective manner
- Transportation goods rescues/improve security services
- Health sector emergency
- Useful to private economic operators as well as Municipal authorities
- Increased investment potentials in the municipal areas
- User friendly to tourist and to local residents
- Technology test

Municipal GIS based map development: Sector, Road Network and Building Footprint Map of Birendranagar Municipality
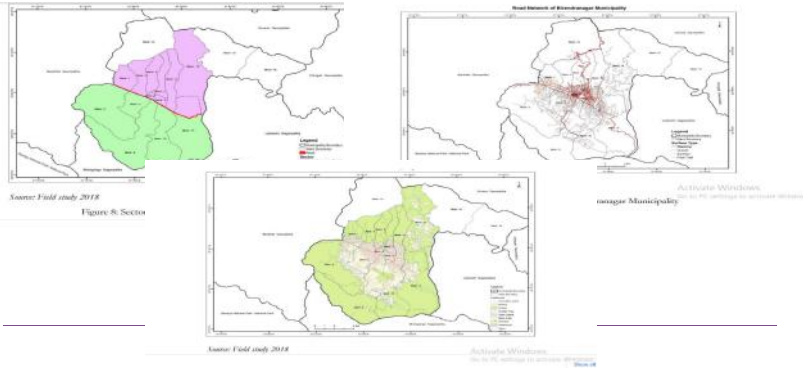
Module 2 Practical Part: Municipal Street Structure and Addressing System (AS)

Source: Google

Participants will learn the structure of our settlements specifically roads and streets networks and practice Addressing System

धन्यवाद

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Module 3: Kathmandu Valley Mapping Project (KVMP):

European Commission, the four-year project was part of the Rs 400 million KVMP project

- KVMP: A successful Initiatives for implementing Addressing System
- Policies : Approaches and Development
- Implementation Challenges
- Present Status and Replication
- Old and New Systems (Practical)

यस सत्रको निर्दिष्ट उद्देश्यहरु र **मुख्य विषयवस्तु**

निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले
- काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) वारे ज्ञान हुने ।
- उपलब्धिनीतिहरु, दृष्टिकोण र विकास, कार्यान्वयनचुनौतीहरुबारे बुझ्ने ।

सत्रका मुख्य विषय वस्तु :
- काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएमपि) एक सफलपहल
- दृष्टिकोण र विकास नीति
- कार्यान्वयनचुनौतीहरु र उपलब्धी

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Kathmandu Valley Mapping Project (KVMP)

Objective: metric addressing system which reduced the hassle of trying to find your way around Kathmandu city (Orientation)
- Each street assigned with a unique name and code
- All the old area names replaced by new ones chosen by the locals and approved by the KMC municipal board.
- KMC stipulated that the names should have local context and be based on the names of national heroes, martyrs, mountains and rivers.
- The detailed street map of Kathmandu that included schools, temples, monuments and office blocks

Situation Before and after: Addressing System

- Block system (BS)
  - formal mechanism for locating people and places
  - BS of addressing does not include the use of street names.
  - BS was useful due to small urban population size in a town
- Street Addressing System (SAS)
  - Need to develop an efficient and standardized system to facilitate urban development and management

Challenges in Implementation

- Inadequate trained personnel
- Ownership of the project by the municipality
- lack of citizen engagement in the implementation process
- Absence of a GIS database management system.
- Problems associated with naming of the streets and numbering of properties
- Service providers such as water supply, electricity and telecommunication as well as many courier service agencies continue to use their own numbering systems to identify properties to facilitate their operations, thus leading to a multiplicity of numbering systems

Kathmandu Street Atlas: Kathmandu Street Map

Implementation of Street Addressing System

Implementation of Street addressing system

Module 3 Practical Part: Block System vs Street Addressing System

- Team **A**: Block System
- Team **B**: Street Addressing System
- Debate on:
  - Pros and Cons
  - Suitability of the system based on population size
  - Application for hilly and mountain municipalities
  - Conclusions and recommendations
  - Presentation by teams (learn - about available technologies, team work do Structured presentation)

धन्यवाद

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Module 4: Contents of Addressing System Guidelines/Manuals

- Base map preparation
- Addressing defined area for house numbering
- Access way identification and naming
- Building, house identification and doorway numbering
- Conclusions and Recommendations
- Number and name plate
- Methods of writing addresses
- Legitimacy

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निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले

- बैज्ञानिक ठेगाना प्रणालीको आवश्यकता तथा विकासको ज्ञान हुने ।
- बैज्ञानिक ठेगाना प्रणालीको वैधानिकता बारे बुभ्ने ।

सत्रका मुख्य विषय वस्तु:

- नगरपालिका स्तरको ठेगाना प्रणालीको अवधारणा
- उपलब्ध सन्दर्भ सामग्रीकामुख्यमुख्यविषयसूची
- ठेगाना प्रणालीको वैधानिकतापक्ष

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Available literatures and learning materials Metric Addressing System Manuals

- Preparation of Street Naming and Development of Metric addressing of Birendranagar Municipality, Vol I
- An Implementation Guide for Metric Addressing System in Tikapur Municipality, Vol II Metric Addressing System Waling Bazar, Waling Municipality Volume V

Slide 1: वैधानिकता (Legitimacy)

- **स्थानीय सरकार संचालन ऐन २०७४ को परिच्छेद १५**
  अनुसार महानगरपालिकाको क्षेत्राधिकार भित्र रहेर ठेगाना प्रणालीको व्यवस्था गर्न सकिने छ ।
- एक भन्दा बढी वडा वा ठेगाना क्षेत्र भएर जाने बाटोको नाम महानगरपालिकाले निर्देशक समिति बाट राख्ने छ ।
- घर नम्बर पाताको अनुगमन महानगरपालिकाको सम्बन्धित निकायले गर्न सकिने छ ।
- बाधा विरोध गर्ने व्यक्तिलाई सार्वजनिक हितको काम गर्दा बाधा पुर्‍याएको मानी आवश्यक कानुनी कारवाही गर्न सकिने छ ।
- ठेगाना प्रणालीलाई अध्यावधिक राख्न ललितपुर महानगरपालिकामा शहरी विकास महाशाखामा भौगोलिक सूचना प्रणाली सुबिधा सहितको ठेगाना प्रणाली शाखा खडा गरिनेछ ।

Slide 2: Module 4 Practical Part: Manuals of Three Selected Municipalities

- Team 1- Lalitpur
- Team 2 -Tikapur
- Team 3- Waling

Participants (divided into 3 teams) will study the conceptual part of the manuals and based on that the team will discuss on the main points and comeup with some conclusions !

Slide 3: धन्यवाद

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Slide 4: Module 5: Implementation process of MAS

तालिका नं. १: ललितपुर महानगरपालिकाको ठेगाना क्षेत्र र वडा वितरण

स्लाइड १ (61)

यस सत्रको निर्दिष्ट उद्देश्यहरु र **मुख्य विषयवस्तु**

निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको ज्ञान हुने ।
- अन्य नगरपालिका स्तरमा भईरहेको वा भईसकेको ठेगाना प्रणालीको बारे बुझ्ने ।

सत्रका मुख्य विषय वस्तु :

- ठेगाना क्षेत्र विभाजन
- सडक तथा घर ठेगाना प्रणाली
- व्यवहारिक पक्ष (३ टोलीले ३ फरक ठेगाना प्रणाली निर्देशिकाको अवधारणा सामग्री अध्ययन, छलफल तथा विश्लेषण गर्नेछ) ।

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स्लाइड २

तालिका नं. २: बाटो पहिचान संकेत नम्बर

भौगोलिक अवस्थिति अनुसार क्षेत्र विभाजन .	क्षेत्र/बाटो संकेत नम्बर
क्षेत्र १ - (पश्चिम)	१००१-१९९९
क्षेत्र २ - (पूर्व)	२००१ - २९९९
क्षेत्र ३ - (दक्षिण पश्चिम)	३००१ - ३९९९
क्षेत्र ४ - (दक्षिण)	४००१ - ४९९९
क्षेत्र ५ - (दक्षिण पूर्व)	५००१ - ५९९९

नोट: अण्डरलाईन गरिएका अंकहरुले ठेगाना क्षेत्र जनाउँछ ।

स्लाइड ३

मंगल मार्ग
(२००१)
Mangal Marg
(2001)

चित्र नं १.२: बाटो/सडक संकेत पाटो

१. ललितपुर महानगरपालिकाको बाटोहरुको वर्गीकरण

किसिम	चौडाइ (मीटरमा)
१. पथ	१४ मीटर वा चार लेन र सो भन्दा चौडा
२. सडक	१० देखि १४ मीटर मुनी वा दुई लेन सम्मका
३. मार्ग	३ देखि १० मीटर भन्दा मुनी सम्मका
४. गल्ली	३ मीटर भन्दा साना
५. चोक, बहाल आदि	-

नोट: हाल चलन चल्तीमा भएका कतिपय नामहरु यस वर्गीकरणसंग मेल नखाने भएमा यस्ता नामहरुलाई अपवादको रुपमा लिई ती नामहरु परिवर्तन गरिने छैन ।

स्लाइड ४

Installation of street name Signage poles and house Number Plates

नगरकोट रोड
(१००१)
Nagarkot Road
(1001)

House Number Plate
Size: 20cm x 12 cm

Road Name Plate
If in Nepali Language Only:
Size:**12cm by 40 cm**

(Source:NAXA)

If both English and Nepali
Size: **32cm by 40 cm**

११५
नगरकोट रोड
नगरबजार १५
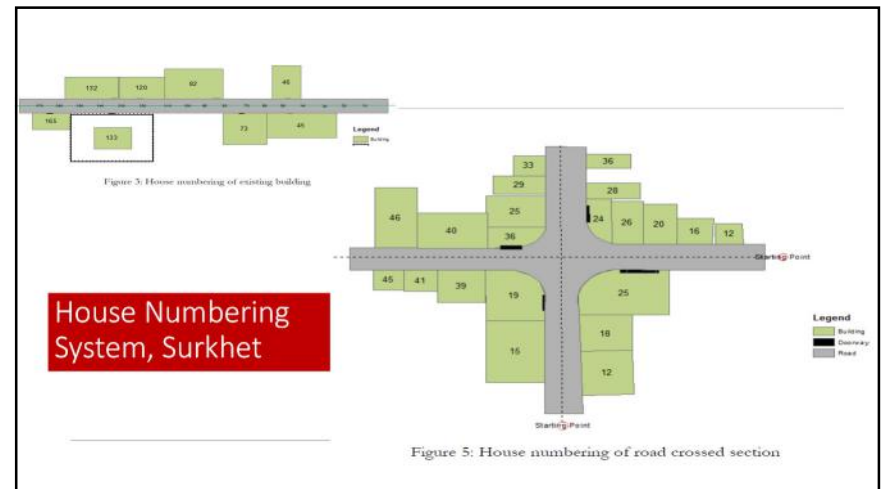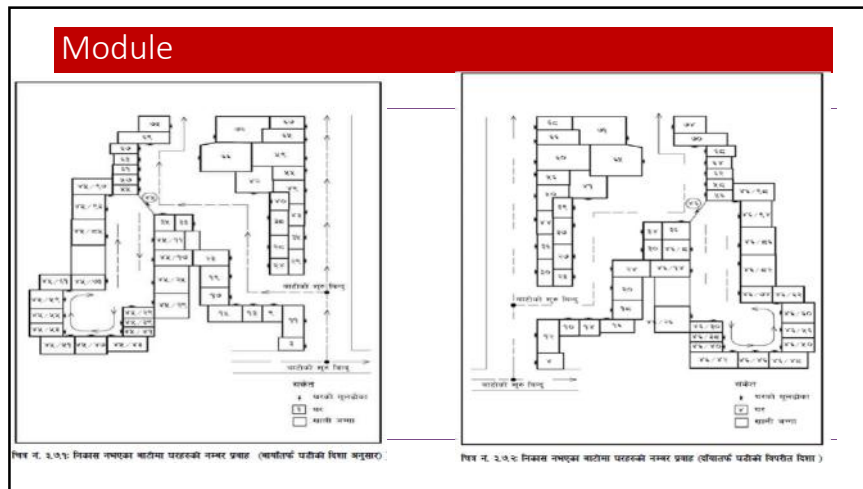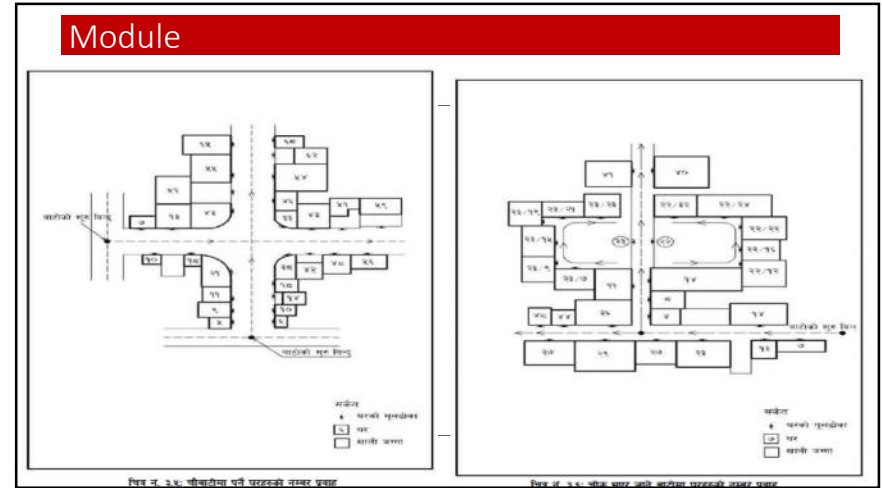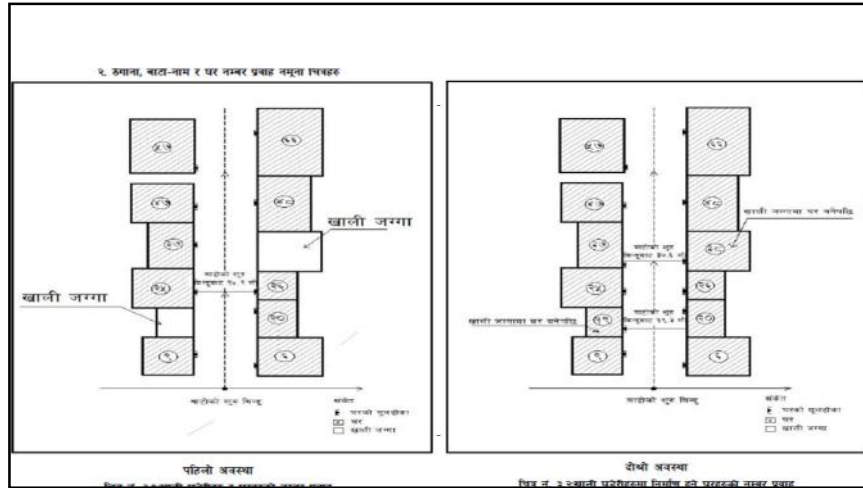
Module

Module

House Numbering System, Surkhet

Figure 3: House numbering of existing building

Figure 5: House numbering of road crossed section

धन्यवाद

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Module 6: Case Study

- Briefing of cases (Apartments: single or multiple and housing: row, detached and others) different areas of the cities/municipalities (core/new development)
- Group Work
  - **Case No 1**
  - **Case No 2**
  - **Case No 3**
- Group Presentations and Group Evaluations

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निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले

- ठेगाना प्रणालीको कार्यान्वयन प्रकियाहरुको बारे अरुलाई प्रस्तुतीकरण गर्न सक्ने ।
- यस प्रणाली पालिकाहरुमा लागु गर्न र गराउन आवश्यक पूर्वाधार बारे ज्ञान हुने ।

सत्रका मुख्यविषयवस्तु:

- केसहरुको सँक्षिप्त विवरण
- समूहगत छलफल तथा विश्लेषण
- प्रस्तुतीकरण

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Case No. 1: Housing complex

1. Number the Apartments, Housing units and Row houses
2. Name the Streets within the Housing Complex
3. Write address of each of the type of housing units
4. Conclusions and Recommendations

http://www.cityscapenepal.com/towermasterplan.php

Case No. 2 : Office Building Complex

1. Number the Office Buildings and other supporting structures
2. Name the Streets within the Singha Durbar Complex
3. Write address of each of the type of Buildings
4. Conclusions and Recommendations

Source: facebook Visit nepal 2020

Case No. 3: Settlement

1. Number the Public Buildings and other Residential structures
2. Name the Streets within the core area
3. Write address of each of the type of Buildings
4. Conclusions and Recommendations

धन्यवाद

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Module 7: Addressing System based on New Technology

- Use of reliable frontier technology especially in the agglomerated urban areas
- Experiences of using high resolution drone images
- Municipal level database and mapping
- Effective implementation of the house numbering system
- Google map plus code system/Open Street map
- Challenges and Opportunities

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निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले
- उच्च रिजोलुसन ड्रोन छविहरुको प्रयोगकाज्ञान हुने ।
- नगरपालिका स्तरको डाटाबेसबारेबुभ्ने ।

सत्रका मुख्य विषय वस्तु :
- ड्रोन आधारित ठेगाना प्रणालीको चरणहरु
- नगरपालिका स्तरको डाटाबेसर म्यापिङ्ग
- गुगल नक्शाप्लस कोड प्रणाली

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DRONE BASED AERIAL MAPPING OF KATHMANDU VALLEY
Changu Narayan Municipality
(NAXA et al., 2021)
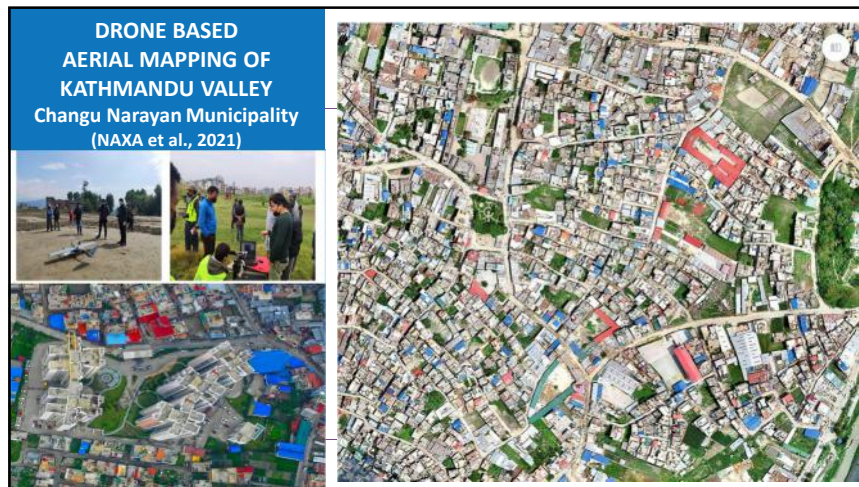
Steps for Drone Based Addressing System

Step 1 : Collection of Available Datasets, Reports
- Detailed household survey data and information
- Reports-Municipal transportation management plan, Physical and long term development plans/Integrated Urban Development plans along with reports on Smart Cities

Step 2 : Acquisition of Aerial Imageries

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Step 3 Data Preparation

- ❑ Overlay and Preparation of Household data onto the High resolution Imagery.
- ❑ Digitization of data layers for buildings, roads, and so o n
- ❑ Preparation of attributes data and GIS shapefiles.
- ❑ Preparation of Centre lines of Road,
- ❑ Establishment of Datum, Nodes
- ❑ Use of validated Ward Boundaries.

(Source:NAXA)

Drone based House Numbering System (Source:NAXA)

Google map plus code system
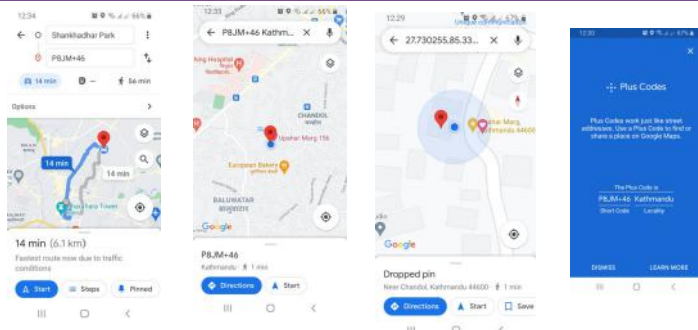
Module 7 Practical Part: Use of Technology in AS

- ▪ Use of Google Map Satellite images for : planning AS in a urban streets and a settlements

- ▪ Use high resolution drone images to : Planning AS in a small town

- ● Use of Google Map Plus Code System to: Receive postal service Locate near by health service

Participants (divided into 3 teams) will discuss & analyse about how importance the available technology in Addressing System

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धन्यवाद

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Module 8: Summary of the Modules

- Short Review of the modules 1 to 7
- Interaction program within the participants as part of preparation for the post test
- Additional learning materials briefing
- Post test and evaluation
- Feedback and Closing

यस सत्रको निर्दिष्ट उद्देश्यहरु र मुख्य विषयवस्तु

निर्दिष्ट उद्देश्यहरु : यस सत्रको अन्त्यमा, सहभागीहरुले
सबै सत्रका मुख्य मुख्य विषय समेटेको पोष्ट टेष्टमा सफलता हासिल गरेको हुने ।

सत्रकामुख्यविषयवस्तुः
मोड्युल १ देखि ७ सम्मको सबै सत्रका मुख्य मुख्य विषयगत समिक्षा

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Expected Output

- Overall understanding of the cities/municipalities
- Road and street infrastructures along with Addressing System (AS)
- Historical development of Addressing System and its importance
- Basic concept and Implementation approaches of AS
- Challenges and opportunities
- Hands on understanding of the AS

Way forward: Signage for house utility services and Fire hydrant (Gas, water, electricity, cable, telecommunication etc)

धन्यवाद

Application of Geographic Information System (GIS) for Street Addressing and House Numbering

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
Local Development Training Academy
(Established under the Local Development Training Academy Act, 2049)
LDTA>>> >>>Learning-Researching-Networking
"An Autonomous, Professional, Client Centered, Gender Responsive National Institute of Excellence in the area of Local-Self Governance."

नेपाल सरकार
सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

Phone: +977 (1)-5522004, 5521051,
Fax: +977(1)- 5521521
E-mail: ldta.org.np@gmail.com,
Website: www.ldta.org.np

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Course Content Outline

Sessions

1 : Introduction to GIS and Concepts on QGIS
2 : Exploring QGIS Desktop Tools/Touring
3 : GIS Database Concepts and Management
4 : Concept of Geo-referencing
5 : GPS and GIS Data Integration
6 : Concept to Google Earth and Exercise on Google Earth & GIS Data Integration
7 : Spatial and Attribute Data Integration
8 : Calculation and Measurement of Spatial Features
9 : Geo-Processing
10 : Output Designing (Map Layout)

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धन्यवाद

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Session 1: Introduction and Concept to Arc GIS (Concept and Demo on Software and Database)

सत्रको मुख्य विषयवस्तु

- Introduction to GIS (5 m)
- GIS Development in Nepal (5 m)
- Importance and Advantage of using GIS in Street Addressing (5 m)
- QGIS Software Introduction (10 m)
- QGIS Software Installation (1 hr)

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निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले
१. GIS को बारेमा सैध्दान्तिक ज्ञान हासिल गरेको हुनेछन् ।
२. नेपालको विभिन्न निकायहरुमा GIS प्रणालीको प्रयोग र यस बाट सँस्थाले प्राप्त गरेको उपलब्धताको बारेमा जानकारी प्राप्त गर्नेछन् ।
३. Street Addressing and Mapping कार्यमा GIS को महत्व तथा प्रयोगको बारेमा जान्नेछन् ।
४. GIS प्रणाली सँचालनको लागि प्रयोग गरिने Software Arc GIS Desktop को बारेमा थाहा पाउनेछन् ।
५. सहभागी आफैंले QGIS Desktop Software आफ्नो कम्प्युटरमा install गर्न सक्नेछन् ।

धन्यवाद

Session 2 : Exploring Arc GIS Tools

सत्रको मुख्य विषयवस्तु

- Getting started
- Touring to QGIS GUI with introduction and demonstration of different tools
- Working with existing data and preparing maps
- Introduction of QGIS Browser
- Introduction of QGIS Tool Box

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले
१. QGIS Desktop सँचालन गरी GIS Data बारेमा परिचित हुनेछन्।
२. नेपाल सरकार, नापी विभागले तयार गरेको विभिन्न GIS Data Layer हरुको बारेमा जानकारी प्राप्त गरी त्यसलाई Software मा कसरी Load गर्ने ? सिक्दछन् ।
३. QGIS मा उपलब्ध Menu Bar, Tool Bar, Shortcut Keys, Icon हरुको बारेमा सिकि त्यसलाई प्रयोग गर्न जान्दछन् ।
४. QGIS Browser को बारेमा थाहा पाउनेछन् ।
५. QGIS Tool Box को बारेमा थाहा पाउनेछन् ।

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धन्यवाद

Session 3 : GIS Database Concepts and Management

सत्रको मुख्य विषयवस्तु

- *Data sources and capturing methods*
- GIS Database management using QGIS Browser
- Creating Feature Dataset using QIS Browser
- Concept of Geo-database

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले

१. GIS Data को बिभिन्न स्रोतहरु जस्तै: विभिन्न निकायले प्रकासनमा ल्याएको नक्सा (Analogue Map),नापी विभाग तथा अन्य सँस्थाहरुले तयार पारेका Digital Data, Remote Sensing based Sattelite Image, Global Positioning System (GPS) Device, Digitization of Paper Maps, आदिको बारेमा जान्नेछन् ।

२. माथी उल्लेखित विभिन्न स्रोतहरुबाट प्राप्त GIS Data लाई QGIS Browser को प्रयोग गरी व्यवस्थापन गर्न सिक्नेछन्।

३. Geo Database को बारेमा जानकारी प्राप्त गरी यसबाट Point Features, Poly lines तथा Polygon हरु बनाउन तथा माथी उल्लेखित स्रोतहरु बाट प्राप्त GIS Data लाई Geo Database मा Import गर्न जान्दछन् ।

धन्यवाद

Session 4 : Concept of Geo-referencing

सत्रको मुख्य विषयवस्तु

- Exercise on Geo-referencing spatial data from scanned Topo Sheet
- Projection and transformation of geo-referenced data
- Creation of Point, Line and Polygon feature from digitizing geo-referenced Topo Sheet

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले,

१. बिभिन्न निकायहरुले प्रकासनमा ल्याएका नक्साहरुमा देखाइएको अक्षाँस र देशान्तर नम्बरहरु **QGIS Software** मा रजिष्टर गरी **Analogue Map** लाई **Geo Reference** गर्न जानेको हुनु पर्नेछ ।

२. **Geo Reference** गरिएको नक्सालाई नेपाल सरकार, नापी विभागले अवलम्बन गरेको **Map Projection System (Projection System: Modified Universal Transverse Mercator, Datum: Everest1830)** मा **Projection** गर्न जान्ने हुनु पर्छ ।

३. यसरि **Geo Reference** र **Projection** गरिएको नक्सालाई आधार बनाई त्यसमा देखाइएका आफ्नो उद्देश्य सँग सम्बन्धित तथ्याँकहरु (उदाहरणको लागी **Topo Map** मा देखाइएको सडक सन्जाल, नदी, खोला, खोल्सी, वस्तीहरु, भू-उपयोग, आदी) **Digitize** गर्न सक्ने हुनु पर्छ ।

धन्यवाद

Session 5 : GPS and GIS Data Integration

सत्रको मुख्य विषयवस्तु

- GPS Theoretical Concept
- Capturing real world data using GPS
- Downloading GPS data and plotting
- Integration of GPS Data to existing Spatial Features

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले

1. Global Positioning System (GPS), यसको आविस्कार, यसका विभिन्न कम्पोनेन्टहरु, सिद्धान्त तथा यसमा आधारित रही तयार पारिएका विभिन्न Application हरु, आजको युगमा यसको नविनतम प्रयोग, फाईदा तथा बेफाईदाका बारेमा सैद्धान्तिक जानकारि हासिल गर्दछन् ।
2. GPS प्रणालीको Space Segment, Control Segment र User Segment को सहायताबाट पृथ्वीको कुनै सतहमा रहेको वस्तुको भौगोलिक अवस्थिति (अक्षाँस, देशान्तर, उचाई) संकलन गर्ने विधि जान्दछन् ।
3. GPS Device को माध्यमबाट संकलन गरिएका तथ्याँकहरुलाई GIS को प्रयोगबाट कसरी Download गर्ने र विभिन्न नक्शाहरु तयार पार्ने कुराको जानकारि पाउँदछन् ।
4. GPS को तथ्यांकहरु प्रयोग गरी तयार पारिएका विभिन्न नक्शाहरुलाई नापी विभाग तथा अरु निकायहरुले पहिलेदेखी नै बनाईरहेका नक्शाहरुमा कसरी आबद्ध गर्ने भन्ने बारेमा प्रयोगात्मक जानकारि पाउँदछन् ।

धन्यवाद

Session 6 : Google Earth and GIS Data Integration

सत्रको मुख्य विषयवस्तु

- Concept and Demo on Google Earth
- GIS Data Capturing using Google Earth
- Conversion from and to KML - Shape File/Geodatabase

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले,

1. **Google Earth** प्रयोगबाट आफ्नो कार्यसँग सम्बन्धित विभिन्न तथ्यांकहरु (उदाहरणको लागी, महत्वपुर्ण स्थानहरुको भौगोलिक अवस्थिति, बाटोको रेखाँकन, ताल, जँगल, आदी) **Digitize** गर्ने बारे जान्दछन् ।
2. **Street Addressing and Mapping** कार्यमा बढी भन्दा बढी आवस्यक हुने तथ्यांकहरु जस्तै: घर रहेको स्थान, त्यस स्थान सम्म पुग्ने बाटो आदि **Google Earth** मा हेरिकन ति स्थानहरुलाई **Digitize** गरी अरु निकायहरुले पहिलेदेखी नै बनाईरहेका नक्शाहरुमा कसरी आबद्ध गर्ने भन्ने बारेमा प्रयोगात्मक जानकारि पाउँदछन् ।
3. **Google Earth** प्रयोग बाट लिईएको तथ्यांकहरु **KML Format** मा हुने भएको हुँदा उक्त **KML Format** लाई **GIS** का विभिन्न **Application** हरुले पढ्न सक्ने **Format (Shape File / Geodatabase)** मा कसरी रुपान्तरण गर्ने भन्ने बारे जानकारी प्राप्त गर्दछन् ।

धन्यवाद

Session 7 : Spatial and Attribute Data Integration in GIS

सत्रको मुख्य विषयवस्तु

- *Joining Data in GIS* (Spatial and attribute)
- Query Building
- Exercise on Selection of Spatial Features using Attribute Query

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निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले,

१. GIS Data (Point, Line and Polygon) र ती GIS Data को बर्णात्मक विवरण (Attribute Data) हरु रहेको File हरु अलग अलग हुन सक्दछन् । त्यस्तो अवस्थामा ती २ वटै File हरुमा रहेको तथ्यांकलाई जोडी ऐकिकृत गर्नु पर्ने हुन्छ ।

२. उदाहरणको लागि सँघिय नेपालमा रहेका ७५३ स्थानिय निकायहरु देखाउने नक्शा को GIS Data (Polygon) Format मा रहेको हुन्छ भने ती स्थानीय निकायको अरु बर्णात्मक विवरणहरु (जस्तै, जनसँख्या, घरधुरि सँख्या, परिवार सँख्या, आदी) Attribute Data Spreadsheet Format मा रहेको हुन सक्छ। प्रशिक्षार्थिहरुले यो सत्रमा यी दुवै Format मा रहेको तथ्यांकहरुलाई एक आपसमा जोड्न जान्ने भएको हुनु पर्नेछ ।

३. Street Addressing and Mapping को हकमा घर तथा बाटोको भौगोलिक अवस्थिति GIS Data (Point and Polyline) हो भने घर सम्बन्धि अन्य विवरणहरु (जस्तै: घरमुलिको नाम, परिवार सँख्या, मुख्य पेशा, बार्षिक आम्दानि तथा खर्च र बाटो सम्बन्धि बिबरणहरु) Attribute Data (Spreadsheet) हो ।

४. प्रशिक्षार्थिहरुले Attribute Data को आधारमा GIS Data Selection गर्ने विधिबारे जान्दछन् । जस्तै घरहरुको बारेमा तयार पारिएको तथ्यांकमा Attribute Query प्रयोग गरी जम्मा तथ्यांक मध्ये परिवार सँख्या ७ देखी माथी रहेका घरहरु छान्न सक्ने हुनेछन् ।

धन्यवाद

Session 8 : Calculation and Measurement of Spatial Features

सत्रको मुख्य विषयवस्तु

- Management of Attribute table
- Length Calculation
- Area Calculation
- Summarization

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले,

१. Digitize गरी तयार पारिएका Line Feature (Street Addressing and Mapping को हकमा बाटो) को लम्बाई GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।

२. त्यस्तै Digitize गरी तयार पारिएका Polygon Feature (Street Addressing and Mapping को हकमा घर तथा त्यसले चर्चेको क्षेत्र) को क्षेत्रफल GIS Application द्वारा कसरि गणना गर्ने भन्ने बारे जानेको हुनु पर्नेछ ।

३. Summarization Tool प्रयोग गरी GIS Data हरुको जम्मा क्षेत्रफल तथा लम्बाई गणना गर्ने विधि जान्दछन् । उदाहरणको लागी कुनै एउटा मुल सडक (एकता मार्गी) भित्र रहेका विभिन्न सहायक सडक खण्डहरु (एकता मार्ग भित्र रहेका सडकहरु मात्र) को कुल लम्बाई गणना गर्न सक्ने हुनु पर्नेछ ।

Session 9 : Geo-Processing

सत्रको मुख्य विषयवस्तु

- Select and Clipping Analysis
- Proximity Analysis using Buffering
- Overlay Analysis using Intersect and Identity

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले,

१. GIS मा रहेको Buffering को प्रयोग गरी पहुँच (दुरी) विश्लेशण गर्ने विधिको बारेमा प्रयोगात्मक जानकारी प्रास गर्दछन ।

२. उदाहरणको लागी कुनै वडा केन्द्रको २ कि.मि. परिधिभित्र पर्ने घरधुरिहरु छानी सँख्या पत्ता लगाउनको लागि Buffering Tool प्रयोग गरिन्छ ।

३. यसका साथै सडकको दायाँ बायाँ ३० मी. को क्षेत्र रेखाँकन गर्नु परेमा समेत यो Tool को प्रयोग गर्न सकिन्छ ।

४. Clipping Analysis Tool को मद्दतबाट कुनै स्थानको पहिचान गरी त्यस स्थानमा रहेका थप Spatial Feature (जस्तै, नदि, बाटो, भु-उपयोग, आदी) छान्न सक्ने हुनेछन । उदाहरणको लागि गाउँपालिका तथा नगरपालिकामा रहेका विभिन्न Spatial Feature हरु मध्ये कुनै निश्चित वडाको मात्रै Spatial Feature हरु छुट्याउनु परेमा यो Analysis Tool को प्रयोग गरिन्छ ।

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Session 10 : Output Designing (Map Layout)

सत्रको मुख्य विषयवस्तु

- Concept of Mapping and Cartographic Elements
- Working on Field Properties
- Labeling and Symbology
- Layout Designing
- Change into Reporting Format

निर्दिष्ट उद्देश्यहरू

यस सत्रको अन्त्यमा सहभागीहरुले

१. **Cartographic Elements** को बारेमा जानकारि प्राप्त गर्दछन । उदाहरणको लागी **GIS** नक्शामा अनिवार्य देखाउनु पर्ने **Map Scale, Direction,** आदिको बारेमा जानकारि प्राप्त गर्दछन् ।

२. त्यसै गरी **Map Symbology, Standard Colors for Specific Features** को बारेमा जानकारी पाउनेछन् ।

३. विभिन्न **Map Symbology** बिधिहरु (**Single Symbol, Symbol by quantities, Symbol by Categories, Dot Density, Chart Symbology**) को उचित प्रयोगको बारेमा जानकारि प्राप्त गर्दछन् ।

४. **Map Layout** तथा **Symbology,** संकेत, **Map Title** प्रयोग गरी प्रकाशनको लागि तयार गर्ने बारे प्रयोगात्मक जानकारी पाउनेछन् ।

EXAMPLE
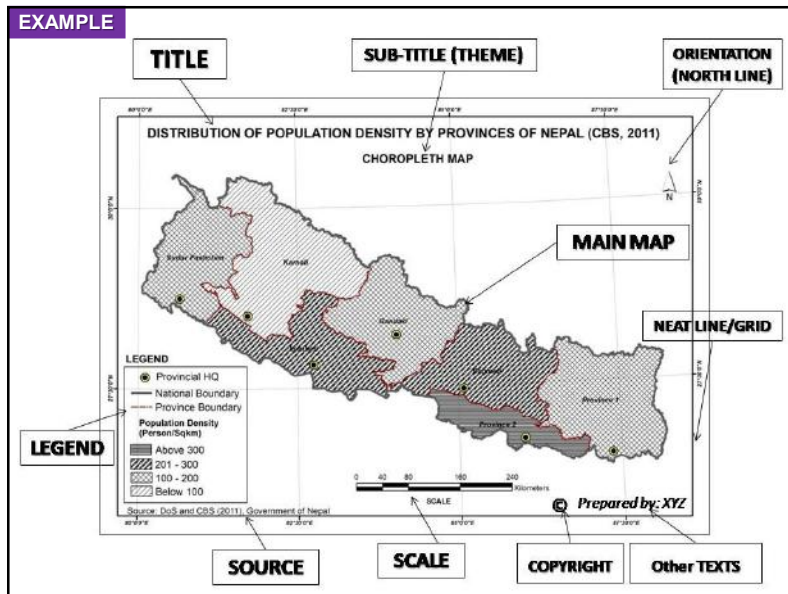
धन्यवाद

परियोजना कार्य र निर्दिष्ट उद्देश्यहरू
(Project Work and Targeted Objectives)

यस सत्रमा सहभागीहरुले,

1. **GPS Device** प्रयोग गरी प्रशिक्षार्थीहरुले आफ्नो परियोजना अन्तर्गतको क्षेत्रमा रहेका घर, बाटो, सँस्थागत संरचनाहरु, मठ, मन्दीर आदिको तथ्यांक सँकलन गर्नु पर्नेछ।
2. प्रशिक्षार्थिहरुले **Google Earth** प्रयोग गरी आफ्नो परियोजना अन्तर्गत क्षेत्रको **Image** हेर्न सक्नेछन् र **Google Earth** मा उपलब्ध रहेको **Tool** को मद्दतबाट आफ्नो परियोजना सँग सम्बन्धित तथ्यांकहरु (घर, बाटो, आदि) **Digitize** गर्नु पर्ने हुन्छ । यसरी **Digitize** गर्दा आफुले **Digitize** गरेको **Feature** प्रष्ट हुने गरी नामाकरण गरी **Save** भए नभएको यकिन गर्नु पर्दछ ।
3. **GIS** मा उपलब्ध **Calculate Geometry Tool** प्रयोग गरी प्रत्येक सडक खण्डको अलग अलग लम्बाई गणना गर्नु पर्दछ ।
4. घर धुरीहरुको सामाजिक-आर्थिक तथ्यांकहरुलाई प्रत्येक घरलाई प्रदान गरिएको **Unique ID** र घरको **GIS Data** मा रहेको **Unique ID** को आधारमा जोडी एकिकृत **GIS Database for Street Addressing and Mapping** तयार गर्नु पर्दछ ।
5. यसरी एकिकृत **GIS Database** तयार भए पश्चात उचित **Symbology, Layout Design** गरी प्रकाशन गर्न मिल्ने अवस्थामा नक्शा तयार गर्नु पर्दछ ।

धन्यवाद

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन. २०४९ द्वारा स्थापित)

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(Established by Local Development Training Academy Act, 2049)

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कार्य योजना मूल्याङ्कन तथा समापन

P >>>   +977 (1) -5522004, -5521051
F >>>   +977(1) - 5521521
E >>>   ldta.org.np@gmail.com
W>>>   www.ldta.org.np

नमुना कार्य योजना

क्र स	क्रियाकलापहरु	कहिले गर्ने	जिम्मेवारी कसको	सहयोगी निकाय	कसरी गर्ने
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पश्चात जानकारी

मूल्याङ्कन

समापन

धन्यवाद

सहभागीका लागि अध्ययन सामग्री
(प्रशिक्षण प्रयोजनका लागि)

नेपाल सरकार

ललितपुर महानगरपालिका

ठेगाना प्रणाली निर्देशिका
ललितपुर महानगरपालिका

ललितपुर महानगरपालिका मेट्रिक ठेगाना प्रणाली

ललितपुर, प्रदेश–३, नेपाल

५ जेष्ठ २०७६

ललितपुर महानगरपालिका

ललितपुर, प्रदेश–३, नेपाल

५ जेष्ठ २०७६

प्राक्कथन

यो बाटो सञ्जालमा आधारित आधुनिक ठेगाना प्रणाली अर्थात् मेट्रिक ठेगाना प्रणाली निर्देशिका ललितपुर महानगरपालिकाको प्रयोजनको लागि तयार गरिएको छ । यो निर्देशिकालाई तीन भागहरुमा बाँडिएको छ । पहिलो भागमा ठेगाना प्रणालीको अवधारणा समावेश गरिएको छ । यस अन्तर्गत परिचय, ललितपुर महानगरपालिकाको शहरी विशेषता, बैज्ञानिक ठेगाना प्रणालीको आवश्यकता, ठेगाना प्रणालीको विकास र कार्यान्वयन बिषयमा बिस्तृत छलफल गरिएको छ । दोश्रो भागमा ललितपुर महानगरपालिकामा ठेगाना प्रणाली निर्माण र लागू गर्नका लागि विस्तृत विधिहरु समावेश गरिएका छन् । यस भागमा विशेषत: बाटोको संकेत नम्बर, बाटोको नाम, घर नम्बर र यससँग सम्बन्धित अन्य पक्षहरुलाई परिभाषित गर्न नियमहरु प्रतिपादित गरिएका छन् । जसमा ठेगाना प्रणालीका तत्वहरु, मेट्रिक ठेगाना प्रणाली कार्यान्वयन प्रक्रियाहरु, घर ठेगाना प्रणाली नम्बर तथा नाम पाता र ठेगाना लेख्ने विधि आदि बिषयहरु समावेश गरिएका छन् । तेश्रो भागमा अनुसूचीहरु समावेश गरिएका छन् जसमा घर नम्बर प्रवाहका उदाहरणका चित्रहरु देखाइएका छन् । बाटोका प्रकारहरु तालिकामा देखाइएका छन् ।

यो निर्देशिका ललितपुर महानगरपालिकाको नक्साङ्कन कार्यक्रमको ठेगाना प्रणाली परामर्शदाता संस्थाहरु जियो/नेष्ट/इन्डेको जे.भी. (जियोस्पासियल सिस्टम्स प्रा. लि., नेष्ट प्रा. लि. र इनोभेटिभ डिजाइन कन्सर्न प्रा. लि.) द्वारा तयार पारिएको हो । यो निर्देशिका तयार पार्नका लागि यस कार्यक्रमका सम्बन्धित बिषय बिज्ञ, महानगरका जनप्रतिनिधि, सल्लाहकार, प्राविधिकहरुका साथै अन्य अनुभवी बिशेषज्ञहरु संगको छलफल, सल्लाह र सुझावका आधारमा तयार गरिएको छ । यस निर्देशिकाको मस्यौदा काठमाण्डौं महानगरपालिका र युरोपेली आयोगले काठमाण्डौं उपत्यका म्यापिङ कार्यक्रम: एकिकृत शहरी विकास प्रयास अन्तर्गत बि.सं. २०५७ मा तयार गरेको "ठेगाना प्रणाली निर्देशिका, काठमाण्डौं महानगरपालिका" लाई आधार मानेर तयार गरिएको छ । काठमाण्डौं महानगर र ललितपुर महानगरको ऐतिहासिक विकासको पृष्ठभूमि, विकासका क्रमहरु र तीनका बनावटमा समेत एकरुपता भएका कारण ठेगाना प्रणालीमा समेत धेरै कुरा मेलखाने भएका कारण त्यो निर्देशिकाको प्रतिवेदनलाई यहाँ आधार मानिएको हो । तथापि बि.सं. २०५७ साल पछिका विकासका आयामहरुको परिवर्तनका साथै काठमाण्डौं महानगरपालिकाको भौगोलिक बनावट र ललितपुर महानगरपालिकाको भौगोलिक बनावटको भिन्नतालाई विचार गर्नुका साथै काठमाण्डौं महानगरपालिकाको ठेगाना प्रणाली निर्माण र कार्यान्वयनमा भए गरेका अनुभव समेतलाई यस मस्यौदामा समाविष्ट गरिएको छ । त्यसका अतिरिक्त नेपाल सरकार शहरी विकास तथा भवन निर्माण बिभाग (DUDBC) ले तयार पारेका घर ठेगाना प्रणालीका अधार तथा अनुभव समेतलाई समावेश गर्ने प्रयास गरिएको छ ।

यो मेट्रिक ठेगाना प्रणाली निर्देशिकाको मस्यौदामा ललितपुर महानगरपालिकाका सम्बन्धित सरोकारवालाहरुको बीचमा छलफल गराई आवश्यक परिमार्जन, अनुमोदन गरी कार्यान्वयनका लागि स्वीकृति गरिएको छ ।

विषयसूची

भाग-३

अनुसूची

भाग १

ठेगाना प्रणालीको अवधारणा

१.१ परिचय

ठूलाठूला शहरुहरुमा घरहरु पहिल्याउन गाह्रो पर्ने भएको हुनाले सरल बैज्ञानिक ठेगाना प्रणाली प्रयोग गरेको पाइन्छ । द्रुतगतिमा विकास भइरहेकोललितपुर महानगरपालिकाको सन्दर्भमा वैज्ञानिक ठेगाना प्रणालीको अभाव महशुस गरिएको छ । शहरीकरणको सिलसिलामा थुप्रै नयाँ घरहरु बन्ने क्रम जारी भइरहेका घरहरुको संरचनामा परिवर्तन हुने र बाटाहरु चौडा गर्ने, नयाँ बाटो तथा मार्गहरुको निर्माणले गर्दा ललितपुर महानगरपालिकाको स्वरुप झन्झन् जटिल हुँदै गएकोले यो शहरको लागि एउटा सरल, बुझिने र लचिलो मेट्रिक ठेगाना प्रणालीको आवश्यकता छ ।

मेट्रिक ठेगाना प्रणालीका केही अवधारणाहरु निम्न छन् ।

- हरेक घर तथा भवनमा मानिसको बसाई तथा क्रियाकलाप र आवागमन अनिवार्य हुन्छ ।

- हरेक घरका लागि बाटोको पहुँच पहिलो आवश्यकता हो ।

- हरेक घर एउटा वा एक भन्दा धेरै बाटा/सडक संग जोडिएका हुन सक्छन्, तर हरेक घरको मूलढोका (मुख्य प्रबेशद्वार) एउटा हुन्छ र त्यो एउटा बाटो संग मात्र जोडिएको हुन्छ ।

- बाटो बिभिन्न स्तरका र बिभिन्न दिशातर्फ जाने हुन्छन् ।

- बाटो एक आपसमा जोडिने वा नजिक र टाढा जोडिने वा एकतर्फ मात्र जोडिने हुन्छन् ।

- प्राय घर/भवनहरु बाटोको बीच भागबाट दाँया वा बायाँ बसेका हुन्छन्, तर केही घरहरुले एउटा मात्र मूलढोका प्रयोग गरेर त्यस भित्र चोक वा संयुक्त आवास तथा क्रियाकलाप गर्ने भिन्दा भिन्दै स्वामित्वका घर, त्यस घरसंग सम्बन्धित एक वा दुई मूल प्रेशद्वार, कोठाहरु तथा फ्ल्याटहरुको निर्माण गरेका हुन सक्छन् ।

- हरेक एकल तथा संयुक्त घरहरु बाटोको निश्चित चोक तथा मिलन बिन्दुको दूरीमा रहेका हुन्छन् ।

- बाटोको चोक तथा मिलन बिन्दु (दोवाटो, चौवाटो) देखि कुनै निश्चित घरको दूरी (लम्बाई) का आधारमा घर ठेगाना पत्ता लगाउन सकिन्छ ।

१

त्यो दूरीलाई आधार मानेर घरको नम्बर, टोलको नाम, बाटाको नाम उल्लेख गरी बाटोका आधारमा गरिने ठेगाना प्रणालीलाई **मेट्रिक ठेगाना प्रणाली** भनिन्छ ।

यो निर्देशिकाको भाग १ मा ललितपुर महानगरपालिकाको शहरी विशेषता र आवश्यकतालाई ध्यानमा राखी सापेक्षित रुपमा सबैभन्दा व्यवहारिक ठेगाना प्रणाली प्रस्ताव गरिएको छ । यसको दोस्रो भागमा मेट्रिक ठेगाना प्रणाली निर्माणका बिधिहरु उल्लेख गरिएको छ । तेस्रो भागमा केही अनुसूचीहरु राखिएका छन्, जसमा नक्सा र ठेगाना प्रणाली बिधिमा प्रयोग गरिएका अधारलाई चित्र तथा ग्राफिक्सका माध्यमबाट स्पष्ट पार्न खोजिएको छ । यसका साथै यस निर्देशिकामा नमूना सर्भेक्षण (piloting survey) समेतका उदाहरण प्रस्तुत गरिएको छ ।

यो निर्देशिका (manual) ललितपुर महानगरपालिकामा अपनाइने "मेट्रिक ठेगाना प्रणाली" का सन्दर्भमा तयार गरिएको हो । यस प्रणालीले महानगरपालिकामा हुन सक्ने घर, घडेरी र बाटो सञ्जालको सम्भाव्य परिवर्तनलाई समेत क्रमिकरुपमा समाबिष्ट गरी ठेगाना प्रणालीलाई अध्यावधिक सुधार गर्न सकिने विश्वास लिइएको छ । यस प्रणालीले आफ्नो मूल अवधारणामा असर नपर्ने गरी महानगरपालिकाको शहरी संरचनाको विशिष्टता र स्थानको परम्परागत नामाकरण गर्ने प्रचलन समेतलाई समाविष्ट गर्नेछ ।

१.२ ललितपुर महानगरपालिकाको शहरी विशेषता

ललितपुर शहरलाई बाटो र भवनको ढाँचा अनुसार मूलतः दुई क्षेत्रमा बाँड्न सकिन्छ, भित्री शहर (पुरानो बस्ती) र बाहिरी शहर (नयाँ बस्ती) । शहरको भित्री क्षेत्रमा पुराना घरहरु र साँघुरो बाटो, चोक, बहाल आदि छन् । घर पुग्ने बाटाहरु कतै बहाल र चोकबाट छन् भने कतै घरमुनि बाट छन् । कतिपय घरहरु धेरै चोकहरु भएर पुग्नुपर्दछ भने कतिपय घरको दुवैपट्टी बाटो पर्दछ । ललितपुर महानगरपालिकाको बाहिरी क्षेत्रको भिन्दै विशेषता छ । बाटोहरु सापेक्षित रुपमा फराकिला छन् । पर्खालले घेरिएका भवनहरु, कार्यालय भवनहरु आदि भएकाले बाहिरी भाग खुल्ला देखिन्छ । तर धेरैजसो बाटोहरुको नाम भने राखिएको छैन । यस क्षेत्रमा भवन बन्ने क्रम जारी तथा घरसंख्या निरन्तर थपिदै छन् । नयाँ आवासीय क्षेत्रमा संयुक्त आवासका भवन तथा कम्प्लेक्सहरु बनेका र बन्ने क्रममा छन् । ललितपुर महानगरपालिकामा अपनाइने ठेगाना प्रणालीले यी सबै विशेषताहरुलाई समेट्नु आवश्यक हुन्छ ।

१.३ बैज्ञानिक ठेगाना प्रणालीको आवश्यकता

शहरी क्षेत्रमा बिबिध भौतिक तथा व्यवशायिक सेवा सुबिधाको बिकास तथा बिस्तारका कारण देश भित्र वा बाहिरबाट समेत शहर भित्र बसाई सराईको तिब्रता बढ्न जान्छ । जसका कारण शहरी बस्तीको बिकास तथा बिस्तार हुन्छ । शहरी बस्तीको बिकास संगसंगै

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शहर अति व्यस्त व्यवशायिक एवं घर तथा भवनहरुको अत्यन्त बाक्लो उपस्थिति आदिका कारण शहरी क्षेत्रका मानिसको एकआपसमा पहिचानपनि बिस्तारै कमहुँदै जान्छ । शहरी सेवा सुबिधा प्रदायक संघ संस्था तथा कार्यलयहरुका लागि आवश्यक घरहरुको पहिचान तथा शहर भित्र घट्न सक्ने बिपद् तथा जोखिमको व्यवस्थापन समेतकालागि घर तथा भवनहरुको पहिचान अनिवार्य हुन्छ । यसका अतिरिक्त महानगरपालिकाको सेवा सुबिधा प्रबाहलाई आवश्यक पर्ने आय आर्जनका लागि समेत घरजग्गा कर, व्यवशाय कर तथा घरभाडा कर जस्ता बिषयमा शहरका प्रत्येक घरहरुको यथार्थ पहिचान आवश्यक हुन्छ । तर जटील शहरी बसोबासका स्थानहरुमा त्यस्ता घर तथा भवनहरुको पहिचान सजिलो हुन सक्दैन । बिश्वका अन्य बिकसित मुलुकको अनुभवले त्यस्तो समस्या समाधान गर्न आधुनिक ठेगाना प्रणालीको निर्माण गरिनुपर्ने आवश्यकता सुझाएका छन (विश्व बैंक सन २००५)[1]। नेपालमा सर्वप्रथम काठमाडौं महानगरपालिकाले काठमाडौं उपत्यका म्यापिङ् कार्यक्रम अन्तरगत सन् २००० मा नै भित्र्याएको हो । यस प्रणालीले सार्वजनिक सेवामा प्रदानगर्ने सहयोग, योजनाबद्ध बिकासमा पुर्याउने सहयोग र यस प्रणालीको क्रमिकता, सरलता र लचकता जस्ता गुणहरुलाई मनन गर्दै नेपाल सरकारको शहरी बिकास तथा भवन निर्माण बिभागले नेपालका थप साना ठूला शहरहरुमा यस प्रणालीलाई अपनाइ सकेको छ । का.म.पा. को भौगोलिक बनावट देखि शहरी विकासको प्रकृति ललितपुर महानगरपालिकासंग मिल्दो जुल्दो भएकोले यो प्रणाली ललितपुर महानगरपालिकामा पनि उपयुक्त देखिन्छ । तर ललितपुर महानगरपालिका जस्तो द्रुततर गतिमा विस्तार भइरहेको शहरलाई अझ बढी सरल, व्यवहारिक र लचिलो ठेगाना प्रणाली आवश्यक छ । यी विशेषताहरुलाई समेट्न ललितपुर महानगरपालिकाको लागि मेट्रिक ठेगाना प्रणाली उपयुक्त देखिन्छ । देशका अरु नगरहरुमा अपनाइसकेको अवस्थामा यस महानगरले पनि सोही प्रणाली अपनाउनु पनि त्यत्तिकै वाञ्छनीय देखिन्छ ।

मेट्रिक ठेगाना प्रणालीका विशेषताहरु निम्न छन् :

क)   घरको नम्बर बाटोको शुरु बिन्दु, चोक, दोबाटो वा चौबाटोबाट घरको मुख्य प्रवेशद्वार सम्मको दूरीको आधारमा दिइन्छ ।

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[1] The World Bank, 2005 Street Addressing and the Management of Cities The International Bank for Reconstruction and Development, 1818 H Street, NW

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ख) हरेक घरको नम्बर पातामा घरको नम्बर, भएको बाटोको नाम, टोलको नाम राखिन्छ ।

ग) प्रयोगकर्ताले दूरीको आधारमा आफूले खोजेको घर पत्ता लगाउन सक्दछ ।

घ) घर/घडेरीहरु थपघट हुँदा पनि घर नम्बर प्रवाहमा कुनै असर पर्दैन ।

ङ) घर नम्बर घर थपिंदा वा टुक्रिंदा पनि निरन्तर रुपमा एउटै किसिमको प्रवाह हुने र यसको एकरुपता कायमै रहनुका साथै तिनीहरुको तथ्यांक लगत भू-सन्दर्भ (Geo-referencing) प्रणालीमा राख्न सम्भव हुन्छ ।

च) प्राविधिक प्रयोजनको लागि बाटोको संकेत नम्बरको आधारमा बाटो र घर नगरको कुन क्षेत्रमा पर्दछ भन्ने कुरा छुट्याउन सकिन्छ ।

छ) यस प्रणालीले नगरबासीहरुको सूचना प्रणाली राख्न र अध्यावधिक गर्न आधार प्रदान गर्दछ ।

ज) यस प्रणालीले नगरबासीहरु लाई प्रदान गर्ने खानेपानी, ढल, फोहर संकलन, बिजुली, टेलिफोन जस्ता सेवा प्रवाहलाई एकीकृत गर्ने लगायत सेवा र कर संकलनका कार्यहरुलाई सहयोग पुर्‍याउन सक्दछ ।

झ) यो ठेगाना प्रणाली नगरमा सेवा प्रबाहगर्ने अन्य संघ संस्थाहरुको प्रयोगका लागि पनि उत्तिकै सहयोगी हुनसक्दछ ।

ञ) शहरी क्षेत्रमा विपद् तथा आकस्मिक समस्या आदि पर्दा समेत घर ठेगानाको पहिचान, उद्धार तथा सेवा प्रवाह गर्न छिटो, छरितो र सजिलो हुन्छ ।

१.४ ठेगाना प्रणालीको बिकास (निर्माण) र कार्यान्वयन

ललितपुर महानगरपालिकामा मेट्रिक ठेगाना प्रणालीको विकास र कार्यान्वयनको लागि देहाएका चरणहरु (phases) अपनाइने छन् ।

१.४.१. ठेगाना क्षेत्र (ZONE) मा विभाजन

१.४.२. बाटो नक्साङ्कन र नम्बर प्रणाली

१.४.३ टोलको नाम र सिमाना निर्धारण

१.४.४ घर नम्बर प्रणाली

१.४.५. कार्यान्वयन

१.४.६. बैधानिकता

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१.४.१ ठेगाना क्षेत्र (ZONE) मा विभाजन

ललितपुर महानगरपालिकाला भौगोलिक र भौतिक विकासको आधारमा विभिन्न मेट्रिक ठेगाना क्षेत्रहरुमा विभाजन गर्नु वाञ्छनीय देखिन्छ । यो विभाजन शहरी व्यवस्थापन र विकास योजनाको लागि आवश्यक भए पनि ठेगाना प्रणालीको लागि भने मुख्यत: बाटोलाई पहिल्याउन सजिलोको लागि हो । बाटोको संकेत नम्बर प्रत्येक क्षेत्रको लागि अलग अलग हुने हुँदा कम्प्युटर सूचना प्रणालीमा बाटो संकेत नम्बरको संख्या (आकार) लाई व्यवस्था गर्न सजिलो हुन्छ ।

ललितपुर महानगरपालिकालाई ५ ठेगाना क्षेत्र (Zone) मा विभाजन गरिने छ । यस महानगरपालिकाको क्षेत्र विभाजनमा वडा सिमानालाई प्रमुख प्रशासनिक क्षेत्र मानिएको छ । जसका कारण एउटा वडालाई दुई क्षेत्रमा बाँडिएको छैन । किनकी नेपालको वर्तमान संविधान अनुसार संघीय शासन पद्धतिमा स्थानीय सरकारको तल्लो तह वडा भएका कारण शहरका हरेक प्रकारका नियम कार्यान्वयन एवं तथ्यांकको व्यवस्थापन वडा कार्यालयबाट गरिने हुँदा क्षेत्र विभाजनलाई वडा सिमानासंग समायोजन गरिएको छ । तर कतिपय वडा बिभाजन बैज्ञानिक तरिकाले नगरिएको अवस्थामा वडामा आधारित हुँदा केही अप्ठेराहरु भोल्नु पर्ने भए पनि यस प्रणालीले वडाको आधारलाई अंगिकार गरेकोछ । यसका अतिरिक्त क्षेत्र विभाजनका अन्य आधारहरु शहरको भित्री भाग, जनसंख्या, भौगोलिक सिमाना तथा बाटो सञ्जालको विस्तार र विकास निर्माण गर्न सकिने क्षेत्र आदिलाई विचार गरिएको छ । क्षेत्र विभाजनको नक्सा तल दिइएको छ (*चित्र नम्बंर २.१*) ।

१.४.२ बाटो नक्साङ्कन र नम्बर प्रणाली

सर्बप्रथमत: महानगरको सम्पूर्ण भागको ठूलो मापकको आधार नक्सा (Base-map) बनाईने छ । त्यो आधार नक्सामा देखिने प्रत्येक ठेगाना क्षेत्रमा रहेका बिभिन्न किसिमका बाटोहरुलाई कम्प्युटर प्रणालीमा व्यवस्थित किसिमले राख्न बाटो संकेत नम्बर दिइन्छ । यसरी दिइएको बाटो संकेत नम्बरले बाटो सम्बन्धी सूचना व्यवस्थापनमा मद्दत गर्दछ । बाटो संकेत नम्बरको शुरुवात क्षेत्र (ZONE) नम्बरले गरिने भएकोले बाटाको नम्बर हेर्ने वित्तिकै कुन क्षेत्रको बाटो भन्ने पत्ता लाग्दछ । ललितपुर महानगरको मेरुदण्डको रुपमा चक्रपथ रहेको छ । चक्रपथबाट बाटो सञ्जालहरु महानगरको उत्तर तथा दक्षिणतर्फ स्पष्ट रुपले गएको देखिन्छ । यसका अतिरिक्त केही पुराना र नयाँ बाटा काठमाण्डौं संग पनि जोडिएका छन् । केही बाटा महानगर बाहिर ललितपुर जिल्लाका अन्य पालिका तर्फ जोडिएका छन् ।

त्यसकारण यस महानगरको बाटाको सञ्जाललाई निम्न समूहमा राखिएको छ ।

क) पथ - १४ मीटर वा चार लेन र सो भन्दा चौडा

ख) सडक- १० देखि १४ मीटर वा दुई लेन सम्मका

ग) मार्ग - ३ देखि १० मीटर भन्दा मुनी सम्मका

घ) गल्ली - ३ मीटर भन्दा साना

ङ) चोक, बहाल

१.४.३ टोलको नाम र सिमाना निर्धारण

टोलका प्रतिनिधिहरु र स्थानीय सरोकारवालाहरु सँग समन्वय गरेर टोलको नाम र सिमाना निक्यौंल गरिनेछ । यसरी तयार भएको टोलको नाम नक्सा सहित वडामा टांस गरी सुझावहरु संकलन गरिनेछ । संकलित सुझावहरु समेत मनन गरी महानगरपालिकाको कार्यपालिकाले अन्तिम निर्णय दिएपछि सो नामहरु औपचारिक हुनेछन् ।

१.४.४ घर नम्बर प्रणाली

मेट्रिक ठेगाना प्रणालीमा घर नम्बर घरसम्म पुग्ने बाटोको दूरीसँग सम्बन्धित हुन्छ । अतः घर नम्बर घरसँग जोडिएको बाटोको शुरु बिन्दु देखिको मूलढोका सम्मको मिटरमा नापिएको दूरी हो । यसबाट बाटो पत्तालाग्ने विक्तिकै घर कति टाढा छ भन्ने अनुमान गर्न सकिन्छ । मूलढोकाले घरको अवस्थितिको पहिचान गराउने भएकोले भविष्यमा घर टुक्रिदा पनि घर नम्बरको क्रमिकता कायमै रहन्छ । यसरी नापिने दूरीले घरको अवस्थिति मात्र जनाउने भएकोले यो दूरी दशमलबमा वा नापेर आएको अंक ठ्याक्कै हुनु जरुरी छैन । घर नम्बर जहिलेपनि पूर्ण अंकमा दिइन्छ । घर नम्बर औसत दूरी भएको हुनाले ठेगाना प्रणाली बाहेक अन्य प्रयोजनको लागि यो मापनको रुपमा लिनु हुँदैन ।

अन्तरराष्ट्रिय प्रचलन अनुसार घर नम्बर दिंदा बाटोको दाँयापट्टी जोडी नम्बर दिइन्छ भने बाटोको बायाँपट्टी विजोडी नम्बर दिइन्छ । यो घर नम्बर प्रणालीको सामान्य सिद्धान्त भए पनि स्थलगत अवस्थिति यथार्थमा माथि उल्लेख गरेको भन्दा भिन्न स्थितिपनि हुन सक्दछन् । ललितपुर महानगरपालिकाको सन्दर्भमा आउन सक्ने अपवादहरुलाई ध्यानमा राखी यस निर्देशिकाको दोस्रो खण्डमा प्रस्तुत ठेगाना प्रणाली लागुगर्ने विधिहरुको विस्तृत व्याख्या गरिएको छ ।

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१.४.५ कार्यान्वयन

यो ठेगाना प्रणाली लागू गर्न निम्न कार्यहरु गरिनेछन् ।

क)	स्वीकृत विधिमा आधारित कार्ययोजना तयारी	परामर्शदाता
ख)	ललितपुर महानगरपालिका (ल.म.पा.) निर्बाचित जनप्रतिनिधि, सल्लाहकार तथा प्राविधिकहरुलाई प्रणालीका बारेमा प्रबोधिकरण	परामर्शदाता
ग)	ल.म.पा.द्वारा मेट्रिक ठेगाना प्रणाली अपनाउने सैद्धान्तिक स्वीकृती र मेट्रिक ठेगाना प्रणाली निर्देशक समिति, संयुक्त समिति र वडा स्तरीय कार्यदलको गठन	ल.म.पा.
घ)	यस ठेगाना प्रणालीको संभावित प्रयोगकर्ताहरुलाई प्रणालीबारे जानकारी	ल.म.पा.
ङ)	ठेगाना प्रणालीका लागि आवश्यक दूर सम्वेदन प्रतिविम्ब (stereo satellite imageries) वाट आधार नक्सा तयार गर्ने, प्रतिवेदन तथा आवश्यक सामग्रीको खरिद, संकलन तथा व्यवस्थापन	परामर्शदाता
च)	सञ्चारका विविध माध्यमहरुबाट सर्वसाधारणमा ठेगाना प्रणाली सम्बन्धी जानकारी	ल.म.पा.
छ)	प्राविधिक टोलीले आधारनक्सा तयारी र निर्देशिकाको मस्यौदा निर्माण	परामर्शदाता
ज)	मेट्रिक ठेगाना प्रणाली निर्देशक समितिबाट मेट्रिक ठेगाना प्रणाली निर्देशिका स्वीकृत	मेट्रिक ठेगाना प्रणाली निर्देशक समिति
झ)	प्रमुख बाटाहरु, मूलतः एकभन्दा बढी वडालाई छुने र रणनीतिक बाटोहरुको पहिचान र नामहरु प्रस्ताव	मेट्रिक ठेगाना प्रणाली निर्देशक समिति, संयुक्त समिति र वडा स्तरीय कार्यदल
ञ)	मेट्रिक ठेगाना प्रणाली निर्देशक समितिबाट प्रमुख बाटाहरुका नामहरु जनसाधारणको जानकारी र सुझावको लागि समयावधि तोकी प्रचार	मेट्रिक ठेगाना प्रणाली निर्देशक समिति, संयुक्त समिति र वडा स्तरीय कार्यदल
ट)	मेट्रिक ठेगाना प्रणाली सम्बन्धी बिभिन्न समितिहरुबाट	मेट्रिक ठेगाना प्रणाली

	प्रमुख बाटाहरुको नामहरु जनसाधारणबाट प्रप्त सुभावहरु मनन गरी स्वीकृत	निर्देशक समिति, संयुक्त समिति र वडा स्तरीय कार्यदल
ठ)	स्थानीय जनताबीच बाटोको नाम बारे छलफल र नाम प्रस्ताव संकलन	मेट्रिक ठेगान प्रणाली निर्देशक समिति, वडा स्तरीय कार्य समिति र परामर्शदाता
ड)	वडाहरुबाट संकलित टोलका नामहरु, बाटाका नामहरु निर्देशक समितिले प्रस्तावको रुपमा स्वीकृत र वडा वडामा सुभावको लागि टांस	मेट्रिक ठेगाना प्रणाली निर्देशक समिति, संयुक्त समिति र वडा स्तरीय कार्यदल
ढ)	संकलित सुभवहरु मनन गरी मेट्रिक ठेगाना प्रणाली निर्देशक समितिबाट स्वीकृत	मेट्रिक ठेगान प्रणाली निर्देशक समिति
ण)	ललितपुर महानगरको भित्री शहरी बस्तीको घर नम्बर सम्बन्धी नमूना सर्भेक्षण	परामर्शदाता
त)	मेट्रिक ठेगान प्रणाली निर्देशिका तथा प्रस्तावित बाटो, टोल आदिका नामहरु निर्देशक समितिबाट स्वीकृति तथा कार्यान्वयनका लागि अनुमोदन	ल.म.पा.
थ)	प्राविधिक टोलीले आधार नक्साको आधारमा क्षेत्रगत ठेगानाका लागि आवश्यक बाटो नक्सा निर्माण, स्थलगत सर्भेक्षण र रुजू	परामर्शदाता
द)	संकलित घर प्रवेशद्वारको तथ्याङ्कको आधारमा घर नम्बरीङ गर्ने कार्य	परामर्शदाता
ध)	घर नम्बर अंकित गर्ने कार्य	परामर्शदाता +ल.म.पा.
न)	नमूना स्थानको १००० घरमा घर नम्बर प्रदान गर्ने	परामर्शदाता
प)	वडामा तथ्यांक तथा नम्बर पाता दस्तुर संकलन	ल.म.पा.
फ)	बाटोको नामको आधारमा बाटो नाम पाता निर्माण	ल.म.पा.
ब)	घर नम्बर पाता तथा बाटो नम्बर पाता टाँस्ने कार्य	ल.म.पा.
भ)	वडामा घर नम्बर पाता दस्तुर संकलन	वडा + ल.म.पा.

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म)	घर नम्बर पाता तथा बाटो नम्बर पाता टाँस्ने कार्य	वडा + ल.म.पा.
य)	तयार गरिएका महानगरपालिकाका नक्सा तथा तथ्याङ्कलाई वेब–जिआईएस (WebGIS) मा राख्ने र महानगरपलिकाका जनशक्तिलाई क्षमता अभिवृद्धि तालिम उपलब्ध गराउने	परामर्शदाता

१.४.६. बैधानिकता

१. स्थानीय सरकार संचालन ऐन २०७४ को परिच्छेद १५ ले व्यवस्था गरे अनुसार महानगरपालिकाको क्षेत्राधिकार भित्र रहेर ठेगाना प्रणालीको व्यवस्था गर्न सकिने छ ।

२. बाटो नाम, चोक, सुरुवाती बिन्दु, टोलका नाम, सिमाना सम्बन्धी विवादहरु हुन सक्ने भएको हुनाले यी नामहरुलाई महानगरपालिकाले औपचारिक स्वीकृती प्रदान गरे पछि सामान्यत: फेर्न पाइने छैन । यसरी दिइने नाम स्थानीय चलन-चल्ती, ऐतिहासिकता र स्थानीय बासिन्दाहरुको परामर्शमा दिइने छ । एक भन्दा बढी वडा वा ठेगाना क्षेत्र भएर जाने बाटोको नाम महानगरपालिकाले निर्देशक समिति (Steering Committee) बाट राख्ने छ । कुनै कारणवश फेर्नु पर्ने भएमा महानगरपालिका कार्यपालिकाको प्रस्तावमा स्थानीय सरकार संचालन ऐन २०७४ ले उपलब्ध गराएको सीमा भित्र रही नगर परिषदले फेरबदल गर्न सक्नेछ ।

३. ललितपुर महानगरपालिकाले वितरण गरेको घर नम्बर ठेगाना प्रयोजनको लागि मात्र भएको हुनाले यसले घर जगाको स्वामित्व लगायत अन्य प्रयोजनको लागि बैधानिकता प्राप्त गर्ने छैन ।

४. घरको भित्ता वा खम्बामा ललितपुर महानगरपालिकाबाट बाटो नाम पाता टाँस गर्दा वा लगाउँदा कसैले बाधा विरोध गर्न पाइने छैन । बाधा विरोध गर्ने व्यक्तिलाई सार्वजनिक हितको काम गर्दा बाधा पुर्‍याएको मानी आवश्यक कानूनी कारवाही गर्न सकिने छ ।

५. बाटाको नाम पाता महानगरपालिकाको आफ्नो सार्वजनिक सम्पत्ति भएको हुनाले यसलाई नाशगर्ने, यस माथि बिज्ञापन लगायत अन्य बस्तुहरु टाँस्ने, छोप्ने र क्षय गर्ने कार्यलाई सार्वजनिक सम्पत्ति नष्ट गरे सरह मानी कारवाही गर्न सकिनेछ । सार्वजनिक जानकारीको लागि उपयोग गरिने बाटो नाम पाता व्यक्तिगत घर पर्खालमा राख्न महानगरपालिकाले अधिकार राख्दछ ।

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६. नक्सा पास भएको वा नभएको भवनहरुलाई भिन्दा भिन्दै रंगको (color) घर नम्बर पाता दिईने छ ।

७. घर नम्बर पाताको अनुगमन महानगरपालिकाको सम्बन्धित निकायले गर्न सकिने छ ।

८. ठेगाना प्रणालीलाई अध्यावधिक राख्न ललितपुर महानगरपालिकामा शहरी विकास महाशाखामा भौगोलिक सूचना प्रणाली (GIS) सुविधा सहितको ठेगाना प्रणाली शाखा खडा गरिनेछ । यस शाखाले महानगरपालिकाको बाटो सञ्जालमा आधारित आधुनिक ठेगाना प्रणाली अर्थात् मेट्रिक ठेगाना प्रणाली कार्यक्रमको सक्रियतामा तयार पारेको ठेगाना प्रणालीलाई निरन्तरता दिनेछ ।

९. घर नम्बर बितरणको कार्य सकिए पछि छुट हुनगएका, थपिन आएका वा मिलान गर्नुपर्ने घर नम्बरको हकमा सम्बन्धित घरधनीले वडा कार्यलय मार्फत ठेगान एकाईमा निवेदन दिनु पर्नेछ । यसरी आएको निवेदनमा एकाईले नापजाँच पश्चात घर नम्बर निश्चित गरी तोकिएको शुल्क लिई घर नम्बर उपलव्ध गराउनेछ ।

१०. महानगर भरीका घर नम्बरलाई एकरुपता दिन महानगरपालिकाले तोकेको आकार, ढांचा, नम्बर र नामलेख्ने तरिका, अक्षर (फोण्ट) को आकार र प्रकार दुरुस्त हुनेगरी घर नम्बर प्लेट बनाउनु पर्दछ । यसभन्दा फरक गरी आफूखुसी गरी नगरलाई कुरुप पार्न पाइने छैन ।

१०

भाग २

ठेगाना प्रणाली निर्माण र लागू गरिने विधिहरु

२.१. परिचय

यो दोस्रो भागमा ललितपुर महानगरपालिका भित्र रहेका हरेक ब्यक्तिगत तथा सार्वजनिक घर/भवन, धार्मिक स्थल तथा सार्वजनिक पाटी, पौवा, फल्चा, ढुंगेधाराआदि लगायतका ठेगाना प्रणाली कसरी बनाउने र सर्वसाधारणले बुझ्नेगरी तीनको प्रयोग गरेर ती घर/भवनहरु कसरी पहिचान गर्ने भन्नेवारे विस्तृत तरिकाहरु वर्णन गरिएका छन् । ती तरिकाहरुलाई बिभिन्न तस्वीर, चित्र र ग्राफिक्सका माध्यमबाट समेत बुझाउने प्रयास गरिएको छ ।

अत्याधुनिक दूर सम्बेदन स्टेरीयो प्रतिबिम्ब (Remote Sensing Stereo Satellite Imageries), शुक्ष्म सम्बेदनशील भूमण्डलीय अवस्थिति प्रणाली (DGPS) र स्थलगत आधार-तल सर्वेक्षण (Field Based Leveling Survey) र बिस्तृत स्थलगत निरिक्षण (Detail field verification) बाट रुजु र अध्यावधिक गरी बनाईएका अधार नक्साको अधारमा तयार गरिएका बाटो सञ्जाललाई आधार मानेर यो मेट्रिक ठेगाना प्रणाली तयार गर्ने बिधिहरु यहाँ उल्लेख गरिएका छन ।

महानगरको भित्री भाग पौराणिक कालखण्ड देखि निर्माण भएको, घर/भवनहरु अत्यन्त बाक्ला, एक आपसमा जोडिएका, सांगुरा, साना र ठूला मिसिएका, भित्री चोक तथा बहालका रुपमा अती जटिल भू-दृष्यमा निर्माण भएका, बाटो तथा गल्लीहरु साना, सांगुरा र कतीपय एउटा घरको भित्रबाट अर्को चोक तथा बहालमा पुग्न सकिने तत्कालिन सामरिक रणनीतिका आधारमा निर्माण गरिएका भएको कारण त्यहाँ अवस्थित बाटो सञ्जाल र तीनमा आधारित मेट्रिक ठेगाना प्रणाली निर्माण पनि अति जटील छ । त्यसकारण त्यो जटीलतालाई बुझ्न शहरको केन्द्रभागको बिस्तृत अध्ययन गरी नमूना सर्वेक्षण (piloting survey) बाट निकालिएको निष्कर्ष समेतलाई यस निर्देशिकामा राखीएको छ ।

२.२ ठेगाना प्रणालीका तत्वहरु

मेट्रिक ठेगाना प्रणालीले ठेगानाको लागि निम्न लिखित आधारहरु अपनाउने छ ।

२.२.१. घर ठेगाना क्षेत्र

ललितपुर महानगरपालिकालाई विभिन्न भौगोलिक क्षेत्रहरु अर्थात् "ठेगाना क्षेत्र"(Metric Addressing Zone) हरुमा विभाजित गरिन्छ ।

२.२.२. बाटो

"बाटो" भन्नाले प्रत्येक घर जाने सार्वजनिक बाटोहरु जस्तै: पथ, बाटा, मार्ग, गल्ली वा पैदलमार्ग आदिलाई जनाउँदछ । प्रत्येक बाटोको पहिचानको लागि एउटा छुट्टै नाम र संकेत नम्बर दिइने छ ।

२.२.३ भवन

सार्वजनिक बाटोले छोएको मूलढोकाको आधारमा प्रत्येक घर/भवनलाई पहिचान गरिन्छ । माथि उल्लेखित मुख्य आधारहरु बाहेक निम्न पूरक आधारहरु पनि घर ठेगाना पहिचान प्रक्रियामा प्रयोग गरिने छन् ।

क) जग्गा कित्ता नम्बर

ख) टोलको नाम र सिमाना

ग) सार्वजनिक आवतजावत गरिने बाटोको किसिमहरु, जस्तै: पथ, मार्ग, बाटो, गल्ली, चोक, बहाल आदि

घ) बाटोले जोडिएको ठाउँको प्रचलित नाम

ङ) घरको विभिन्न उप विभाजित इकाईहरु, जस्तै आवास घर इकाई, तला आदि पहिचान गर्न प्रयोग गरिने पूरक नम्बर ।

२.३. मेट्रिक ठेगाना प्रणाली कार्यान्वयन प्रक्रियाहरु

२.३.१. ठेगाना क्षेत्र विभाजन

बाटोहरुलाई संकेत नम्बर दिन सजिलो र सानो अंक (digit) आकार होस भन्ने हेतुले महानगरपालिकालाई पाँच ठेगाना क्षेत्रमा विभाजन गरिएको छ (*चित्र नं. २.१ मा हेर्नुहोस्*) । यसो गर्दा हरेक बाटो र घर कुन ठेगाना क्षेत्र अन्तर्गत पर्दछ भन्ने कुरा थाहा पाइने हुँदा जोकोहीलाई पनि सजिलो पर्दछ । हरेक ठेगाना क्षेत्रलाई भिन्दै संकेत दिइने छ । क्षेत्र र बाटोको सम्बन्ध राख्नको लागि बाटो जुन क्षेत्रबाट शुरु भएको हो त्यसै क्षेत्रको संकेत नम्बर अगाडी हुनेछ र त्यसपछि बाटो संकेत नम्बर रहने छ । *चित्र नं. २.१* मा महानगरपालिकाको ठेगाना क्षेत्रहरु र तिनीहरुमा पर्ने वडाहरु आदि देखाइएका छन् । महानगरपालिकाको मेट्रिक ठेगाना प्रणाली प्रयोजनका लागि विभाजन गरिएको क्षेत्रहरुमा पर्ने वडाहरु, क्षेत्रफल, घरधूरी र जनसंख्याको वितरणमा सकभर ठूलो बिषमता नहोस भन्ने उद्देश्य राखिएको भएतापनि महानगरको बिस्तार र बिकासका कारण क्षेत्रफल र जनसंख्यामा केही बिषमता देखिएको छ । तर भबिष्यमा बिकासहुँदै जाँदा हालका कम जनघनत्व भएका स्थानमा शहरको नयाँ बिकासले जनसंख्यामा समानता आउन सक्ने सम्भावना छन् (**तालिका नं. १**) ।

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तालिका नं. १: ललितपुर महानगरपालिकाको ठेगाना क्षेत्र र वडा वितरण

भौगोलिक अवस्थिति अनुसार क्षेत्र बिभाजन	वडाको वितरण			
	वडा नम्बर	क्षेत्रफल (वर्ग कि.मी.)	घरधूरी (२०६८ सालको जनगणना अनुसार)	जनसंख्या (२०६८ सालको जनगणना अनुसार)
क्षेत्र १ (पश्चिम)	१,२,३,४,१०, १३	६.७९	२०,००२	७८३६५
क्षेत्र २ (पूर्व)	५,६,७,८,९,११,१२,१६, १७,१९, २०	४.३५	२५,६६१	१०७३४७
क्षेत्र ३ (दक्षिण पश्चिम)	१८, २१, २२, २५	११.१७	५,४६०	२२१६३
क्षेत्र ४(दक्षिण)	१४, १५, २६, २७	७.०२	११,३१५	४५१८२
क्षेत्र ५ (दक्षिण पूर्व)	२३, २४, २८, २९	६.७६	५,९१५	२३४१४
जम्मा	**२९**	**३६.०९**	**६८,३५३**	**२७६,४७१**

ललितपुर महानगरपालिका ठेगाना क्षेत्र विभाजन
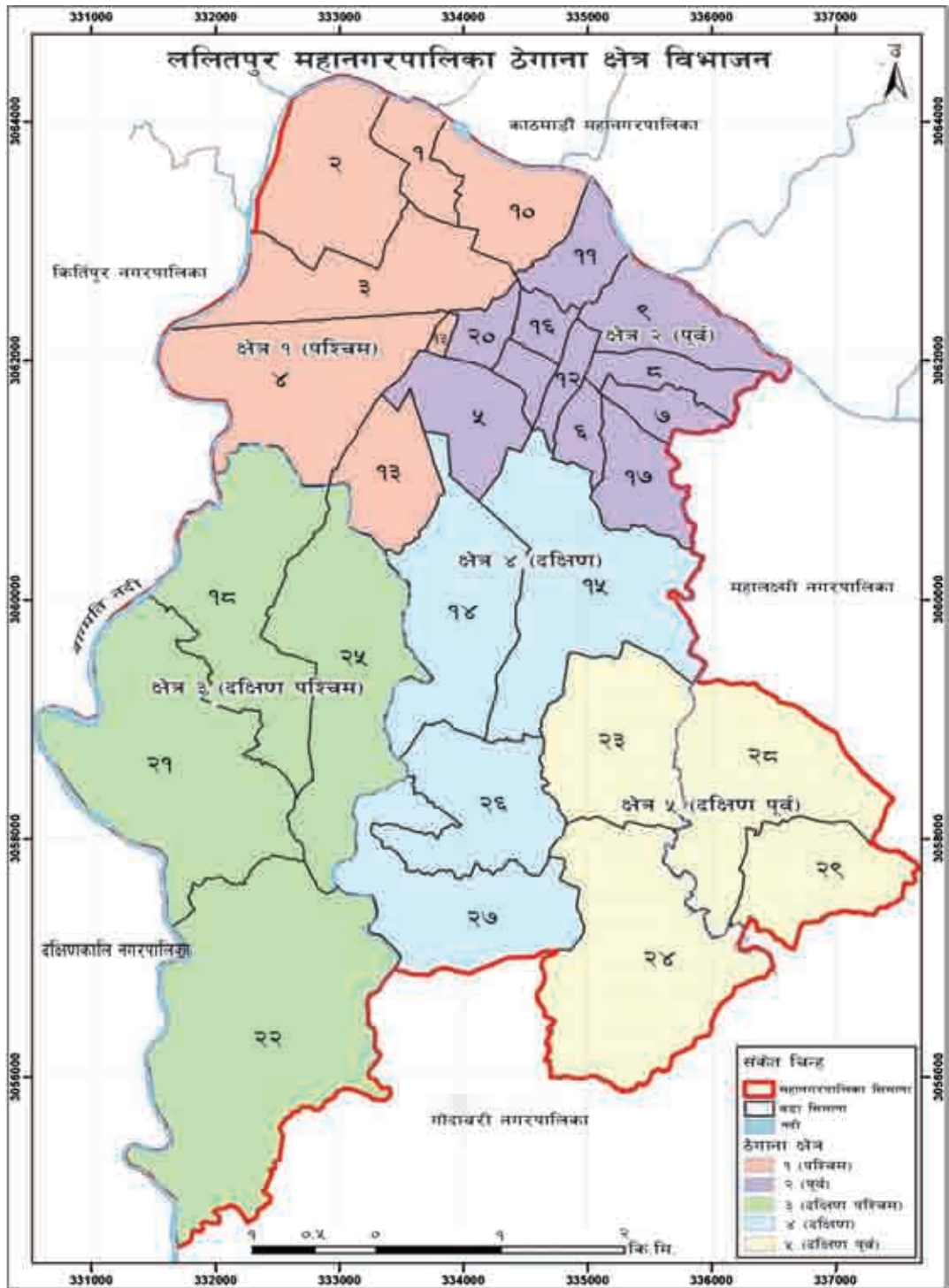
२.३.२ बाटो ठेगाना प्रणाली

बाटो नक्सामा प्रत्येक घरको मूलढोका जोड्ने सार्वजनिक बाटोहरु पत्ता लगाइन्छ र स्थलगत निरीक्षणबाट उक्त बाटोहरु सही भए नभएको यकीन गरिन्छ । बाटो रुजु र थपघटको (verification) लागिबाटो नक्सामा निम्न अनुसारको सूचना हुनुपर्दछ ।

- नक्साको स्केल १:५०० (Enlarge the Base Map to cadastral level scale)

- ग्रीड रेखाहरु

- भवनहरुको फैलावट

- नक्साको शीट (sheet) संकेत नम्बर

२.३.२.१. बाटो संकेत प्रणाली

क) बाटोका तत्वहरु

माथि उल्लेखित उपखण्ड २.२.२ मा परिभाषित गरिए अनुसारको बाटो/सडक कुनै एक बिन्दुबाट शुरु भई कुनै अर्कै दोबाटो/चौबाटोमा जोडिएका हुन्छन् । कतिपय अवस्थामा "बाटो" यस्ता एक भन्दा बढी दोबाटो/चौबाटोहरु नाघेर पनि गएका हुन सक्दछ । केही अपबादमा बाटो दोबाटो चौबाटोमा नमिसिएर आफै अन्त (dead-end) पनि हुन सक्छन । त्यसकारण बाटामा सुरु बिन्दु र अन्त्य बिन्दुहरु हुन्छन । बाटोलाई चौडाई र सतहको वनावटका आधारमा विभिन्न किसीममा विभाजन पनि गर्न सकिन्छ ।

ख) बाटोको दोबाटो, चौबाटो तथा शुरु र अन्त्य बिन्दुको पहिचान

दुईवटा बाटाहरु भेट हुने बिन्दुलाई दोबाटो, तीनवटा मिसिनेलाई तीनकुने, चारवटा मिसिनेलाई चौबाटो तथा जंक्सन आदि नाम दिईन्छ । प्रत्येक बाटोको बीच भागमा पर्ने गरी केन्द्र रेखा कोरिन्छ र दुईवटा बाटोहरुका यस्ता केन्द्र रेखाहरु भेट हुने बिन्दुलाई नै बाटोको दोबाटोबिन्दु भनिन्छ । यस्ता दोबाटो, तीनकुने वा चौबाटोमा एउटा वा केही बाटोको अन्त्य बिन्दु हुन्छ र अर्कोबाटोको सुरुबिन्दु हुन्छ । तर एउटा ठूलोबाटोको नियमितता लगातार नै गईरहेको अवस्थामा सानो बाटोको मिलन बिन्दु वा दोबाटो, चौबाटो भएमा पनि ठूलो बाटोको अन्त्य बिन्दु हुन सक्दैन । यस्तो अवस्थामा साना बाटाहरु ठूलो बाटाबाट सुरुवात भएका हुनेछन (***चित्र नं. २.२***)।
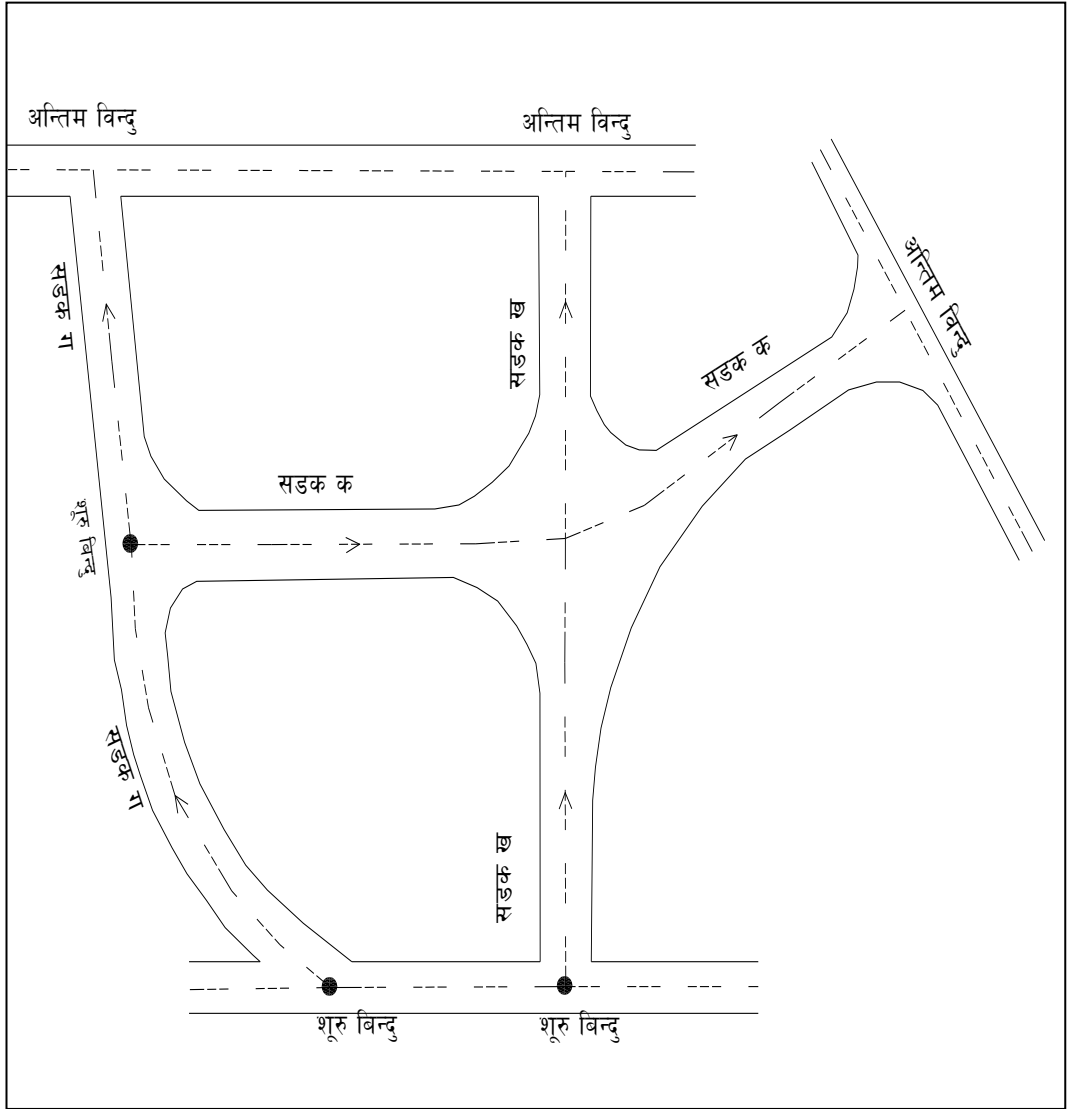
चित्र नम्बर २.२ बाटोको शुरु बिन्दु निर्धारण गरिने तरिका

ग) बाटो संकेत नम्बर

तालिका नं.२ मा प्रत्येक ठेगाना क्षेत्र परेका बाटोहरुको संकेत नम्बर देखाइएको छ ।

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भौगोलिक अवस्थिति अनुसार क्षेत्र बिभाजन	क्षेत्र ∕बाटो संकेत नम्बर
क्षेत्र १ - (पश्चिम)	<u>१</u>००१-१९९९
क्षेत्र २ - (पूर्व)	<u>२</u>००१ - २९९९
क्षेत्र ३ - (दक्षिण पश्चिम)	<u>३</u>००१ - ३९९९
क्षेत्र ४ - (दक्षिण)	<u>४</u>००१ - ४९९९
क्षेत्र ५ - (दक्षिण पूर्व)	<u>५</u>००१ - ५९९९

नोट: अण्डरलाईन गरिएका अंकहरुले ठेगाना क्षेत्र जनाउँछ ।

घ)   बाटो संकेत अंक

बाटो नक्सामा प्रत्येक बाटोलाई चार अंकले चिनिने छ । त्यसमध्ये शुरुको एक अंकले ठेगाना क्षेत्र जनाउँछ र बाँकी तीन अंकहरुले बाटो जनाउँछ । उदाहरणको लागि: ३००१ भन्नाले ठेगाना क्षेत्र ३ को बाटो नम्बर १ भन्ने बुझिन्छ । त्यस क्षेत्रमा रहेका बाटोहरुको संकेत नम्बर ३००२, ३००३ आदिले बढ्दै जानेछ र ३९९९ सम्म हुने छ ।

ङ)   बाटो संकेत शुरुआत

ललितपुर महानगरपालिकाको भौगोलिक बनावट हेर्दा यसलाई बैज्ञानिक ठेगाना प्रणालीमा विभाजन गर्नुपर्दा सबैभन्दा उपयुक्त आधार चक्रपथ (Ring Road) हुनआउँछ । यसरी चक्रपथलाई आधार मान्दा प्रत्येक ठेगाना क्षेत्र भित्रका बाटोहरुको सुरुवात चक्रपथबाट हुनेछ । सर्वप्रथम चक्रपथलाई आधार मानी सहर भित्रको मूल बाटो पहिचान गरिन्छ । साथसाथै मूल चोकहरुको पनि पहिचान गरिन्छ । यसैका आधारमा शाखा बाटोहरुको शुरु र अन्त्य बिन्दुसंयुक्त समन्वय समिति तथा वडा स्तरीय कार्यदल र स्थानीय बासिन्दा संगकोसमन्वयमानिर्धारण गरिन्छ *(चित्र नं. २.३)।*

च)   यसरी मूलबाटो र चोकहरुको निर्धारण पश्चात् मेट्रिक ठेगाना प्रणालीको सिद्धान्तमा रहेर हरेक छुट्टाछुट्टै बाटोको संकेत नम्बर दिइने छ । यदि कुनै बाटोको शुरु बिन्दु

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छ तर निकास (dead-end) छैन र त्यसको लम्बाई ५० मिटर भन्दा कम छ भने छुट्टै संकेत नम्बर दिइने छैन । तर ५० मीटर भन्दा लामो यस्ता बाटाहरुलाई भने वेग्लै संकेत नम्बरहरु दिइने छ ।
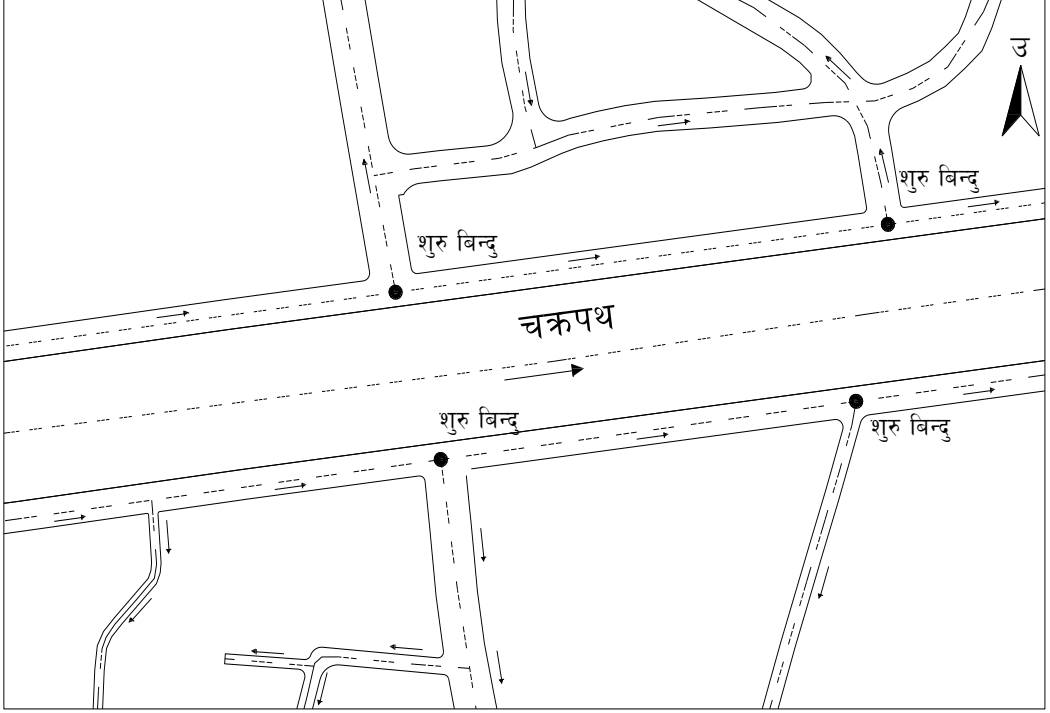
चित्र नम्बर २.३: बाटो संकेतको शुरुवात र आधार

छ) बाटो संकेत नम्बर मूलत: कम्प्युटर तथ्यांक आधार (database) प्रणालीको प्रयोजनको लागि मात्र हो । यसरी बाटो नम्बर दिनाले कम्प्युटरमा सूचना पहिचान गर्ने तथा अध्यावधिक गर्ने जस्ता कार्यहरु गर्न सजिलो हुन्छ ।

ज) जवसम्म एउटा बाटोलाई अन्य बाटोले जोडिदैन अथवा त्यही बाटोमा हिंडेको जस्तो भान हुन्छ, त्यस बाटोको संकेत नम्बर त्यही नै कायम राखिने छ । घुम्ती, दोबाटो∕चौबाटो खोल्सा, पुल∕पुलेसा आदि स्वरुपहरुले एक बाटोको अन्त्य भई अर्को बाटो शुरु भएको भान गराउँदछ । कुनै बाटोहरु निकै नै लामा हुन्छन् र बीचमा घुम्ती वा चोक परेतापनि त्यही बाटोमा भइरहेको भान हुन्छ । यस्ता लामा बाटोहरुको बीचमा अनेकौं टोलका नामहरु आउन सक्दछन् । तर बाटो संकेत नम्बर भने एउटै हुनेछ ।

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झ) नयाँ बनेका बाटाहरुको संकेत नम्बर तिनिहरुको अवस्थिति अनुसार संकेत नम्बर दिइने छ । यस्ता बाटाहरु जहाँ अवस्थित भएतापनि तिनिहरुले नयाँ संकेत नम्बरहरु पाउने भएकोले भौगोलिक निरन्तरतालाई भंग गर्दछ तरपनि यो नम्बर केवल कम्प्युटर सूचना आधारको लागि प्रयोग गरिने भएकोले व्यवहारमा कुनै फरक पर्ने छैन ।

ञ) चोक, बहाल आदीको पहिचान पनि भिन्न संकेत नम्बर र नामले गरिने छ । चोक, बहाल कहाँ छ भनी जनाउनको लागि ती बहाल, चोकमा छिर्ने बाटोमा दिशा संकेत पाता (Direction Plate) राखिने छ ।

ट) बाटो टुङ्गिएको अवस्थामा जुन बाटोबाट शुरु भएको छ, त्यही बिन्दुलाई बाटोको शुरु बिन्दु मानिनेछ । यदि भविष्यमा त्यही टुङ्गिएको बाटो बिस्तार भएमा बाटोको दिशा त्यहीकायम रही परिवर्तन हुनेछैन ।

ठ) कुनै बाटो दुईवटा क्षेत्र भएर गएको अवस्थामा बाटोको शुरु बिन्दु जुन क्षेत्रबाट शुरुवात भएको छ, त्यही क्षेत्रमा राखिनेछ ।

ड) माथि उल्लेखित बाहेक अन्य सार्वजनिक बाटाहरु भए तिनीहरुलाई पनि स्थापित नियम अनुसार संकेत नम्बर दिइने छ ।

२.३.२.२ बाटो किसिम र नाम

ठेगाना प्रणालीको लागि प्रत्येक बाटोको नाम हुनु आवश्यक छ । बाटोको नाम दिनु महानगरपालिकाको दायित्व भित्र पर्दछ । हाल भइरहेको बाटाहरुको नाम कायमै राखिने छ । नयाँ विस्तार भएको क्षेत्रमा धेरै ठाउँहरुमा बाटोको नाम राखिएको छैन । अत: विना नामका बाटाहरुको नाम राख्न निम्न प्रकियाहरु सुभावको लागि प्रस्ताव गरिएका छन् ।

● परम्परागत नामलाई यथावत् राखिने छ ।

● मुख्य बाटोलाई मुख्य ठाउँको आधारमा नाम दिंदा उपयुक्त हुनेछ ।

● सबै बाटोहरुलाई स्थानीय र मौलिक नाम दिंदा राम्रो हुन्छ ।

● सामान्यत: हरेक बाटोको सम्पूर्ण लम्बाई भरि एउटै नाम हुनुपर्ने हुन्छ ।

● बाटोको नाम त्यसले जोडेको अन्तिम प्रचलित ठाउँको नाम राख्न सकिने छ । जस्तै: गोदाबरी जाने बाटोलाई **गोदाबरी सडक** राख्न सकिन्छ ।

● बाटोले जोडेको सुरुवाती र अन्तिम बिन्दुका दुबै स्थानका नामलाई पनि राख्न सकिने छ । जस्तै **एकान्तकुना-बुझ्मती सडक** राख्न सकिन्छ नाम राख्दा राजनितिक तथा व्यक्तिका नाम सकेसम्म नराख्ने ।

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- नामहरु सकेसम्म छोटा हुनु पर्छ ।

- बाटोका नाम महानगरपालिका भित्र नदोहोरिने हुनु पर्छ ।

- यदि बाटाका नाम तथा खण्ड (segmentation) यथास्थितिमा स्पष्ट नभएमा वडा स्तरीय कार्यदल र स्थानीय टोलबासी सहितको रोहबरमा नाम र खण्डहरुको बिषयमा स्पष्ट खुल्नेगरी वडा स्तरीय कार्यदलबाट अनुमोदनका लागि निर्देशक समिति वा संयुक्त समितिमा प्रस्ताव पठाउने र निर्देशक समितिबाट आवश्यकता अनुसार निर्णय गर्ने ।

- निर्देशक समितिबाट अनुमोदित नाम र खण्डहरुलाई आधार नक्सामा अध्याबधिक गरी सोही अनुसार मेट्रिक ठेगाना प्रणालीमा उल्लेख गर्ने *(अनुसूचि १, तालिका १)।*

२.३.३ टोलको नाम र सिमानाको निर्धारण

शहरी क्षेत्र अत्यन्त जटीलबाटो सञ्जाल र घरहरु भएका कारण मेट्रिक ठेगाना प्रणालीको अधारमा घर/भवनहरु पत्ता लगाउन टोलको पनि सहायता लिनुपर्ने हुन्छ । शहरका टोलहरुको पृष्ठभूमि ऐतिहासिक हुने हुँदा टोलका आधारमा सर्बसाधारणले ठेगाना सजिलै पत्ता लगाउन सक्छन । जस्तै **मंगलबजार, सुन्धारा, जाउलाखेल, पुल्चोक** आदि नाम लिना साथ ती स्थानको अवस्थितिका बिषयमा जानकारी भै हाल्छ । तर टोलको नाम र तीनको सिमानाको नक्सांकन गर्न निम्न माध्यमहरु अपनाउनु पर्ने हुन्छ ।

- परम्परागत नामलाई यथावत् राखिने छ ।
- मुख्य ठाउँको आधारमा नाम दिंदा उपयुक्त हुनेछ ।
- स्थानीय र मौलिक नाम दिंदा राम्रो हुन्छ ।
- नाम राख्दा राजनितिक तथा व्यक्तिका नाम सकेसम्म नराख्ने ।
- नाम सकेसम्म छोटा हुनु पर्छ । नाम नगरपालिका भित्र नदोहोरिने हुनु पर्छ ।
- टोलका नाम तथा सिमाना स्पष्टछुट्टिएका भएमा तीनलाई नक्सामा अंकित गर्ने ।
- यदि टोलका नाम तथा सिमाना यथा स्थितिमा स्पष्ट नभएमा वडा स्तरीय कार्यदल रस्थानीय टोलबासी सहितको रोहबरमा नाम र सिमानाहरुको संकलन गरी तीनिहरुलाई वडा स्तरीय कार्यदलबाट अनुमोदनका लागि संयुक्त समन्वय समिति वा निर्देशक समितिमा प्रस्ताव गराउने ।
- संयुक्त समन्वय समिति वा निर्देशक समितिबाट अनुमोदित टोलका नाम तथा सिमानालाई अधार नक्सामा अध्याबधिक गरी सोही अनुसार मेट्रिक ठेगाना प्रणालीमा उल्लेख गर्ने ।

२.३.४. घर ठेगाना प्रणाली

महानगरका सम्पूर्ण ब्याक्तिगत आवाशीय तथा व्यवशायिक घर/भवन, सार्बजनि एवं सरकारी घर तथा भवनहरु, धार्मिक मठ, मन्दिर, पाटी, पौवा, फल्चा, चोक, बहाल ढुंगेधारा आदि सबैलाई बाटाको सुरुवाति बिन्दु देखि घरका मुल ढोका सम्म नक्सामा नापेर आएको दुरीको मीटर बराबरको संकेत नम्बर दिइने छ ।

२.३.४.१. घर नम्बर प्रणाली

निम्न लिखित नियमहरुको आधारमा घर नम्बर प्रणाली गरिने छ ।

क) यस ठेगाना प्रणालीमा प्रत्येक भवनलाई मौलिक (Unique) नम्बर दिइने छ । यो नम्बर घरमा पुग्ने बाटो तर्फको मूलढोका सम्मको नक्सामा आधारित (Road centre line) दूरीको आधारमा दिइने छ ।

ख) हरेक घरमा प्रवेश गर्ने ढोका र बाटोको शुरु बिन्दु (Datum point) सम्मको दूरी मिटरमा नक्सामा नापिने छ । बाटोको शुरु बिन्दु देखि अन्त्यसम्म घर नम्बर बढ्दै जानेछ तर यो बृद्धि नम्बर क्रमिक रुपले भने हुने छैन । दूरीको आधारमा घर नम्बर बढ्ने भएकोले घर नम्बर २, ४, ६, ८ आदिको आधारमा क्रमबद्ध रुपमा नबढी दूरी अनुसार २, ८, १४, २४, ४० आदि हुन सक्छन् ।

उदाहरणको लागि, यदि दुईवटा घरहरुको दूरी बाटोको शुरु बिन्दु देखि करिव १८ र २४ मीटरहरुमा छन् भने तिनीहरुले क्रमशः १८ र २४ घरनम्बर प्राप्त गर्दछन् । यदि बाटोको दाँयातिर रहेको घरको दूरी ११.३ मिटरमा छ भने त्यसलाई ११ नम्बर र सोही दूरीमा रहेको बाटोको वाँयातिरको घरलाई ११ वा १३ नम्बर दिइने छ । नम्बर दिंदा दशमलब (decimal) नम्बरमा दिइने छैन ।

ग) प्रत्येक घरको एउटा मात्र मूलढोका मानिने छ र एउटै मात्र नम्बर दिइने छ ।

घ) घरहरुको नम्बर जोडी र विजोडी नियमअनुसार दिइने छन् । जोडी नम्बरहरु बाटोको दाँया र विजोडी नम्बरहरु बाँया तर्फको घरहरुलाई दिइने छन् ।

ङ) भवन बनाउने इजाजत प्राप्त नभएसम्म खाली घडेरीहरुलाई घर नम्बर दिइने छैन । खाली जग्गामा घर बनाइयो भने घरधनीले घर नम्बर प्राप्त गर्नको लागि महानगरपालिकाको सम्बन्धित एकाईमा आफै सम्पर्क राख्नुपर्ने हुन्छ । महानगरपालिका नक्सांकन एकाईवाट घर नम्बर निर्धारण गरी दिन सक्ने छ ।

२.३.४.२. घर नम्बर प्रवाह किसिमहरु

घर नम्बर प्रवाह बाटोको किसिमले निर्धारण गर्दछ । योजनाबद्ध तरिकाले बस्ती नबसेको हुनाले ललितपुर महानगरपालिकामा थुप्रै विशिष्ट (special) र जटिल (complex)

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अवस्थाहरु हुन सक्छन् । उदाहरणको लागि केही घर नम्बर प्रवाहहरु तल दिइएका छन् र तिनीहरुको चित्र यस निर्देशिकाको भाग ३ को अनुसूची २ मा दिइएका छन् ।

क) खाली घडेरीमा क्रमशः भवनहरु निर्माण भएपछि घर नम्बर दिइने तरिका *चित्र नं. ३.१, र ३.२,* मा देखाइएको छ । उदाहरणको लागिः *चित्र नं. ३.१* मा देखाए अनुसार पहिलो अवस्थामा घर नं. ९ र २५ तथा २६ र ४८ को बीच खाली घडेरी थिए । दोश्रो अवस्थामा *(चित्र नं. ३.२)* उक्त घडेरीमा १९मी. र ३८मी. मा मूलढोका राखी नयाँ घर निर्माण भएको हुनाले उक्त घरहरुको नम्बर क्रमशः १९ र ३८ दिइन्छ ।

ख) एउटा ठूलो घर अंश बण्डामा बाडीयो वा टुक्रागरेर बेचियो भने त्यस्ता अवस्थामा नयाँ खोलीएको मूल ढोकामा पर्ने बाटाको सुरुवाती बिन्दु देखिको दूरीका आधारमा नयाँ नम्बर दिईन्छ । *चित्र नं. ३.३* मा घर नं. ६६ पुनः दुई भागमा बांडियो । नयाँ बनेको मूलढोका बाटोको सुरुवाती बिन्दु देखिको दूरी ५७.७ मीटरमा रहेछ भने त्यस घरको नम्बर ५८ कायम गरिन्छ । किनकि त्यो घर बाटोको दायाँ पट्टी छ । यसरी घर नम्बरको क्रमिकतालाई यस प्रणालीले भविष्यसम्म पनि कायमै राख्ने छ ।

ग) सामान्य अवस्थामा घर नम्बर प्रवाह रेखीय प्रणाली (linear pattern) भएको बाटोमा रहेका घरहरुलाई क्रमिकरुपमा दिइने गरिन्छ । तर बाटोको प्रबाह दिशाबाट घरहरु दायाँ भएमा जोर नम्बर र बायाँ भएमा बिजोर नम्बरको नियम सबैठाउँमा लाग्ने छ । जस्तै *(चित्र नं. ३.४* हेर्नुहोस्*)* । अन्य अवस्थामा घर नम्बर प्रवाह यस भन्दा तलका विभिन्न उप खण्डमा भनिए अनुसार हुनेछ ।

१) यदि दुबै तर्फबाट मूल बाटोहरु आएर एउटा चौबाटोमा मिलेका छन्, तर चौबाटो बाट मूलबाटोको क्रमिकता रोकिएको छैन भने त्यस्तो अवस्थामा बाटाहरुमा अवस्थित घरहरुलाई मूलबाटोबाट दिदैआएको नम्बरको प्रबाह आ-आफनै बाटोको दूरी अनुसार नियमित नै गरेर दिइन्छ । यसमा *चित्र नं ३.५* मा देखाए जस्तैगरी घर नम्बर प्रवाह गरिने छन् । चौबाटोमा परेका घरहरुको नम्बर घरको मूलढोका कुन बाटोमा पर्दछ, त्यसै अनुसार दिइन्छ ।

२) यदि बाटोले चोक तथा बहाललाई दायाँ बायाँ पारेर बीचभागबाट काटेर गएको छ भने त्यस्तो अवस्थामा बाटोको सुरुवाती बिन्दुबाट चोक वा बहालको ठीक मध्यभागमा कति दूरी छ त्यो नाप्ने । त्यस दूरीलाई मुख्य दूरी मानेर बाटोको दयाँतर्फ घडीको सूई अनुसार र बायाँतर्फ घडीको सूई

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बिपरित हरेक घरलाई पुरक नम्बर दिँदैजाने । यस्तो घरहरुको नम्बर प्रवाह *चित्र नं. ३.६* मा देखाए जस्तै हुनेछन् ।

३) दोहोरो निकास नभएका एकातर्फबाट मात्र प्रवेशद्वार रहेका चोक वा बहालमा रहेका घरहरुको नम्बर प्रवाहगर्दा मुख्य प्रवेश बिन्दुको दूरीलाई मूल नम्बर र त्यस भित्रका घरलाई त्यही बिन्दुदेखिको दूरीलाई पुरक नम्बर दिनुपर्छ । पुरक दूरीदिँदा यदि त्यो बहाल वा चोक मूल बाटोको बायाँ भएमा घडीको सूईको अनुसारका घरहरुलाई क्रमशः नाप्दै जाने र दायाँ भएमा घडीको सूईको उल्टो अनुसारका घरहरको दूरी नाप्दै गएर दिनुपर्छ । यस किसिमको उदाहरण *चित्र नं. ३.७१ तथा ३.७२* मा दिईएको छ ।

४) सामान्यतया साना चोक वा बहाल जुन २५मी. x २५मी. भन्दा सानो क्षेत्रफल भएमा त्यस्ता चोक तथा बहालमा अवस्थित घरहरुको नम्बर दिँदा प्रवेशद्वारलाई नम्बर दिइनेछ र घरहरुलाई प्रवेशद्वारबाट मूल बाटोको बायाँ घडीको सुई घुम्ने दिशामा नापेर पूरक घर नम्बरहरु दिइने छ भने दायाँतर्फ घडीको सूईको बिपरित दिशामा नापेर पूरक घर नम्बरहरु दिइने छ । यी नम्बरहरुको प्रबाह *चित्र नं. ३.८* अनुसार गरिने छ ।

५) ठूलो चोक वा बहाल जुन २५मी. x २५मी. भन्दा ठूलो चोकको हकमा भने मूल प्रवेशद्वारमा शुरु बिन्दु कायम गरी सो बिन्दुबाट चोक वा बहाललाई ठीक आधा फ्याकको अनुमान गरेर (प्रबेश बिन्दुको सिधा लम्बमा) काट्ने । प्रबेश बिन्दुबाट बायाँतर्फ घडी घुम्ने दिशामा र दायाँतर्फ घडीको सूईको बिपरित दिशामा रहेका घरहरुको दूरीको आधारमा घरहरुलाई नम्बर दिँदैजाने । यसरी *चित्र नं. ३.९* मा देखाएजस्तै नम्बर दिँदैजाँदा अन्तमा प्रबेशद्वारको बिपरित बिन्दुमा दायाँ र बायाँ दुबै नम्बर मिल्न पुग्छन् ।

६) यदि ठूलाचोकहरुबाट बाहिर बाटाहरु निस्कन्छन् र ती बाटाहरुमा घरहरु छन् भने ती घरहरुको नम्बर ठूला चोकहरुबाट निस्कने बिन्दुको दुरीलाई मूल नम्बर र तीनको बीचको दूरी पुरक नम्बरका आधारमा गरिन्छ । यसको उदाहरण **चित्र नं ३.१०** मा दिईएको छ ।

७) यदि चोकको बीचमा घरहरु छन् भने यी घरहरुलाई घडी घुम्ने दिशामा बाटोको दायाँ बायाँ जोडी विजोडी नम्बरहरु दिइने छ । जस्तैः **चित्र नं**

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३.११ । ठूला चोकहरुका बीचमा घरहरु भएर अर्को सानो चोकको भित्रीभाग निर्माण गरेका भएमा पनि त्यस्ता चोकका घरहरुको नम्बर दिंदा **चित्र नं ३.११** अनुसार प्रवेशद्वार बाट बायाँतर्फ गरी क्रमशः घडीको सुईको अनुसार नम्बर दिने । तर तीनको दायाँ तर्फ जोर र बायाँ तर्फ बिजोर भने **चित्र नं ३.४** अनुसार नै गर्ने ।

८) यदि सानो चोक भएर अर्को चोकहरु जोडिएका छन् भने पहिलो चोकको प्रवेशद्वार नम्बरको आधारमा सो चोक भित्र पर्ने घरहरुलाई पूरक घर नम्बर (जस्तै:

१५/२०-२०/२४ इत्यादि) प्रवाह गरिने छ । यी बाहेक अन्य चोकहरु भएको अवस्थामा ठेगाना इकाईका पदाधिकारीहरुको सरसल्लाह अनुसार घर नम्बर दिइनेछ । यसरी नम्बर दिंदा मेट्रिक ठेगाना प्रणालीको मूलआधारमा रहेर दिइनुपर्छ ।

घ) घुम्ती बाटो (loop street) भन्नाले मूल बाटोसंग आवद्ध भएका अर्धगोलाकार, आयातकार वा घुमाउरो खण्डलाई बुझाउँदछ । यस्ता घुम्ती बाटोको लम्बाई ५० मीटर भन्दा कम भएमा **चित्र नं.३.६** मा देखाए जस्तै घुम्ती बाटोको शुरु बिन्दुलाई घर नम्बर र घुम्तीमा रहेका घरहरुलाई पूरक नम्बर दिइने छन् । पूरक नम्बर घुम्ती बाटो शुरु हुने बिन्दुबाट नापेर दिइने छ । मूलबाटोको बायाँतर्फ जोडिएका घुम्ती बाटोमा विजोडी नम्बर र दायाँतर्फ जोडिएका घुम्ती बाटोहरुमा जोडी नम्बरहरु प्रवाह गरिने छ । तर यस्ता घुम्ती बाटोको लम्बाई ५० मीटर भन्दा बढी छ भने वेग्लै बाटो मानिने छ र घर नम्बर प्रवाह घुम्ती बिन्दु देखि शुरु हुनेछ ।

ङ) एउटा मात्र निकास भएका गल्लीहरु दुईवटा वा बढी छन् भने पहिलो वा मुख्य (ठूलो र बढी आवत जावत हुने) गल्लीलाई छुट्टै बाटो मानिने छ र अर्कोलाई पूरक वा आश्रित बाटो मानिने छ र पूरक घर नम्बरहरु दिइने छ, जस्तै **चित्र नं. ३.७१** वा **३.७२** ।

च) यदि कुनै घरको दुईवटा प्रवेशद्वाराहरु दुई तर्फको बाटोहरुमा छन् भने कुनै एक मुख्य प्रवेशद्वारलाई मात्र घर नम्बर दिइने छ । तर एउटै घरभएपनि दुईवटा ढोकाहरु भई दुई फरक स्वामित्वमा छन् भने प्रत्येकलाई फरक घर नम्बर दिइने छ ।

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छ) कुनै हाता (compound) भित्र रहेका विभिन्न घरहरु एउटै मूलद्वार भएर जान्छन् भने उक्त द्वारलाई एउटा घर नम्बर र घरहरुलाई पूरक नम्बर दिइने छ, जस्तै *चित्र नं. ३.१२*।

ज) कुनै भवनको तल्लाहरु, कोठाहरु वा कवलहरु बेग्लाबेग्लै प्रयोजनको लागि प्रयोग गरिएका छन् भने *चित्र नं. ३.१३* र *३.१४* मा देखाए जस्तै घरलाई नम्बर र अरु इकाईहरुलाई पूरक नम्बरहरु दिइने छ ।

झ) संयुक्त आवास क्षेत्रमा नम्बर दिंदा परामर्शदाताबाट मूल प्रवेशद्वारको नम्बर दिइने छ र पुरक नम्बर नगरपालिकाको नक्सांकन एकाईले सम्बन्धित भवनको व्यवस्थापकको रोहवरमा दिनुपर्ने छ ।

ञ) अन्य माथि उल्लेखित उदाहरणहरु बाहेक फरक प्रकारको बाटो किसिम आएको खण्डमा नगरपालिकाको सम्बन्धित इकाइले प्रतिपादन गरेको नियम अनुसार निर्णय गर्नेछ ।

२.३.५. नम्बर तथा नाम पाता

नम्बर तथा नाम पाता देहायबमोजिम तय गरिने छन् :

पाता: पाता बढी टिकाउ र खिया नलाग्ने हुनु पर्दछ ।

रंग: संलग्न नमूना अनुसारको गाढा नीलो रंगको भूँइमा सेतो रंगको अक्षरले लेखिएको र बढी टिकाउ रंग प्रयोग गरिएको हुनु पर्दछ ।

लिपि: देवनागरी लिपिमा महानगरपालिकाले तय गरे अनुसार चित्रमा देखाए जस्तै अक्षरहरुको आकार (size), रुप (font), ढाँचा आदि सबै एकैनासको हुनुपर्दछ । अंग्रेजीमा लेख्दा टोपोग्राफिक (topographic) नक्साले प्रयोग गरेको phonetics प्रयोग गरिनेछ ।

२.३.५.१. बाटो नाम पाता र आकार

क) बाटो नामको लागि प्रयोग गरिने पाताको आकार नेपालीमा मात्र राख्नु पर्दा १६ से.मी चौडा र नेपाली तथा अंग्रेजी दुवैमा राख्नुपर्दा ३२ से.मी चौडा हुनेछ । लम्बाई कम्तीमा ४० से.मी र आवश्यकता अनुसार बढी पनि हुनेछ । यसरी लेखिने अक्षरको रुप संकलन डिजाइन अनुसार हुनेछ । बाटो/सडक संकेत पाता **चित्र नं २.४** मा देखाए अनुसार हुनेछन्।

ख) पातामा बाटोको पूर्ण नाम र तीन अंक रहेको संकेत नम्बर रहने छन् ।

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ग) बाटो नाम पातामा बाटोको नाम राखिने छ । मुख्य बाटाहरु मिसिने ठाउँ र पर्यटकीय स्थानहरुमा बाटोको नाम नेपाली र अंग्रेजी दुवै अक्षरहरुले लेख्नु पर्दछ ।

घ) बाटो नाम पाता खम्बा वा घरको भित्तामा निम्न अनुसार राखिने छ ।

- प्रत्येक बाटोको शुरु र अन्त्यमा गरी दुई बाटो-नाम पाताहरु राखिने छ ।
- दुई मुख्य बाटोहरु भेट हुने चोकको चार कुनामा चारवटा बाटो-नाम पाताहरु राखिने छ ।
- मुख्य बाटोमा जोडिएका प्रत्येक सहायक बाटोहरुको लागि दुई बाटो नाम पाता राखिने छ ।

ड.) बाटो-नाम पाता सम्भव भएसम्म बाटोको कुनामा रहेको घरको भित्तामा राख्नु पर्दछ । पाता राख्दा करिब ३ मिटर उचाइमा राख्नु पर्दछ । घरको भित्तामा राख्न सम्भव नभएमा चारकुनामा खम्बाहरुमा राख्नुपर्ने हुन्छ । बाटो-नाम पाताको लागि अलग्गै खम्बा (pole) गाड्ने कार्यले बाटोमा अप्ठ्यारो थप्न सक्ने हुनाले सकेसम्म खम्बा नराख्ने कोसिस गर्नु पर्दछ ।

- कुनै मूलबाटो भएर गएको सहायक मार्ग, गल्ली वा चोक देखाउनका लागि बाटो पाता उक्त स्थान वा बाटोको प्रस्थान बिन्दुमा राखिने छ । उक्त पातामा गल्ली, चोक या बहालको नाम र दिशा पनि देखाइने छन् ।

च) पातामा बाटो नाम लेख्न र पाता ठोक्न धेरै खर्च लाग्ने हुँदा कुनै फर्म, कम्पनी आदिलाई प्रायोजनका लागि उत्प्रेरित गर्न सकिने छ । प्रायोजकको पहिचान पाताको कुना वा तल लेख्न सकिनेछ, जसलाई बाटोको नाम र अन्य सूचनालाई न्यून नगर्ने गरी लेख्न सकिने छ । यसरी राखिने विज्ञापनको क्षेत्रफल बढीमा १/५ भाग भन्दा बढी हुनु हुँदैन ।

२६

२.३.५.२.घर नम्बर पाता

शहरभरि नै घर नम्बर पाता एकै आकार, प्रकार र रंगको भएमा सबैलाई घर नम्बर पत्ता लगाउन सजिलो हुने हुनाले घर नम्बर निम्न तरिकाले राख्नुपर्दछ :

क) घर नम्बर पाताको आकार २० x १२ से.मी. हुनुपर्दछ ।

ख) यसमा घर नम्बर ठूलो आकारमा र बाटो नाम घर नम्बरको मुनि सानो आकारमा हुनेछ, जस्तै: *चित्र नं. २.५* ।

चित्र नं २.५: घर नम्बर पाता

ग) दुई वा दुई भन्दा बढी क्षेत्र भएर जाने धेरै लामो बाटोमा पर्ने घरहरुको हकमा मूल बाटोलाई नटुक्राउने सिद्धान्त अनुसार घर नम्बरपातामा घर नम्बर, बाटोको नाम र स्थानीय नाम राखिने छ ।

घ) घर नम्बर पाता घरको मूलढोका नजिकै बाटोबाट सजिलै देख्न सकिने किसिमले राख्नु पर्दछ ।

ड.) पूरक घरको नम्बरहरु भने घरधनी आफैले राख्न सक्नेछन् । यस्ता पूरक नम्बर पनि एकनाश हुनुपर्ने भएको हुँदा महानगरपालिकाले त्यसको नमुना दिन सक्नेछ ।

च) माथि भनिए अनुसारको भन्दा फरक प्रकारको घर नम्बर पाता राख्न चाहने घरधनीहरुले महानगरपालिकाको अनुमतिमा उसले तोकिदिए बमोजिमको ढाँचामा घर नम्बर पाता राख्न सक्नेछ ।

२७

२.४.   ठेगाना लेख्ने विधि

पत्राचार वा अन्य प्रयोजनको लागि ठेगाना लेख्दा सामान्यतया: निम्न अनुसार लेख्नु पर्नेछ ।

उदाहरण :

क) प्रापकको नाम

ख) घर नम्वर, बाटोको नाम

ग) टोल, वडा नम्वर

घ) महानगरपालिकाको नाम, क्षेत्र

ङ.) प्रदेश, देश

> हरेराम जोशी
>
> ९२३, मंगल मार्ग
>
> मंगलबजार, वडा १६
>
> ल.म.पा. (पूर्व)
>
> प्रदेश ३, नेपाल

भाग – ३

अनुसूची

ॐ

अनुसूची - १

१. ललितपुर महानगरपालिकाको बाटोहरुको वर्गीकरण

किसिम	चौडाइ (मीटरमा)
१. पथ	१४ मीटर वा चार लेन र सो भन्दा चौडा
२. सडक	१० देखि १४ मीटर मुनी वा दुई लेन सम्मका
३. मार्ग	३ देखि १० मीटर भन्दा मुनी सम्मका
४. गल्ली	३ मीटर भन्दा साना
५. चोक, बहाल आदि	-

नोटः   हाल चलन चल्तीमा भएका कतिपय नामहरु यस वर्गीकरणसंग मेल नखाने भएमा यस्ता नामहरुलाई अपवादको रुपमा लिई ती नामहरु परिवर्तन गरिने छैन ।

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अनुसूची – २

२. ठेगाना, बाटो-नाम र घर नम्बर प्रवाह नमूना चित्रहरु
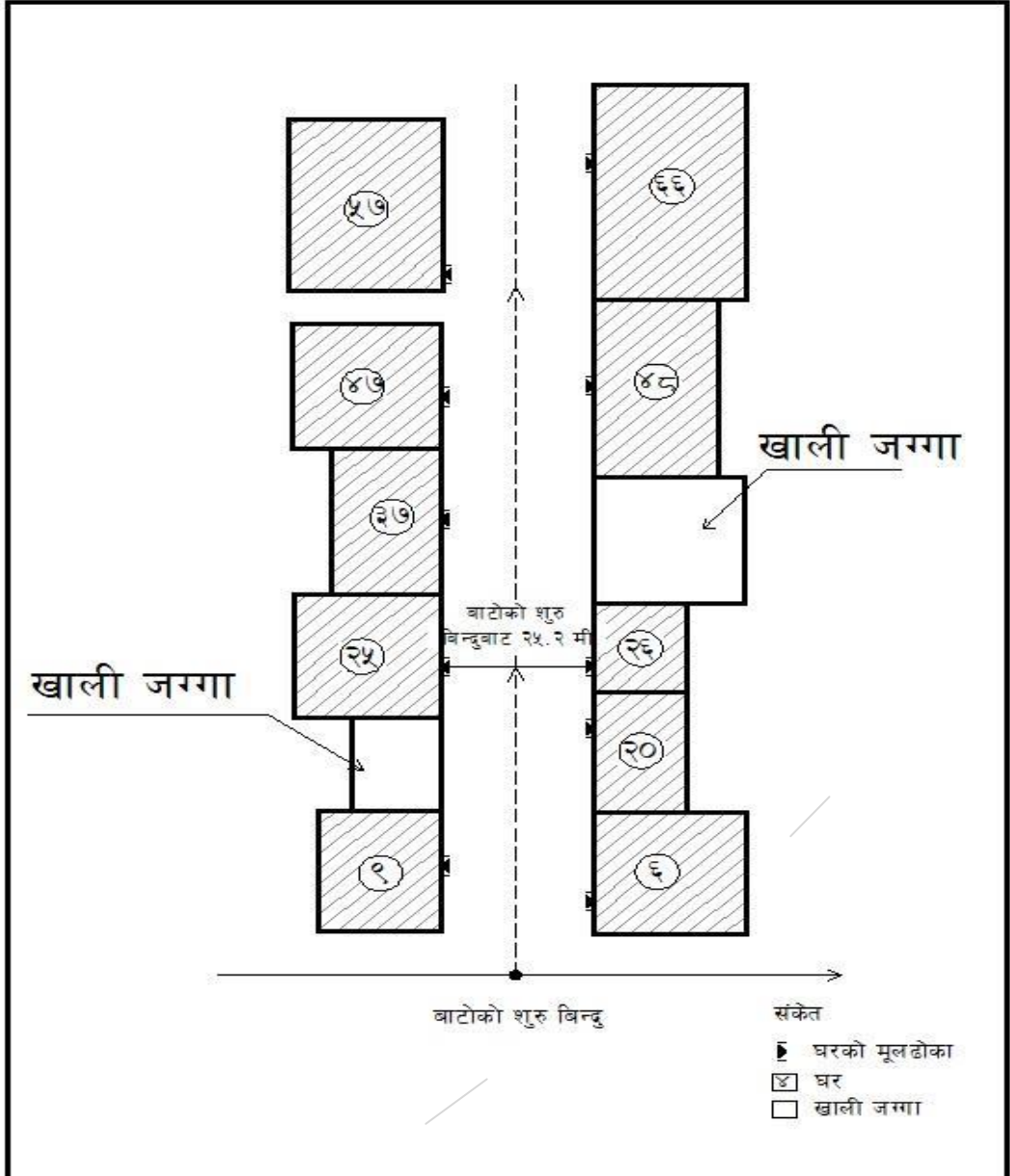
पहिलो अवस्था

चित्र नं. ३.१:खाली घडेरीहरु र घरहरुको नम्बर प्रवाह
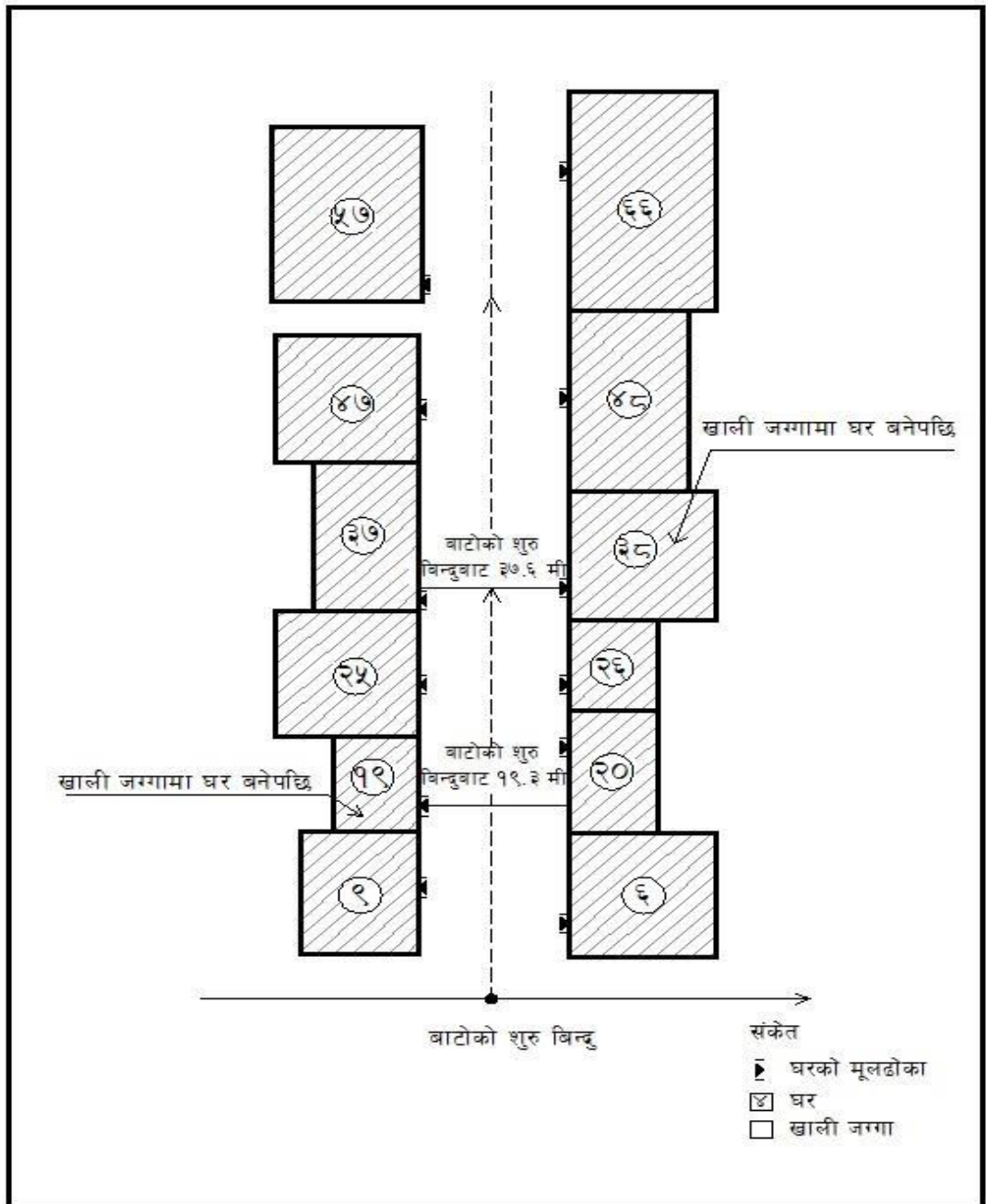
दोश्रो अवस्था

चित्र नं. ३.२:खाली घडेरीहरुमा निर्माण हुने घरहरुको नम्बर प्रवाह

३३

बाटोको शुरु बिन्दुबाट ५७.७ मी.

घर टुक्रा गरेपछि

बाटोको शुरु बिन्दु

संकेत

घरको मूलढोका
घर
खाली जग्गा
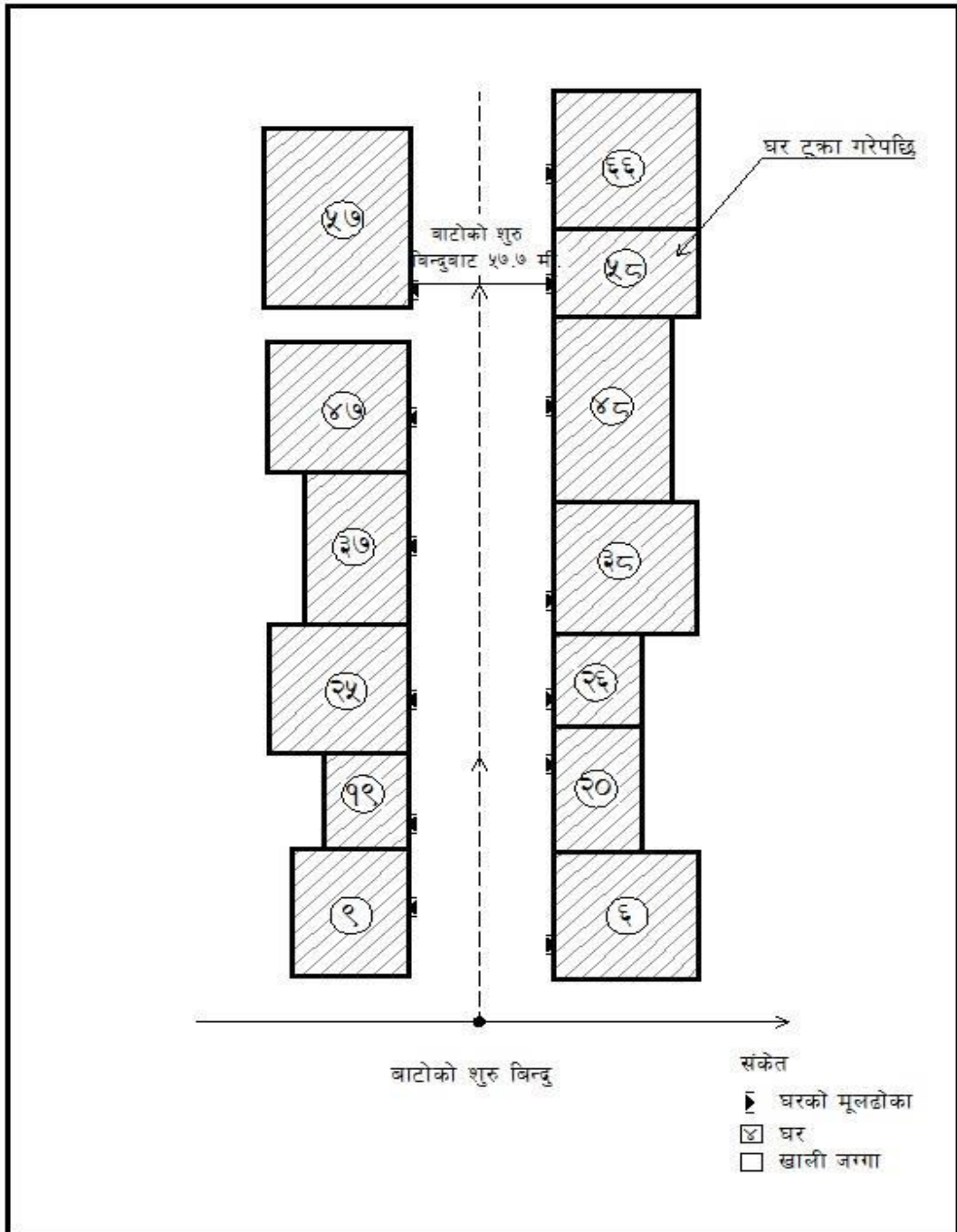
तेश्रो अवस्था

चित्र नं. ३.३: एउता घडेरी टुक्रा भएर दुईघर भएकोमा घरहरुको नम्बर प्रवाह

३४
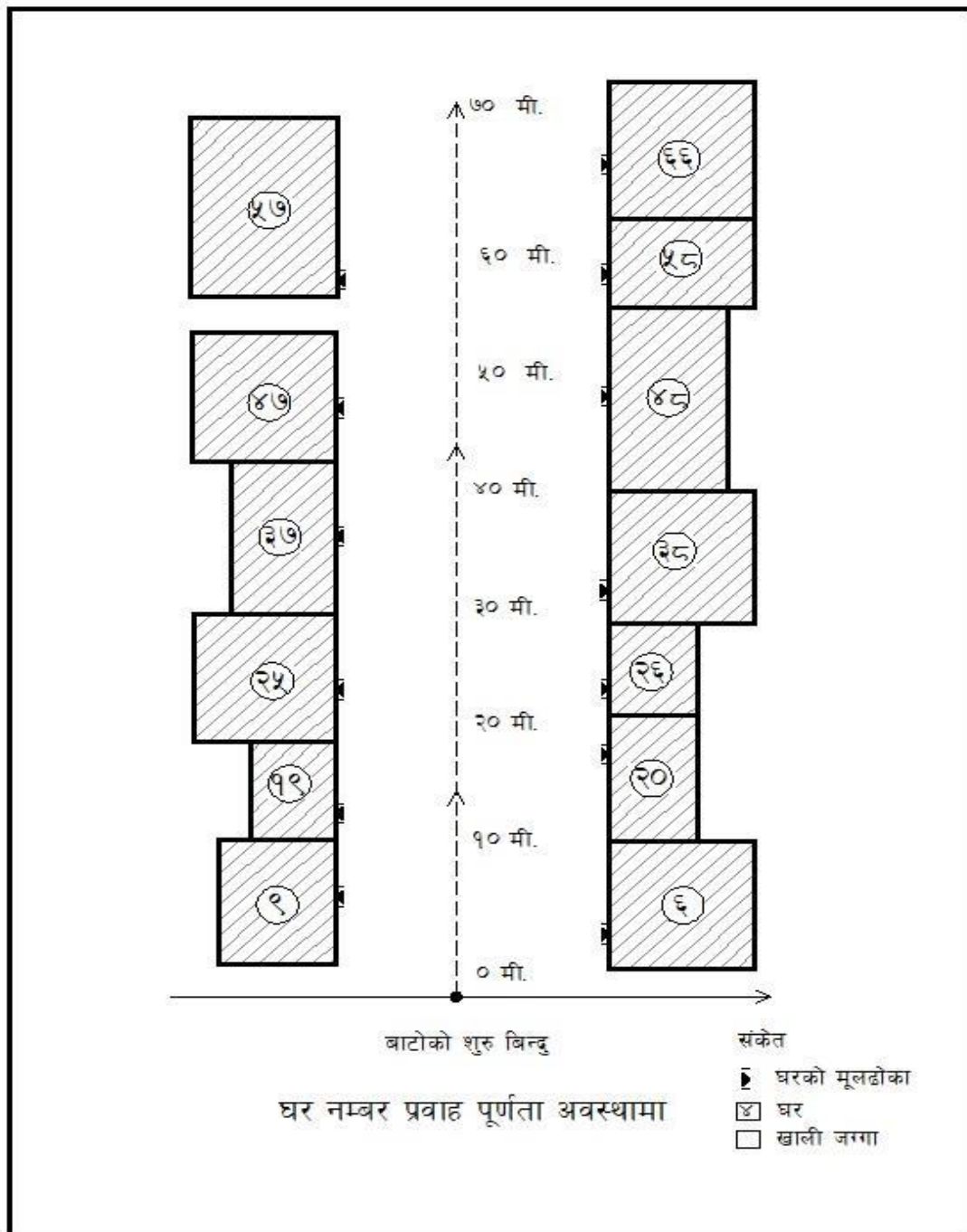
चौथो अवस्था

चित्र नं. ३.४: सामान्य पूर्णताको अवस्थामा घर नम्बर प्रवाह

३५
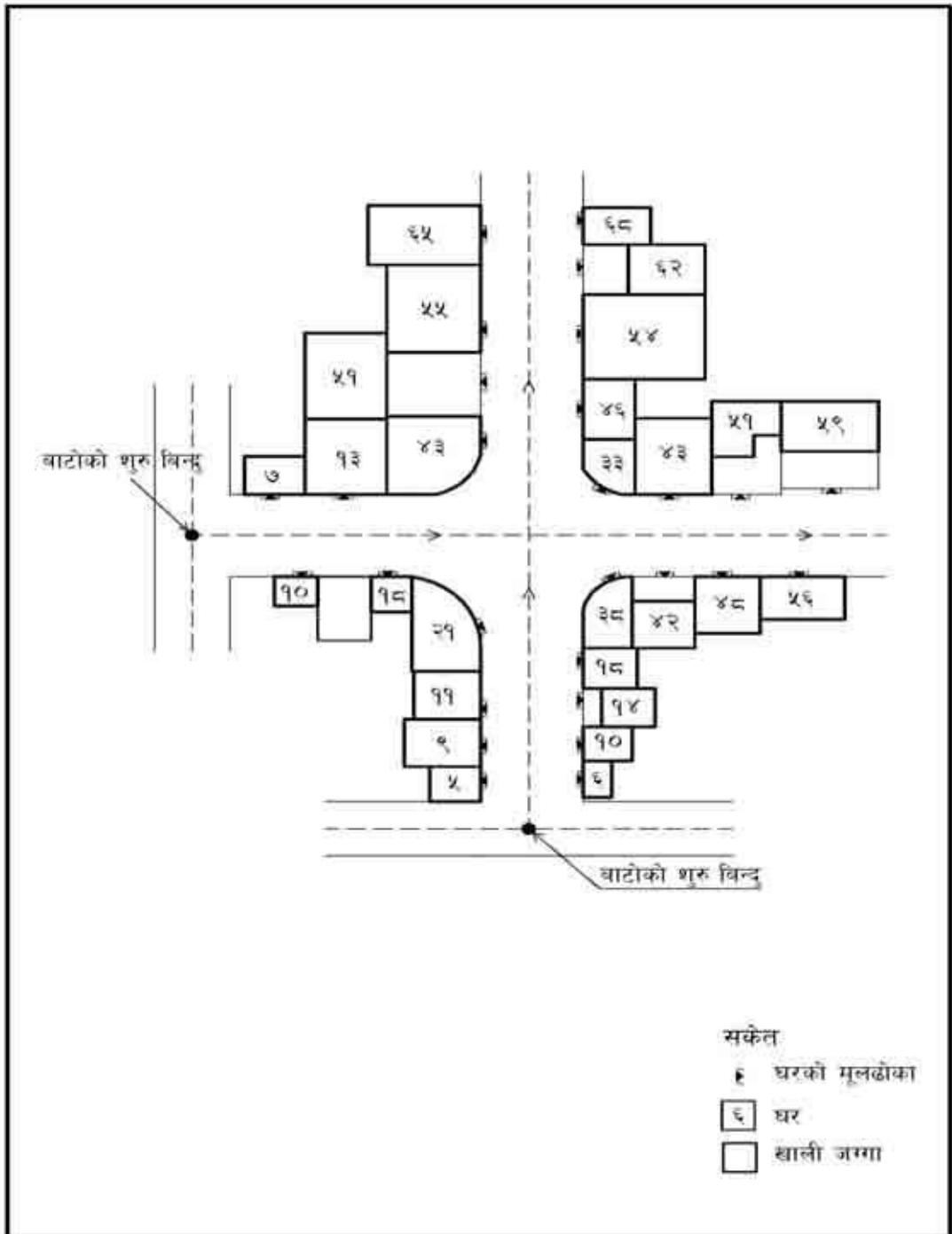
चित्र नं. ३.५: चौबाटोमा पर्ने घरहरुको नम्बर प्रवाह
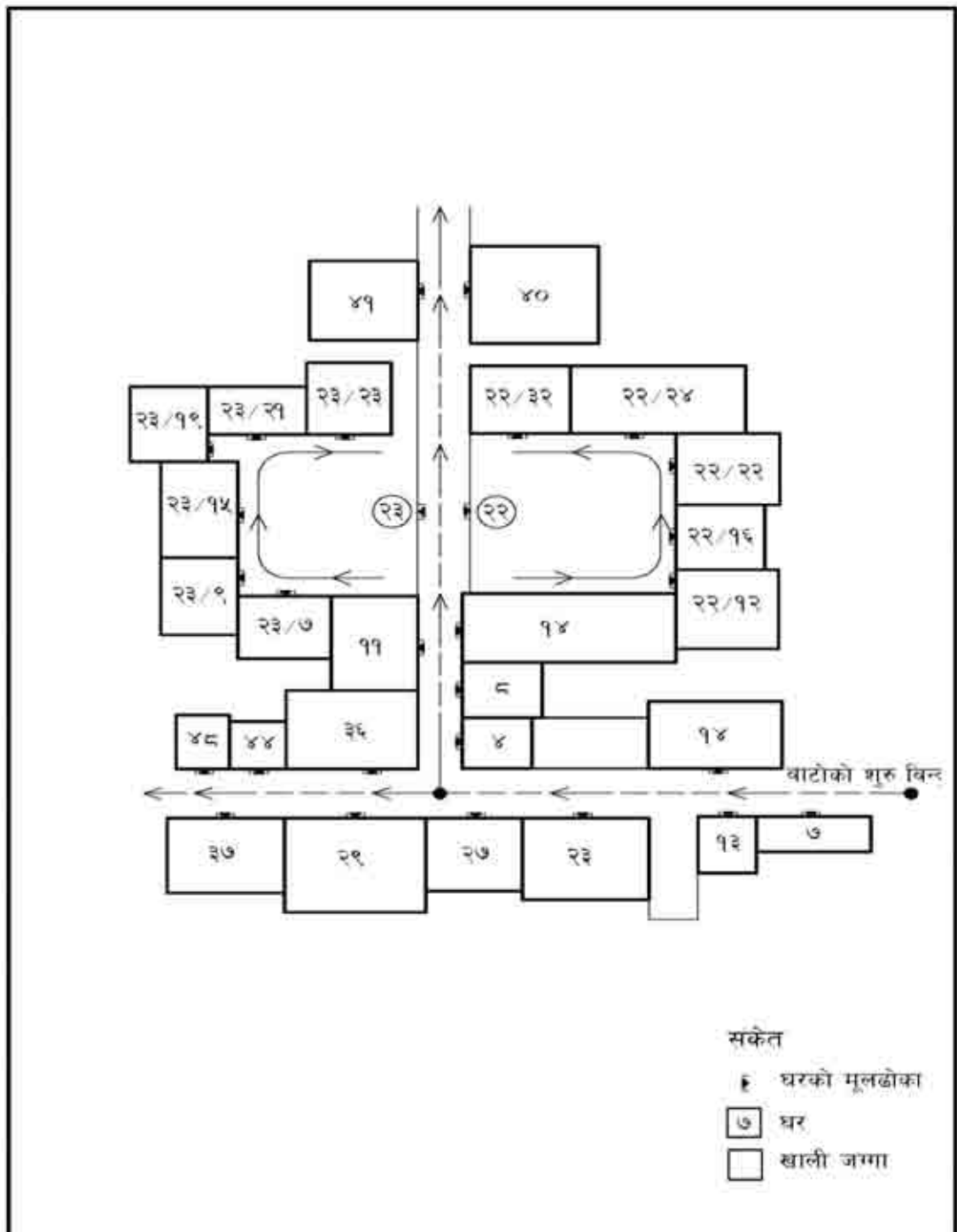
चित्र नं. ३.६: चोक भएर जाने बाटोमा घरहरुको नम्बर प्रवाह
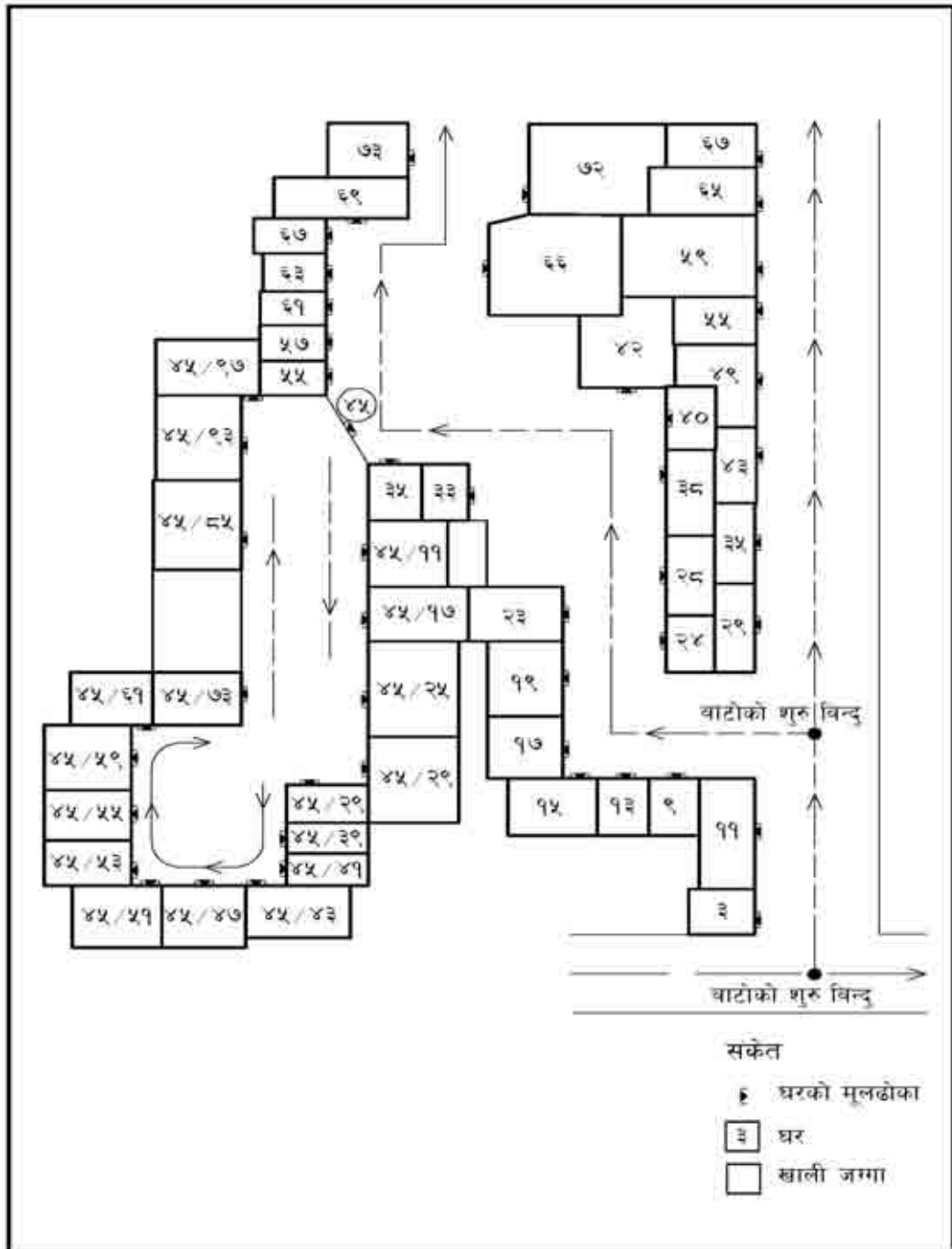
चित्र नं. ३.७.१: निकास नभएका बाटोमा घरहरुको नम्बर प्रवाह (बायाँतर्फ घडीको दिशा अनुसार))
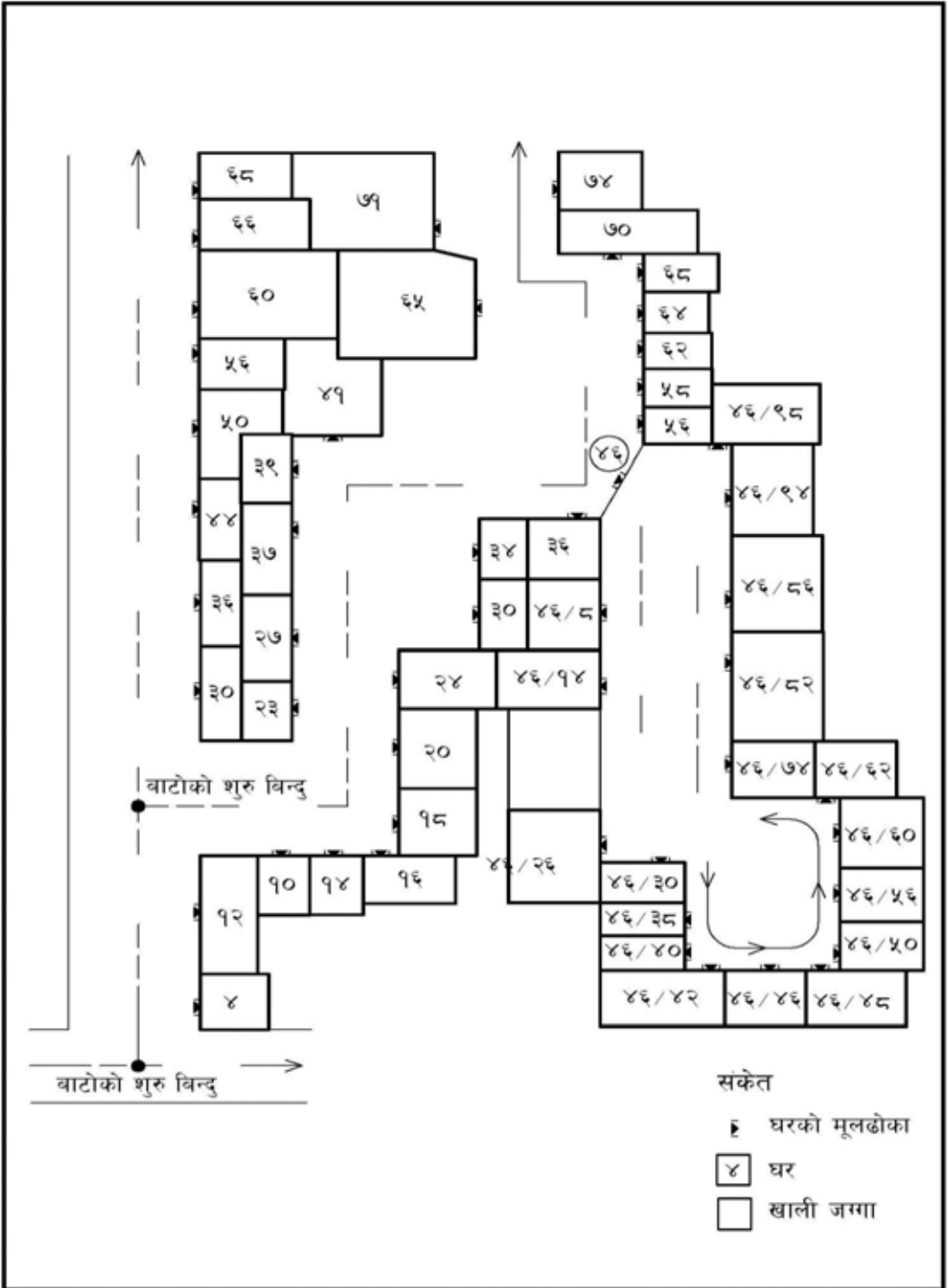
चित्र नं. ३.७.२: निकास नभएका बाटोमा घरहरुको नम्बर प्रवाह (दाँयातर्फ घडीको विपरीत दिशा)

Top block (upper settlement):

८८
८४
७८
७४
७०
६४
१७/१९
१७/१५
५०

१७/२९ १७/४१
१७/४३
१७/४७
१७/५३
चोक
१७/६३
२७
⟨१७⟩

बाटोको शुरु बिन्दु

⟨३८⟩

Bottom block (lower settlement):

३०
२६
२२
१६
८

१८ २६ ३८/१६
३८/२६
३८/३२
३८/३६
३८/३८ ३८/५०
१५ २५ ३१

४२
३८/६४
३८/५४
३८/४४
४३

चोक

बाटोको शुरु बिन्दु

संकेत

╽	घरको मूलढोका
८	घर
▢	खाली जग्गा
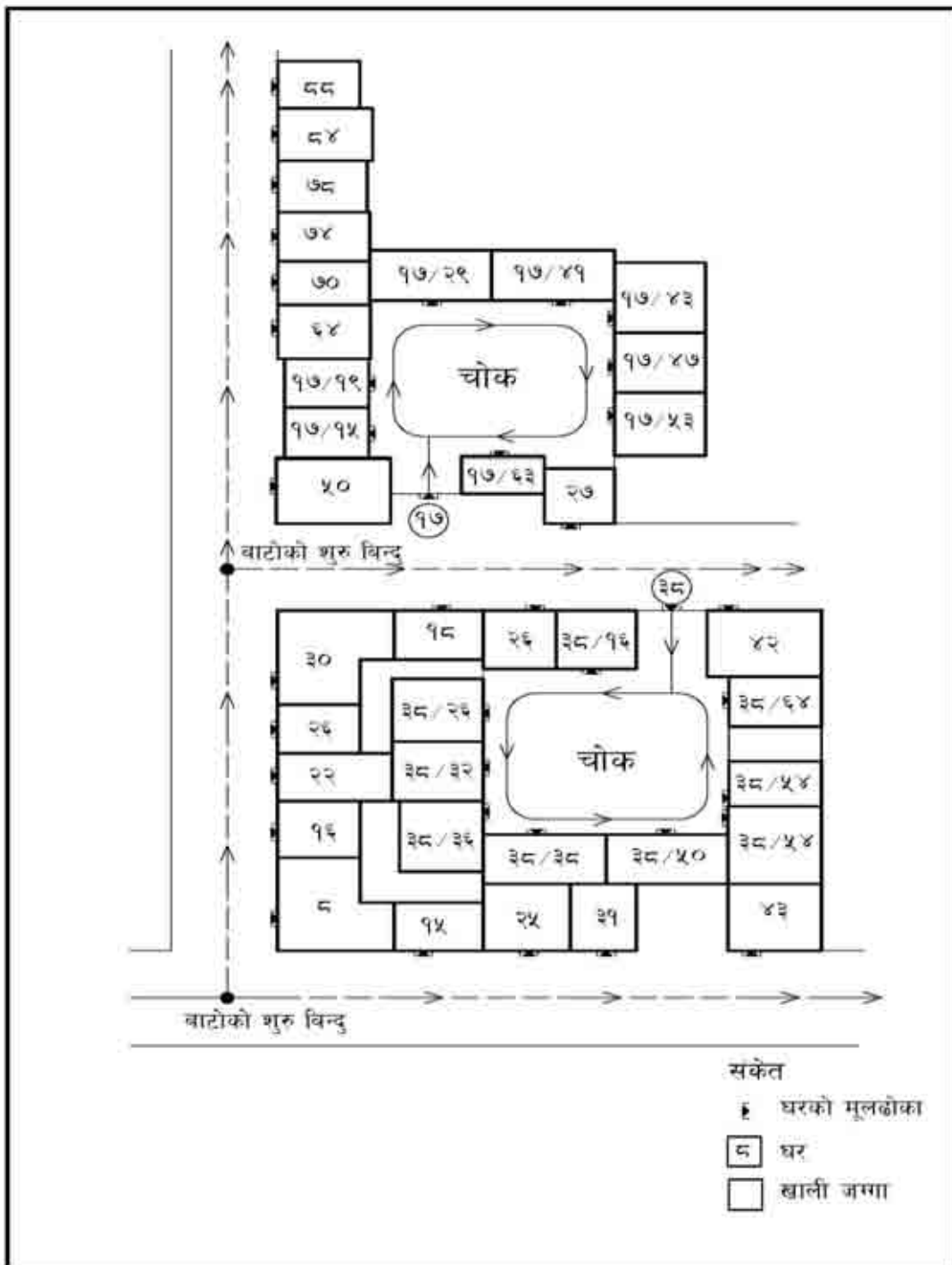
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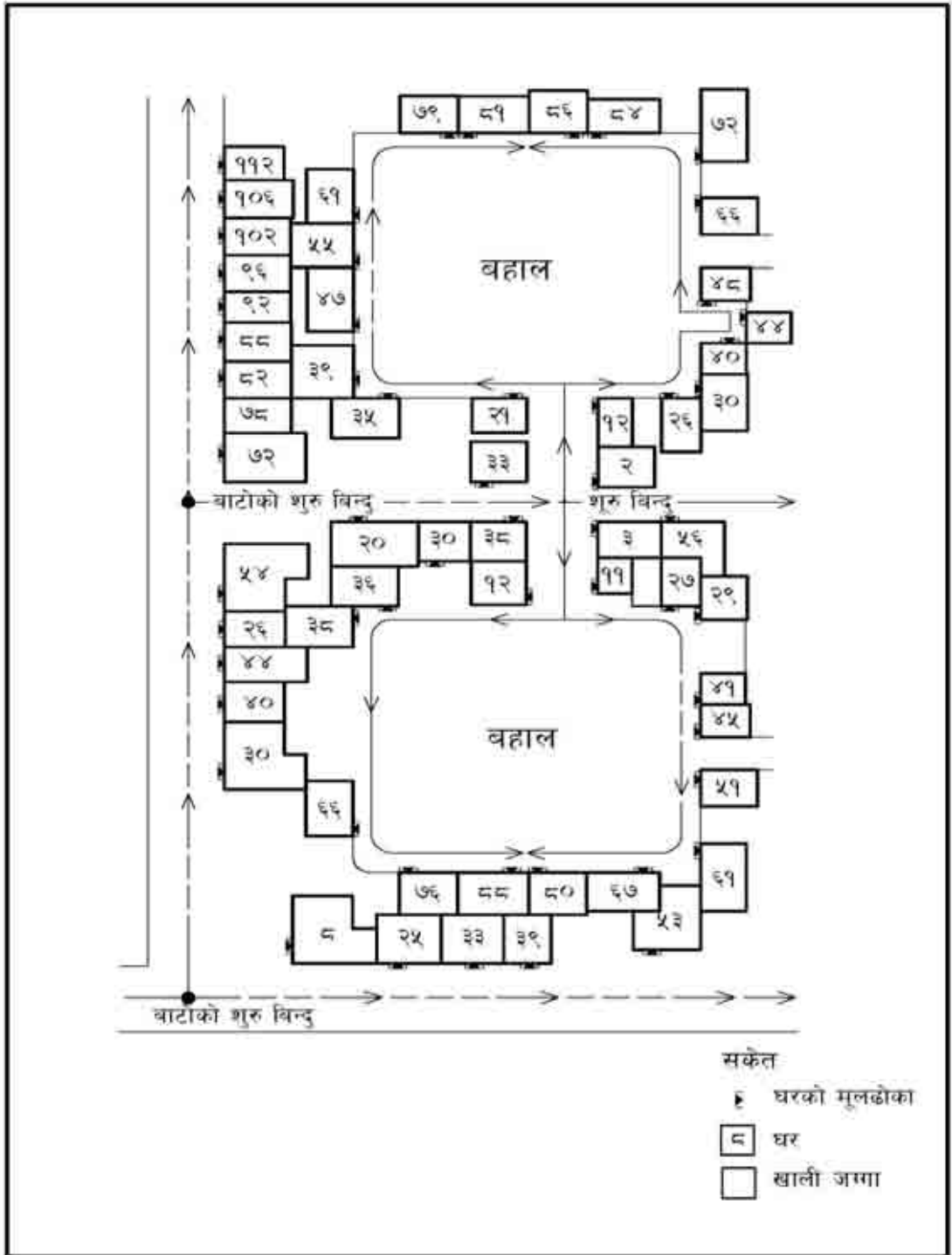
चित्र नं. ३.९: (ठूलो चोक) बहाल मा घरहरुको नम्बर प्रवाह

४१
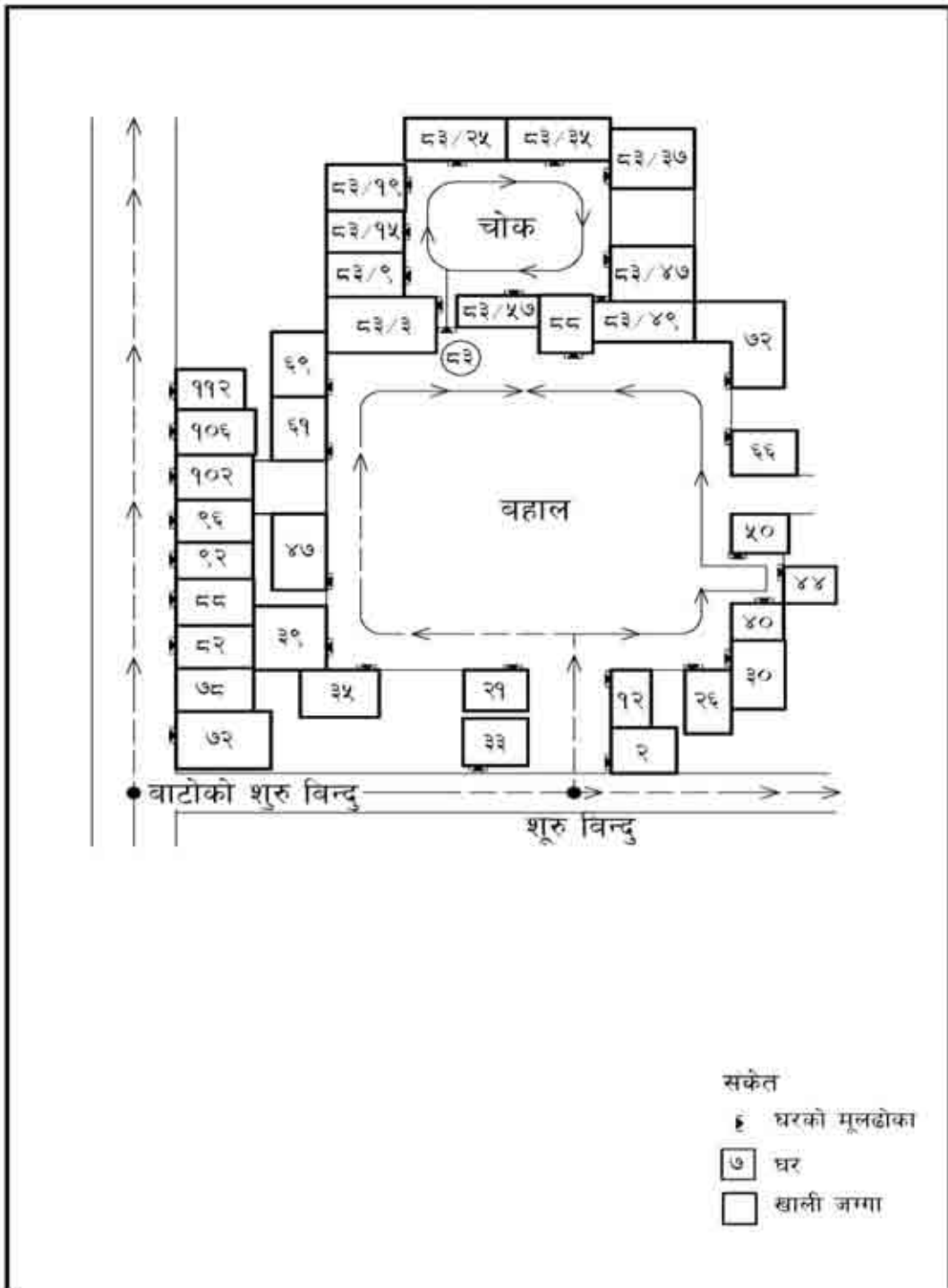
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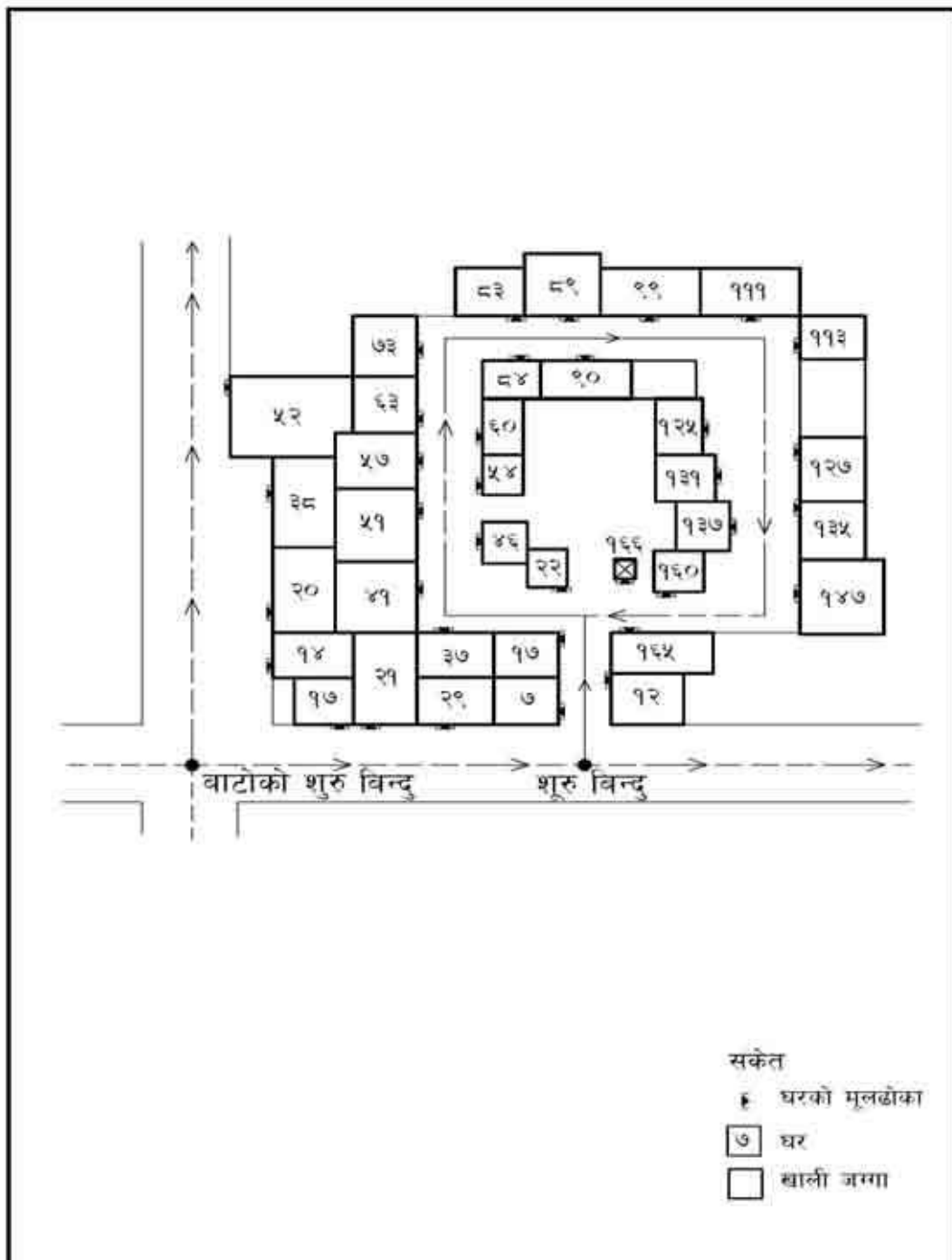
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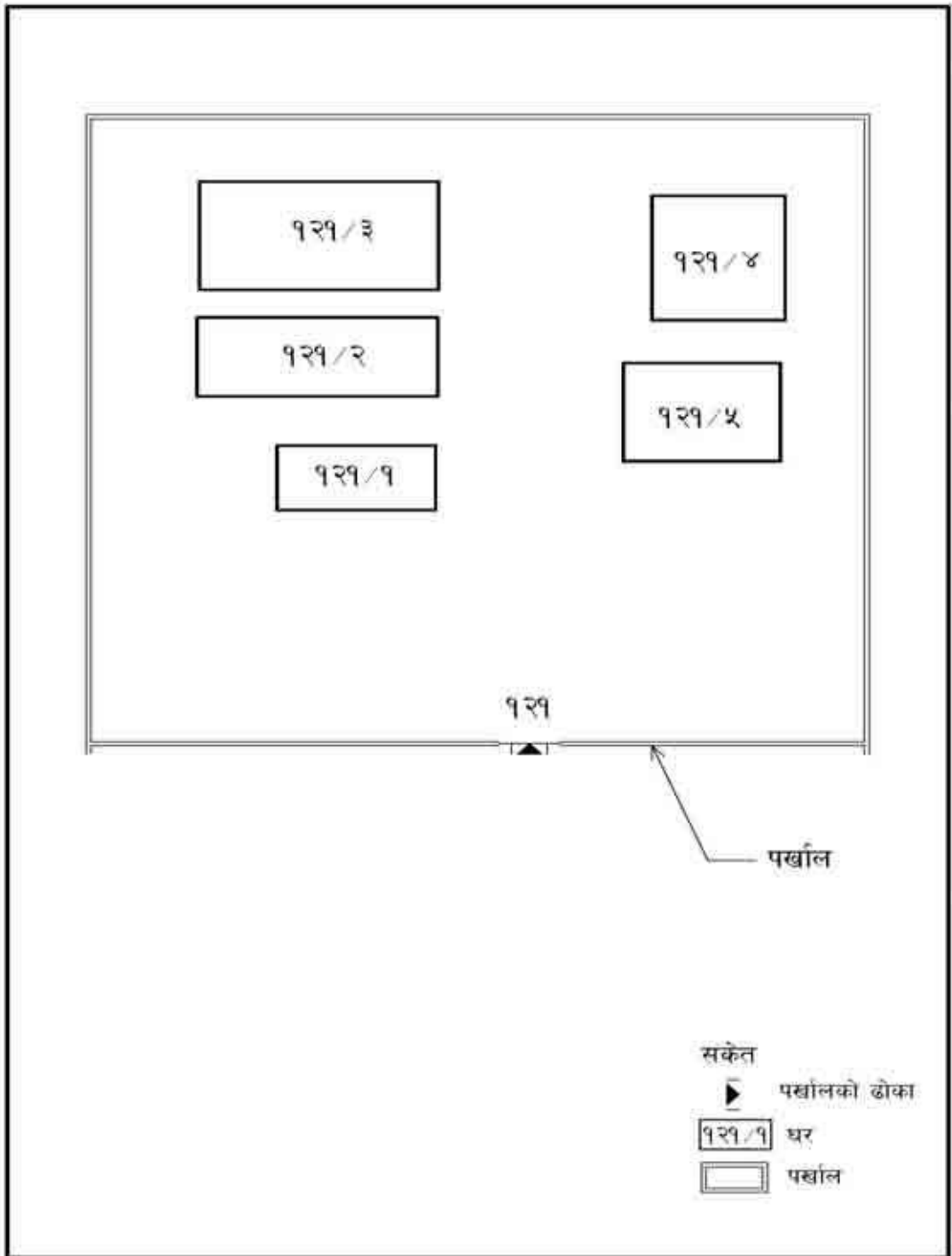
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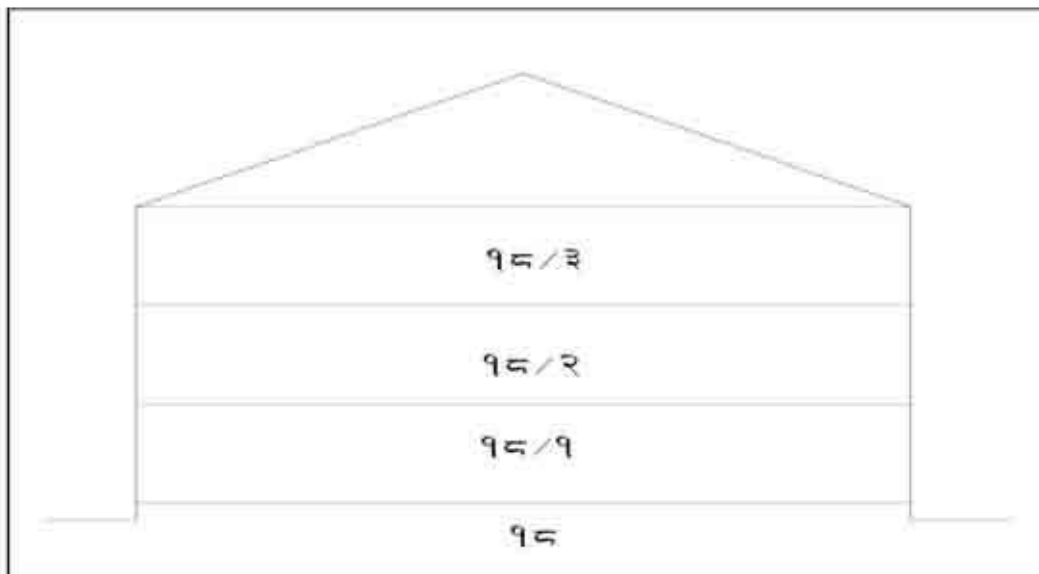
चित्र नं. ३.१३: संयुक्त आवास भएको खण्डमा घर नम्बर प्रवाह
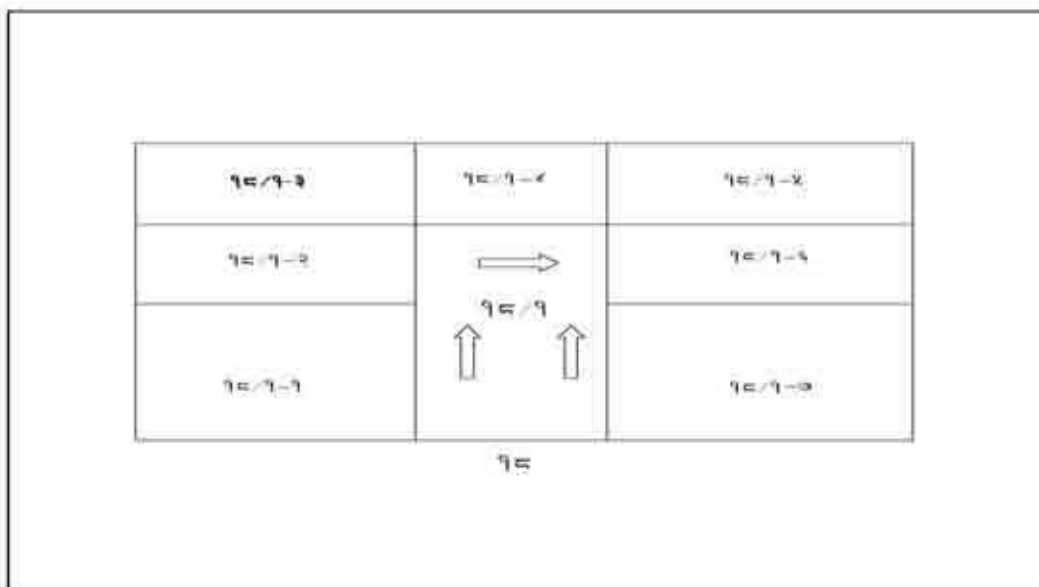
चित्र नं. ३.१४: संयुक्त आवासको एउटै छ्याना भित्र फरक फरक स्वामित्व भएको खण्डमा घर नम्बर प्रवाह

४५

अनुसूची – ३
घर ठेगाना सूचना आधार फारम

घर ठेगाना सूचना आधार फारम

मौजा नम्बर नापी	गाउँ नापी नम्बर	कित्ता किसिम						वडाको नाम	टोलको नाम	पुरानो घर नम्बर	घर नम्बर	घर किसिम				कैफियत
		घर	नक्सा	बाटो	सडक	गल्ली	कच्ची बाटो					छानाको किसिम	जग्गाको किसिम	गारो लगाउने	काठ	

नोट: किता नम्बर नापी विभागको नापी नक्सावाट अंकित गरिनेछ ।

अनुसूची - ४
ठेगाना प्रणाली कार्यान्वयन प्रक्रिया

परियोजनाको आधिकारिक प्रक्रिया

⇩

ललितपुर महानगरपालिकाका पदाधिकारीहरुलाई अभिमुखीकरण र विभिन्न समितिहरूको गठन → ल.म.पा.काप्रतिनिधि र जनताहरुलाई मेट्रिक ठेगाना प्रणालीका गतिबिधिहरु बारे अन्तरक्रिया

⇩

कार्यालय समीक्षा र नमुना क्षेत्रको अध्ययन तथा निरिक्षण → प्रारम्भिक प्रतिवेदन

⇩

निर्देशिकाको मस्यौदा तथा ठेगाना क्षेत्रको प्रस्ताव

⇩

GCP, DGPSतथा लेवल सर्वेक्षण

⇩

स्टेरियो सैटेलाइट इमेज तथा नापी नक्सा खरिद

⇩

निर्देशिका तथा ठेगाना क्षेत्र बिभाजनको अन्तिम निर्णयको लागी निर्देशक समिति संग बैठक ← निर्देशिका तथा ठेगाना क्षेत्र बिभाजनको अन्तिम प्रतिवेदन निर्देशक समिति बाट अनुमोदन

⇩

आधार नक्साको लागि पूर्व तयारी

⇩

बाटो विभाजन, नामाकरण, कोडिङ र टोल पहिचान ← बाटो नामाकरणको लागि महानगरपालिका निर्देशक समितिको अनुमोदन

⇩

घर नम्बरीङ गर्ने कार्य

⇩

घर नम्बर प्लेट तथा आधारभूत सर्वेक्षणको तयारी → निर्देशक समितिद्वारा छनौट गरिएको नमुना स्थानमा १,००० घरहरुको घर नम्बर प्रदान गर्ने

⇩

ल.म.पा.का पदाधिकारीहरुलाई मेट्रिक ठेगाना प्रणालीको कार्यान्वयन तथा अध्यावाधिक गर्न क्षमता अभिबृद्धि तालिम

⇩

WebGIS डिजाइन र कार्यान्वयन

⇩

मस्यौदा प्रतिवेदन तयारी, मस्यौदा लागि कार्यशाला र मेट्रिक ठेगाना प्रणाली कार्यको अन्तिमीकरण

⇩

अन्तिम प्रतिवेदन पेश

४७

अनुसूची – ५
नमूना घर नम्बर सर्भेक्षण

Drone Image of Piloting Area

Metric Addressing of Piloting Area
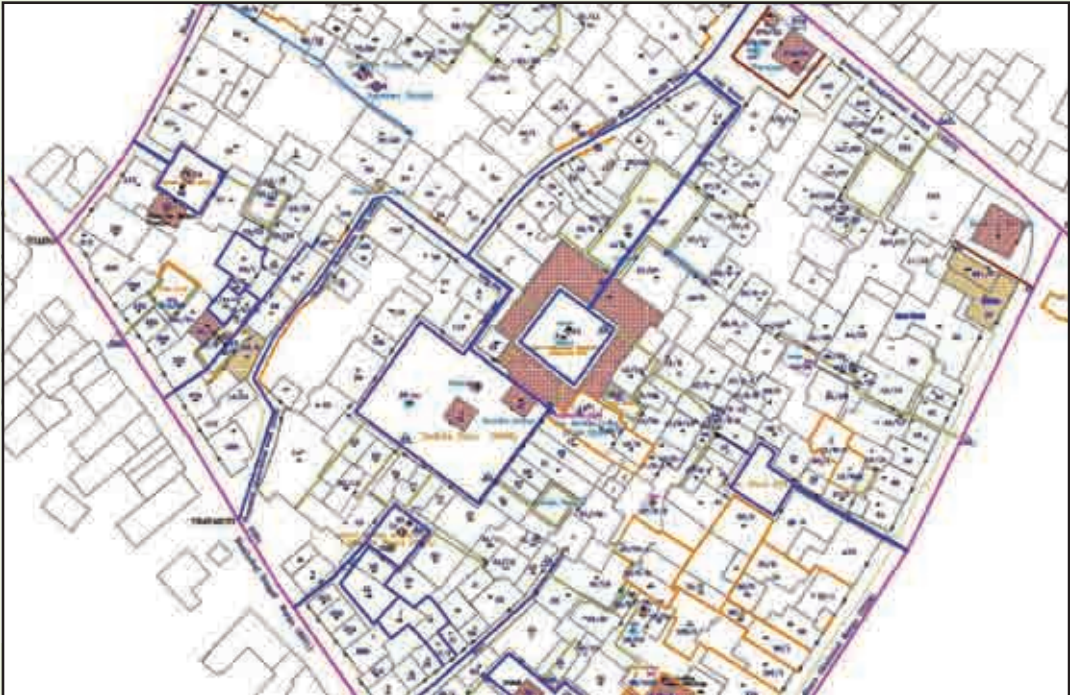
STREET AND HOUSE ADDRESSING MANUAL

Report Volume-II

An Implementation Guide for Metric Addressing System in Tikapur Municipality,

This document is the Specification manual for street and house addressing of the Tikapur Municipality, for the project "Preparation of Street Naming and Development of Matric addressing of Tikapur Municipality, Kailali undertaken by the Department of Urban Development and Building Construction. This document give the basic information about the street and house addressing, presents its functionality, guide the user to implement mention system and for this purpose, use of Municipal GIS Data is encouraged.

This document is prepared refereeing different published, unpublished document and resources. The different data such as Satellite imagery, GIS datasets and other data used in this manual are produce/ developed in the project Preparation of GIS based digital base maps. This manual is the part of mention project.

List of Acronyms

BM	Bench Mark
DGPS	Differential Global Positioning System
DUDBC	Department of Urban Development and Building Construction
DEM	Digital Elevation Model
DTM	Digital Terrain Model
GCP	Ground Control Points
GIS	Geographical Information System
GoN	Government of Nepal
HA.	Hectares
ICP	Independent Check Point
ISO	International Standards Organization
KM	Kilometer
M	Meter
MM	Millimeter
MUTM	Modified Universal Transverse Mercator
MSL	Mean Sea Level
NEA	Nepal Electricity Authority
NTC	Nepal Telecommunication Corporation
NWSC	Nepal Water Supply Corporation
RMSE	Root Mean Square Error
SQ. KM.	Square Kilometre
TIFF	Tagged Image File Format

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CHAPTER 1

INTRODUCTION

1.1 Background

In recent decades, many cities in the developing world have experienced extremely rapid growth. This growth has created many underserviced neighbourhoods. The street identification systems initially used in old neighbourhoods in the city centres have rarely been extended to new ones. Inadequate identification systems have created a worrisome predicament for urban services. As the pace of urbanization accelerated, many governments in the early 1990s were also embracing decentralization. The abrupt emergence of local governments made capacity building of municipal government teams a priority. Municipal governments were unequipped to meet the challenges of such a broad array of problems: substantial new investments and maintenance work were required while few resources were available to do so, owing to almost non-existent tax revenues. The house number is often part of a postal address and describes the number of a building (residential or not). House numbering schemes vary by place, and in many cases even within cities. The purpose of the numbering was generally to determine the distribution of property ownership in the city, rather than for the purpose of organization.

Street and house addressing provides logical and easily understandable system to identify geographical locations using a system of maps and signs conveying numbers or names of streets and house or buildings. Designation of house address is defined in relation to its access street. This operation of house addressing also serve to improve urban and municipal Management. Street addressing provides an opportunity to create a map of the city used by different units of the municipality, collecting significant information about the city and its dwellers and set up a database on the built environment. Information gathered is associated with an address making it easily locatable. The database which takes the form of GIS is the major creation of street addressing initiatives particularly in Nepal with rapidly growing urban areas. Street and house addressing systems is being practiced in major urban cities in Nepal.

The success of this system is expected to be repeated in this municipality as well. This chapter describes in brief the methodological approach implemented, in Tikapur Municipality, to develop such Metric Addressing System. In addition, it also presents the standards and conventions adopted as a guideline for systematic implementation.

1.1.1 General Arguments for Adopting a Street Naming and House Numbering System

Many arguments may be advanced to justify the need of street naming and house numbering. It has several objectives:

- For the public, it makes the city more "user-friendly" by

- Improving the system of street coordinates to enable people to get around the city more easily,

- Facilitating the delivery of emergency health, fire, and police services, and

- Locating urban facilities.

- For local governments: it increases municipal revenues and improves Urban management through the use of:

- Tools for planning and managing municipal services by technical departments: the identification of public assets (street system, facilities, their length, number, and condition) allows a monitoring system to be put in place to assist with urban planning and programming of investments;

- Tools for planning and management municipal services in emergency fire, ambulance and doctor access to correct address.

- Tools for planning and management municipal services in maintaining correct legal documents, such as those for licenses, vital statistics, deeds

- Tools to improve local tax collection: using information gathered by street addressing initiatives, it is possible to locate and compile a register of taxable individuals or businesses and thereby more accurately determine the tax base.

- For the private sector: it enables utility concessionaires to manage their networks more effectively. In fact, street addressing helps water, electricity, and telecommunications concessionaires to maintain their networks and collect fees.

1.1.2 What is Street Addressing

The addressing system involves naming streets and then numbering the building along them. Street addressing is an exercise which makes it possible to identify the location of a parcel or building or service. That is, to "assign an address" using a system of maps and signs that gives numbers or names to streets and numbers to buildings/parcels of land. Street addressing is an exercise that makes it possible to identify the location of a plot or dwelling on the ground, that is, to "assign an address" using a system of maps and signs that give the numbers or names of streets and buildings. This concept may be extended to urban networks and services: in addition to buildings, other types of urban fixtures, such as public standpipes, streetlamps, and taxi stands also get addresses.

Street Addressing as a system goes beyond the mere naming of streets and numbering of properties. It includes developing digitised maps for use in the management of settlements and urban communities. The maps with the information thereon can be developed into GIS [geographical information system] as a database.

Thus, development of a street addressing system should not be viewed as a one-off activity, but as a process to be expanded and refined over time to address a range of needs. It therefore has a number of arms and processes which are elaborated in subsequent sections of this document.

More than just a simple street identifying operation, street addressing provides an opportunity to (a) create a map of the city that can be used by different municipal units, (b) conduct a systematic survey that collects a significant amount of information about the city and its population, and (c) set up a database on the built environment, a rich source of urban information that is too often unavailable. Information gathered is associated with an address, thus making it easily locatable.

This database (which can take the form of a GIS [geographical information system] at a later stage) is the major innovation of street addressing initiatives, particularly in countries with rapidly growing urban areas where local authorities have lost control of the urbanization process. The real advantage lies in the potential of the urban information database, which, in conjunction with a street addressing plan and a street index, can be used for various applications and benefit the population as a whole, local government, and the private sector.

1.1.3 Objectives of the Street Addressing System

Addressing makes it easier to: Locate residents and their homes by means of an address system that can be used by the people themselves and by government officials, concessionaires, and other service providers;

• Operate urban services (ambulances, fire trucks, taxis);

• Enforce collection for user-pay services, in particular those provided by utility concessionaires [water companies, electrical companies].

1.2 Street Addressing Practices

There are various types of addressing systems. Basically two main types, metric and non-metric systems are often used in cities of the world. Besides this, there are other systems known as block numbering and sequential numbering along/around an access way.

1.2.1 Metric Addressing System

The basic principle of a metric system is; each building along an access way is given a number that equals the distance measured in meters from the access way's starting point to the main gate (entrance) of the house/building. In other words, structures are assigned even or odd numbers corresponding to the distance between the building/house main entrance and the beginning of the street segment. The numbering sequence does not necessarily start with 1, 2, 3 even if the buildings/houses are the first building or house at both sides of an access way e.g. a building with its main entrance or gate 10 meters from the starting point, will have no. 10, even if it is the first building along an access way. Benefits of this system are:

• Modifications occurring in the urban site, wise; demolishment of existing structures, replacement or construction of a new house/building, or vacant plot turned into a new building, will have no effect in the existing number flow.

• New building will be given new numbers, which do not conflict with the numbers already given.

• There will be no occurrence of the repetition of the number or number flow.

The metric system method follows the odd and even rule in a road segment which means that buildings on one side will have odd numbers and other side will have even numbers. For e.g. a
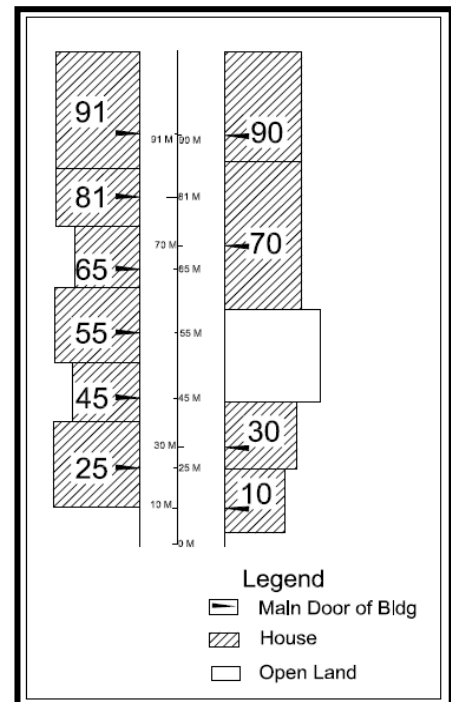
building on the right side of an access way with its main gate or entrance at 15 meters from the starting point, will be allocated as building number 14 or 16. The same rule applies to even distances measured for buildings situated on the left side of an access way. In this method vacant sites will not be allotted a number as there is no certainty on how many buildings will be constructed on that vacant plot. But the site can be identified if necessary in relation to the next building.

1.2.2 Non-Metric System

As the metric system, the non-metric system numbers buildings from the access way's starting point. However, the numbering flow increases sequentially in an even or odd manner along the right and left side of the access way. On the right side, the first building is given number 2, the next number 4 and then 6, 8 and so on. On the left side, the first building is given number 1 and the number flow continues with 3, 5, 7, and so on. There is no interruption in these sequences. Vacant sites do receive a number. It is an easy and simple system to identify buildings. As long as there are no major changes in the building layout or no subdivisions of sites, the system is suitable. Indeed, this system is used in many countries around the world.

A problem arises when buildings are demolished (resulting in a gap in the existing sequential numbering), or when new buildings are erected. This influences the existing numbering sequence. To avoid renumbering, the gaps have to be tolerated and the use of appendixes to existing numbers is essential to identify new buildings. This situation distorts the original concept of sequential numbering along the access way. Summing up, the non-metric method tends to break its own rules in numbering if the building pattern changes, thus losing all its simplicity and requiring a review of the numbers. This will cause inconvenience to dwellers. The metric system on the other hand is designed to avoid the problems encountered by the non-metric system as it uses non-continuous numbers. The only inconvenience in the metric system is the fact that in long access ways high building numbers will be necessary.

1.2.3 Other Systems

Block numbering and sequential numbering along/around an access way are the other methods. It neither follows a metric or non-metric way of numbering. Block numbering system was used in Kathmandu to identify buildings. As it has some drawbacks like a new building within a block gets the number following the last number allocated. As such the number has no relationship to the physical location of the building. When there are a large number of buildings in each block, it is impossible to find a particular by means of its block and house number alone.

CHAPTER 2

PROCEDURE FOR DEVELOPING STREET ADDRESSING AND HOUSE NUMBERING

The following steps were adopted for the development of metric addressing system in the case of the work conducted in Tikapur Municipality:

2.1 Preparing Building and Road Base Map

Maps showing building, streets, administrative boundaries and other topographic feature form the base for the street and house addressing. Building footprints and road centrelines are extracted from high resolution satellite imagery. Following steps were adopted for delineating building footprints and road centrelines:

• Building footprints and roads were digitized in Arc GIS environment over the high resolution satellite imagery. The digitized vector data were stored in Arc GIS Geo database or the shape file format. Attribute data were collected by the field work and secondary sources were included to create building and road GIS database. All road segments were given a unique id number (Road Code).

• These vector data (building and roads) were then verified on the ground and update as required. Administrative ward boundaries were ground verified and updated. Rivers and streams captured by digitizing over the ortho-rectified satellite image were the topographical features required for street addressing. Building and road base maps were printed in large scale for field observation and naming of the roads.

2.2 Division of municipality into manageable addressing sector

The sector division is the process of dividing municipality into neighbourhoods addressing zone. The division is to establish a firs level of geographical reference for access ways and building addressing. The division of sector can be done based on commonly known places, administrative units or according homogeneous city blocks with Regular Street and building patterns.

Considering the sector implementation method mention above, the addressing sectors of Tikapur Municipality are divide based on administrative boundaries and named based on locality. These addressing sectors are Kailali North and Kailali South which is shown the below.

Table 1: Sector division of Tikapur Municipality

SN	Zone Name	Ward Comprise	Description
1	Tikapur Municipality East	1,2,3,4,5, 6,7,8,9	Tikapur Municipality devided by Tikapur to Lamki Road. From the Lamki road Eastern direction encompasses ward no 2,5,7,8 and 9. It is bordered by Geruwa Gaunpalikaand Rajapur Municipality in the

			East direction, India in the South derection and Janaki Gaunpalika in the North derection.
2	Tikapur Municipality West	10	Tikapur Municipality West Zone encompasses ward no1,3,4 and 6. It is bordered by Bhajani Municipality West direction and India in South derection and Joshipur gaunpalika North derection
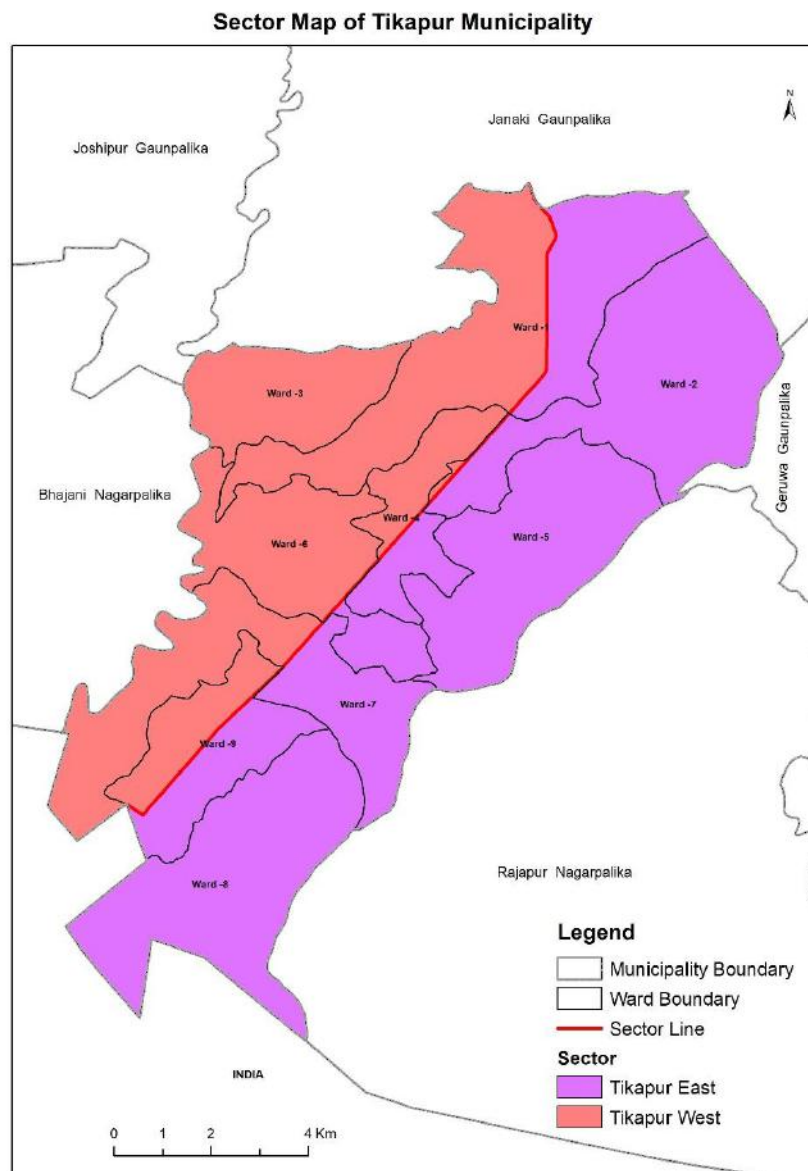
Figure 1: Addressing sectors of Tikapur Municipality

2.3 Access Way and Mapping for Street Naming

Street naming started with the determination of the starting point of each access. The starting point of each access ways were define in order to designate a name and distribute house numbers

along them. Public participation and awareness among them is vital for its use and success. Hence an approach of public appraisal and participation was adopted for this task. Participatory approach, in which the local community themselves were involved in defining the starting point and naming of the access ways, was implemented. The approach thus takes was:

• The starting and ending point of each access way was defined on the digital map in GIS environment. By definition, the starting point is located on the eastern side of an access way if that access way is aligned east-west direction and southern side in case of a north –south aligned access way.

• In case of alignments, of an access ways, not exactly along the north-south or east- west axis, the starting point is defined by the angle by which the access way deviates from the north-south and east-west lin. If the angle is smaller than 45° or smaller referring to the east-west line, the starting point will be the eastern side of access way, and if more than 45° then the southern side will be the starting point.

• In case of roads with a dead but having possibility to expand more, direction of the main road is followed.

• The defined access way were discussed at the public hearing with the participation of the municipal office ward, TLO, Political parties Political, representatives, and the general public. The access ways with conflicting starting point were discussed at the same meeting and finalized.

• Access way name were designated for each individual segment through a discussion amongst the participants of a meeting, and old names were followed for already designated streets. Access ways with conflicting and repeating names were designated with synonymous names or with an alternative.

2.4 Doorway Measurement of Building

Each building was numbered based on the measured metric distance from the starting point of the street. The following method was applied:

• Each individual building was identified from the base map and verified on the ground.

• The distances for building entrances were measured on the GIS map.

• Based on the measurements, odd numbers are assigned to buildings on the left side of the access way and even for buildings on the right side. Some sampled buildings numbers were temporarily marked on the walls. Permanent house numbers are distributed later during the operational installation of signage for the street and house numbers.

2.5 Development of GIS Database of Street and House Address

All the road access given codes name and building numbers are maintained in relational database in GIS environment. The road name and house numbering was given in ARC GIS by geo-code system (US dual Range Geo-coding service). The street networks segments and buildings from the base map, in addition will contain the addressing data.

- After the designation of access way codes, names and building numbering, GIS database system was developed for the streets and buildings. The addressing GIS database specifically contains the designated names and codes of the access way and the numbers of the building along with other base map attribute data. This information's were added as attribute data in the GIs database system.

- The street GIS database contains addressing sector name and code, access way code and name, type, surface type, status, width, length and other physical attributes and traffic type.

- The building addressing, database contains the addressing sector name, access way name, code and type, house number, location, parcel number, number of floors, functional use and designated name.

Table 2: Access way addressing and building geo-database model

Feature Class Category	Description	Feature Geometry	Feature Attributes
Road Centerline	Road network/ road Centerline	Poly Line	ID, ADDRZN (Text), STRTCD (Text), STRTNM (Text), RDHIER (Text), RDSURF (Text), RDLEN (Double), RDWIDTH (Double), ROW (Double), STRTLMP (Text), VFLAG (Short)
Building	Footprint of Building	polygon	BIN (Long), ADDRZN (Text), STRTCD (Text), ADDR (Text), WARD (Long), TOLE (Text), BLDGASC (Text), BLDGUSE (Text), USECATG (Text), FUNCNM (Text), CONSTTYP(Text), ROOFTYP (Text), FLRCOUNT (Integer), VFLAG (Integer), ROADACS (Text), ELECACS (Text)

2.6 Municipal Street Maps

Street map was prepared at larger scale showing all the street, designated names, buildings and landmarks of importance, location names and other relevant information, which would facilitate to orient the map reader and locate a specific address.

- Street map is composed at large scale, preferably at 1:2500 to 1:5000 scales.

- The Street map clearly shows each of the access ways with unique color and cartographic symbols for each category, major access with prominent than minor ones.

- Designated access way names distinctly shown on the maps.

- Prominent places name such as public squares town center etc. are shown on the map.

- Landmarks such as status, temples, parks and other public places shown on the map

- Infrastructures and places of tourist attraction, business, commercial buildings, official buildings, banks, recreational, hotels, places of historical and cultural importance and other important infrastructures/places are shown with designated names.

- Services such as police stations, hospitals, fire stations, hospitals/health posts, clinics, post office etc. are show on the map with appropriate symbology.

- Transportation services such as bus parks, taxi or auto stand, public parking area, petrol station, service station etc. are shown on map with appropriate symbology.

- The directions of the traffic in one-way streets are being shown clearly with directional arrows. Streets with restricted access are also shown on the map.

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CHAPTER 3

IMPLEMENTATION SPECIFICATION

3.1 Access Way Identification

The first step taken is to identify the access way on the prepared base map and its verification on the ground. A clear starting and ending point is identified for every access way with the local participation and the assistance of the municipality and the concerned ward. In principle, the exact starting point of an access way is the intersection point of the centre-lines of two access way. The ending point is the junction point of other access way. The identification of the starting and ending points of the access way delineates its segment length thus enabling the naming of the segment. The identification of the starting point also defines the origin for building numbering in metric system. A starting point, by definition is located on the eastern side of an access way if it is aligned in east-west direction, referring to the north orientation. If the access way is north-south aligned, then the starting point is on the southern side. If the alignment of an access way is not exactly north-south or east west, the starting point is defined by the angle by which the access way deviates from the north-south or east-west line. If the angle is smaller than $45\,^{\circ}$ referring to the north-south line, the starting point is the point in the southern side. If the angle is 45° or smaller referring to the east-west line, the starting point is at the eastern side of the access way.

The above defined convention does not seem to be practical in case of Kailali the originating point of an access way would start from the end of the road located too far from the reference.

Therefore, Major business centre and major thoroughfares are considered as the reference point for the starting of any access way.
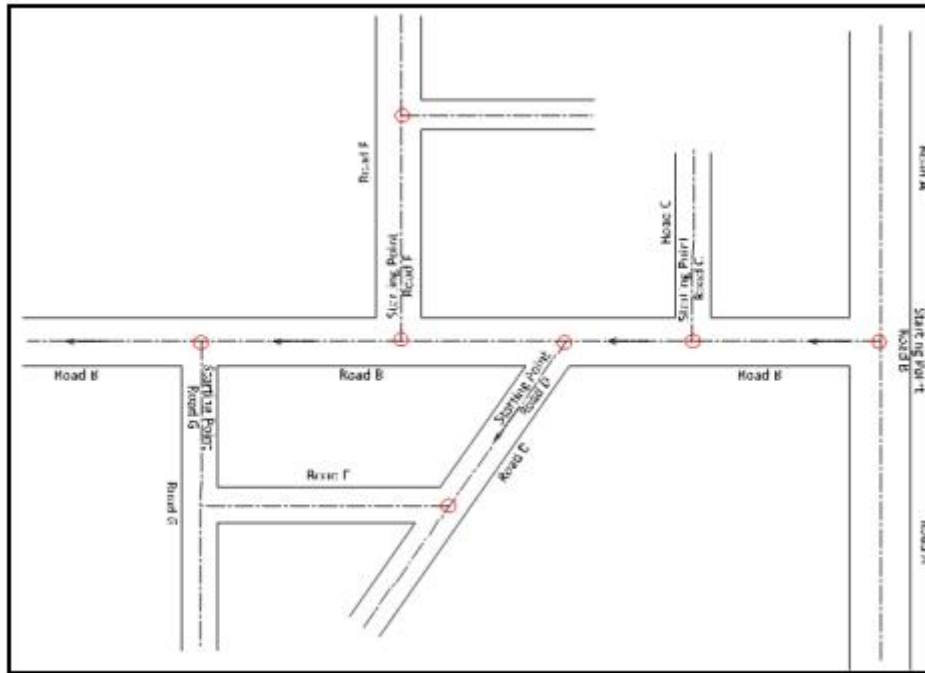
Figure 2: Access way identification

3.2 Access Way Naming

Access way naming is also one of the main tasks in addition to coding. The designation of access way names is done by adopting participatory appraisal approach with an active participation of local people and authorities. Upon the request of the municipality and technically supported by the consultant, each ward organized ward level meetings to identify the origin and the end points of the access ways and designate a commonly used names of each identified access ways. In practise, access ways are designated with names (terminologies) of deities and mythical figures, popular figures, martyrs, people's movements, popular spot or location and other cultural terminologies. Certain naming convention should be followed such that the name would not offend certain group of people or prove to be controversial. Following are the points to be considered in the designation of the names:

• Names should not reflect political agenda

• Living individual's name should not be used

• Any name should be unique throughout the municipality i.e. there should not be repetition of the same name

• Traditional and already existed name are maintained.

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The access ways are categorically designated into four types based on their widths. These categorical types along with the designated names is the full name of the access way. These categorical types are as follows:

Table 3: Access way categorization

Type of Access Way	Nepali Terminology	Width (meter)
Arterial Road	Path	>14
Street	Sadak	9-14
Alley (Motorable)	Marga	3-9
Path	Galli	<3

These categorical types also help in distinguishing the access ways with the same designated names. For example, Bazar Galli is different to Bazar Marga and is valid according to the naming convention.

For the access ways with already existing names, the original names are preserved. In case of any repetition conflict in the designated names with the access ways of other sectors/wards, the naming committee of the municipality should modify the name suggesting an alternative or synonymous name or by adding a prefix or suffix to the suggested name which may justify the original name suggested. The names can also be distinguished using a suffix such as location references, numbers referring to sections as in highway sections and others.

3.3 Limitation of Access Way Naming

Although the designation of access way names is done by adopting participatory appraisal approach with an active participation of local people and authorities, the participation were unable to finalized the access way naming as mention above. Due to this limitation, the accesses way were named as from starting point to ending point (i.e. origin-destination).

3.4 Building/House Identification and Doorway Numbering

Metric house addressing system is followed for building doorway/entrance numbering. Under this system, house address numbers represent the distance in meters from the street's "point zero" to each individual building's main entrance. These rules are followed for allotting the numbers to the buildings.

- A unique number is given to every building currently used for human dwelling and other purposes. Each and every main entrance of the buildings is numbered. The number given to the building main entrance is the measured distance in meters from the starting point of an access way to the middle of the building's main entrance along that access way. The distance is measured along the access way from the starting point in the field.

- Even and odd numbers are allotted to the buildings. Odd numbers are assigned to buildings on the left side and Even numbers are assigned to the buildings on the right side of an access way. A right side building with an entrance at a distance of 10 meters from the starting point of the access way is allotted as number 10. If a right side building has an entrance at a distance of

13.5 meters from the starting point, the building is allotted number 14, while for a left side building the number is 13 or 15. Likewise for the right side building with an entrance at 19 meters from the starting point of the access way, the number is 18 or 20. Similar, rounding off to the nearest even or odd numbers are applied to the fractioned distances on the right or the left side respectively of an access way. In all cases consistency has to be maintained strictly.

- As every building is defined by the main entrance the number allotted is only one. If a building has two or more independent entrances (either to one or more access ways), one of the entrance is selected as the main entrance and is allocated the main building number. If the various entrances give access to units that are owned by different owners, each entrance is given a unique number.

- Permanent number of metric house number plate is fixed at the main entrance of the building.

CHAPTER 4

SUCCESSFUL IMPLEMENTATION OF STREET AND HOUSE ADDRESSING AT MUNICIPAL LEVEL

The first and foremost requirement for sustainably implementing Street Addressing System is to establish a "Street and House Addressing Unit" under the Planning Section in Tikapur Municipality. This unit shall collaborate and function collectively with other municipal departments and shall provide its services to all the departments within the municipality. The primary responsibility of this unit will be to manage and maintain data besides giving house numbers, street naming. The other responsibility is to improve the performance of the existing tax system and reform the present system optimizing for the resource mobilisation of the municipality.

4.1 Street and House Addressing Unit

As has been described above this unit is responsible for assigning addresses and verifying road names within Kailali and ensuring their conformance with existing regulations. This unit's main functions are:

• Assigning code numbers and names to every access ways.

• Assigning addresses to all parcels and properties based on metric system.

• Maintaining an officially valid road name inventory.

• Managing and maintaining street and house address database, regular updating of data, analysis of data and prepare presentation as per the requirements of the municipal departments as well as external organizations and general public.

4.2 Legal Status

The unit functions under the municipal authority. The municipal authority has to endorse its functions and all the information system that this unit has generated. Present administrative structure accommodates this unit in one of the departments. The Municipality Board has to approve the functioning of this unit. This unit should be given mandate to perform the following tasks:

• Coordinate the street naming process

• Arbitrate and resolve conflicts during street naming

• Authenticate and approve the designated street names

• Assign new building numbers

• Issue temporary and permanent house address certificates

• Collect fees for installation and issuing of house address plates

- Publication of street maps, development of other map and data products (tourist maps, road data etc.)

- Distribution and dissemination of such maps and data rendering certain fees

- Updating of street and house address database and maps

- Installing new signage and house number plates

4.3 Roles of Addressing Unit

The role of addressing unit is to assign record and issue addresses. Addresses of all buildings are issued to applicants upon submission of the following information:

- The valid/official street name upon which the structure is located or to be located.

- The distance of the buildings in meter to the nearest property line (House No.) and whether that building is on the north, south, east or west side of the property line.

- Plan which shows the street with the above information, the address is verified by this unit. After verification a certificate is provided to the building permit department to issue the building permit.

- Provide support to land and house/property taxation unit by maintaining/updating the street name, house number and other database and associated building information records.

- Provide support to the road construction and maintenance unit by establishing/updating road status inventory and maps.

4.4   Establishing Addressing Unit

4.4.1 Human Resource Requirement

In view of the present organizational structure of Tikapur Municipality it seems quite logical to establish one separate unit as Street and House Addressing Unit which will collaborate and function collectively with other departments of the Municipality and especially with the department which issues the building permit. As has been described early in this manual, the recruitment of personnel depends upon availability of the personnel with sufficient knowledge of this nature of the work within the municipality. If there are no such personnel available, the municipal office should recruit appropriate personnel. The recommended human resources are:

Table 4: Human resource requirement

S.N	Personnel	Qty	Responsibility	Remark
1	Engineer	1	• Coordination with the parent municipal department • Oversee all the tasks in the unit Tasking to the sub-ordinate technicians • Coordinate with local stake holders during street naming process • Plan and undertake field monitoring, verification and updating • Issue temporary/permanent house address certificates to public • Plan for new installation of street signage • Collaborate and support GIS unit in street updating, street and house address updating	Head of Department
2	Surveyor/Overseer	1	• Conduct measurement of entrances of newly constructed houses for issuing new house number • Collect the location of newly constructed buildings/houses to be updated in the database • Support GIS unit of updating of street, houses and address database • Assist the engineer in planning new installation of street signage	With basic surveying training and basic computer knowledge

			• Undertake new installation of street signage and building number plates • Assist computer operator in updating the database	
	Computer Operator		Assist the engineer in data preparation, updating, analysis and map preparation	computer literate, preferably with technical background (sub overseer, computer operator, Assistant surveyor etc.)
	Helpers	1	Install street signage, house number plates	

4.4.2 Hardware System

For maintaining the addressing database, reporting and performing day-to-day office tasks for the aforementioned personnel of the unit, at least two networked computer systems with normal configuration and a printer is required.

4.4.3 Software System

As all the GIS and mapping work is done in collaboration with the Municipal GIS Unit, special GIS software may not be required for the unit. However, it is recommended to have one unit of commercial GIS software provided funding is available. As an alternative a free GIS tool such as Arc Explorer by ESRI, open source Quantum GIS, Map Window or other freely available GIS applications may be used to visualize and map the streets.

4.4.4 Other Equipment

Updating of street map in collaboration with other municipal departments/units is one of the major tasks of the addressing unit. Other tasks include installation of new street signage and building number plates. So, the unit should be equipped with proper equipment. These are the required equipment:

• Handheld GPS set – 2 units to maps newly constructed roads and buildings GPS data downloading software – 1 unit to download GPS readings

• Odometer – 2 units to measure the metric distances of the entrances of newly constructed buildings, alternatively measuring nylon tapes can be used

- Ladder to install street sign plaques on building walls / Electric Poles

- Lettering stencils, colour paints, paint brushes/rollers etc. for temporary numbering until permanent metal plates are installed

- Electric/hand drills, hammers, nails/screws etc. to install street signage and building number plates

- Printed temporary and permanent house address certificate forms

4.5 Updating of Street and House Addresses

For the successful implementation of the addressing system in the municipality, regular updating of the streets, buildings and associated addressing system is imperative. The municipality should formulate certain policy and institutional framework for updating the addressing system. This updating policy and institutional framework is also governed by the availability of resources including the human resources. Hence the addressing unit should have a clear mandate as well as technical and infrastructural capability to undertake the updating operations. The policy should be such formulated that the updates are carried out at municipal level as soon as the roads and buildings are constructed. This might require frequent updating at municipal level but the benefit is having an advantage of up-to-date street and building database and their respective addressing system. Frequent updating might also eliminate the need of hiring and external consultant to do the mass updating, which otherwise would be necessary. The following sub-sections provide a general road map for undertaking the updating operations:

4.5.1 Updating Buildings and House numbers

As a new building is constructed and the owner applies for the permanent house number, the addressing unit surveyor makes a field visit to verify and map the location of the building. The surveyor takes the GPS observations of the four corners of the building and make as recording. The metric distance measurement of the doorway is also done at the same time. Basic household and house characteristics data are enumerated using a simple structured questionnaire. Detailed household data may also be enumerated at the same time using structured questionnaire if required.

If a GPS reading of the corners of the house is not possible, only one reading to indicate the location of the building can be taken.

The GPS reading is downloaded and overlaid on top of existing municipal base map or satellite Ortho-photo to draw the building footprint using GIS software.

Associated building and household data collected is then entered into the attribute database.

The house number and the street name are entered into the address database. The applicant house owner is then given a permanent house number and the house number plate is installed at his/her doorway entrance.

4.5.2 Updating Roads and Street Addressing

When as new road is constructed, the addressing unit should seek for the acquisition of the design drawing and layouts with the concerned line agency or with the contractor/consultant involved

in the construction. Such design layouts, in general are in CAD digital format as well as in printed maps. The addressing unit should verify the compatibility of such layout drawing with the Municipal GIS system. The digital drawing is then converted to compatible GIS data format with associated attribute data.

In case, design layout is not available, the roads are updated using handheld GPS sets. In this method, the surveyor traverses along the center line of the constructed road, taking GPS readings at every turning point. Other relevant information such as road width, pavement type, side-drain and other structures constructed and other are recorded. The recorded GPS points and the surveyed route are plotted on the base map in GIS environment. Associate data collected are entered as attribute data of the road.

Once the road map and GIS data is updated, the access way is given a code according to the coding specification. The addressing unit holds a public counselling for the naming of the new access way. The name is approved by the municipality and the access way is officially designated a name.

The GIS and database is also updated accordingly with new access way code and designated name.

Street signage (street plaques or street sign post) is installed at the appropriate location for the new access road.

If in case the buildings/houses along this newly constructed road have not obtained permanent house numbers (due to temporary status of road such as bund -cFnL, under construction road or others), these houses are given permanent house numbers and house number plates. The GIS and database of such buildings are also updated accordingly.
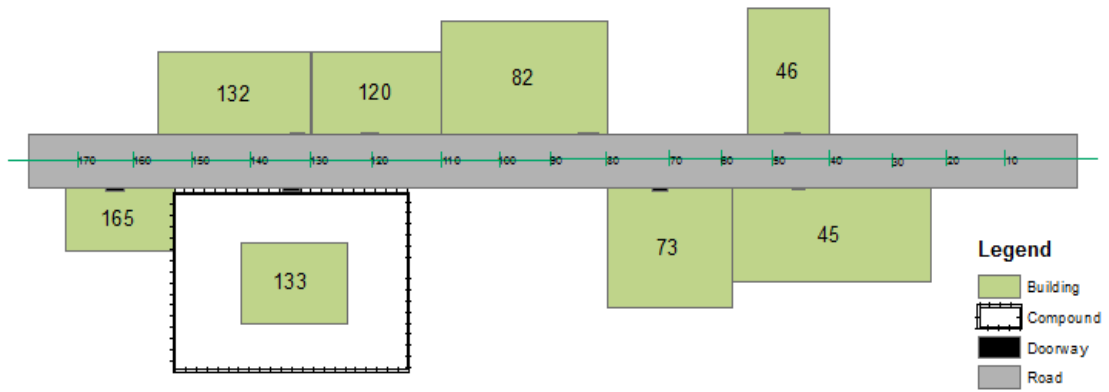
Figure 3: House numbering of existing building
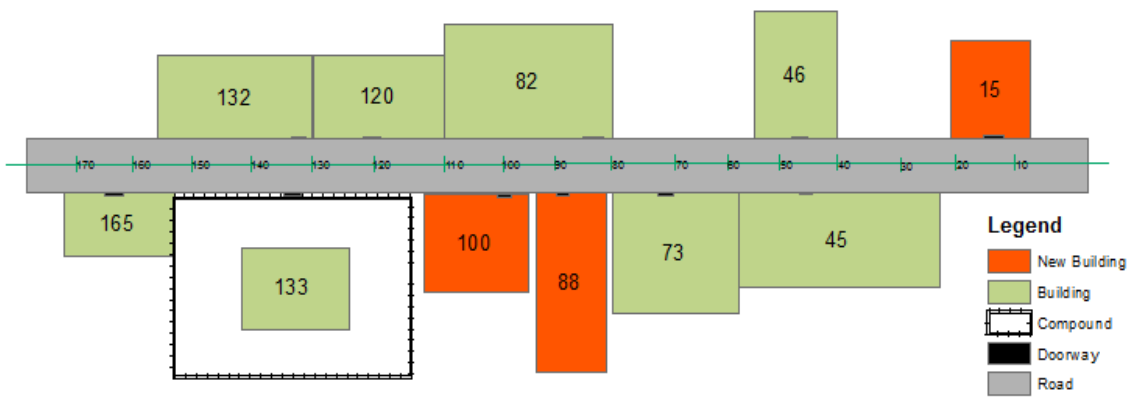
Figure 4: House numbering of newly constructed house

Figure 5: House numbering of road crossed section

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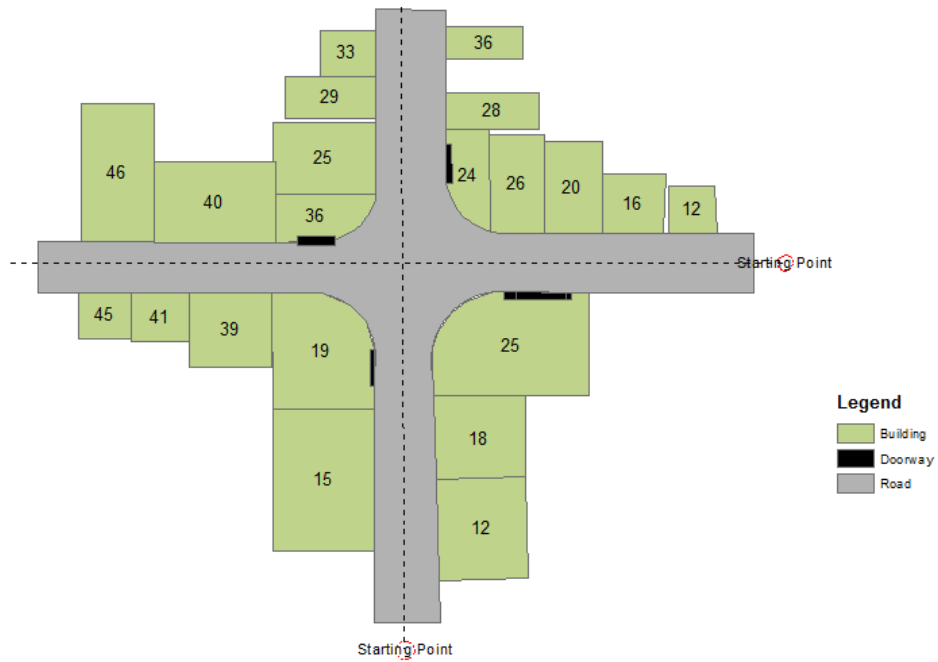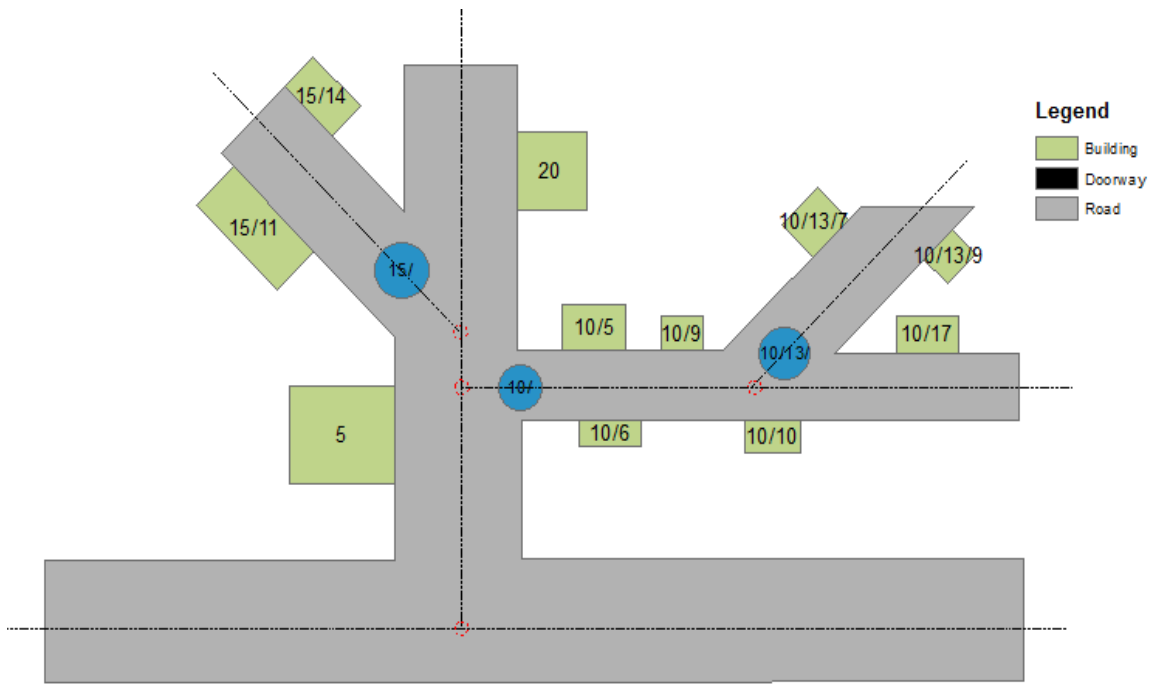
Figure 6: House numbering at dead end road
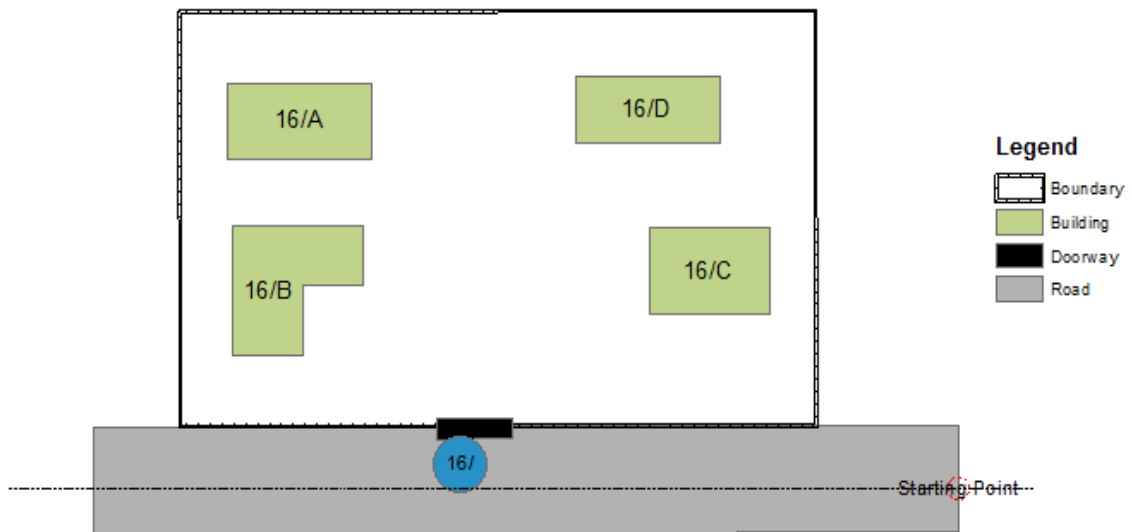
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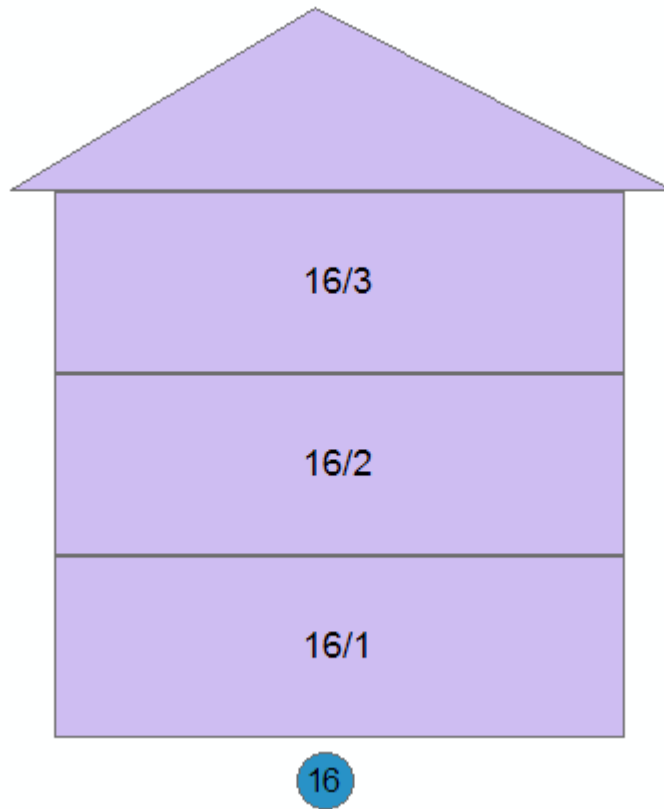
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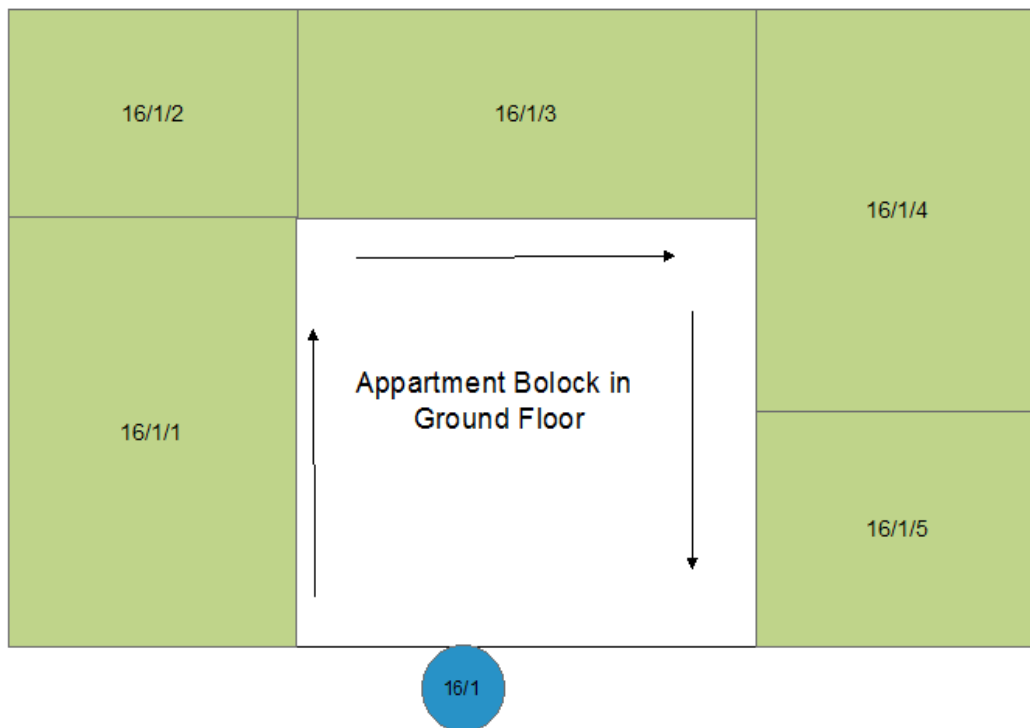
Figure 9: House numbering system of flat base system

Government of Nepal

Ministry of Urban Development

Department of Urban Development and Building Construction

New Town Project Coordination Office

Babarmahal, Kathmandu

Preparation of Master Plan for Developing Waling as A Smart City

Package: CS-06-074/75

Final Report

On

Volume V: Metric Addressing System

Waling Municipality, Syangja District, Gandaki Province
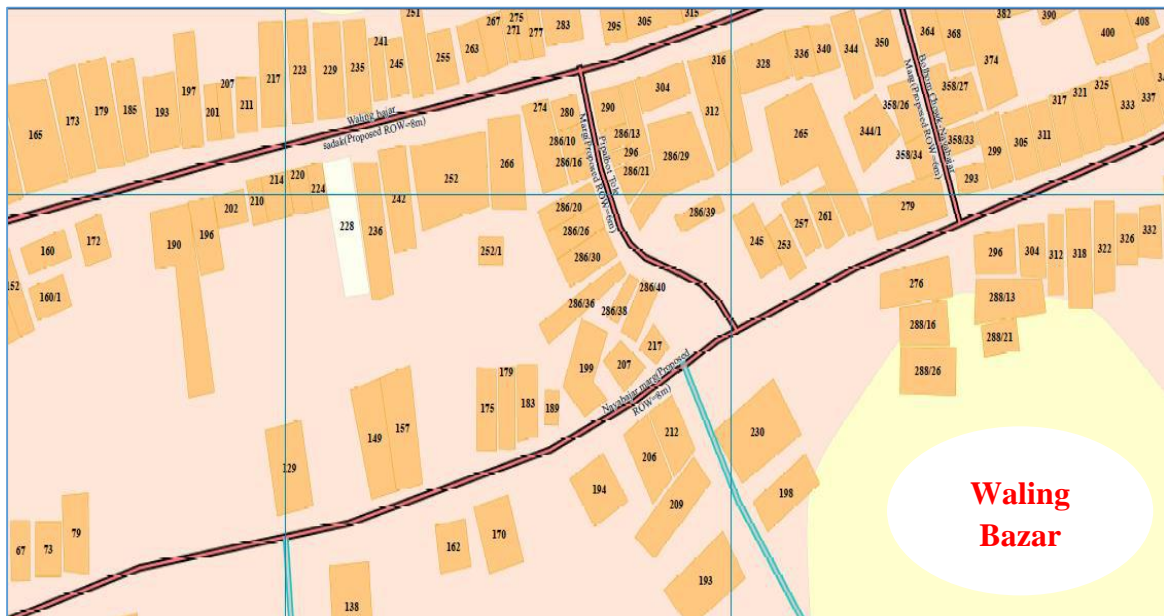
Consultant

SDRC (P) Ltd., GEC (P) Ltd., and RES Engineering Consultancy-JV

Nayabazar, Kathmandu

2076

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CHAPTER 1:- Introduction

1.1 Background

House numbering is a system of providing a unique number to each building in a street or area, with the intention of making it easier to locate. The house number is often part of a postal address and describes the number of a building (residential or not). Street Numbering was first introduced across Europe in the 18th century, to facilitate administrative tasks and provision of services such as the post.

Street and house addressing provides logical and easily understandable system to identify geographical locations using a system of maps and signs conveying numbers or names of streets and house or buildings. Designation of house address is defined in relation to its access street. This operation of house addressing also serve to improve urban and municipal management. Street addressing provides an opportunity to create a map of the city used by different units of the municipality, collecting significant information about the city and its dwellers and set up a database on the built environment. Information gathered is associated with an address making it easily locatable. The database which takes the form of GIS is the major creation of street addressing initiatives particularly in Nepal with rapidly growing urban areas.

Different utility authorities normally use their own system for their specific application. A common addressing system usable by all the municipal utility and infrastructure services as well as the general public has yet to be implemented in the majority of the Nepalese cities. Kathmandu Metropolitan City has set an example in implementing such a common addressing system in the form of Metric Street and House Addressing System since 2001.

For this purpose, Metric Street and House Addressing System was adopted in Waling Municipality. Consulting services is required to assists DUDBC in Preparation of Street Naming and development of Metric addressing of Waling Municipality. During the preparation phase, the project is being coordinated at national level by New Town Project Coordination Office (NTPCO).

1.2 Objective of the Study

The main objectives are outlined as follows:

❖ Prepare Maps of Street Naming and development of Metric addressing of Waling Municipality at 1:2500 scale for the delineated area (dense settlement area).

❖ Development and establishment of effective house numbering and street addressing database system of the defined area of municipality.

1.3 Scope of the Study

The scopes of work for the assignment are:

Development and establishment of effective house and street addressing system.

❖ This includes the metric addressing system of house numbering. The consultant submits a road segment map for initiating the road naming process to the municipality. The naming of the streets is carried out in consultation with the municipality and the

local people. The road names are finalized after approval from the municipality board by the consultants. Each street isassigned a unique name as well as digital code.

❖ Every house of the municipality isassigned a number based on the street name and using metric system and indicated in the base map.

❖ The task is performed only within the delineated area of Ward-9 which is approved by Waling Municipality Board (Meeting held on 2076/07/20 B.S.). The Boundary of delineated area comprises Vhimtari Mirdi Bridge in the East, Kandel Gaun, Dumrikot in the West, Aadhikhola Corridor in the North and B.P. Chowck in the South. This area includes 962 households including temporary houses like Goth and the delineated area covers about 0.46 sq.km.

1.4 Expected Output

❖ Metric House addressing datasets

❖ Building data

❖ Access way network

❖ Base Maps of defined area

CHAPTER 2:- **Methodology**

Metric Street and House Addressing System was adopted in Waling Municipality. The basic principle of a metric system is; each building along an access way is given a number that equals the distance measured in meters from the access way's starting point to the main gate (entrance) of the house/building. In other words, structures are assigned even or odd numbers corresponding to the distance between the building/house mid-point and the beginning of the street segment. The numbering sequence does not necessarily start with 1, 2, 3 even if the buildings/houses are the first building or house at both sides of an access way e.g. a building with its mid-point 10 meters from the starting point, will have no. 10, even if it is the first building along an access way.The metric addressing system accommodates new buildings without breaking the flow of numbers and this system is suitable and convenient in the municipal context. As such, as in other municipalities of Nepal, this system is suitable for Walling Municipality. An easy method to use reference for both citizens and outside visitors to locate the addresses as all the access ways are identified with unique names along with the location (neighborhood name and sectorial reference) and buildings are identified based on the access ways.

Followings are the methodological steps adopted for addressing in Waling Municipality:

❖ Preparation of base map.

❖ Addressing delineated area for house numbering.

❖ Access way identification and naming.

❖ Identification of buildings and numbering of doorways.

❖ Development of addressing system database.

It is important to know, if there is existing street names and house numbering system already implemented in a part or the whole of the municipality. The aim is to retain the existing street names already in use. The stock of all the streets and their existing names are collected and showed on the map. Besides the existing names, the street base data should also contain other attributes such as the width of the road, category, status, surface type, traffic type/volume and others if possible to help categorize the streets and support other addressing activities.

2.1 Preparation of Base Map

At first Base Maps of Waling Municipality were prepared using satellite image, field data we collected in the field and the secondary data like topographic data, maps etc. Every important infrastructure like schools, hospitals, banks, health posts, etc. of the Municipality including its land use, roads, buildings were included in the base maps. These maps further helped for the field verification of the buildings and streets which are key features of the house numbering system.On this base map every houses digitized has been given a unique ID code so that we could verify every houses in the field according to the base maps.

2.2 A

Photo No 1: Base Map used for Field Verification and Data Collection, Satellite Image

ined Area for House Numbering

After base map preparation, area of the Municipality was defined to be addressed in the consensus of the Waling Municipality itself. The rationale behind the addressing the territory is to establish a first level of geographical reference for access ways & buildings addresses. With the agreement of the Municipality the boundary for the house addressing was fixed within the Ward-9 of the Municipality. The boundary extends from the Mirdi-Vhimtari Chowk in the East to Vhu Pu Chowck in the West. The Northern boundary comprises the Aadhi Khola Corridor and the Southern boundary comprises the Kandel Gaun of Dumrikot and B.P. Chowk.

Photo No 2: Defined area on Satellite Image for House Numbering

2.3 Access Way Identification and Naming.

The first step taken is to identify the access way on the prepared base map and its verification on the ground. A clear starting and ending point is identified for every access way with the local participation and the assistance of the municipality and the concerned ward. In principle, the exact starting point of an access way is the intersection point of the centre-lines of two access way. The ending point is the junction point of other access way. The identification of the starting point also defines the origin for building numbering in metric system. A starting point, by definition is located on the western side of an access way if it is aligned in east-west direction, referring to the north orientation. If the access way is north-south aligned, then the starting point is on the southern side. If the alignment of an access way is not exactly north-south or east-west, the starting point is defined by the angle by which the access way deviates from the north-south or east-west line. If the angle is smaller than 45° referring to the north-south line, the starting point is the point in the southern side. If the angle is 45° or smaller referring to the east-west line, the starting point is at the eastern side of the access way.

The designation of access way names is done by adopting participatory appraisal approach with an active participation of local people and authorities. Upon the request of the municipality and technically supported by the consultant, each ward organized ward level meetings to identify the origin and the end points of the access ways and designate a commonly used names of each identified access ways. In practice, access ways are designated with names (terminologies) of deities and mythical figures, popular figures, martyrs, people's movements, popular spot or location and other cultural terminologies. Certain naming convention should be followed such that the name would not offend certain group of people or prove to be controversial. Following are the points to be considered in the designation of the names:

❖ Names should not reflect political agenda.

❖ Living individual's name should not be used.

❖ Any name should be unique throughout the municipality i.e. there should not be repetition of the same name.

❖ Traditional and already existed name are maintained.

The access ways are categorically designated into four types based on their widths. These categorical types along with the designated names is the full name of the access way. These categorical types are as follows:

Table No 1: Urban Road Hierarchy

S.N.	Type of Access Way	Nepali Terminology	ROW (Meter)
1	Highway	Highway	50
2	Arterial Road	Path	>20
3	Sub-Arterial	Sadak	10-20
4	Collector Road	Marga	8-10
5	Street	Vhitri Marga	<6
6	Path	Galli	< 3

These categorical types also help in distinguishing the access ways with the same designated names. For the access ways with already existing names, the original names are preserved. In case of any repetition conflict in the designated names with the access ways of other sectors/wards, the naming committee of the municipality should modify the name suggesting an alternative or synonymous name or by adding a prefix or suffix to the suggested name which may justify the original name suggested. The names can also be distinguished using a suffix such as location references, numbers referring to sections as in highway sections and others.

Photo No 3: Street Naming and House Coding

2.4 Building/House Identification and Doorway Numbering

Metric house addressing system is followed for building doorway/entrance numbering. Under this system, house address numbers represent the distance in meters from the street's "point zero" to each individual building's main entrance. These are the following rules for allotting the numbers to the buildings.

❖ A unique number is given to every building currently used for human dwelling and other purposes. Each and every main entrance of the buildings is numbered. The number given to the building main entrance is the measured distance in meters from the starting point of an access way to the middle of the building's main entrance along that access way.

❖ Even and odd numbers are allotted to the buildings. Odd numbers are assigned to buildings on the left side of an access way (with reference to the east-west and south-north directions). Even numbers are assigned to the buildings on the right side. A right side building with an entrance at a distance of 10 meters from the starting point of the access way is allotted as number 10. If a right side building has an entrance at a distance of 13.5 meters from the starting point, the building is allotted number 14, while for a left side building the number is 13 or 15. Likewise for the right side building with an entrance at 19 meters from the starting point of the access way, the number is 18 or 20. Similarly, rounding off to the nearest even or odd numbers are applied to the fractioned distances on the right or the left side respectively of an access way. In all cases consistency has to be maintained strictly.

❖ As every building is defined by the main entrance the number allotted is only one. If a building has two or more independent entrances (either to one or more access ways), one of the entrance is selected as the main entrance and is allocated the main building number. If the various entrances give access to units that are owned by different owners, each entrance is given a unique number.

❖ Plots which are vacant are assigned a number until the building permit is awarded. It is the duty of the owner to procure a number assigned by the concerned department or unit of municipality before the building is constructed. The owner of the building shall apply for the building number following the due process at the time for building permit application. The municipal addressing unit shall visit the construction site and measure the

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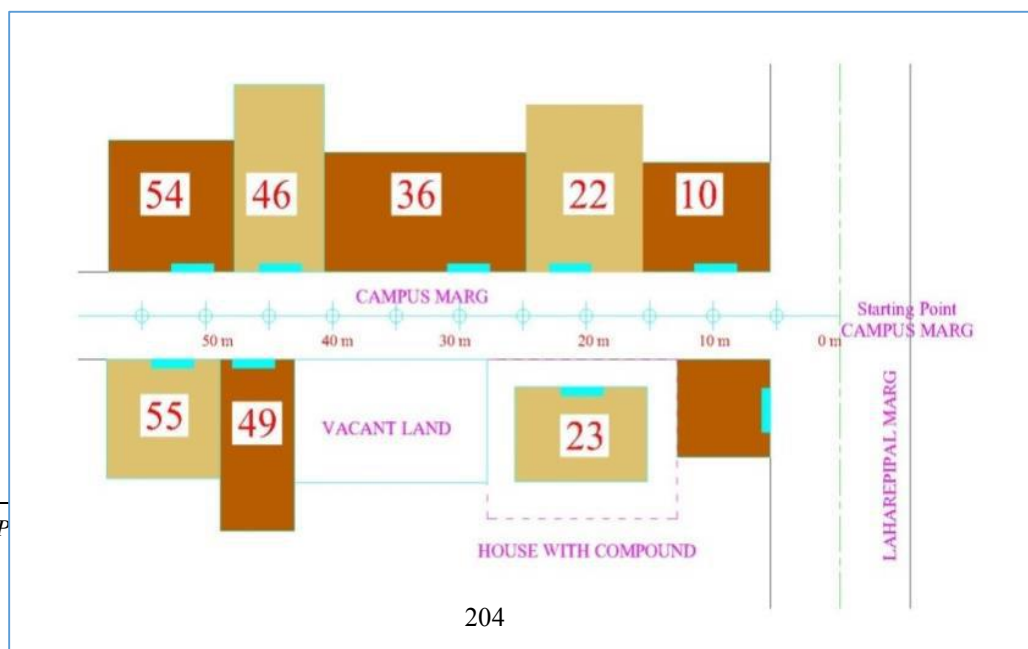
distance from the starting point of the adjacent access way. Based on this measured distance, a temporary.house number certificate is issued to the owner. The owner then shall apply for a permanent house number plaque and shall place the main entrance after the construction of the building.

2.4.1 Building Patterns and Numbering

Besides the above general rules for building identification and enumeration, there are few other types of building numbering flow, which are presented below with illustrations to make it more simple and illustrative.

Linear Pattern: A simple building numbering flow.

Infill &Subdivision: The building numbering in case of infill of vacant land and subdivision of existing buildings is exemplified in the following ways. There was a vacant land in between 23 number building and 49 number building. A building has come up in that vacant land with the main gate 31 meter from the junction. So 31 number is assigned for that house. The plot again

subdivided with another house having another gate at 33 meter. Here 33 number is assigned to the new house coming at subdivided plot.

Photo No 5: Linear, Vacant land and Subdivision Pattern

Crisscross Pattern:

The building numbering flow in the case of a crisscross pattern. The numbering flow follows the access way's starting and ending points.

Square and Courtyard:

In case of buildings, which are accessed through a square or courtyard. In case of an open square of a size equal or larger than 25 x 25 meters, the building numbering will be clockwise with references to the north orientation. This is shown in Figure 6.

In an access way with a circle pattern that has a garden, shrine or pond at the center, the only entrance to the main access way is both a starting and ending point. A number is assigned to the entrance of the access way, and complement numbers are assigned to all buildings as they are measured from the entrance of the access way. The buildings shall be numbered in a clockwise direction, taking into account the odd and even rule. If an access way with a circle pattern has buildings at its center, odd numbers will be given to the buildings at outer ring and even numbers to those at the center.

This pattern refers to an enlarged portion or flared along and associated with a main access way. If the diameter of the loop is 50 meter or less, then the loop shall get an individual number that is based on the distance measured between the access way's starting point and the center point of the loop's diameter. The buildings along in the loop will get complementary numbers to the loop's number. These complementary numbers are based on the clockwise

distance of the from the starting odd and

measured to the entrances buildings loop's point. The even

numbering rule shall be applied to the loops located at left or right sides respectively. A loop that measures more than 50 meter shall be treated as an individual access way with the numbering flow starting from the point where the loop starts.

Photo No 6: Square and Courtyard Pattern

Cul-de-sac:

An access way that has an entrance at one end is known as a cul-de-sac. This type of access ways (which are mostly accessed by alleys or galleys) will be considered as individual access ways when the density of the building in this type of access way is quite high. In that case,

numbering of buildings will start from the point where the access way starts, following the odd and even rule for left and right side buildings. When cul-de-sacs have low density of the building, buildings will get complementary numbers. In the figure 8. Cul-de-sac has low density so it is considered as the continuity of which starts from 47 meter from main junction. Another sub branch that starts at 53 meter gets the numbering as sub branch of first branch of Campus Marg. In this cases second oblique are used in numbering the houses.

Building Cluster:

A cluster of buildings located within a compound with an entrance shall be allocated a number for the compound according to the general building numbering rule. Each unit inside the compound shall be allocated complementary numbers. The complementary number is shown as [Building no./complementary no.] or [Building no.- complementary no.].

Subdivided Buildings:

If a building is subdivided into more than one unit (such as apartments or shops), a complementary identification number shall be added to main building number to identify the subdivided units.

Public Squares, Traffic Islands and Roundabouts:

Buildings around public squares, large traffic island and roundabouts are numbered with reference to the starting point taken at the entrance of the square/roundabout where the most prominent/important street converges. The numbering is done progressively in clock-wise direction.

2.4.2 Special Cases of Building/House Numbering

These are some special cases of buildings and houses that needs to be treated differently during numbering. Before numbering, these cases should be addressed implicitly with the understanding of the concerned parties and the approval of the municipality. Such special cases are:

❖ Disputed houses (houses with family dispute).

❖ Illegally built buildings/houses (buildings without legal permits).

❖ Buildings such as "Patis" and "Dharmasala," generally owned by certain "guthi" or temple.

❖ Buildings/houses in illegal settlement.

CHAPTER 3:- Introduction of Study Area

3.1 Walling an Overview

Waling city lies in Syangja District of Gandaki Province along the North-South Siddhartha Highway. This city is the center of Waling Municipality. Waling was declared municipality by annexing all wards of former Waling Municipality, Majhkot Shivalaye V.D.C,Aladi V.D.C, Jagatbhangyanj V.D.C, Kewarebhangyaj V.D.C, Sirsekot V.D.C, Thumpokhara V.D.C, and. during local level restructuring, Changchangdi V.D.C (Ward 1,4-5), Malyangkot V.D.C(ward-4),Tindobate V.D.C (Ward 2-5),Kalikot V.D.C (Ward 1,2,9), Pelakot V.D.C (Ward 5,6), Swarek V.D.C (Ward 2-4,8),Changchadi V.D.C.

According to the Population Census 2068, Waling Municipality has 51,243 population with 22,580 male and 28,663 female. The municipality has 14 wards and 128.40 square km area. In Fiscal year 2074/75, municipality has conducted a survey in support of *Asian foundation* to understand the demographic features and other status of the municipality and its inhabitants. The study showed that the Municipality has its present population 45,603 with 21,108 male (46.3 %) and 24,500 female (53.7%) and none of the population were 3rd gender. At the same time 7,910 seems to be absent during household survey. The study area is Waling Bazar area of ward no.9.

(Source: Waling Municipality, 2018)

3.2 History of Waling

There are a number of stories about origin of the word *Waling*. One of them mentions it to be derived from the word *wali-* the monsoon folk songs sung by women in fields while planting paddy. Waling is famous for its unending paddy fields on the plains along banks of *Aandhikhola River*and the undulating terraces in mountain slopes that are crisscrossed by numerous creeks. Many people used to come to watch these festive women groups singing *wali*and planting paddy beautifully in unison in the monsoon drizzle.

The town itself is on the banks of river *Aandhikhola* that flows west along the valleys and gorges in the western lesser himalayan mountains to meet the famous *Kali Gandaki*river. Mythology dates back the origin of *Aandhikhola* to the ancient time of *Treta Yuga* described in *Hindu Puranas*during the period of *King Dasharatha*, the father of *Lord Ram* of *Ramayana*. During that time, a pious and aged blind couple had a devoted son named *Shrawan Kumar*. The old couple wished a pilgrimage before their death and Shrawan Kumar was on journey carrying them on his shoulder to fulfill their desire. On the way in a forest near Himalaya, his parents became very thirsty. He left them in a comfortable tree shade and rushed to a nearby river promising to return soon with water. As he hurriedly plunged his pitcher in the water, it produced a noise like that of a wild animal. King Dasaratha was hunting nearby and happened to hear the sound. The king could shoot his target without seeing the target only with guidance of sound. He assumed the sound to be of a wild beast and shot his arrows in the direction. As he arrived, he saw a young man lying dead with his arrow piercing his chest. He then saw the pitcher and immediately realized his mistake. The guilt-ridden king quietly carried water to the old couple but they demanded to know about their son before drinking it. When he told them about his mistake resulting in their son's death, they began to cry and died in the spot leaving behind a pool of tears which transformed into a small lake. A stream began to flow from this lake. The term 'Aandhi' means 'blind' and 'khola' means 'river' in nepali language. Thus this new river got its name as Aandhikhola referring to tears of Shrawan Kumar's blind parents.

(Source: Waling Municipality, 2018)

3.3 Existing Physical situation

3.3.1 Geographical Characteristics

It is situated between 713 meter- 1596 meter above the sea level in the fold of the mountains that are considered part of *inner lesser Himalaya*in Syangja district of western Nepal. The geology of inner Lesser Himalayan rocks constituting the Kusma-Syangja area in western Nepal are separated into the Lower Nawakot Group, Upper Nawakot Group, Sirkot Group, and Tansen Group, respectively from bottom to top.

Natural and artificially promoted erosion and slope instability in those hill and mountain area are drastically threatening the ecological balance. A geological study of rock structure and slope stability study of Walling area done in 1981 described a potential risk mapping method that was quick, giving a good picture of the condition of the terrain and based only on the relationship between the rock structure and topography.

Syangja district has been described as one of the most disaster-prone areas in western Nepal. The geological and climatic condition have resulted in extremes of landslides, debris flow, flooding and wildfires. Most of the disasters have been natural and in the recent years, there is some evidence of increase of flooding, land sliding, deforestation and land degradation. The district ranked second highest, along with Makawanpur, with the total number of landslide events occurred during the period 1971–2000 being 46. It also ranked highest in terms of landslide density and loss of property compared to other districts. Landslides at Dhanubase *(Dhanubaseko pahiro)* is a major vulnerable hotspot in Waling area.

Waling falls under the very high hazard probability area according to the Syangja district disaster management plan

3.3.2 Physical Location

Wailing Municipality is located in the North -west of Kathmadnu and Southern part of Province No.4 and covers an area of around 128.40 square kilometres. Topographically Municipality entails 28°3'20412" N and 83°41'36.85" E to 27°55'26.58" N and 83°50'18.45" E . Andhi Khola, Armdi Khola, Mirdi Khola,Baya khola, Chyangdi Khola are major river flowing through the Municipality. Further, Municipality lies in between Gyalyang Municipality; one of the Business centered municipality of Syanja District.

WM is located 293 km North-west from Kathmandu, 64 km south from Pokhara, 96 Km north from Butwal, 115 kmsouth from Bhairahawa.The study area is a developing part of the Syanja district next to district headquater Putalibazzar. The basic infrastructures available in the area at present are transportation, drinking water, solid waste management, electricity and telecommunication but these infrastructures in poor condition.
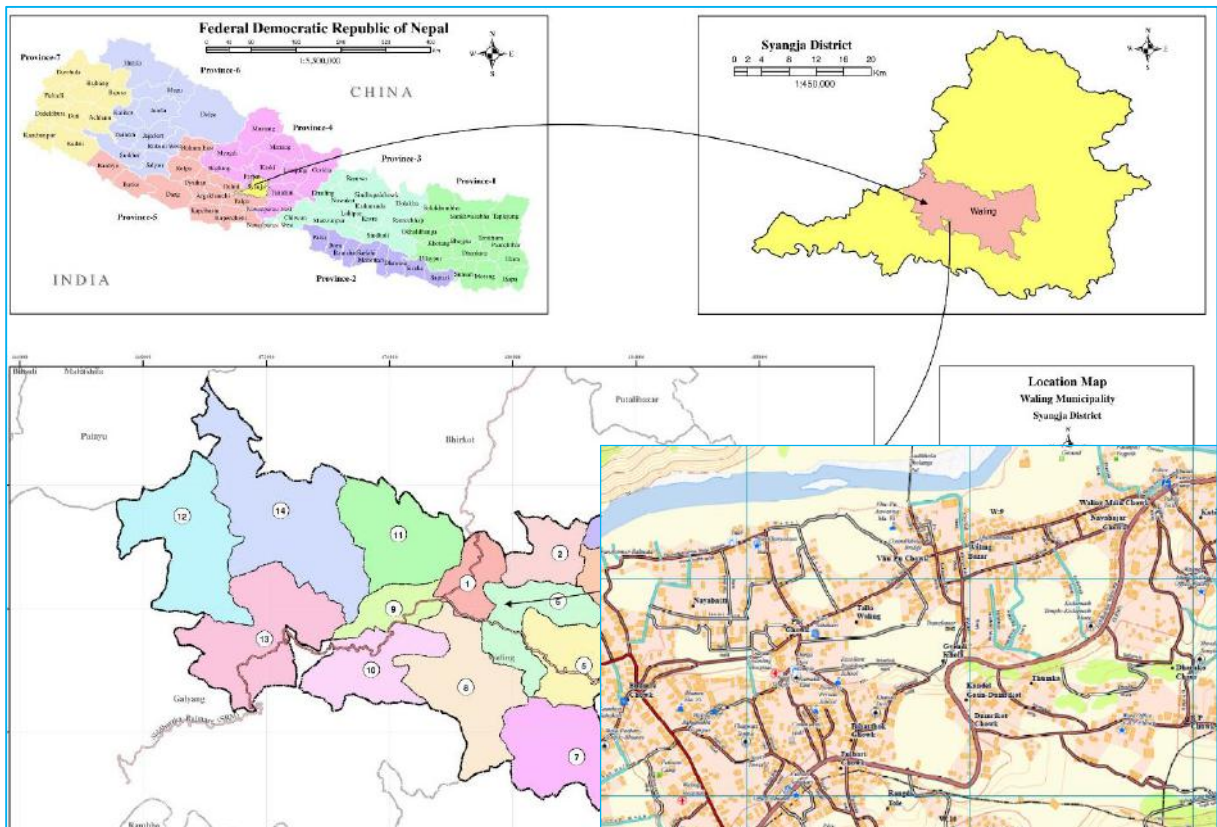
Map No 1: Location map, Metric Adressing

Table No 2: Political Boundary, Waling Municipality

East :	Biruwa Rural Municipality and Chapakot Municipality
West :	Galyang Municipality and Parvat District
North :	Bhirkot Municipality

South :	Galyang Municipality and Chapakot Municipality

3.4 Major Settlements

The settlement of the town follows linear (Ribbon) development pattern in the municipal center, Waling bazar and other market areas such as Triyasi, Rambachha, Bhumre, Bhakunde and Bayatari along the Sidhhartha Highway. The other settlements in each wards are scattered with low population density. The buildings constructed along the highway are mostly RCC framed structures and use for commercial and residential purposes. The urban roads access is sufficient but road width is narrow than standards. Most of the roads have been blacktopped with drainage network. Water supply distribution by Sana Sahari Khane Pani Projects and others local spouts, spring sources, lifting projects in the locality. Municipal has been collecting solid waste from markets area by door to door collection. The collected wastage has been segregated at Waling Sarsafai Kendra. The residents along the highway is high population density and the altitude of low land topography.
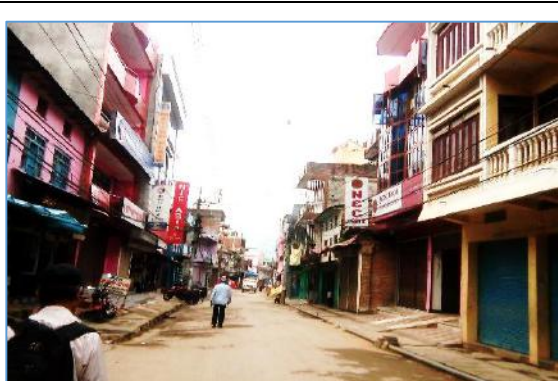
Photo No 7: Ribbon Settlement, Waling Tallo Bazar	Photo No 8: Commercial Area, Waling Bazar Along the Highway

3.5 Socio-Economic and Demographic Status

Waling Municipality is following the way of urbanization, modernization and development as a smart city. Local people involvement in economic activities includes for inclusion, participation, open markets claim to more freedoms, more choices and more options. Local government is expecting to change the socio economic development process with guaranteed right, economic decentralization, shifting resources to pooper geographic. Waling municipality has tried to address skills, knowledge and expertise of the local people in the process of socio-economic development. Local government has provided trainings, skills, knowledge and expertise to backwards groups, women and youth as well in poverty reduction, employment generation, gender equality with technical assistance, monitoring and evaluation.

Change in population impacts in its future population andrequirement of infrastructures like physical, social, economic, environmental etc.Demography of the city helps to forecast the population changes pattern and its proper management. Total Population, population density,household structure, literacy rate status, health, education., economic status, existing infrastructures, topography, climates changes, environment conditions, natural resources, and their characteristics are some of the major pillar for better understanding of the locality.

3.5.1 Population and Density

According to the census of 2011, the population of Waling Municipality is 51,243 But, the household survey conducted by municipality in 2018 A.D. has verified the actual population is 45,608 living in 11,357 households.Comparing the male female ratio of the total population shows that, 46.3 % (21,108) are male and 53.7% (24,500) while 7,910 seems to be absent.

The population density of the municipality is 463 people per square kilometers, which is higher than the population density of Syangja district. The average family size of the municipality is around 4.01 while average family size of whole district is 4.20 (*Source: CBS 2011*).

As seen from the Table and Chart below, there is distinct variation in population distribution among 14 wards. Population density lies in the range of 166 person per sq.km. in ward 3,4 to 1834 person per sq. km in ward 9, Waling Bazar area, where city center lies. Less population density is witnessed in Ward 3,7,12 having population density of just 166 , 205 and 207 respectively, whereas higher population density is witnessed in the ward 9,1,2,8 followed by ward 10.The socio-demographic details of each wards has been given in Table No.3, below.

Table No 3: Description of Demography and Household

Ward No	Total Households	Male	Female	Total	Sex Ratio	Avg. Household	Area (Sq.km)	Density (per Sq.km)
1	851	1,739	1,852	3,591	93.9	4.22	3.94	911
2	534	1,055	1,206	2,261	87.48	4.23	4.43	510
3	346	672	568	1,240	118.31	3.58	7.46	166
4	512	892	1,048	1,940	85.11	3.79	11.7	166
5	575	1,153	1,265	2,418	91.15	4.21	8.07	300
6	748	1,480	1,626	3,106	91.02	4.15	6.71	463
7	513	990	1,109	2,099	89.27	4.09	10.23	205
8	1,425	2,422	2,830	5,252	85.58	3.69	11.05	475
9	1,732	2,929	3,599	6,528	81.38	3.77	3.56	1834
10	724	1,438	1,618	3,056	88.88	4.22	7.74	395
11	690	1,187	1,498	2,685	79.24	3.89	9.75	275
12	619	1,159	1,456	2,615	79.6	4.22	12.63	207
13	981	1,967	2,308	4,275	85.23	4.36	13.16	325
14	1,116	2,025	2,517	4,542	80.45	4.07	17.98	253
Total	11,366	21,108	24,500	45,608	86.16	4.01	128.41	463

Source: Waling Municipality (Household Survey,2018)
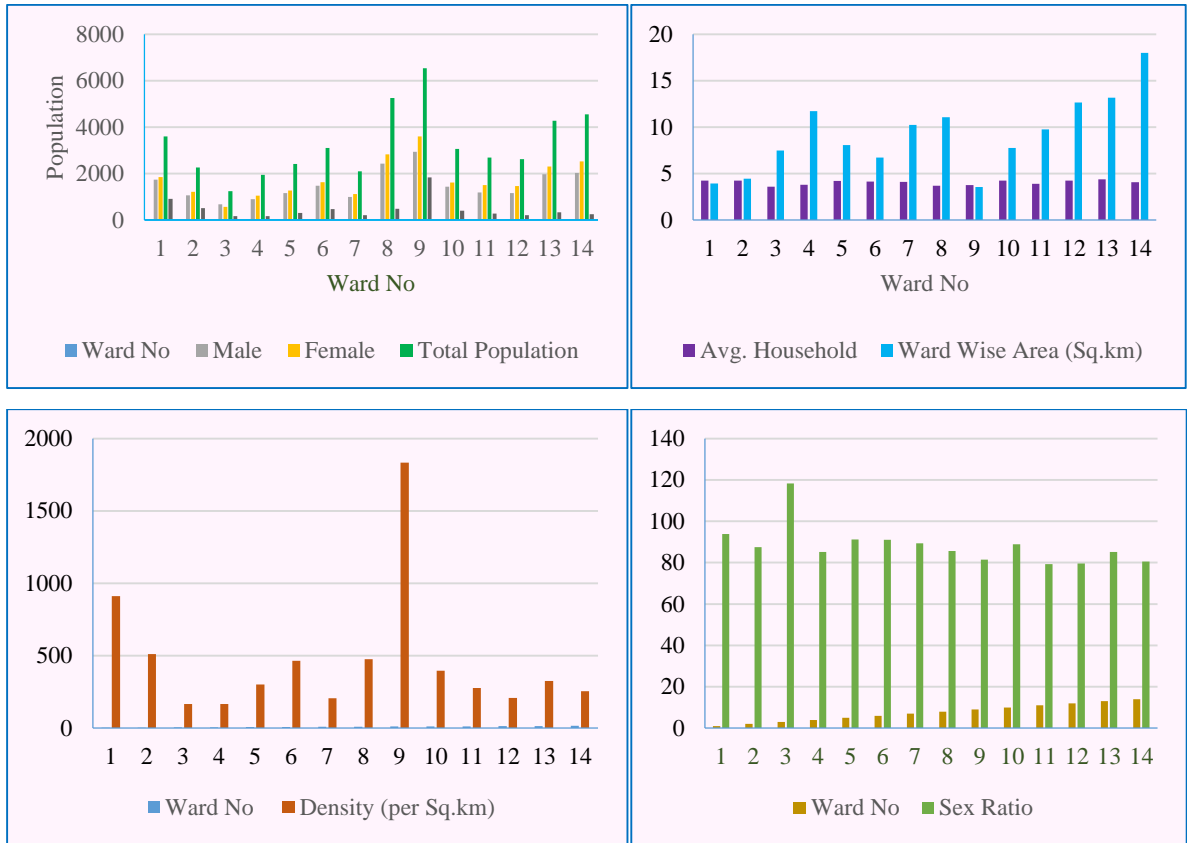
Chart No 1: Population and Density

3.5.2 Population Distribution by Age Group

Population classification by age is a good way to depict the age and gender distribution of a population. The population from 2018 show the age structure of the population. Demographic changes have implications for changes in family and household structure.

The population distribution by Age Group has been presented in Table No. 4, below. The data of ward no 9 is main concern for the study.

Table No 4: Population Distribution by Age Group

Ward No	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	44-49	50-54	54-59	60-64	64-69	70-74	above 70	Not Mentioned	Total	Percentage
1	188	287	315	380	335	360	303	252	214	192	202	152	118	98	87	108		3,591	7.87
2	142	175	225	280	211	165	122	123	124	130	132	103	77	83	63	106		2,261	4.96
3	52	61	111	100	120	117	106	107	77	74	60	56	62	53	27	57		1,240	2.72
4	138	128	214	208	146	120	102	107	108	105	107	72	120	100	76	89		1,940	4.25
5	171	165	210	271	236	253	151	129	112	139	130	99	108	79	86	77	2	2,418	5.30
6	171	243	297	360	290	260	210	213	183	174	191	115	129	86	87	97		3,106	6.81
7	148	168	195	194	187	209	136	101	105	88	117	114	108	88	55	86		2,099	4.60
8	357	451	530	521	464	485	442	395	328	311	240	192	179	132	96	125	4	5,252	11.52
9	469	644	698	676	641	598	473	515	369	308	306	206	196	169	106	154		6,528	14.31
10	212	253	328	330	320	307	208	204	169	163	146	106	87	90	43	90		3,056	6.70
11	212	180	252	284	279	184	129	135	108	154	163	145	129	120	83	128		2,685	5.89
12	169	191	225	308	251	196	145	148	139	145	133	145	123	116	69	112		2,615	5.73
13	336	343	441	475	440	350	268	232	250	204	221	188	165	134	99	129		4,275	9.37
14	325	301	449	528	478	290	255	230	231	182	249	271	219	215	150	169		4,542	9.96
Total	3,090	3,590	4,490	4,915	4,398	3,894	3,050	2,891	2,517	2,369	2,397	1,964	1,820	1,563	1,127	1,527	6	45,608	100.00

Source: Waling Municipality(Household survey,2018
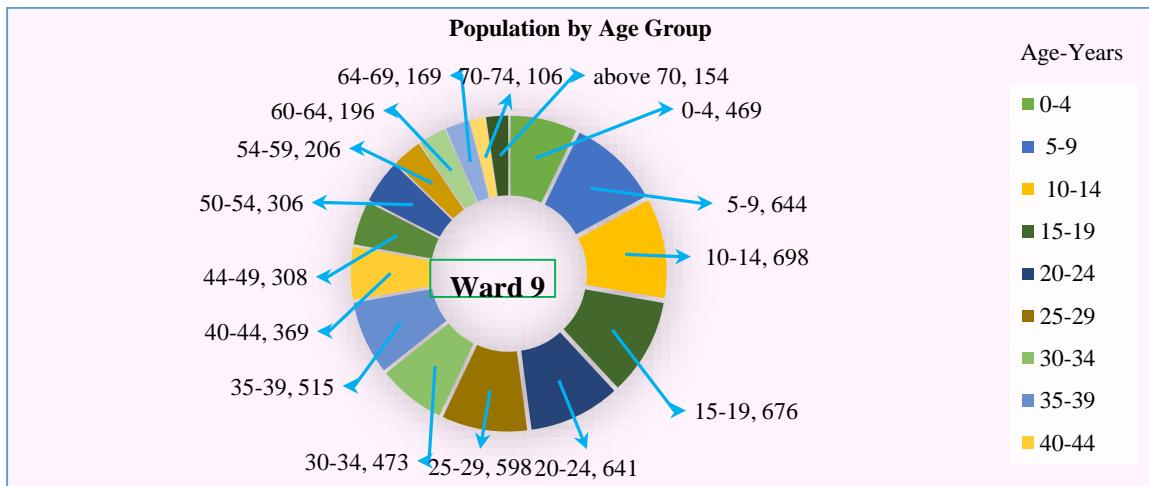
Chart No 2: Population Distribution by Age Group, Ward-9

3.5.3 Economically Active and Inactive Population

Economically active population accounts to the population falling in the age group between 15 to 59. Similarly the inactive population accounts population below 15 and above 59. The comparison of active and inactive population of the municipality has been tabled in Table No. 5, below.

Table No 5: Active and Inactive Population

Population	Male	Female	Total	Percentage
Active Population (Between 15-59)	9903	13577	23480	51%
Inactive Population (Below 15 And Above 59)	11205	10923	22128	49%

Source: Waling Municipality(Household survey,2018)
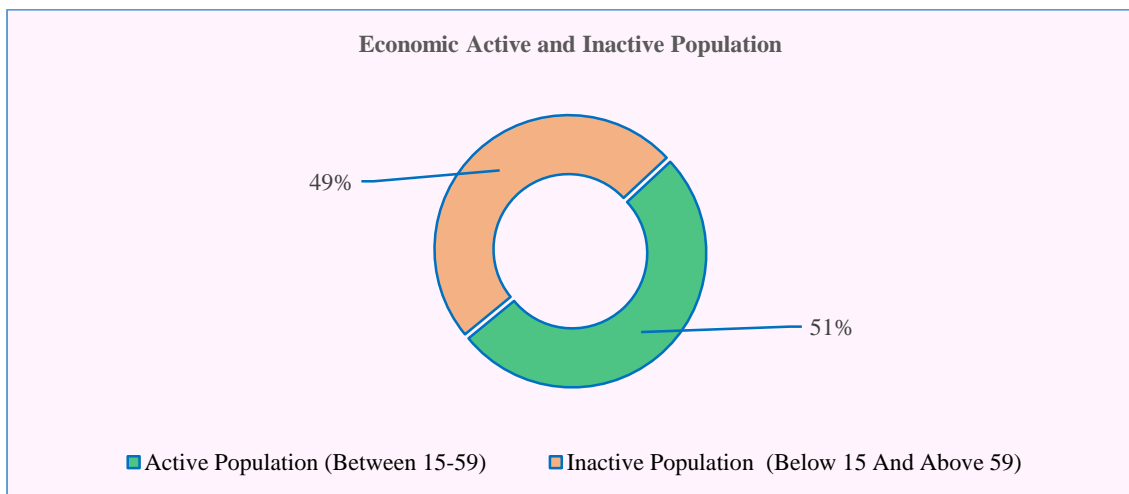
Chart No 3: Economically Active and Inactive Population

Economically active population of the Municipality is 23,480 which accounts to 51% of the total population. Similarly the inactive population is 22,128 which accounts to 49 %. The information shows that there is almost balanced population in between active and inactive population. Although more percentage of population is seen to be economically active because population above are considered as inactive while at present scenario up to age 65 people are

found to be active. Most of the economically active population is found to involve in sectors like agricultural. A few percentage of the population is involved in service sector , business and labor. The most of the people from the study area has engaged in business sector.

3.5.4 Population by Ethnicity and Caste

The ethnicity and caste pattern of the municipality shows diversity with major ethnic groups as Bhramin (32.48 %), Magar (17.77 %), Gurung (12.75 %), Chhetri (10.19 %) , Sarki (6.11%) Besides these ethnic groups other various groups comprises small proportions of the population such as, Gharti (1.02 %),Kathawoniya (0.91%).The remaining other ethnic and caste group like muslim, Bote, Dome, Majhi etc. Comprises about 3.00 % of the total population which is illustrated in the Table No.6, below. The population by ethnicity and cast composition of study area (Ward no-9) has been illustrated in Chart No.5, below.

Table No 6: Ethnicity and Caste Composition

Caste	Ward No.														Total	Percentage
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**		
Bhramin	1,446	716	18	347	356	1,268	184	2,166	1,871	1,028	1,029	926	1,739	1,719	14,813	32.48
Magar	275	424	0	47	353	764	945	888	1,156	1,034	554	394	533	737	8,104	17.77
Gurung	699	63	1,161	825	166	254	300	361	601	198	0	867	278	40	5,813	12.75
Chhetri	384	142	3	560	693	293	50	462	698	90	437	133	53	650	4,648	10.19
Sarki	74	637	0	10	154	56	348	85	404	124	137	43	275	439	2,786	6.11
Kami	202	36	47	69	184	127	134	204	477	120	200	164	255	250	2,469	5.41
Damai	136	90	10	53	29	123	92	206	94	26	121	83	65	150	1,278	2.80
Newa	46	0	0	0	6	20	0	195	524	132	53	0	23	190	1,189	2.61
Thakuri	28	4	0	23	116	125	15	227	156	198	116	0	0	41	1,049	2.30
Muslim	21	0	0	0	328	4	0	162	15	0	0	0	22	1	553	1.21
Gharti	6	74	0	6	0	24	12	67	14	9	8	0	235	9	464	1.02
Kathawoiya	0	0	0	0	0	0	0	0	0	0	0	0	414	0	414	0.91
Other	274	75	1	0	31	48	19	189	513	97	30	5	383	316	1,981	4.34
Foreigners	0	0	0	0	0	0	0	36	5	0	0	0	0	0	41	0.09
Total	3,591	2,261	1,240	1,940	2,418	3,106	2,099	5,252	6,528	3,056	2,685	2,615	4,275	4,542	45,608	100.00

Source: Waling Municipality (Household survey, 2018)

Ethnicity and Cast Composition in Municipality
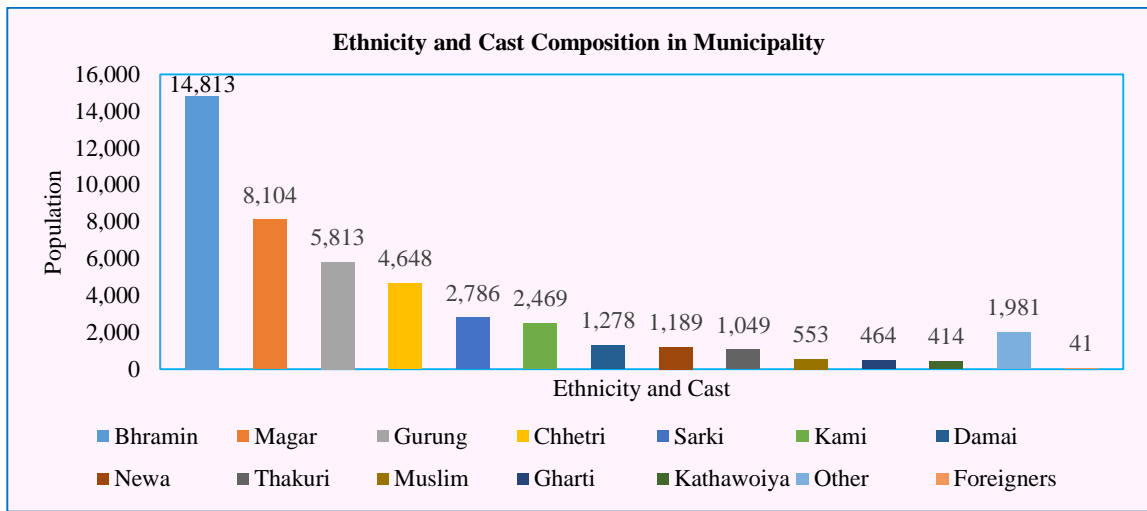
Chart No 4: Ethnicity and Caste Composition
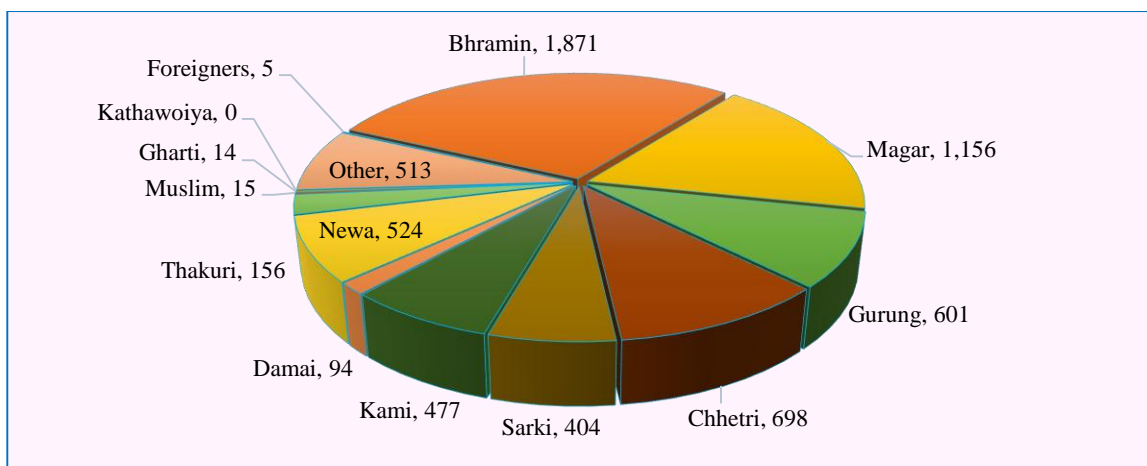
Chart No 5: Ethnicity and Cast Composition at Study Area, Ward No-9

3.5.5 Population Based on Mother Tongue

Out of 45,608 populations in municipality, about 85.40% of the population speak Nepali language, 6.69% speaks Gurung language which counts 3,051 populations, Magar and Newar language is spoken as third and fourth language which account 6.0 % and 0.55% respectively. The detailed description of mother tongue language has been listed in Table No.7 and Chart below.

Table No 7: Population Distribution based on Mother Tongue

Ward No.	Nepali	Magar	Gurung	Newar	Tamang	Rai	Sanskrit	Maithali	Bhojpuri	Tharu	Not Mentioned	Other	Total
1	2,691	171	460	33	134	0	3	73	5	0	0	21	3,591
2	2,158	90	6	0	0	0	2	5	0	0	0	0	2,261
3	77	0	1,162	0	1	0	0	0	0	0	0	0	1,240
4	1,525	19	386	2	0	0	1	6	0	1	0	0	1,940

Ward No.	Nepali	Magar	Gurung	Newar	Tamang	Rai	Sanskrit	Maithali	Bhojpuri	Tharu	Not Mentioned	Other	Total
5	2,401	4	1	0	0	0	0	1	1	1	2	7	2,418
6	3,044	0	51	0	0	0	0	6	3	2	0	0	3,106
7	879	895	304	0	1	0	4	1	10	5	0	0	2,099
8	4,452	348	148	113	0	8	54	27	18	20	5	59	5,252
9	6,086	227	163	17	1	0	15	9	7	3	0	0	6,528
10	2,246	660	94	49	0	0	2	2	3	0	0	0	3,056
11	2,677	0	0	0	0	0	1	4	0	3	0	0	2,685
12	2,604	0	1	0	0	0	3	3	1	3	0	0	2,615
13	3,657	322	275	0	0	0	0	4	2	11	0	4	4,275
14	4,453	0	0	39	0	0	3	9	0	38	0	0	4,542
Total	38,950	2,736	3,051	253	137	8	88	150	50	87	7	91	45,608
%	85.40	6.00	6.69	0.55	0.30	0.02	0.19	0.33	0.11	0.19	0.02	0.20	100.00
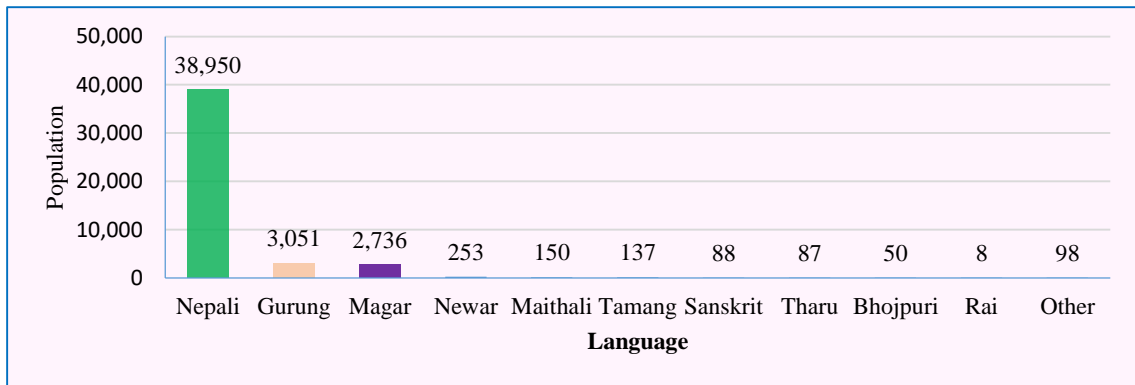
Chart No 6: Population Distribution based on Mother Tongue

Source: Waling Municipality (Household Survey, 2018)
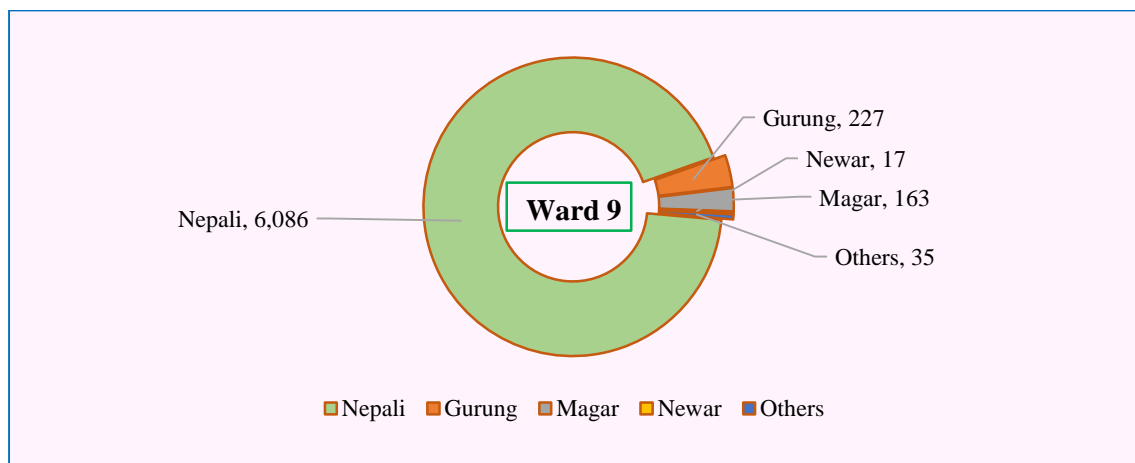
Chart No 7: Population Distribution based on Mother Tongue, Study Area

3.5.6 Literacy Status

The literacy rate of the population in the municipality is 78 percent. The literacy is characterized by higher proportion of literate female than male and accounts39.47% and 38.53% of total literate population respectively.

Table No 8: Literacy Status of Municipality

Gender	Read and Write		Read Only		Illiterate		N/A		Total
	Population	%	Population	%	Population	%	Population	%	
Male	16,383	38.53	344	0.81	2,684	6.31	12	0.03	19,423
Female	16,783	39.47	398	0.94	5,910	13.90	4	0.01	23,095
Total	33,166	78.00	742	1.75	8,594	20.21	16	0.04	42,518

Table No 9: Literacy Status of Study Area

Ward No	Gender	Read and Write		Read Only		Illiterate		Total
		Population	%	Population	%	Population	%	
9	Male	2,404	39.68	30	0.50	245	4.04	2,679
	Female	2,741	45.24	60	0.99	579	9.56	3,380
	Total	5,145	84.92	90.00	1.49	824.00	13.60	6,059
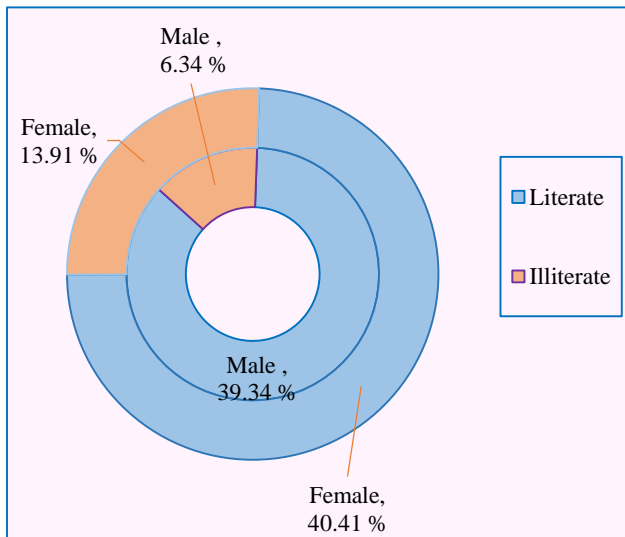
Chart No 8: Municipal Literacy Status
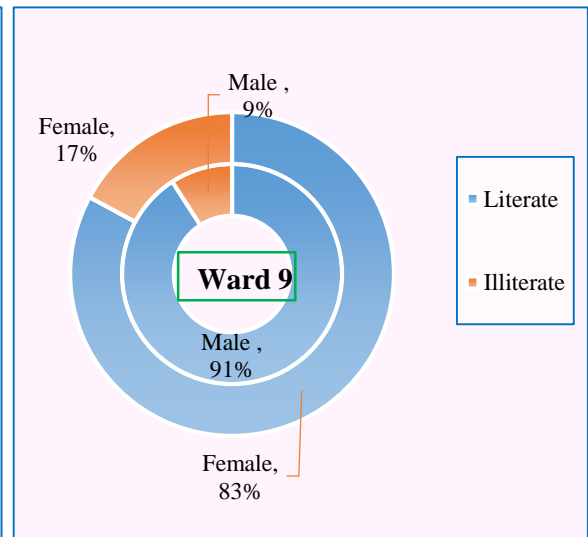
Chart No 9: Literacy Status, Study Area

Source: Waling Municipality (Household Survey, 2018)

3.6 Lan Use

The land use means that the land covered by different aspect like forest, water bodies, built up area etc. In the well planned city, the land is used properly as per requirement of the city with sustainable way. But, the Waling city is developing haphazardly with unplanned. The delineated area is a core area and it is totally commercialized and residential area. The detailed land use information has been listed in Table No.10 below.

Table No 10: Land Use

S.N.	Land Use/Land Cover	Area (sq.km.)	Percentage (%)
1	Agriculture	0.19	40.56
2	Build-Up Area	0.26	55.25
3	Forest	0.02	4.03
4	Sand	0.0002	0.05
5	Water Bodies	0.0005	0.10
Total		**0.46**	**100**
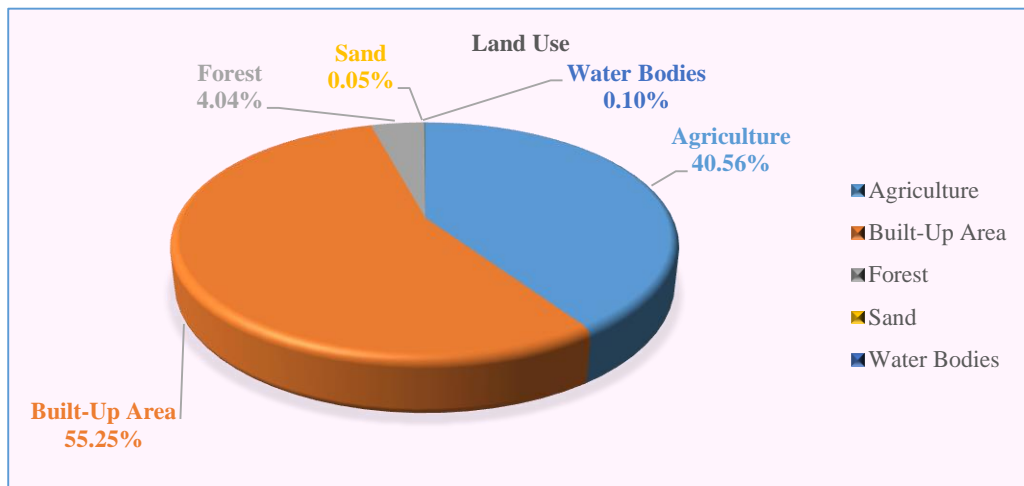
Chart No 10: Land Use of the Study Area

3.7 Road and Transportation Networks

The transportation is the back bone of socio-economic development of the particular area. The means of transportation may be roads, air, waterways, rail etc. Here, in this study is concentrated on roadways only. The Road network feature dataset and associated database includes different type of road in use, bridge and others.

The study area is Waling Bazar, ward no.9. The selected area is core market area of the municipality and residential area as well. The road network and transportation facilities are smooth and easy access in the study area. The area is delineated and metric addressing system has been completed. The major component for the development of house numbering system is urban roads identification and providing them unique names. The National Highway naming Siddhartha Highway has passed via. the study area of length 1.508 km. All houses have been good access with urban roads. The total length is 9. 028.km, where 5.919 km is black topped, 2.269 km is gravel and 0.597 km is earthen. The existing urban roads width is upto 12-25 ft. and width of highway is about 30-40 ft. Buses, Tempo, Pickup, Bicycles etc. are major transportation facilities in the area. The detailed information of transportation network has been listed Table No 11 and 12 below.

Table No 11: Road Network

S.N.	Road Name	Length,Km	Road Width	Surface Types

S.N.	Road Name	Length,Km	Road Width	Surface Types
1	Aadhikhola Corridor	0.169	20-24 ft	Black Top
2	Aadhikhola Corridor	0.461	15-20 ft	Gravel
3	Aadhikhola Corridor	0.119	15-20 ft	Gravel
4	Aadhikhola Corridor	0.242	6-9 ft	Foot Trail
5	Aadhikhola Corridor	0.042	12-15 ft	Earthen
6	B.P. Marga	0.001	20-24 ft	Black Top
7	B.P. Marga	0.084	20-24 ft	Black Top
8	Banijya Tole Marga	0.076	20-24 ft	Black Top
9	Banijya Tole Marga	0.047	20-24 ft	Black Top
10	Biharthok Marga	0.065	12-15 ft	Earthen
11	Bolbom Chowk-Nayabajar Marga	0.050	20-24 ft	Black Top
12	City Hall Marga	0.108	15-20 ft	Gravel
13	Dumrikot - B.P Chowk- Vhimtari-Kharibot Sadak	0.241	20-24 ft	Black Top
14	Jaycees Marga	0.182	20-24 ft	Black Top
15	Joisi Pandera Marga	0.262	20-24 ft	Black Top
16	Kataharbot Tole Marga	0.147	20-24 ft	Black Top
17	Katauje-Nagarpalika Karyalaya - Srawanda Kumar Park -Gyangling Sadak	0.213	20-24 ft	Black Top
18	Katauje-Nagarpalika Karyalaya - Srawanda Kumar Park -Gyangling Sadak	0.014	15-20 ft	Gravel
19	Katauje-Nagarpalika Karyalaya - Srawanda Kumar Park -Gyangling Sadak	0.241	15-20 ft	Gravel
20	Kedarnath Marga	0.228	15-20 ft	Gravel
21	Kedarnath Marga	0.242	20-24 ft	Black Top
22	Nagarpalika Marga	0.075	20-24 ft	Black Top
23	Nagarpalika Marga	0.168	15-20 ft	Gravel
24	Nagarpalika Marga	0.205	20-24 ft	Black Top
25	Nagarpalika Marga	0.033	20-24 ft	Black Top
26	Nagarpalika Marga	0.087	20-24 ft	Black Top
27	Namuna Marga	0.149	20-24 ft	Black Top
28	Namuna Marga	0.062	20-24 ft	Black Top
29	Nayabajar-Baidikhet Marga	0.222	15-20 ft	Gravel
30	Nayabajar-Baidikhet Marga	0.239	15-20 ft	Gravel
31	Nayabajar Marga	0.404	20-24 ft	Black Top
32	Nayagaun Marga	0.297	20-24 ft	Black Top
33	Odare-Pandhera-Bagale Danda Sadak	0.032	15-20 ft	Gravel

S.N.	Road Name	Length,Km	Road Width	Surface Types
34	Patanjali Marga	0.214	15-20 ft	Gravel
35	Pipalbot Tole Marga	0.063	20-24 ft	Black Top
36	Sahakarya Marga	0.188	20-24 ft	Black Top
37	Sahakarya Marga	0.162	15-20 ft	Gravel
38	Sahakarya Marga	0.111	20-24 ft	Black Top
39	Sahakarya Marga	0.385	20-24 ft	Black Top
40	Siddhartha Rajmarga	1.508	30-40 ft	Black Top
41	Sitalnagar-Surkhaundi Chowk Sadak	0.006	20-24 ft	Black Top
42	Tallo Waling Bajar Marga	0.535	20-24 ft	Black Top
43	Thumka Marga	0.355	12-15 ft	Earthen
44	Vhu. Pu. Tole Marga	0.096	20-24 ft	Black Top
45	Vhu. Pu. Tole Marga	0.083	12-15 ft	Earthen
46	Waling Bajar Vitri Sadak	0.062	15-20 ft	Gravel
47	Waling Bajar Vitri Sadak	0.053	12-15 ft	Earthen
Total		9.028		

Table No 12: Road Surface

Road Surface	Length, Km	%
Black Top	5.919	65.57
Gravel	2.269	25.13
Earthen	0.597	6.62
Foot Trail	0.242	2.68
Grand Total	**9.028**	**100**
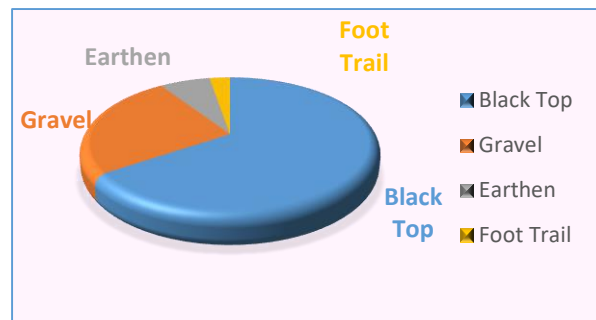
Chart No 11: Road Surface Types

3.8 Functional Use of Building

The study area is Waling bazar which seems core city area of the municipality. The constructed buildings have been used for different aspects and requirements. The city is business trade center and administrative center of the municipality. The buildings have been occupying as residential, commercial, institutional etc. purposes. The detailed information of functional purposes of buildings in the city has been listed in Table No.13 and Chart below.

Table No 13: Functional Use of Building

S.N.	Functional Uses	Numbers, Houses	Remarks
1	Residential+Commercial	414	
2	Residential	373	
3	Commercial	50	
4	Financial	35	

S.N.	Functional Uses	Numbers, Houses	Remarks
5	Temporary	25	
6	Industrial	23	
7	Community Buildings	12	
8	Administrative	8	
9	Educational	7	
10	Health Service	5	
11	Garage	4	
12	Institutional	4	
13	Others	2	
	Total	962	
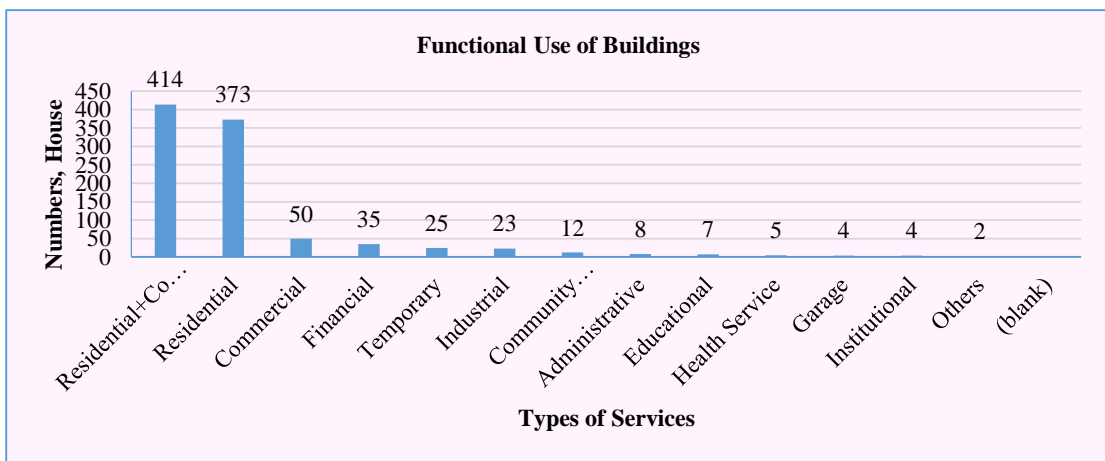
Chart No 12: Functional Use of Building

3.9 Building Ownership

Generally, a building can be defined as an enclosed structure intended for human occupancy. However, a building includes the structure itself and non-structural components (e.g., cladding, roofing, interior walls and ceilings, electrical systems, sanitation etc.) permanently attached to and supported by the structure. Majorly, the buildings are a RCC frame structure with a roof and walls standing more or less permanently in one place, such as a house or factory. Buildings come in a variety of sizes, shapes and functions, and have been adapted throughout history for a wide number of factors, from building materials available, to weather conditions, to land prices, ground conditions, specific uses and aesthetic reasons. Buildings serve several needs of society- primarily as shelter from weather, security, living space, privacy, to store belongings, and to comfortably live and work. A building as a shelter represents a physical of the human habitat (a place of comfort and safety) and the outside (a place that at times may be harsh and harmful).

According to field survey total building are 962 among them 926 are private, 24 Public and 12 are community buildings which have been listed in Table No.14 below.

Table No 14: Building According to Ownership

S.N.	Private	Public	Community	Remarks
House	926	24	12	

3.10 Building Types

Roof shapes and types differ greatly from region to region. The main factors which influence the shape of roofs are the climate and the materials available for roof structure and the outer covering. Usages vary slightly from region to region, or from one builder or architect to another. According to roof type's buildings of study areaare categorized into CGI Sheet, Khar, RCC etc. Among them there are 222 CGI sheet, Khar 14 and ,722 RCC buildings are present. The detailed information has been listed in Table No.15 and Chart below.

Table No 15: Building Roofing Types

S.N.	Roof Types	Numbers	Remarks
1	RCC	722	
2	CGIs/Jasta	222	
3	RCC+ CGIs	14	
4	Khar	4	
Total		962	
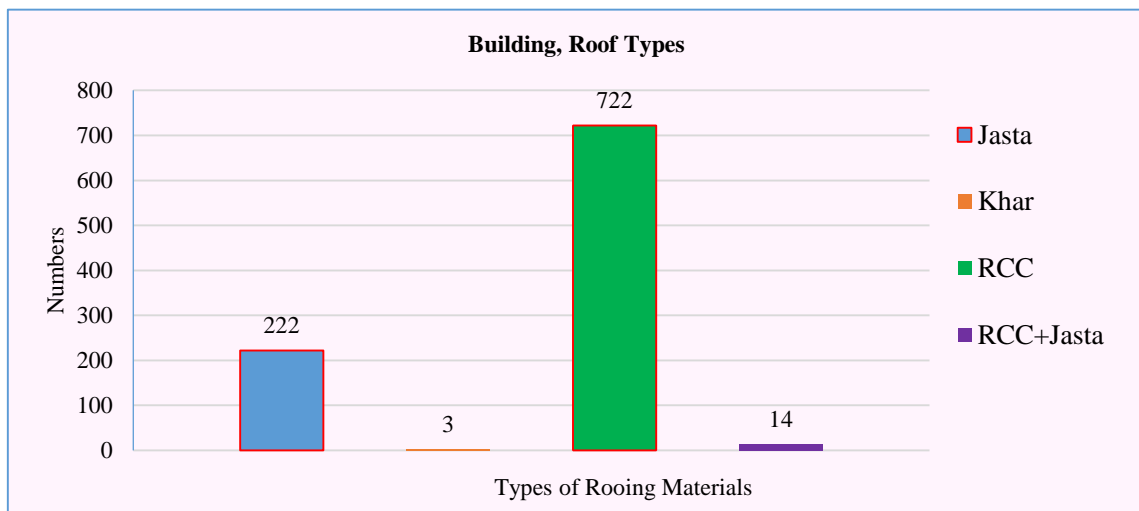
Chart No 13: Building Roofing Types

3.11 Building Construction

The construction of building differs as economic condition & social status of people in particular location. The main factors which influence the construction are materials available. Usages vary slightly from region to region, or from one builder or architect to another. According to construction of buildings of study area are categorized into Load bearing, frame structure and Timber structure, Bamboo structure. The detailed information of building construction on the basis of material use has been listed in Table No 16 and Chart below.

Table No 16: Building Construction, Material Uses

S.N.	Construction Types	Numbers
1	Kachi (Stone Masonary+Timber)	1
2	RCC+Jasta	1
3	RCC+Truss+Jasta	1
4	Timber+Jasta	1
5	Block+Truss	2
6	Kachi (Stone Masonry)	2
7	Truss+Jasta	3
8	Block+Jasta	4
9	RCC+Truss	7
10	Kachi (Mud Mortar)	8
11	Truss	8
12	Kachi (Block)	9
13	Kachi (Brick Masonary)	12
14	Jasta	16
15	Load Bearing	19
16	Kachi	34
17	Kachi (Stone Masonary)	51
18	Frame Structure (RCC)	783
Grand Total		**962**
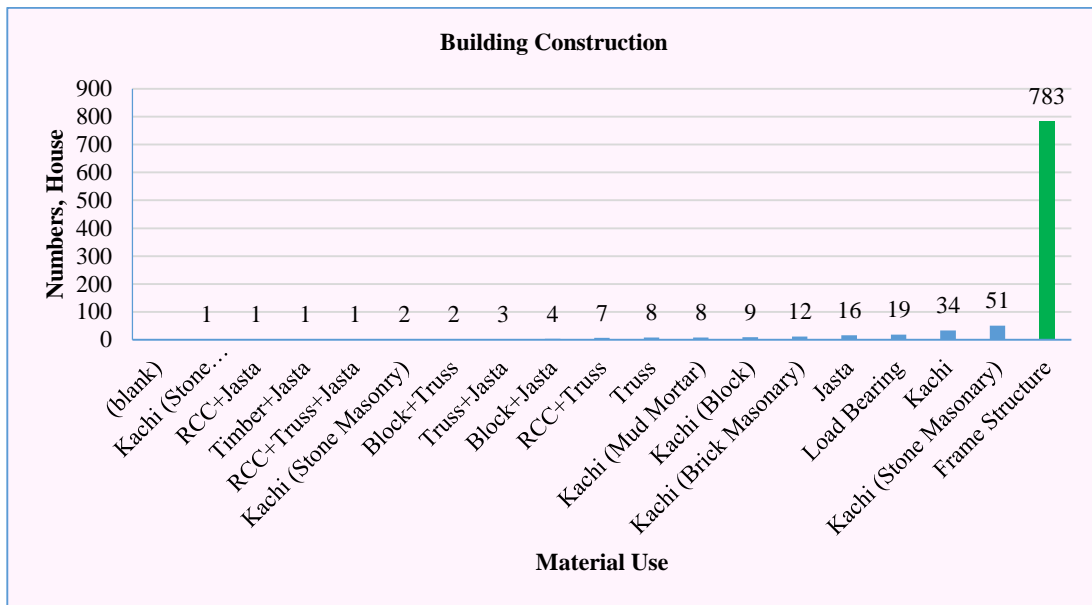
Chart No 14: Building Construction, Material Uses

3.12 Water Supply and Electricity Distribution

Water supply and electricity distribution in the city is one of the main facility for the living people. Electricity has been supplied by National Grid and water supply network by Small Water Supply Scheme, spouts, rivers, lifting projects and spring sources. The water supply network is not well planned in the city. The distribution line has been aligned along the road side drain and which may pollute the drinking water any incident. The distribution is not sufficient and people in city are facing drinking water and low voltage problems. The electricity distribution cable has been stretched haphazardly which may make city un-aesthetic. Also, such distribution system has created serious accidents like firing, electricity shut down etc. The water supply and electricity distribution facility in each household detailed has been listed in Table No 17. below.

Table No 17: Water Supply and Electricity

S.N.	Service Facility	Houses	Remarks
1	Water Supply	962	
2	Electricity	962	

3.13 Importance of House Numbering System in Smart City

House and street metric system is a system in which each house and street has been given their own name and unique code called house number. The system helps to find address as you need. House numbers are not only convenient for finding addresses but necessary for emergency responders to locate those in need. When responding to an emergency, minutes matter so be sure that fire, ambulance, and police personnel, business service delivery can easily and quickly find location and address thorough GPS machine. The system develops the house numbering code plates which has been stitched in front of main gate, If the numbers on such houses are not visible or easy to read, it will take emergency personnel longer to find house. If there is no house number and street name, there should be spent extra minutes find the location in the meantime there might be casualty in property, life and death. Therefore,

from house number and street naming, it is easy to find the location and prompt response in emergency time. The system is itself new for the Waling municipality which helps making smart city. Due to detail information of houses and owner includes in the house numbering data base, the municipality can make quick decision on following points:

- ❖ To provide infrastructure facilities,
- ❖ To provide social security
- ❖ Easy to provide safety to every citizen.
- ❖ Easy to collect revenue
- ❖ Easy to control haphazard development
- ❖ Easy to provide digital information of the locality
- ❖ Easy to prepare city map for tourist information

CHAPTER 4:- Conclusions

Geographic Information System is being very widely used as decision support tool in many application domains in recent years. The advent of new and affordable technologies in data capture, management and dissemination in the last decade has also played a pivotal role in wide applicability of GIS and related technologies. Urban sector has also seen a fair share of new developments and applications of geographical information technology. Development of new tools and methods, Web-GIS technology, availability of very high-resolution commercial satellite imagery and other new developments have opened up new perspectives in applications of GIS in urban sector.

Study shows that most of the RCC buildings are concentrated along the Siddhartha Highway. Among the 962 buildings surveyed in defined area for house numbering in Ward-9, 783 buildings are frame structured buildings, only 19 are load bearing type, 117 are Kachi which includes Stone Masonry, Brick Masonry and Block Masonry, and remaining others are temporary like jasta, truss etc. Every houses are found to be facilitated with Electricity and Water Supply. Waling Municipality lacks the facility of street lights system and traffic lights.Municipality lacks centralized water supply system. Sewerage system is absent in the municipality. Septic tanks are used for sewerage disposal. Storm drainage system is present on either side of black topped roads inside core area and Siddhartha Highway.

In this project, GIS has been developed as an integrated information system. Prior efforts have been made to implement similar projects, as in the case of Kathmandu Metropolitan City, which unfortunately have failed due to many impeding factors. The next step would be to gradually integrate the system in the municipal planning and business functions and gradually develop its human resources and institutional capacity towards fully automated and digital municipality.

CHAPTER 5:- Recommendations

Sustainability is only sought if the system proves to be beneficial in terms of technology as well as in term of finance. If the Municipal GIS technically helps to enhance municipal functions as well as provide financial benefits. The following recommendations are made in order for Municipal GIS to be self-sustained:

a) Internal Revenue Generation Through Data and Map Sales

- ❖ Formulation of data share and sales policy within   the municipality
- ❖ Acquisition of data copyright and sales right from   the Survey Department
- ❖ Regulation of data shares and sell prices
- ❖ Development of data and map sales service
- ❖ Development of various thematic maps, street and tourist maps, heritage maps etc. for publication and sales

b) Regular Refresher and Application Trainings

- ❖ Regular refresher trainings to introduce new techniques and tools to GIS unit personnel
- ❖ Application trainings to other technical and non-technical personnel to develop theircapability to use GIS as a tool in their daily tasks
- ❖ Trainings to executive level personnel in interpreting maps and spatial data for better decision making

CHAPTER 6:- Appendices

6.1 Appendix: Municipal Letter
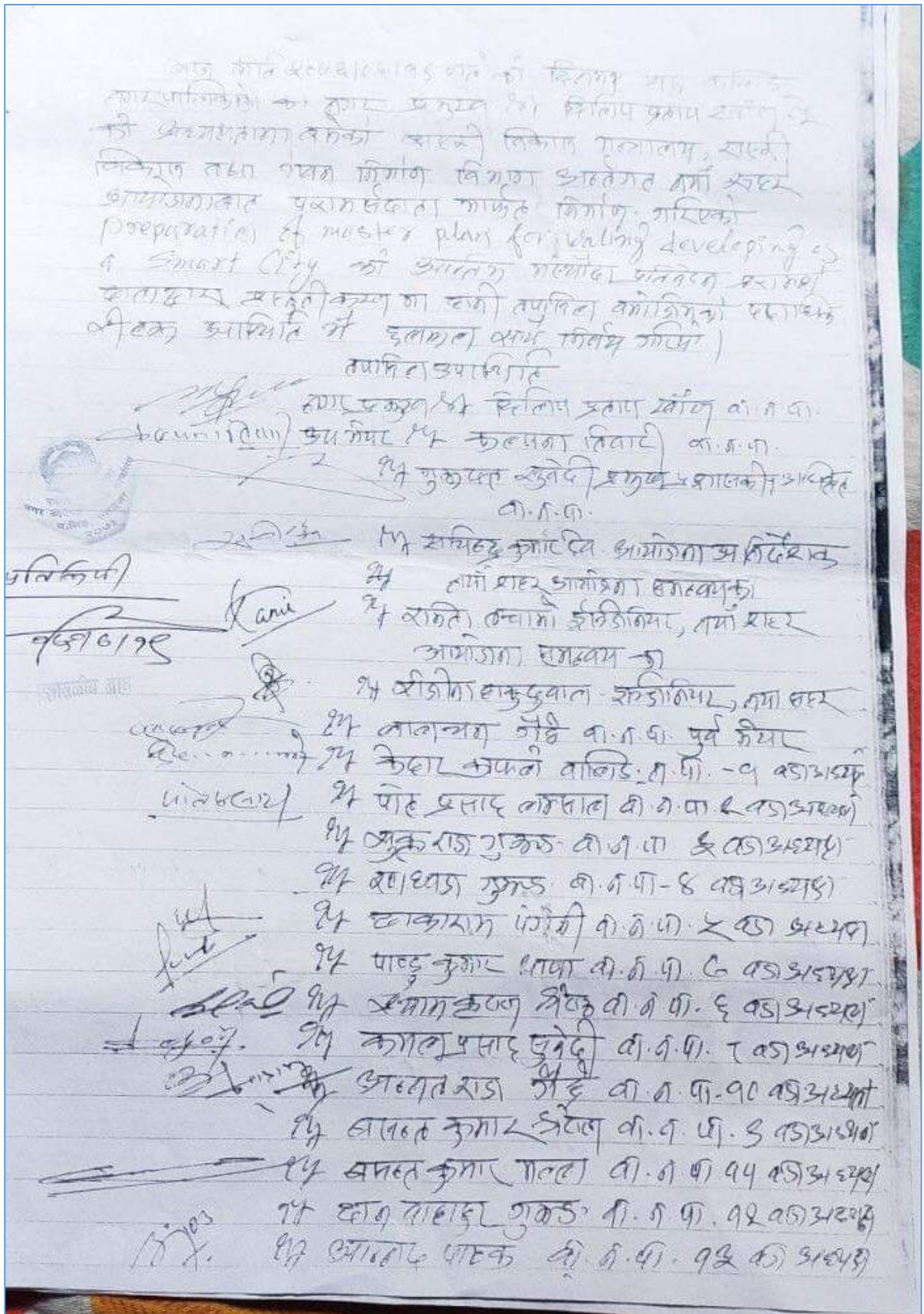
6.2 Appendix: Field Photographs

Note: All the photographs of each houses have been taken

Photo No 9: Some Others Field Photographs

and attached to GIS Data Base Sheet.

6.3 Appendix: Data Sheet Sample, Field Survey

Waling Municipality, Syangja

Surveyor Name | Sheet 33 | Date :

Construction Type
1. RCC/Frame str.
2. Load Bearing
3. Timber
4. Steel.
5. Kachhi (/BM/SM).
BM: Brick Mud Mtr
Notes SM: Stone Mud

Catagory
1. Residential
2. Commercial
3. Combined(1+2)
4. Indusrties
5. Health Center
6. Petrol Pump
7. Tel.Com.
8. Govt.Off
9. Security
10. Recreat.
11. Public Hall
12. Bank/Finance
13. Culture/Religious
14. School

Roof Types
1. Jasta(CGI)
2. Khar
3. RCC
4. Tile
5. Slate
6. UPVC

FID	W.N	House_Owner	Catagory	Storied	Const_Type	Roof Tp	Road_Name	Road Width	Road Surface	Vehicle Ac(Y/N)	Electricity	WaterSupply	Tole Name	Remarks
5003	8	Deusupa pangeni	1	2	SM	Tasta	kataure-dap4	—	BT	Y	Y	Y	kataure	—
5004	8	"	1	1	RCC	Rcc								12 Laal
001	8	Shakishowa B.K	1	1	Block/sm	tasta	—	—	ER	Y	Y	Y	katoure	
0001	8	~~Sorba po~~												
0011	8	Dhruba parapuli	1	1	RCC	RCC	Toishi pandera	20'	pitch	Y	Y	Y	kataure	9:46
0002	8	Om prakash pangeni	1	2.5	RCC	RCC	Toishi pander	"	"	"	"	"	" Toishi pander	9:49
0003	8	Huma chetri	1	1	RCC	RCC	Toishi pander	20'	"	"	"	"	"	9:55
0004	8	Niru pandye	1	3.5	RCC	RCC	"	"	"	"	"	"	"	9:58
0005	8	Ganashyam pangeni	1	1	RCC	RCC	"	"	"	"	"	"	"	10:00
0006	8	Harimaya pangeni	1	2	RCC	RCC	"	20'	"	"	"	"	"	10:0.
0007	8	Kusma Kumari Thapa	1	2.5	RCC	RCC	"	"	"	"	"	"	"	10:03
0008	8	Sritama panta	1	3.5	RCC	RCC	"	"	"	"	"	"	"	10:25
~~0009~~	8	chola prasad gopali	8	2.5	RCC	RCC	"	जिसंस	—	N.	"	"	"	10:15
00010	8		3	1	Road bearing	Tasta	20'	pith	Y	Y	Y	"	10:.
0001.	8	Romesho Tiwari	3	3	RCC	RCC	(Toishi pandera) viski mang	12'	ER	Y	Y	Y	"	11:52
00012	8	Bhola chetri	1	1	SSM	tasta	"	12'	pith	Y	"	Y	kataure (nama sc)	12:1
00014	8	surya prasad parauli	1	2	RCC	RCC	"	"	"	"	"	"	"	12:3
00015	8	Hadikala aryal	1	2	RCC	RCC	Nagospali mang	"	ER	"	"	"	kataure	1:58
0005	8	Sulo chand	1	1	RCC	RCC	Nagospali mang	12'	pitch	Y	Y	Y	kataure	(ERReta)
0017	8	surma koisala	1	3	RCC	RCC	"	"	"	"	"	21	"	2:01
00018	8	Ishowri p. Tiwari	1	2	SSM	Tasta	Nagospali mang	12'	ER	Y	Y	Y	n	2:14
00019	8	survey dep.	1	3	RCC	RCC	"	"	"	"	"	"	"	2:17
00020	8	Tiwari dep.	1	8	RCC	RCC	"	"	ER	Y	.	Y	"	2:18 undsion
5051	8	sangita poudel kafle	1	2.5	RCC	RCC	kataure mang	14'	ER	Y	Y	Y	kataure	— 2:29
6151	8	Renuka kunwar	1	3	RCC	RCC	"	"	ETL	"	"	"	"	2:30

Waling Municipality, Syangja

Surveyor Name | Sheet 33 | Date :

Construction Type
1. RCC/Frame str.
2. Load Bearing
3. Timber
4. Steel.
5. Kachhi (/BM/SM).
BM: Brick Mud Mtr
Notes SM: Stone Mud

Catagory
1. Residential
2. Commercial
3. Combined(1+2)
4. Indusrties
5. Health Center
6. Petrol Pump
7. Tel.Com.
8. Govt.Off
9. Security
10. Recreat.
11. Public Hall
12. Bank/Finance
13. Culture/Religious
14. School

Roof Types
1. Jasta(CGI)
2. Khar
3. RCC
4. Tile
5. Slate
6. UPVC

FID	W.N	House_Owner	Catagory	Storied	Const_Type	Roof Tp	Road_Name	Road Width	Road Surface	Vehicle Ac(Y/N)	Electricity	WaterSupply	Tole Name	Remarks
3393	9	Associate	1	2	5 SM	1	Nagliopalika mang	—	—	N	Y	Y	kataure	
3394	9	Associate	1	2	5 SM	1					Y	Y	kataure	01:39
3395	8	Associate (nadavp. tiwari)	1	2	5 SM	1	nagar palika mang	—	—	N	Y	Y	kataure	
3396	9	Associate	1	2	5 SM	1								
3397	3	Associate	1	2	5 SM	1								
3400	3	Associate	1	2	5 SM	1								
3401	3	Associate Tika p.	1	2	5 SM	1								11:55
3402	8	Associate Tika p.	1	2	rcc SSM	3	(जिसीं)	—	—	N	Y	Y	kataure.	
3413	3	Associate	1	2	5 SM	1								
3415	3	Associate	1	2	5 SM	1								9:
3479	3	Associate (702)	—	2	SSM	Tasta	Toshipander	20'	pit Lid	Y	—	—	Toshipander	9:
3480	3	Associate (902) am mra	—	2	"	"	"	"	"	"	—	—	Toshipander	9
4992	8	Hum B Parajuli prem pana B	3-5	1/RCC	RCC		Toshipander mang	20'	pitlid	Y	Y	Y		
4993	3	~~Om Prakesh Pangani~~	1	2	1	3								
4994	3	Bhuma Chatri	1	2	1	3								10:0
4995	8	Loknath Bagale	1	2.5	1	RCC	Toshipander mang	20'	pitlid	Y	Y	Y	Toshi pandeka	
4996	3	Tika Kumari Pangani	1	2	1	3								
4997	3	Sita Palli Magar	1	1	1	3								
4998	3	Krishna Kumari Thapa	1	1	1	3								
4999	3	Bhuparaj Bagale	1	3	1	3								
5000	3	~~Sovakanta Tiwari~~	1	2	1	3	आंगसी मांग.		ER	Y	Y	Y	kataure	—
5001	3	Shovakanta Tiwari (madan)	1	2	1	3								kataure
5002	3	Hari Pangani Tshioteri	1	2	1	3	नाजसी आंगी		ER	Y	Y	Y	"	—
5006	8	Dhanapati Pangani	1	2	1 SSM	1			BT	Y	Y	Y		(15* 4 Laal)
5004	3	Guru p. Tiwari	1	2	1	3								
5005	3	Loknath Gare	1	2	1	3								
5006	3	Laxman Pangani	1	2	1	3								
5007	3	Buddhi B Thakali	1	2	1	3								12:52
5008	3	Daya Ram Pangani	1	3	1	3	Nagospali morg	12'	pit	Y	Y	Y	kataure	— 12:48
5009	3	~~Bhoj Kumari Khawas~~ P hala Tiwari	1	1	1	3	—	12'	pit	Y	Y	Y	kataure.	
5010	3	Tankla P. Tiwari	1	4	1	3								
5011	8	Sarada Pangeni	1	2	1	3	nagulpati mang	12'	ER	Y	Y	Y	kataure	+(fingrie) 2:07
5012	3	Rikesh Tiwari	1	2	1	3								
5013	3	Ramu Pangeni	1	3	1	3								
5014	3	Risikant Tiwari	1	3	1	3	nagospali mang	12	ER	Y	Y	Y	kataure	2:12
5015	3	~~Rikesh Tiwari~~												

6.4 Appendix: House Numbering Database

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
1	9	84/87	Aama Samuhako Samudayik Bhawan	Residential	Residential	2	Frame Structure	RCC	Odare Pandera Hudai Bagal Danda	8	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
2	9	888	Achyut Gaihre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
3	9	375	Achyut Sharan Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
4	9	286/40	Aiti Maya Gurung	Residential+Commercia	Residential+Commercial	3.5	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
5	9	416	Ajad+Shahajad	Residential+Commercial	Residential+Commercial	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
6	9	997	Ali Ishun Miya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
7	9	85	Amar B. Thapa	Residential	Residential	3.5	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Earthened	Joisi-Pandera	Permanent
8	9	358/27	Amarlal Karmacharya	Commercial	Commercial	1	Frame Structure	Jasta	Bolbom Chowk-Nayabajar Marg	12	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
9	9	368	Amarlal Karmacharya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
10	9	462	Ambika Poudel	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
11	9	1116	Amina Ali Miya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
12	9	105	Amrit Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
13	9	400	Anisha Parajuli	Residential	Residential	2.5	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
14	9	2253	Anisha-Anishka Koirala	Residential	Residential	1	Frame Structure	RCC	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
15	9	124/42	Anita Rana	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
16	9	373	Anita Thapa	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
17	9	367	Anita Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
18	9	193	Anju Thamcha	Residential	Residential	2.5	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
19	9	413	Anu Shrestha	Commercial	Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
20	9	41	Archana Regmi	Residential	Residential	2.5	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
21	9	118/77	Arjun Kandel	Residential	Residential	1.5	Frame Structure	RCC	Goreto	0	No	Yes	Yes		Kandel Gaun	Permanent
22	9	135	Arjun Tiwari	Residential	Residential	1.5	Frame Structure	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
23	9	82/70	Asha Maya Saaru	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
24	9	68	Asha Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
25	9	220	Ashok Kumar Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
26	9	1133	Ashok Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
27	9	389	Ashok Tiwari	Residential+Commercial+Bank/Finance	Financial	5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
28	9	102/1	Associate to 063	Residential	Residential	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Temporary
29	9	286/39	Associate to 094	Temporary	Temporary	1	Kachi (Stone Masonary)	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Temporary
30	9	-	Associate to 1082	Goth	Temporary	1	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Temporary
31	9	133	Associate to 1082	Residential+Commercial	Residential+Commercial	1	Jasta	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
32	9	175/1	Associate to 1083	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
33	9	20/12	Associate to 1250	Goth	Temporary	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Temporary
34	9	82/16	Associate to 1274	Garage	Garage	1	Jasta	Jasta	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Temporary
35	9	92/1	Associate to 1478	Goth	Temporary	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Temporary
36	9	160/1	Associate to 1497	Residential	Residential	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Temporary
37	9	252/1	Associate to 1513	Residential	Residential	2	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Temporary
38	9	344/1	Associate to 1702	Temporary	Temporary	1	Truss+Jasta	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Temporary
39	9	413/1	Associate to 2503(Mahesh Pr. Gaihre	Residential	Residential	1.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
40	9		Associate to 3151	Temporary	Temporary	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
41	9	195/49/1	Associate to 3155	Buffalo Farm	Industrial	1	Kachi	Khar	Goreto	0	No	Yes	Yes		Sano Katauje	Temporary
42	9		Associate to 3402(Diladevi Tiwari)	Goth	Temporary	1	Kachi (Stone Masonary)	Jasta	Goreto	6	Yes	Yes	Yes	Earthened	Katauje	Temporary
43	9	41	Associate to 3466	Residential + Commercial	Residential + Commercial	2	Frame Structure	RCC	City Hall Marg	12	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
44	9	57	Associate to 3466	Residential+ Commercial	Residential + Commercial	3	Frame Structure	RCC	City Hall Marg	12	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
45	0	185	Associate to 3812	Residential	Residential	1.5	Kachi (Stone Masonary)	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
46	9	335	Associate to 5080	Commercial	Commercial	1	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
47	9	170/113/32/2	Associate to 5085	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary
48	9	170/113/32/1	Associate to 5085	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
49	9	-	Associate to 5101	Temple+Water Tank	Residential		Frame Structure	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Khaniyapati	Temporary
50	9	118/33/1	Associate to 5112	Kitchen	Residential	1	Kachi (Mud Mortar)	Jasta	Goreto	0	No	Yes	Yes		Kandel Gaun	Temporary
51	9	-	Associate to 5118	Goth	Temporary	2	Kachi (Brick Masonary)	Jasta	Goreto	0	No	Yes	Yes	Earthened	Kandel Gaun	Temporary
52	9	-	Associate to 5123	Goth	Temporary	2	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Temporary
53	9	118/83	Associate to 5123	Residential	Residential	2	Kachi (Mud Mortar)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Temporary
54	9	-	Associate to 5124	Goth	Temporary	1	Kachi (Stone Masonary)	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Kandel Gaun	Temporary
55	9	705	Associate to 5806	Temporary	Temporary	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Temporary
56	9	407/1	Associate to 5894	Goth	Temporary	1	Kachi (Block)	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje	Temporary
57	9	-	Associate to 5968	Farm	Industrial	2	Kachi (Block)	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Temporary
58	9	-	Associate to 5968	Farm(Temporary)	Industrial	1	Timber+Jasta	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Temporary
59	9	163	Associate to 5977	Temporary	Temporary	1	Kachi	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Temporary
60	9	248	Associate to 6745	Goth	Temporary	2	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Temporary
61	9	351	Associate to 6749	Residential	Residential	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaycess Tole	Permanent
62	9	672	Associate to 686	Residential	Residential	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
63	9	1134	Associate to 694	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
64	9	197	Associate to 702(Govinda Tiwari)	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi-pandera	Permanent
65	9	193	Associate to 702(Govinda Tiwari)	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi-pandera	Permanent
66	9	-	Associate to 776	Goth	Temporary	2	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Temporary
67	9	19	Associate to a023	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
68	9	46	Associate to a110	Residential	Residential	2	Frame Structure	RCC	City Hall Marg	12	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
69	9	170/245	Associate to b035	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary
70	9	170/244	Associate to b037	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary
71	9	170/250/2	Associate to b037	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary
72	9	170/250/1	Associate to b037	Residential	Residential	2	Frame Structure	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Temporary
73	9	1445	Associate(MaimunNisha)	Residential+Commercial	Residential+Commercial	1	Kachi (Stone	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
							Masonary)									
74	9	1407/1	Associate(Netra Kumari Bhattrai)	Residential	Residential	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
75	9	718	Baburam Shrestha	Residential	Residential	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
76	9	525	Baburam Shrestha	Furniture Industry	Industrial	1	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
77	9	185	Bagale Guthi	Community House	Community Buildings	1	Block+Truss	Jasta	Namuna Marg	12	Yes	Yes	Yes	Earthened	Jaisi Pandhera	Permanent
78	9	20	Bakery Industry	Bakery Industry	Industrial	1	Kachi (Stone Masonry)	Jasta	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Bagale Tole	Permanent
79	9	499	Bal Prasad Shrestha	Residential+Commercial+Bank/Finance	Financial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
80	9	216	Balkrishna Shiwadi	Residential	Residential	1	Load Bearing	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
81	9	93	Balkrishna Subedi	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
82	9	276	Balram Regmi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
83	0	39/20	Ban Bahadur Maske	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
84	9	469	Barun Gaihre	Commercial	Commercial	4	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
85	9	420	Basanta Bahadur Shahi Shrestha	Residental+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
86	9	834	Basanta Malla	Residental+Commercial	Residential+Commercial	2	RCC+Truss+Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
87	9	893	Basanta Malla+Dipendra Gaihre	Residental+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
88	9	136	Basanta Sunar	Residental+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
89	9	942	Basanta Tiwari	Residental+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
90	9	19	Basmaya Gurung	Residental+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
91	9	321	Basudev Poudel	Residental+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
92	9	159	Bedh Bahadur Kandel	Residential	Residential	2	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
93	9	314	Bedhmaya Pangeni	Residental+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
94	9	82/50	Bhabhishwor Aryal	Residental+Commercial	Residential+Commercial	2	Frame Structure	RCC	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
95	9	35	Bhabhishwor B.K.	Residential	Residential	1	Kachi (Brick Masonry)	Jasta	Katauje-Khapa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
96	9	945	Bhabisara Kafle	Residential+Pharmacy	Health Service	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
97	9	1609	Bhabishwor Bhattrai	Residential	Residential	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
98	9	301	Bhagabati Bagale	Residential	Residential	3	Frame Structure	RCC	Khanepani Tank Jane Bato	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
99	9	327	Bhagwan B.K.	Resiedential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
100	9	117	Bhagwati Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
101	9	973	Bhagwati Chhetri	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
102	9	277	Bhagwati Pandey	Commercial	Commercial	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
103	9	20/24	Bhagwati Shrestha	Residential	Residential	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
104	9	1077	Bhakta Bahadur Bohora	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
105	9	288/26	Bhanubhakta Subedi	Residential	Residential	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
106	9	125	Bharat Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
107	9	2257	Bharat Koirala	Residential	Residential	3	Frame Structure	Jasta	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
108	9	34/100	Bharat Rana	Commercial	Commercial	1	Block+Jasta	Jasta	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
109	9	1086	Bhesh Kumari Pandey	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
110	9	293	Bhim Bahadur Bhujel	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
111	9	34/27	Bhim Bahadur Shrestha	Residential	Residential	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
112	9	40	Bhim Bhattrai	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
113	9	340	Bhim Kumari Gaihre Chhetri	Residential	Residential	2	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
114	9	238	Bhim Kumari Saaru	Residential(Under Construction)	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
115	9	441	Bhim Lal Pangeni	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
116	9	293	Bhim Maya Saaru	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
117	9	337	Bhim Maya Thapa	Commercial	Commercial	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
118	9	255	Bhim Prasad Pandey	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
119	9	283	Bhim Prasad Pandey	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Mathillo Pipalbot	Permanent
120	9	135	Bhim Prasad Pangeni	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
121	9	176	Bhimkanti Subedi	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
122	9	440	Bhimlal Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
123	9	252	Bhimlal Tiwari	Residential	Residential	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
124	9	36	Bhimsen Saaru Thapa	Residential	Residential	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
125	9	106	Bho Maya Thapa	Residential	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
126	9	1151	Bhojraj Gurung	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
127	9	295	Bhojraj Pandey	Residential+Commercial	Residential+Commercial	3	Kachi (Stone Masonary)	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Mathillo Pipalbot	Permanent
128	9	20/15	Bhojraj Thapa Chhetri	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
129	9	54	Bhola Chhetri	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
130	9	89/1	Bhu Pu Sainik Ucha Mavi	Institutional	Educational	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
131	9	89/2	Bhu Pu Sainik Ucha Mavi	Institutional	Educational	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
132	9	89	Bhu Pu Sainik Ucha Mavi	Institutional	Educational	2	Frame Structure	RCC+Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
133	9	30	Bhumi Prasad Subedi	Commercial	Commercial	1	Truss+Jasta	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Permanent
134	9	16	Bhumi Prasad Subedi	Commercial	Commercial	1	Kachi	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Dumrikot	Permanent
135	9	110	Bhuparaj Bagale	Residential	Residential	2.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
136	9	286/16	Bhuparaj Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
137	9	110/1	Bhuparaj Bagale(Associate)	Goth	Temporary	1	Kachi (Stone Masonary)	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje Tole	Temporary
138	9	150/60	Bhuparaj Tiwari	Residential	Residential	2	Frame Structure	RCC	Goreto	0	No	Yes	Yes		Nayagaun	Permanent
139	9	200/25	Bhupen Lamichhane	Residential	Residential	2.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
140	9	211	Bijuli Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
141	9	56	Bimal Aryal	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
142	9	199	Bimala Rana	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
143	9	140	Bina Gurung	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
144	9	118/27	Bini Madhav Kandel	Residential	Residential	2.5	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
145	9	1249	Binod Karki	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
146	9	400	Binod Pandey+Nisha Miya	Residential+NIC Asia Bank	Financial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
147	9	313/76	Binod Shrestha	Residential	Residential	1	Kachi	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
148	9	791	Bipin Chaudhary	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
149	9	1095	Bir Bahadur Thapa	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
150	9	513	Birendra Rana	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
151	9	337	Bishnu Bahadur Malla	Commercial	Commercial	1	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
152	9	96	Bishnu Maya Thapa	Residential	Residential	3.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
153	9	666	Bishnu Pangeni	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
154	9	89	Bishnu Prasad Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
155	9	117/26	Bishnu Prasad Dhakal	Residential	Residential	2.5	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Earthened	Sahakarya Tole	Permanent
156	9	1012	Bishnu Prasad Dumre	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
157	9	290	Bishnu Shahi Darji	Residential+Commercial	Residential+Commercial	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
158	9	478	Bishnu Shrestha	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
159	9	34/50	Bishnu Thapa	Residential	Residential	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
160	9	55	Bishnu Thapa	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
161	9	1543	Bodhraj Regmi	Residential	Residential	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
162	9	857	Bodhraj Regmi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
163	9	216	Bodhraj Subedi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
164	9	195/93	Bodraj Subedi	Residential	Residential	2.5	Frame Structure	Jasta	Goreto	0	No	Yes	Yes		Sano Katauje	Permanent
165	9	150/32	Buddha Kumari Darji	Residential	Residential	2.5	Frame Structure	RCC	Goreto	6	No	Yes	Yes	Earthened	Nayabajar	Permanent
166	9	78	Buddhi Narayan Aryal	Residential	Residential	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
167	9	357	Buddhisagar Subedi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
168	9	170/121	Budhisagar Subedi	Residential	Residential	1	Frame Structure	RCC	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
169	9	382	Chakra Bahadur Aale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
170	9	286/20	Chamaklal Kunwar	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
171	9	34/20	Chandi Dumre	Commercial	Commercial	1	Kachi (Brick Masonary)	Jasta	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
172	9	30	Chandi Prasad Subedi	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Jaycees Tole	Permanent
173	9	20/46	Chandra Bahadur KC	Industry	Industrial	1	Jasta	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
174	9	1361	Chandra Bahadur Rana	Residential	Residential	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
175	9	82/111	Chandra Bahadur Thapa Chhetri	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
176	9	170/143	Chandra Kanta Subedi	Residential	Residential	2	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
177	9	165	Chandra Kanta Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
178	9	864	Chandra Kumari Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
179	9	328	Chandra Man Shrestha	Residential(Under Construction)	Residential	6	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
180	9	1349	Chandrakala B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
181	9	1517	Chandrakala Tiwari	Residential+Commercial	Residential+Commercial	4	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
182	9	374	Chandraman Shrestha	Residential+Kumari Bank	Financial	5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
183	9	118/84	Chayachandra kandel	Residential	Residential	3	Kachi (Stone Masonary)	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
184	9	1617	Chet B Gaha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
185	9	674	Chet Narayan Shrestha	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
186	9	2255	Chhabilal Koirala	Residential	Residential	1	Frame Structure	RCC	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
187	9	286/29	Chhabilal Kunwar	Residential	Residential	3.5	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
188	9	172	Chhabilal Kunwar	Residental+Finance	Financial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
189	9	49/60	Chhabilal Subedi	Residential	Residential	1	Kachi	Jasta	Kedarnath Marg	0	No	Yes	Yes	Earthened	Sano Katauje	Permanent
190	9	783	Chiranjeevi Sharma	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
191	9	1177	Chit Bahadur Thapa	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
192	9	1045	Chitra Bahadur Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
193	9	194	Chitra Kumari Darji	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
194	9	635	Chnadramaya Gurung	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
195	9	266	Chok Narayan Shrestha	Residential(Under Construction)	Residential	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
196	9	84/82	Cholakant Bagale	Goth	Temporary	1	Frame Structure	RCC	Odare Pandera Hudai Bagal Danda	8	Yes	Yes	Yes	Earthened	Katauje Tole	Temporary
197	9	311	Cholakanta Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
198	9	286/10	Cholakanta Bagale	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
199	9	367	Cholakanta Subedi	Residential	Residential	2	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
200	9	871	Chop Narayan Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
201	9	106	Chudamani Kharal	Residential	Residential	2	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
202	9	138/12	Chumakala Kuwar	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
203	9	125	Chun Kumari Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
204	9	1605	Chura Kumari Gaha	Residential	Residential	2	Kachi (Stone	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
							Masonary)									
205	9	327	Dal Bahadur Thapa	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
206	9	500	Dal Bahadur Thapa	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
207	9	103	Daman Kumari Shrestha	Commercial	Commercial	2.5	Frame Structure	RCC	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Waling Mode	Permanent
208	9	190	Dammra Pangeni	Residential	Residential	3.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi-pandera	Permanent
209	9	512	Damodar Gaihre	Commercial	Commercial	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
210	9	527	Damodar Gaihre	Commercial	Commercial	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
211	9	1345	Dan Bahadur B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
212	9	1381	Dasarath Prasad Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
213	9	82/106	Dasarath Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
214	9	351	Dashiraya Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
215	9	1100	Daya Prasad Regmi	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
216	9	503	Daya Ram Pangeni	Residential	Residential	3	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	katauje	Permanent
217	9	433	Dayaram Gaihre	Dairy	Industrial	1	Truss	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
218	9	917	Dayaram Regmi	Residential+Commercial	Residential+Commercial	4	RCC+Truss	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
219	9	385	Dayaram Tiwari	Residential	Residential	1	Frame Structure	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
220	9	51	Debaka Parajuli	Residential	Residential	3	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
221	9	177	Deepak Lamsal	Residential	Residential	3	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
222	9	609	Deepak Subedi	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
223	9	155	Deependra Man Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
224	9	84/107	Del Bahadur Palli Magar	Residential	Residential	1	Load Bearing	Jasta	Odare Pandera Hudai Bagal Danda	8	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
225	9	200/19	Dev Bogati	Residential	Residential	2.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
226	9	261	Dev Kumari Pariyar+Dipak Pariyar	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
227	9	326	Dev Kumari Tiwari	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
228	9	1144	Dev Prasad Upadhyaya	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
229	9	118/51	Devi Kandel	Residential	Residential	2	Frame Structure	Jasta	Goreto	0	No	Yes	Yes		Kandel Gaun	Permanent
230	9	-	Devi P. Tiwari	Goth	Temporary	1	Kachi	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Temporary

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
231	9	150/58	Devi Prasad Tiwari	Residential	Residential	1	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
232	9	248	Devilal Subedi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
233	9	334	Devrupa Pangeni	Residential	Residential	1	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
234	9	344	Devrupa Pangeni	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
235	9	95	Dhan Kumari Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
236	9	157	Dhan Kumari Thapa	Residential	Residential	2.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
237	9	25	Dhan P. Subedi	Residential	Residential	2	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
238	9	257	Dhan Prasad Regmi	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
239	9	180/1	Dhan Prasad Subedi(Associate to 0114)	Hotel and Party Palace	Industrial	3.5	Frame Structure	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
240	9	235	Dhana Kumari Bagale	Residential+Commercial+Bank/Finance	Financial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
241	9	180	Dhana Prasad Subedi	Hotel and Party Palace	Industrial	1	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
242	9	272/4	Dhana Prasad Tiwari	Residential	Residential	2.5	Frame Structure	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
243	9	216	Dhana Prasad Tiwari	Commercial	Commercial	1	Kachi (Block)	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
244	9	914	Dhana Prasad Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
245	9	18	Dhanapati Pangani	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Odare Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
246	9	170/307/46	Dhanapati Subedi	Residential	Residential	3	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
247	9	-	Dhara Chaur Mandir	Regligious (Temple)	Community Buildings		Frame Structure		Katauje-Kha Pa Dharachaur Jane Sadak	0	Yes	Yes	Yes	Pitch	Dhara Chaur	Permanent
248	9	50	Dharma Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
249	9	16	Dhir Bahadur Rana	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
250	9	245	Dhruva Bagale	Residential+Commercial	Residential+Commercial	2	Kachi (Stone Masonary)	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
251	9	184	Dhurba Parajuli	Residential	Residential	1	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
252	9	138	Dil Bahadur B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
253	9	1030	Dil Bahadur Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
254	0	1255	Dil Kumari Khanal	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
255	9	34/33	Dil Kumari Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
256	9	151	Dil Kumari Subedi	Residential	Residential	1	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
257	9	487	Dil Kumari Tiwari	Residential	Residential	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
258	9	147	Dil Maya B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
259	9	458/60	Diladevi Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	RCC	Goreto	6	Yes	Yes	Yes	Earthened	Katauje	Permanent
260	9	82/28	Dilip Pratap Khand	Residential	Residential	3	Frame Structure	Jasta	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
261	9	84	Dilip Pratap Khand	Residential+Finance	Financial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
262	9	406	Dilli Grill Industry	Grill Industry	Industrial	1	Jasta	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
263	9	286/26	Dilli Maya Aryal	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
264	9	164	Dilli Sara Soti Thapa	Residential+Commercail	Residential+Commercial	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
265	9	299	Dilliram Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
266	9	1029	Dilliram Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
267	9	434	Dilliram Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
268	9	993	Dilliram Poudel	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
269	9	126/65	Dilliram+Bhojraj Subedi	Residential	Residential	2	Kachi (Stone Masonry)	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
270	9	175	Dilukumari Thapa	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
271	9	787	Dina Bandu Parajuli	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
272	9	1023	Dipa Kumari Regmi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
273	9	170/113/59	Dipa Subedi	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
274	9	150/78	Dipa Tiwari	Residential	Residential	1	Kachi (Mud Mortar)	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Permanent
275	9	43/40	Dipak Kandel	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Permanent
276	9	117	Dipak Thapa	Residential	Residential	1	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
277	9	280	Dipak Wagle	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
278	9	356	Dipendra Prasad Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
279	9	817	Dipendra Tiwari	Residential+Finance	Financial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
280	9	105	Dirga Prasad Kandel	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
281	9	43	Dollendra Thapa	Residential	Residential	3	Frame Structure	RCC	Udhyog Banijya Tole	12	Yes	Yes	Yes	Pitch	Udhyog Banijya	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
									Marg						Tole	
282	9	298	Dolraj Basyal	Residential	Residential	2	Frame Structure	RCC	Pani Tank Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
283	9	1613	Dolraj Koirala	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
284	9	322	Dolraj Pangeni	Residential+Machhapuchchhre Bank	Financial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
285	9	835	Dolraj Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
286	9	458/26	Dolraj Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
287	9	390	Dolraj Tiwari	Residential+Commercial	Residential+Commercial	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
288	9	877	Domanti Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
289	9	1044	Doraj Tiwari	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
290	9	48	Durga Devi Sharma	Residental+Finance	Financial	3	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
291	9	28	Durga Kumari Neupane Bhattrai	Residential	Residential	2	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
292	9	1099	Durga Kumari Parajuli	Residental+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
293	9	395	Durga Narayan Subedi	Residential	Residential	2	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
294	9	657	Durga Parajuli	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
295	9	371	Durga Prasad Tiwari	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
296	9	370	Durga Subedi	Residential	Residential	2	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
297	9	154	Durga Tiwari	Residential	Residential	1	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	katauje	Permanent
298	9	776	Durga Tiwari	Hotel Greenland(Commercial)	Industrial	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
299	9	165	Ful Kumari Thapa	Residential	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
300	9	429	Gagan Thapa	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
301	9	2233	Ganesh Koirala	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
302	9	162	Ganesh Parajuli	Commercial	Commercial	1	Block+Truss	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Temporary
303	9	338	Ganesh Prasad Sharma Arjel	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
304	9	267	Ganga Pandey	Commercial	Commercial	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
305	9	44	Ganga Saru Magar	Residential	Residential	3	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
306	9	25	Gangadhar Subedi	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
307	9	63	Gautam Pangeni	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC+Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
308	9	205	Geeta Bhandari	Residential+Commercial+Bank/Finance	Financial	3.5	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
309	9	106	Ghan Bahadur Bhujel	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
310	9	72	Ghan Bahadur Thapa	Residential	Residential	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
311	9	124/70	Ghan Shyam Subedi	Kawach Automobile and Vocational Training Institut	Educational	1	Block+Jasta	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
312	9	124/70/1	Ghan Shyam Subedi	Kawach Automobile and Vocational Training Institut	Educational	1	Block+Jasta	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
313	9	124/70/2	Ghan Shyam Subedi	Kawach Automobile and Vocational Training Institut	Educational	1	Block+Jasta	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
314	9	1052	Ghane Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
315	9	440/79	Ghanshyam Kandel	Commercial	Commercial	1	Truss	Jasta	Sahakarya Marg	12	Yes	Yes	Yes	Earthened	Sahakarya Tole	Permanent
316	9	146	Ghanshyam Pangeni	Residential	Residential	1	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
317	9	625	Ghanshyam Subedi	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
318	9	217	Giri Raj Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
319	9	1629	Girman Gurung	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC+Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
320	9	1597	Girman Gurung/Dilu Pangeni	Residential	Residential	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
321	9	209	Gita Kumari Rana	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
322	9	271	Gomata Pandey	Commercial	Commercial	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
323	9	223	Gopal Malla	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
324	9	165	Gopal Prasad Upadhyaya	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
325	9	1083	Gopal Rana	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
326	9	504	Gopi Bishwokarma	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
327	9	468	Gopi Krishna Tiwari	Residential+Laxmi Bank	Financial	6	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
328	9	57	Gopitra Soti	Residential	Residential	3	Frame Structure	Jasta	Waling Bajar Vitri Sadak	12	Yes	Yes	Yes	Gravelled	Nanapani Tole	Permanent
329	9	207	Govinda Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
330	9	1207	Govinda Prasad Poudel	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
331	9	196	Govinda Tiwari	Residential	Residential	3.5	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Earthened	Jaisi Pandhera	Permanent
332	9	344	Gudal Khand	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Walign Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
333	9	77	Guma Devi Kunwar	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
334	9	102	Gun Maya Gurung	Residential	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
335	9	358/26	Guna Prasad Pangeni	Commercial	Commercial	1	Truss	Jasta	Bolbom Chowk-Nayabajar Marg	12	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
336	9	1537	Gupta Bahadur Aale	Residential	Residential	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
337	9	69	Gupta Bahadur Birkatta	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
338	9	474	Gurudutt Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
339	9	93	Gyamu Pandey	Residential	Residential	1	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath Tole	Permanent
340	9	1549	Gyan Bahadur Thapa Magar	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
341	9	275	Gyan Prasad Pandey	Commercial	Commercial	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
342	9	407	Gyan Prasad Tiwari	Residential	Residential	2.5	Frame Structure	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
343	9	220	Gyanu Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
344	9	232	Gyanu Chhetri	Residential	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
345	9	808	Hairhar Pandey	Residential+Finance	Financial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
346	9	241	Hari Bagale	Residential+Commercial	Residential+Commercial	2	Kachi (Stone Masonary)	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
347	9	121	Hari Bahadur Thapa	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
348	9	117/35	Harikala Aryal	Residential	Residential	3	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	katauje	Permanent
349	9	66	Harikala Pathak	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Khaniyapati Tole	Permanent
350	9	84/30	Harilal Pangeni	Residential	Residential	2	Frame Structure	RCC	Odare Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
351	9	134	Harimaya Pangeni	Residential	Residential	2	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
352	9	133/53	Harka Bahadur Thapa	Residential	Residential	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
353	9	51	Hasta Bahadur Gurung	Residential	Residential	2.5	Frame Structure	RCC	Katauje- Kha Pa Dharachaur Jane Sadak	20	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
354	9	34/44	Hem Bahadur Thapa	Residential	Residential	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
355	9	138/20	Hem Bahadur Thapa	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
356	9	1171	Hem Narayan Manandhar	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
357	9	111	Hemlal Kunwar	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
358	9	193	Him Bahadur B.K.	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
359	9	863	Himal Subedi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
360	9	844	Himlal Pangani	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
361	9	1567	Hira Bahadur Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
362	9	19/26	Hira Moti Gurung	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Galli	6	No	Yes	Yes	Earthened	Udhyog Banijya Tole	Permanent
363	9	1393	Hom B Shrestha	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
364	9	336	Hom Kanta Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
365	9	149	Homkanta Koirala	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Earthened	Jaisi Pandhera	Permanent
366	9	980	Homnath Poudel	Residential+Cooperative	Financial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
367	9	85	Hum Narayan Shrestha	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
368	9	164	Huma Chhetri	Residential	Residential	1	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
369	9	343	Huma Kanta Koirala	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
370	9	170/317	Humakanta Khanal	Residental+Finance	Financial	2.5	Frame Structure	RCC	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
371	9	288/13	Humakanta Pangeni	Residential	Residential	3.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
372	9	449	Humkala Bhandari	Residential	Residential	1	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
373	9	34/26	Humkala Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
374	9	151	Humkanta Subedi	Residential	Residential	3	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
375	9	797	Inam Malla Ansari	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
376	9	345	Indra Bhusal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
377	9	19/32	Indra Kala	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Galli	6	No	Yes	Yes	Earthened	Udhyog Banijya Tole	Permanent
378	9	49/49	Indra Narayan Subedi	Residential	Residential	1	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath Tole	Permanent
379	9	73	Indra Prasad Regmi	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
380	9	933	Ishwor Kumar Shrestha	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
381	9	151	Ishwor Man Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
382	9	231	Ishwor Shrestha	Residential	Residential	4	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
383	9	26	Ishwori Prasad Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
384	9	316	Ishwori Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
385	9	84/43	Ishwori Tiwari	Residential	Residential	2.5	Frame Structure	RCC	Odare marg	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
386	9	420	Ishwori Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
387	9	13	Ita Bahadur Raskoti	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
388	9	152	Jabbar Miya	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
389	9	369	Jagannath Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
390	9	88/25	Jagat Bahadur Thapa	Commercial	Commercial	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
391	9	257	Jagat Thapa	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
392	9	2259	Jagendra Gaha Magar	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
393	9	381	Jagganath Tiwari	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
394	9	870	Jahiruddin Miya	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
395	9	1155	Jaibun Nisha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
396	9	262	Janak P. Tiwari	Residential+Government(Revenue office)	Administrative	2	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
397	9	918	Janak Tiwari	Commercial	Commercial	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
398	9	391	Janaki Thapa	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
399	9	94/38	Janardh Subedi	Residential	Residential	2	Kachi	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Permanent
400	9	78/32/25	Jas Maya Gurung	Residential	Residential	3.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
401	9	1019	Jaylal Giri	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
402	9	701	Jeevan Malla	Temporary Commercial	Commercial	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Temporary
403	9	126	Jeevan tiwari	Residential	Residential	3	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	katauje	Permanent
404	9	140	Jeevan tiwari(Associate to 1081)	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	12	Yes	Yes	Yes	Pitch	katauje	Permanent
405	9	634	Jhalak Subedi	Residential	Residential	1	Kachi (Mud Mortar)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
406	9	19/14	Jhalak Subedi	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Galli	6	No	Yes	Yes	Earthened	Udhyog Banijya Tole	Permanent
407	9	595	Jhalak Subedi+Kamal Subedi	Commercial	Commercial	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
408	9	1080	Jiblal Pangani	Commercial	Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
409	9	88/51	Jit Bahadur Aale	Residential	Residential	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
410	9	117/30/36	Jograj Pathak	Residential	Residential	3.5	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Earthened	Sahakarya TOle	Permanent
411	9	1115	Junga Bahadur Aale	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
412	9	841	Jyoti Kandel	Residential+Polyclinic	Health Service	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
															Chowk	
413	9	117	Kabita Kandel	Residential	Residential	3	RCC+Truss	RCC+Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
414	9	196	Kajiman+Rajuman Shrestha	Residential(Under Construction)	Residential	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
415	9	67	Kala Kumari Subedi	Residential	Residential	2	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
416	9	157	Kala Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
417	9	349	Kalinun Miya	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
418	9	447	Kalpana Basyal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
419	9	179	Kalpana Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
420	9	56	Kamal Baral	Residential	Residential	1	Kachi (Block)	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
421	9	463	Kamal Gaihre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
422	9	265	Kamal Kandel	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
423	9	34/58	Kamal Pangeni	Residential	Residential	1	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
424	9	84/24	Kamal Pangeni	Residential	Residential	2.5	Frame Structure	RCC	Odare Marg	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
425	9	145	Kamal Prasad Bagale	Commercial	Commercial	2.5	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
426	9		Kamal Subedi	Temporary	Temporary	1	Kachi (Block)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
427	9	622	Kamal Subedi	Residential	Residential	2	Kachi (Mud Mortar)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
428	9	585	Kamal Subedi+Jhalak Subedi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
429	9	34/80/15	Kamala Basnet	Residential	Residential	3.5	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
430	9	84/23	kamala Pangani	Residential	Residential	1	Frame Structure	RCC	Odare Marg	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
431	9	455	Kamala Pangeni	Residential+Commercial+Bank/Finance	Financial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
432	9	305	Kamala Rana	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
433	9	61	Kamala Sen Thakuri	Residential	Residential	3	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
434	9	49/33	Kanti Kumari Subedi	Residential	Residential	1	Kachi	Jasta	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
435	9	1415	Karim Baksh Miya	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
436	9	651	Karna Giri	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
437	9	53	Kashiram Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
438	9	251	Kedar Khanal	Residential+Commercial	Residential+Commercial	1.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
439	9	296	Kedar Sharan Bika	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
440	9	577	Kedarnath Mandir	Temple	Community Buildings	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
441	9	565	Kedarnath Mandir	Temple	Community Buildings		Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
442	9	160	Kembar Bahadur Sunar	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
443	9	133/41	Keshar Thapa	Residential	Residential	3	Frame Structure	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
444	9	286/13	Keshav Parajuli	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
445	9	1573	Keshav Raj Koirala	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
446	9	20/37	Keshmaya Kunwar	Residential	Residential	1	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
447	9	645	Khadka Bahadur Thapa	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
448	9	173	Khagendra B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
449	9	711	Khagendra Prasad Aryal	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
450	9	926	Kheamanda Upadhyaya	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
451	9	34/32	Khem B Pathak	Residential	Residential	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
452	9	34/38	Khem Bahadur Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
453	9	170	Khemananda Pathak	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
454	9	358/33	Khemandha Regmi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Bolbom Chowk-Nayabajar Marg	12	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
455	9	279	Khemnarayan Bagale	Residential	Residential	2	Frame Structure	RCC	Khanepani Tank Jane Bato	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
456	9	519	Khimananda Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
457	9	147	Khuma Kumari Subedi	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
458	9	49/63	Khumkanta Subedi	Residential	Residential	1	Kachi	Jasta	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
459	9	120	Khushi Kumari Kunwar	Residential	Residential	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
460	9	894	Kiran Gaihre	Commercial	Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
461	9	124/60	Kopila Bhusal	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
462	9	389	Kopila Shahi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
463	9	82/54	Krishna Bahadur Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
464	9	2263	Krishna Koirala	Residential	Residential	1	Kachi (Stone	Jasta	Dumrikot-B.P. Chowk-	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
							Masonary)		Bhimtari-Kharibot							
465	9	122	Krishna Pangeni	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
466	9	131	Krishna Prasad Kandel	Residential	Residential	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
467	9	840	Krishna Prasad Pangani	Commercial	Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
468	9	493	Krishna Prasad Pangeni	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
469	9	35	Krishna Prasad Pathak	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
470	9	1152	Krishna Prasad Shrestha	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
471	9	426	Krishna Prasad Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
472	9	170/250	Krishna Prasad Subedi	Residential	Residential	2	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
473	9	11	Krishna Prasad Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
474	9	515	Krishna Prasad Tiwari	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
475	9	983	Krishna Puri	Residential+Commercial	Residential+Commercial	3	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
476	9	165	Krishna Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
477	9	1463	Krishna Ranapal	Residential	Residential	2.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
478	9	118/65	Kubija Kandel	Residential	Residential	2	Frame Structure	RCC	Goreto	0	No	Yes	Yes	Earthened	Kandel Gaun	Permanent
479	9	533	Kuka Devi Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
480	9	39	Kul Bahadur	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
481	9	138/32	Kul Bahadur Aale	Residential	Residential	1	Kachi (Stone Masonry)	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
482	9	1161	Kul Bahadur Aryal	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
483	9	1557	Kul Bahadur Baral	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
484	9	357	Kul Bahadur Khatri	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
485	9	60	Kul Bahadur Thapa Chhetri	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
486	9	55	Kul Prasad Subedi	Residential	Residential	2	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
487	9	31	Kula P Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
488	9	1587	Kum Bahadur Gurung	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
489	9	103	Kumal Bahadur Kunwar	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
490	9	236	Kumar Malla	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
491	9	174	Kunwar Samaj	Community Hall	Community Buildings	1	Frame Structure	RCC	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Waling Maidan	Permanent
492	9	126	Kushma Kumari Thapa	Residential	Residential	2.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
493	9	195/49	Kusmakar Subedi	Residential	Residential	2	Kachi	Khar	Goreto	0	No	Yes	Yes		Sano Katauje	Permanent
494	9	435	Lal Bahadur B.K.	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
495	9	118/33	Lal Gopal Kandel	Residential	Residential	3	Kachi (Mud Mortar)	Jasta	Goreto	0	No	Yes	Yes		Kandel Gaun	Permanent
496	9	655	Lal Kumari Khadka	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
497	9	34/43	Lal Kumari Shrestha	Residential	Residential	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
498	9	377	Lalu kanta Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
499	9	67	Laxima Pandey	Residential	Residential	3	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
500	9	109	Laxman Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
501	9	1375	Laxman Ghimire	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
502	9	79	Laxman Kuwar	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
503	9	28	Laxman Pangeni	Residential	Residential	2	Kachi (Stone Masonary+Timber)	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
504	9	210	Laxman Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
505	9	1583	Laxmi Aryal	Residential	Residential	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
506	9	440/96	Laxmi Basnet	Residential	Residential	1	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Earthened	Sahakarya	Permanent
507	9	503/1	Laxmi Devi Aryal (Associate to 00027	Health Centre+Bank/Finance	Health Service	3	Frame Structure	RCC	Waling Bajar Sadak	12	Yes	Yes	Yes	Earthened	VIP Tole	Permanent
508	9	1145	Laxmi Devi Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
509	9	54	Laxmi Gaihre+Gopal Gaihre	Residential+Commercial	Residential+Commercial	2	Frame Structure	Jasta	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
510	9	63/19	Laxmi Khanda	Residential	Residential	1.5	Frame Structure	RCC	Jaisi Pandhera Vitri Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
511	9	50	Laxmi Kunwar	Residential	Residential	2	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
512	9	130	Laxmi Narayan Guthi	Dharmashala	Community Buildings	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
513	9	1233	Laxmi Neupane	Residential+SBI Bank ATM	Financial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
514	9	484	Laxmi Regmi	Temporary Commercial	Commercial	1	Truss	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Temporary
515	9	503	Laxmidevi Aryal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
516	9	517	Lekhnath Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
517	9	820	Lekhnath Panday	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
518	9	206	Lila Bahadur Ranpal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
519	9	992	Lila Poudel	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
520	9	47	Lila Subedi	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
521	9	20/47	Lok Bahadur Kunwar	Residential	Residential	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
522	9	1160	Lok Bahadur Thapa	Residential	Residential	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
523	9	176/23	Loknath Bagale	Residential	Residential	2.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
524	9	19/20	Loknatha Abasthi	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Galli	6	No	Yes	Yes	Earthened	Udhyog Banijya Tole	Permanent
525	9	119	Madan Aryal	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati	Permanent
526	9	78/35	Madan Aryal	Labour House(Temporary)	Residential	1	Truss+Jasta	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Temporary
527	9	84/49	Madan Tiwari	Residential	Residential	2.5	Frame Structure	RCC	Odare Marg	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
528	9	174/26	Madhav Prasad Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
529	9	192	Magar Samaj Hall	Community Hall	Community Buildings	2	Frame Structure	RCC	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Waling Maidan	Permanent
530	9	20/21	Mahendra Kumar Shrestha	Residential	Residential	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
531	9	315	Mahendra Raj Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
532	9	457	Mahesh Kafle	Residential	Residential	1	Kachi	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
533	9	413	Mahesh Prasad Gaihre	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
534	9	1457	Maimun Nisha	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
535	9	440/92	Maina Bhandari	Residential	Residential	2.5	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Earthened	Sahakarya	Permanent
536	9	494	Majmun Miya	Residential+Commercail	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
537	9	333/77	Malpot Karyalaya	Residential	Residential	4	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
538	9	87	Mamata Subedi	Residential	Residential	3	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
539	9	63	Man Bahadur Aale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
540	9	687	Man Bahadur Basnet	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
541	9	253	Man Bahadur Gurung	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
542	9	317	Man Bahadur Saaru	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
543	9	767	Mandhoj Gurung+Tikmaya Gurung	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabaajar	Permanent
544	9	118/55	Mani Kandel	Residential	Residential	1.5	Frame Structure	RCC	Goreto	0	No	Yes	Yes	Earthened	Kandel Gaun	Permanent
545	9	116	Mani P Parajuli	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
546	9	355/25	Mani P Tiwari	Residential	Residential	1	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
547	9	230	Mani Prasad Pangani	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
548	9	473	Manikala Tiwari	Residential	Residential	1	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
549	9	348	Maniklal Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
550	9	1387	Maniklal Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
551	9	277	Manju Dumre	Residential	Residential	2.5	Frame Structure	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
552	9	198	Manju Khanal	Residential	Residential	3.5	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
553	9	735	Manmaya Gurung	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
554	9	49	Manmaya Manandhar	Residential	Residential	3.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
555	9	373	Manoj Tiwari	Residential	Residential	1	Frame Structure	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
556	9	75	Manrupa Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
557	9	1124	Manu Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
558	9	-	Masjid	Religious	Community Buildings		Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
559	9	315	Mathura Pathak	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
560	9	-	Mathura Regmi	Residential	Residential	1	Load Bearing	Jasta	Goreto	0	No	Yes	Yes		Khaniyapati Tole	Permanent
561	9	311	Maya Tiwari	Residential	Residential	2.5	Frame Structure	RCC+Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
562	9	60	Mayadevi Kandel	Residential	Residential	1.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
563	9	828	Mayadevi Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
564	9	84/91	Meena Palli Magar	Residential	Residential	2.5	Frame Structure	RCC	Odare Pandera Hudai Bagal Danda	8	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
565	9	5	Meg Bahadur Gaha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
566	9	1063	Megh Bahadur Rana	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
567	9	987	Mekh Bahadur Kunwar	Commercial	Commercial	1	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
568	9	257	Min Bahadur Gurung	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
569	9	25	Min P. Paudel	Residential	Residential	2	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
570	9	251	Min Prasad Subedi	Commercial	Commercial	1	Kachi (Block)	Jasta	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Jaycees Tole	Permanent
571	9	920	Mina Aryal	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
572	9	82/105	Mina Khadka	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
573	9	79	Mina Kumari Subedi	Residential	Residential	2	Frame Structure	RCC	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
574	9	92	Mina Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
575	9	375	Mina Sharma Pangeni	Residential	Residential	3.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
576	9	64	Mina Thapa	Residential	Residential	3	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
577	9	190	Minlal Karmacharya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
578	9	34/108	Mithalal Baniya	Residential	Residential	1	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
579	9	146	Mithu Miya	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
580	9	1611	Mohamath Kalam	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
581	9	157	Mohammud Noor	Residential	Residential	2	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
582	9	73	Mohan Kumari B.K.	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
583	9	856	Mohan Laxmi	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
584	9	312	Mohan Naseer Kha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
585	9	115/15	Mukti Prasad Pandey	Residential	Residential	2.5	Frame Structure	RCC	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
586	9	330	Mukti Subedi	Residental+Commercial+Ward Office	Administrative	3	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
587	9	379	Muna Devi Bhattrai	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
588	9	34/104	Mustafa Miya+Amina Begam	Residential	Residential	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
589	9	117/47	Nagarpalika Office	Government	Administrative	3	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
590	9	110	Nagarpalika Vegetable Collection Centre	Government	Administrative	1	Truss	Jasta	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
591	9	1183	Nanda Bir Thapa	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
592	9	150/93	Nanda Kumari Tiwari	Residential	Residential	1	Kachi (Mud Mortar)	Jasta	Goreto	0	No	Yes	Yes		Nayagaun	Permanent
593	9	448	Nanda Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
594	9	507	Nandakala Tiwari	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
595	9	64	Nara Bahadur Shrestha	Residential+Commercial	Residential+Commercial	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
596	9	117/36	Narayan Dutta Poudel	Residential+Bank/Finance	Financial	3.5	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
597	9	307	Narayan Gaudel	Residential	Residential	1	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
598	9	2239	Narayan Koirala	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
599	9	19	Narayan P Tiwari	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
600	9	202	Narayan Pangeni	Residential(Under Construction)	Residential	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
601	9	1621	Narayan Prasad Koirala	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
602	9	28	Narayan Prasad Subedi	Furniture Industry	Industrial	1	Jasta	Jasta	B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
603	9	441	Narayan Prasad Subedi	Residential	Residential	3	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
604	9	41	Narayan Shrestha	Residential+Bank/Finance	Financial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
605	9	170/170	Narayan Subedi	Residential	Residential	2	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
606	9	46	Narayan Tiwari	Residential	Residential	2	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Permanent
607	9	387	Narayan Tiwari	Residential	Residential	1	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
608	9	762	Narayan Tiwari	Commercial	Commercial	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
609	9	56	Narendra Joshi	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
610	9	67	Narendra Joshi	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
611	9	78/32/7	NauMaya Gurung(UC)	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
612	9	114	Nawal Bahadur Thapa	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
613	9	1407	Netra Kumari Bhattrai	Residential	Residential	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
614	9	1089	Netra Kumari Kunwar	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
615	9	141	Netra Prasad Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC+Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
616	9	82/64	Netra Prasad Khanal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
617	9	180	Netra Prasad Parajuli	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
618	9	224	Netra Regmi	Residential	Residential	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
619	9	313/39	Nilkantha Kafle	Cinema Hall(Commercial)	Industrial	2	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
620	9	154	Niru Pandey	Residential	Residential	3.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
621	9	333	Niru Thapa	Residential	Residential	1	Load Bearing	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
622	9	197	Nitu Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
623	9	179	Om Bahadur Pariyar	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
624	9	419	Om Bahadur Sen	Residential+Commercial+Bank/Finance	Financial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
625	9	801	Om Bahadur Thapa	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
626	9	860	Om P Pangani	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
627	9	312	Om Prakash Aryal	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
628	9	189	Om Prakash Bagale	Garage	Garage	1	Kachi (Brick Masonary)	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
629	9	217	Om Prakash Pangani	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
630	9	178	Om Prakash Pangeni	Residential	Residential	2.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	joisi pandera	Permanent
631	9	286/36	Om Prasad Bagale	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
632	9	279	Om Prasad Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Bolbom Chowk-Nayabajar Marg	14	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
633	9	508	Om Prasad Shrestha	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
634	9	1035	Pabitra Kumari Khand	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
635	9	318	Padam Bahadur Sinjali	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
636	9	959	Padam Bahadur Sotu Magar	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
637	9	1551	Padam Bahadur Thapa	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
638	9	20/36	Padam Basnet	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu.Tole	Permanent
639	9	440/127	Padam Prasad Subedi	Residential	Residential	2.5	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
640	9	117/46	Padam Prasad Subedi	Commercial	Commercial	1	Truss	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
641	9	1403	Padam Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
642	9	1559	Padham B Saru	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
643	9	28	Pandit Pangeni	Residential	Residential	2.5	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
644	9	158	Parbati Gaha	Residential	Residential	2	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
645	9	755	Parbati Pangeni	Residential+Furniture	Industrial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
646	9	33	Parbati Parajuli	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Vitri Sadak	12	Yes	Yes	Yes	Gravelled	Nanipani Tole	Permanent
647	9	138/2	Patanjali Yog Pith	Institutional	Institutional	1	Frame Structure	RCC	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
648	9	138/1	Patanjali Yog Pith	Institutional	Institutional	1	Frame Structure	RCC	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
649	9	138/4	Patanjali Yog Pith	Institutional	Institutional	2	Frame Structure	RCC	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
650	9	138/3	Patanjali Yogpith	Institutional	Institutional	2	Frame Structure	RCC	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Permanent
651	9	263	Pimala Pandey	Commercial	Commercial	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
652	9	166	Pitambar Gaihre	Residential	Residential	2.5	Frame Structure	RCC	Nagapalikaa Marg	12	Yes	Yes	Yes	Pitch	katauje	Permanent
653	9	84	Pitambar Gaihre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
654	9	49/73	Pitambar Subedi	Residential	Residential	1	Kachi	Jasta	Goreto	0	No	Yes	Yes	Earthened	Sano Katauje	Permanent
655	9	343	Pitambar Tiwari	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
656	9	911	Pitambar Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
657	9	902	Pitambar Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
658	9	41	Pitambar Tiwari	Residential	Residential	1	Kachi	Jasta	Waling Bajar Vitri Sadak	12	Yes	Yes	Yes	Gravelled	Nanapani Tole	Permanent
659	9	816	Pitamber Shrestha	Residential+Mega Bank	Financial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
660	9	1070	Pitamber Tiwari	Commercial	Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
661	9	951	Police Bit	Security	Administrative	1	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
662	9	126/35	Pom P. Subedi	Residential	Residential	2	Frame Structure	RCC	Goreto(2 wheeler)	4	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
663	9	103	Pradip Bagale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
664	9	5	Prashuram Tiwari	Residential	Residential	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
665	9	341	Pratap B.K.	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
666	9	408	Pratap Thapa	Residential+Janata Bank	Financial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
667	9	225	Pratima Thapa	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
668	9	923	Prek Kumari Regmi	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
669	9	34/37	Prem B Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
670	9	1103	Prem Bahadur Thapa	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
671	9	1108	Prem Narayan Aryal	Commercial	Commercial	1	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
672	9	405	Prem Narayan Subedi	Residential	Residential	1	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
673	9	605	Prem P. Gaire	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
674	9	996	Prem Prasad Paudel	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
675	9	170/144	Prem Subedi	Residential	Residential	1	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
676	9	129	Pritam B.K.	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
677	9	960	Prithvi Raj Bhusal	Residential+Jyoti Bikas Bank+Kamana Sewa Bank	Financial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
678	9	218	Public Hall	Community Hall	Community Buildings	2	RCC+Truss	Jasta	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Waling Maidan	Permanent
679	9	470	Public Toilet	Government+Commercial	Administrative	3	Frame Structure	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
680	9	910	Public Waling Club	Community House	Community Buildings	2	Truss	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
681	9	82/100	Puja Bhusal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
682	9	124/35	Punarkala Dumre	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
683	9	82/117	Purna Bahadur Gurung	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Kataharbot Tole Marg	20	Yes	Yes	Yes	Pitch	Uhdyog Banijya Tole	Permanent
684	9	89	Purna Chandra Kandel	Residential	Residential	2	Kachi (Stone Masonary)	Khar	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
685	9	118/99	Purnachandra Kandel	Residential	Residential	2	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
686	9	907	Purushuttam Gaihre	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
687	9	229	Pushpa Thapa	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
688	9	410	Pushpa Tiwari	Residential	Residential	3.25	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
689	9	383	Pushpa Tiwari	Residential+Commercial	Residential+Commercial	4	Frame Structure	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
690	9	410/1	Pushpa Tiwari(Associate)	Goth	Temporary	1	Load Bearing	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Temporary
691	9	330	Rabindranath Pangeni	Residential	Residential	1	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
692	9	275	Radha Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Khaniyapati	Permanent
693	9	529	Raghupati Lamsal	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
694	9	829	Ragupati Lamsal	Residential+Garima Bikas Bank	Financial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
695	9	84/121	Rajan Bagale/Cholakanta Bagale	Residential	Residential	2	Frame Structure	RCC+Jasta	Odare Pandera Hudai Bagal Danda	12	Yes	Yes	Yes	Earthened	Katauje Tole	Permanent
696	9	464	Rajeev Tiwari	Residential	Residential	3	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
697	9	115	Rajendra Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
698	9	227	Rajendra Kandel	Residential	Residential	3	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
699	9	1002	Rajendra Pangeni	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
700	9	82/58	Rajendra Prasad	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
701	9	34/47	Rajendra Shrestha	Residential	Residential	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
702	9	189	Rajesh Subedi	Shine Village Int'l Academy	Educational	1	Frame Structure	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
703	9	207	Rajita Miya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
704	9	159	Raju B.K.	Garage	Garage	1	Load Bearing	Jasta	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
705	9	472	Raju B.K.	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
706	9	446	Raju BK	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
707	9	456	Raju Gurung	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
708	9	358/34	Raju Khand	Commercial	Commercial	1	RCC+Truss	Jasta	Bolbom Chowk-Nayabajar Marg	12	Yes	Yes	Yes	Pitch	Bolbom	Permanent
709	9	350	Raju Khand	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
710	9	99	Raju Koirala+Sudan Shrestha	Commercial(The Jungle Resort+Departmental Store)	Industrial	7	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
711	9	249	Raju Malla	Residential	Residential	1	Kachi	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
712	9	1040	Raju Pangeni	Commercial(Furniture)	Industrial	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Temporary
713	9	477	Raju Thapa	Commercial	Commercial	4	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
714	9	362	Raju Tiwari	Residential+Commercial	Residential+Commercial	2	RCC+Truss	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
715	9	756	Raju Tiwari	Temporary	Temporary	1	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
716	9	807	Raju Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
717	9	1069	Ram Bahadur Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
718	9	14	Ram Bhakta Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
719	9	57	Ram Chandra Aryal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Udhyog Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijay Tole	Permanent
720	9	1399	Ram Chandra Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
721	9	274	Ram Chandra Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
722	9	226	Ram maya	Residential	Residential	3.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
723	9	325	Ram Prakash Parajuli	Residential+Finance	Financial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
724	9	442	Ram Prasad Adhikari	Residential	Residential	3	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
725	9	934	Ram Prasad Aryal	Residential+Gandaki Bikas Bank	Financial	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
726	9	761	Ram Prasad Aryal+Prakash Koirala	Garage(Temporary)	Garage	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Temporary
727	9	803	Ram Prasad Lamsal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
728	9	473	Ram Prasad Shrestha	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
729	9	337	Ram Prasad Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
730	9	242	Ram Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
731	9	33	Rama Kanta	Residential	Residential	2	Frame Structure	RCC	Udhyog Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
732	9	489	Rama KC	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
733	9	1058	Ramchandra Acharya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
734	9	848	Ramchandra Kafle	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
735	9	2247	Ramchandra Koirala	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Dumrikot-B.P. Chowk-Bhimtari-Kharibot	20	Yes	Yes	Yes	Pitch	Kharibot	Permanent
736	9	26	Ramesh Bhusal	Commercial	Commercial	1	Kachi (Block)	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
737	9	174	Ramesh Tiwari	Residential	Residential	3.5	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Earthened	Jaisi Pandhera	Permanent
738	9	201	Rameshwor Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
739	9	493	Rana Bahadur Aale	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
740	9	364	Rana Bahadur Sunar	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Chowk	Permanent
741	9	88	Ranamaya Gurung	Residential	Residential	1	Load Bearing	Jasta	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
742	9	38	Ranjita Lamichhane	Residential	Residential	2	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
743	9	74/45	Renuka Kunwar	Residential	Residential	3	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
744	9	1008	Resham Raj Bhattrai	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
745	9	247	Resham Raj Koirala	Residential	Residential	1	Kachi	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
746	9	939	Reshmilal Koirala	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
747	9	82	Rice Mill	Industry	Industrial	1	Kachi (Stone Masonary)	Jasta	City Hall Marg	12	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
748	9	46	Rima KC	Residential	Residential	3.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
749	9	170/307/44	Rishiram Subedi	Residential	Residential	1.5	Frame Structure	RCC	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
750	9	46	Risiram Tiwari	Residential	Residential	3	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
751	9	188	Ritu Bhujel	Residential	Residential	2	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
752	9	304	Roshan Shrestha+Tulsiram Upadhyaya	Residental+Sunrise Bank	Financial	4.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
753	9	102	Rudra Bagale	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
754	9	629	Rudra Gurung	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
755	9	106	Rudra P Bagale	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
756	9	365	Rukmangat Aryal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
757	9	350	Runnafa Bagale	Residental+Rice Mill	Industrial	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
758	9	1341	Rupnarayan Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
759	9	116	Saaru Furniture	Commercial	Commercial	1	Jasta	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Temporary
760	9	116/1	Saaru Furniture(Associate)	Commercial	Commercial	1	Jasta	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Temporary
761	9	479	Sabitri Sharma	Residential+Commercial+Bank/Finance	Financial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
762	9	1453	Sairam Miya	Residential	Residential	3.5	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
763	9	1055	Sakina Nisha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
764	0	451	Sangeeta Kumari Gaihre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
765	9	1237	Sangita Aryal	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
766	9	74/39	Sangita Poudel Kafle	Residential	Residential	2.5	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
767	9	304	Sansuddin Miya	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
768	9	189	Sapana Regmi	Residential	Residential	3	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
769	9	38	Sara Bahadur Gurung	Residental+SBI Bank	Financial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
770	9	117/41	Sarada Pangeni	Residential	Residential	2	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	katauje	Permanent
771	9	170/178	Saraswoti Giri	Residential	Residential	1	Frame Structure	RCC	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
772	9	34/88	Saraswoti Khand	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
773	9	124/36	Saraswoti Malla	Residential	Residential	2.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Nayabajar	Permanent
774	9	117/42	Saraswoti Pangeni	Residential+Bank/Finance	Financial	3	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
775	9	488	Saraswoti Regmi	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
776	9	153	Sarfaraj	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
777	9	107	Sarita Bagale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
778	9	129	Sarita Kafle Aryal	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
779	9	1165	Saunarayan Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
780	9	1001	Sayera Khand	Residetial+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
781	9	195/62	Seshkanta Subedi	Residential	Residential	2	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
782	9	1107	Shal Bahadur Rana	Residential+Commercial	Residential+Commercial	5.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
783	9	1223	Shalikram Bhattrai	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
784	9	214	Shalikram Malla	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
785	9	849	Shambhu Sharan Kalawar	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
786	9	27	Shankar Shrestha	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
787	9	615	Shankar Subedi	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
788	9	320	Shanta Kumari Adhikari	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
789	9	1016	Shashi Thapa	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
790	9	126	Shesh Maya Aale	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
791	9	27	Sheshkant Tiwari	Commercial	Commercial	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
792	9	288/21	Shiva Aryal	Commercial	Commercial	1	Kachi (Block)	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
793	9	120	Shiva Bhusal	Residential	Residential	3.5	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Jaycees Tole	Permanent
794	9	1229	Shiva KC	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
795	9	63	Shiva Kumari Ringjali	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC+Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
796	9	136	Shiva Pandey	Residential	Residential	3	Frame Structure	RCC	Katauje -Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
797	9	178	Shivahari Neupane	Residential	Residential	1	Frame Structure	RCC	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Nayagaun	Permanent
798	9	1024	Shivakanta Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
799	9	137	Shivalal Dumre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Earthened	Jaisi Pandhera	Permanent
800	9	1003	Shova Kha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
801	9	332	Shova Kumari Soti	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
802	9	452	Shova Poudel	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
803	9	138/17	Shree Krishna Udhyog	Commercial(Furniture)	Industrial	1	Kachi	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
804	9	111	Shree Laxmi Narayan Temple	Temple	Community Buildings	2	RCC+Jasta	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
805	9	118	Shrijana Panta	Residential	Residential	3.5	Frame Structure	RCC	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Jaisai Pandhera	Permanent
806	9	1575	Shukuran Khan	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
807	9	410	Shuvam Party Palace	Party Palace	Industrial	2	Frame Structure	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
808	9	695	Shyam Bahadur Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
809	9	465	Shyam Dhiraj Malla	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
810	9	1017	Shyam Prasad Aryal	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
811	9	876	Shyam Prasad Gaihre	Commercial	Commercial	1	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
812	9	531	Shyam Prasad Gaihre	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
813	9	118/81	Shyam Prasad Kandel	Residential	Residential	2	Kachi (Mud	Jasta	Nayagaun Marg	20	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
							Mortar)									
814	9	455	Shyam Prasad Subedi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
815	9	113	Sita B.K.	Residential	Residential	2.5	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
816	9	385	Sita Kunwar	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P.Tole	Permanent
817	9	1007	Sita Marasaini Lamsal	Residential+Commercial	Residential+Commercial	3	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
818	9	1041	Sita Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
819	9	729	Sitaram Adhikari	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
820	9	927	Sitaram Adhikari	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
821	9	223	Sitaram Tiwari	Residential	Residential	1.5	Frame Structure	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
822	9	916	Sitaram Tiwari	Commercial	Commercial	1	Kachi (Brick Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
823	9	245	Som Bahadur Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
824	9	67	Som Kumar Gurung	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC+Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
825	9	885	Subash Thapa	Residential	Residential	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
826	9	671	Subid Bahadur Chhetri	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
827	9	123	Sudan Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
828	9	372	Sudan Shrestha	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
829	9	813	Sudan Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
830	9	34/70	Sudip Khand	Residential	Residential	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
831	9	212	Sukamaya Masarangi	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
832	9	117/21	Sulochana Shrestha	Residential	Residential	2	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
833	9	121	Suman Bagale	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
834	9	137	Sundar B.K.	Residential	Residential	3	Frame Structure	RCC	Kedarnath Marg	20	Yes	Yes	Yes	Gravelled	Nayabajar	Permanent
835	9	20/9	Sunita Joshi	Residential	Residential	2	Frame Structure	RCC+Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
836	9	1599	Sunmaya Thapa	Residential	Residential	2	Kachi (Block)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
837	9	98	Sur Bahadur Bhujel	Residential	Residential	2	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
838	9	82/87	Suraj Pratap Khand	Residential+Commercial	Residential+Commercial	4	RCC+Truss	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
839	9	228	Surendra Malla	Residential+Pharmacy	Health Service	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
840	9	224	Suresh Shrestha	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
841	9	333/47/47	Survey Department	Residential	Residential	3	Frame Structure	RCC	Nagarpalika Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
842	9	1435	Surya Bahadur Kunwar	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
843	9	1561	Surya Prasad Koirala	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
844	9	49	Surya Prasad Parajuli	Residential	Residential	3	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
845	9	352	Surya Prasad Regmi	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
846	9	264	Surya Prasad Sharma	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
847	9	417	Surya Prasad Tiwari	Residential	Residential	1	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
848	9	480	Surya Tiwari	Residential+Commercial	Residential+Commercial	2	Frame Structure	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
849	9	175	Surya Tiwari	Residential	Residential	2	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
850	9	270	Sushila Aryal	Residential	Residential	3	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
851	9	117/29	Sushma Koirala	Residential	Residential	3	Frame Structure	RCC	Nagarpalika marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
852	9	150	Tamu Samaj Samiti	Community Hall + Religious Kyobo	Community Buildings	2	Frame Structure	RCC	Adhikhola Corridor	20	Yes	Yes	Yes	Earthen	Waling Maidan	Permanent
853	9	135	Tanka Bhusal	Commercial(Furniture)	Industrial	1	Kachi (Brick Masonary)	Jasta	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
854	9	34/112	Tanka Bhusal	Residential(Under Construction)	Residential	3	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
855	9	20/27	Tanka Kunwar	Residential	Residential	1	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
856	9	439	Tanka P. Tiwari	Residential	Residential	3.5	Frame Structure	RCC	Katauje-Kha Pa Dharachaur Jane Sadak	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
857	9	439/1	Tanka P. Tiwari(Associate)	Residential	Residential	1	Frame Structure	Jasta	Katauje-Kha Pa Dharachaur Jane Sadak	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
858	9	65	Tanka Prasad Bhusal	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
859	9	1579	Tanka Prasad Pangeni	Residential	Residential	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
860	9	525	Tanka Prasad Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	12	Yes	Yes	Yes	Gravelled	VIP Tole	Permanent
861	9	149	Tara Devi Ranpal	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
862	9	82/99	Taradevi Regmi	Residential	Residential	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
863	9	1625	Tau Bahadur Gurung	Residential+Commercial	Residential+Commercial	2	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
864	9	773	Tek Bahadur Bhujel	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
865	9	1125	Tek Bahadur Thapa	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
866	9	34	Teku Thapa	Residential	Residential	2	Frame Structure	RCC	Namuna Marg	12	Yes	Yes	Yes	Pitch	Katauje	Permanent
867	9	56	Temporary	Residential	Residential	1	Kachi	Jasta	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	Dumrikot	Temporary
868	9	105	Temporary	Residential	Residential	1	Jasta	Jasta	Patanjali Marg	20	Yes	Yes	Yes	Pitch	Patanjali	Temporary
869	9	-	Temporary	Temporary	Temporary	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
870	9	-	Temporary	Temporary	Temporary	1	Jasta	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
871	9	288/16	Thakur Prasad Bagale	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
872	9	344	Thakur Prasad Bagale	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
873	9	175	Thakur Prasad Subedi	Residential	Residential	2	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
874	9	121/28	Thakur Prasad Subedi	Residential	Residential	2	Frame Structure	RCC	Sahakarya Marg	12	Yes	Yes	Yes	Pitch	Kedarnath Tole	Permanent
875	9	82/40	Thaman Bahadur Aryal	Residential	Residential	2	Frame Structure	RCC	Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
876	9	303	Than Maya Gurung	Residential	Residential	3.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaycees Tole	Permanent
877	9	170/307/28	Than Prasad Subedi	Residential	Residential	1.5	Frame Structure	RCC+Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
878	9	34/23	Thug Kumari Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Kataharbot Tole Marg	12	Yes	Yes	Yes	Pitch	Kataharbot	Permanent
879	9	286/38	Tika Kumari Darji	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
880	9	289	Tika Kumari Khadka	Residential	Residential	2.5	Frame Structure	RCC	Pani Tank Jane Sadak	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
881	9	775	Tika Prasad Shrestha	Residential+Pharmacy	Health Service	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
882	9	20/33	Tika Ram Aryal	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Earthened	Vhu.Pu. Tole	Permanent
883	9	170/160	Tika Ram subedi	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
884	9	170/239	Tika Ram Subedi	Residential	Residential	2	Frame Structure	RCC+Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
885	9	639	Tikaram Giri	Residential+Commercial	Residential+Commercial	1	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kedarnath	Temporary
886	9	59	Tikaram Kafle	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Vhu. Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
887	9	121	Tikaram Tiwari	Residental+ime	Financial	3	Frame Structure	RCC	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
888	9	84/29	Tikaram Tiwari	Residential	Residential	2	Frame Structure	RCC	Odare Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
889	9	423	Til Kumari Thapa	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
890	9	332	Tilak Pangeni	Residential+Commercial	Residential+Commercial	3.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
891	9	1011	Tilakram Parajuli	Residential+Commercial	Residential+Commercial	4.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
892	9	296	Tirtha Raj Darji	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
893	9	867	Top Bahadur Rana	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Main Chowk	Permanent
894	9	745	Top Bahadur Thapa Chhetri	Residential+Commercial	Residential+Commercial	5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
895	9	79	Topala Pangeni	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
896	9	9	Toyalal Kandel	Residential	Residential	1.5	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun Dumrikot	Permanent
897	9	1059	Tuk Bahadur Rana	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
898	9	170/113/32	Tuk P. Subedi	Residential	Residential	1	Frame Structure	RCC	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
899	9	1013	Tukadevi Giri	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
900	9	399	Tulasa B.K.	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
901	9	307	Tulasi Bagale	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Khanepani Tank Jane Bato	12	Yes	Yes	Yes	Pitch	Katauje Tole	Permanent
902	9	12	Tulasiram Pangeni	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	Jasta	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
903	9	286/30	Tulkumari Malla	Residential+Finance	Financial	2	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
904	9	58	Tulsi Gurung	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
905	9	20	Tulsi Ram Pangeni(Associate)	Residential	Residential	2.5	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath	Permanent
906	9	117	Tulsi Regmi	Residential	Residential	2.5	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
907	9	326	Tulsi Tiwari	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
908	9	449	Tulsiram Bhattrai	Residential+Commercial+Bank/Finance	Financial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
909	9	286/21	Tulsiram Upadhyaya	Residential+Finance	Financial	2	Frame Structure	RCC	Pipalbot Tole Marg	8	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
910	9	265	Tum Kala Tiwari	Commercial	Commercial	1	Truss	Jasta	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot Tole	Permanent
911	9	1051	Ujeli Miya	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Jaisi Pandhera	Permanent
912	9	347	Ujeli Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
913	9	979	Ujeli Thapa	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
914	9	118/91	Uma Kala Kandel	Residential	Residential	2.5	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
915	9	680	Uma Kumari Basnet	Residential	Residential	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
916	9	1439	Umadevi Kunwar	Residential+Commercial	Residential+Commercial	1	Kachi (Stone Masonary)	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
917	9	97	Umadevi Kunwar	Residential+Commercial	Residential+Commercial	2	Frame Structure	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Pitch	Vhu.Pu. Tole	Permanent
918	9	333	Uman Sing B.K.	Commercial	Commercial	1	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Nayabajar	Permanent
919	9	53	Umesh Aryal	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
920	9	50·	Under Construction	Residential	Residential	3	Frame Structure	RCC	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath Tole	Permanent
921	9	441	Upakar Sahakari	Finance	Financial	2.5	Frame Structure	RCC	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya	Permanent
922	9	882	Upendra Raj Gaihre	Commercial	Commercial	1	Frame Structure	Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
923	9	414	Uyan Singh B.K.	Residential+Commercial	Residential+Commercial	2	Load Bearing	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Waling Bajar	Permanent
924	9	1589	Ved Prasad Pangeni	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kharibot	Permanent
925	9	431	Veshraj Subedi	Residential	Residential	3	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
926	9	195/80	Vim Lal Subedi	Residential	Residential	1	Kachi (Stone Masonary)	Jasta	Sahakarya Marg	12	Yes	Yes	Yes	Pitch	Sano Katauje	Permanent
927	9	103/1	Waling City Hall	Industrial	Industrial	1	Frame Structure	RCC	City Hall Marg	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
928	9	307	Waling Sahakari	Industry	Industrial	1	Kachi (Stone Masonary)	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Permanent
929	9	19/10	Waling Udyog Banidjya sangh	Institutional	Administrative	3	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
930	9	103	Waling Udyog Banijya Sang Karyalaya	Institutional	Administrative	3	Frame Structure	RCC	City Hall Marg	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
931	9	419	Yagya Prasad Gaihre	Temporary	Temporary	1	Jasta	Jasta	Sahakarya Marg	20	Yes	Yes	Yes	Pitch	Sahakarya Tole	Temporary
932	9	361	Yak Lal B.K.	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
933	9	138/44	Yam Bahadur Aale	Residential	Residential	1	Kachi	Jasta	Vhu.Pu. Tole Marg	12	Yes	Yes	Yes	Eathened	Vhu.Pu. Tole	Permanent
934	9	523	Yam Bahadur Aale	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
935	9	305	Yam Bahadur Gurung	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bolbom Tole	Permanent
936	9	77	Yam Bahadur Shrestha	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC+Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale Tole	Permanent
937	9	183	Yam Nath Pathak	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Nayabajar Marg	20	Yes	Yes	Yes	Pitch	Pipalbot	Permanent
938	9	123	Yamkala Kandel	Residential	Residential	3	RCC+Truss	RCC+Jasta	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Kandel Gaun	Permanent
939	9	170/113/43	Yamkala Subedi	Residential	Residential	2	Kachi (Stone Masonary)	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
940	9	51	Yem Bahadur Thapa	Residential+Commercial	Residential+Commercial	2	Frame Structure	RCC	Udhyog Banijya Tole Marg	12	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
941	9	1215	Yem Kumari Saaru	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent
942	9	1243	Yem Prasad Adhikari	Residential+Commercial	Residential+Commercial	6	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Sitalnagar	Permanent

S.N.	Ward No	House Number	House Owner	Category	Functional Type	Storied	Construction Type	Roof Type	Road Name	Road Width(in feet)	Vehicle Access	Electricity Access	Water Supply	Road Surface	Tole	House type
943	9	74	Yubaraj Aale	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
944	9	492	Yubraj Bagale	Residential + Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
945	9	357	Yubraj Pathak	Residential+Commercial	Residential+Commercial	4	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
946	9	290	Yubraj Subedi	Residential	Residential	2.5	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. TOle	Permanent
947	9	170/218	Yubraj Subedi	Residential	Residential	3	Kachi	Jasta	Thumka Marg	12	Yes	Yes	Yes	Earthened	Thumka	Permanent
948	9	419	Yubraj Subedi+Bhawana Subedi	Residential	Residential	3	Frame Structure	RCC	Dumrikot-B.P. Marg	20	Yes	Yes	Yes	Pitch	B.P. Tole	Permanent
949	9	185	Yukta Prasad Tiwari	Commercial	Commercial	1	Kachi	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
950	9	193	Yukta Tiwari	Residential	Residential	2.5	Frame Structure	Jasta	Nagarpalika Marg	20	Yes	Yes	Yes	Pitch	Katauje	Permanent
951	9	183	Not Availiable	Residential	Residential	1	Load Bearing	Jasta	Jaisi Pandhera Marg	20	Yes	Yes	Yes	Pitch	Joisi Pandera	Permanent
952	9	174/58	Not Availiable	Residential	Residential	2	Frame Structure	RCC	Jaisi Pandhera Vitri Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
953	9	174/40	Not Availiable	Residential	Residential	3	Frame Structure	RCC	Jaisi Pandhera Vitri Marg	12	Yes	Yes	Yes	Earthened	Katauje	Permanent
954	9	147	Not Availiable	Residential+Commercial	Residential+Commercial	1	Frame Structure	RCC	Jaycees Marg	20	Yes	Yes	Yes	Pitch	Udhyog Banijya Tole	Permanent
955	9	55	Not Availiable	Residential	Residential	1	Kachi	Jasta	Kedarnath Marg	12	Yes	Yes	Yes	Pitch	Kedarnath Tole	Permanent
956	9	78/32/15	Not Availiable	Residential	Residential	3	Frame Structure	RCC	Nayabajar-Baidikhet Marg	12	Yes	Yes	Yes	Earthened	Khaniyapati Tole	Permanent
957	9	967	Not Availiable	Residential+Commercial	Residential+Commercial	3	Frame Structure	RCC	Siddhartha Highway	36	Yes	Yes	Yes	Pitch	Waling Mode	Permanent
958	9	44	Not Availiable	Residential+Commercial	Residential+Commercial	2.5	Frame Structure	RCC	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Kataharbot Tole	Permanent
959	9	407	Not Availiable	Residential	Residential	1	Kachi	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	VIP Tole	Permanent
960	0	122/1	Not Availiable	Temporary	Temporary	1	Jasta	Jasta	Waling Bajar Sadak	20	Yes	Yes	Yes	Pitch	Bagale	Temporary
961	9	57/1	Not Availiable	Residential	Residential	1	Frame Structure	RCC	Waling Bajar Vitri Sadak	12	Yes	Yes	Yes	Gravelled	Nanapani Tole	Permanent
962	9	41/1	Not Availiable	Residential	Residential	1	Kachi	Jasta	Waling Bajar Vitri Sadak	12	Yes	Yes	Yes	Gravelled	Nanapani Tole	Permanent

6.5 Appendix: Maps

The all detailed base maps have been attached to separate volume.

Application

of

Geographic Information System (GIS)
on Resource Management in
Local Level Development

(Using QGIS Version 3.16.8)

HANDS-ON RESOURCE BOOK

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Prepared By:

Bhola Nath Dhakal, PhD
(*dhakalbn@gmail.com*, Tel: 9841381007)
Deepak Neupane
(*dneupane2003@gmail.com*, Tel: 9841227903)

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FOREWORD

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- Concept and Application of Spatial and Attribute Data Management
- Spatial Joining of Attribute Data in GIS (Hands on Exercise)
- Query Building (Hands on Exercise)
- Selection of Spatial Features using Attribute Query (Hands on Exercise)
- Selection of Spatial Feature using Select Location Query (Hands on Exercise)

Part 6: Statistical and Spatial Analysis
- Calculation and Measurement of Spatial Features
- Length and Area Calculation (Hands on Exercise)
- Use of Summarization Tools (Hands on Exercise)
- Concept on Geo Processing Tools and Application (Theory) (Hands on Exercise on Identify, Clip, Buffer, Intersection, Merge etc.)
- Selection of Spatial Features based on Buffer Area (Hands on Exercise)

Part 7: Output Design and Project Work
- Working on Mapping Field Properties (Hands on Exercise)
- Hands on Exercise for Labeling and Symbology
- Theoretical Concept on Cartographic Element of the Maps
- Cartographic Designing for Map Outputs
- Layout and Reporting Format of GIS Map Outputs

PROJECT WORK
- *Capture location of houses and other structures using GPS*
- *Capture location of house and other structures using Google Earth and Open Street Map(OSM)*
- *Conversion of captured spatial data and integration to GIS Data*
- *Joining Attribute or Socio-economic data to GIS Data*
- *Preparation of Street Map with Addressing*

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PART- I
Concept & Application of GIS and Software Management

Course Outline:

- Introduction to GIS, GIS Application, Opportunities and Development in Nepal
- Importance and Advantage of using GIS Application in Street Addressing
- Importance and Advantage of using GIS Application in Property Tax
- Software Installation (Hands on Exercise)
- Getting to know QGIS (Hands on Exercise)

Introduction

Recent reflection of the overall trend within society towards increasing reliance on the computer as a data handling and data analysis tool is becoming a part of science and art. The use of computers is twofold. First, extremely large and complex data sets can be both compactly stored and rapidly retrieved with mechanical accuracy. The use of automated techniques also, of necessity, imposes uniformity in both storage formats and methods for handling data. Second, many of the quantitative and analytical techniques developed in the earth/social sciences and many other disciplines are limited in their practical applications. Computers provide the capability to deal with the large volumes of observational data handling. At the same time the rapid changes in information communication technology have turned satellite imagery into a high value-added product. The integration of data from Global Positioning System (GPS), Remote Sensing (RS) and various other sources enhanced the use of computer technology. Therefore, the computer-based GIS are becoming necessary to the best advantage of the users.

Governmental agencies as a response to a new awareness and the agency in dealing with complex environmental and natural resources issues developed the first GIS in the middle 1960s. In the latter half of 1980s, Geographic Information System (GIS) has been developed as a field of scientific discipline based on both real world information as well as advanced electronic technology. In the beginning of 21st century GIScience (including both tools and science related with the spatial database handling and application for social welfare and economic development) is becoming one of the prominent scientific disciplines. The advancement of communication technology, computer application and realization of geographic data on social welfare and

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economic planning has been introducing the new concept of database management and using of GIS like geo-database, database infrastructure, data mining, GIS portal and web GIS. It is also integrated with other sciences of data acquisitions and analysis. Therefore GIS is becoming useful tool and science to interpret the natural and social phenomena in a 'holistic approach'.

Geo-coding Address

Geo-coding is the process of transforming a description of a location-such as a pair of coordinates, an address, or a name of a place-to a location on the earth's surface. We can geo-code by entering one location description at a time or by providing many of them at once in a table. The resulting locations are output as geographic features with attributes, which can be used for mapping or spatial analysis.

We can quickly find various kinds of locations through geocoding. The types of locations that we can search for included points of interest or names from a gazetteer, like mountains, bridges, and stores; coordinates based on latitude and longitude or other reference systems, such as the Military Grid Reference System (MGRS) or the U.S. National Grid system; and addresses, which can be in a variety of styles and formats, including street intersections, house numbers with street names, and postal codes.

From simple data analysis to business and customer management to distribution techniques, there is a wide range of applications for which geo-coding can be used. With geo-coded addresses, we can spatially display the address locations and recognize patterns within the information. This can be done by simply looking at the information or using some of the analysis tools available with GIS. We can also display our address information based on certain parameters, allowing us to further analyze the information.

About the Software

Quantum GIS (QGIS) is an Open Source GIS product. As such the Software is constantly developing and being improved upon by the World-wide GIS Community. QGIS is free and the source code is available for those who want to improve or customize the interface/tools. The training material is based on latest stable release that was available at the time of this manual writing. This training manual is based on QGIS Version 3.16.8.

To download the latest version of QGIS, visit the official QGIS website http:// www.qgis.org/

Training Materials

QGIS Version 3.16 (Already Downloaded) is located on our computer C:\QGIS Training\Software\ Folder. Details training manual and other learning materials are available in C:\QGIS Training\Manual\ Folder. The training data is located in C:\QGIS Training\Data\ Folder.

Software Installation

For 64 bit processor:

Double click the following .exe file located in C:\QGIS Training\Software Folder

QGIS-OSGeo4W-3.16.8-1-Setup-x86_64.exe
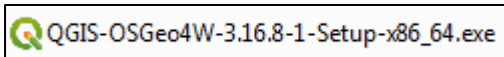
After successful installation of QGIS Desktop Version 3.16, we should see following shortcut icons in QGIS3.13 folder located in our computer's desktop.

OSGeo4W Shell	08/07/2021 17:03	Shortcut	2 KB
QGIS Desktop 3.16.8 with GRASS 7.8.5	08/07/2021 17:03	Shortcut	2 KB
Qt Designer with QGIS 3.16.8 custom wid...	08/07/2021 17:03	Shortcut	3 KB
SAGA GIS (2.3.2)	08/07/2021 17:03	Shortcut	3 KB
QGIS Desktop 3.16.8	08/07/2021 17:03	Shortcut	2 KB

❖ Copy QGIS Desktop 3.16.8 to the desktop for ease of access.

For 32 bit processor:

Download and install QGIS-OSGeo4W-3.16.8-1-Setup-x86_32.exe from http://www.qgis.org/

The QGIS Graphical User Interface (GUI)

There is QGIS Icon on our computer which is labelled QGIS Desktop 3.16.8. Double click this icon to open QGIS. When QGIS starts, it is presented with following GUI.

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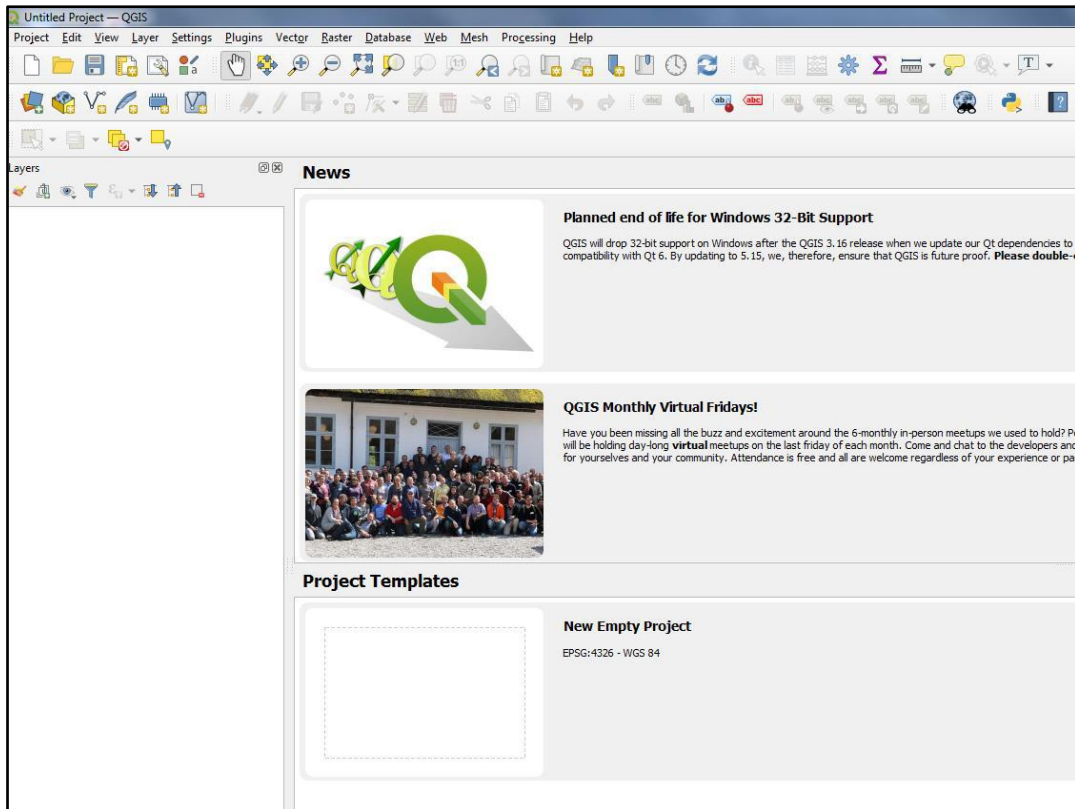
Click on New Emtpy Project.
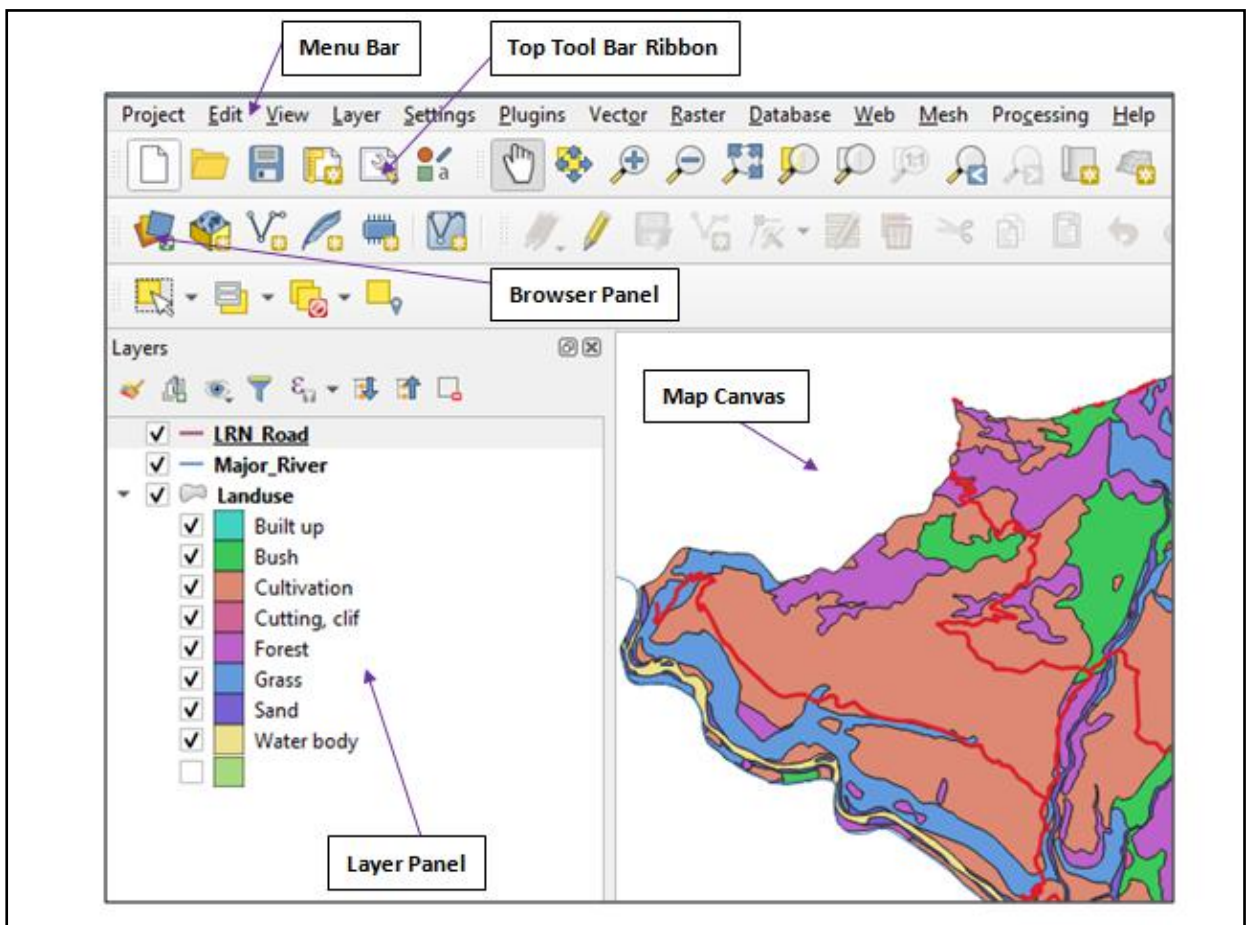
1.0 Menu and Tool Bar:

Our most often used sets of tools can be turned into toolbars for basic access. For example, the File toolbar allows us to save, load, print, and start a new project. We can easily customize the interface to see only the tools we use most often, adding or removing toolbars as necessary via the *View ►Toolbars* menu.Even if they are not visible in a toolbar, all of our tools will remain accessible via the menus. For example, if we remove the *File* toolbar (which contains the *Save* button), we can still save our map by clicking on the *Project* menu and then clicking on *Save*.

2.0 The Layer Panel:

In the Layer Panel, we can see a list, at any time, of all the layers available to us. Expanding collapsed items (by clicking the arrow or plus symbol beside them) will provide us with more information on the layer's current appearance. Hovering over the layer will give us some basic information: layer name, type of geometry, and the complete path of the location on our device. Right-clicking on a layer will give us a menu with lots of extra options. We will be using some of them before long, so take a look around!

3.0 The Browser Panel

The QGIS Browser is a panel in QGIS that gives us easily navigates in our database. We can have access to common vector files (e.g. ESRI Shapefile or MapInfo files), databases (e.g. PostGIS, Oracle, SpatiaLite, GeoPackage or MSSQL Spatial) and WMS/WFS connections. We can also view our GRASS data. If we have saved a project, the Browser Panel will also give us quick access to all the layers stored in the same path of the project file under in the Project Home item.

4.0 The Map Canvas

This is where the map itself is displayed and where layers are loaded. In the map canvas we can interact with the visible layers: zoom in/out, move the map, select features and many other operations.

PART – II
Introduction of QGIS Software and GIS Database Management

Course Outline:

- Tour in QGIS Software and Existing Exercise Data (Hands on Exercise)
- Introduction of QGIS Browser and QGIS Processing Tool Box (Hands on Exercise)
- Vector and Raster Models of GIS Data (Theory)
- Concept of Geo-database, Data Sources and Capturing Methods (Theory)
- GIS Database Management and Creating Feature Dataset using QGIS Browser (Hands on Exercise)

2: Exploring QGIS Desktop Application

A: Working with QGIS Browser

▪ **Introduction to QGIS Browser**

QGIS Browser is the QGIS module used for organizing, browsing, and managing our data and map documents, as well as for viewing and editing metadata. In many ways, QGIS Browse is similar to Windows Explorer. For instance, when we modify a file's location, or create or delete a file, we do not need to save the changes - it is done automatically. Since it is easy to delete files this way, we should be careful to delete *only* when you are *sure* that we will not need the file any longer.

● **Starting QGIS Browser**

Now we will start QGIS Browser and explore its contents. To start QGIS Browser clicks on Data Source Manager and navigate to Browser.

▪ **What is in QGIS Browser**

□ Select the directory **C:\GIS_Training\Training Data.** We will view the following data catalog. We can preview the geometry; attribute table and metadata of each feature data set in this Training Data folder using QGIS Browser.

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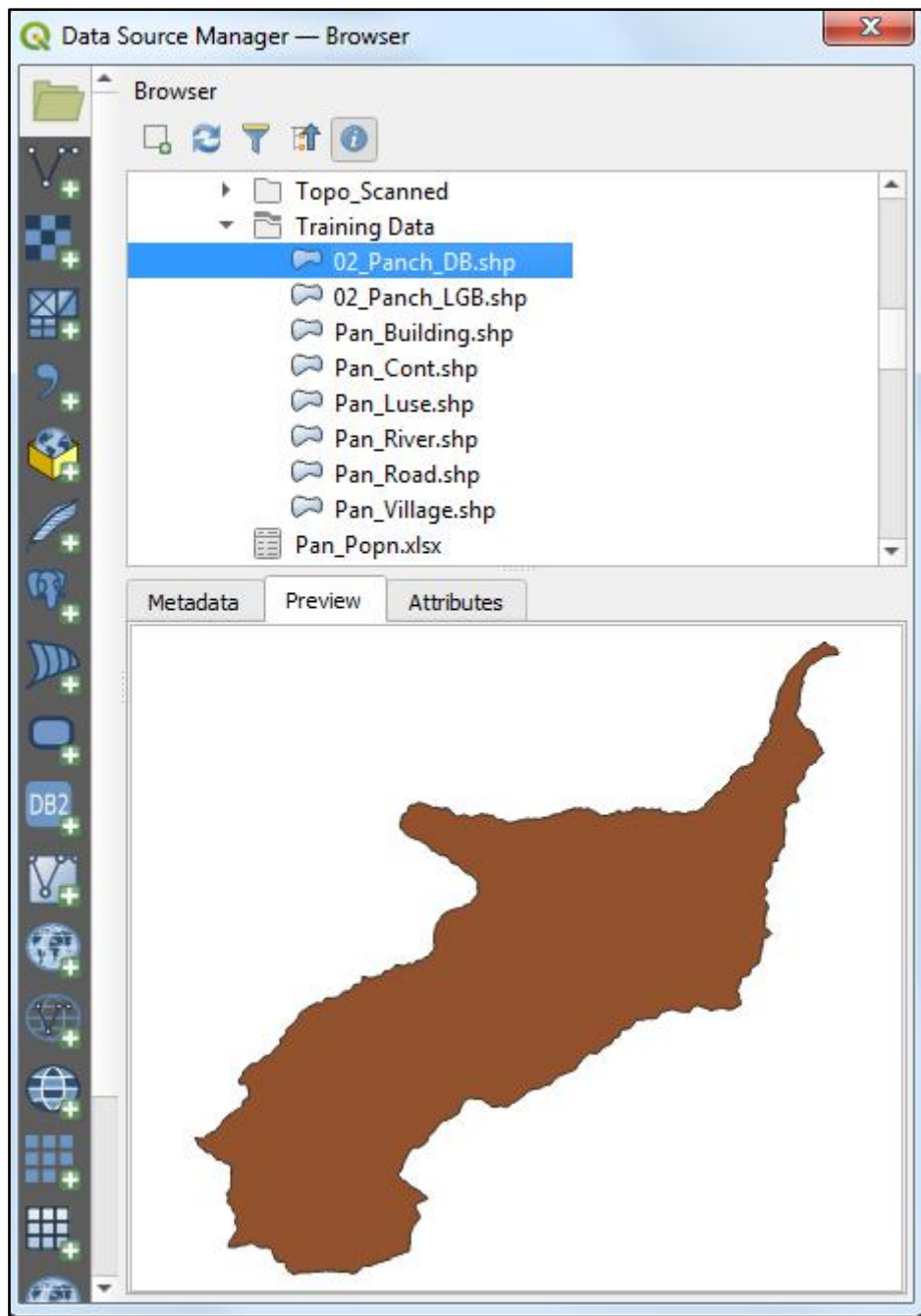
QGIS Browser is similar in structure to Windows Explorer. On the left hand side is a view of the Browser "tree" showing how the data is organized. The right hand side provides options for exploring the contents of the data shown in the Browser tree. We will notice that there are different icons used to represent the available folders and their contents. When QGIS Browser is initiated, it automatically looks for folders containing spatial data. Any spatial data it finds will be given a special icon to indicate the specific type of data in the file or folder.

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- **What can be done in QGIS Browser?**

For organizing data, QGIS Browser is quite easy to use. However, if we delete, move, or otherwise alter the data using QGIS Browser, it is permanent (i.e., if we delete a coverage, it is GONE-we cannot retrieve it). Data organizing in QGIS Browser is very similar to that in Windows Explorer. We can drag and drop coverages, shapefiles, or geo-databases into new workspaces, or we can use the Windows shortcut keys (Ctrl-C, Ctrl-X and Ctrl-V for copy, cut and paste, respectively).

Try this out by copying and pasting our lab data into a new folder.

Browsing through our data is simple using QGIS Browser. The Browser tree displays in a hierarchical fashion all of the items in the Browser, much like how data browsing is done through programs such as Windows Explorer.

Take a moment to explore the data in the Browser tree. We can use the arrow buttons on the keyboard, or the mouse to navigate. While navigating, pay attention to the changes that take place on the right hand side of the QGIS Browser window.

If you click on the "**Preview**" tab, we will see a preview of the data geography
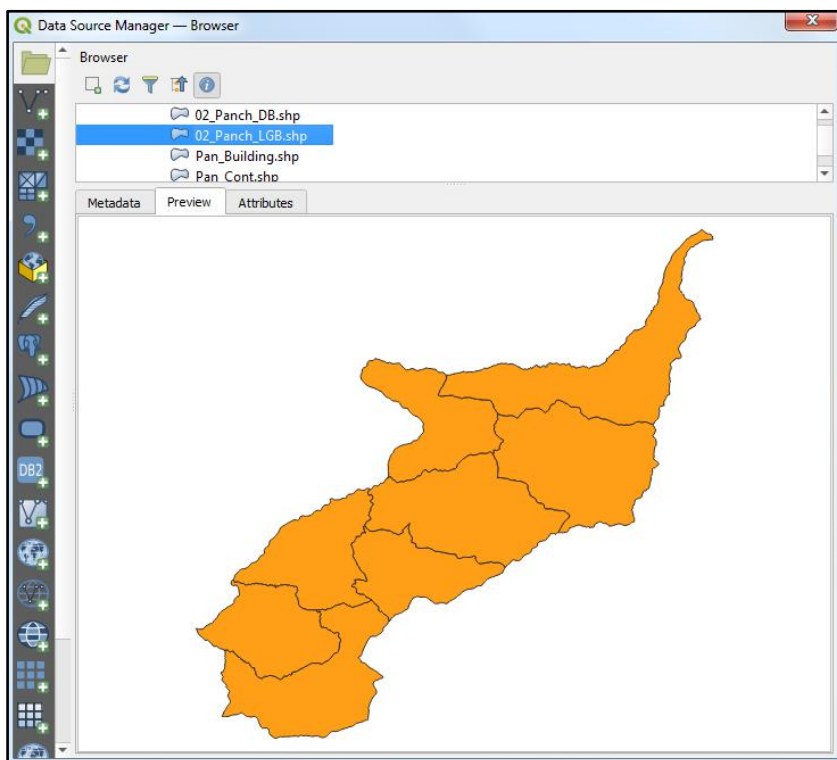
or the data attribute table. To change from geography view to table view (or vice versa), change the value listed in the preview pull down menu at the bottom of the Window.
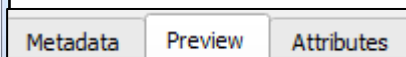
Click our mouse on those menu we will view the above info of our data catalog.

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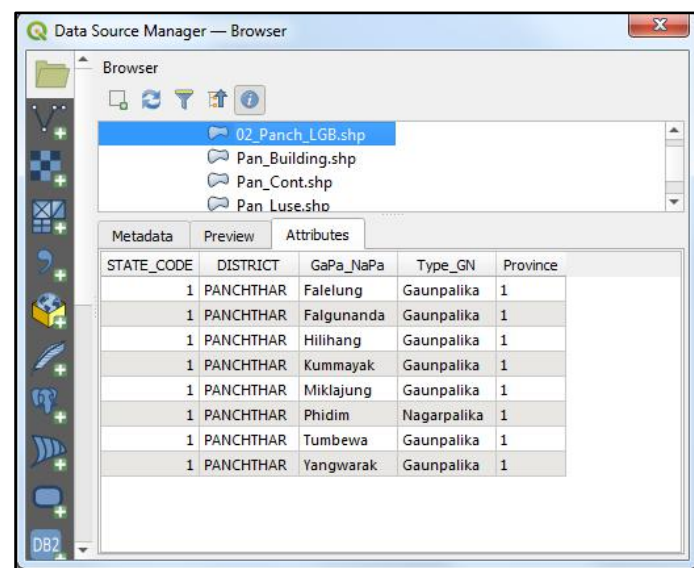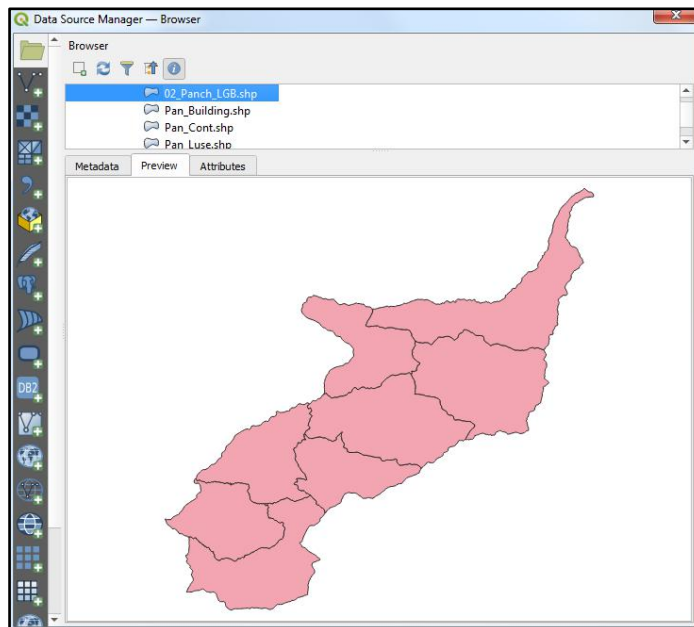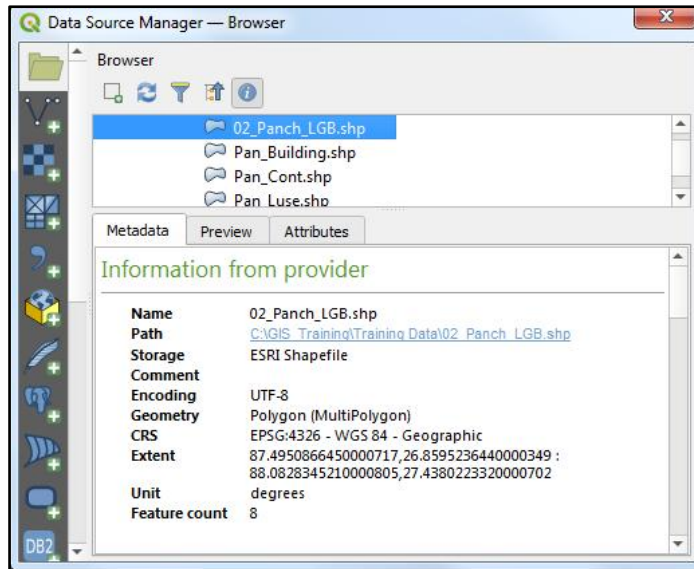
B: Working with QGIS Processing Toolbox

▪ **Introduction to QGIS Processing Toolbox**

QGIS Processing Toolbox is the QGIS module used for data processing, analysis, and conversion. It contains a large set of tools that allow for more specialized or complicated operations than those available in the various other modules. Processing Tool Box also provides a means for the user to write scripts and create customized tools to fit specialized needs.
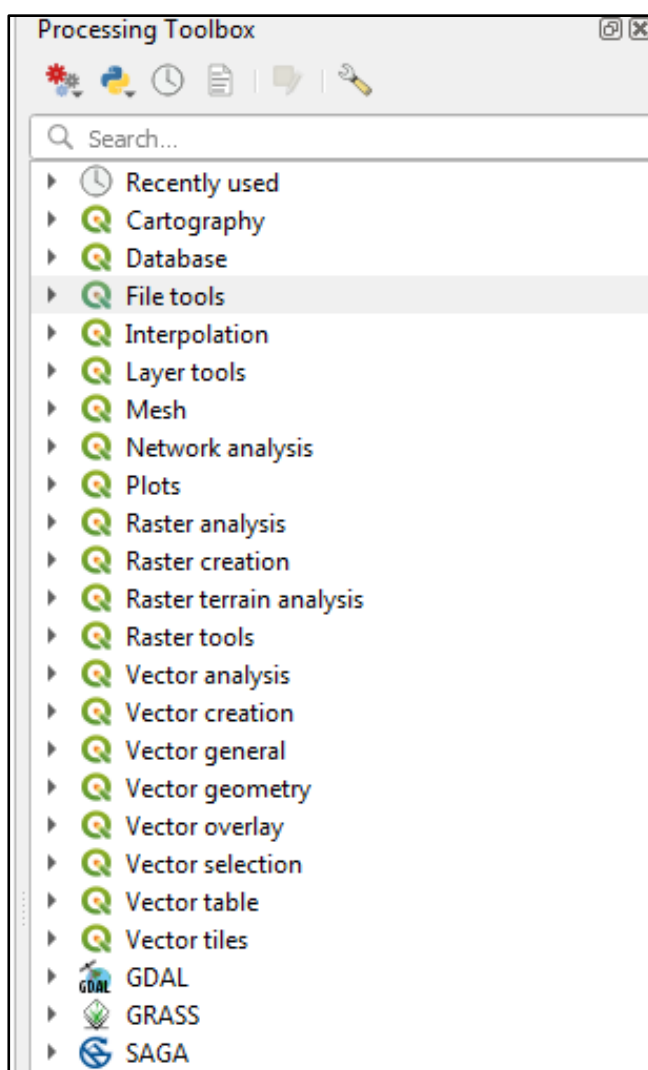
▪ **Starting QGIS Processing Toolbox**
To start Toolbox, click on **Processing Menu** in the main Menu Bar and then Click on Toolbox.

To run a tool, simply double-click on the specific tool we want to use. This will open a window for setting the various file inputs and outputs and other options related to the tool.

Adding our first layers
We will start the application, and create a basic map to use for examples and exercises.

The goal for this lesson: To get started with an example map.
    Note: Before starting this exercise, QGIS must be installed on our computer. Also, we should have copied training data to our computer.
Launch QGIS from its desktop shortcut, menu item, etc., depending on how we configured its installation.

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Creating and Exploring a Basic Map

1. Open QGIS. We will have a new, blank map.
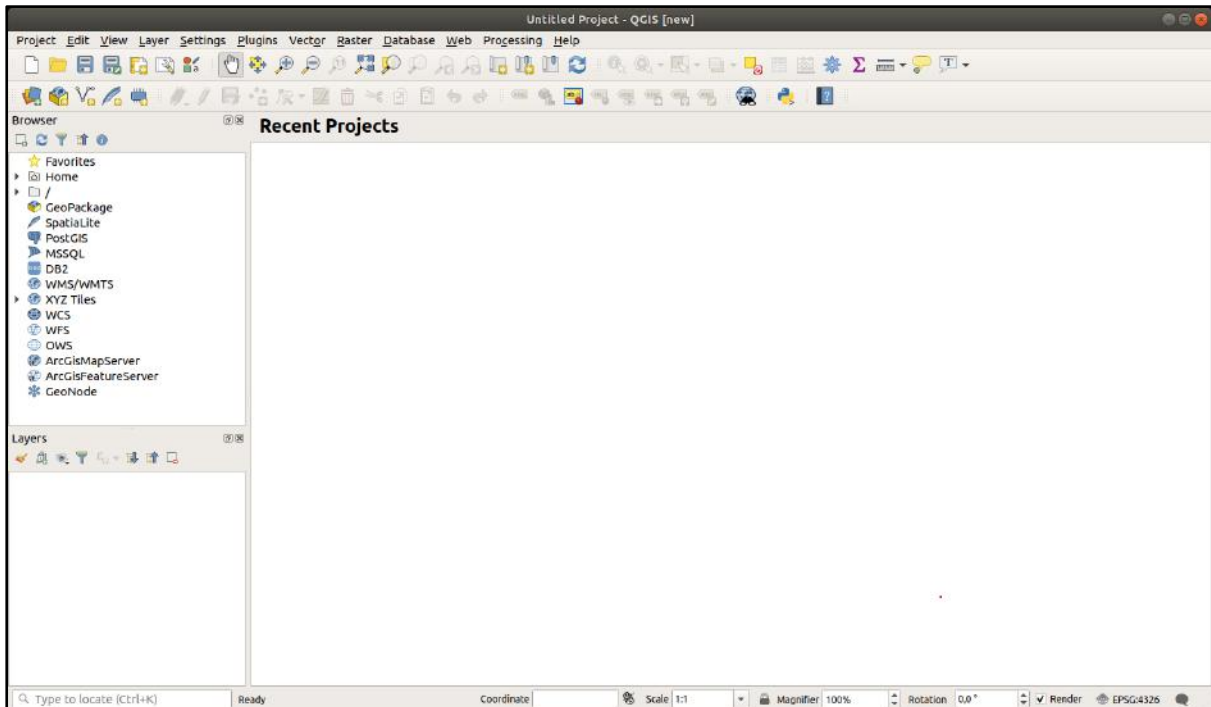
2. The ***Data Source Manager*** dialog allows us to choose the data to load depending on the data type. We'll use it to load our dataset: click the **Open Data Source Manager button.**

If we can't find the icon, check that the *Data Source Manager* Tool bar is enabled in the *View ►Toolbars* menu.

3. Load the Pan_LGB.shp vector dataset:

1. Click on the *Vector* tab.
2. Enable the *File* source type.

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3. Press the *…* button next to *Vector Dataset(s)*.
4. Select the training data/Pan_LGB.shp file in our training directory.
5. Click *Open*. We will see the original dialog, with the file path filled in.
6. Click *Add* here as well. The data we specified will now load: we can see a Local Unit Map item in the *Layers* panel (bottom left) with its features shown in the main map canvas.
7. Now load other vector dataset related to Panchthar district in our map canvas.
8. Click on the *Save As* button:
9. Save the map under a solution folder next to exercise_data and call it basic_map.qgz.

Navigating the Map Canvas

This section will focus on basic QGIS navigation tools used to navigate within the Map Canvas. These tools will allow us to visually explore the layers at different scales.

Pan:

1. In the *Map Navigation Toolbar*, make sure the Pan button is activated.
2. Move the mouse to the center of the Map Canvas area.
3. Left-click and hold, and drag the mouse in any direction to pan the map.

Zoom In:

1. In the *Map Navigation Toolbar*, click on the Zoom In button.
2. Move your mouse to approximately the your area of interest.
3. Left click and hold.
4. Then drag the mouse, which will create a rectangle
5. Release the left click. This will zoom in to include the area that you selected with your rectangle.

Zoom Out:

6. To zoom out, select the Zoom Out button and perform the same action as you did for zooming in.

As you pan, zoom in, or zoom out, QGIS saves these views in a history. This allows you to backtrack to a previous view.

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1. In the *Map Navigation Toolbar*, click on Zoom Last button to go to your previous view.

2. Click on Zoom Next button to proceed to move forward in your history. Sometimes after exploring the data, we need to reset our view to the extent of all the layers. Instead of trying to use the Zoom Out tool multiple times, QGIS provides us with a button to do that action for us.

1. Click on the Zoom Full Extent button.

As we zoomed in and out, it notice that the *Scale* value in the Status Bar changes. The *Scale* value represents the Map Scale. In general, the number to the right of: represents how many times smaller the object you are seeing in the Map Canvas is to the actual object in the real world.

We can also use this field to set the Map Scale manually.
1. In the Status Bar, click on the *Scale* text field.
2. Type in 50000 and press Enter. This will redraw the features in the Map Canvas to reflect the scale you typed in.
3. Alternatively, click on the options arrow of the *Scale* field to see the preset map scales.
4. Select *1:5000*. This will also update the map scale in the Map Canvas.

GIS DATA TYPES (Model/Structure of GIS Data)
<u>Vector Data:</u>
Vector data is the most common kind of data type we will find in the daily use of GIS. It describes geographic data in terms of points, known as vertices, that may connected to lines, poly lines and polygon. Vector data has feature constructed out of vertices, connected with lines to make poly lines or areas. Every discrete object in a vector dataset is called a feature, and is associated with attribute data that is that describes that feature.

Each feature and its attributes take up one row in the dataset table. Attributes are listed in the columns known as fields in the table. In QGIS a single dataset can only contain one type of data i.e. points, lines or polygon. These cannot (should not) be mixed within a dataset following good GIS/spatial data practice.

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Point   Line   Polygons
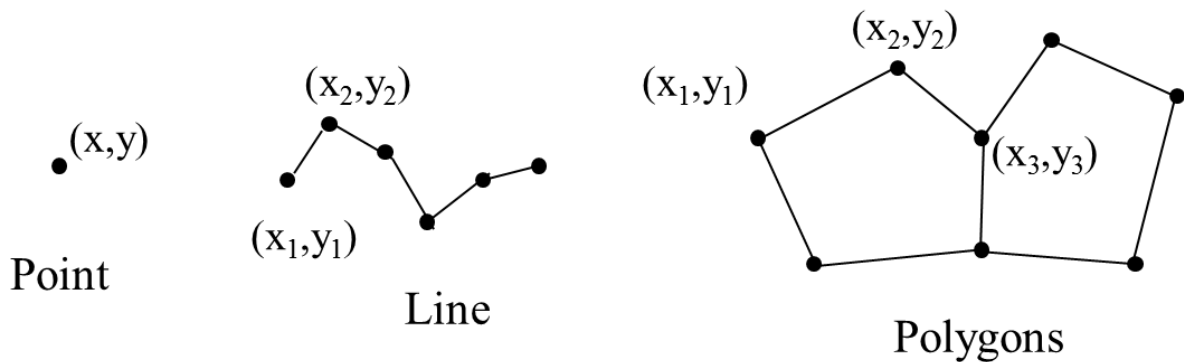
Raster Data:

Raster data is quite different from vector data, it is known as image. Although it may portray various properties of the data in the real world, these objects don't exist as separate object; rather they are represented using a grid of pixels (square boxes) of differing values usually associated with a color (but not always) in which case the pixels combine to make a picture. The size of the raster image is the number of squares on each side of the spatial resolution is the real world measurement of each pixel such as in satellite image (Google Earth). Each pixel grid square must contain a value (can be null) therefore raster images tend to be large (in bytes) as compared to a vector dataset.

There are two main types of raster image, geo-referenced and non-georeferenced. Georeferenced images can be mapped in GIS, non-georeferenced images (such as Logo) cannot. However, non-georeferenced images can georeferenced using a technique known as Geo-Registering the image by assigning some pixel (minimum 3) a real-world coordinate value usually relating to previously mapped visible feature in the image.

GIS DATA SOURCES

The most important and expensive component of the Geographic Information System is *Data* which is generally known as fuel for GIS. GIS data is combination of spatial (graphic) and attribute (tabular) data from various sources. A wide variety of data sources exist for both spatial and attribute data from the analog map, aerial photo, remote sensing, GPS, existing digital data, socio-economic data & others.

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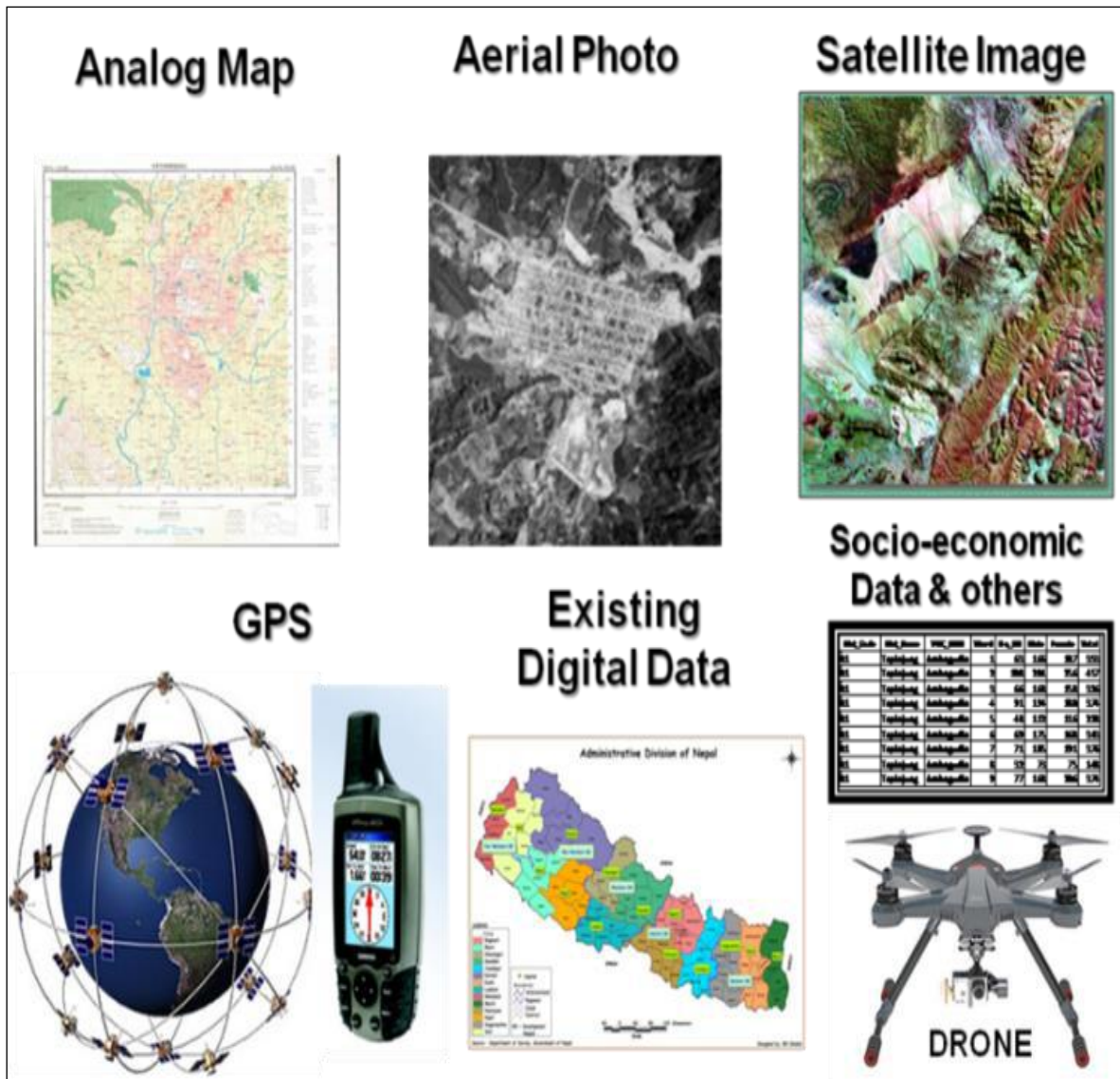
Concept of Geo-database/Geo Package in case of QGIS

The Geodatabase (ArcGIS) format has emerged as a very common format for storing and exchanging spatial data, particularly considering that it allows for the storage of multiple data layers, and for the storage of data layers that exceed the limits of other specifications. It is the native data structure designed to work in GIS as the primary data format (.gdb) used for editing and data management.

The GeoPackage (QGIS) format is an open container that allows us to store GIS data (layers) in a single file. GeoPackage is a special data package, has followed an OGC (Open Geospatial Consortium) standard data package that can store different kinds of spatial data types such as points, polyline, and polygon. We can save multiple layers into a single GeoPackage (. gpkg) file.

A GeoPackage is an open, standards-based, platform-independent, portable, self-describing, compact format for transferring geospatial information.

A Container for Linking Statistical & Geospatial Data

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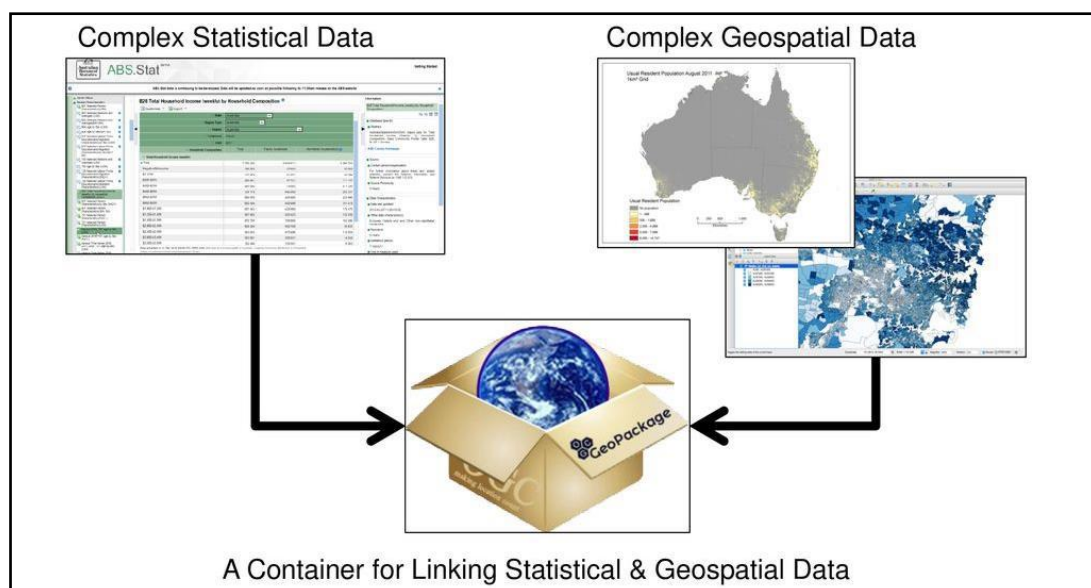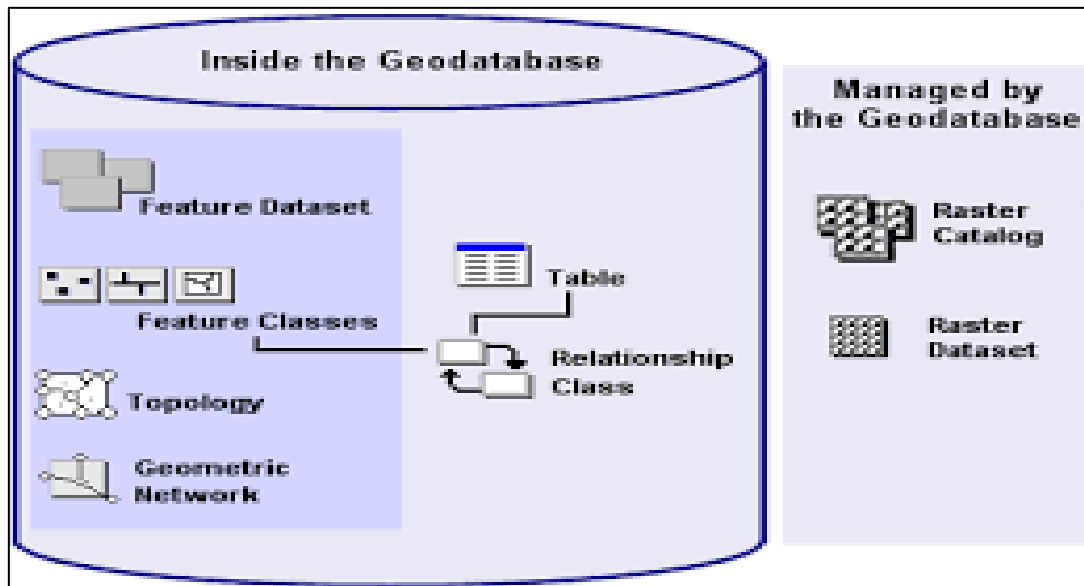
PART – III

Geo-referencing, Map Projection & Transformation and Data Extraction

Course Outline:

- Concept of Geo-referencing and Hands on Exercise on Geo-referencing spatial data from scanned Topo Sheet
- Concept of Map Projection System and Coordinate Reference System (Nepal Coordinate System and Global/Google Earth Coordinate System)
- Projection and transformation of geo-referenced data (Hands on Exercise)
- Creation of Point, Line and Polygon feature from geo-referenced and Projected Topo Sheet (Hands on Exercise)

Map projection

A globe is the best way to show the relative positions of places but it is neither portable nor practical for large scales. The three-dimensional shape of the earth means that it is not possible to depict locations and features directly on to a two-dimensional map space without some distortions. Map projection is a procedure to transform locations and features from the three-dimensional surface of the earth on to two-dimensional paper in a defined and consistent way.
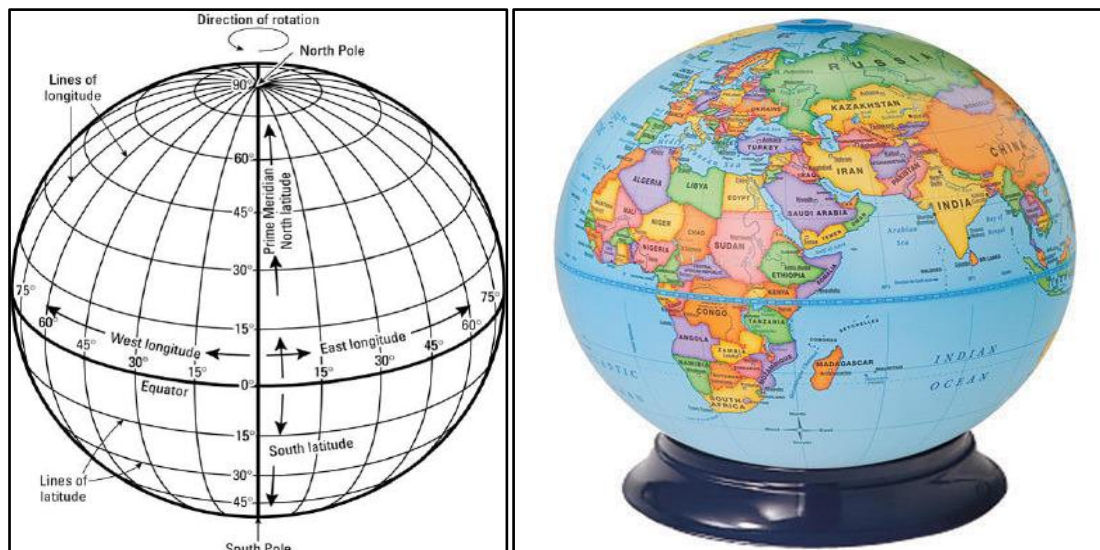
Globe (Model of Earth)

GIS data are encoded with certain units, the spatial components of each feature (lines, points and polygons) are projected using a mathematically defined coordinate system transformation. The earth is round and maps are

flat. Map projections flatten the round earth. ArcGIS recognizes a bewildering number of projections and coordinate systems, but in practice only a limited subset of these are used. ArcGIS has attempted to remedy problems associated with dealing with projections with "projections on the fly". Essentially ArcGIS will try to recognize what projection your data have, if this information is not already explicitly defined (the .prj component of the shape file contains this information), and then open them in ArcMap. Sometimes this works, sometimes it doesn't.

Some of the files in our training course have no defined coordinates. This is the case of undefined coordinate system. Some may have coordinates stored in latitude and longitude spherical coordinates (degrees, minutes, seconds, or decimal degrees). This is called the Geographic Coordinate System (GCS). If, however, you wish to calculate an area, or determine a precise distance, this is not an appropriate coordinate system. You need a planar, Projected Coordinate System to do this. Square degrees are meaningless, and for most people a distance specified in degrees is also meaningless. All projection operations are based on spherical coordinates, and so this lab begins with feature classes in GCS, and then moves to transforming these data into projected coordinate systems.

The transformation of map information from a sphere to a flat sheet can be accomplished in many ways. Mapmakers have invented projections that show distances, directions, shapes or areas as they are on a globe to at least some extent. Each projection has advantages and disadvantages. Orthographic projections, for example, show shapes as they appear when the globe is viewed from space. Equal-area projections do not distort the size of areas but do distort their shape. Conformal projections are those on which the scale is the same in any direction at any point on the map. Many projections retain one geometric quality and a few retain more than one, but no single projection can accurately portray area, shape, scale and direction.
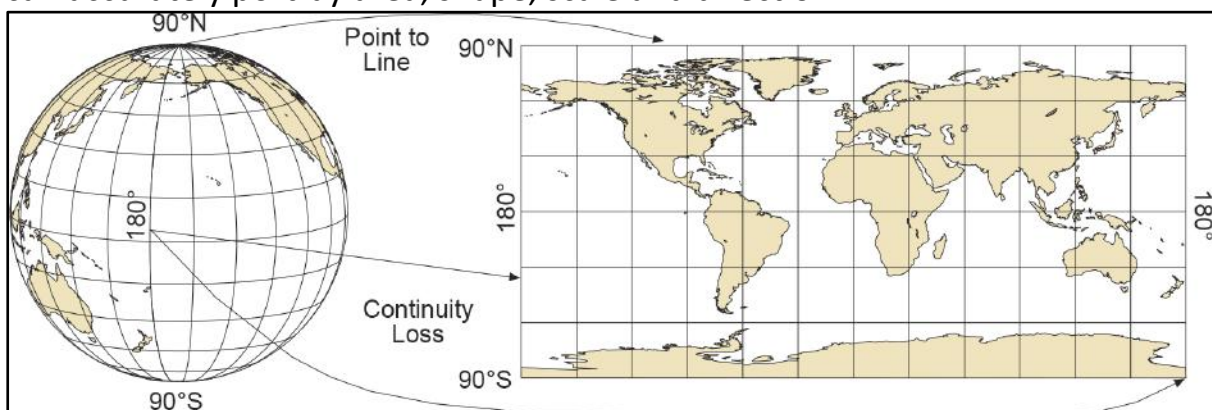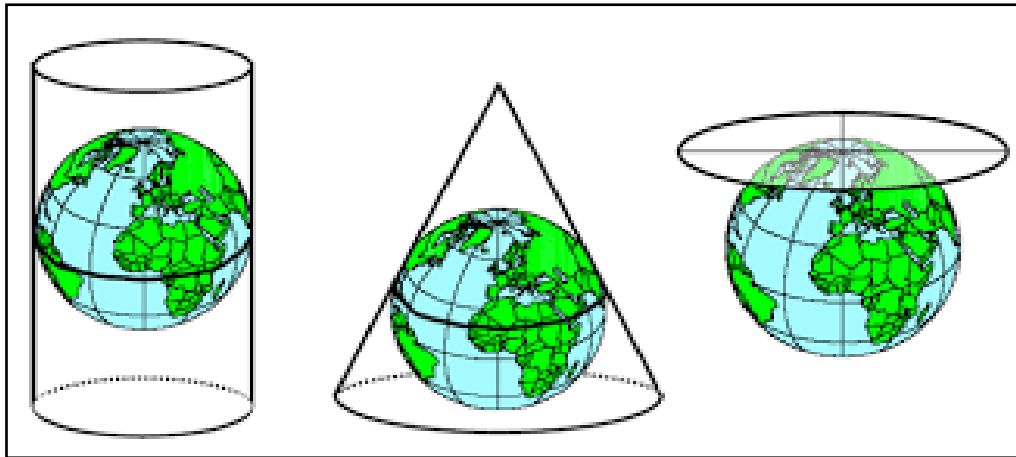
Map projections

NATIONAL PROJECTION SYSTEM ADOPTED BY SURVEY DEPARTMENT AND PROJECTION TRANSFORMATION

One of the main aims of the projection systems adopted by a country is to produce the geographical data in a unique system, which helps the data users to share the data. As Such the selection of a projection system is greatly affected by the area (shape, size and orientation) to be mapped, accuracy requirement and the intended purpose of the maps. Recommendations of international organizations like UN, also affect the selection of map projections in a given country. The shape of Nepal is like a rectangle and it is oriented in east west direction. From this viewpoint the standard conical projection with some modification could have been a suitable projection system for Nepal. But the UTM projection has been used for long time by different countries to create the base maps. This projection being conformal projection is more suitable for topographical mapping and therefore Nepal also adopted this projection for base mapping but with modifications suited to its shape. This is called a Modified Universal Transverse Projection (MUTM) system.

In the MUTM system a cylinder is considered to envelope around the earth (spheroid) in such a way that it touches the earth along two meridians which differ by 180°. The center of the projection is in the middle of the earth. Only for mapping purpose that part of the cylinder is taken which touches one meridian only. This meridian is called the Central Meridian. Then the features are projected from the surface of the earth into the spheroid and then from it projected into the projection surface, which can later be flattened. In this way the Central Meridian is projected in its actual length in this projection.

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To limit the distortion, specially, in the areas farther from the Central Meridian, 3° zones are selected for mapping, 1° 30'in each side of the central meridian. To reduce the amount of distortions within the mapping area, a scale factor of 0.9999 at the Central Meridian was chosen. With these modification the projection popularly known as MUTM projection in Nepal, has the following distortions:

-10 cm. for the distance of 1 km. in the Central Meridian,

+18cm. for the distance 1km. at the edges of the zone and

0.0 cm. at the great circle lying 0° 55' east or west of the Central Meridian.

For each zone the origin for computing the easting and northing coordinates is the intersection of the Central meridian and the Equator. To eliminate the negative coordinate values in the areas lying in the west of the Central Meridian, a false Easting value of 500,000 meters for the easting origin has been chosen. Existing GIS softwares have a great range of projection transformation facilities. But the projection system used in Nepal is being unique; they may not have such facility for local modified system like MUTM. The National projection parameters are:

Spheroid: Everest 1830,

Projection: Modified UTM

Origin: Longitude 81°, 84° or 87° East, Latitude 0° North

False Co-ordinates of Origin: 500,000m Easting, 0m. Northing

Scale Factor at Central Meridian: 0.9999

Elevation Reference: Above Mean Sea Level (amsl)
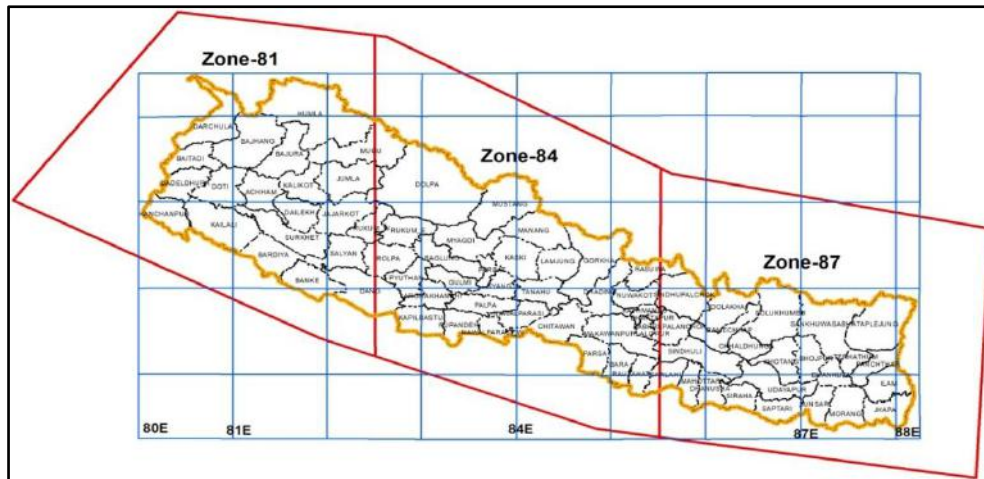
Georeferencing: It is the process of assigning well-defined coordinate system to the spatial entities. Coordinate system can be of two types: geographic and Projected. Geographic coordinate system possess coordinate in terms of longitude and latitudes. They are always based on certain spheroid or Datum. Projected coordinate system possesses coordinates based on linear pattern of measurement such as meters or feet. It should be understood that it is the numeral model of the earth i.e. a given datum which is projected.

While geo-referencing we should not forget that we always enter projected coordinates. If we do have only latitude and longitude of corner points of a map then we must transform these coordinates into projected units i.e. meters or feet etc. The following exercise helps how to Geo-reference a piece of image in GIS environment.

If our data bears GCS system then we cannot calculate actual area of polygon or length of the line. In the mean time we cannot overlay these maps which are in other projection systems and undefined. Recent digital database of Panchthar have been transformed in Universal Transverse Mercator Projection (UTM) system by the some agency. Similarly most of the global database including Google Earth System data and Remote Sensing Images are found in Geographic System based on WGS 1984 datum. Different areas may be projected in different projection zone. For Panchthar UTM Zone 45 North is applicable and for Dang UTM Zone 44 North is applicable. If we take the case of National Coordinate system adopted by the Department of Survey, Nepal (which adopts MUTM) has three different projection zones. Hence it is different to what is adopted by ICIMOD (which is UTM) and other organizations like Universities, UN and other funded programs, and Ministries.

Hence, it is important to find out in which system a data has been prepared or has to be prepared.

Geo-referencing in QGIS

1. Start **QGIS Desktop** programme. Select for "a new empty project" and then click OK.
2. Click Raster**/Georeferencer** from Main Menu.
   The plug in window is divided into 2 sections. The top section where the raster will be displayed and the bottom section where a table showing our Geo-referencer Control Points will appear.
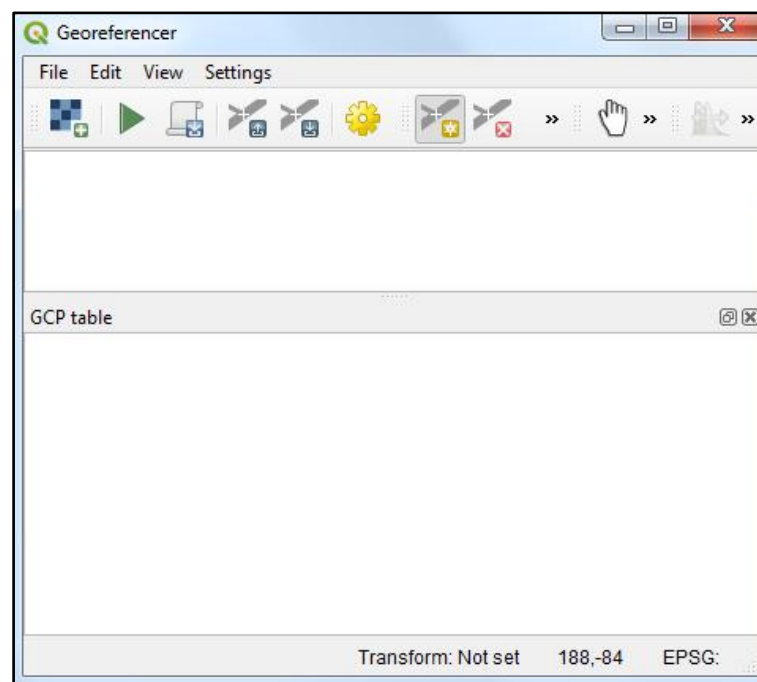
3. Go to **File/Open Raster** of Georeferencer Window to add Topo Scanned image from C:\GIS_Training\Training Data\Topo_Scanned.

4. Select the image 2883_03b.bmp and click Open.

5. *Zoom* in at the **lower left grid intersecting point (**i.e. at the low left blue lines intersecting point**)** as shown below.
6. Click *Add Control Points* tool in the **geo-referencing** tool bar.
7. The cursor changes to a **small plus sign**. With this cursor, *Click* in the center of the *intersection pixelwhere you had zoomed* in the *step no 5*. Now, click to add*x/East and y/North…*

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467,000   468,000   469,000
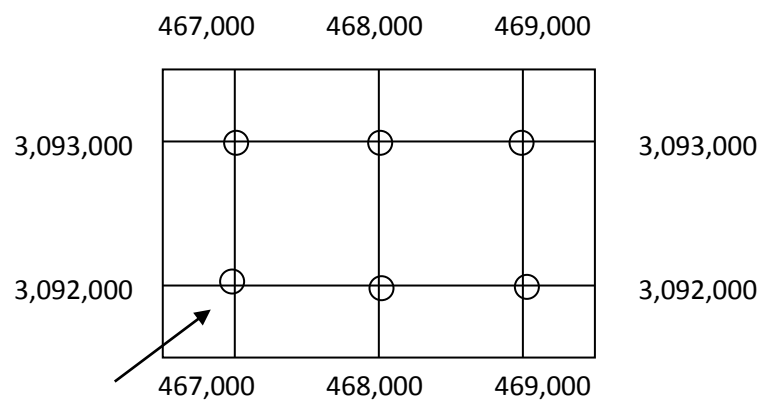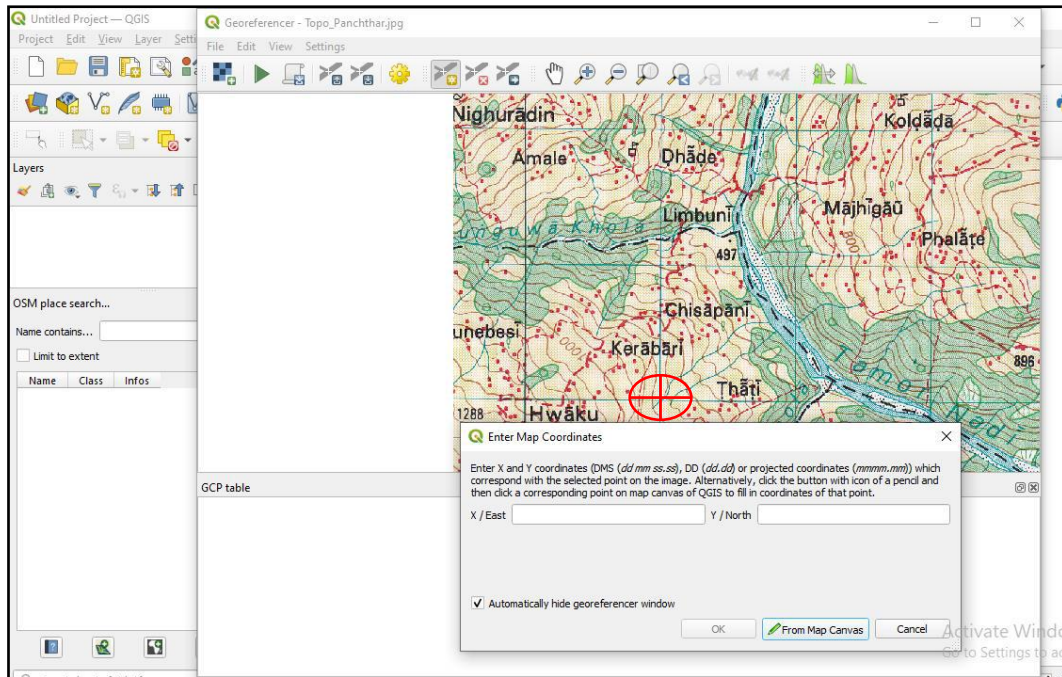
8. **_Enter Map Coordinate dialog box_** appears as shown above. Enter the proper coordinates in the **x (here, for this point, ………..) and y (for this point ……….)**_text panel_ of the dialog box. Click OK.

9. Click select elements tool (Arrow tool) and then click [icon] Zoom to Previous Extent.
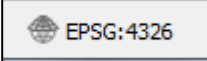
10. **Now, click Zoom** in tool and zoom to the other coordinate position in the map and then **proceed in the same way as explained from step no 6 to 8.**

11. When you finish entering the coordinates of all of the intersection points, check the image appearance.

12. Click on [icon]**Transformation Settings**, the following dialogue box appears.
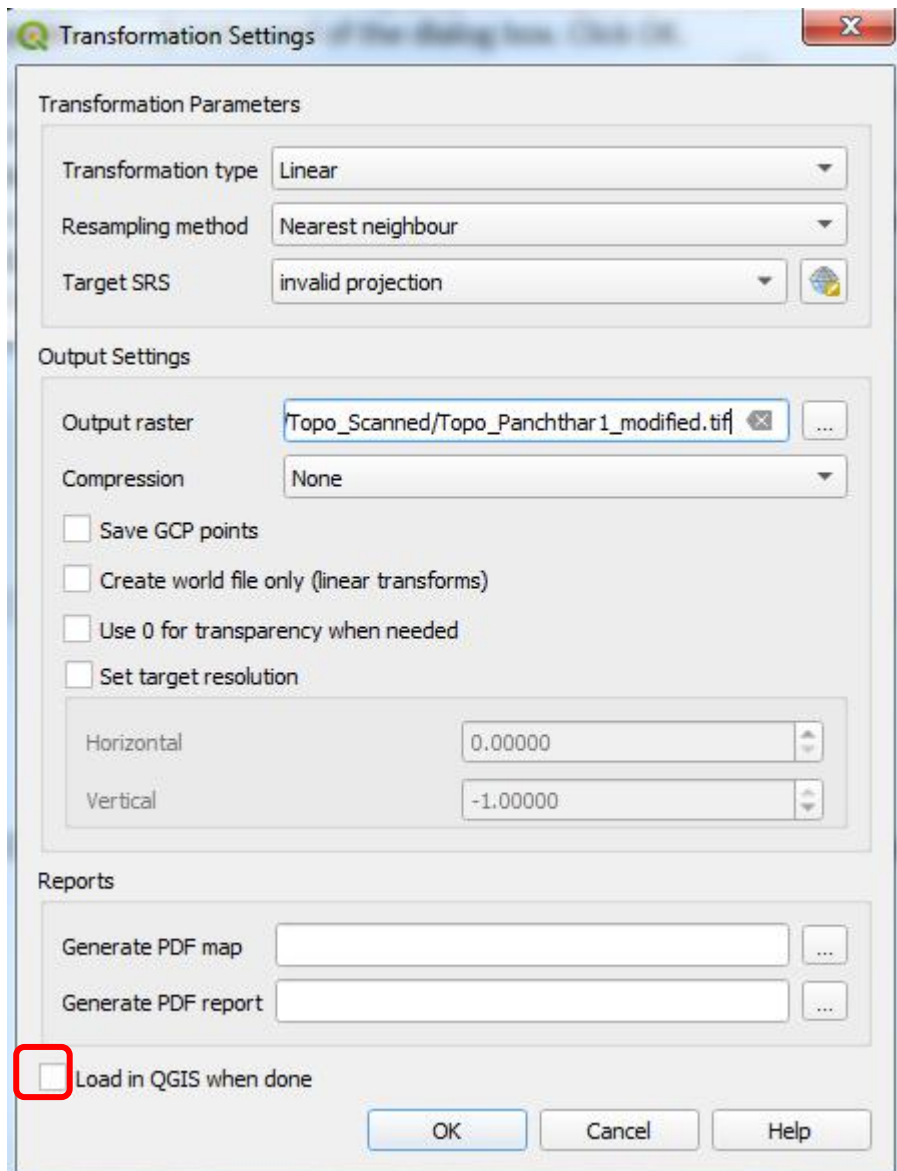
13. Set the **Transformation Type** as **Linear**.

14. Name the Output Raster as**…………………..**.

15. Set **Target SRS** to **EPSG 4326**

16. Make sure the **Load in QGIS when done** option is checked then Press **OK.**

17. In the main Georeferencer Window, go to **File/Start georeferencing.** This will start the process of wrapping image using the GCPs and creating the target raster.

18. We now need to project the coordinate reference system of the image.

19. Click ⬡ EPSG:4326 located at lower right corner of QGIS Map Canvas., following dialogue box appears.
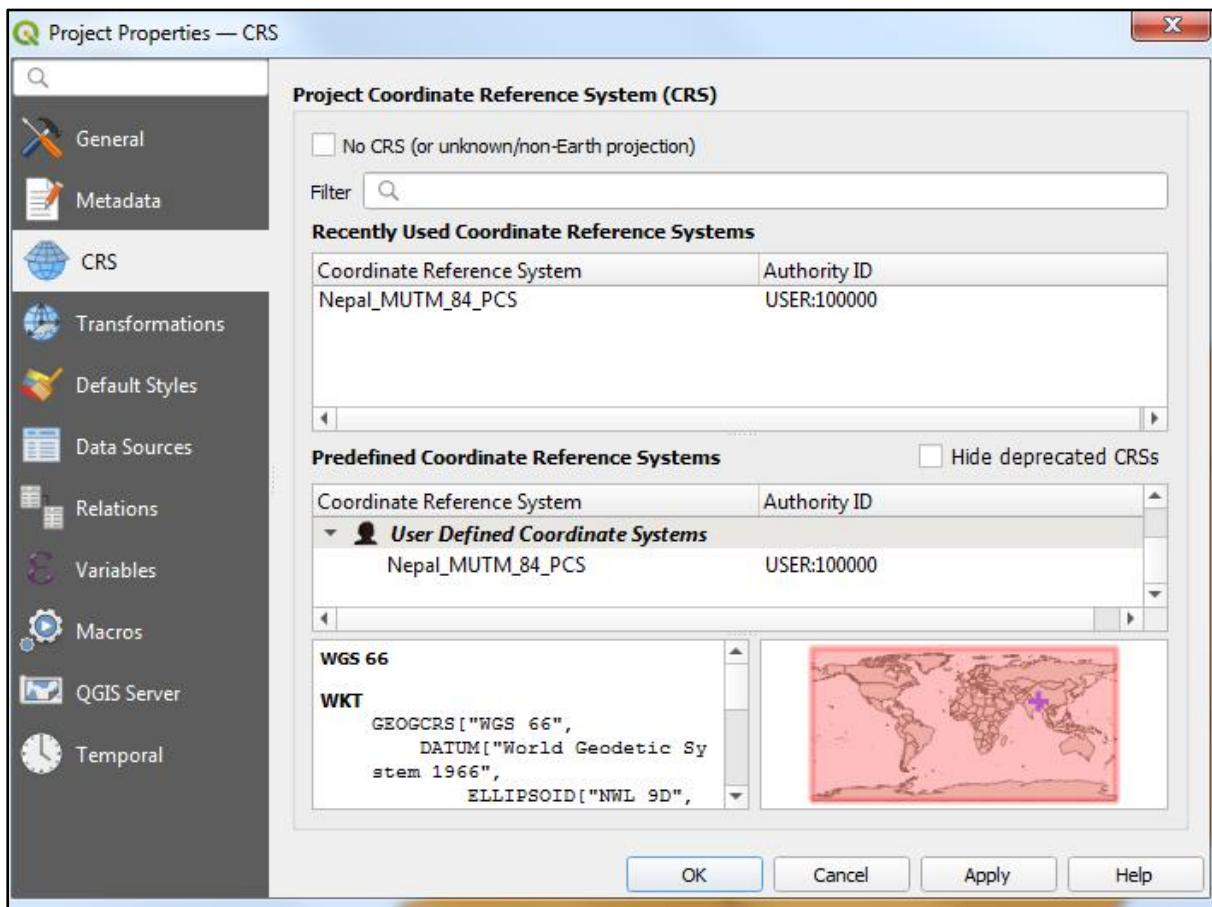
20. In **Coordinate Reference System,** Select **User Defined Coordinate System,** then **Choose Nepal_MUTM_84_PCS**.
21. Click Apply. This will project our Image Coordinate Reference System from WGS84 i.e. EPGSG: 4326 to Nepal MUTM Projected Coordinate System. Now we need to permanently save this image having projected coordinate system.
22. Right click the **Layer**, then select **Export,** then **Save Feature as** option, which brings following dialogue box.

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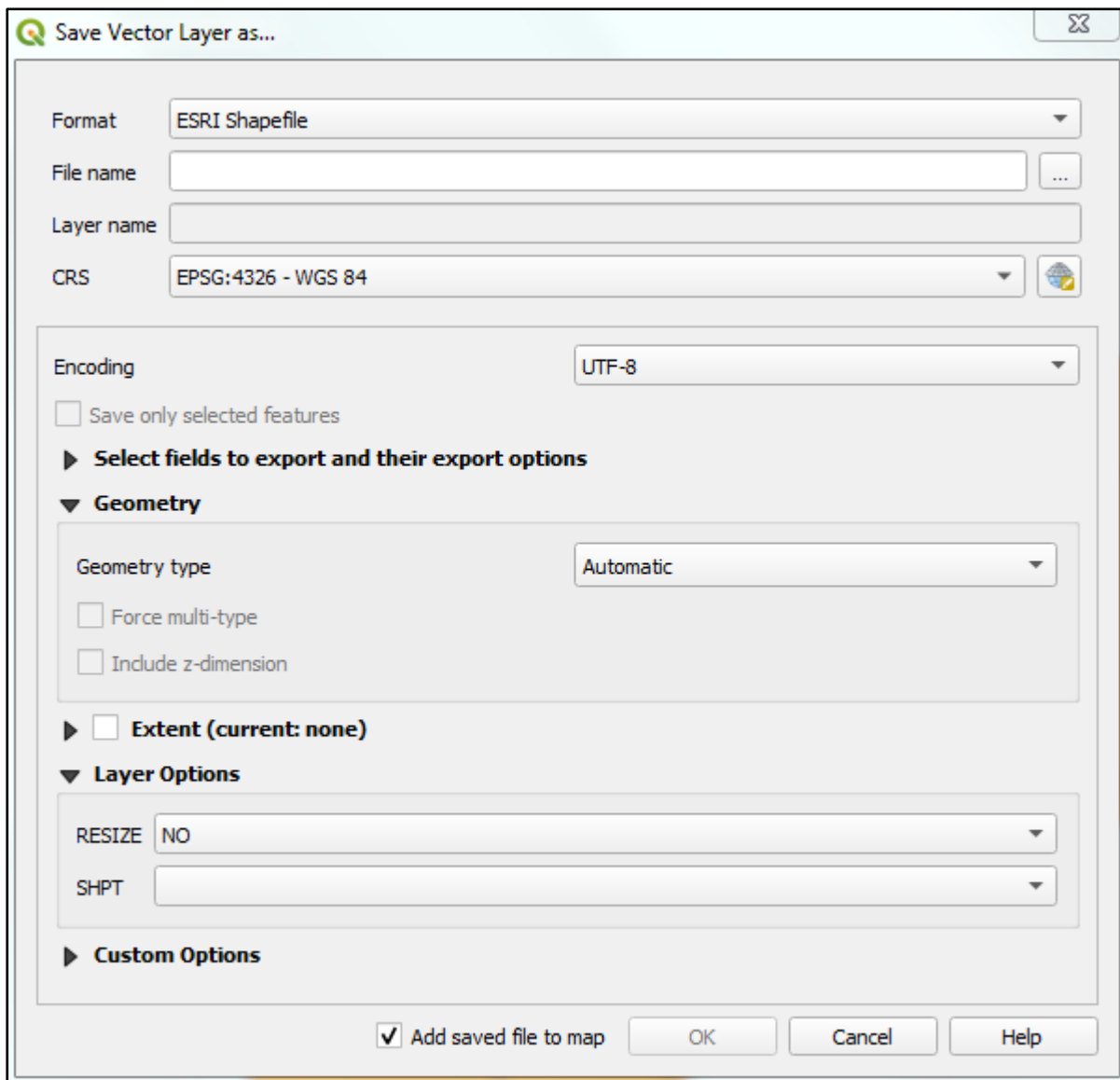
23. In the **Format Text Box:** choose ESRI Shape file.

24. In the **File Name Box:** Give appropriate file name for your projected shape file.

25. In the **CRS Text Box:** choose the Projected Coordinate Reference System as we applied before for the image.

26. Click OK to save Projected Image permanently.

27. Load Projected Image in **New Empty Canvas**.

28. Check the Coordinate Reference System.

CREATING POINT, LINE AND POLYGON FROM GEO REFERENCED IMAGES

1. Open QGIS and create a new blank project.
2. Navigate to and click on the menu entry *Layer ►Create Layer ►New Shape file Layer*. We'll be presented with the *New Shape file Layer* dialog, which will allow us to define a new layer.

3. Click *…* for the *File name* field. A save dialog will appear.
4. Navigate to the GIS Training/QGIS Training/Training Data directory.
5. Save the new layer as New_Road.shp.

> It's important to decide which kind of dataset we want at this stage. Each different vector layer type is "built differently" in the background, so once we've created the layer, we can't change its type.

For this exercise, we're going to create new features which describe length. For such features, we'll need to create a **Line** dataset.

6. For *Geometry Type*, select ***Line*** from the drop down menu:

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This has no impact on the rest of the dialog, but it will cause the correct type of geometry to be used when the vector dataset is created.

The next field allows you to specify the Coordinate Reference System, or CRS. CRS is a method of associating numerical coordinates with a position on the surface of the Earth. For this exercise we will use the default CRS associated with this project, which is WGS84.

Next there is a collection of fields grouped under *New Field*. By default, a new layer has only one attribute, the **id** field (which we should see in the *Fields list.*) However, in order for the data we create to be useful, we actually need to say something about the features we'll be creating in this new layer. For our current purposes, it will be enough to add one field called name as Road_Name that will hold Text data and will be limited to text length of 80 characters.
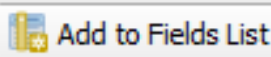
7. Replicate the setup below, and then click the *Add to Fields List* button:

8. Check that the **Field List box** looks like this:

9. Click *OK*

The new layer should appear in your *Layers* panel.
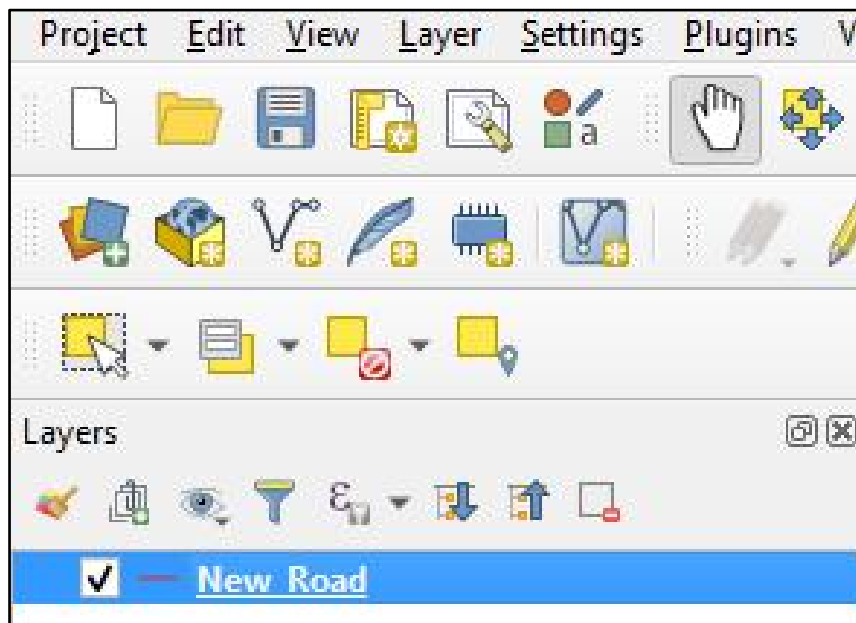
Digitizing:

Digitizing is the process of creating new features/shapes by using base layers already loaded onto a map as Aerial Photography (In our Case the Georeference Image). Digitizing is a common process used in GIS to capture new data.

1. Click on Data Source Manager Button.

2. Select *Raster* on the left side.
3. In the *Source* panel, click on the *…* button:
4. Navigate to GIS Training/QGIS Training/Training Data/Topo Scanned/.
5. Select the file …………………………..tif.
(**Note: You should select only georeferenced image)**
6. Click *Open* to close the dialogue window.
7. Click *Add* and *Close*. An image will be loaded into your map.

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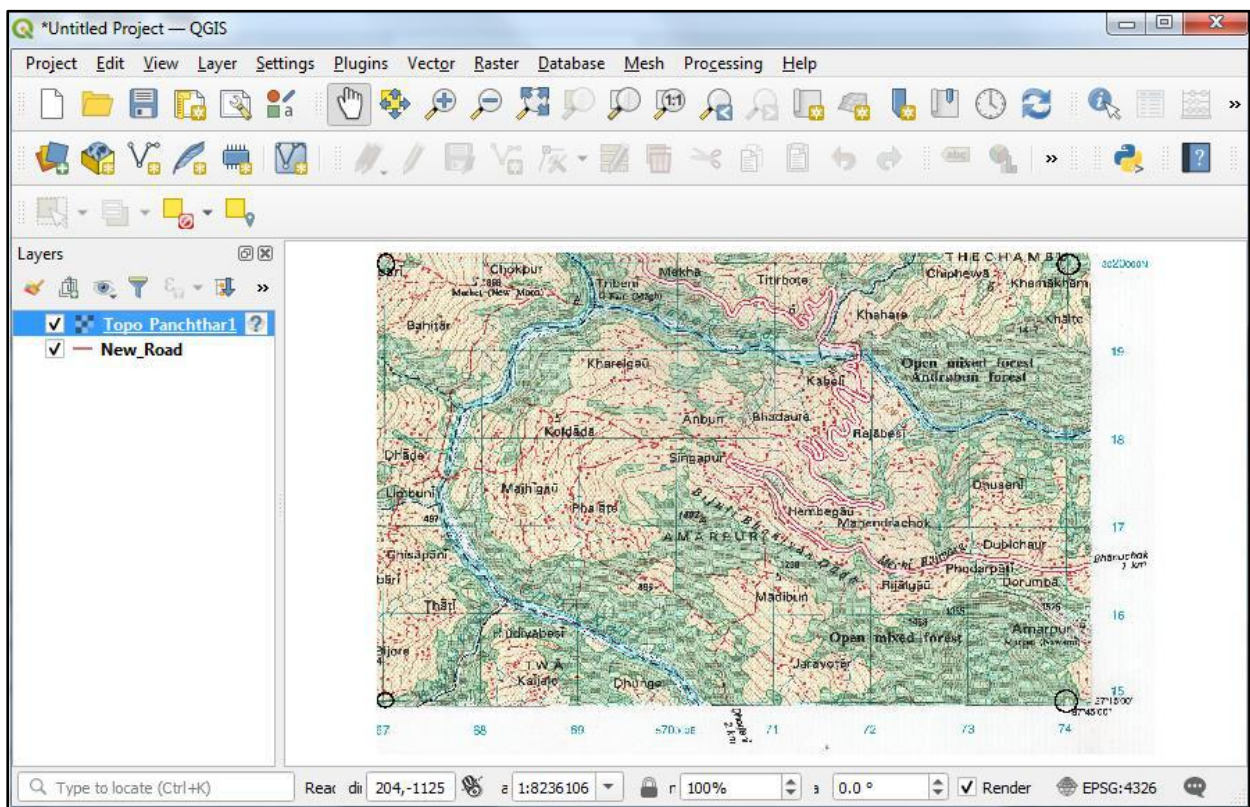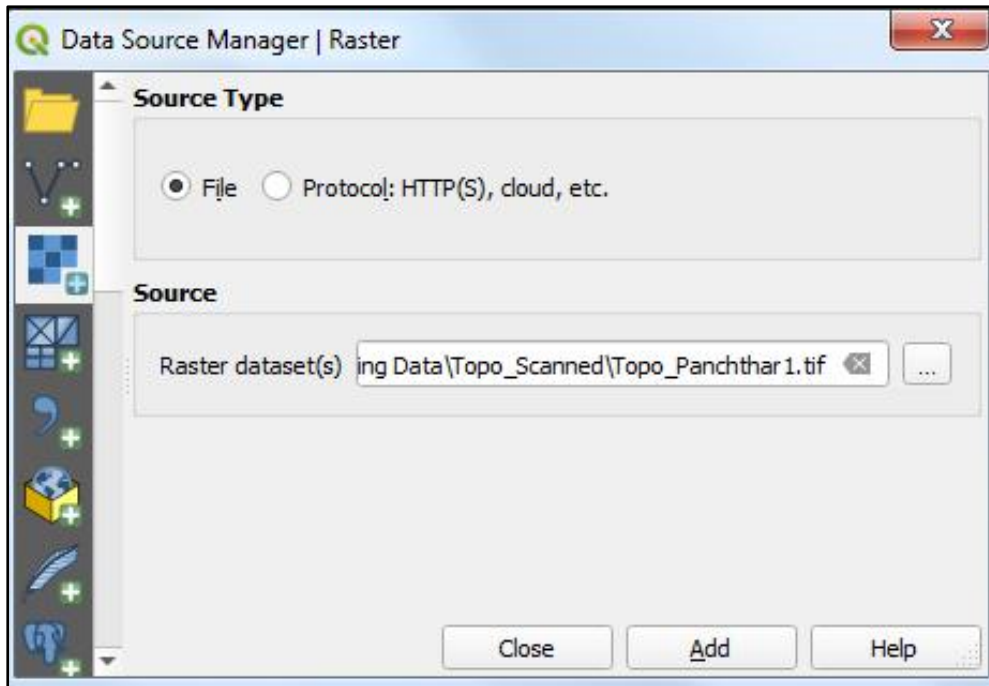
8. If you don't see an aerial image appear, select the new layer, right click, and
   choose *Zoom to Layer* in the context menu.

9. Zoom to the area where you want to digitize New Road.

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10. Before start to digitize, move New_Road feature above the image.
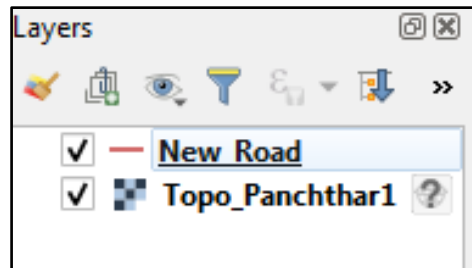
In order to begin digitizing, we'll need to enter **edit mode**. GIS software commonly requires this to prevent us from accidentally editing or deleting important data. Edit mode is switched on or off individually for each layer.

To enter edit mode for the New_Road layer:
1. Click on the New Road layer in the *Layers* panel to select it.

2. Click on the Toggle Editing button.
   If you can't find this button, check that the *Digitizing* toolbar is enabled. There should be a check mark next to the *View ►Toolbars ►Digitizing* menu entry.
   As soon as you are in edit mode, you'll see that some digitizing tools have become active:

- Add Line Tool

- Vertex Tool

   Other relevant buttons are still inactive, but will become active when we start interacting with our new data.
   Notice that the layer New Road in the *Layers* panel now has the pencil icon, indicating that it is in edit mode.

3. Click on the **Add Line button** to begin digitizing our New Road feature.
   It'll notice that our mouse cursor has become a crosshair. This allows us to more accurately place the points to be digitizing. Remember that even when we're using the digitizing tool, we can zoom in and out on our map by rolling the mouse wheel, and we can use pan around by holding down the mouse wheel and dragging around in the map.

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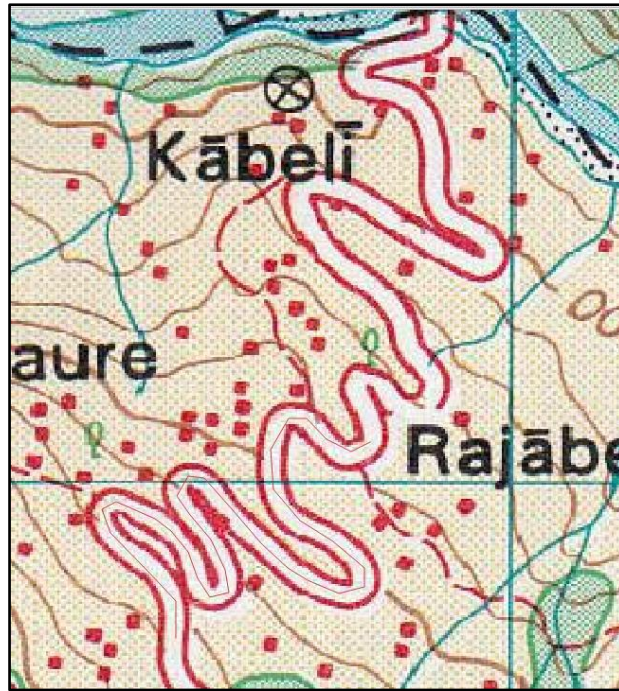
4. Start digitizing by clicking on a point somewhere along the start of the road section.

5. Place more points by clicking further along the center of the road, until the shape we're drawing completely covers the field.

6. After placing on the last point, right click to finish drawing the Line. This will finalize the feature and show us the *Attributes* dialog.

7. Fill in the values as below:

8. Give ID Number to the section of this New Road

9. Give Name of this section of the New Road.

10. Click OK and we have created a new feature.

11. In the *Layers* panel select the New Road layer.

12. Right click and choose *Open Attribute Table* in the context menu.
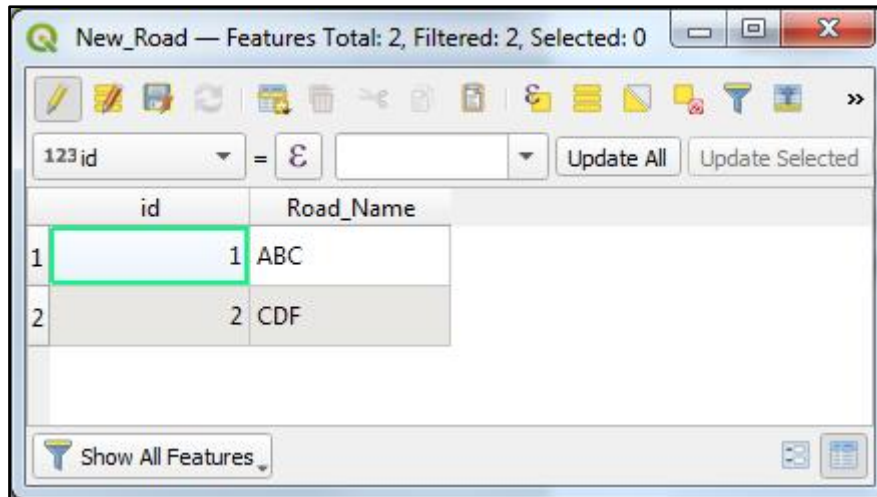
In the table we will see the feature we just added. While in edit mode you can update the attributes data by double click on the cell you want to update.

13. Close the attribute table.

14. To save the new feature we just created, click on [icon] Save Layer Edits button.

Remember, if you've made a mistake while digitizing a feature, you can always edit it after you're done creating it. If you've made a mistake, continue digitizing until you're done creating the feature as above. Then:

15. Click on [icon] Vertex Tool button.
16. Move the mouse over a vertex we want to move and left click on the vertex.
17. Move the mouse to the correct location of the vertex, and left click. This will move the vertex to the new location.

18 When done editing, click the [icon] Toggle Editing button to get out of edit mode.

- *Now we know how to create features! Knowing how to digitize is important because it's a very common activity in GIS programs.*

- *Try your own with adding, point and polygon features.*

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PART – IV

Global Positioning System (GPS) and Web Map Services (WMS)

Course Outline:
- Theoretical Concept of Global Positioning System (GPS)
- Capturing Real World data using GPS (Field Work)
- Downloading GPS data and plotting (Hands on Exercise)
- Integration of GPS Data to existing Spatial Features (Hands on Exercise)
- Installation of QGIS Plugin (Hands on Exercise)
- Connecting to Web Map Service - WMS (Hands on Exercise)
- Digitizing Spatial Features based on Google Earth and Open Street Maps (Hands on Exercise)
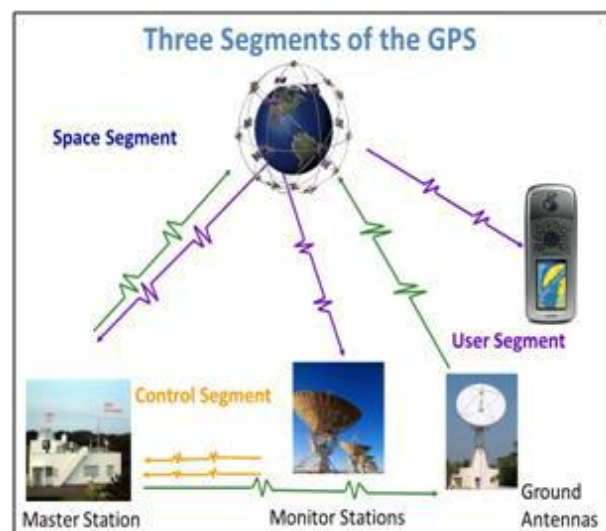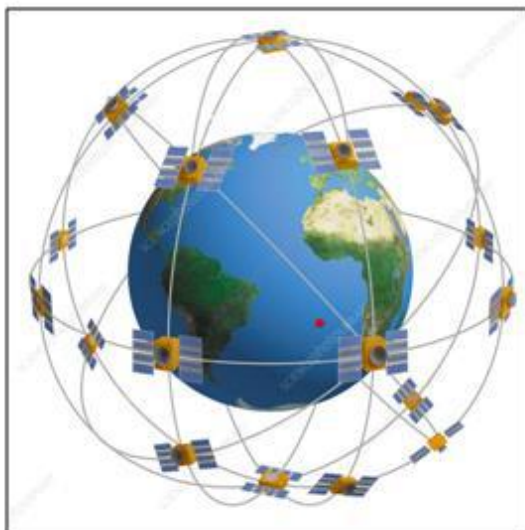
The **Global Positioning System** (**GPS**), originally **Navstar GPS** is a satellite-based radio navigation system owned by the United States government and operated by the United States Space Force. It is one of the global navigation satellite systems (GNSS) that provides geo-location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites Obstacles such as mountains and buildings block the relatively weak GPS signals.

The GPS does not require the user to transmit any data, and it operates independently of any telephonic or internet reception, though these technologies can enhance the usefulness of the GPS positioning information. The GPS provides critical positioning capabilities to military, civil, and

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commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver.

Component of GPS:

1. Space Segment:

The GPS uses constellation of 24 satellites that orbit the earth at about 11000 nautical miles, once every 12 hours. The orbital position is constantly monitored and updated by the ground stations. Each satellite is identified by a number and broadcasts a unique signal.

2. Control Segment:

The ground segment of GPS has one master control, one alternative master control station, 12 command and control antennas and 16 monitoring sites.

3. User Segment:

This segment consists of GPS Receiver. The receiver collects and process signals from the GPS satellites and use that information to determine and display the location, speed, time and so on.

Capturing Real World Data in GPS:

Demonstration of GPS Devices, Settings and capturing real world data

Downloading GPS Data in QGIS:

1. Open QGIS Desktop 3.16.8
2. Click on New Empty Project. This brings new empty canvas.
3. Goto **Plugins,** then select **Manage and Install Plugins**
   This will bring following dialogue box

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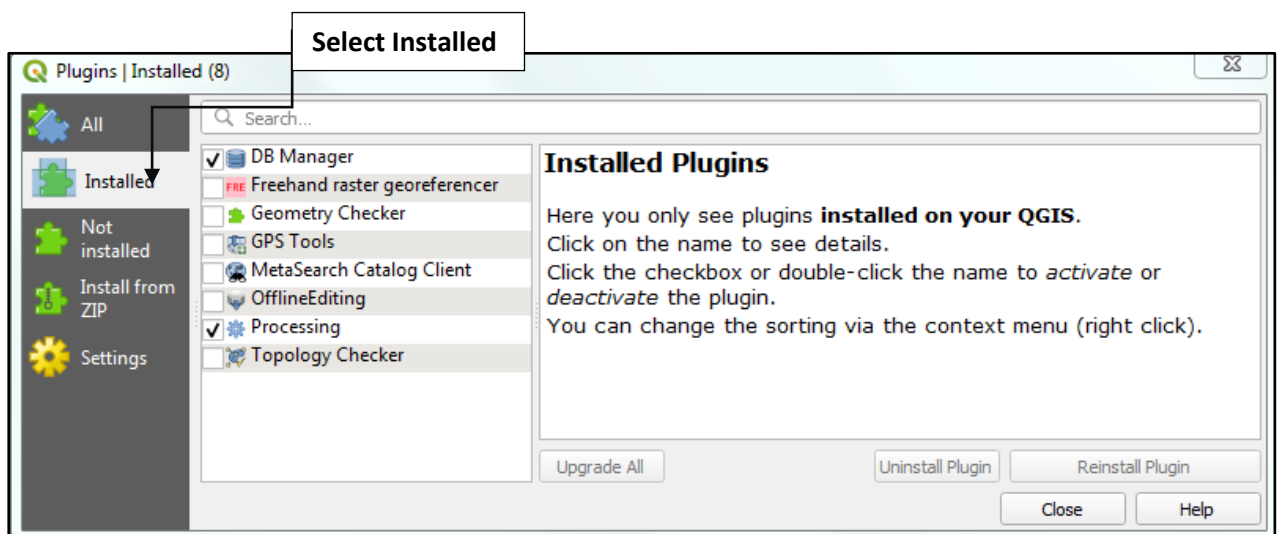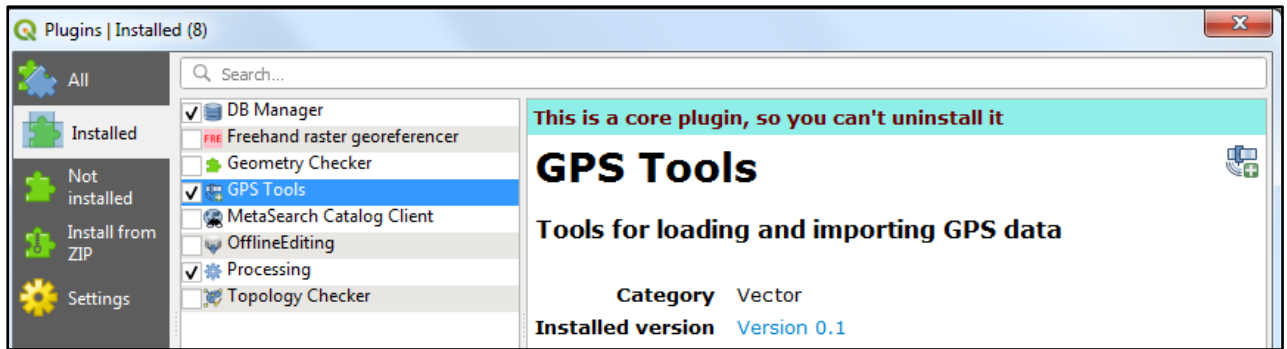
4.   Check in GPS Tools box and Close.

5.   This will bring ⬚icon in Vector Tool Bar.

GPS Tool Icon

6.   Click on GPS Tool icon, following window will appear.
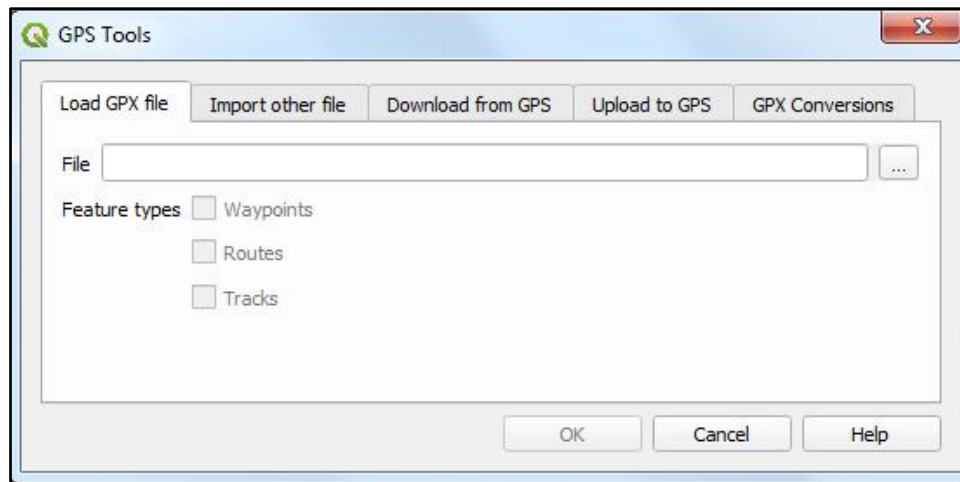
7.   In File ……, navigate to GIS Training/QGIS Training/Training Data/GPS File/…………………gpx file stored in our computer
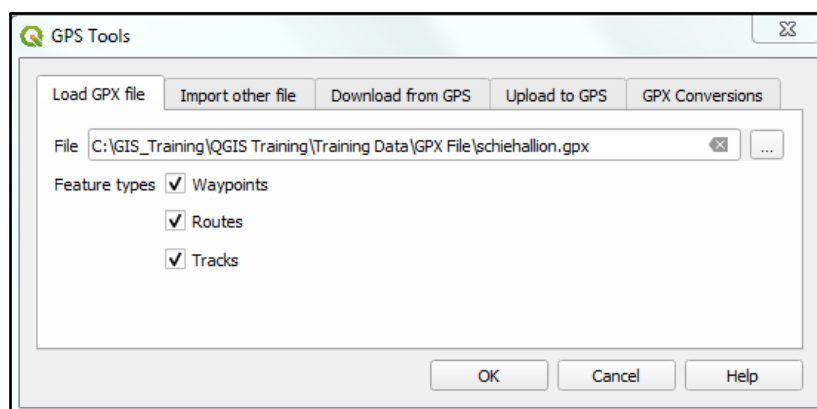
8. Check out Routes and Tracks check box and click OK.

Figure: Different Models of GPS Device

There are different functions of Global positioning system (GPS) which are generally fall into following major categories:

1. Location   - determining a position
2. Navigation   - getting from one location to another
3. Tracking   - monitoring object or personal movement
4. Mapping   - creating maps of the world
5. Timing   - bringing precise timing to the world

Advantages of GPS

Following are the advantages of GPS:

- GPS provides accurate geographical location of the receiver with longitude, latitude and altitude which helps in search and rescue through tracking and navigation.

- GPS provides users with information based on location (X Y Coordinates) in real time for any object on the earth surface which is helpful in mapping and analysis of performance. It is a source of GIS data input.

- GPS is powered by world satellites so it can be accessed anywhere in the world through tracking system with a GPS receiver.

- GPS works in all weather conditions and all over the world. The GPS signal is available worldwide. Therefore, users will not be deprived of it anywhere.

- There is no charge to utilize the GPS service so it is cheaper compare to other navigational systems.

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- Global Positioning System is used for a wide variety of purpose that includes military as well as civil interests.
- GPS technology helps surveyors to establish property identification and boundaries demarcation. GPS land surveying produces accurate results with little effort, and also provides greater flexibility and improved efficiency than conventional surveying methods and tools.

Disadvantages of GPS

Following are the disadvantages of GPS:
- The accuracy of GPS depends on sufficient signal quality received. Sometimes the GPS signals are not accurate due to some obstacles of manmade or natural features to the signals such as buildings, trees and sometimes by extreme atmospheric conditions such as geomagnetic storms.
- Positional error may occur due to the access with limited number of satellite, poor signal or battery failure.
- An incorrectly installed GPS can lead to inaccurate data.
- GPS cannot be used in underground areas or any objects blocked from a direct view of the sky.

Application of GPS in Local Level Resource Mapping
- Identification of individual household and settlement location.
- Mapping for the location of service centers like educational institutions, health centers, agricultural service centers, sources of drinking water etc.
- Evaluation on status of infrastructure development like road network, electricity and communication supply, sewage management, canal or irrigation network, solid waste management network, market centers and accessibility assessment etc.
- Agricultural crop pocket area, mining and excavation centers identification and management
- Risk and hazard zone delineation and management
- Collect and manage information on land use and other natural resources.

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Installation of QGIS Plugins:

Connecting to a Web Map Service (WMS):

- Open Layer Plugin

This is to install OpenLayers through QGIS plugin repository. **For this you must have connection to the internet at all times**.

- From the main menu bar, go to **Plugins->Manage and Install Plugin**. This will take a couple of minutes for QGIS to contact its repository and show the list of plugin available.
    Type Open Layers into the filter box.
- Select *Open Layer Plugin* then *install plugin* – this will take a couple of minute for the plugin to download and install.
- A window should popup saying "Plugin Installed Successfully" **OK** and **Close** the QGIS Plugin Installer window.

How to Add Google Maps in QGIS 3.16.8 Version:

Once we open a project in QGIS, in the Browser window to the left, scroll down to XYZ Tiles.
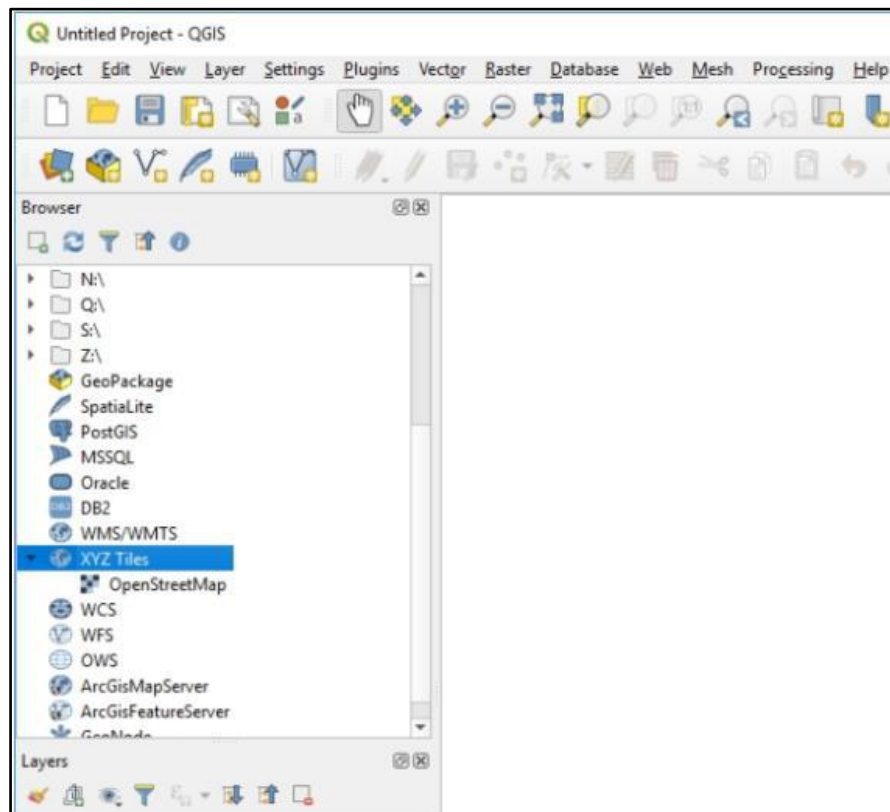
- Right click on XYZ Tiles and choose New Connection.

- In the XYZ Connection window, enter a name, like Google Maps, and then enter the URL "https://mt1.google.com/vt/lyrs=r&x={x}&y={y}&z={z}". Also set the Max Zoom Level to 19.
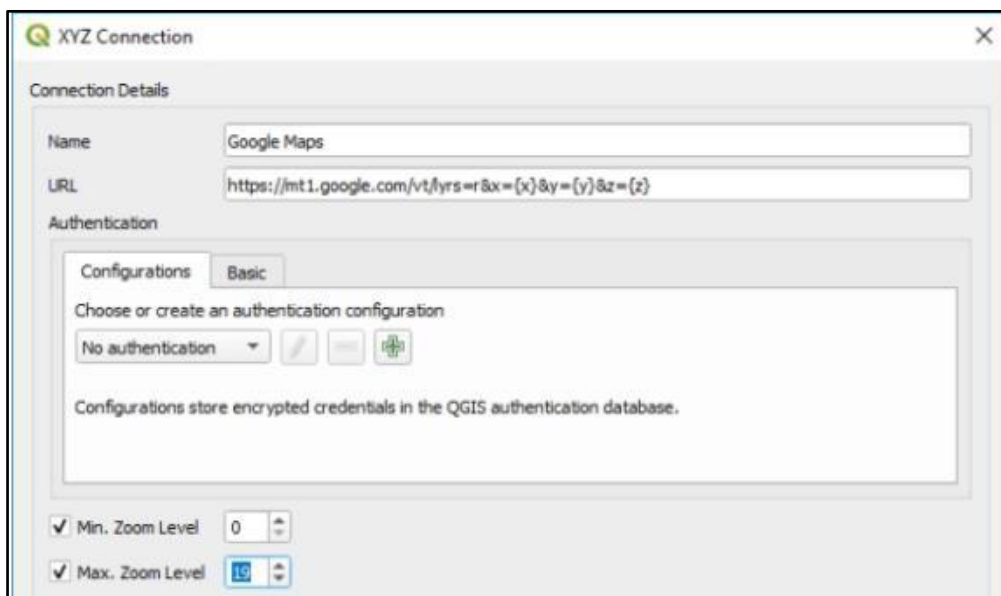
- Click the OK button, and Google Maps is added to our XYZ Tiles list.

- Now double click on Google Maps or drag & drop it and we will see it in our map area!

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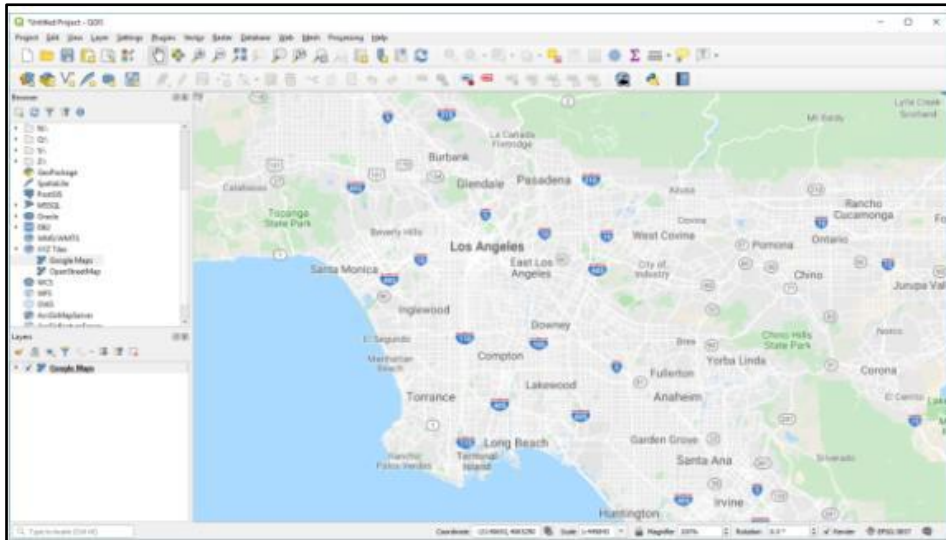
If you prefer the satellite image or other images, here is a list of Google Maps layers that you can add to QGIS:

Google Maps: https://mt1.google.com/vt/lyrs=r&x={x}&y={y}&z={z}
Google Satellite:
      http://www.google.cn/maps/vt?lyrs=s@189&gl=cn&x={x}&y={y}&z={z}
Google Satellite Hybrid: https://mt1.google.com/vt/lyrs=y&x={x}&y={y}&z={z}
Google Terrain: https://mt1.google.com/vt/lyrs=p&x={x}&y={y}&z={z}
Google Roads: https://mt1.google.com/vt/lyrs=h&x={x}&y={y}&z={z}

CREATING POINT, LINE AND POLYGON FROM WMS

- Digitizing Features based on Google Image

- Digitizing Features based on Open Street Maps

- ❖ *Go back to manual "Creating point, line and polygon from geo reference image".*

- ❖ *Start to create point, line or polygon features and attributes accordingly!*

1. Open Data Source Manager

2. Select Add XYZ Layer Icon.

3. Select Open Street Map or Google Earth Hybrid from Drop down List as shown below:

XYZ Connections

OpenStreetMap

New | Edit | Remove | Load | Save
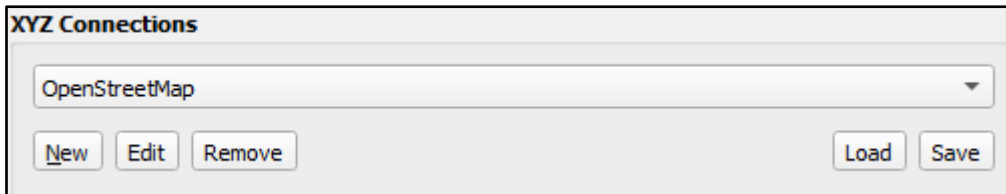
4. Click on **Add**.
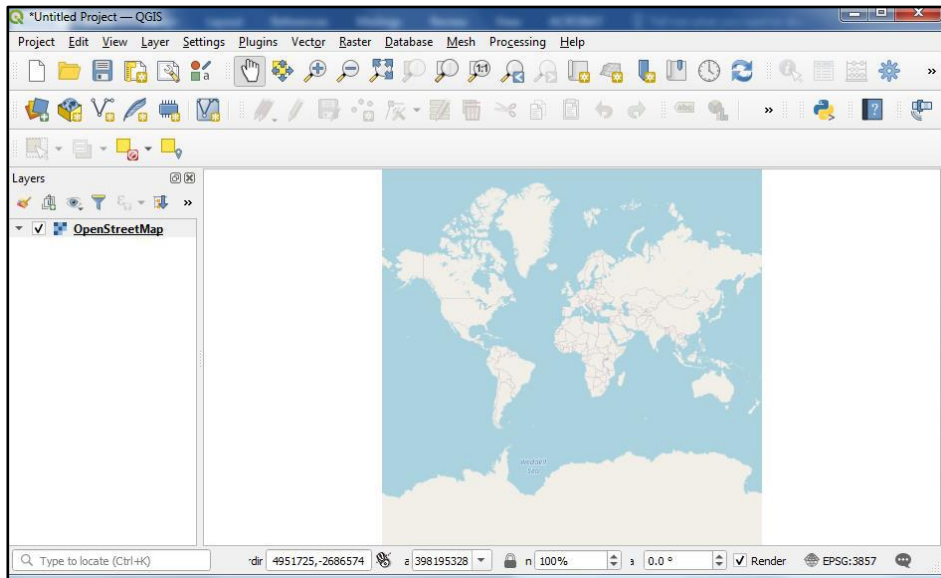
5. Zoom in to the area where Panchthar District lies in Open Street Map Layer

6. Add Pan_LGB.shp file from GIS Training/QGIS Training/Training Data/ folder.
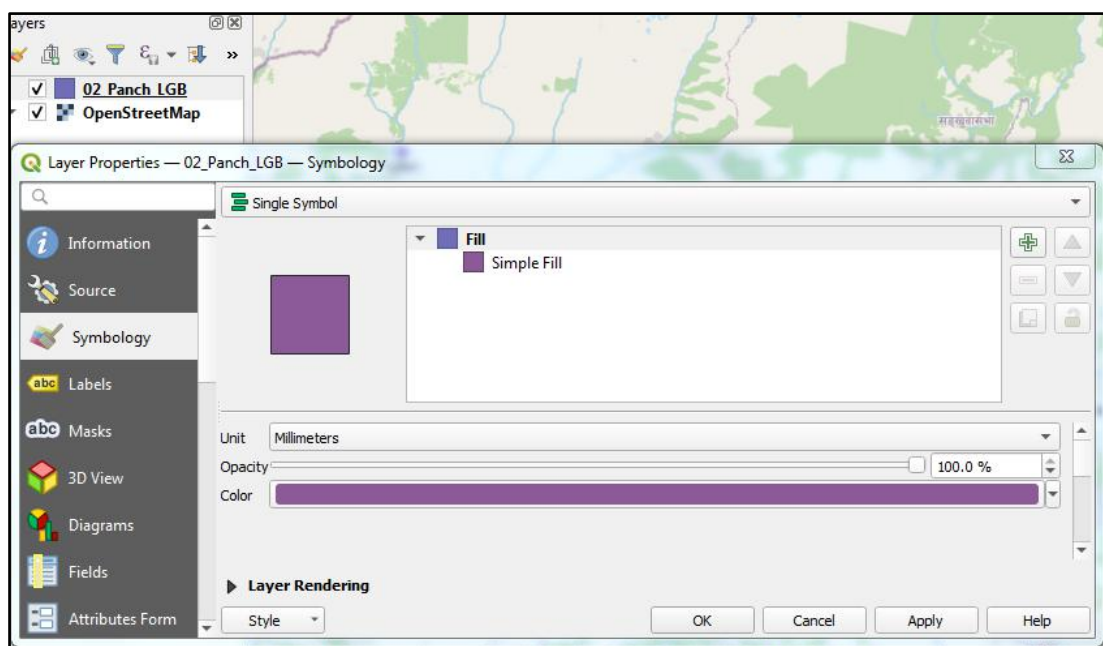
7. Right Click the Pan_LGB Layer for Layer Properties

8. In Symbology Tool, Choose Fill Color as **Transparent.**

9. Change Stroke width to 1. and click on **Apply**. This will bring us the following.
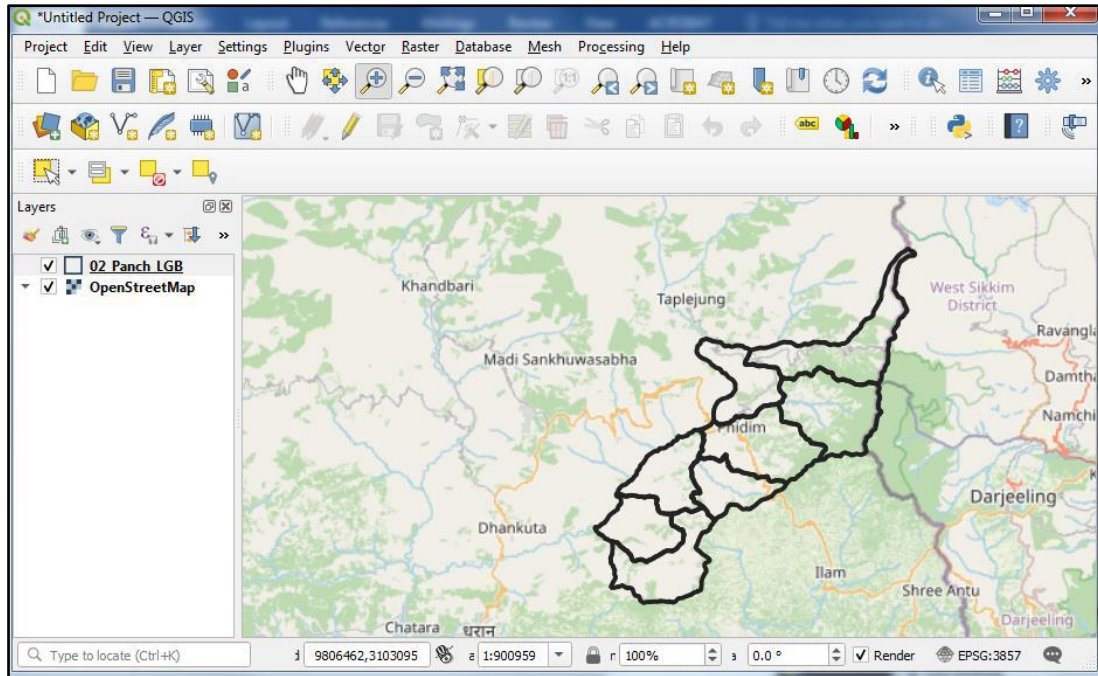
10. Now Add the New Feature Dataset you created just like you did for New_Road.shp in Georeference Exercise.

❖ *Go back to Digitizing Exercise in the Training Manual that we already did in Georeference Exercise and start digitizing.*

Application of Google Earth image

- Install *Google Earth Pro.* In your computer.
- Open **Google Earth.**
- Select desired area and make **Zoom in** to observe required information.
- Select **Add** from main menu.
- Go to **Folder** then make a *folder* to store extracted information.
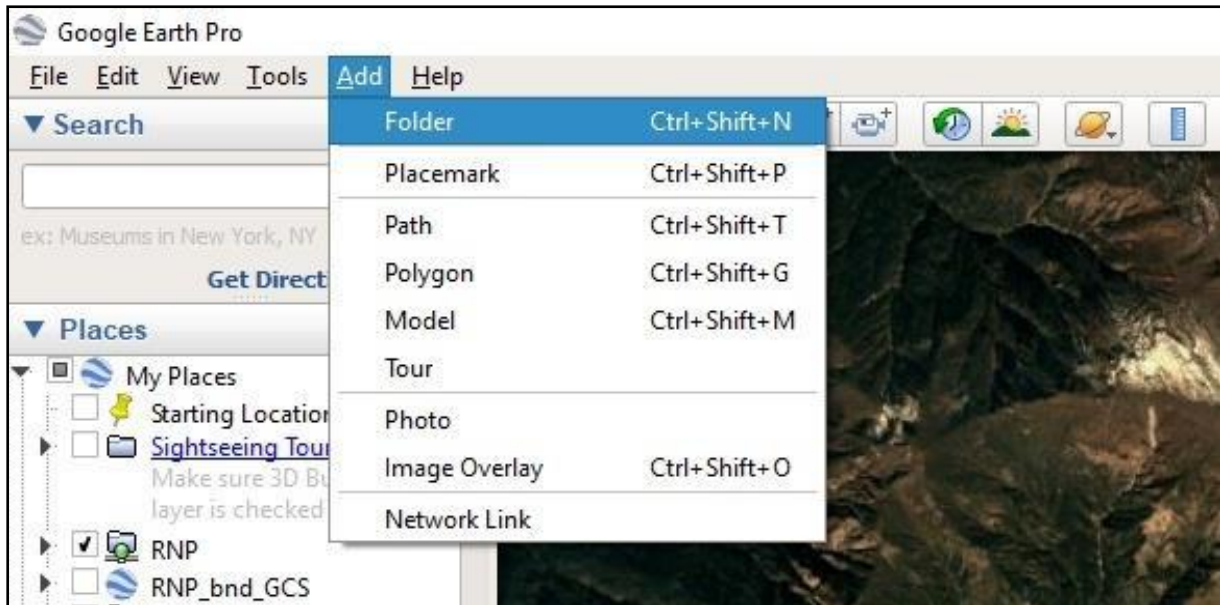
- o Use **Placement** for point feature, **Path** for liner feature and **Polygon** for areal features.
- o Right click on given **Folder.**
- o Extract the features one by one as more as required. (Digitize/extract land cover information by different polygons).
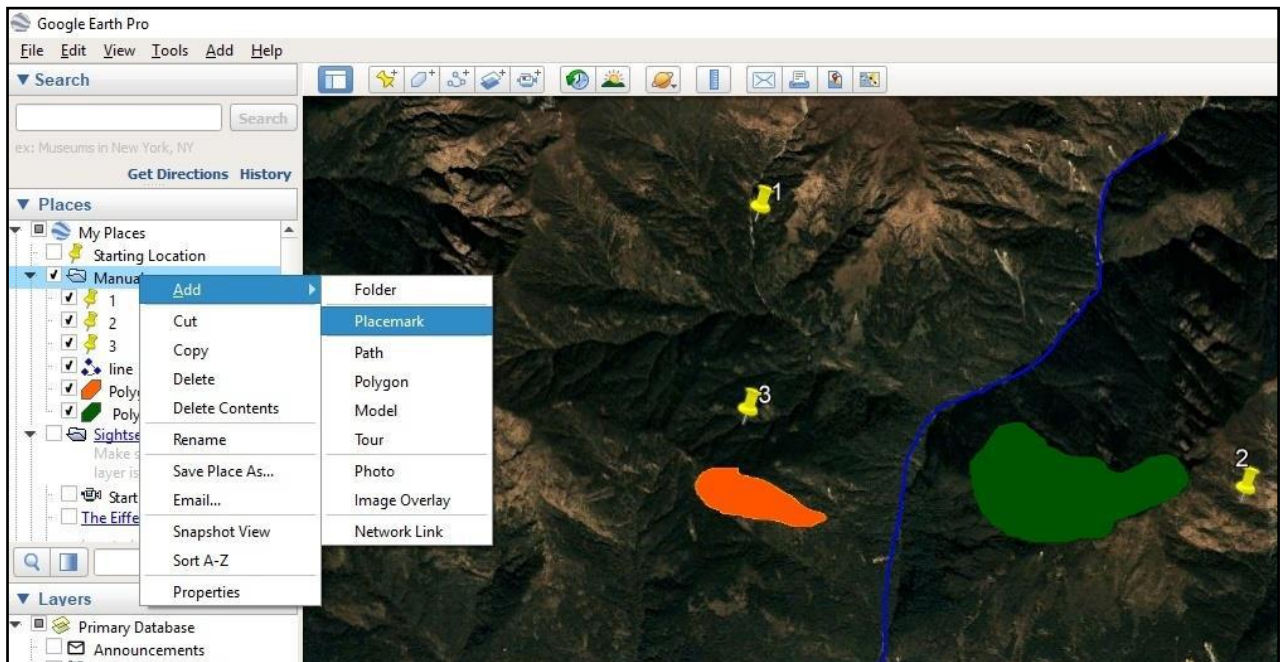
- o Right click on given folder then select **Save Place As** from pop-down menu.

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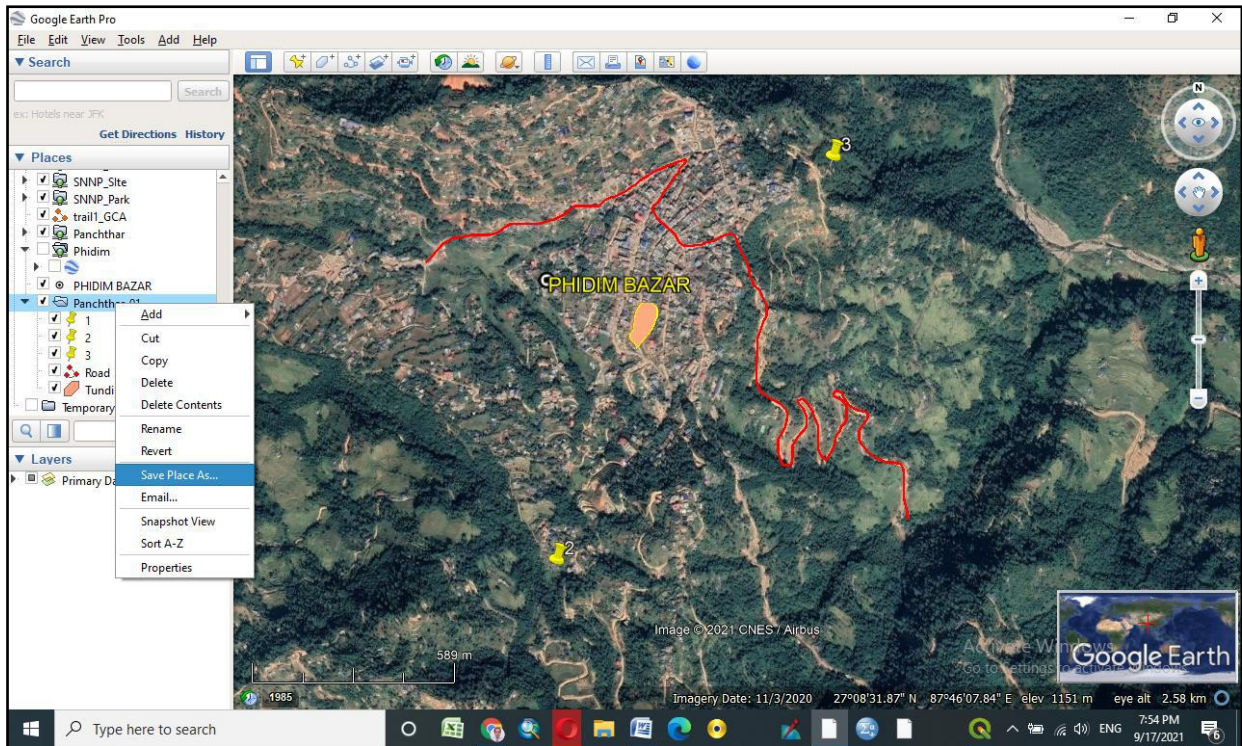
o Give the **File Name** and location for output file then select *(*.KML)* for save as type format.
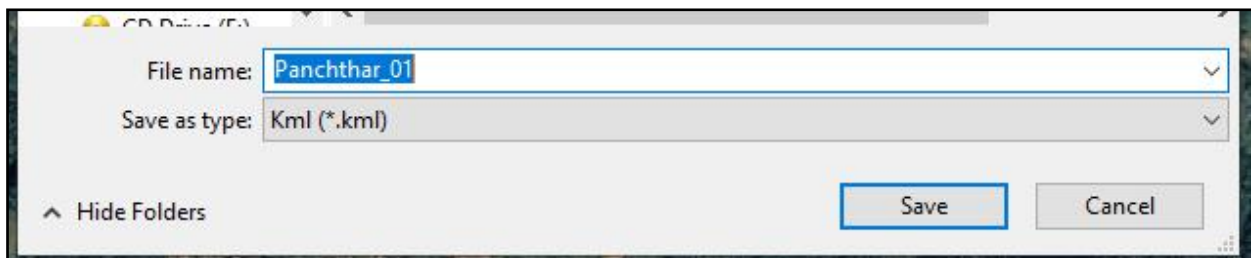
Import Google Earth .kml file to QGIS

o Open **QGIS**.
o Select **Layer** from main menu bar**.**
o Explore **Add Layer.**
o Go to **Add Vector Layer.**
o Highlight **File** option in *Source type***.**
o Then explore data layer through browse option in **Source** from *Vector datasets***.**
o Select **.kml** file from the data folder.
o Click on **Add** and close the *popup window*.

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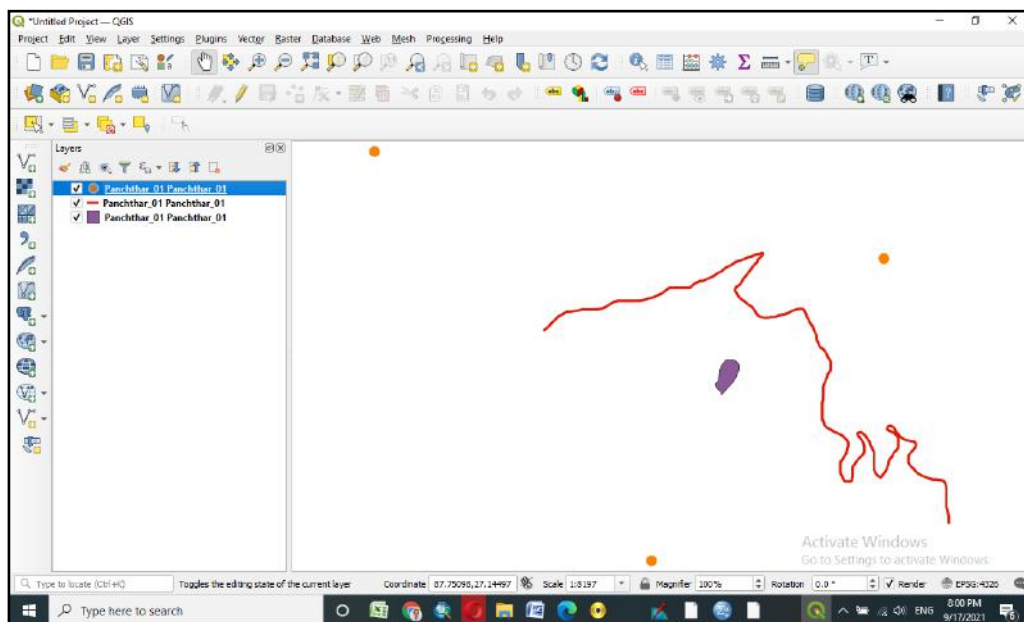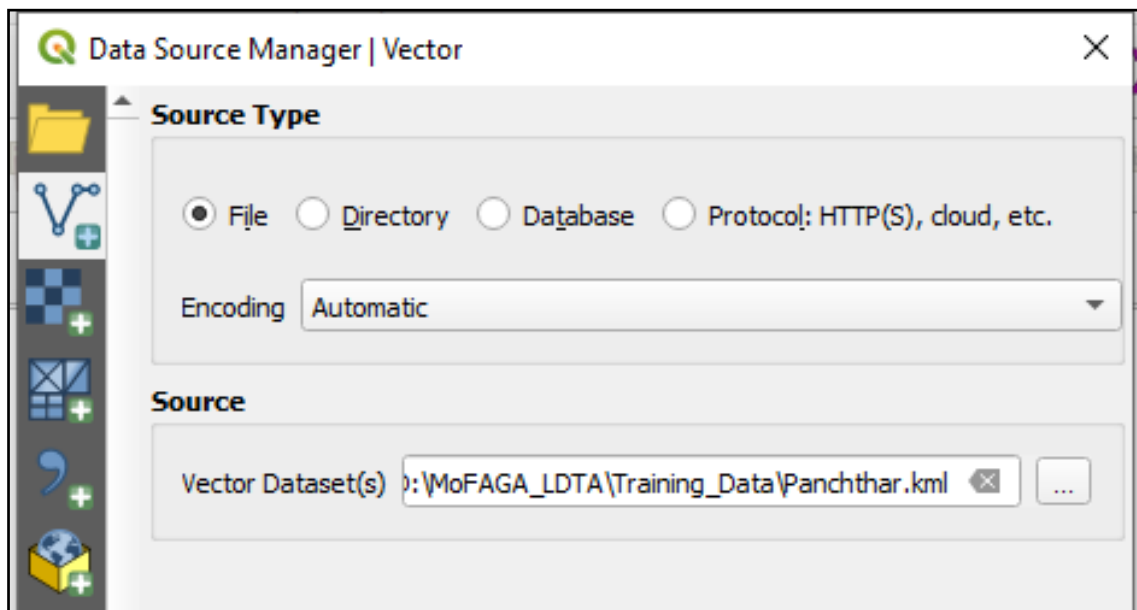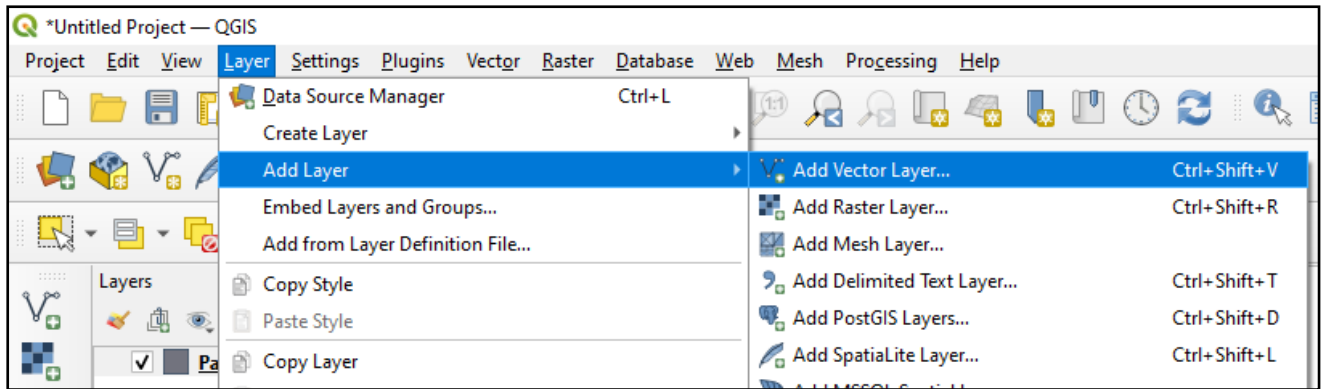
o *Now, it can export in shape file (*.shp) format by different features in GIS Environment for further analysis and mapping to give output result.*

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Upload Shape files from QGIS to Google Earth

- o Add desired file/layer in the view
- o Right click on data layer
- o Click on *Export*
- o Select *Save Feature as*
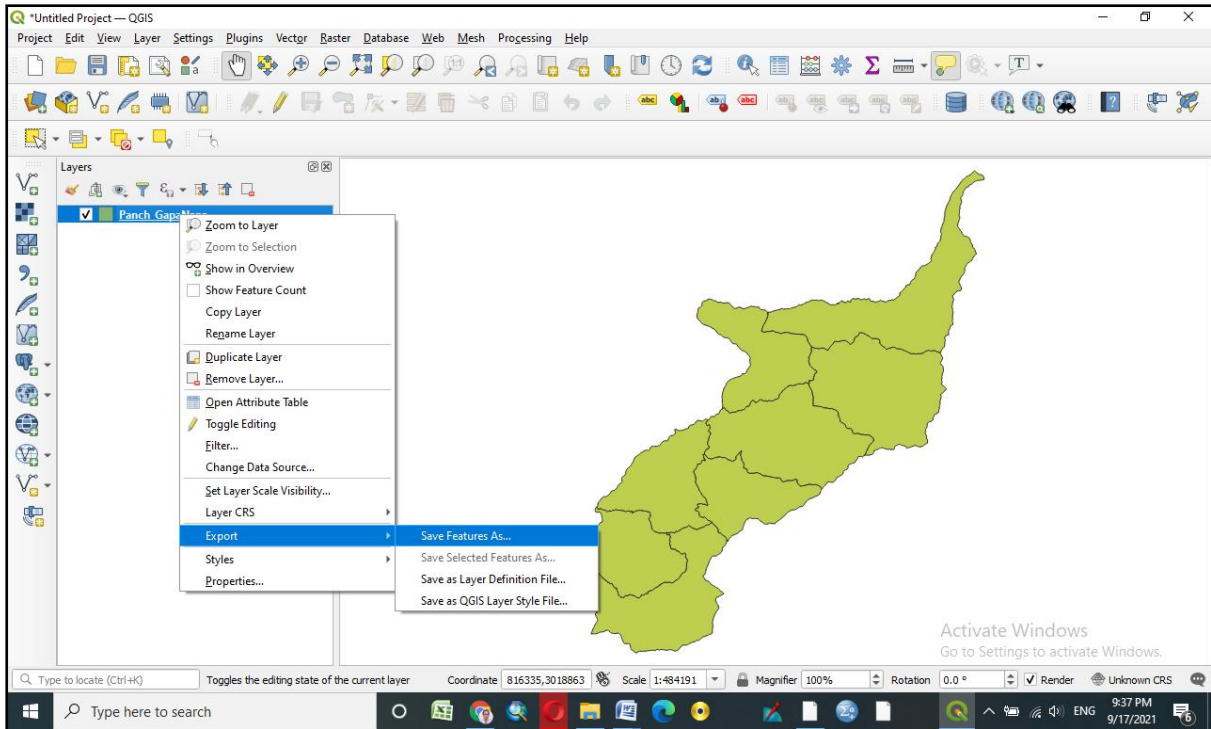
- o Select format as *.KML* and give file name with output directory.
- o Click on **OK.**
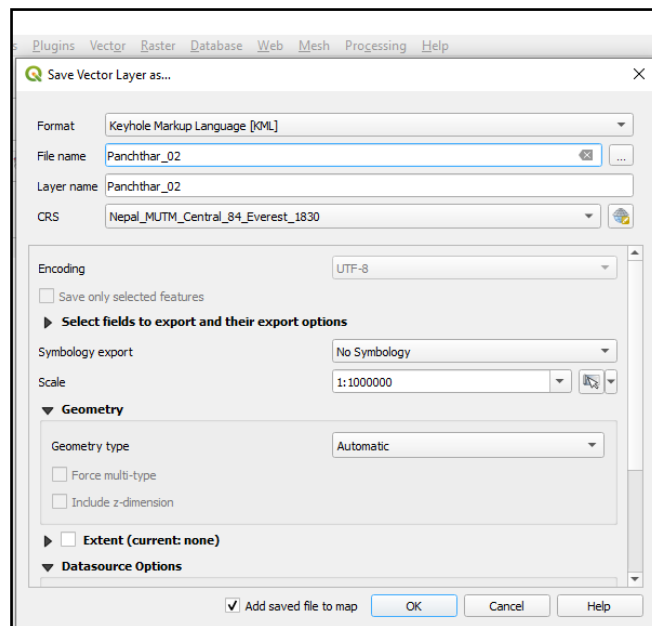
- o Now, we can open this *.KML* file in Google Earth by double clicking on icon.

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PART – V
Join Table and Query Building

Course Outline:
- Concept and Application of Spatial and Attribute Data Management
- Spatial Joining of Attribute Data in GIS (Hands on Exercise)
- Query Building (Hands on Exercise)
- Selection of Spatial Features using Attribute Query (Hands on Exercise)
- Selection of Spatial Feature using Select Location Query (Hands on Exercise)

A spatial join links the attributes of two layers based on the location of the features in the layers. Like joining two tables by matching attribute values in a field, a spatial join appends the attributes of one layer to another. A Spatial join is a GIS operation that affixes data from one feature layer's attribute table to another form a spatial perspective.

Joining Data in QGIS – Spatial and Attribute:

If we need to make a map of total population by *Local Unit of Panchthar District* but the Local Unit of GIS layer does not have population as an attribute. Rather this data is contained in an Excel spreadsheet which is located in GIS Training/QGIS Training/Training Data/Excel Files/ folder. It is possible to join additional tabular data to an existing attribute table. For this, two tables (Attribute and Excel Files) need to share fields with attributes to match for joining.

To create a join, load both the GIS layer (Pan_LGB.shp) and the Excel Sheet (Join_Table.xls) into QGIS Desktop.

Once the data is loaded a join can be completed by following these steps:

1. Select the GIS layer in the Layers panel that will receive the new data from the Excel Sheet with joining method.
2. Click Layer Properties and choose the **Joins**
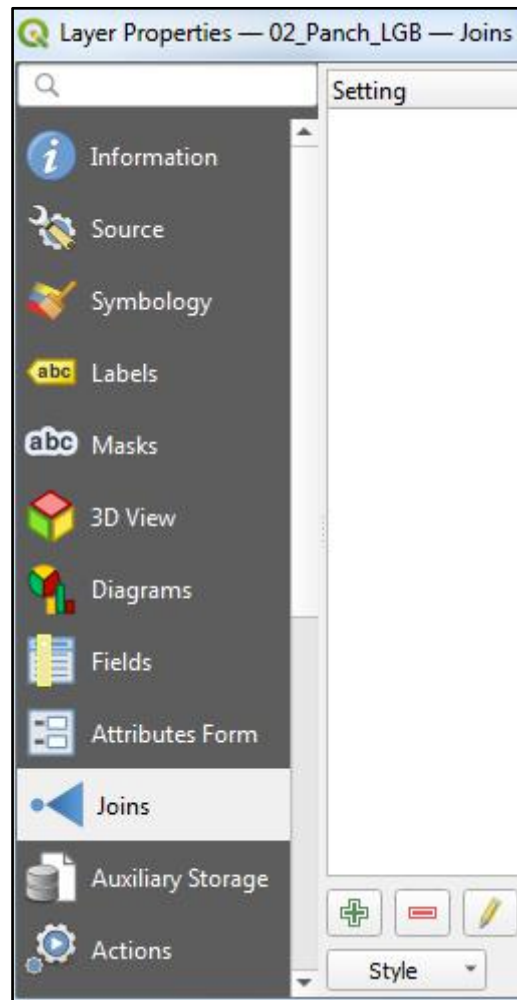
3. Click the Add Join button
4. Choose the Join Layer, Join Field and Target Field. The **Join Layer** and **Join Field** represent the Excel table. The **Target Field** is the column in the GIS Layer attribute table the join will be based on.
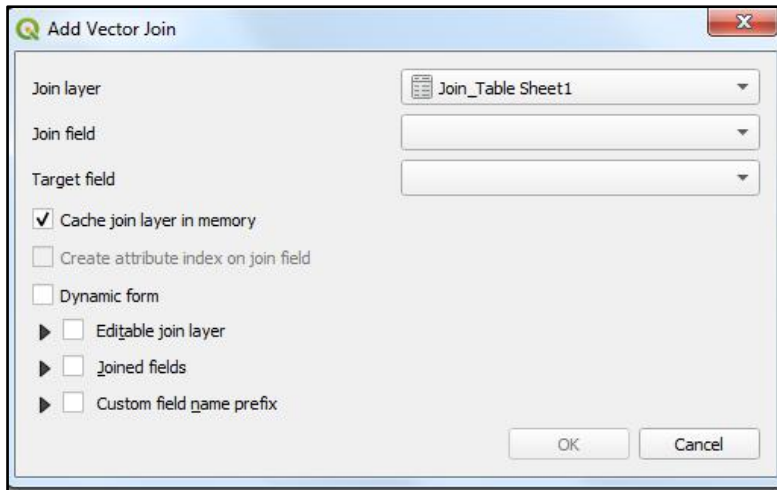
5. Choose **Join_ID** in Join Field and also **Join_ID** in Target Field.
6. Once created, the join will be listed on the **Joins** The extra attribute columns from the **Join Layer** will be appended to the attribute table where the value in the Join Field matched the value in the Target Field.

7. Joins can be removed by clicking the Remove Join button

Note: Joins only exist in virtual memory within the QGIS Desktop document. To preserve the join outside the map document click Layer | Save as... and save a new copy of the layer. The new layer will include the attributes appended via the join.

Selection by Attribute:

Select Features by Value:
This selection tool opens the layer's feature form allowing the user to choose which value to look for each field, whether the search should be case-sensitive, and the operation that should be used. The tool has also auto completes, automatically filling the search box with existing values.

1. Select Feature by Value Tool

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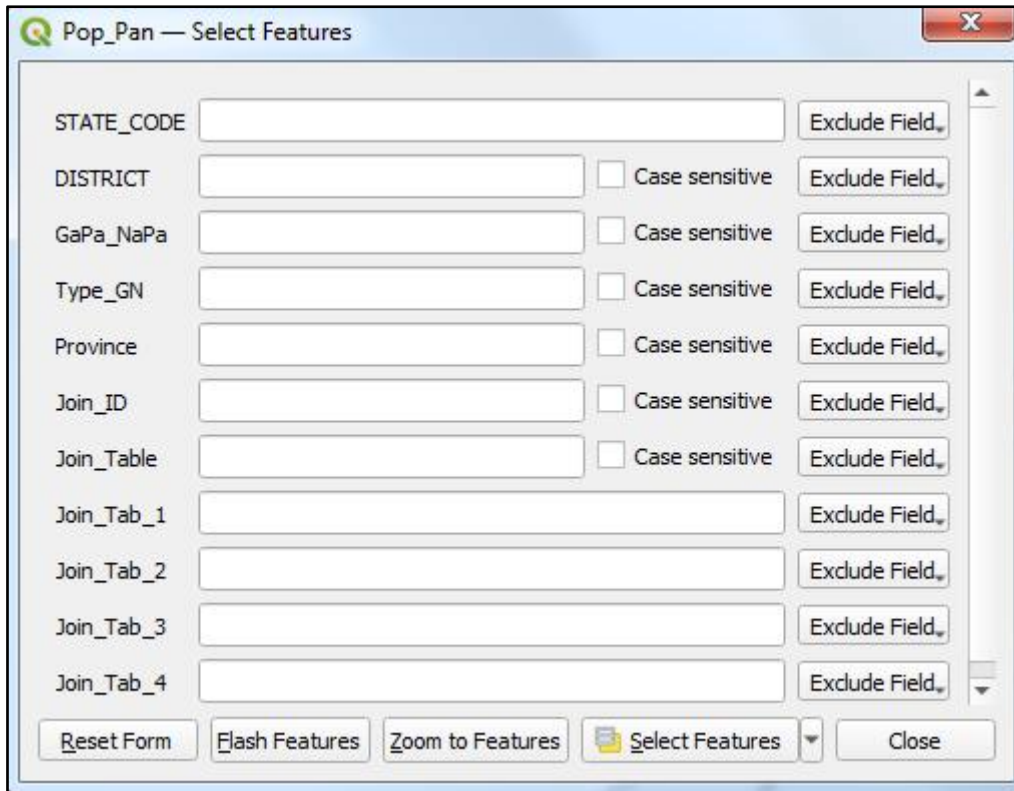
In the Join_Tab_3 text box (This is the total population field came after joining population data of local unit of Panchthar District).

2. Give Value 20000 and choose Greater than or Equal to Sign in Exclude Field just right to the text box.

3. Click on Select Features button.

4. This will select all local units having total population greater than or equal to 20000. The selected local unit will be highlighted in the map.

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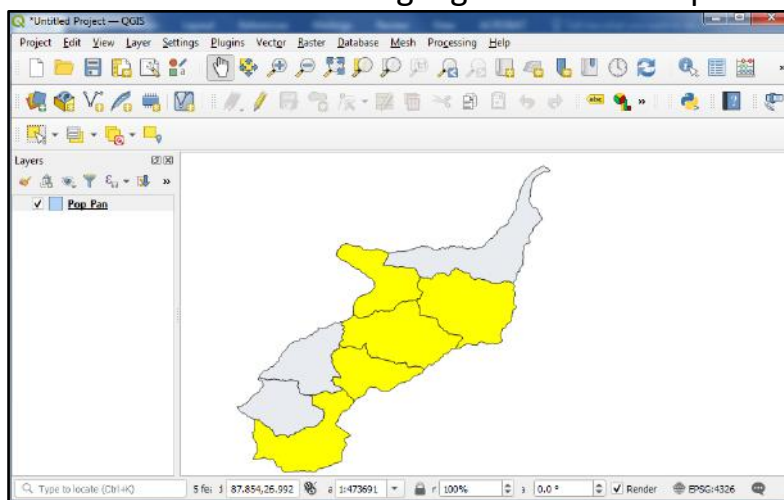
Selection by Location:

1. Open QGIS Desktop and Choose New Empty Project

2. Add two Vector Datasets located in GIS Training/QGIS Training/Training Data/ folder (a) Pan_LGB.shp and (b) Pan_Village.shp.
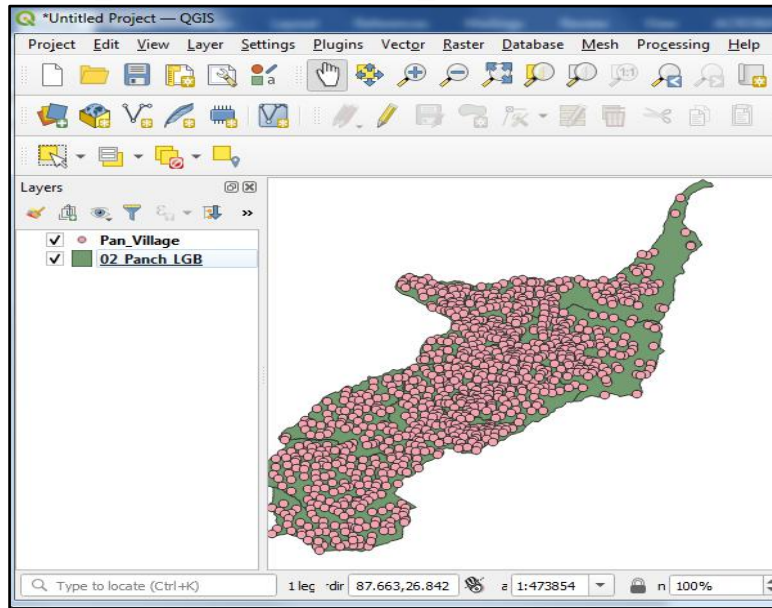
3. Select any one Local Unit among total of 8 from Pan_LGB.shp by With Select Feature Tool
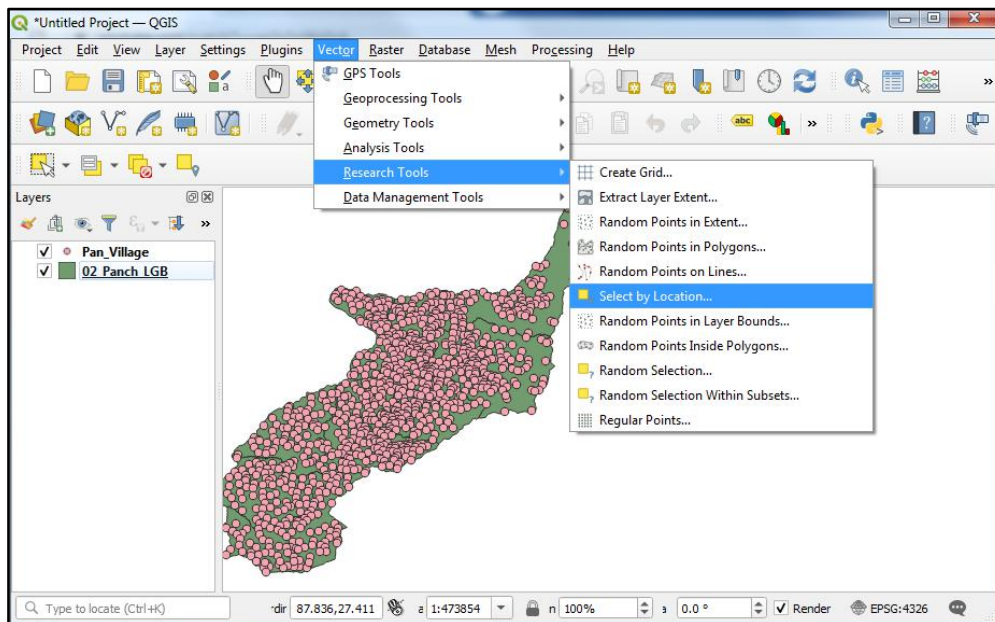
4. In Main Menu Bar, *select Vector->Research Tools->Select by Location*
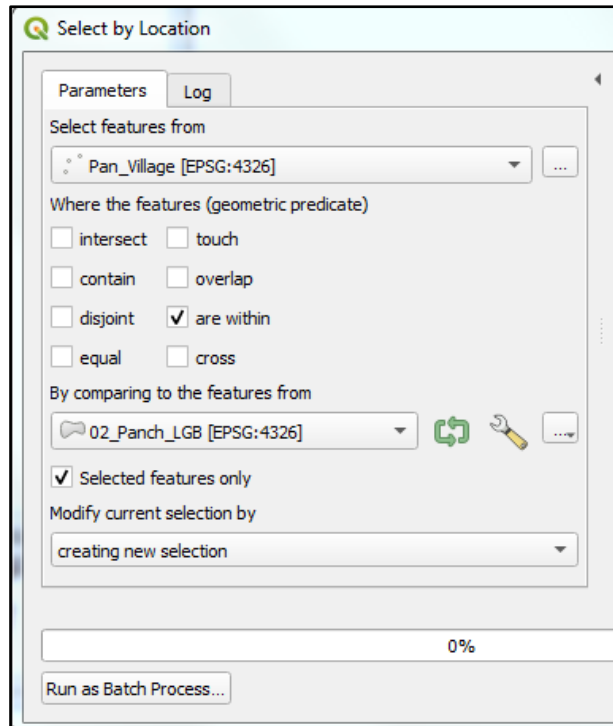
5. Select **Pan_Village** in **Select feature from** drop down box.
6. Check in **are within** box.
7. Select **Panch_LGB** in **By comparing to the features from** dropdown box.
8. Check in **Selected features only** box.
9. Click on **Run** and **Close**.
10. This will select all the villages points located inside selected local unit of Panchthar district like following.
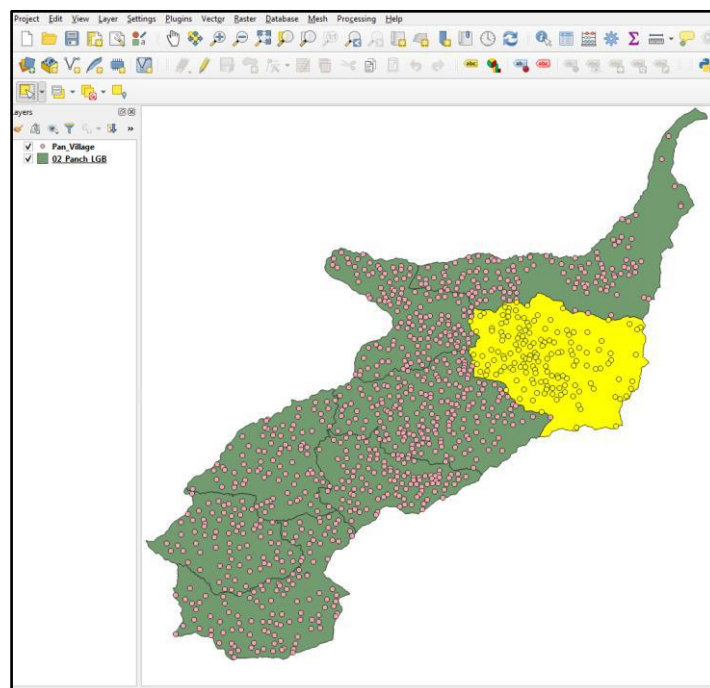
PART – VI
Statistical and Spatial Analysis

Course Outline:

- Calculation and Measurement of Spatial Features
- Length and Area Calculation (Hands on Exercise)
- Use of Summarization Tools (Hands on Exercise)
- Concept on Geo Processing Tools and Application (Theory)
  (Hands on Exercise on Identify, Clip, Buffer, Intersection, Merge etc.)
- Selection of Spatial Features based on Buffer Area (Hands on Exercise)

Field Calculator:

The Field Calculator button in the attribute table allows you to perform calculations on the basis of existing attribute values or defined functions, for instance, to calculate length or area of geometry features. The results can be written to a new attribute field, a virtual field, or they can be used to update values in an existing field.

The field calculator is available on any layer that supports edit. When you click on the field calculator icon the dialog opens. If the layer is not in edit mode, a warning is displayed and using the field calculator will cause the layer to be put in edit mode before the calculation is made.

The quick field calculation bar on top of the attribute table is only visible if the layer is editable.

In quick field calculation bar, you first select the existing field name then open the expression dialog to create your expression or write it directly in the field then click on **Update All** button.
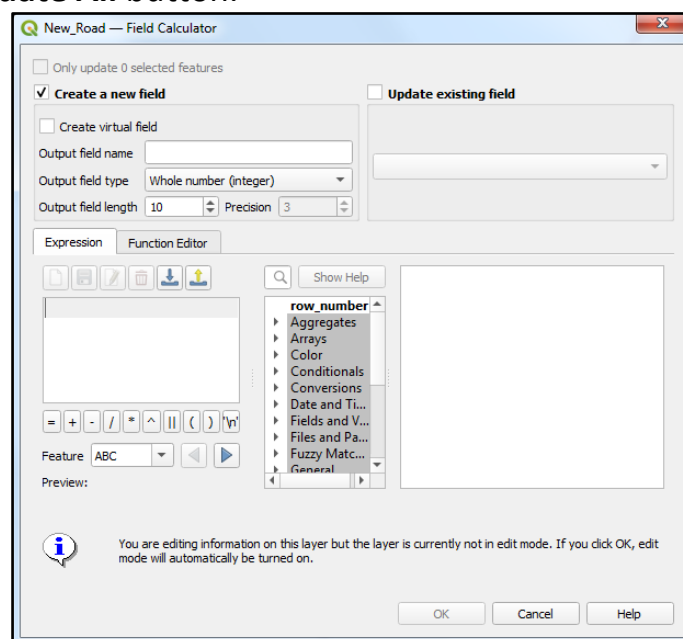
QGIS has built-in functions and algorithms to calculate various properties based on the geometry of the feature - such as length, area, perimeter etc.
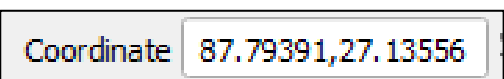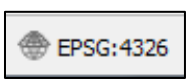
Calculation of Length of Digitized Road i.e. New_Road.shp:

1. Start QGIS Desktop and choose **New Empty Project**.

2. Click on **Data Source Manager** Icon
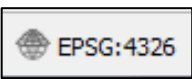
3. Add New_Road.shp using **Add Vector** tools.
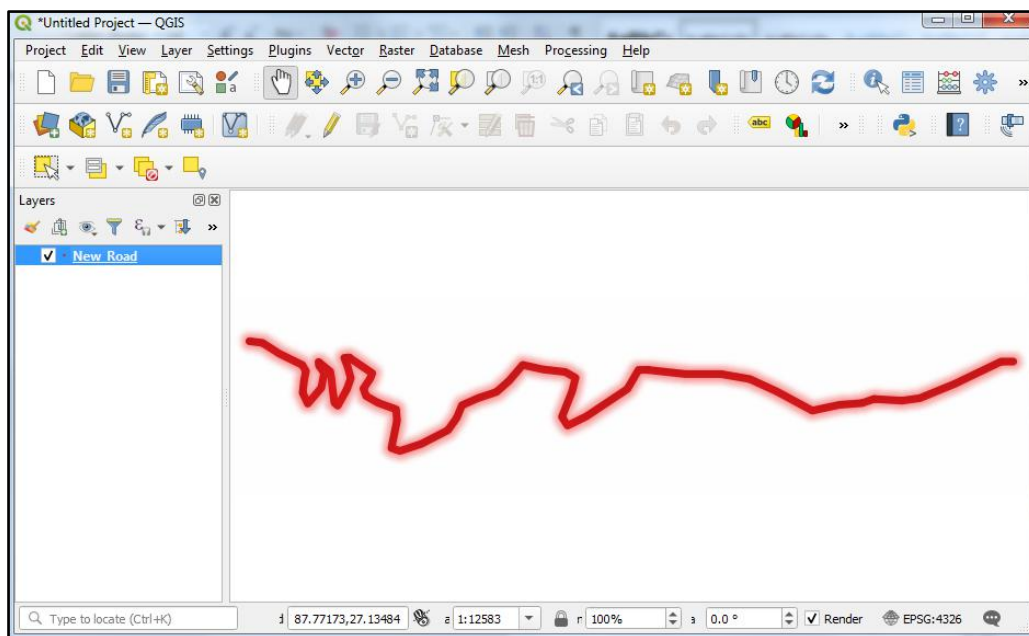
4. Look at Coordinate Values

   Reference System ![EPSG:4326]

5. This Coordinate Values represent Longitude and Latitude in Decimal Degrees and Coordinate Reference System (CRS) is WGS84.

   ❖ **We need to project this to Universal Transverse Mercator system**

6. Click on CRS icon at lower right corner ![EPSG:4326], following window appear
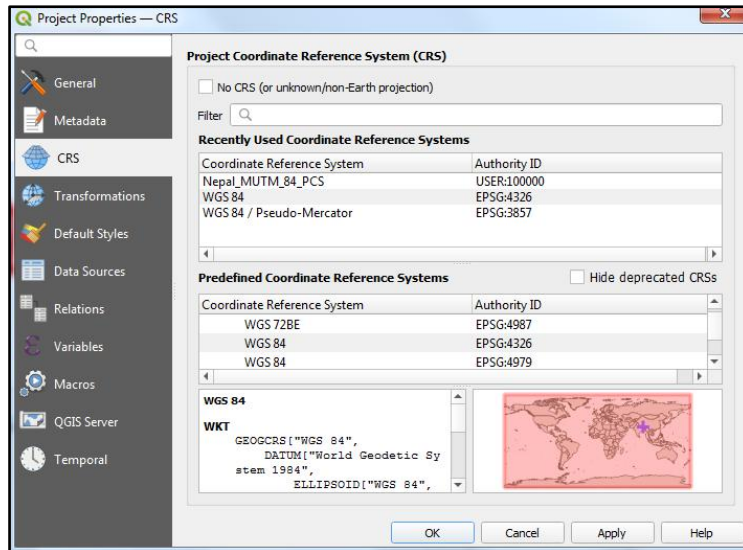
7. Choose Nepal_MUTM_84_PCS Coordinate Reference System from User Defined CRS and Click on Apply.

8. Now coordinate values changes to Meters | Coordinate | 873751,3008421 | and

CRS Changes to | USER:100000 |

9. To make this change permanent, Right click the projected layer
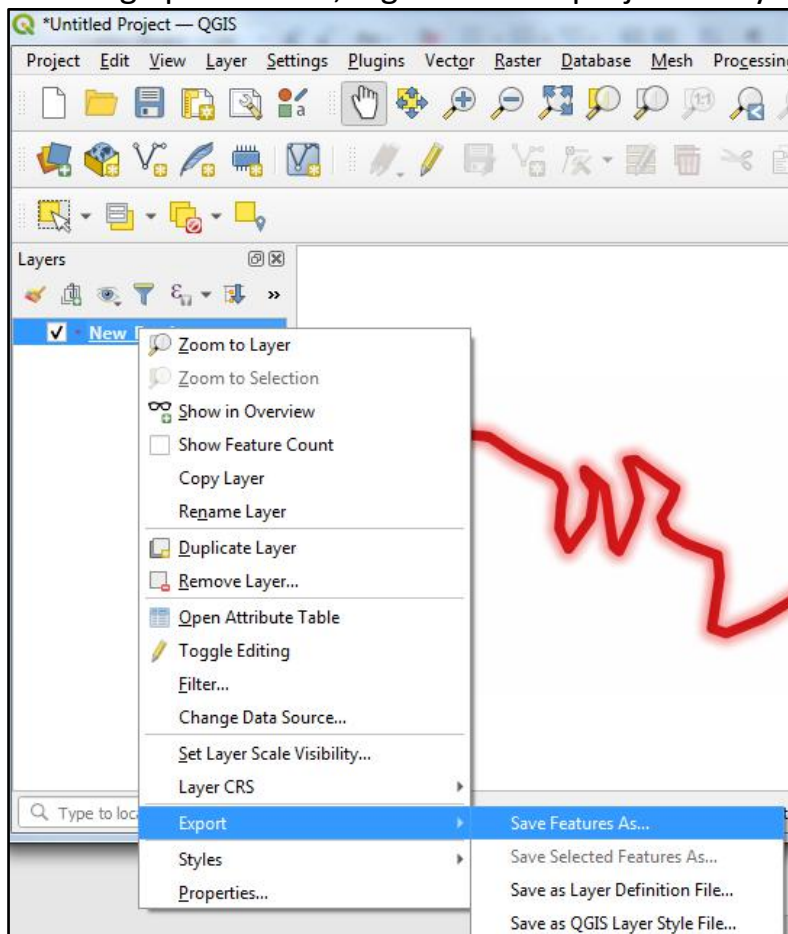
Select **Export** and **Save Feature As.**

10. Give New File Name as New_RoadMUTM.shp
11. Change the CRS to Nepal MUTM_84_PCS as shown below.
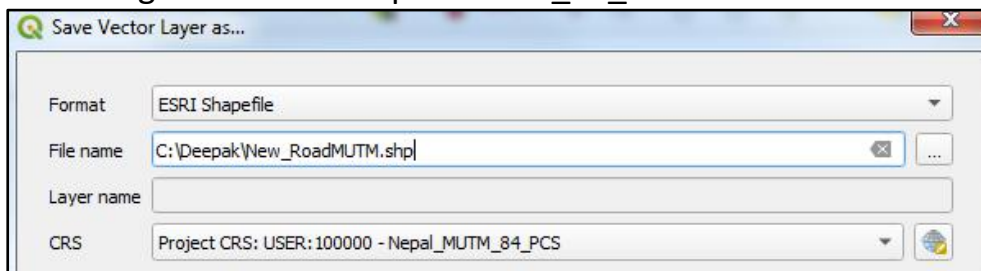
12. Click OK.

13. Remove **New_Road.shp** Layer which is based on WGS84 CRS.

14. Now Go to **Project**, **Properties** and **General**, following window appear.
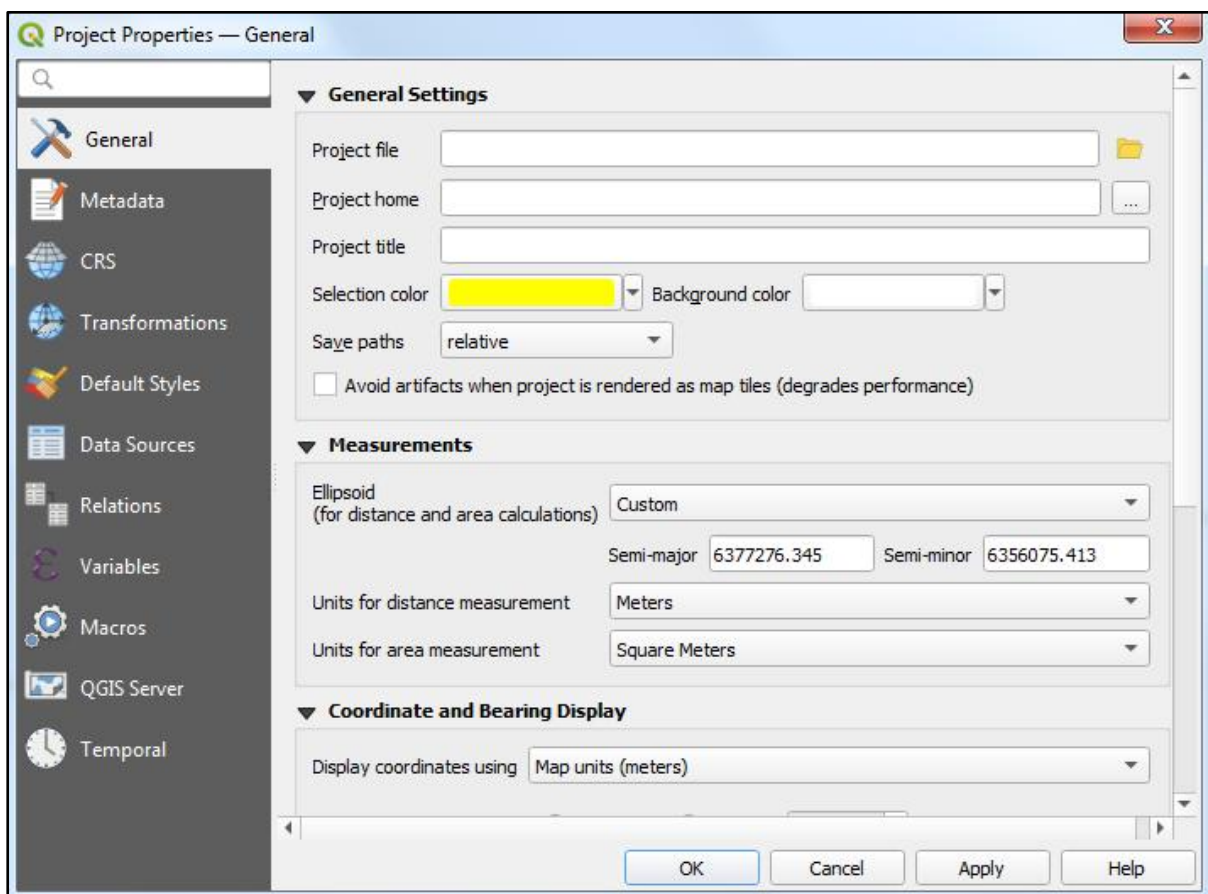
15. In the **Measurement** dropdown menu, Change **Ellipsoid** to **Everest 1830 Definition** instead of **Custom.**

16. Click Apply and OK.

17. Now Press Toggle Editing to get your data for Editing Mode.

18. Open Field Calculator

19. Check In the **Create a New Field** box.

20. Give Length at Output field name

21. Change Output field type to Decimal number (real)

22. Search Length in Search Bar and Double Click on **$length** in **Geometry** Dropdown menu.
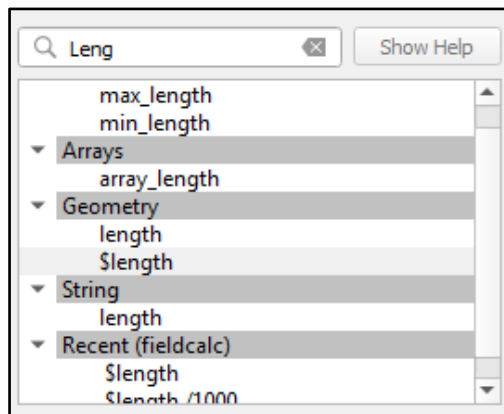
23. Expression box look likes following
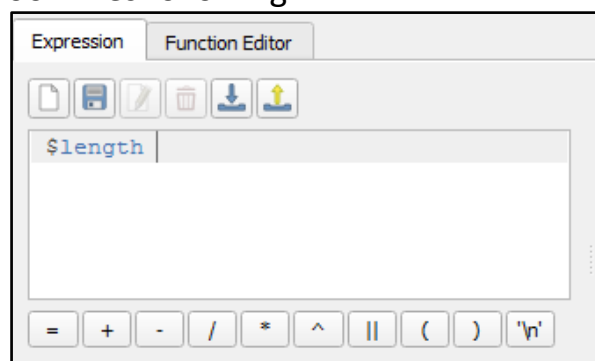
24. Click OK.

25. Save your Layer Edit

26. Toggle the Editor to off the Editing Mode.

26. Click the Attribute Table

27. A New field **Length** is added with length in meters of the Digitized New Road Feature.
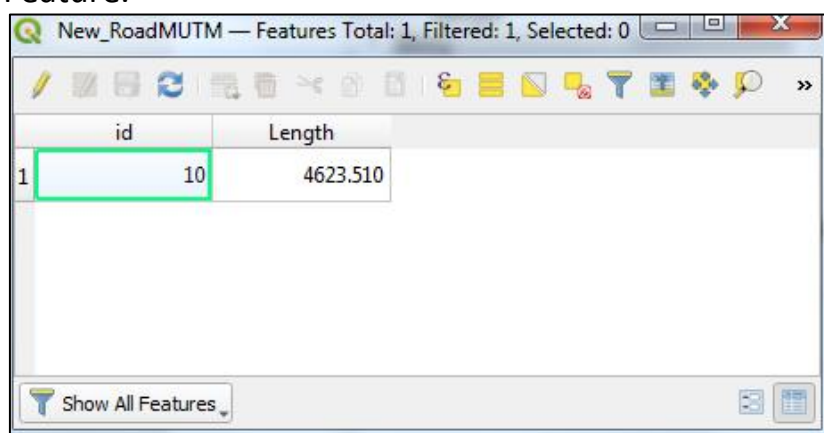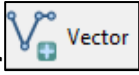
> ❖ *Now try yourself to calculate area of digitized polygons and enjoy!!!!*

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Summarization:

1. Open QGIS Desktop and click on **"New Empty Project"**.
2. From Menu Bar, go to *Plugin->Manage and Install Plugins*
3. Search for **Group Stats** Plugin in search box.
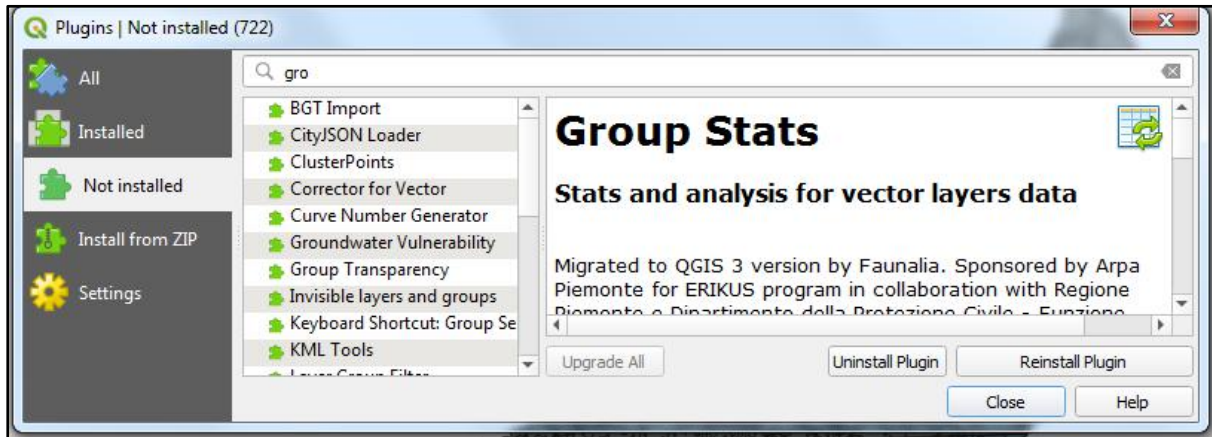
4. Install Group Stats plugin.

5. A new icon would appear in Vector Toolbar.

6. Click on **Data Source Manager** Icon

7. Add Pan_Luse.shp using **Add Vector** tools.

> ❖ *Now following steps 4 to 27 of previous exercise for calculation of length of the road, calculate/update area of land use polygon data.*

8. Add projected Land use Data layer to the map canvas.

Now you need to summarize land use category by summing up the area belonging to each category. For example how much area is Forest needs to summarize using this tool.

9. Open Attribute Table. You can see Land use category is in FEATURES field.

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Summarizing Field

10. Click on Group Stats Tool Icon
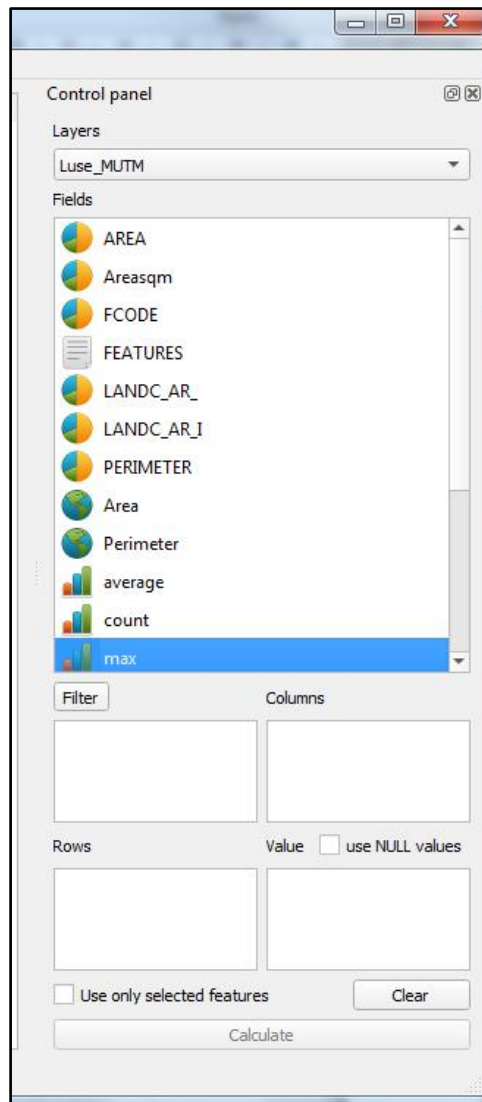
11. Drag and drop FEATURES field to **Rows** text box.

12. Drag and drop Area in **Value** text box.

13. Drag and drop sum in **Columns** text box. See below.
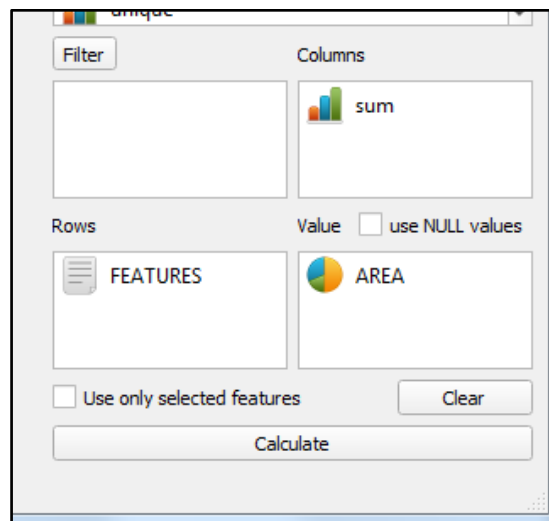
14. Click on **Calculate** tab. Following statistics is displayed.

15. Goto Data and select **Copy All to Clipboard.**
16. Open Excel Sheet and Paste the data.

Geo Processing:

Geoprocessing is a framework and set of tools for processing geographic and related data. The comprehensive suite of geoprocessing tools can be used to

perform spatial analysis or manage GIS data in an automated way. Geoprocessing is for everyone that uses GIS. Whether you are a new or advanced user, geoprocessing will likely be an essential part of your day-to-day work.

A typical geoprocessing tool performs an operation on a dataset such as a feature class, raster, or table, and creates a resulting output dataset. For example, the Buffer tool takes features as input, creates buffer areas around the features to a specified distance, and writes those buffer areas to a new output dataset.

In addition to the suite of tools, geo-processing is also a powerful framework that supports control of the processing environment and allows you to build custom tools that can further automate your work.

Buffering:

A buffer is a reclassification based on distance: classification of within/without a given proximity. Buffering involves measuring distance outward in directions from an object. Buffering can be done on all three types of vector data: point, line, area. The resulting buffer is a polygon file.

Most often buffers are measured in uniform distance. For example, creating a 50 meters buffer around all rivers. A buffer based on different distances is called a variable buffer. For example, the noise level surrounding a street network may be based on the traffic load. Therefore a variable buffer may be used to illustrate the noise level by using a larger distance for high traffic roads and a shorter distance for quieter roads.

Creating buffer of 200 m around the digitized Road Data:

1. Start QGIS Desktop and choose **New Empty Project**.

2. Click on **Data Source Manager** Icon

3. Add Projected New_RoadMUTM.shp using **Add Vector** tools.

4. Go to ***Vector->Geoprocessing Tools-> Buffer***

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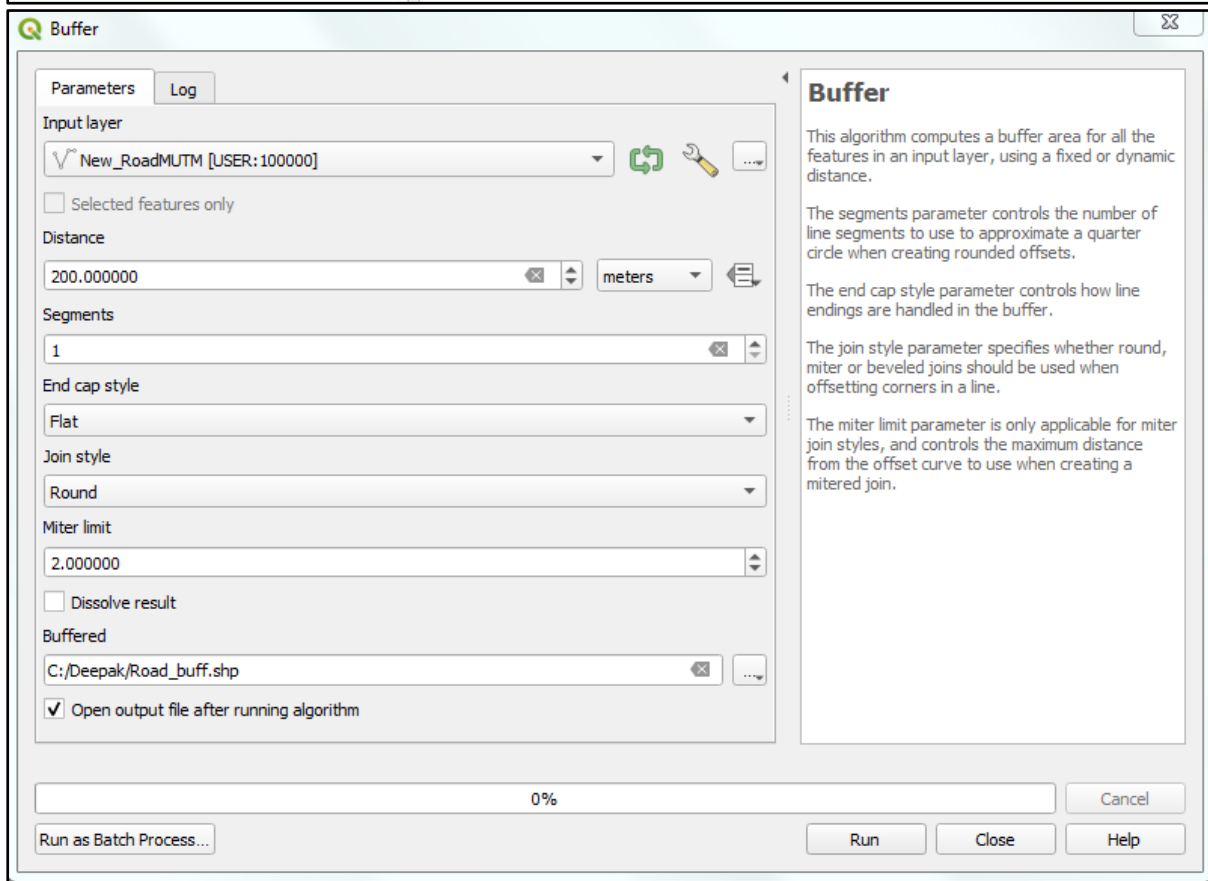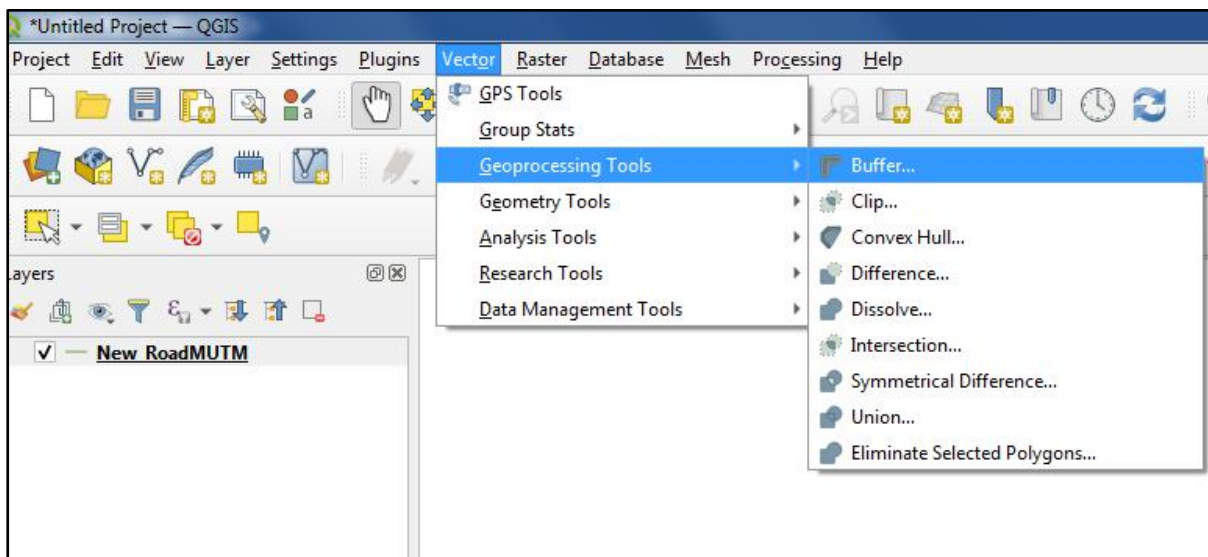
5. Choose New_RoadMUTM.shp in Input Layer
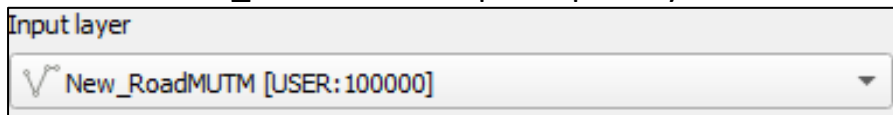
6. Type 200 in Distance text box. Note the unit should be in meter.
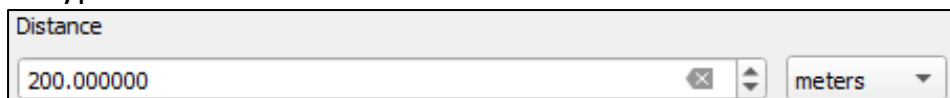
7. Type 1 in Segment text box.

Segments

| 1 |
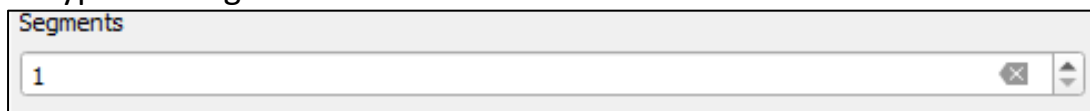
8. Save as Road_buff.shp in Buffered text box.

Buffered

| C:/Deepak/Road_buff.shp |
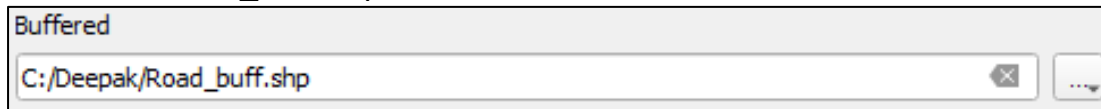
9. Click on Run tab.

10. A buffered area having polygon feature is overlaid into the road segment.
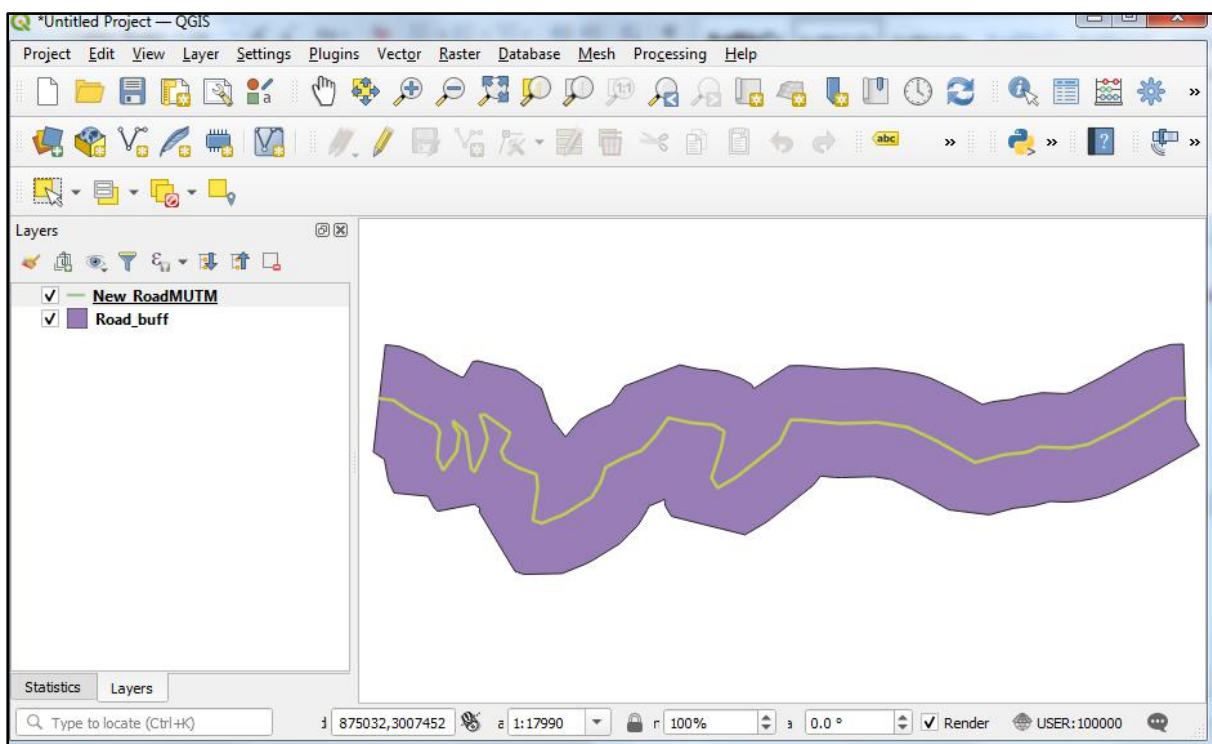
Clipping Analysis:

This analysis extracts input features that overlay the clip features. Use this tool to cut out a piece of one dataset using one or more of the features in another dataset as a cookie cutter. This is particularly useful for creating a new dataset—also referred to as study area or area of interest (AOI)—that contains a geographic subset of the features in another, larger dataset.

Illustration

INPUT   +   CLIP FEATURE   →   OUTPUT
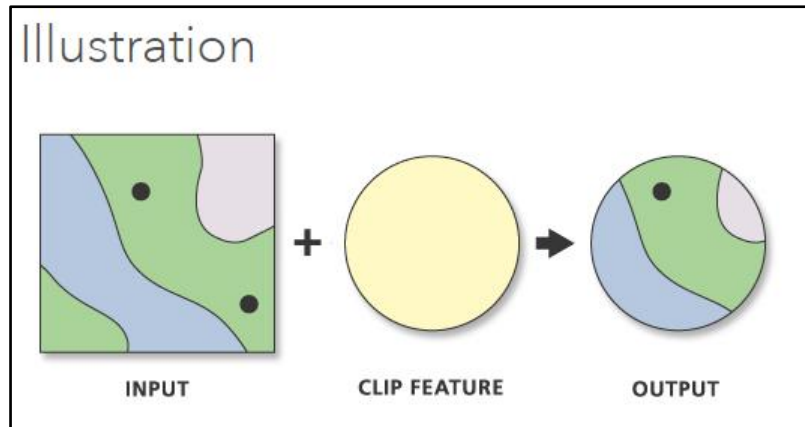
Clipping Land use Features from Road Buffer Polygon:

1. Open QGIS Desktop and click on **"New Empty Project"**.

2. Click on **Data Source Manager** Icon

3. Add Luse_MUTM.shp and Road_Buff.shp using **Add Vector** tools.
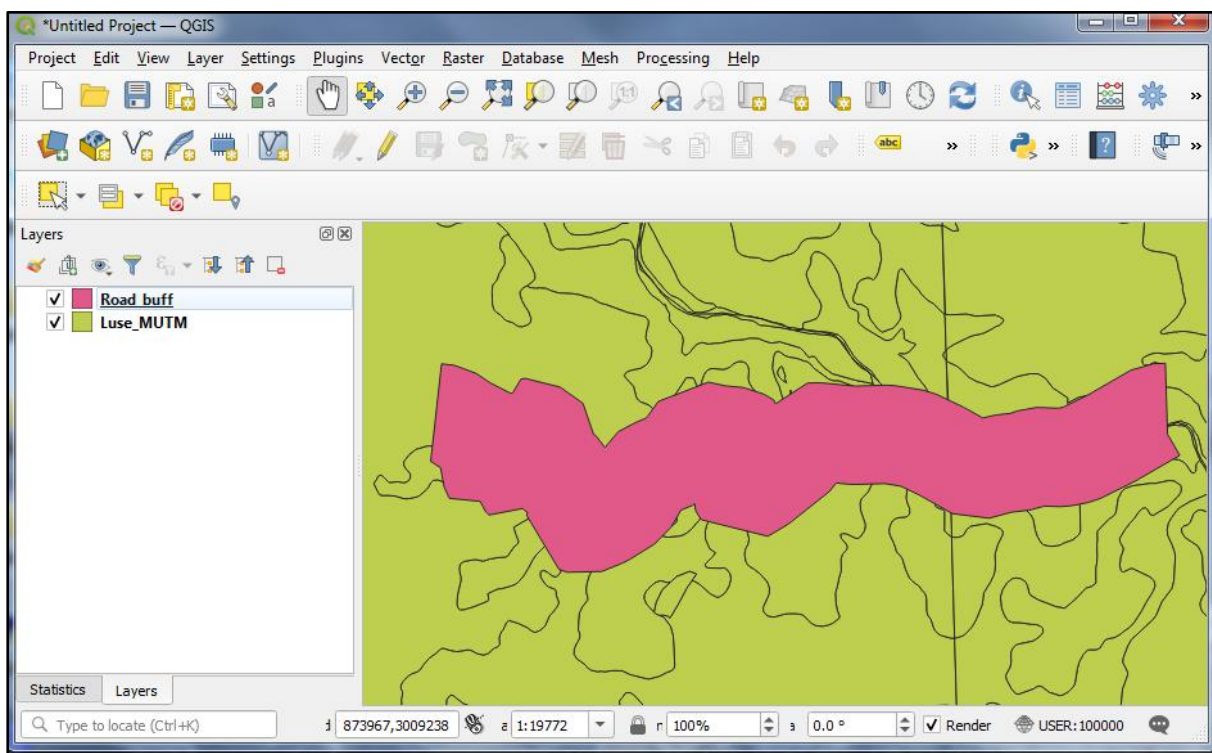
4. Move Road_buff layer top of the land use layer.

5. Go to **Vector->Geoprocessing Tools->Clip**
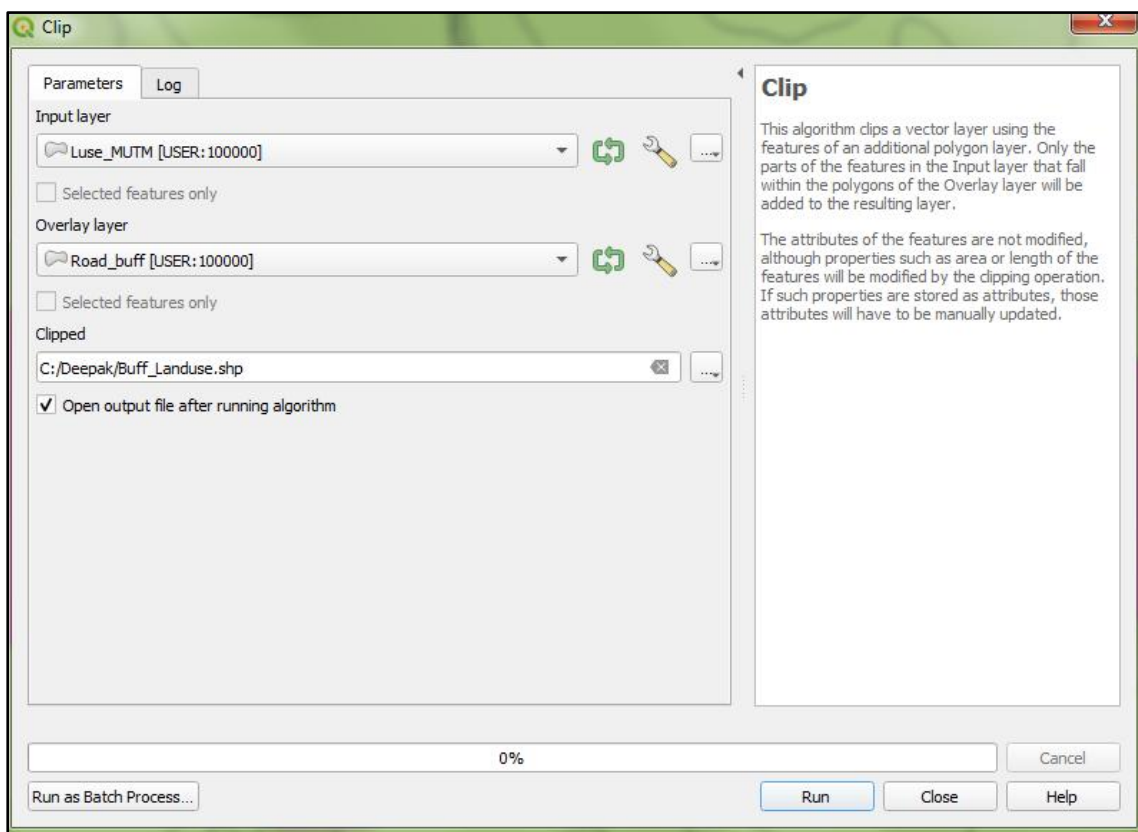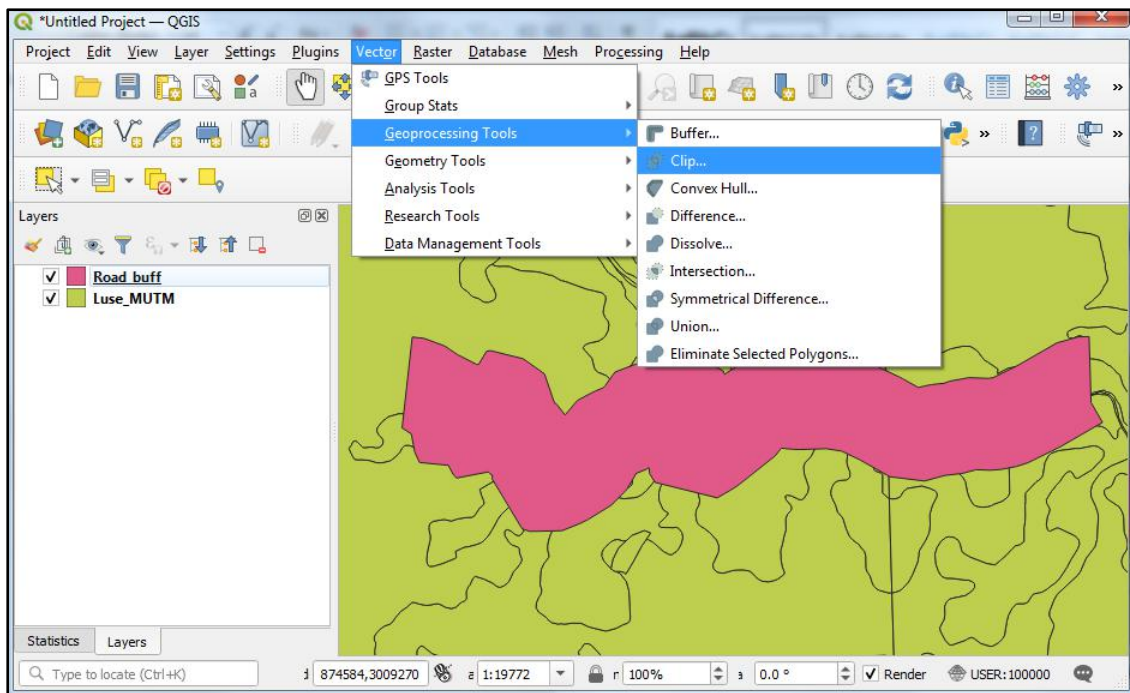
6. Select Luse_MUTM.shp in **Input Layer**

7. Select Road_buff.shp in **Overlay Layer**

8. Give Buff_Landuse.shp file name in **Clipped** text box.

9. Click **Run**

10. A new Layer **Buff_Landuse.shp** is added to Layer window.

11. Turn off **Road_buff.shp** and **Luse_MUTM.shp** layers.
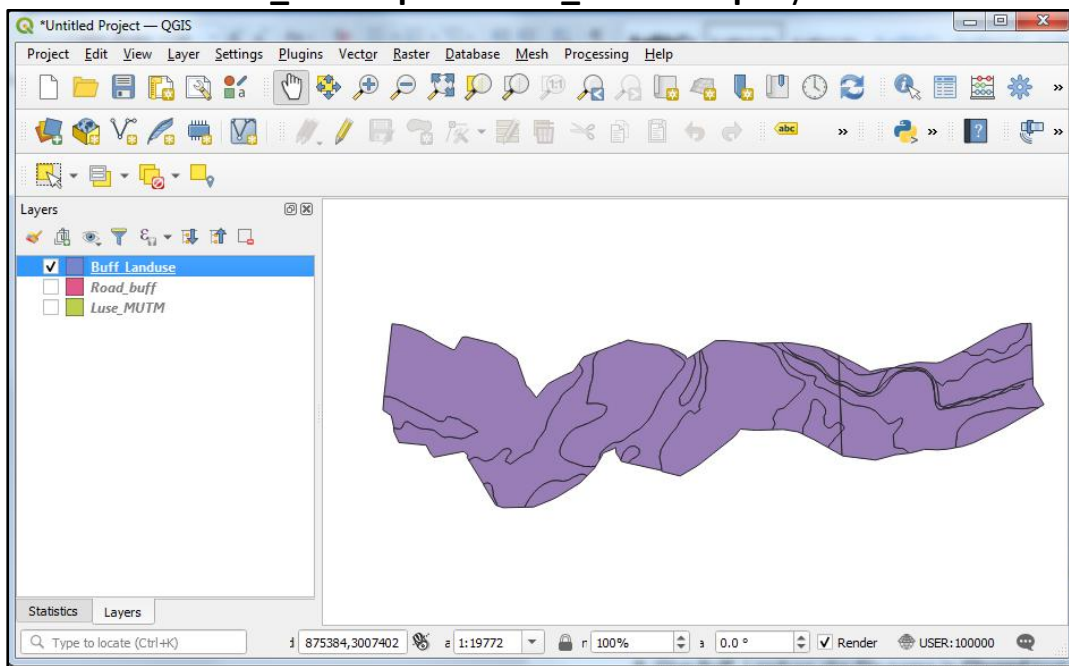
12. Clipped land use layer is displayed.
13. Now we have to update area of this newly created land use polygon features.
14. Go to *Project->Properties->General*
15. In **Measurement** dialogue box, change Ellipsoid to **Everest 1830 (Definition)**
16 Click on **Apply** and **OK**
17. Open attribute table

18. Toggle editing mode on for this layer.
19. Open field calculator
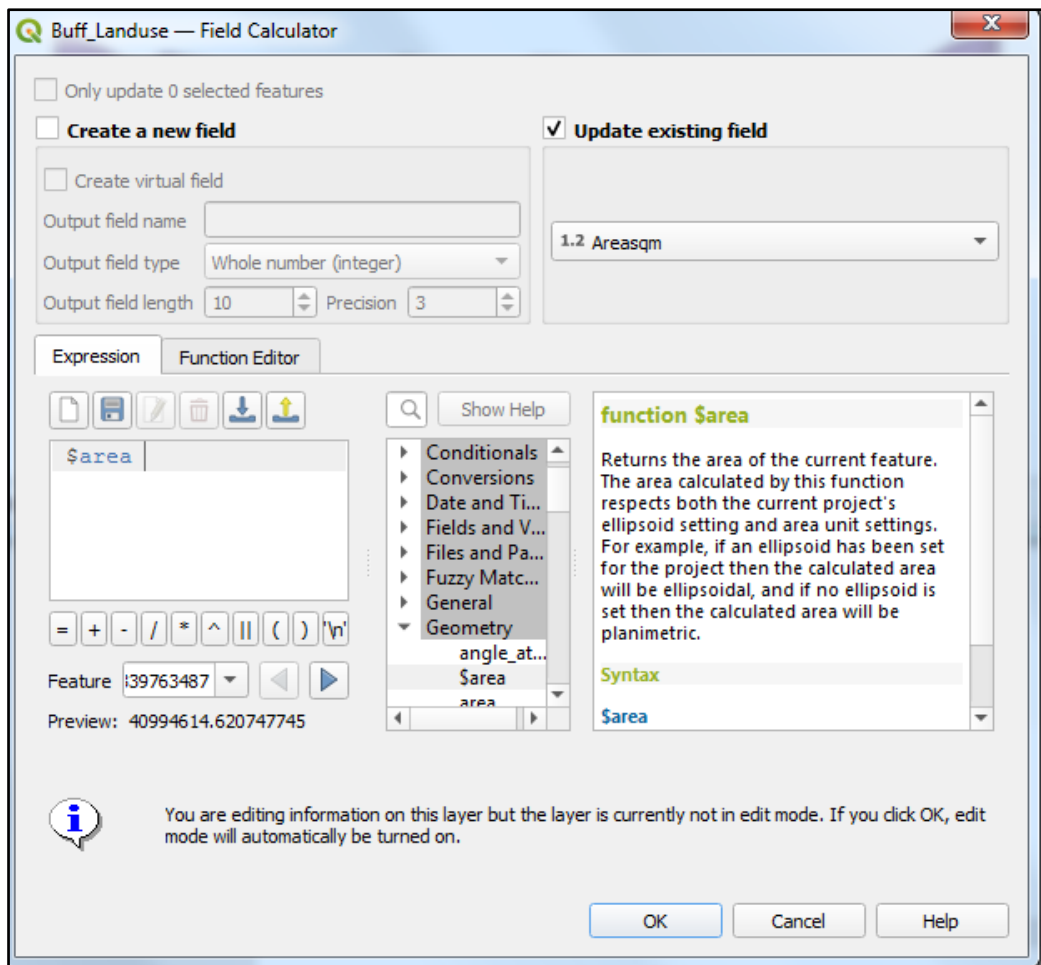
20. Check in the **Update existing field** box

21. Select existing Area sqm field from dropdown list

22. In the Geometry, double click **$area** expression
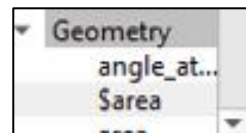
23. Click OK.

24. Select **Save Edit Tool**

25. Toggle editing mode to off .

PART – VII
Output Design and Project Work

Course Outline:

- Working on Mapping Field Properties (Hands on Exercise)
- Hands on Exercise for Labeling and Symbology
- Theoretical Concept on Cartographic Element of the Maps
- Cartographic Designing for Map Outputs
- Layout and Reporting Format of GIS Map Outputs

Symbology:

Symbology, in the context of Cartographic design, is the use of graphical techniques to represent geographic information on a map. Map symbols for geographic features include Visual variables such as color, size, and shape.

Generically, a symbol is an object, picture, written word, sound, or particular mark that represents something else by association, resemblance, or convention. For example, Roman numerals are symbols for quantitative values and personal names are symbols representing individual people. On a map, a red cross is a commonly understood symbol to indicate the location of a hospital, crossed sabers may indicate the site of a battlefield, and a blue region would commonly be interpreted as a water body. Semiotics is the scientific and philosophical study of how symbols work by establishing these connections between the representation and the represented concepts and real-world features.

Map Symbols:

Maps communicate their messages through symbols--drawn graphics that represent spatial phenomena such as objects, places, or attributes. At their most basic, map graphics can be categorized by Dimension: points, lines, and regions; each can be portrayed using symbology. These symbols are commonly used to describe different features mapped. For example, cities or airports are commonly represented as point symbols (depending on scale), roads or railroads are usually represented by line symbols and the cities, lakes, or forests are common examples of region symbols.

Map symbols are created by controlling visual variables such as color, shape, and size. When designing a map, the cartographer determines that a certain combination of these variables; a symbol (e.g., a dashed 0.5pt blue line)- represents a certain class of geographic feature. Although there is no set

standard on symbology for all maps, especially among thematic maps, various conventions (such as using contour lines for elevation or blue for water) are commonly followed for some classes of maps.

The choice of symbology is a crucial part of cartographic design; the goal is for the map reader to spend less time figuring out what the symbols mean, and thus more time using the symbols to understand the World. A good symbol is easily recognizable (i.e., connected to the geographic features and concepts it represents), is aesthetically pleasing, and works in harmony with other symbols (for example, as part of a clear visual hierarchy). A legend is needed to explain the meaning of the symbols that cannot safely be assumed to be intuitive.

Types of Map Symbols

Map symbols are "read" by map users when they make a connection between the graphic mark on the map (the *sign*), a general concept, and a particular feature of the real world. For example, thick blue line (*sign*) = major river*.*

- **Image or Iconic Symbols** *look like* the real-world feature, although it is often in a generalized manner. For example, a tree icon to represent a forest, or green denoting vegetation.
- **Functional Symbols** directly represent the *activity* that takes place at the represented feature. For example, a picture of a skier to represent a ski resort or a tent to represent a campground.
- **Conceptual Symbols** directly represent a *concept* related to the represented feature. For example, a dollar sign to represent an ATM
- **Conventional Symbols** do not have any intuitive relationship but are so *commonly used* that map readers eventually learn to recognize them. For example, a red line to represent a highway or a cross to represent a hospital.
- **Ad Hoc Symbols** do not have any intuitive or commonly accepted relationship; in fact, the symbol is often used only for a single map. These symbols require effective legends and/or labels to be correctly interpreted.

1. Open QGIS Desktop and click on **"New Empty Project"**.

2. Click on **Data Source Manager** Icon

3. Add District Boundary, Local Unit Boundary, Village, Land use, Road and River features using **Add Vector** tools.
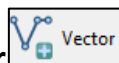
Note: Press and hold **Ctrl** key and select all these features one by one to add all in single click.
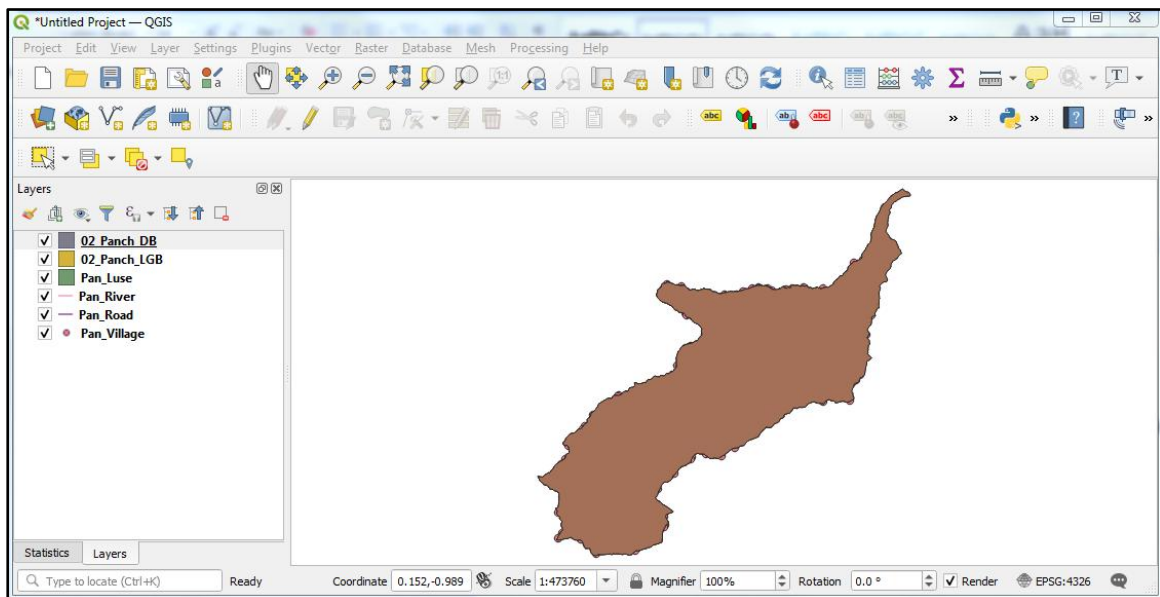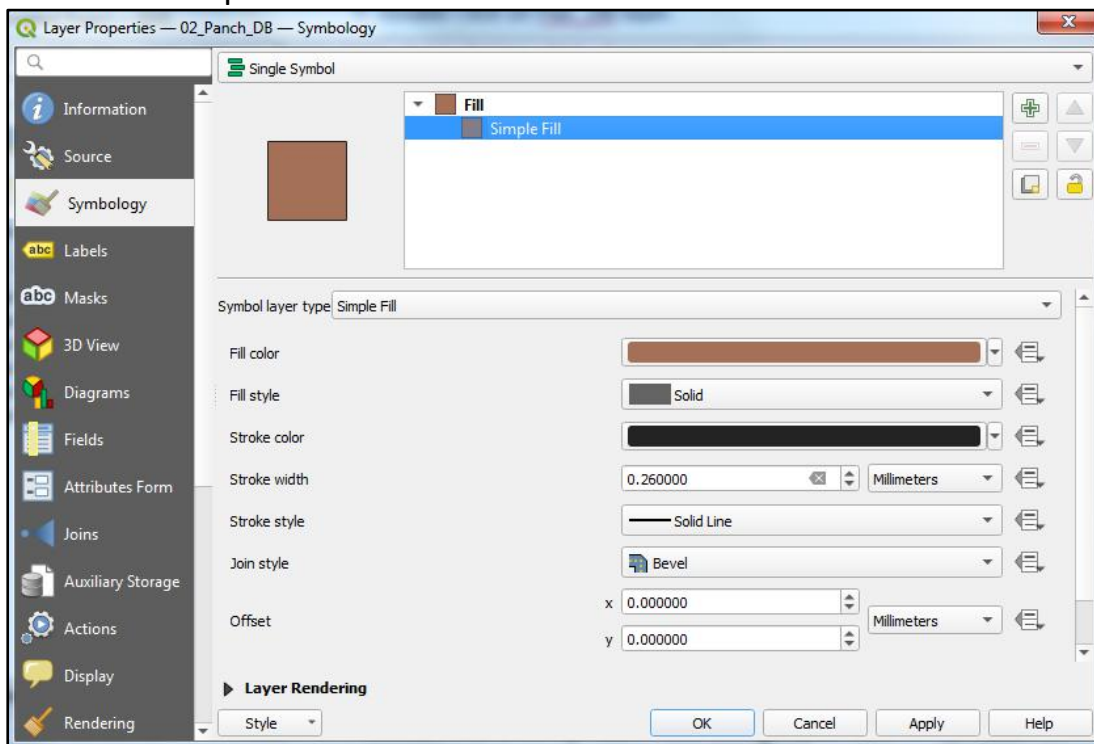

4. Bring Point feature (village) on top, and then Line features (road and river) in the layer panel.
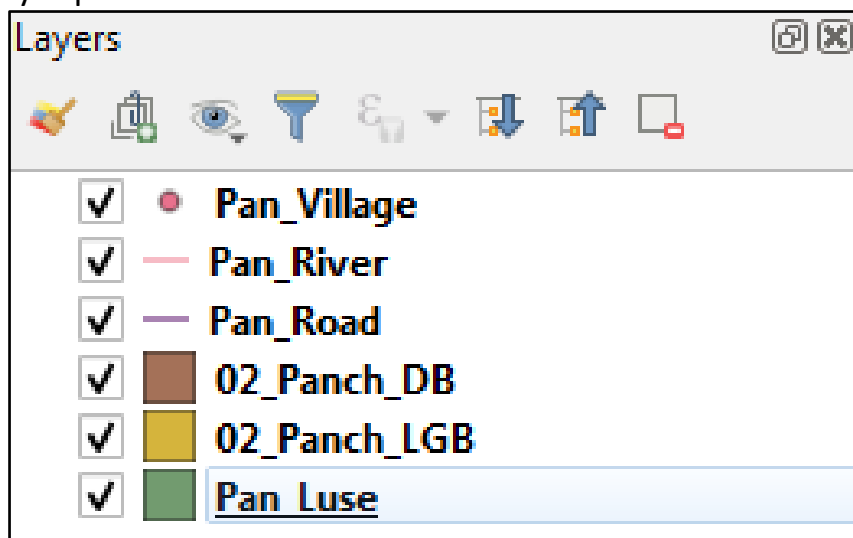
5. Double Click on Pan_DB layer.
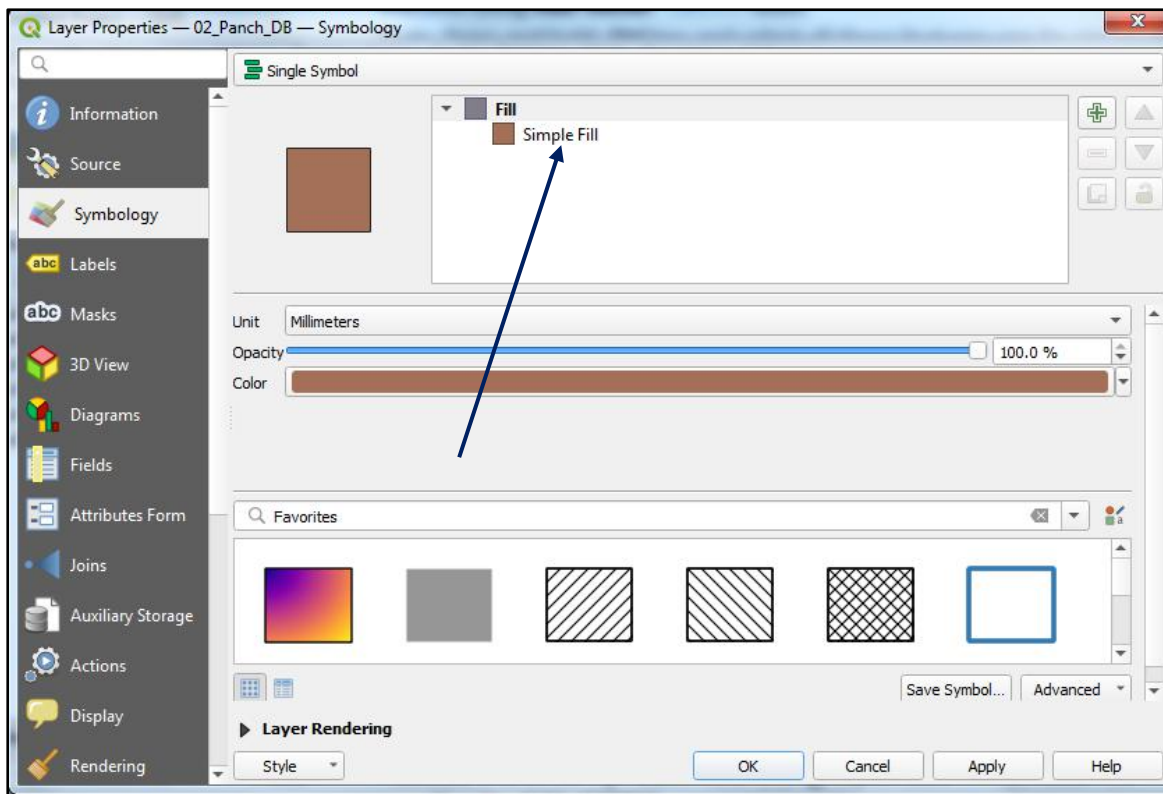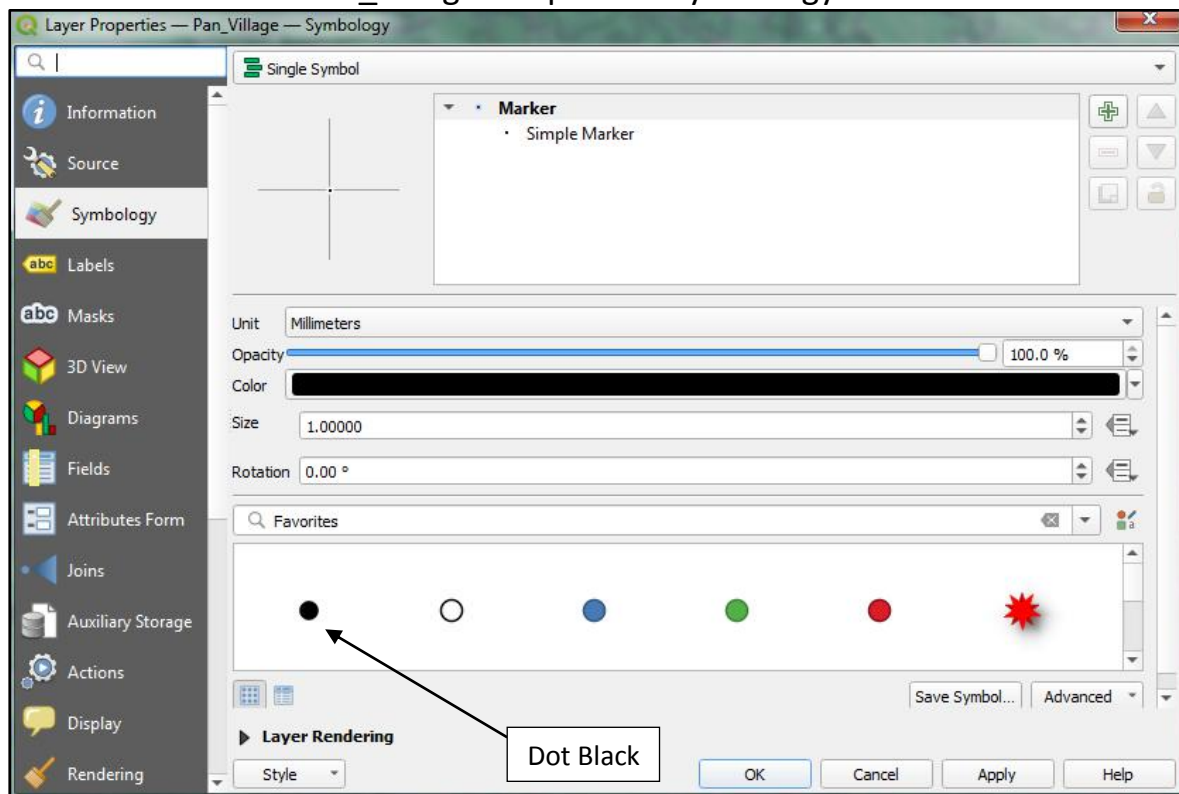
5. Click on Simple Fill.

6. Choose Transparent in **Fill Color**

7. Put the value 1 in **Stroke width**

8. Click Apply and OK.

9. Apply same symbology method to Pan_LGB but put 0.7 in **Stroke width** and also choose light gray color in **Strike Color**

10. Double click on Pan_Village to open the symbology tool.

11. Choose Dot black symbol and put 1 in size
13. Double click the *layer Village*
14. Select Labels in **Layer Properties**
15. Select **Single Labels.**
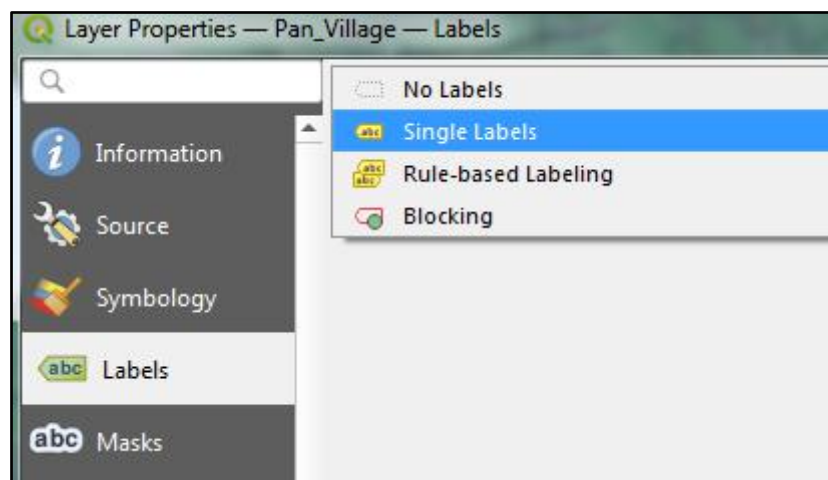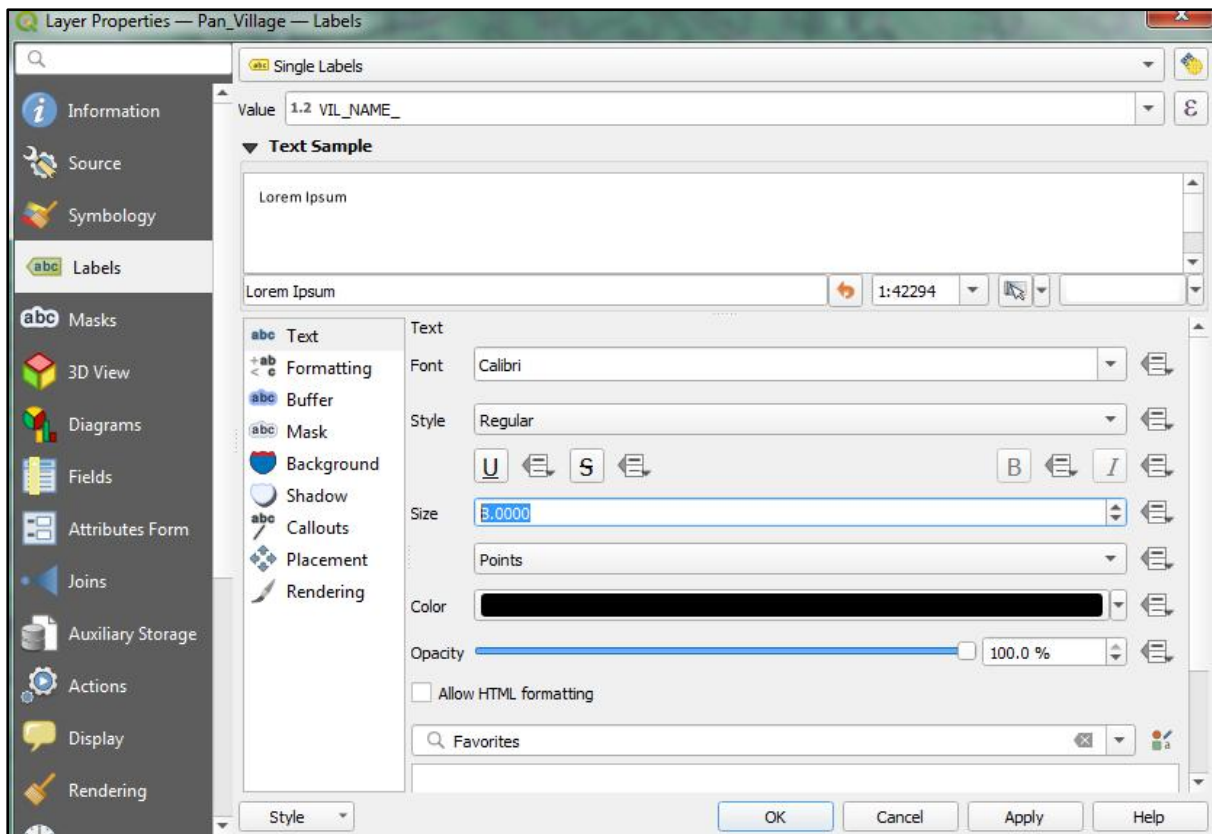
16. Select Value for Label field, Font type, color and size then click Apply and OK.
17. Apply same method to label name of Local Unit i.e. ***Gaunpalika/Nagarpalika***.

18. Now double click the Road Layer.
19. In **Symbology**, choose **Categorized**
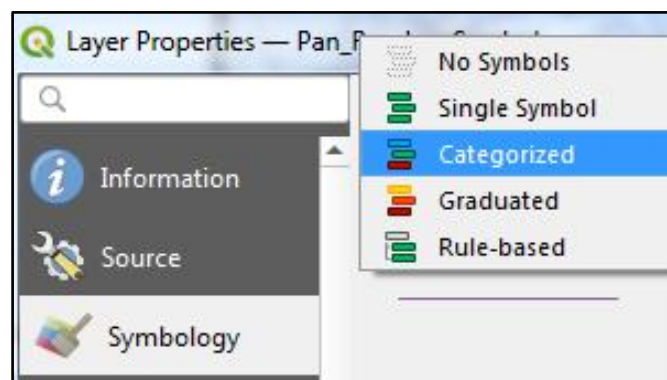
20. Select FEATURES in value field.
21. Click on **Classify** tab.
22. This will list all types of FEATURES i.e type of road
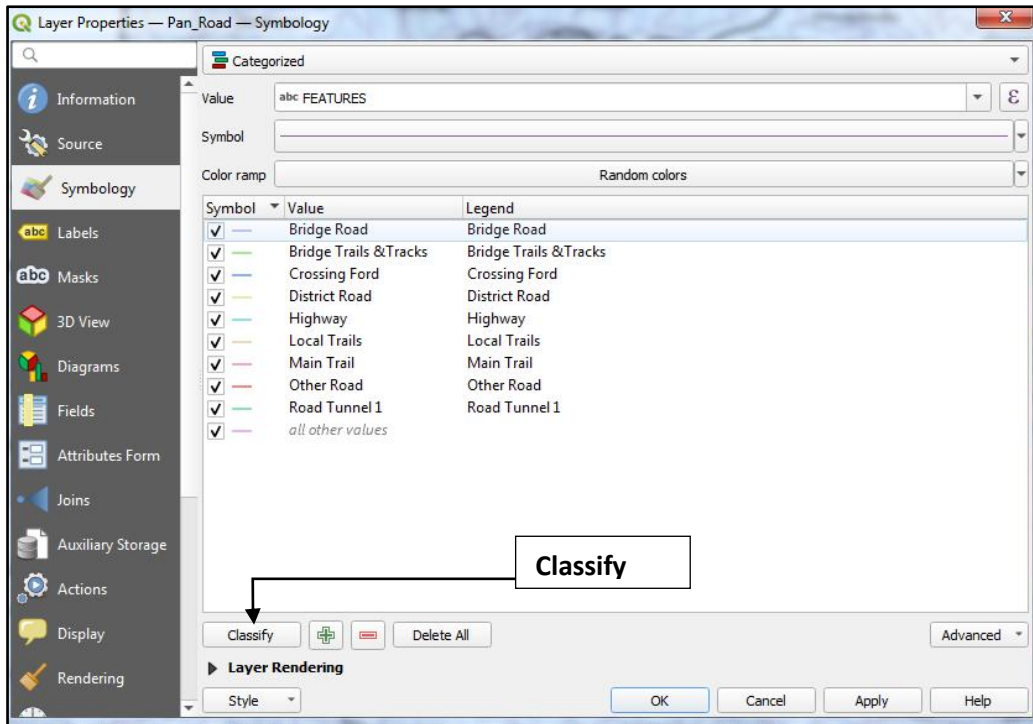
23. Now apply thickness and color for each type of road by selecting road type one by one.

24. Example of Symbol for highway is like this

25. Zoom in the map in Phidim Area.

26. Put the **land use** layer off.

27. By doing all above work, the map should look like this.
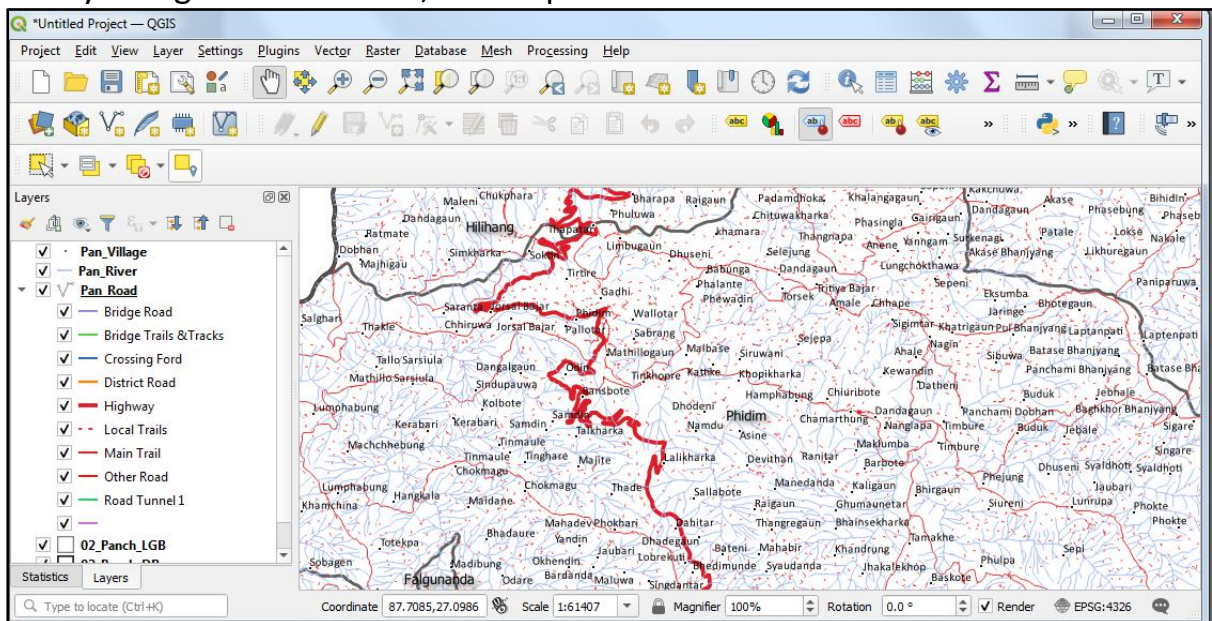
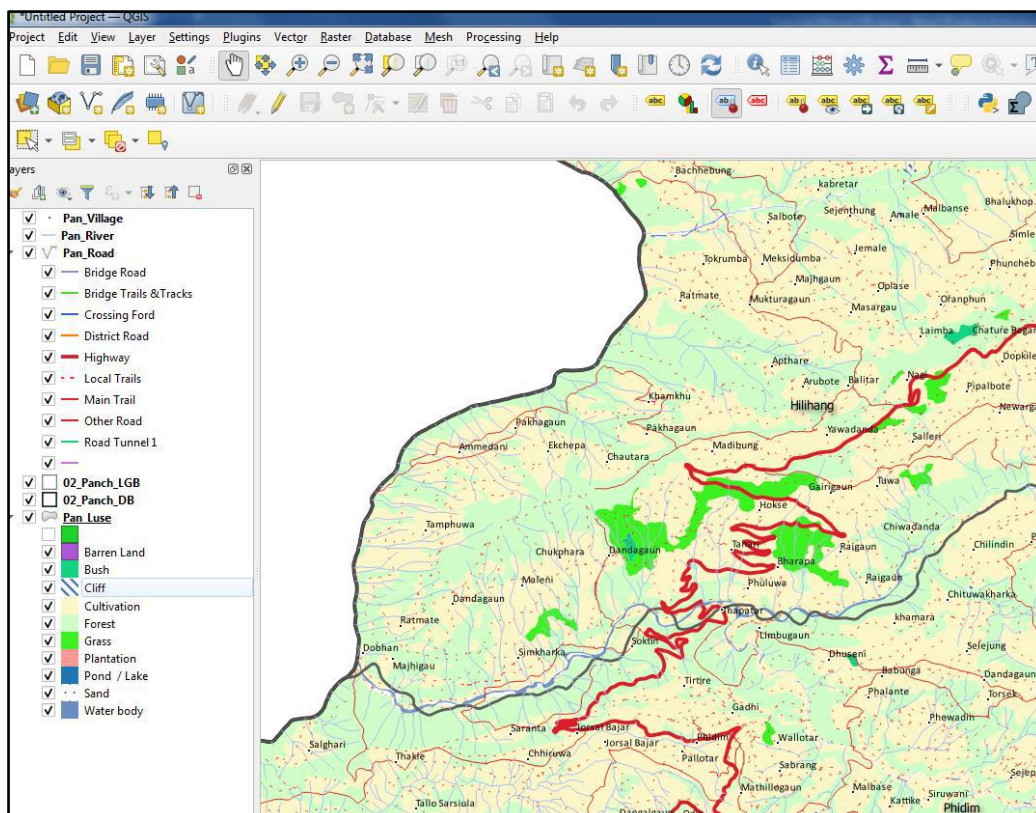27. Now turn on the **land use** layer and double click for layer properties.

28. Apply symbology and choose **Categorized.**

29. Choose FEATURES in Value field.
30. Click on Classify tab.
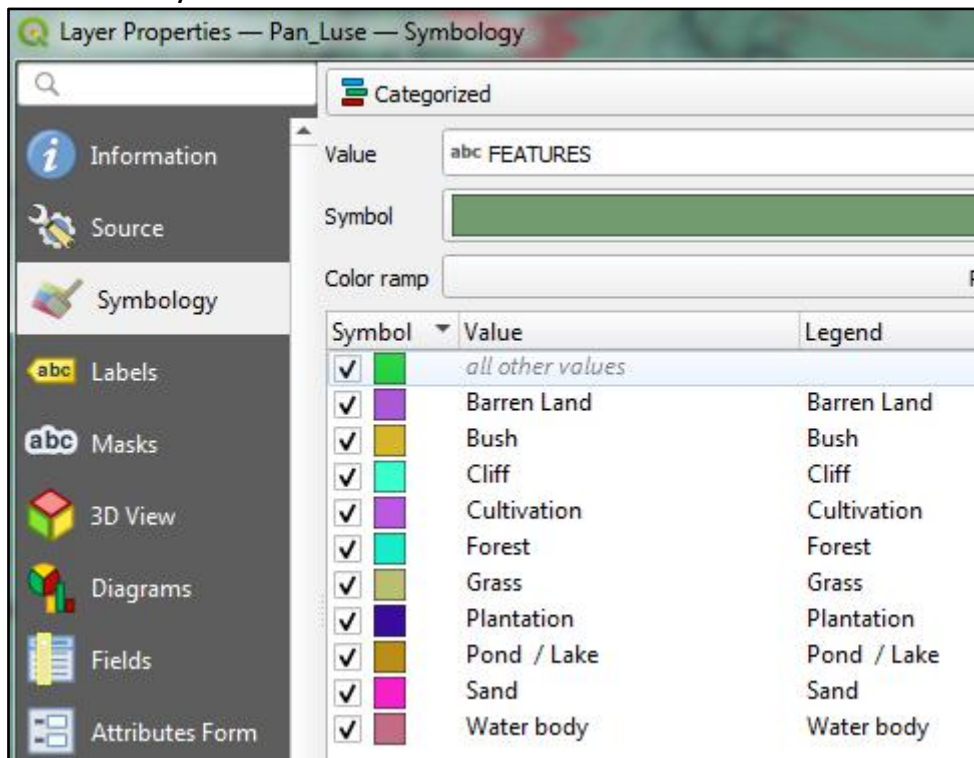
31. Apply Color for different land category. Remember Green color for Vegetation (Like Forest, Bush, and Grass etc.), blue for water body, Light yellow for cultivation and plantation.

Page Layout and Cartographic Elements:

A page layout (often referred to simply as a layout) is a collection of map elements organized on a virtual page designed for map printing. Common map elements include one or more data frames (each containing an ordered set of map layers), a scale bar, north arrow, map title, descriptive text, and a legend. For geographic reference, you can add grids or graticules.

Though page layouts can be exported and used electronically, they are primarily designed for printing. Page layouts can have either a landscape (wide) or portrait (tall) orientation. Page size varies depending on the specifications for the output. What you see on the layout is what you get if you print or export the map to the same page size.
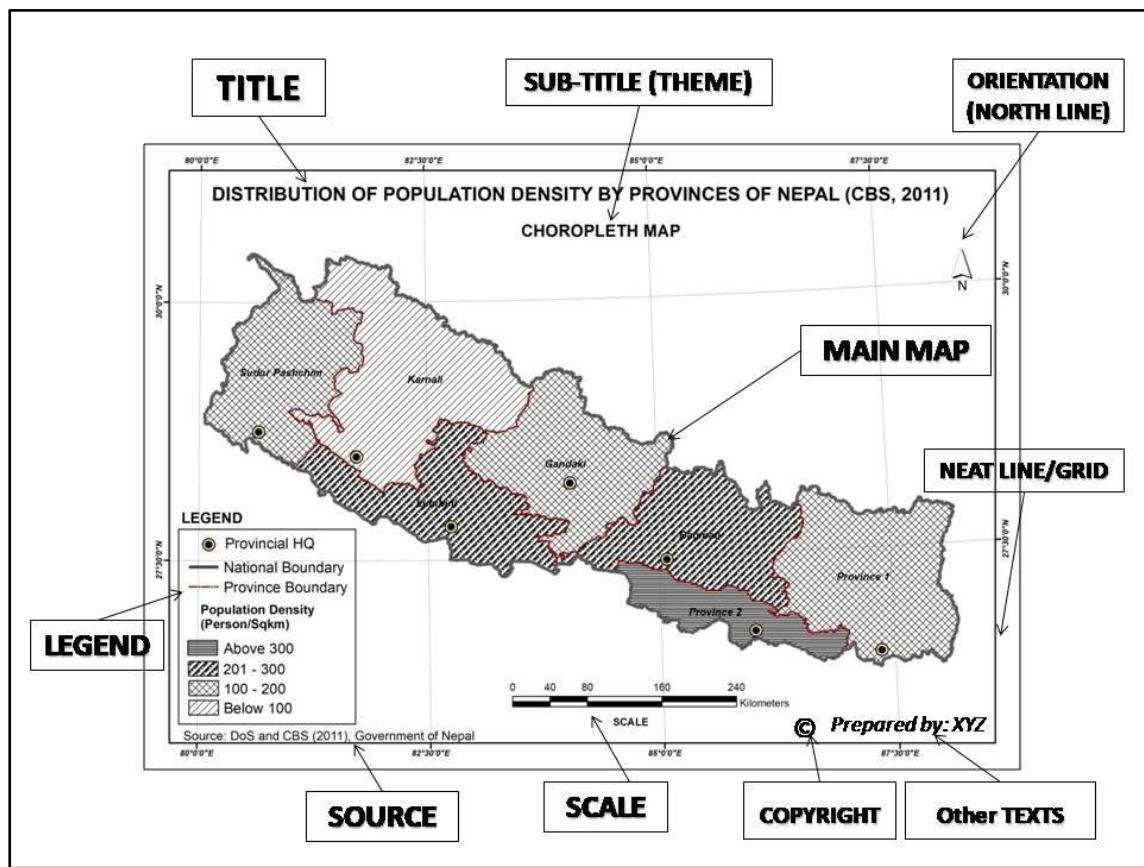

Map Elements:
- Title/Sub title
- Orientation/North Arrow
- Scale Bar /Scale Text
- Legend
- Sources of Information
- Neat line, table, pictures and text (copy right, designer etc.)

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Map Layout:

Now that you've got a map, you need to be able to print it or to export it to a document. The reason is, a GIS map file is not an image. Rather, it saves the state of the GIS program, with references to all the layers, their labels, colors, etc. So for someone who doesn't have the data or the same GIS program (such as QGIS), the map file will be useless.

Luckily, QGIS can export its map file to a format that anyone's computer can read, as well as printing out the map if you have a printer connected. Both exporting and printing is handled via the *Print Layout*.

1. Go to Project->**New Print Layout**
2. Give the name of the Layout in the text box
3. A separate layout window will be displayed as shown below
4. Right click on the center of map layout page and go to Page Properties.
5. Choose the Page size **A4** and Orientation **Landscape**
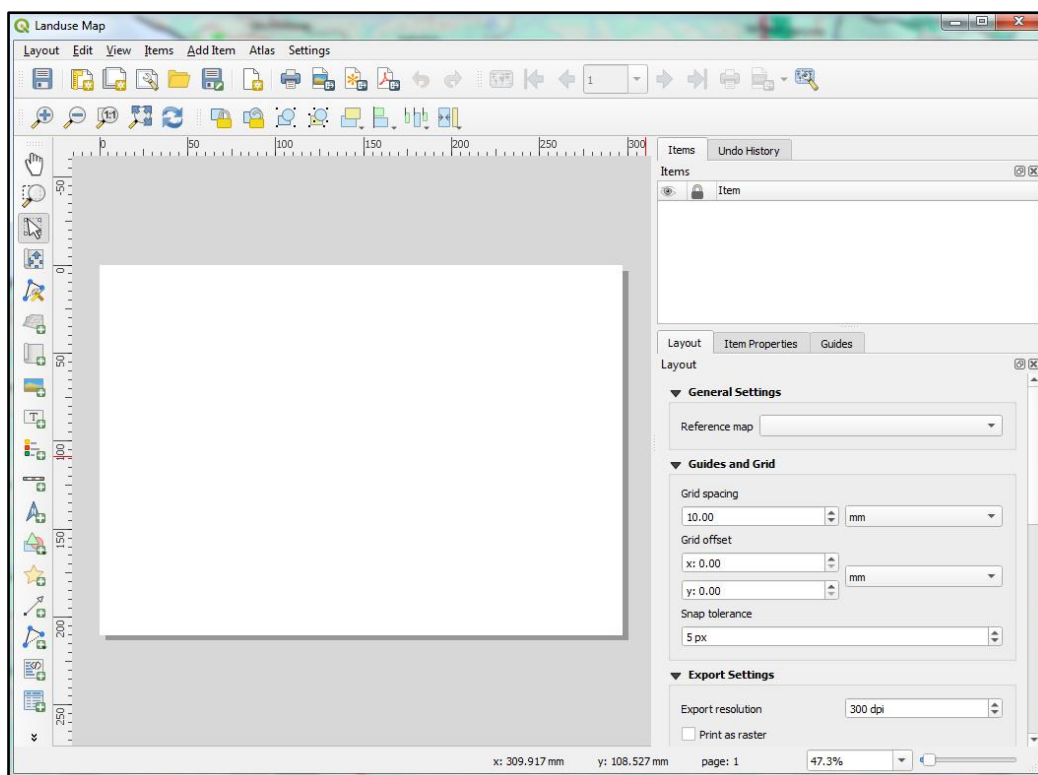
6. Click on the Add Map button[image]. With this tool activated, we will be able to place a map on the page.
7. Click and drag a box on the blank page. The map will appear on the page.
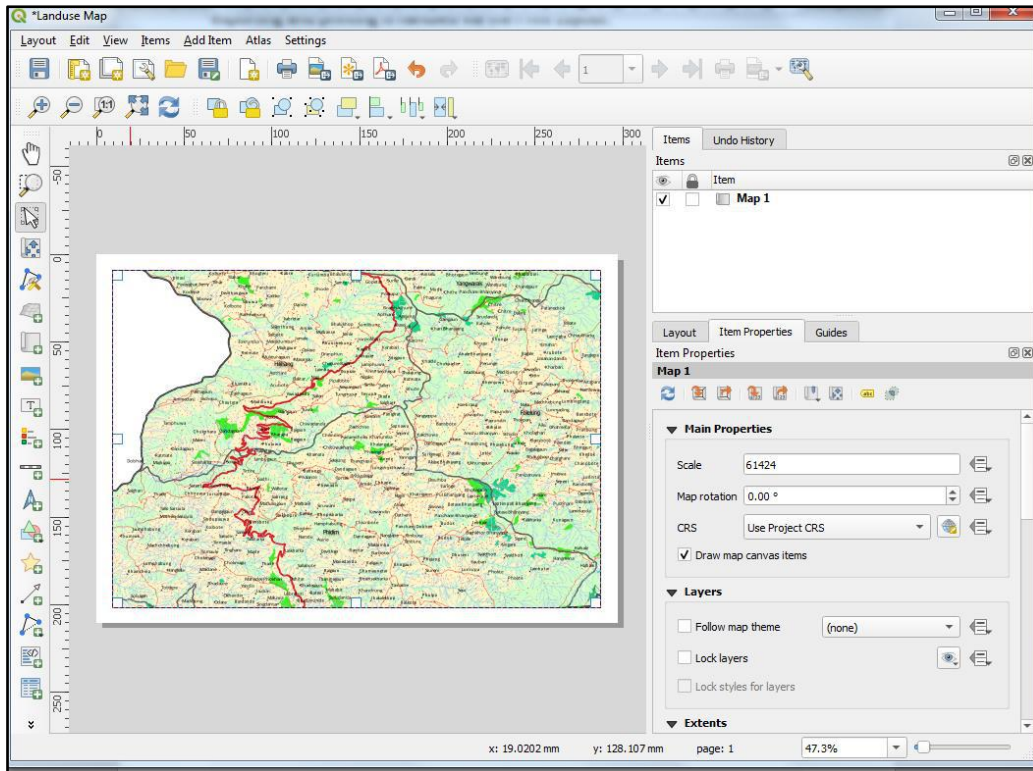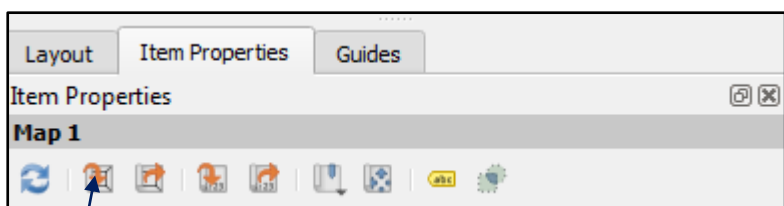
8. Be sure to leave margins along the edges, and a space along the top for the title.

9. Zoom in and out on the page (but not the map!) by using these buttons:

10. With Item Properties as shown below, we can update the changes in the map (for example moving the map from one area to another, zoom in and out) to Layout page of map layout window.

Using this icon, any changes in the view of the map will be updated to layout window.

11. **Adding Title**: Click on the Add Label icon.

12. Click on the page, above the map, Accept the suggested values in the *New Item Properties* dialog, and a label will appear at the top of the map.

13. Resize it and place it in the top center of the page. It can be resized and moved in the same way that you resized and moved the map.

14. As we move the title, we'll notice that guidelines appear to help the position for the title in the center of the page. However, there is also a

tool in the Actions Toolbar to help position the title relative to the map.

15. **Adding Legend:** Click on the ![icon] Add legend button.
16. Click on the page to place the legend, accept the suggested values in the *New Item Properties* dialog,
17. A legend is added to the layout page, showing layers symbology as set in the main dialog.
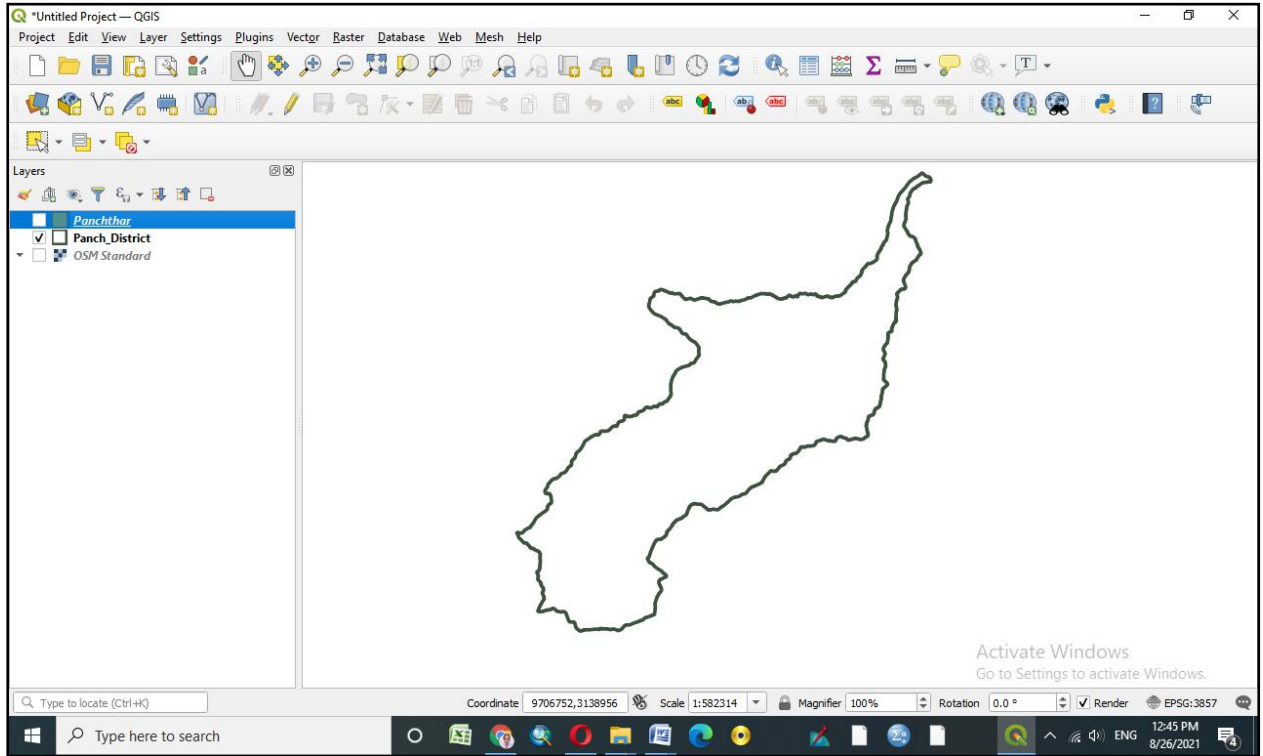18. As usual, we can click and move the item to where we want it.
   ❖ ***Not everything on the legend is necessary, so let's remove some unwanted items.***
19. In the *Item Properties* tab, we'll find the *Legend items* group.
20. Uncheck the *Auto update* box, allowing us to directly modify the legend items
21. Select the unwanted item in the legend list
22. Delete it from the legend by clicking the ![button] button
   ❖ **You can also rename items.**
23. Select a layer from the same list.
24. Click the Edit selected item properties button.
25. Rename the layers

Final Layout will be display like below

Topographic Map

Panchthar District

LEGEND
- Settlements
- River
- Highway
- District road
- GapaNapa boundary
- District boundary

Landuse Class
- Cliff/River cutting
- Agricultural land
- Forest area
- Plantation
- Grass land
- Bush/Shrub land
- Sandy area
- Baren land
- Waterbodies

Source: MoFAGA and DoS, Government of Nepal
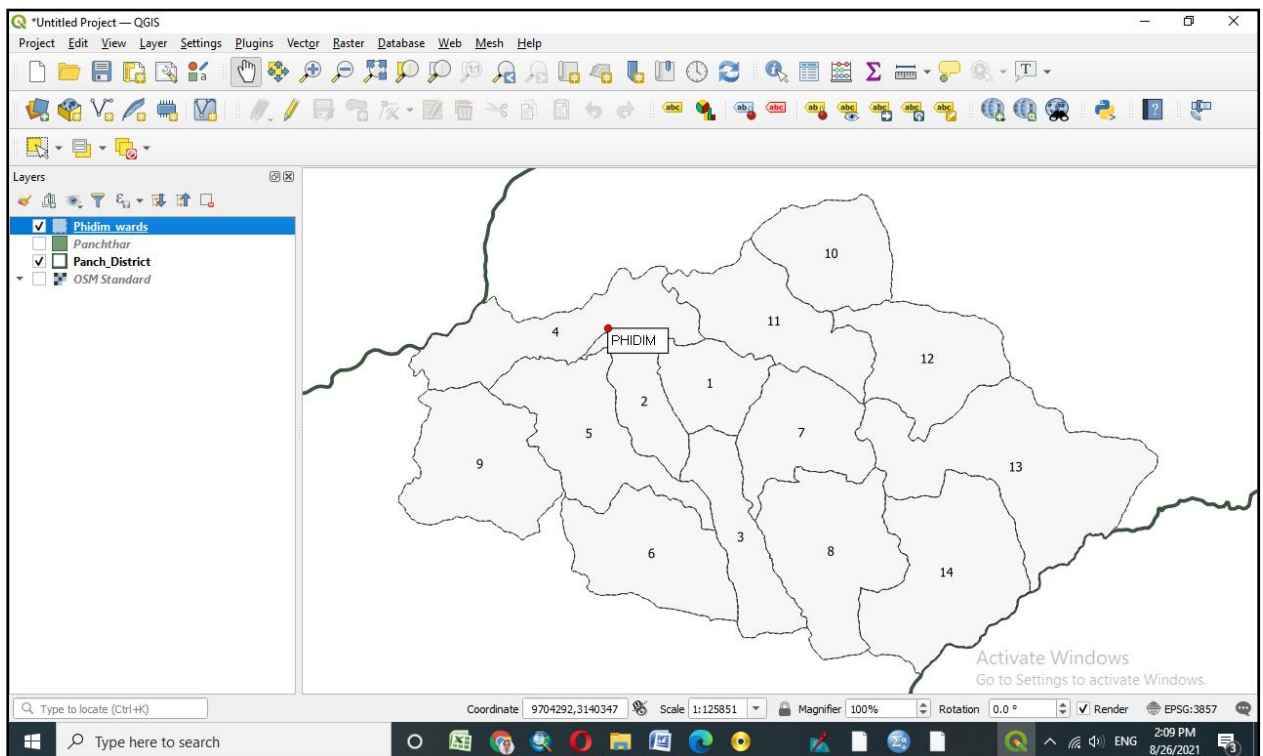
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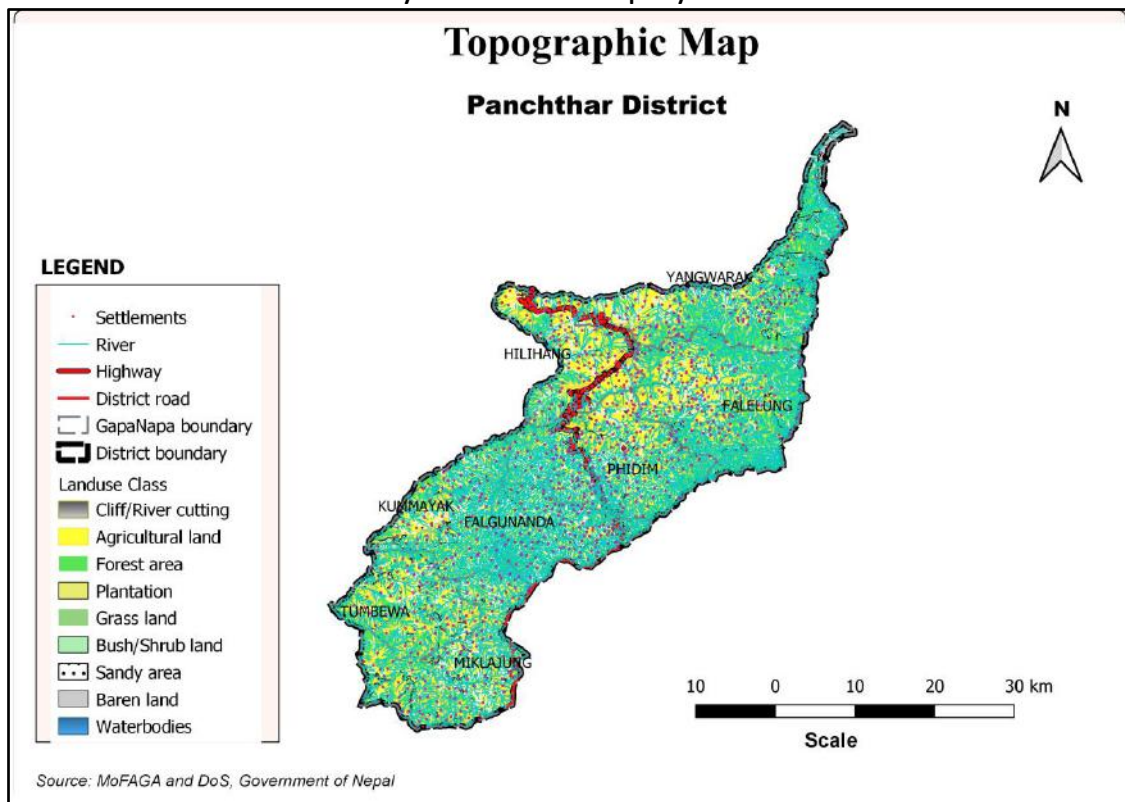
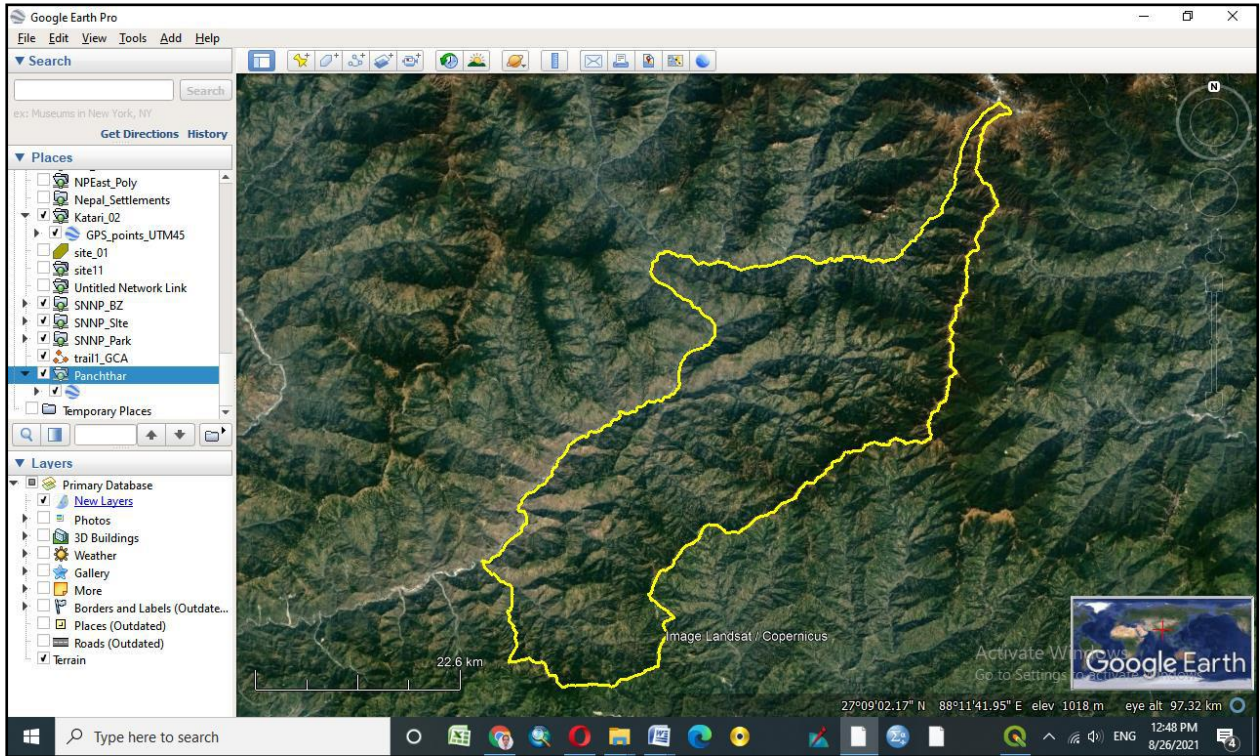# PREVIEW FOR PROJECT WORK EXERCISE
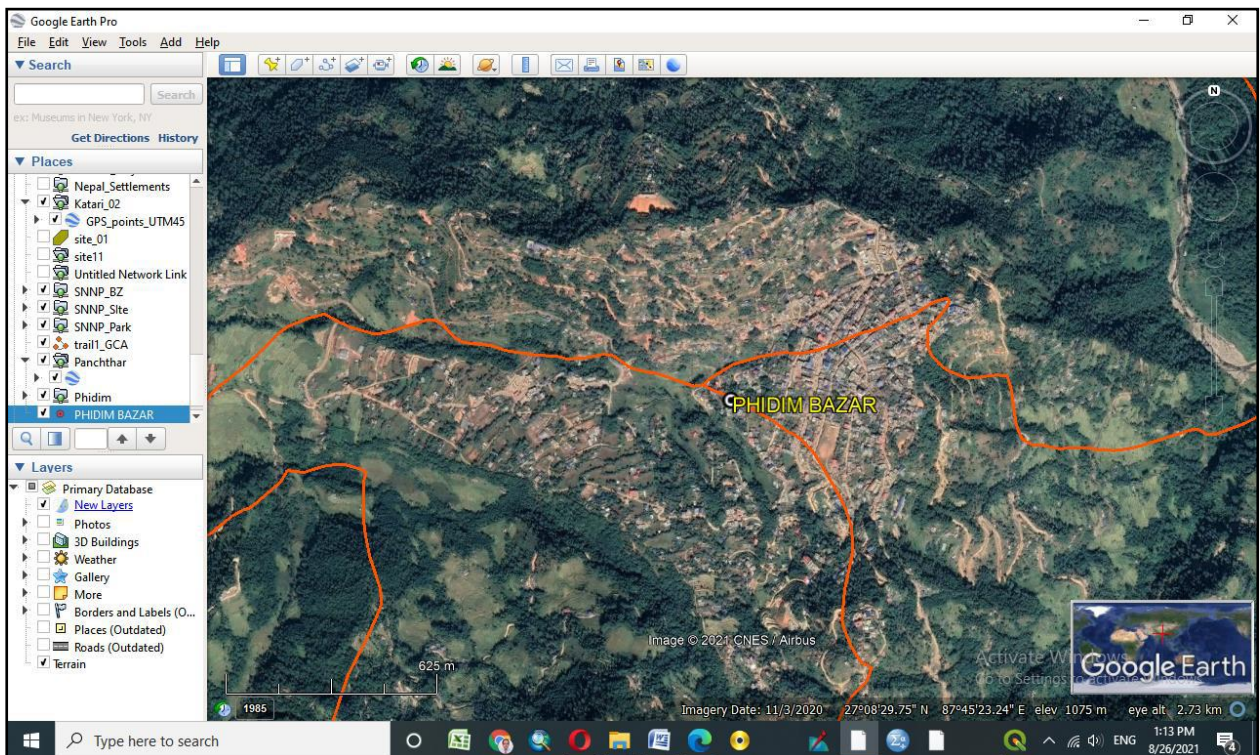
Panchthar District Boundary

Ward Boundary of Phidim Municipality
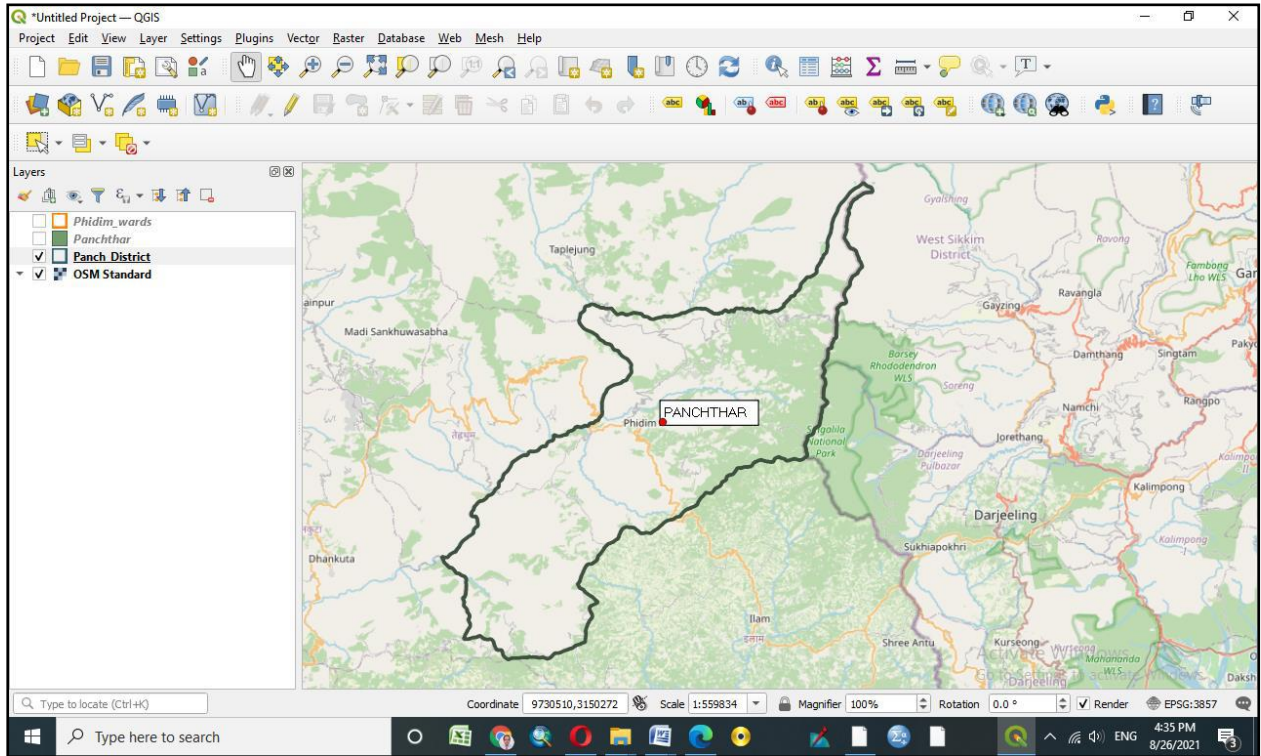

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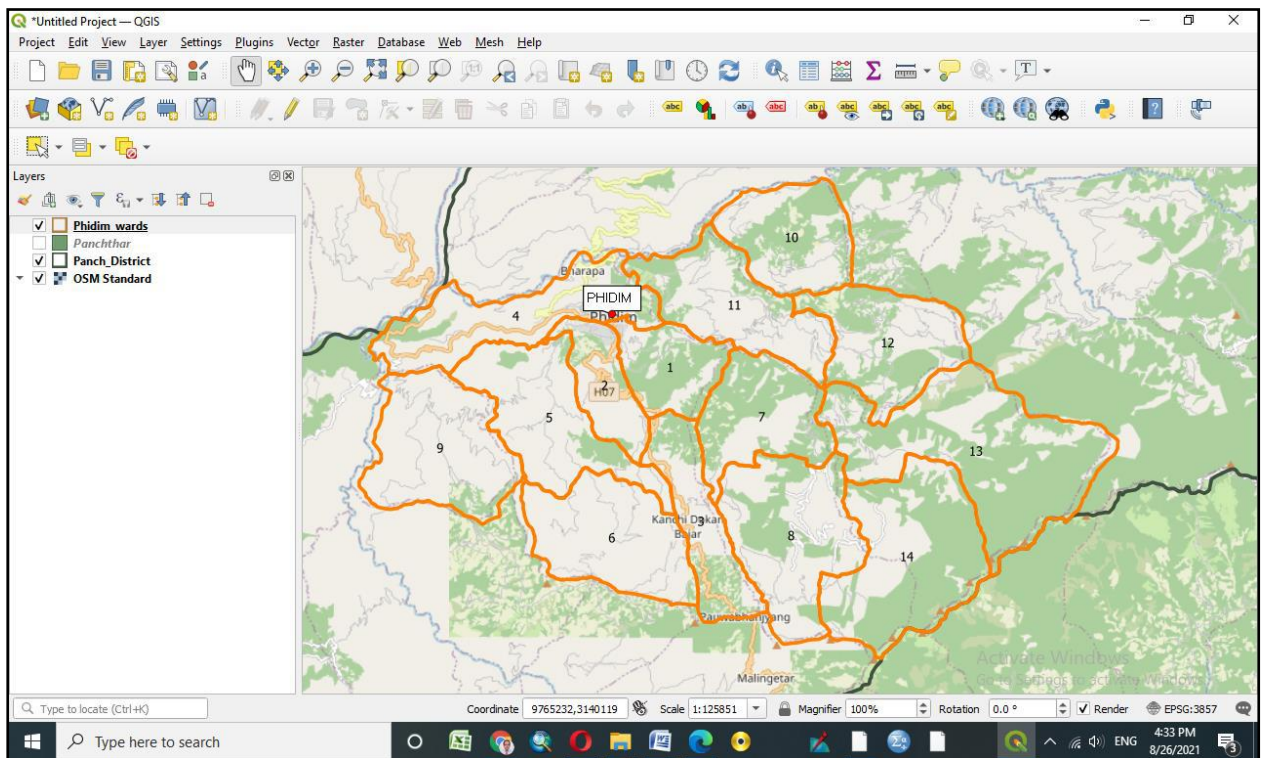## Panchthar District Boundary along Google Earth

Ward Boundary of Phidim Municipality along Google Earth

Panchthar District Boundary along Open Source Map

Ward Boundary of Phidim Municipality along Open Source Map

मूल्याङ्कनका औजारहरू

स्थानीय विकास प्रशिक्षण प्रतिष्ठान
(स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०४९ द्वारा स्थापित)

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

Local Development Training Academy
(Established by Local Development Training Academy Act, 2049)

LDTA >>>

नेपाल सरकार
सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

सडक ठेगाना र भौगोलिक सूचना प्रणाली प्रशिक्षण
पुर्व र पश्चात जानकारी

सहभागी विवरण

नामः		संस्थाः
पदः		जिल्लाः

अन्य विवरण

क. लिङ्गः		ख. उमेरः
ग. जाती		घ. शिक्षाः

(क) तलका विषयहरुमा तपाईको ज्ञान र सीपको स्तरीकरण निम्न तरिकाले गर्नुहोस् ।

- विषयमा पटक्कै ज्ञान र सीप छैन भने १मा चिन्ह लगाउनुहोस् ।

- विषयमा अलिअलि ज्ञान र सीप छ भने २मा चिन्ह लगाउनुहोस् ।

- विषयमा सन्तोषजनक मात्रामा ज्ञान र सीप छ र ठीकै मात्रामा कार्यमा प्रयोगमा ल्याउन सक्नुहुन्छ भने ३ मा चिन्ह लगाउनुहोस् ।

- विषयमा राम्रो ज्ञान र सीप छ र आफ्नो कार्यमा प्रयोगमा ल्याउन सक्नुहुन्छ भने ४मा चिन्ह लगाउनुहोस् ।

- विषयमा धेरै राम्रो ज्ञान र सीप छ र आफ्नो कार्यमा आत्मविश्वासका साथ प्रयोगमा ल्याउन सक्नुहुन्छ भने ५ मा चिन्ह लगाउनुहोस् ।

विवरण					
▪ शहरीकरण शहरी योजना शहर व्यवस्थापन तथा शहरी नीतिहरु	१	२	३	४	५
▪ आधारभूत पूर्वाधार तथा सेवाहरु र त्यस्का वर्तमान अवस्था	१	२	३	४	५
▪ सडक ठेगाना यस्का कार्यान्वयन पक्ष र चुनौतीहरु	१	२	३	४	५
▪ सडक ठेगाना सम्वन्धी निर्देशिका वारे जानकारी	१	२	३	४	५
▪ काठमाण्डौ उपत्यका मानचित्रण परियोजना (केभिएम्पि)	१	२	३	४	५
▪ सडक ठेगाना योजना लागु भएका नगरपालिकाहरुको अनुभव	१	२	३	४	५
▪ सडक ठेगाना र भौगोलिक सुचना प्रणालीको सम्वन्ध	१	२	३	४	५
▪ हाल पालीकाहरु बाट भइरहेको अध्ययन, डाटाबेस तथा योजना तथा मानचित्र विकास	१	२	३	४	५
▪ स्थानीय निकायहरुबाट प्रयोग गरिरहेका ठेगाना प्रणाली सँम्वन्धित वा अन्य नयाँ प्रविधिहरु	१	२	३	४	५

(ख) तलका प्रश्नहरु राम्रोसंग अध्ययन गरी सबै प्रश्नको जवाफ दिनुहोस् ।

१. भौगोलिक सूचना प्रणाली तालिमको लागी निम्न मध्ये कुन सफ्टयेरको प्रयोग गरिन्छ ?

क) Microsoft Office Package

ख) QGIS Open Source Software

ग) SPSS

घ) माथिका सबै

२. भौगोलिक सूचना प्रणाली मा कुन प्रकारको Data प्रयोग हुन्छ ।

क) Vector Data

ख) Raster Data

ग) Vector and Raster Data

घ) Vector, Raster and Tabular Data

३. तलका मध्ये कुन चाहीं भौगोलिक सूचना तथ्याँकको स्रोत होईन ।

क) GPS

ख) Remote Sensing

ग) Scanned Map with No Coordinates

घ) माथिका सबै

४. तलका मध्ये नापी विभागले प्रयोग गर्ने Map Projection System कुन हो ?

क) Universal Transverse Mercator (UTM)

ख) Modified Universal Transverse Mercator (MUTM)

ग) Everest 1830

५. GPS Device प्रयोग गरेर भु सतहको के तथ्यांक लिईन्छ ?

क) Longitude and Latitude Information

ख) Air Pressure Measurement

ग) Temperature Measurement

६. Google Earth बाट लिईएको तथ्यांक तलका मध्ये कुन Format मा हुन्छ ?

क) *.Shp

ख) *.Kml,

ग) *.Cov,

७. **GIS Feature को वर्णात्मक विवरणहरु भएको Data लाई के भनिन्छ ?**

 क) Spatial Data

 ख) Attribute Data

 ग) Vector Data

८. **नापी विभागले प्रयोग गर्ने गरेको Map Projection पछि कुन ईकाईमा लम्बाई तथा क्षेत्रफल गणना गर्न सकिन्छ ?**

 क) लम्बाई : मिटर, क्षेत्रफल : स्क्वायर मिटर

 ख) लम्बाई : फिट, क्षेत्रफल : स्क्वायर फिट

 ग) लम्बाई : ईन्च, क्षेत्रफल : स्क्वायर ईन्च

९. **७५३ स्थानीय निकाय मध्ये ३०० स्क्वायर कि.मि. भन्दा ठुलो क्षेत्रफल भएको छान्नको लागी कुन Query प्रयोग गर्नु पर्छ ?**

 क) Spatial Query

 ख) Attribute Query

 ग) Select by Location

१०. **तलका मध्ये सबभन्दा सानो स्केल कुन हो ?**

 क) १:५००

 ख) १:२५००

 ग) १:२०००

सडक ठेगाना र भौगोलिक सूचना प्रणाली प्रशिक्षण

दैनिक पृष्ठपोषण फाराम (..........................दिन)

नामः   मितिः

१. आजको प्रशिक्षण सत्रहरूबाट के के सिकाइहरू भए ?

- ◼
- ◼
- ◼
- ◼
- ◼

२. तपाईँ ती सिकाइहरूलाई व्यवहारमा कसरी प्रयोग गर्नुहुन्छ ?

- ◼
- ◼
- ◼
- ◼
- ◼

३. प्रशिक्षणलाई अझ प्रभावकारी बनाउन के गर्नुपर्ला ?

- ◼
- ◼
- ◼
- ◼
- ◼

सडक ठेगाना र भौगोलिक सूचना प्रणाली प्रशिक्षण

प्रशिक्षण अन्तिम मूल्याङ्कन फाराम

प्रशिक्षणको नाम◌ः .... प्रशिक्षण मिति◌ः ....

कृपया तलका प्रश्नहरूमा आफूलाई उपयुक्त लागेको विकल्पमा चिह्न लगाउनुहोस् ।

१. यस प्रशिक्षणलाई तपाईं कसरी मूल्याङ्कन गर्नुहुन्छ ?
(क) उत्कृष्ट   (ख) ज्यादै राम्रो   (ग) राम्रो   (घ) ठिकै   (ङ) सुधार गर्नुपर्ने

टिप्पणी सुझाव ....

....

२. सहजकर्ताहरूलाई तपाईं कसरी मूल्याङ्कन गर्नुहुन्छ ? (विषयवस्तुको ज्ञान, सञ्चार क्षमता, प्रस्तुतीकरण शैली आदि)
(क) उत्कृष्ट   (ख) ज्यादै राम्रो   (ग) राम्रो   (घ) ठिकै   (ङ) सुधार गर्नुपर्ने

टिप्पणी सुझाव..

....

३. प्रशिक्षणको विषयवस्तु तपाईंलाई कस्तो लाग्यो ? (कामसँग सम्बन्धी र उपयोगी, ज्ञानमा वृद्धि, सिप र दक्षताको विकासमा सहयोगी आदि)
(क) उत्कृष्ट   (ख) ज्यादै राम्रो   (ग) राम्रो   (घ) ठिकै   (ङ) सुधार गर्नुपर्ने

टिप्पणी सुझाव..

....

४. प्रशिक्षणमा प्रयोग भएको प्रशिक्षण विधि तपाईंलाई कस्तो लाग्यो ? (विषयवस्तु बुझ्नका 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 पाठ्यसामग्री तथा सन्दर्भसामग्रीहरू तपाईंलाई कस्ता लागे ? (विषयवस्तु बुझ्नका 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 (अर्बन डिजाइन)
मोड्युल १९	सूचना र संचार प्रविधि
मोड्युल २०	पूर्वाधार निर्माण
मोड्युल २१	चट्ट्याङ्ग र विद्युतीय लेखा परीक्षण