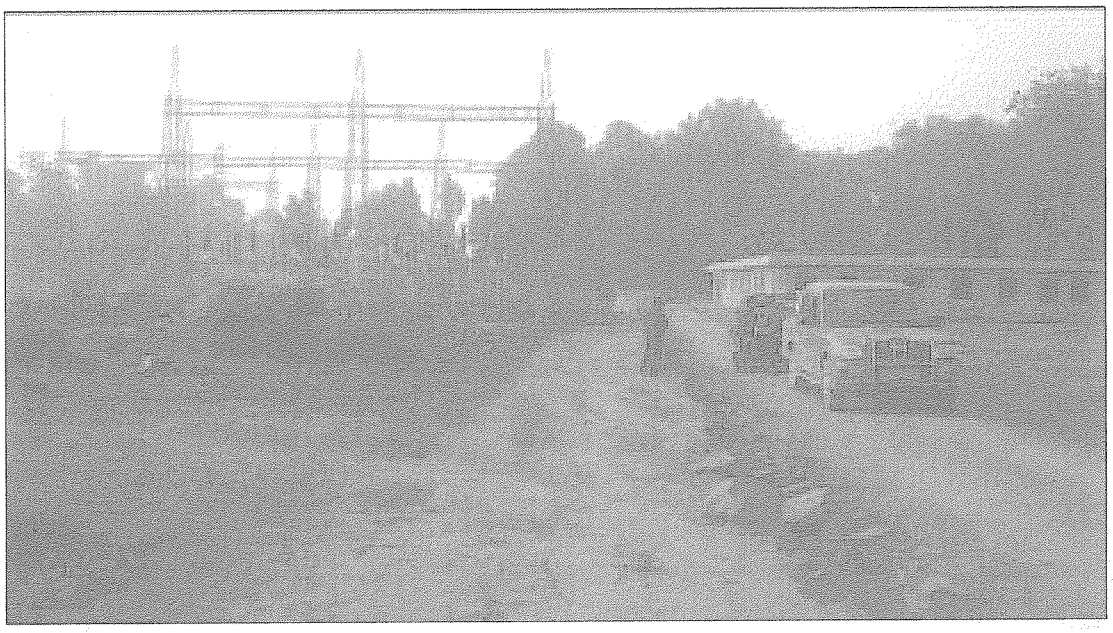
Initial Environmental Examination

Marsyangdi Corridor (Udipur – New Bharatpur)

220 kV Double Circuit Transmission Line



Submitted to:

Ministry of Energy

Singhdurbar, Kathmandu

Submitted through:

Department of Electricity Development (DoED)

Bijulibazar, Kathmandu

Submitted by:

Nepal Electricity Authority (NEA)

Ratnapark, Kathmandu

Prepared by:

Environmental Services Nepal Pvt. Ltd. (ESN)

Thapathali, Kathmandu

September, 2017

मर्स्याङ्गदी कोरीडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. प्रशारण लाइन आयोजना

वातावरणीय प्रभाव मुल्याङ्कन

कार्यकारी सारांश

१. प्रस्तावक

प्रस्तावित मर्स्याङ्गदी कोरीडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. प्रशारण लाइन आयोजनाको प्रस्तावक नेपाल विद्युत प्राधिकरण हो । नेपाल विद्युत प्राधिकरणको सम्पर्क ठेगाना निम्न अनुसार रहेको छ ।

नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं
फोन नं.: ०१-४१५३०२५
फ्यक्स नं.: ०१-४१५३०४०

२. परामर्शदाता

आयोजनाको प्रस्तावकको तर्फबाट नेपाल इन्भाइरोमेन्ट सर्भिर्सेज प्रा.लि.ले यस आयोजनाको प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन तयार पार्ने अभिभारा लिएको छ । नेपाल इन्भाइरोमेन्ट सर्भिर्सेज प्रा.लि.को सम्पर्क ठेगाना निम्न अनुसार रहेको छ ।

इन्भाइरोमेन्टल सर्भिर्सेज नेपाल प्रा.लि.
कुपण्डोल, ललितपुर, नेपाल
फोन नं.: ०१-५०११२५५
ईमेलः info@esn.com.np
वेब साइटः www.esn.com.np

३. प्रस्तावको विवरण

प्रस्तावित मर्स्याङ्गदी कोरीडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. प्रशारण लाइन आयोजना लम्जुङ जिल्लाको साबिक उदीपुर (हाल बेशिसहर नगरपालिका)बाट सुरु भएर चितवन जिल्लाको आँपटारी सम्म पुग्दछ । आयोजनाले उदीपुर, मार्कीचोक र आँपटारी सव-स्टेशनलाई जोड्दछ र मार्कीचोक र आँपटारी सव-स्टेशन निमार्ण सुरु भइसकेको हुनाले यस प्रारम्भिक वातावरणीय परिक्षणले उदीपुर सव-स्टेशनलाई मात्र समेटेको छ । यस प्रसारण लाइनको कुल लम्बाई ६४.४५ कि.मी. रहेको छ ।

४. प्रारम्भिक वातावरणीय परिक्षणको सान्दर्भिकता

वातावरण संरक्षण नियमावली २०५४ र त्यसको संशोधन (मिति २०६६-१०-१३ को राजपत्रमा प्रकाशित) अनुसार कुनै पनि १३२ के.भी. क्षमता भन्दा ठूला विद्युत प्रशारण लाइन विस्तार गर्नु परेमा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन तयार गरी उर्जा मन्त्रालय मार्फत स्वीकृत गराउनु पर्ने प्रावधान रहेको छ । प्रस्तावित आयोजनाको क्षमता २२० के.भी. भएकाले वातावरण संरक्षण नियमावलीको प्रावधान अनुसार प्रारम्भिक वातावरणीय परिक्षण गरिएको हो ।



५. प्रारम्भिक वातावरणीय परिक्षणका उद्देश्य

यस प्रारम्भिक वातावरणीय परिक्षणको मुख्य उद्देश्य आयोजना निमार्णबाट स्थानिय वातावरणमा पर्न जाने अनुकुल तथा प्रतिकुल असरहरु पहिल्याएर, आयोजना सँग सम्बन्धित अनुकुल असरहरुलाई बढावा दिने उपायहरु तथा प्रतिकुल प्रभावहरुलाई न्यूनिकरण गर्ने उपायहरु पहिचान गर्ने रहेको छ ।

६. प्रारम्भिक वातावरणीय परिक्षणको कार्यविधि

यस प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन वातावरण संरक्षण नियमावली २०५४, र त्यसको संशोधन (मिति २०६५-११-२६) र राष्ट्रिय वातावरणीय प्रभाव मुल्याङ्कन निर्देशिका २०५१ अनुसार तयार परिएको हो । प्रारम्भिक वातावरणीय परिक्षण अध्ययन सुरु गर्नु भन्दा अधि उर्जा मन्त्रालय मार्फत स्वीकृत गराइयो । प्रारम्भिक वातावरणीय परिक्षण गर्ने क्रममा सान्दर्भिक ग्रन्थहरुको अध्ययन गरी secondary information सङ्कलन र स्थलगत भ्रमण (भाद्र २०७३ देखि माघ २०७३ सम्म विभिन्न चरणमा) गरी विद्यमान वातावरणीय अवस्थाको उचष्बचथ ष्लायचबतष्यल लिने कार्य गरियो । आयोजना प्रभावित क्षेत्रका सरोकारवालाहरुसँग राय सुझाव सङ्कलन गर्नका लागि मिति २०७३-१०-०७ को आर्थिक अभियान राष्ट्रिय दैनिकमा सार्वजनिक सूचना प्रकाशित गरी आयोजना प्रभावित क्षेत्रको जिल्ला विकास समिति, जिल्ला वन कार्यालय, नगरपालिका, गाँउ विकास समिति, सामुदायिक वन उपभोक्ता समिति, आदीको कार्यालयको सूचना पाटी र सार्वजनिक स्थलहरुमा सो सार्वजनिक सूचनाको छाँया प्रति टाँस गरी मुचुल्का समेत सङ्कलन गरियो । यसै गरी स्थानिय वातावरणीय प्रभावको सन्दर्भमा राय सुझाहरु सङ्कलन गर्नका लागि विभिन्न चरणमा स्थानिय सरोकारवालहरुसँग छलफल गरियो ।

यसरी आयोजनासँग सम्बन्धित सम्पूर्ण आवश्यक तथ्याङ्क एवं सूचनाहरु विश्लेष्ण गरी आयोजनाले स्थानिय वातावरणमा पार्ने सकारात्मक र नकारात्मक प्रभावहरु पहिल्याउने कार्य गरियो र सकारात्मक प्रभावहरुलाई बढावा दिने तथा नकारात्मक प्रभावहरुलाई न्यूनिकरण गर्ने उपायहरु सहित वातावरणीय व्यवस्थापन तथा वातावरणीय अनुगमन योजना बनाई प्रतिवेदन तयार गरियो ।

७. विद्यमान वातावरणीय अवस्था

भौतिक वातावरण

प्रस्तावित विद्युत प्रशारण लाइन तराई, चुरे र महाभारत गरी तीनवटै भू-भाग भएर विस्तार गरिन्छ । आयोजनाको सबैभन्दा कम उचाइ आँपटारी सब-स्टेशनमा समुद्री सतहबाट २२५ मी. रहेको छ भने, सबैभन्दा धेरै छिम्केश्वरीमा समुद्री सतहबाट १४५० मी. रहेको छ । आयोजनाको उदीपुर - मार्कीचोक खण्ड मर्स्याङ्दी नदीको उपत्यका भएर विस्तार गरिन्छ ।

भैगर्भिक अध्ययनका क्रममा आयोजना क्षेत्रलाई दुई खण्डमा विभाजन गरिएको छ: १. उदीपुर-मार्कीचोक खण्ड र २. मार्कीचोक-भरतपुर खण्ड । उदीपुर-मार्कीचोक खण्ड मर्स्याङ्दी नदीको उपत्यका भएर निमार्ण गरिन्छ जसमा वन र खेतीयोग्य जमिनको वाहुलियता रहेको छ । रानिमाटा फर्मेशनमा पर्ने सो क्षेत्रमा फिलाइट र क्वार्ट्ज जस्ता चट्टानहरु पाइन्छ । मार्कीचोक-भरतपुर खण्डको सन्दर्भमा भरतपुर तर्फ चितवन उपत्यकाको बालुवा, माटो र ग्राभेल मिसिएर बनेको भू-बनोट रहेको छ ।

आयोजनाको उदीपुर-मार्कीचोक खण्डको भू-उपयोगको सन्दर्भमा ६०% खेती योग्य जमिन, २५% वन, ६% झाडी तथा घाँसे चौर र ८% नदी तथा नदी किनार रहेको छ । उक्त खण्डमा मर्स्याङ्दी मुख्य नदी

हो । मार्कीचोक-भरतपुर खण्डको भू-उपयोगमा भने ४१% खोती योग्य जमिन, ५४% वन र ३% झाडी तथा घाँसे चौर रहेको छ । यस खण्डमा मर्स्याङ्दी र त्रिशुली मुख्य नदीहरु हुन् । आयोजनाले पृथ्वी राजमार्ग र मुग्लिन-नारायणघाट सडकलाई विभिन्न ठाँउमा पार गर्दछ ।

आयोजनाको सम्पूर्ण खण्डहरु मध्य कविलासको डाँडाको दक्षिण पट्टीको पहिरो मुख्य जोखिम हो जसलाई आयोजना निमार्ण गर्ने क्रममा नियन्त्रण गर्न जरुरी छ । चुरेका पहाडहरुमा भू-क्षयको गति अधिक भएको हुनाले त्यस क्षेत्रमा विशेष ध्यान दिन जरुरी छ । आयोजना क्षेत्रमा परेको पानीलाई त्यहाका स-साना खोल्सी-खोलाहरुले मर्स्याङ्दी र त्रिशुली नदीमा पुऱ्याएर मिसाउछन् ।

जैविक वातावरण

प्रस्तावित आयोजना कुनैपनि संरक्षित क्षेत्र (राष्ट्रिय निकुन्ज, वन्यजन्तु संरक्षण क्षेत्र, मध्यवर्ती क्षेत्र र संरक्षण क्षेत्र) अथवा वातावरणीय सम्बेदनशिल क्षेत्रमा पर्दैन । प्रशारण लाइनसँगै रहेका वनमा साल, साँज, सिमल, चिलाउने, कटुस, सल्ला, खस्रु, ओक जस्ता रुखका प्रजाति पाइन्छन् । आयोजनाको च्यध्मा पर्ने ३९ वनबाट कुल ९०.६५ हेक्टर वनको जग्गा अधिकरण गर्नेछ जसमध्य ४३.८४ हेक्टर सामुदायिक वन, ४३.५० हेक्टर राष्ट्रिय वन , ३.३१ हेक्टर कबुलियती वनको क्षेत्र पर्दछन् ।

आयोजना क्षेत्रमा पाइने वन्यजन्तुहरुमा चितुवा, मृग, दुम्सी, बदेल, फ्याउरो, बाँदर, ढेडु, स्याल, आदी हुन् । चराहरुमा काग, भंगेरा, कालिज, चिवे, बाज, बउदै, लामपुच्छे, वन कुखुरा, कुकु, ढुकुर, जुरेली, तित्रा, कलचउडे, बकुल्ला, कोइली, पानी हाँस, हलेसो, सुगा, आदी हुन् ।

आर्थिक - सामाजिक तथा साँस्कृतिक वातावरण

आयोजना प्रभावित गा.वि.स./न.पा.हरु मध्य चितवन जिल्लाको भरतपुर न.पा.मा सबैभन्दा धेरै र तनहुँ जिल्लाको साबिक छिम्केश्वरी गा.वि.स. (हाल बेशिसहर नगरपालिका)मा सबैभन्दा कम जनसंख्या रहेको छ । आयोजना प्रभावित साबिक गा.वि.स./न.पा.हरुमा जातिय तथा साँस्कृतिक विविधता रहेको छ । लम्जुङका प्रभावित साबिक गा.वि.स./न.पा.हरुमा गुरुङ्ग, गोरखाका प्रभावित साबिक गा.वि.स./न.पा.हरुमा क्षेत्री, तनहुँका प्रभावित साबिक गा.वि.स./न.पा.हरुमा मगर र चितवनका प्रभावित साबिक गा.वि.स./न.पा.हरुमा सबै जात जातीको समान मिश्रण रहेको छ । आयोजना क्षेत्रमा नेपाली, मगर, गुरुङ्ग, नेवार र चेपाङ जस्ता भाषाहरु मात्रीभाषाका रुपमा विद्यमान छन् । आयोजना प्रभावित मध्य भरतपुर न.पा.मा साक्षरता प्रतिशत सबैभन्दा धेरै ८५.३४% र सबै भन्दा कम छिम्केश्वरी गा.वि.स.मा ५५.२९% रहेको छ । अयोजना प्रभावित क्षेत्रका वासिन्दाहरुको मुख्य पेशा कृषी हो र सो क्षेत्रमा खाद्य बाली अधिक मात्रामा खेती गर्ने प्रचलन रहेको छ ।

आयोजनाले ४८ घर धुरीलाई असर पार्नेछ । कुल प्रभावित जनसंख्या २८५ रहेको छ, जसमा महिलाको संख्या पुरुषको भन्दा अधिक रहेको छ । सर्वेक्षण गरिएका घरधुरीको परिवारको आकार ६.४२ रहेको छ । एकल परिवारको वाहुलियता (७१%) रहेको प्रभावित घरधुरीमा १५-५९ उमेर समुहका मानिसहरु ६५.८६% छन् । प्रभावित घरधुरीहरुमा बहुसंख्यक मानिसहरु (८९.६%) हिन्दु धर्म प्रति र (१०.४%) बौद्ध धर्म प्रति आस्था राख्दछन् । जातिय हिसाबमा प्रभावित घरधुरीहरुमा ३१% ब्राह्मण, १८.७५% मगर, १६.६७% दलित, १४.५९% नेवार र १०.४२% क्षेत्री छन् । अयोजना प्रभावित ४५% घरधुरीको मुख्य पेशा कृषी हो भने अन्य पेशामा बैदेशिक रोजगारी (१०.३%), सेवा (५.४%), ज्याला मज्दुरी (१.३%), घरेलु उद्योग (१.८%), आदी हुन् । घरधुरी सर्वेक्षणका अनुसार प्रभावित घरहरुमा ९३% मानिस साक्षर

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६५

छन् भने ७% निरक्षर छन् । यसै गरी खानेपानीको सन्दर्भमा आयोजना प्रभावित ५३.३% प्रतिशत घरमा निजी धारा, ३१.२% घरहरुमा सामुदायिक धारा र १०.४% घरहरुमा इनार तथा कुवाको पानी खाने प्रचलन छ । करिव ८३% आयोजना प्रभावित घरहरुमा खाना पकाउन दाउराको प्रयोग हुने गर्दछ भने १०% मा ग्यास, २ % मा गुइठा र ४% मा अन्य श्रोतहरुको प्रयोग हुन्छ । यसै गरी ९४% सर्वेक्षण गरिएका घरहरुमा विजुलीको प्रवन्ध छ । विजुलीको प्रवन्ध नभएका घरहरुमा ४%मा सोलार र २ प्रतिशतमा मैनवत्ती तथा टुकीवत्ती बाल्ने गरिएको छ । शौचालयको प्रयोगको सवालमा सर्वेक्षण गरिएको ९८% घरहरुमा शौचालयको सुविधा छ भने २% ले अझै पनि खुल्ला ठाँउमा शौच गर्ने गर्दछन् ।

८. वातावरणीय प्रभावहरु

प्रस्तावित विद्युत प्रसारण आयोजनाले, आयोजना कार्यान्वयन हुने क्षेत्रमा सकारात्मक र नकारात्मक दुवै किसिमका वातावरणीय प्रभावहरु पार्दछन् । आयोजनाका सकारात्मक प्रभावहरुमा आयोजनाका कारणले सृजना गर्ने रोजगारीका अवसरहरु, सिप अभिवृद्धी, स्थानिय पूर्वाधारहरुको मर्मत एवं सुधार, पहिरो तथा भूक्षय नियन्त्रण, स्थानिय पूर्वाधारहरुको सुधार तथा मर्मतका लागि आर्थिक तथा प्राविधिक सहयोग, जलविद्युत विकासका अवसरहरु, आदी हुन् ।

आयोजनाका नकारात्मक प्रभावहरुमा जग्गा अधिग्रहण, विद्यमान भू-उपयोगमा हुने परिर्वतन, खेतीबाली नाशहुनु, रुख विरुवाहरु काटिनु तथा हटाइनु हुन् । आयोजना निमार्ण गर्नका लागि आवश्यक निर्माण सामाग्री थुपार्नको लागि १.९६ हेक्टर जमिनको आवश्यकता पर्दछ । आयोजना निमार्ण गर्ने कामदारहरुको अस्थाई शिविरबाट निस्कने फोहोर व्यवस्थापन, प्रशारण लाइनको टावरका लागि जग खन्दा निस्कने माटो व्यवस्थापन, दुर्घटनाका जोखिमहरु, आदी जस्ता चुनौतीहरु समेत सम्बोधन गर्नु पर्ने हुन्छ । प्रशारण लाइनका टावर प्वाइन्टहरु विशेष गरी AP-1, AP-12, AP-13, AP-16, AP-17, AP-20, AP-21, AP-27, AP-28 / AP-30 पहिरोको जोखिममा छन् ।

आयोजना निर्माण गर्ने क्रममा २,७८३ रुख (११ इन्च भन्दा बढी गोलाई भएका), २,७३९ रुख (५-११ इन्च गोलाई भएका) र २२२,३६४ साना विरुवाहरु (५ इन्च भन्दा कम गोलाई भएका) लाई काट्नु पर्ने हुन्छ । आयोजना निमार्ण गर्दा प्राकृतिक वासस्थान खुम्चने सम्भावना उच्च रहन्छ । अयोजना सँग सम्बनिधत क्रियाकलापहरुका कारण दुर्घटना र आगलागिको सम्भावना पनि रहन्छ ।

यसै गरी आयोजना निर्माण गर्ने क्रममा १.३७२५ हेक्टर निजी जग्गा स्थायी रुपमा अधिग्रहण गर्नु पर्ने हुन्छ । आयोजना निर्माणका क्रममा तार मुनी पर्ने ३४ घरहरुलाई विस्थापन गर्नु पर्ने हुन्छ । विद्युत प्रशारण लाइनको टावर बस्ने जग्गा अधिग्रहण गर्नाले प्रति वर्ष कुल ८.६३ मे.टन (गेडागुडी ५.८९ मे.टन र आलु २.७४ मे.टन) उत्पादनमा ह्रास आउँछ । यसका साथै १६७.४० मे.टन बाली (धान ७५.२६ मे.टन, मकै २०.१७ मे.टन, गहुँ १०.४७ मे.टन, कोदो ८.३४ मे.टन र आलु ५३.१४ मे.टन) प्रशारण लाइनको टावर निर्माण गर्ने क्रममा नोक्सान हुने छ । यसै गरी तार मुनी पर्ने जग्गाको एक वर्षको उत्पादन हिसाव गर्दा १६७.४० मे.टन हुन जान्छ । एउटा प्रशारण लाइनको टावरले करिव ०.४५ रोपनी जग्गा ओगट्ने गर्दछ जस्का कारण ९० के.जी धान अथवा ६० के.जी. चामल उत्पादनमा ह्रास आउँछ । तसर्थ आयोजना निर्माणले गर्दा कृषी क्षेत्रमा समेत महत्वपूर्ण प्रभाव पार्दछ ।

९. वातावरणीय प्रभाव न्यूनिकरणका उपायहरु

आयोजनाका लागि वातावरणीय तथा आर्थिक रुपमा उपयुक्त उपायहरुद्धारा वातावरणीय प्रभावहरुलाई न्यूनिकरण गर्नका लागि प्रस्ताव गरिएको छ । यस अर्न्तगत पहिरो तथा भू-क्ष्य नियन्त्रण गर्ने उपायहरु, खोला-खोल्सीहरुमा पर्ने असरहरु न्यूनिकरण गर्ने उपायहरु, दुर्घटनाबाट बाँच्नका लागि पेशागत लगायतका सुरक्षाका उपायहरु, आयोजनाका कारण काट्नु पर्ने विरुवाहरुलाई क्षतीपुर्ती स्वरुप १:२ को अनुपातमा रोप्ने व्यवस्था, घर जग्गाको उचित मुआब्जा तथा क्षतीपुर्ती, आदी पर्दछन् । आयोजना अर्न्तगत जोखिमपूर्ण स्थानमा भएका टावर वर पर पहिरो तथा भू-क्षय नियन्त्रणका लागि इन्जिनियरिङ तथा वायोइन्जिनियरिङ उपायहरु अवलम्बन गर्ने व्यवस्था गरिएको छ । आयोजना सँग सम्बन्धित कामदारहरुको पेशागत सुरक्षाका लागि पन्जा, मास्क, हेल्मेट, आदी प्रयोग गर्ने तथा रातको समयमा हुन सक्ने सम्भावित दुर्घटनाका जोखिम न्यूनिकरण गर्नका लागि बत्तीको व्यवस्था गर्ने लगायतका प्रावधान समेत प्रतिवेदनमा समावेश गरिएको छ । आयोजनाका कामदारहरुको शिविरबाट निस्कने नकुहिने किसिमका फोहोरहरुलाई सङ्कलन गरेर सम्भव भए सम्म पुनः प्रयोगमा ल्याइनेछ । आयोजनाका निर्माण सामाग्री राखिएको स्थानहरुलाई वरीपरीबाट बार बारेर, भुइमा प्लास्टिक अथवा पाल ओछ्याएर मात्र थुपार्ने काम गरिन्छ । आयोजना निर्माण सँग सम्बन्धित औजारहरुमा प्रयोग हुने तेल, इनधन, आदी रसायनलाई सुरक्षित रुपमा भण्डारण गरिन्छ । यसरी भौतिक वातावरणमा पर्ने असरहरु न्यूनिकरण गर्नका लागि रु. २,९५५,००० विनियोजन गरिएको छ ।

आयोजना निर्माणका क्रममा काटिने रुखहरुको क्षतीपुर्ती स्वरुप १:२५ को अनुपातमा पुनः विरुवाहरु रोप्ने प्रावधान यस प्रतिवेदनमा गरिएको छ । आयोजना निर्माण पूर्व वृक्षरोपण सम्बन्धि कार्ययोजना तयार गरिनेछ र सोही योजना अनुरुप विरुवाहरु रोपिनेछ । आयोजना क्षेत्रका सामुदायिक तथा कबुलियती वन उपभोक्त समूहका सदस्यहरुलाई तालिमको व्यवस्था पनि प्रतिवेदनमा गरिएको छ । आयोजनाका कारण जैविक वातावरणमा पर्ने प्रभाव न्यूनिकरण गर्नका लागि रु.४७,२८७,५५० र जैविक क्षेत्रमा थप कार्यक्रमहरु गर्नका लागि रु.४,६००,००० विनियोजन गरिएको छ ।

अयोजनाले प्रभाव पार्ने जग्गा अधिग्रहण गर्नका लागि आयोजनाले जग्गा अधिग्रहण, पुनःस्थापना तथा पुर्नवास योजना तयार गर्नेछ । यसै गरी आयोजना निमार्णका क्रममा टावर रहने तथा तार मुनी पर्ने जग्गामा उत्पादन हुने बालीको एक वर्षको उत्पादन बराबरको क्षतीपुर्ती प्रदान गर्नेछ ।

आयोजनाको वातावरणीय प्रभाव न्यूनिकरण गर्न, सकारात्मक प्रभावहरुलाई बढावा दिन र वातावरणीय अनुगमन गर्न रु. १३२,५६३,०३० विनियोजन गरिएको छ ।

१०. निर्ष्कष

प्रस्तावित मर्स्याङदी कोरिडोर (उदीपुर-न्यू भरतपुर) २२० के.भी. प्रशारण लाइन आयोजनाले, आयोजना कार्यान्वयन हुर्ने क्षेत्रको वातावरणमा ठूलो परिमाणमा असर नगर्ने दखिन्छ । आयोजनाका असरहरुलाई यस प्रतिवेदनमा उल्लेख गरिएका उपायहरुद्धारा सहजै न्यूनिकरण गर्न सकिन्छ । साथै आयोजना कार्यान्वयन गर्नका लागि प्रारम्भिक वातावरणीय प्ररिक्षणनै पर्याप्त छ ।



Marsyangdi Corridor (Udipur- New Bharatpur) 220 kV/TL Project

Initial Environmental Examination

Executive Summary

1.0 Proponent

The proponent of proposed "**Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/T/L Project**" is the Nepal Electricity Authority (NEA). The contact detail of the project proponent is as follows:

Nepal Electricity Authority (NEA)
Ratnapark, Kathmandu
Phone No.: 01-4153025
Fax No.: 01-4153040

2.0 Consultant

On behalf of the proponent Environmental Services Nepal (ESN) Pvt. Ltd. has undertaken the responsibility for the preparation of Initial Environmental Examination (IEE) report of the proposed project. The contact detail of the consultant is as follows:

Environmental Services Nepal (ESN) Private Limited
Kupondol, Lalitpur, Nepal
Phone No.: 01-5011255
Email: info@esn.com.np
Website: www.esn.com.np

3.0 Details of the Proposal

The proposed Marsyangdi Corridor (Udipur - New Bharatpur) 220 kV/TL Project starts from then Udipur (now Besisahar Municipality) of Lamjung district and ends at Aptari of Chitwan district. Three substations, Udipur, Markichok and Aptari associated with the proposed project are under construction. Both Markischok and Aptari substation are under construction and this IEE report will only deal about Udipur substation. The total line length of the project is 64.45 Km.

4.0 Rationality of the proposal

As per the EPR, 1997 and the subsequent amendment (published in 2066/10/13 BS on Nepal Gazette) an Initial Environmental Examination (IEE) is mandatory for transmission line (TL) of voltage level of 132 kV or above. Since, the proposed project is of 220 kV capacity, it needs an IEE for execution.

5.0 Objectives of IEE

The main objective of IEE is to assess and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate

mitigation measures to mitigate and/or minimize the adverse impacts so that the project is implemented in an environmentally sound manner.

6.0 Methods adopted for IEE study

The IEE report has been prepared based on the mandate of EPR 1997, and its amendments 2009 (2065/11/26) and National EIA Guidelines 1993. For this Terms of Reference had been prepared and approved by the MoE. Then after literature review, field visit (August 2016 to February 2017 at different level) to collect environmental baseline and publication of public notice in Aarthik Abhiyan National Daily in 2073/10/07 was done to collect suggestion from concerned stakeholders. During field visit, household survey, Key information interview, Market survey, Public participation, etc. was also carried out. Based on the primary and secondary information, impact analysis was carried out, and suitable mitigation measures for each of the significant measures are proposed and finally Environment Management Plan was prepared and the report was finalized.

7.0 Existing Environmental Condition

Physical Environment

The overall alignment of transmission line passes through three physiographic regions i.e. Terai, Siwalik and Mahabharat region. The lowest elevation at the Aaptari substation is 225 m above mean sea level (amsl), while the highest elevation is 1450 m amsl at Chhimkeshwori hill. The TL alignment within Udipur to Markichowk section traverses along Marsyangdi Valley.

The geology along the TL alignment has been divided into two sections, i.e., Udipur to Markichowk Section and Markichowk to Bharatpur Section. The Udipur – Markichowk section traverses along the wide Marsyangdi River valley. Major land uses observed along the alignment are forest and cultivated land. The transmission line alignment mainly passes through Lesser Himalayan Rocks such as grey greenish phyllites and white massive quartzite of Ranimata Formation near Markichok substation. The alignment passes toward the soft sediments of Chitwan Dun Valley, which is mainly comprised of sand, slit, clay and mud near Bharatpur Substation.

The alignment of TL along Udipur –Markhichowk Section passes through cultivated (60%), forest (25%), bushes/grass land (6%) and river bank (8%). Marsyangdi is the major river in the alignment. Likewise, the alignment of TL along Markhichowk- Bharatpur section passes through cultivated (41%); forest (54%) and bushes/grass land (3%). Marsyangdi and Trishuli rivers are the major rivers in the alignment. Prithvi Highway and Muglin - Narayanghat Highway are also crossed.

Landslide observed near the Kabilas Hill (500m from the alignmnet) is of major concern. Due to the high vulnerability of Siwalik Hills, land surface are highly susceptible to erosion. Trishuli and Marsyangdi are the major rivers along the T/L alignment that drains all the rain falling around the project area, and the T/L alignment crosses both the rivers.

Biological Environment

The proposed project area does not fall in protected area (national parks, wildlife sanctuary, buffer zone and conservation area) or environmentally sensitive area. The forest along the TL consists of tree species such as Sal, Saj, Simal, Chilaune, Katus, Salla, Khashru, Oak, Kaphal, Guras, Tooni, Uttis, etc. A total 90.65 ha of forest area from 39 forests will be acquired by the

project along Right of Way (RoW) and AP locations in which CFs area is 43.84 ha, NFs area is 43.50 ha and LHFs area is 3.31 ha.

Common Leopard (*Panthera pardus*), Barking Deer (*Muntiacus muntjack*), Porcupine (*Hystrix indica*), Wild Boar (*Sus* scrofa), Fox (*Vulpes vulpes*), Rhesus Monkey (*Macaca mullata*), Common langur (*Presbytes entellus*), jackal (*Canis aureus*) are some of the wildlife present around the project area. Likewise, Crow (*Corvus splendens*), House Sparrow (*Passer domesticus*), Kalij (*Lephura leucomelana*), Chibe *(Dicrurus adsimilis),* Baj *(Buteo spp.), Baudai (Falco tinnunculus),* Lampuchchhre *(Cissa erythrorhyncha),* Ban Kukhura, Cuckoo (*Plantative cuckoo*), Dhukur *(Streptopelia chinensis),* Jureli *(Pycnonotus cafer),* Titra *(Francolinus spp.),* Kalchaudo *(Myophonus caeruleus),* Bakulla *(Bubulcus ibis),* Koili *(Surniculus lugubris),* Pani Hans *(Podiceps cristatus),* Haleso *(Treron spp.),* Suga *(Psittacula cyanocephala)* are the common bird species observed in the project area.

Socio-Economic and Cultural Environment

Bharatpur Municipality of Chitwan District has the highest population among all the project affected VDCs/Municipalities whereas, thenChhimkeshwori VDC (now Anbukhaireni RM) of Tanahau district has the least population compared to other project affected then VDCs. The project affected then VDCs have diversity in ethnic composition. Gurung is the dominant ethnic group in Lamjung, Chhetri in Gorkha, Magar in Tanahu whereas; Chitwan has the mixed ethnic communities of Chhetri, Gurung, Magar, Brahmin, Newar etc. Nepali language is the mother tongue for large fraction of population around the project affected VDCs, which is followed by Magar, Gurung, Newar, and Chepang. Among the project affected VDCs/Municipality, Bharatpur Municipality has the highest literacy rate, i.e. 85.34%. Likewise the least literate VDC is the Chhimkeshwori VDC whose literacy rate is 55.29%. Agriculture is the main occupation of the local people around the project affected areas. Food crops are the dominant agricultural product in the project area.

A total of 48 households are affected by the project. The total affected population is 285, where the population of female is greater than that of male. The average household size is 6.42. Nuclear type of family (71%) is dominant in the project affected households. The majority of the population falls in the age group of 15-59 year, which is 65.86%. Majority of the population are Hindus (89.6%) followed by Buddhist (10.4%). About 31% of the households are Brahmin, 18.75% are Magar, 16.67% are Dalit, 14.58% are Newar, and 10.42% are Chhetree. About 45% of the affected households have adopted agriculture as their main occupation. The other occupations rather than agriculture are foreign employment (10.3%), service (5.4%), wage labor (1.3%), cottage industries (1.8%), etc. About 93% of the population are literate whereas, the rest 7% are illiterate. The household survey showed that 58.3% of the households relied on piped water supply, 31.2% on public tap and 10.4% on well. About 83% of the households use fuel wood for cooking purpose while about 10% use LPG, about 2% use cow dung and about 4% use other sources. Likewise, about 94% of the households use electricity for lightning. Likewise, about 4% use solar for lightning and about 2% use candles. About 98% of the affected households have their own toilet facility for defecation, whereas, the remaining 2% used open field for the defecation purpose.

8.0 Environmental Impacts

There are both positive and negative impacts due to the implementation of the proposed project. Positive impacts include employment to the local people, skill enhancement, upgrading of

existing road around the project area, landslide and soil erosion control, technical and financial support for the improvement of infrastructures, opportunities for hydropower development, etc.

Adverse environmental impact includes land clearance which involves the levelling terraces, removing crops, clearing tees and ground vegetation etc. A total of about 1.96 ha of land should be cleared for stockpiling site. Likewise, there would be impact associated waste and spoil disposal, risk associated with construction related accidents, change in land use, etc. Similarly, impact due to landslide and erosion is very significant due to the project. The angle points such as: AP-1, AP-12, AP-13, AP-16, AP-17, AP-20, AP-21, AP-27, AP-28 and AP-30 are particularly vulnerable to slope failure.

A total of 2,783 trees (circumference more than 11 inch), 2,739 poles (5-11 inch circumference) and 222,364 regenerations (seedlings and saplings (less than 5 inch circumference)) of different species need to be removed for the project. Hence, there will be considerable shrinking of the natural habitat. Likewise, mechanical activities related to tower construction with the frequent use of electrical devices could cause accidental fire hazards.

Moreover, a total of 1.3725 ha of private land is required for the project construction. Likewise, there are 34 houses and private structures that fall under the Row of the proposed transmission line alignment. Similarly, the total annual crop loss from agricultural land proposed for tower pad is estimated to be 8.63 MT (cereal crops 5.89 MT and cash crop potato 2.74 MT). Furthermore, about 167.40 MT of crops (paddy 75.26 MT, maize 20.17 MT, wheat 10.47 MT, millet 8.34 MT and potato 53.14 MT) will be lost due to the construction of TL. Likewise, a single tower pad will occupy 0.45 ropani of land which can produce 90 kg of paddy and 60 kg of rice. Hence, there would be farming hindrances due to tower construction.

9.0 Environmental Impact Mitigation and Environmental Management Plan

Suitable and cost effective mitigation measures for the prevention of environmental impacts are recommended. This includes mitigation measures for landslide and erosion, mitigation measures for impact on drainage system, safety measures for construction related accidents, compensatory plantation for cleared vegetation, compensation for affected land owners and house owners, etc. Slope protection measures (both engineering and bioengineering) have been proposed for the stabilization of landslide and soil erosion. The construction crew will be provided with personal safety measures like gloves, masks, helmets, etc. for their safety and lightning facilities will be installed around the construction site to avoid accidents during night time. The non-biodegradable waste generated from construction activities will be collected, reused, and if possible will be recycled. The stockpiling yard fenced, the ground will be covered with plastic or tarpaulin sheet before stockpiling of sand and gravel. Likewise, the oil, fuels, lubricants will be stored in closed container to avoid accidental spillage. The total cost for the mitigation of physical environment is NRs. 2,955,000.00.

Furthermore, the document also has the provision for tree plantation in the ratio 1:25 for the affected trees. Separate Plantation Action Plan will be prepared before implementing the plantation program which will figure out the potential plantation sites, seedling production and availability, plant species and mode of plantation. Likewise, training programs will be provided to the users of CFUGs/LHFGs for the enhancement of biological environment. The total cost for biological impact mitigation is NRs. 47,287,550.00 and biological enhancement cost is estimated NRs. 4,600,000.00.



The land acquired for the project will be compensated and project will prepare separate resettlement plan to address the issues associated with the relocation and/or resettlement of houses under the RoW of the TL. Likewise, the compensation will be provided for the project affected HHs for production loss of 8.63 MT.

The total cost allocated for the environmental mitigation, enhancement and monitoring is NRs. 132,563,030.

10.0 Conclusion

The IEE study concludes that the proposed Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL Project shall not have significant impacts on physical, biological; socio-economic and cultural environment of the project area. Therefore, the proposed project is environmentally and socially feasible, with adoption of suggested mitigation and enhancement measures. The IEE study is adequate and no further study is supposed to be required regarding environmental assessment of the proposed project.


भारत सरकार
ऊर्जा मन्त्रालय

ACRONYMNS AND ABBREVIATIONS

ADB	:	Asian Development Bank
AFO	:	Assistant Forest Office
amsl	:	above mean sea level
AP	:	Angle Point
CBS	:	Central Bureau of Statistics
CBD	:	Convention Biological Diversity
CDO	:	Chief District Office
CF	:	Community Forest
CFUG	:	Community Users Group
°C	:	Degree Celcius
cft	:	cubic feet
CITIES	:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CFC	:	Compensation Fixation Committee
dbh	:	diameter at breast height
DDC	:	District Development Committee
DFO	:	District Forest Office
DIA	:	Direct Impact Area
DoEn	:	Department of Energy
EIA	:	Environment Impact Assessment
EMU	:	Environment Monitoring Unit
EMP	:	Environment Management Plan
EIB	:	European Investment Bank
DoF	:	Department of Forest
EPA	:	Environment Protection Act
EPR	:	Environment Protection Rules
GIS	:	Geographic Information Centre
GoN	:	Government of Nepal
GPS	:	Global Positioning System
GRM	:	Grievance Redress Mechanism
HHS	:	Households
IEE	:	Initial Environment Examination
IIA	:	Indirect Impact Area
ILO	:	International Labor Organization
IPPs	:	Independent Power Producers
IUCN	:	International Union for Conservation of Nature
KII	:	Key Informant Interview
Km	:	Kilometer
kV	:	Kilovolt
LHF	:	Leasehold Forest
MHT	:	Main Himalayan Thrust
MIS	:	Management Information System
m	:	Meter
MoFSc	:	Ministry of Forest and Soil Conservation
MT	:	Metric ton
MoEN	:	Ministry of Energy
NEA	:	Nepal Electricity Authority
NEPAP	:	Nepal Environmental Policy and Action Plan



NF	:	National Forest
NTFPs	:	Non-timber Forest Products
OPGW	:	Optical Ground Wires
PAF	:	Project Affected Families
MW	:	Megawatt
RoW	:	Right of way
SPAF	:	Severely Project Affected Families
SPSS	:	Statistical Package for the Social Sciences
SWCA	:	Soil and Watershed Conservation Act
ToR	:	Terms of Reference
UN	:	United Nations
TL	:	Transmission Line
VDC	:	Village Development Committee
ZOI	:	Zone of Influence

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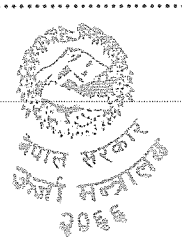

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CHAPTER ONE: NAME AND ADDRESS OF THE INSTITUTION PREPARING THE REPORT

1.1 Proponent

The proponent of proposed "**Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/T/L Project**" is the Nepal Electricity Authority (NEA). NEA is a semi-governmental organization established in 2042 BS (1985 AD) and since its establishment; it's engaged in the generation, transmission, and distribution of electricity throughout the nation at a very affordable cost. The contact detail of the project proponent is as follows:

Nepal Electricity Authority (NEA)
Ratnapark, Kathmandu
Phone No.: 01-4153025
Fax No.: 01-4153040

1.2 Organization Responsible for the Preparation of IEE Report

On behalf of the proponent Environmental Services Nepal (ESN) Pvt. Ltd. has undertaken the responsibility for the preparation of Initial Environmental Examination (IEE) report of the proposed project. The contact detail of the consultant is as follows:

Environmental Services Nepal (ESN) Private Limited
Kupondol, Lalitpur, Nepal
Phone No.: 01-5011255
Email: info@esn.com.np
Website: www.esn.com.np

1.3 Rationality for Conducting IEE

Government of Nepal (GoN)'s policies emphasize on the need of environmentally sound and financially sustainable development of power in the country.

Schedule-1 of Environment Protection Rules (EPR), 1997 lists proposal requiring IEE. As per the EPR, 1997 and the subsequent amendment (published in 2066/10/13 BS on Nepal Gazette) an Initial Environmental Examination (IEE) is mandatory for transmission line (TL) of voltage level of 132 kV or above. **The proposed transmission line project does not cross any protect areas, wetlands, historically and archaeologically important sites and environmentally sensitive/fragile areas. Further, proposed TL project does not displace more than one hundred people.**

Since, the proposed transmission line project is of 220 kV capacities, it needs an IEE for the execution. Ministry of Energy has approved the Terms of Reference (ToR) document for IEE of

Marsyangdi Corridor (Udipur-New Bharatpur) 220 kV TL Project dated on **2073/10/03B.S.** This IEE has been conducted according to the terms and conditions set in the survey license as well based on the approved ToR document. A copy of approved IEE ToR document is attached in **Appendix-II.**

1.4 Objectives of IEE

The broad objective of the IEE is to assess and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate mitigation measures to mitigate and/or minimize the adverse impacts so that the project will be implemented in an environmentally sound manner. The specific objectives of the study are presented below:

- To document physical, biological, socio-economic and cultural baseline conditions of project area
- To analyze alternative transmission line routes
- To identify, predict and assess the beneficial and adverse environmental impacts in project affected areas of the transmission line in terms of magnitude, extent and duration during project construction and operation phases
- To suggest appropriate and pragmatic mitigation and enhancement measures for potential adverse impacts
- To familiarize various stakeholders with the IEE outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues in environmental mitigation plan
- To prepare an environmental monitoring plan
- To facilitate informed decision making including setting the environmental terms and conditions for implementing the proposed project

CHAPTER TWO: PROJECT DESCRIPTION

2.1 Background

To overcome the existing situation of energy crisis and lead the economic enhancement of the country, energy generation through the construction of hydropower projects is very essential. Both NEA and Independent Power Producers (IPP's) are working for the construction of hydropower projects and generate electricity by utilizing the water resources of Nepal. Moreover, several IPP's have been developing hydropower stations from Marsyandi River and its tributaries. Hence, to evacuate power generated through those stations to the nearest load centers, Udipur–New Bharatpur 220 kV transmission line has been proposed. Power shall be evacuated through Udipur hub Sub Station (SS), Markichowk SS and New Bharatpur SS by interconnecting it to Integrated Nepal Power System (INPS) through Udipur-New Bharatpur 220 kV D/C transmission line.

The proposed Marsyangdi Corridor (Udipur - New Bharatpur) 220 kV/TL Project starts from Udipur of Lamjung district and ends at Aaptrai of Chitwan district. Three substations, Udipur, Markichok and Aaptari associated with the proposed project are under construction. Both Markischok and Aaptari substation are under construction (**separate Environment Assessment had been carried out**) and this IEE report will only deal about Udipur substation. The total line length of the project is 64.45 Km.

2.2 Project Location

The project is located at the Central and Western Development Region of Nepal. Project scope is spread over four districts, viz. Chitwan, Tanahu, Gorkha and Lamjung. Chitwan is located in Central Development Region (now in Province No. 3) while rest of the three, i.e., Tanahau, Gorkha, and Lamjung are located in the Western Development Region (now in Province 4). The location of the proposed project area shown is in figure 2.1.

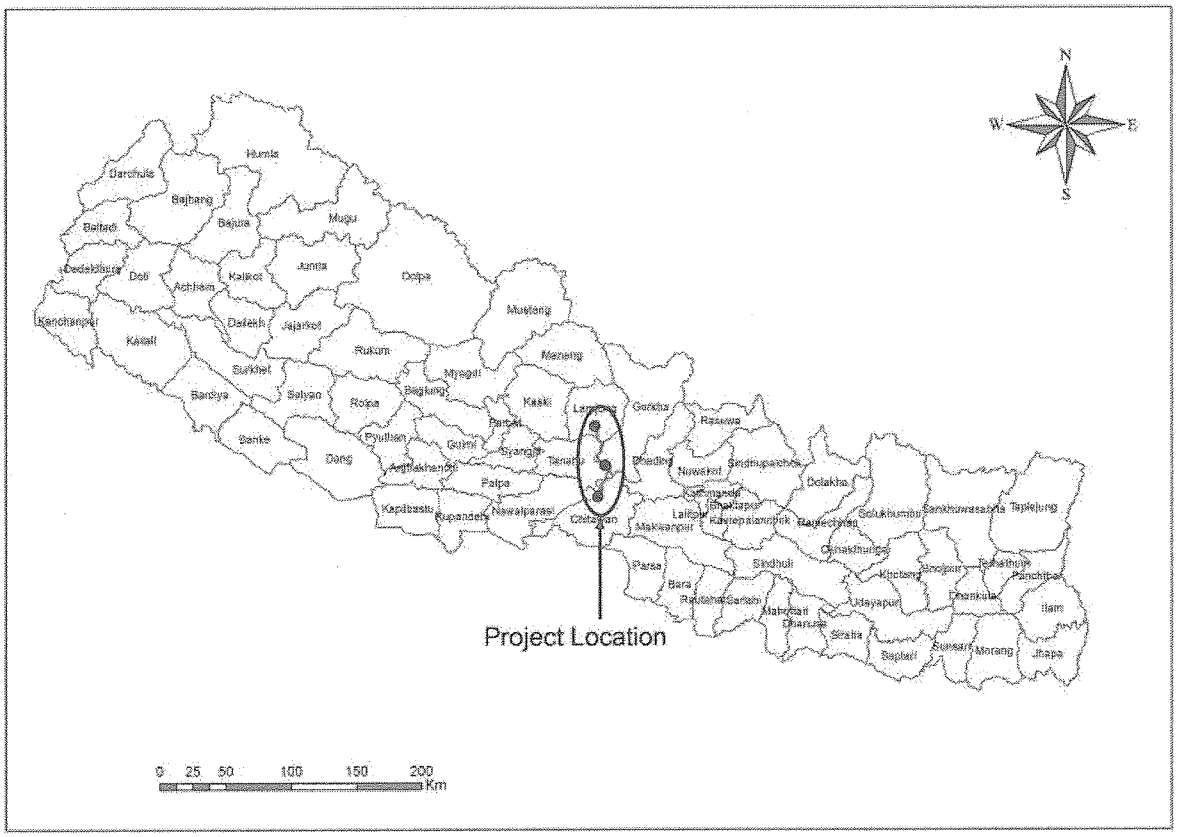


Figure 2.1: Location of the proposed Marsyangdi Corridor (Udipur - New Bharatpur) 220 kV/TL Project

The proposed project passes through 24 VDCs/Municipalities of four different districts. The name of the VDCs/Municipalities within area affected by the project is listed in table 2-1 and shown in figure 2-2. Route of transmission line in topographic map is given in **Annex I.**

Table 2- 1: List of project affected VDCs/Municipalities

S.N.	District	VDCs
1	Lamjung	Chiti, Udipur, Archalbot, Mohoriakot, Bhoteodar, Bharte, Sundarbazar, Tarkughat, Dhamilikuwa
2	Tanahu	Chokchisapani, Purkot, Bhanu, Anbukhaireni, Chhimkeshwori, Bandipur
3	Gorkha	Palungtar, Gaikhur, Chyangli, Dhuwakot, Deurali
4	Chitwan	Chandibhanjyang, Kabilas, Dahakhani, Bharatpur Municipality

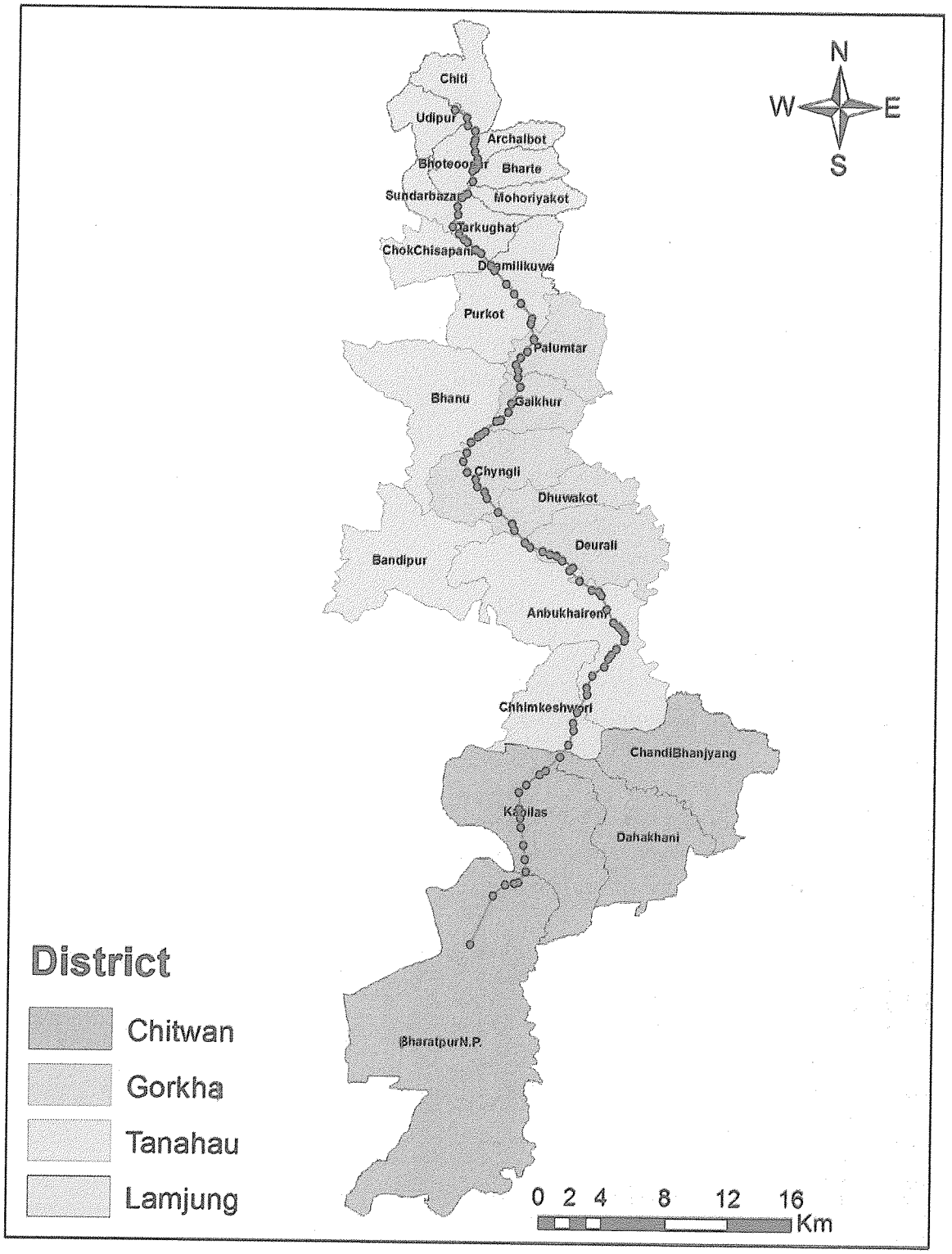


Figure 2.2: Project affected VDCs distributed across four different districts

2.3 Salient Features of the Project

The salient features of the proposed project are presented in table 2-2.

Table 2-2: Salient features of the project

S.N.	Project Component	Description
1	Name of Project	Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL Project
2	Project Affected Districts	Lamjung, Gorkha, Tanahu, Chitwan
	Project Affected VDCs	**Lamjung District:** Then Udipur Chiti (now Besisahar Municipality), then Bharte & Archalbot (now Dordi RM), Bhoteodar (now Sundarbazar), then Sundarbazar (now Sundarbazar Municipality), then Tarkughat, Mohoriakot, Dhamilikuwa VDCs (now Rainas Municipality) **Gorkha District:** Palungtar (Palungtar RM), then Gaikhur, Chyangli & Dhuwakot VDCs (Palungtar RM), Deurali (Gorkha Municipality) **Tanahau District:** Then Chokchisapani, Purkot & Bhanu VDCs (now Bhanu Municipality), then Anbukhaireni & Chhimkeshwori, (now Anbukhaireni RM), then Bandipur (nowBandipur RM) **Chitwan District:** Then Chandibhangyanj (now Ichchyakama RM), then Kabilas (now Bharatpur Municipality), Dahakhani (now Ichchyakama RM), Bharatpur Municipality
3	Number of Angle towers	101
4	System Voltage	220 kV
5	Capacity	1600 MW
6	Number of circuit	Double circuit
7	Length of T/L	64.45 Km
8	Ruling Span	350 m
9	Tower Type	Lattice tower A, B,C,D, Special Type Tower MA& MD and Multi-circuit Tower MA & MD
10	Tower Height	40 m and extension +3,+6,+9,+18,+25
11	Tower Foundation Area	A 214 m^2 B 282 m^2 C 375 m^2 D 400 m^2
12	Conductor	HTLS, Zebra Equivalent
13	Right of Way (RoW)	30m (15m on either side of centerline)
14	Minimum Ground Clearance	7 m from land
15	Minimum clearance for road,	9.8 m road, river 7 m, power lines 7 m buildings and

	river, crossing lines and other utilities	Temples 7 m
16	Project Construction Period	36 months
17	Funding Agency	European Investment Bank
18	Substations	Udipur substation, Aaptari Substation
19	Tentative Project cost	Nrs.5,31,05,96,000

Source: Detail Survey Report of Marsyangdi Corridor 220 kV Transmission Line Project

2.4 Access to the Project

Almost all of the Angle towers (AP's) can be approached through motorable road. Largely, Narayanghat-Mugling Highway, Prithvi Highway, and Dumre-Beshisahar Highway are the road networks providing approaches to the APs. To get into the actual locations of the APs, either graveled roads or foot tracks have to be followed. The Chhimkeshwori section of the proposed alignment does not have easy access road.

2.5 Project Components

The Udipur-Bharatpur 220 kV TL project consists of two major project components – the transmission line route and the substations. The TL route is divided into two sections;

(i) Udipur – Markichowk section: The Khudi-Markichowk 220 kV Transmission Line project has been identified for evacuating power from hydropower station by IPP's mainly form Marsyangdi River and its tributaries. The project starts from Udipur of Lamjung district and ends at Markichowk of Tanahu district. The alignment passes through the terrain of moderate hill along the Marsyandi River. This alignment section passes through Tanahu, Gorkha and Lamjung districts. The total length of this section is 36.46 Km.

(ii) Markichowk – Bharatpur Section: The Makrichowk-Bharatpur 220kV Transmission Line project has been identified for evacuating power from hydropower stations by IPP's mainly from Marsyandi and its tributaries. The project starts from Marichowk of Tanahu district and ends at Aptari of Chitwan district. The tower route alignment mainly passes through the top parts of Mahabharat hills of Tanahu and Chitwan districts as well as flat land of Chitwan district. The total length of this section is 27.99 Km.

The total length of the route, including both of the sections, is 64.45 Km. Similarly; other major project component is substation. The project comprises of two sub-stations which are to be constructed at two different districts, i.e., Udipur VDC (present Besisahar Municipality) of Lamjung district and Bharatpur Municipality of Chitwan district. This IEE study will include the environmental issues associated with the construction of Udipur substation, as Tanahu and Bharatpur substations are under construction and will be commissioned very soon. These project components are discussed in the following sections in detail.

2.6 Impact Area Delineation

The study area is defined as the project area consisting of the alignment as well as the area that will be impacted due to the construction and operation of the project. The project impact area that will be considered during IEE study has been defined as follows:

Direct Impact Area (DIA): This consists of 30 m Right-of-Way (RoW) comprising 15 m on either side of the center line of the transmission line alignment. Thus, the settlement area, forest or other vegetation, aquatic habitat and places having built up infrastructures or facilities that fall within the RoW constitute the "Direct Impact Area" of the project.

Indirect Impact Area (IIA): This consists of the area within 100 m stretch from the edge of DIA. Any built-up community infrastructures and facilities, terrestrial habitat, aquatic habitat etc. that fall within this area will be studied as a part of IIA.

Zone of Influence (ZoI): The area outside the IIA and within the project affected VDCs is termed as Zone of Influence for this project. The information on ZoI will include the information on project VDCs.

The detail baseline covers the information regarding DIA zone and 100 m IIA.

2.7 Construction Power

The project affected then VDCs have access to power supply through National Grid. Hence, the project will supply the construction power required through National Grid.

2.8 Constructing Planning

The implementation of proposed project comprises that construction of new substation, tower foundation and erection of towers, stringing of conductor, testing and commissioning of the 64.45 Km 220 kV TL.

2.8.1 Tower Foundation

The construction of tower foundation will be undertaken by manual labor assisted by the mechanical plant wherever possible. The mechanical plant will be limited to small demountable steel skid framed concrete mixer, air compressor, and air drills/chisels and tamping/compaction tools. Excavation and the concreting of the tower foundations will be carried out as per the design requirements and after necessary curing, the foundations will be backfilled with suitable material.

2.8.2 Erection of Galvanized Steel Tower

The members of galvanized steel lattice towers (pylon structure) assembled on the tower foundation will be erected manually by employing pulleys, wenches, etc.

2.8.3 Insulator Fittings, Conductor and Ground Wire Stringing

Conductors, Optical Ground Wires (OPGW), insulators, hardware and necessary accessories will be transported manually to the tower locations. The fitting of insulators on the tower will be carried out manually. Stringing of conductors and OPGW will be carried out with the help of tensioners and other pulling devices as per the design requirements.

2.8.4 Construction Materials

The materials required for construction works related to the TL and substation will be:

- Steel reinforcement bars
- Cement
- Coarse aggregate
- Fine aggregates (sand)

The main materials required for construction works related to the transmission line and substation are cement, sand and aggregates, and steel reinforcement. Steel reinforcing bars and cement can be acquired from local manufacturers or also can be imported. Coarse aggregates will be purchased from the licensed suppliers, while fine aggregates will be collected from major quarries along riverbanks. The excavated foundation materials will be used as backfilling materials after the construction of foundation. The quantity of materials required for the construction of proposed TL project is presented in table 2.3.

Table2-3: Quantity of materials required for the construction of proposed TL project

Materials	Quantity
Cement	3,000 MT
Fine	8 422.86 MT
Coarse	16 845.71 MT
Fe 500 steel	870 MT

(*Source: Marsyangdi Corridor 220 kV/TL project)*

Construction materials will be collected from approved sites of Marsynadi and Trishuli Rivers for which separate Initial Environmental Examination (IEE) study of construction materials collection will be done by DCC Lamjung, Gorkha, Tanahu and Chitwan.

2.8.5 Spoil Management

Since the construction of TL towers requires clearing and excavation of fairly small areas at tower location, construction work will not produce huge volume of muck to be disposed of separately. The spoil will be filled up and compacted in the tower base area. Similarly, spoil generated from the substation construction will be used around switchyard location where borrowed earth materials have to be filled and compacted for the site grading.

2.8.6 Worker's and Contractor's Camp

There will be 12 temporary labor's camp throughout the project alignment. Few more workers' camp would be added during the construction period based upon the physical terrain and difficulty of the tower location. The location of labor's camps is presented in table 2.4.

Table2-4: Location of temporary worker's camp

Camp	Location	Land use	Area (m^2)
C1	Udipur, Besisahar Municipality	Barren Land	2430
C2	Archalbot, Archalbot VDC	Barren Land Near Forest	2354
C4	Bhoteodar, Sundarbazar Municipality	Barren Land Near Marsyangdi CF	2650
C5	Dhamilikuwa, Rainas Municipality	Barren Private Land	1860

C6	Garambesi, Rainas Municipality	Barren Land	2430
C7	Old Airport, Palungtar Municipality	Old Airport (not operational)	2800
C8	Markichowk Substation, Aabukhaireni Municipality	NEA premise	2400
C9	Aduwakharka, Aabukhaireni Municipality	Barren Land	2650
C10	Barlung, Chhimkeswori VDC	Barren Land	2800
C 10	Kabilas, Kabilas VDC	Barren Land near school	2200
C 12	Aaptari, Bharatpur Municipality	NEA substation	2200

Source: Field Survey, 2016

Likewise, the contractor's camp will be set within the substation premises to avoid unnecessary land use changes.

2.8.7 Human Resource Requirement

The project will generate employment opportunities during the construction phase. Members of project affected families and people from project impact area will be encouraged for employment. Semi-skilled and unskilled labor will be sourced from local area to the extent possible. Altogether 71,900 man days total labor will be required during the construction of the project, which includes; 43,140 man days unskilled, 21,570 man days semi-skilled and 7,190 man days skilled.

2.8. Land Requirement

The total land requirement for the proposed Udipur-Bharatpur transmission line has been divided into permanent land requirement and temporary land requirement. Permanent land requirement includes land required for the construction of towers and land under the conductors. The total land required for the installation of Tower including ROW whereas temporary land requirement includes campsite. The detail breakdown of land requirement is presented in table 2.5.

Table 2.5: Details of Land Requirement

Project Components		Forest (ha) (Gov.)	Agricultural land (Private) (ha)	River Flood Plain (ha) (Gov.)	Barren land (ha) (Gov.)
Below ROW (Permanent)		90.7	101.19	2.65	0.11
Tower (Permanent)		0.72	1.395		
Campsite (Temporary)	Private land				0.186
	Gov land				2.49

2.9. Project Schedule

The project is expected to be completed and commissioned within 3 years' period. The detail project schedule is attached in **Annex E.**

2.10. Limitation of EIA Study

The EIA study had been limited to project affected then VDCs.

CHAPTER THREE: STUDY METHODOLOGY

The IEE process follows the Environment Protection Rules 1997, and its amendments 2009 (2065/11/26) and National EIA Guidelines 1993. This IEE report is prepared in accordance with the legal requirements of GoN, based on approved IEE ToR, field study, consultation with local people/stakeholders and officials of governmental organizations.

3.1 Desk Study and Literature Review

Review of IEE reports of similar types of hydropower projects, district level annual reports, and other pertinent literatures was done. Topographical and land use maps of the area including the Google Earth map were studied for field study. The major reports consulted are: Districts profile of Chitwan, Gorkha, Tanahu, and Lamjung districts published by the District Development Committees; National Population and Housing Census 2011, published by Central Bureau of Statistics, GoN; Village Development Committee Profiles; Feasibility Report of Udipur - Bharatpur 220 kV D/C and Survey Report. On the basis of the reviewed information regarding the project areas, data gaps were identified and the methodology described in this chapter was developed to collect other relevant information required for the IEE. All the issues highlighted in ToR document were given emphasis during the IEE.

Information on climate, geology and hydrology were taken from the Feasibility Report prepared for this project. Review of topographical map and land use map was done to identify the land use patterns of the area.

The general information of the forest area, types and community forest of the district was obtained through review of publication of District Forest Office. Socio-economic and cultural data, such as population of project district and VDCs, households size, male-female ratio, infrastructures, ethnicity, religion etc. were derived from Population and Housing Census, 2011. District Profile of Chitwan, Gorkha, Tanahu, and Lamjung district and profiles of the affected VDCs were reviewed for the required socioeconomic data.

On the basis of the reviewed information with respect to the project, data gaps were identified and the methodology described in following sections of this chapter was developed to collect other relevant information required for IEE study.

While carrying out the IEE, literature, review on topographic maps, land use maps, CBS publications, project technical reports and other TL project related environmental reports have been extensively carried out.

The following documents which were considered to be relevant for the study were reviewed:

- 1:25,000 scale topographical maps prepared by the Department of Survey, GoN.

- 1:25,000 scale district map of Chitwan, Gorkha, Tanahu, and Lamjung Districts
- Detail Survey Report of Udipur-Bharatpur 220 kV TL project and prepared by Project Development Department, NEA
- IEE Report of Koshi Corridor 400 kV TL, Chilime-Trishuli 220 kV TL and Samundratar Trishuli 132 kV TL projects.
- ToR and IEE report of Tamakoshi-Kathmandu 400kVTL project.
- Regional Geological Maps and previous geological reports of the Nepal.
- Population Census, Central Bureau of Statistics, GoN/ Nepal, 2011.
- District Profile of Affected District, District Information Centre.
- Demographic Profile of Nepal 2013/14.
- Profiles of Concerned VDCs and Municipalities.
- Forest Act, 2049, and Forest Regulation, 2051
- Guidelines for Community Forestry Development Program, 2009
- Google Earth, the online software for verifying the TL alignment.

On the basis of the reviewed information with respect to the project, data gaps were identified and the methodology described in following sections of this chapter was developed to collect other relevant information required for IEE study.

3.2 Data Requirement, Collection Methods and Analysis

A team of experts specialized in engineering, forestry, and socio-economics visited the project area in June to October 2016, to collect baseline information of the area, identify the likely impacts of the proposed project during construction and operation phases and inform stakeholders regarding the project. During this visit, the team visited the project site proposed for structures and facilities as well as settlements of the affected VDCs and collected required data on physical, biological and socioeconomic and cultural environment of the area. Topographical maps were referred for site investigations. The study team observed various assets and took GPS location point references and photographs to establish the baseline. The team also visited relevant government offices of the affected district to interact with concerned officials and collect necessary information and their concerns.

The study team has adopted a participatory approach with maximum involvement of different stakeholders of the project at the local and district levels to generate relevant information for the IEE. The study team has maintained a close contact with the district level government relevant line agencies, VDC level key stakeholders and other stakeholders while conducting fieldwork for the IEE.

3.2.1 Physical Environment

3.2.1.1 Hydrology and Meteorology

The general climatological and meteorological information of the project impact area has been taken from the District Development Profile.

3.2.1.2 Geology

The regional geology around the project area highlighting geology has been covered in the IEE Report, as per the available information in the Feasibility Report. The stability of slopes and the presence of landslides, fan deposits and rock fall within the project area were evaluated mainly by site observations and from topographical maps. The local people were enquired about the occurrence of major landslides and soil erosion in the project area.

3.2.1.3 Land use Pattern

Land use pattern of the study area was derived from review of topographical map, Google Image and GIS map of the area.

3.2.1.4 Data Requirement and Collection Methods

The following data were collected during the IEE study:

- Meteorological data: Maximum and Minimum Temperature and rainfall of the project area;
- Topographical data: Altitude and landscape
- Air, water and noise quality of the project area
- Physical setting: Physiographic location, river system, etc. of the project area
- Geological data: Rock type, soil type, slope stability, erosion, landslides, etc. of the project area
- Spoil materials: Total volume, volume to be used for construction, disposal volume, etc.
- Significant crossings along the alignment
- Land use pattern of the project area.

The following methodology has been used to collect the baseline data on each environmental domain:

- Collection of secondary data and review
- Field survey and investigation by the team of experts
- Observation
- Expert's judgments
- Checklist and households' survey
- Public/stakeholder's consultation through group meetings/key person interview
- Impact assessment

An intensive field investigation from June 12, 2016 to October 4, 2016 along the proposed alignment was conducted to collect information on existing physical environment. During the field visit inspection of site condition of the angle towers and other critical areas along the TL were done. Documents and other relevant literature were collected and reviewed.

The data on climate (temperature, rainfall, and moisture) was collected through secondary source; District Profile of Nepal, 2014/15. The data on air, noise and water quality of the area has been collected through observation by subject expert during site visit. Geographic and geological data, such as topography, rock type and soil type, stability of the Angle Tower locations, soil

erosion and other key environmental features were investigated and obtained from the Regional Geological Maps and previous geological reports of the Nepal and by general observation. Physical settings, land-use pattern and significant crossings were adopted from topographical maps and detail plan and profile of the alignment.

The type of land use and area calculation has been prepared with reference to the topographical maps, survey report provided by the Survey Department with field verifications. The obtained data of land-use pattern, river system and significant crossings along the alignment from the review of the topographical maps and plan and profile of the alignment has further been verified at site. Similarly, the numbers of structures under RoW, at substations area and near angle towers were determined with the help of the plan and profile of the Final Survey Report with verifications at site. During the field visit the data on occurrences of slides and other information related to the physical environment were gathered by observation, group discussion and inquiring the local people.

3.2.1.5 Data Analysis

The collected data from the field visit was analyzed using different software like ArcGIS 10.1, AutoCAD, and Google Earth by the study team in coordination with the project engineers and experts. Necessary maps and information thus generated were presented in the report. The beneficial and adverse impacts have been predicted and appropriate mitigation measures proposed to reduce the impacts.

3.2.2 Biological Environment

Following methodology was adopted to collect data on biological environment of the proposed project:

3.2.2.1 Desk Review

Secondary information was reviewed from the Community Forestry Monitoring and Annual Progress Reports of Chitwan, Gorkha, Tanahu, and Lamjung DFOs; Management Information System (MIS) data base of Community Forestry Division of Department of Forest (DoF), Forest and Vegetation Types of Nepal published by Tree Improvement and Silviculture Component of DoF, Forest Resource Inventory Guidelines, 2061, Forest Act and Rules, Government Tree Cutting Procedures, 2071. Meeting was also held with concerned officials in the Ministry of Forest and Soil Conservation (MoFSC), DoF, DFO of Chitwan, Gorkha, Tanahu, and Lamjung Districts.

3.2.2.2 Field Survey

Half day orientation training was organized to brief about the inventory process, necessary formats, use of GPS for identification of angle tower (AP) and transmission line (TL) alignment to the concerned DFO staff and CFUG before conducting field survey. AP and TL alignment passing through the forest have been identified by the IEE team by using GPS, Technical Survey Report, topographical sheets (maps) of 1: 25,000 and 1: 50,000 scale of Department of Survey. Field survey was organized simultaneously in all Ilaka Forest Offices within the District starting from 12 August to 31 November 2016.

Total enumeration in each angle tower (15mx15m) and under TL passing from the forest (30 m RoW) was done to assess the number and types of plants likely to be affected by the project. This has been done by the concerned District Forest Office (DFO) staff and community forest users group (CFUG) representative to involve them from the very beginning of the tree counting and cutting process. Field survey was done by forming a team at Ilaka Forest Office comprising of two forest guards (FG), one CFUG representative headed by Assistant Forest Officer (AFO). In addition, the proposed alignment and substation were visited by the Environmental and Forestry Specialist and ESSD team to collect baseline information and for impact prediction.

Forest survey was conducted in each AP and TL alignment to count each tree, pole and regeneration, measure height and diameter at breast height (dbh) for tree and pole and number each tree with enamel painting. Regenerations were counted below 5" dbh and number of each species was recorded. Aspect, slope, forest condition, canopy cover and forest type and name of the forest were also recorded. Non timber forest products (NTFPs) and medicinal plants were also counted and recorded.

According to Forest Rules, 1995, trees having more than 11" diameter at breast height (dbh) are referred as tree and species having girth below 11" and above 5" are referred as pole and below 5" are regeneration which were not measured but counted. Trees are also classified in three classes based on their quality. Class 1 trees are green, dead or dying, standing or fallen with solid stem and without scar or disease, class 2 trees are green, dead or dying, standing or fallen with partly decayed from inside having 6' long two logs or one 10' long log and class 3 trees are those which don't fall in class 1 or 2.

3.2.2.3 Interaction with Community Forest User Group

During tree counting, representative from concerned CFUG has been involved and a letter of consent for the implementation of the proposed project through community forest has been obtained as given in **Appendix-G**. Similarly, meetings, interviews and discussions were held with the members of CFUG and local peoples to collect information on the availability of flora and fauna, dependency of local people on forest resources, availability of Non-Timber Forest Products etc.

3.2.2.4. Wildlife Survey

Primary data on the wildlife was collected by direct observation (sightseeing) and by interviewing local people and forest rangers. Data collected from field were compared with secondary sources and species list was tallied with the list of endangered and protected species of Nepal availed in CITES Appendices, and IUCN Red Data Book.

3.2.2.5. Bird survey

Primary data on birds around the project area was collected by direct observation (bird watching along the project alignment) and by interviewing local people. Data collected from field were

compared with secondary sources and species list was tallied with the list of endangered and protected species of Nepal availed in CITIES Appendices.

3.2.2.5 Data Analysis

Timber volume in cubic feet (cft) and fuel wood in chatta (20'x10'x5') was calculated using following formula according to Community Forestry Resource Inventory Guidelines:

Table 3.1: Calculation table for timber and fuelwood volume

Category	Timber (cft)	Fuel wood in chatta (20'x10'x5')
Class 1	$\frac{\pi d2x \text{ height x form factor x } 2}{4 \times 3 \times 144}$	$\frac{\pi d2x \text{ height x form factor x } 1}{4 \times 3 \times 144 \times 1000}$
Class 2	$\frac{\pi d2x \text{ height x form factor x } 1}{4 \times 2 \times 144}$	$\frac{\pi d2x \text{ height x form factor x } 1}{4 \times 2 \times 144 \times 1000}$
Class 3		$\frac{\pi d2x \text{ height x form factor}}{4 \times 144 \times 1000}$

Note: Form factor is taken as 0.5

Based on the final data and on its analysis the impacts, both positive and negative, were identified and their magnitude predicted as well as benefits augmentation and mitigation measures were recommended.

3.2.3 Socio-economic and Cultural Environment

3.2.3.1 Data Requirement and Collection Method

The following types of data are acquired for IEE study:

- Socio-economic survey of project affected households whose land and house will be permanently acquired. Information on livelihood and property has also conducted;
  Demographic characteristics: Population distribution, migration pattern, age group distribution etc.
- Ethnicity and religion;
- Education and skill level: literacy rates
- Health and sanitation: information on sub-health post/health post, hospitals, main disease, incidence of water born disease and infectious disease such as HIV/AIDS;
- Gender, children, the elderly, poor and ethnic minorities;
- Land holding size and ownership
- Community infrastructures and service: drinking water supply,
- Local institution and activities: government and non-government agencies, cooperatives, community based organizations;
- Other development activities;
- Cropping pattern, practices and production;
- Livestock raising;

- Estimation of loss of standing crops due to project construction, by crop type area and value.

The socio-economic and cultural environmental survey of the people residing in the project affected area as defined in this section was carried out by using the methodology described in the following chronological order. Secondary data published by District Development Committee of the concerned districts and Central Bureau of Statistics, Kathmandu was intensively used to draw the baseline information of moderate and low impact zones. However, the baseline information of high impact zone was collected from the field survey by using the appropriate techniques as mentioned in the subsequent sections.

3.2.3.2 Literature Review

Based on previous experiences and the review of relevant literature associated with IEE studies of various TL projects, demographic tables were developed. To fill these tables, a desk study was conducted in the office. All the relevant information associated with socio-economic and cultural environment was reviewed. On the basis of the reviewed information, data gaps were identified and the following techniques were used to generate the remaining data.

3.2.3.3 Identification of PAFs and SPAFs

The land owners of the Angle Towers/substation and the land owner's/structure owners of the high impact zone have been identified. These identified families were considered as Project Affected Families (PAFs). In addition, the families losing their residence irrespective of their land holding size and other off farm income and the families losing more than 50% of land were identified as Seriously Project Affected Families (SPAFs). The landowners (PAFs & and SPAFs) were identified through social survey.

3.2.3.4 Data Collection Tools

After identification of PAFs, their baseline information was collected by using the following techniques: census of affected households, Key Informant Interview, market survey for agricultural commodity and land price, informal meeting/discussion with district level government officials and local stakeholders and Photographs.

a. Households' Survey

Pre-tested questionnaires were designed and applied by a trained team of enumerators to solicit information from project affected families. Households' survey was conducted only for project affected families belonging to angle towers and structures falling in right of way. Altogether, 48 questionnaires were filled. The land owners belonging to tower points and substation area were identified through walkover survey and survey report and hence socio-economic status of them has been studied using questionnaires. Households' survey of landowners belonging to RoW was not conducted in this stage. It will be finalized during detail design and check survey of the TL route.



The questionnaire has been designed specially to cover the sectors like demographic characteristics, basic health conditions, income and expenditure, availability of infrastructure facilities, water and energy related issues, information about project, attitude towards resettlement and expectations from the project. The list of surveyed HHs is given in **Annex F**.

b. Key Information Interview

Key informant Interview was employed with social workers, businessmen, and teachers, representatives of political parties, former VDC Chairmen and intellectuals of the project area. The main objective of KIIs was to assess their views, concerns and expectation from the project and collect relevant information of the project area. The main objective of KIIs was to assess their views, concerns and expectation from the project and collect relevant information of the project area. Altogether 14 key informant interviews (KIIs) were conducted in project affected VDC/Municipality. The respondents of the KIIs were purposively selected for interviews. The KII was conducted using an in-depth interview guideline (**Appendix E-III**).

c. Market Survey

Market survey was conducted in the project VDCs to get the prevailing price of agricultural commodity, major construction materials, and wage rate. The market survey was conducted with the help of a checklist (Appendix E-III).

d. Meetings/ Consultations/ Public Participation

Informal meetings/consultations/public participations were conducted with relevant district level government officials at districts headquarters, and at local levels (VDC) with key stakeholders (VDC secretaries, teachers, representative of civil society organization, CFUGs and health workers. The purpose of the meeting/consultation was to inform them about the project, collect their concerns/expectations regarding the project such as project purpose, project type, impact area, likely impacts and potential opportunities due to project implementation and required information for the IEE.

The key issues and concerns raised by the local people are related to compensation, employment, implementation of mitigation and enhancement measures and community participation in the project activities. The key issues/concern raised by the local people during community consultations was summarized.

e. Field Observation

Observation of the project site was made to obtain information on different socio-economic and cultural activities of the impact area. Religious and archaeological sites of the impact area were identified to assess the impact on these sites within the high, moderate and low impact zones. At the end of each day notes were written about the observations and a field diary was maintained. Project photographs were also taken during field investigation.

3.2.3.5 Data Analysis

The field data from each project affected VDCs were compiled edited and analyzed in Kathmandu using windows software like WORD, EXCEL and SPSS. The analyzed data were then interpreted and discussed in appropriate sections of the IEE report.

3.3 Impact Identification, Evaluation and Predication

A logical, simple and systematic approach has been adopted for impact identification, evaluation and prediction. The impact has been identified for physical, biological, socio-economic, and cultural environment of the project area. The following tools have been used for impact identification:

- VDC Checklist, Key Informant Interview
- Households Questionnaire
- Table format for loss of land, crop production and property of the project affected families
- Expert's judgment

Topographic map of the route alignment has been used in predicting the impacts of the proposed T/L by analyzing the effect of project activities on the resources like existing infrastructures, rivers/rivulets, settlements, private land, forest, etc. present in the location. The expert's judgment using past experiences of similar type of projects have been used to predict impacts. Wherever possible, impact predictions have been done quantitatively.

Field inventories before project implementation provide the baseline condition of resources. The assessment of impacts is based on the baseline environmental conditions of the affected area with the project activities in relation to spatial and temporal aspects in terms of magnitude, extent and duration using various environmental prediction methods. The impact has been predicted over a specified period and within defined area. Consequences of environmental impacts were interpreted in terms of local, regional and national contexts. The significant positive and adverse environmental impacts associated with the project components have been identified considering the impact zone. The magnitude, extent and duration of the impacts which were categorized according to the National EIA Guidelines, 1993 are given below:

Magnitude of Impacts

- Low Impact (L): If the value of the resources could be used with no or minimum inconvenience to the public
- Medium/Moderate Impact (M): If the value of the resources could be used with inconvenience to the public
- High Impact(H): If the value of the resources reduced far below publicly acceptable level

Extent of Impacts

- Site Specific (S): The impact is limited within RoW then it is site specific one.

- Local (L): If the impact of the work extends to the adjoining wards and or within 100m up 300m from the TL or angle tower then it is termed as local.
- Regional (R): If the impact of the work extends to the entire district or further then it is termed regional

Duration of Impacts

- Short Term (ST): If the impacts last for 3 years after project initiation it is classified as short term. Construction phase impacts are mostly categorized under this category.
- Medium Term (MT): An impact that continues for more than 3 years but less than 20 years is considered as medium-term. The construction phase impacts which carry over for few years of operation falls under this category.
- Long Term (LT): An impact that lasts beyond 20 years is considered to be long term. The operation phase impacts are mostly categorized under this category.

3.4 Public Involvement

3.4.1 Public Consultation

Public consultation process was carried out by conducting group discussion, interaction meetings, and household survey among the local people/stakeholders, concerned VDCs and related officials/agenesis of the project areas.

3.4.2 Recommendation Letters

As per EPR 1997, a 15 days' public notice was published in **Arthik Abhiyan National Daily** on **20/01/2017** (**Annex B**). The notice included statement regarding brief project information and request to provide comments and suggestions within 15 days to the project office or concerned ministry.

A team was mobilized in the field with copy of public notice along with cover letters to the concerned VDCs/Municipalities, CFUGs, district level line agencies and other local stakeholders. Copy of the notice displayed in the project sites and proof of deed (*Muchulkas*) collected (**Annex C**). Similarly, recommendation letters was collected from the affected VDCs. In addition, consent letter was collected from the affected CFUGs. Summary of the draft IEE report distributed to the concerned VDCs and CFUGs and a copy of IEE report provided to DDCs and District Forest Offices.

3.5 The Study Team

The IEE study carried out with the involvement of the multidisciplinary team of environmental experts. Following experts were engaged for the Scoping exercise of proposed project.

Table 3.2: List of Study Team

Name	Position	Specialization
Niranjan Shrestha	IEE Team Leader/ Environmental Expert	M.Sc (Environmental Engineering)
Padam Bahadur Chand	Biologist	MSc (Forestry)
Geologist Team	Soil, Rock and Concrete Laboratory, NEA	
Ujjwal Tiwari	Environmentalist	M.Sc. Environmental Science
NEA Team	Technical support regarding the project	
Munesh Bhakta Upadhyaya	Socio-Economist	Masters in Sociology

CHAPTER FOUR: REVIEW OF POLICY AND LEGAL PROVISIONS

4.1 Introduction

Nepal integrated environment aspects in all its development activities and projects only from early 1980s. Environment conservation was included in the policies since the Fifth Plan (19751980). The second milestone was taken during the Sixth Plan. The Sixth Plan under the environment and land use policy emphasized the integration of environmental aspects into the construction of large-scale development projects. Then finally, in the Seventh Plan it was stated that developmental programs would be implemented only after an approved EIA/IEE report. The Eighth, Ninth and Tenth Five Year Plans have further emphasized the making of more effective EIA systems. The formulation of Sectoral Guidelines, promotion of participatory EIA/IEE system and inclusion of mitigation cost into the total project costs were some of the activities included in these three five year plans.

The prevailing Acts, Policies, Regulations and Guidelines, which are required for the construction and operation of TL projects in Nepal, have been reviewed as per the followings while preparing the present IEE report. The proponent will abide by any other laws besides those already mentioned in the documents that are attracted due to different activities that will be undertaken during project implementation.

4.2 The Constitution of Nepal

The Article 30 states about the Right regarding clean environment which includes three parts. According to this article part 1, each person shall have the right to live in a healthy and clean environment. According to this article part 2, the victim of environmental pollution and degradation shall have the right to be compensated by the pollutant as provided for by law. According to this article part 3, provided that this Article shall not be deemed to obstruct the making of required legal provisions to strike a balance between environment and development for the use of national development works. The proposed project is a component of hydropower development project and it attracts the provisions made in Constitution of Nepal. Hence, it is mandatory to follow the Constitution of Nepal, 2072 (2015) in regards with environment conservation while implementing the project.

The Article 51 states about policy regarding the conservation, management and use of natural resources as follows:

- The State shall pursue a policy of making a sustainable use of biodiversity through the conservation and management of forests, fauna and flora, and by minimizing the negative impacts of industrialization and physical development by promoting public awareness on environmental cleanliness and protection.
- The State shall pursue a policy of keeping an environmental balance.

- The State shall pursue a policy of adopting appropriate ways of minimizing or stopping negative impacts on environment if it is there, or if there is a possibility of such an impact nature, environment, or biodiversity.
- The State shall formulate policies and enact laws on the basis of the principle of sustainable environment development based on pre-warning and pre-informed agreements regarding environmental protection. Those people who pollute the environment shall have to be responsible for their action.

4.3 Plan and Policy

4.3.1 Nepal Environmental Policy and Action Plan, 2050 (1993) and 2055 (1998)

Nepal Environmental Policy and Action Plan (NEPAP) were endorsed to further institutionalize environmental protection in the development processes. The NEPAP recognize that a growing number of people are exposed to pollute from industrial enterprises. The NEPAP identifies the following factors as contributing to this process:

- Industrial plan inappropriately cited close to population centers
- Insufficient emphasis on fuel efficiency.
- Little, if any pollution abatement equipment used for reducing emission, and
- A total lack of industry pollution standards.

Hence, the NEPAP emphasizes the need for mitigating adverse environmental impacts to address urban and industrial development, air and water pollution and infrastructures development.

4.3.2 Forestry Sector Policy, 2071(2014)

The Forest Sector Policy of Nepal such as the National Forestry Plan, 1976, Master Plan for the Forestry Sector, 1988, Periodic Five Year Plan and Forestry Sector Policy, 2071 (2014) have emphasized people's participation in the forestry management. Nepal's main forest management is based on people's participation and various management models are underway. Similarly, Forestry Sector Policy, 2071 (2014) stresses on conservation of biodiversity, maintain environmental balance through forest, wildlife, conservation areas and watershed proper management and protection. Similarly, promotion and development community forest and community based forest management and involvement of private sector for the management and conservation of forest resources are other main goal of Forest Sector Policy, 2071. The Public participation in forest management is sought through community forestry, collaborative forest management, leasehold forestry etc. The mitigation measures such as plantation, NTFP program and other social and community support program proposed by the project will be implemented by mobilizing the local people which is in line with the Forest Sector Policy.

The procedural guidelines for the use of forest land for other purpose stated that feasibility study will be carried out with no use of forest land to the extent possible. If it is not possible, the alternate will be considered with minimum use of forest land. This guideline also stated that the

project proponent will be responsible for the plantation of 2 tree species for the loss of one tree and their management for 5 years and handing over to the concerned forest office of the district.

4.3.3 Hydropower Development Policy, 2058 (2001)

The Hydropower Development Policy was promulgated in 2001. The main objectives of the policy include producing clean energy through the development of hydroelectric projects and to help conserve the environment. It is stipulated that one of the policies is to extend the use of electricity for achieving a reduction in the utilization of fuel wood and to render necessary assistance in the conservation of forest and environment.

4.4 Acts

4.4.1 Aquatic Animals Protection Acts, 2017 (1961)

This Act provided legislative protection of the habitats of aquatic species. Under this Act, it is offence to introduce poisonous, noxious or explosive material in to a water source or destroy any dam, bridge, fish ladder or water system the intent of catching or killing aquatic life. The Act was amended in 1988 to prohibit the use of unsafe pesticides.

4.4.2 Land Acquisition Act, 2034 (1977)

One of the important acts that have a bearing on the implementation mechanisms and mitigation adverse impacts of power projects is the Land Acquisition Act, 2034. This Act covers all aspects of land acquisition and compensation of land and other assets. It authorizes the government to acquire land for public purposes by providing compensation to the private landowners.

Land acquisition and compensation has not been a major issue in the rural electrification in the past because the area required for erection of a pole is so small that it has not been an issue. However, this study recommends providing appropriate cash compensation for the land acquired by the erection of the towers. The compensation paid under this Act will be given in cash. To decide the amount of the compensation, the Land Acquisition Act (1977) has made provisions for the constitution of a Compensation Fixation Committee (CFC). That committee consists of the CDO, Chief District Land Administration and Revenue Office, Project Chief or an officer designated by the CDO and the Representative of the DDC.

As per the land Acquisition Act, 2034 (1977), it is mandatory to acquire the land prior to the implementation of the project. The provisions made here will be applied while acquisition of land. Cultivated land requires for the project will be acquired by direct negotiation with the land owners while the forest land will be acquired by taking approval from the government.

4.4.3 Soil and Watershed Conservation Act, 2039 (1982)

In order to manage watersheds of Nepal, the Soil and Watershed Conservation Act (SWCA), 1982 was enacted. The act is devoted to the protection of watersheds. Under Section 10 of SWCA, power is extended to the Watershed Conservation Officer to grant permission to

construct dams, drainage ditches and canals, cut privately owned trees, excavate sand, boulders and soil, discharge solid waste and establish industry or residential areas within any protected watersheds. The Act outlines the essential parameters necessary for proper watershed management.

The Act is relevant to the proposed project as the project will utilize the soil for tower foundation in different location. There is likely to impact on soil and watershed condition of the project area. Hence, the project is obliged to follow the Soil and Watershed Conservation Act, 2039 (1982) during project implementation.

4.4.4 Water Resources Act, 2049 (1992)

The objectives of the Water Resources Act, 2049 is to make legal arrangements for determining beneficial uses of water resources, preventing environmental and other hazardous effects thereof and also for keeping water resources free from pollution. The Act strives to minimize environmental damage to water bodies, especially lakes and rivers through environmental impact assessment studies and the proponents who wish to use water resources for various purposes should prepare IEE report before a license can be granted. The Act stipulates that soil erosion, flooding, landslides or any significant impact on the environment should be avoided in all uses of a water resource. The provisions made in Water Resources Act, 2049 (1992) is mandatory in case of the implementation of the proposed project. As per the provision, the environmental impact mitigation and enhancement measures have been proposed in view of environment conservation.

4.4.5 Electricity Act, 2049 (1992)

Electricity Act, 2049 is related to survey, generation, transmission and distribution of electricity. Electricity includes electric power generated from water, mineral oil, coal, gas, solar energy, wind energy etc. Under Section 3 of the Act it is stated that survey, generation, transmission or distribution of electricity without obtaining a license is prohibited. The Electricity Act, 2049 also contain provisions to minimize soil erosion, flood, air pollution and damage on environment while producing electricity and transmission of the power (Article 24). This Act is not relevant in case of transmission and distribution of generated electricity. The present study is only for hydropower generation excluding transmission component. NEA is responsible for electricity transmission and distribution.

4.4.6 Forest Act, 2049 (1993) with amendment in 2073

The Forest Act, 1993 (amendment 2073) recognizes the importance of forests in maintaining a healthy environment. As mentioned in the preamble, one of the major objectives of the enactment and enforcement of the Act is to promote the healthy environment. Decision - makers should take into account of all forest values, including environmental services and bio-diversity. The basis of the Act is to consider forest and forest products as "resource oriented" rather than "use oriented".

Section 49 prohibits reclaiming lands, setting fires, grazing, removing or damaging forest products, felling trees or plants, wildlife hunting and extracting boulders, sand and soil from National forests without prior approval.

Section 68 empowers the government to permit use of any part of government-managed forest, leasehold forest or community forest, if there is no alternative for the implementation of a plan or project of national priority without significantly affecting the environment.

4.4.7 Labor Act, 2049 (1993)

This act is enforced by GoN in 2049/2/2. This Act classified below 15 years as child and 'nabalik' for the age group of above 14 years and below 18 years. The Act has also made provision of labor court and department of labor. The Act clearly mentions that the appointment letter should be issued for all the employees which include their working hours, working time, wages and other benefits. The Act allows for the time bond contract for the manpower required for development work. The Act specifies that working hours for the Anabolic and women must be within 6 AM to 6 PM which clearly restrict to deploy women in night works. The Act also state that equal opportunity shall be given to women as men. Similarly working period for the other employees must not exceed 8 hours a day and 48 hours in a week. If some people work beyond that period, over-time allowances must be paid which is 150% of the normal per hour wages and such over-time must not exceed 4 hours in a day. According to this act the wage rate of the employees shall not be less than the rate fixed by the concerned offices of GoN.

4.4.8 Environment Protection Act, 2053 (1997)

Nepal has enacted a comprehensive and umbrella type Act, the Environment Protection Act, 1997 (EPA, 97) which is now enforced through appropriate regulatory measures. The EPA provides a legal basis for the concerned authorities for regulation an initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA). Section 3 of the Act requires the proponent to conduct an IEE or EIA in relation to the prescribed proposals. The Act uses the word proposal instead of Projects which makes the scope of the Act much broader in relation to environmental studies. Proponent includes any government, semi government or nongovernment agency or organization submitting an application for the approval of a proposal and possessing the responsibility to work according to such a proposal or implementing the proposal.

According to the provision in Section 6 (1) of the Act, the relevant agency is empowered to grant approval for the IEE and EIA report, only if it finds that no significant adverse effects will be caused to the environment by the implementation of the proposal. Implementation of any proposal without the approval of the relevant agency is prohibited by the Act. As per EPA, 1997, the proposed project has obligation to carry out IEE study prior its implementation.

4.4.9 Local Self-Governance Act, 2055 (1998)

The Local Self-Governance Act, 2055 contains several provisions for the conservation of soil, forest and other natural resources and implementation of environmental conservation activities.



Section 28 and 19 of the Act provide that the Village and the District Development Committees are responsible for the formulation and implementation of the programs related to the protection of the environmental bio-diversity. Section 96 stipulates that it is the duty of the municipality to protect the environment through the control of air, water and sound pollution. It also obligates the Municipality to maintain environmental cleanliness through the implementation of solid waste management, flood and landslide control programs.

This Act is relevant as the proposed project will utilize natural resources and carry out development activities in the project affected VDCs. Hence, it is mandatory to the project for proposing mitigation measures.

4.4.10 Child Labor (Prohibition and Regulation) Act, 2056 (2000)

The Child Labor (Prohibition and Regulation) Act, 2056 is enacted and enforced adopting ILO Convention concerning Elimination of Worst Forms of Child Labor and Minimum Age Convention. This Act has defined the 'Child' as a person who has not achieved the age of 16 years. Article 3 bans the employing a child below the age of 14 to work as a laborer and engaging a child in the hazardous and risky works listed in the Schedule of the Act. The proponent is mandatory to follow the Child Labor (Prohibition and Regulation) Act, 2056 (2000) during the project implementation phase. The contractor may use child labor during construction period. Hence, the contractor will be instructed to follow the Child Labor (Prohibition and Regulation) Act, 2056 (2000).

4.5 Rules and Regulations

4.5.1 Electricity Rules, 2050 (1993)

Regulations on electricity sectors have been formulated for the implementation of the provisions made in the Electricity Act, 2049. The Electricity Rules, 2050 emphasize environmental analysis, which should include environmental mitigation measures to minimize adverse impacts likely to occur while developing hydro-electricity (Rule 12 and 13).

Rule 12 (f) and Rule (g) are related to the EIA/ IEE process which emphasize that the IEE report should include measures to be taken to minimize the adverse effects of the project on social, biological and physical environments and should also elaborate utilization of local labor, source of materials, benefits to the local people after the completion of the project, training to local people in relation to construction, maintenance and operation, facilities required for construction site and safety arrangements.

4.5.2 Water Resources Rules, 2050 (1993)

The Environment Protection Rules (EPR) was endorsed in June 1997 and was made under the provisions of the Environment Protection Act. The EPR has been amended several times and the recent was done in 2010/01/27. The recent amendment states that TL projects of capacity above 132 kV voltage level requires only IEE unless it traverses through protected area, buffer zone or

national parks. The EPR adopts the environmental assessment criteria mentioned in the EIA guidelines. However, the EPR establishes the administrative framework for assessing, exhibition and determination of the EIA/IEE, in terms of issues needing to be addressed and the format/layout of the EIA/IEE document.

Under section (18) of EPA, any person who contravenes any of the provisions of the Act, or the Regulations or the guidelines issued under the Act, shall be punishable with a fine up to NRs 50,000. If a proposal is implemented without the approval of the Ministry of Environment (in case of IEE, Ministry of Energy) or relevant government agency, or the person implementing the proposal is not complying with the conditions of the approval or license, the authorized official is empowered to close down that activity and may impose fine of up to NRs. 100,000 on such person or organization. This Act is relevant to the proposed project.

Under this Rules, the IEE study of the proposed project has to be carried out by the proponent and get approval from the Ministry of Energy prior to the project implementation.

4.5.4 Local Self-Governance Rules, 2056 (1999)

Local Self Governance Rules, 2056 empower the local bodies to coordinate and implement development program and for rationale utilization of local natural resources. Article -7 (69) empowers the VDCs for monitoring and supervision of development work implemented in the VDC. The Article - 4 of DDC has provision of 3 members (Agriculture, Forest and Environment) committee to look after the concerned issues. Article-6 (206) specifies that the need of social, economic, environmental and public facilities should be consider while planning the project. Article-7 (210) focuses on environmental studies and stresses due consideration while implementing the project like sand quarry, stone quarry, coal mines and others.

4.6 Guidelines and Conventions

4.6.1 Convention on Biological Diversity (CBD), 1992

The convention contains a series of far reaching obligations related to the conservation of biological diversity and sustainable uses of its components. One of these obligations is the requirement for environmental study. The purpose of an environmental study in relation to biodiversity conservation is to identify in advance:

- The aspects of the project which is likely to have significant adverse effects on biological diversity at genetic, species and ecosystem level, and
- The steps to be taken to avoid or minimize significant adverse effects to ensure that the proposed project comply with existing environmental legislation.
- The GoN has included 17 species of plants and 39 species of wild animals in the protection list.

If the project area is in the core habitat of these species and project activity will likely to affect them, mitigation measures shall be proposed and be implemented to avoid and/ or mitigate the

adverse impacts. Nepal is a party to the convention of Biological diversity and in accordance to the article 14, adequate attention should be given to minimize and or avoid the impacts.

4.6.2 National Environmental Impact Assessment Guidelines, 1993

The National EIA Guidelines, 1993 developed by the National Planning Commission in conjunction with IUCN, set out the process for the environmental review and management of infrastructure projects in all sectors and the respective roles of certain GoN agencies and project proponents. The guideline was part of a comprehensive program to develop the national and sectorial guidelines for establishing a national system for Environmental Impact Assessment which was part of GoN's National Conservation Strategy. The EIA Guideline was endorsed by GoN on 27 September 1992 and gazette on 19 July 1993. The schedules attached to the Guidelines include:

Schedule 1	:	Project requiring and IEE Report
Schedule 2	:	Project requiring and EIA
Schedule 3	:	EIA based on project sites
Schedule 4	:	Projects requiring and IEE Report
Schedule 5	:	Format for Terms of Reference
Schedule 6	:	Environmental Impact Report Format

It is mandatory to follow the National Environmental Impact Assessment Guidelines, 2050 (1993) during the IEE study. Following the guidelines, the environmental impact prediction and evaluation of the proposed project has been done on physical, biological and socio-economic and cultural environment of the project area. The guideline is used for analysis of significant issues.

4.6.3 EIA Guidelines for Forestry Sector, 1995

The GoN in keeping with the spirit of the National Environmental Impact Assessment Guidelines, 1993 framed EIA guidelines for the forestry sector in 1995. The Guideline aim to facilitate the sustainable use of forest resources for socio-economic development and meeting basic need to the community regarding the forest products, to make proposals socio culturally acceptable, economically feasible, and environmental friendly to conserve genetic resources and biodiversity and minimize environmental damage in forest areas and facilitate in identification of positive and negative impacts of programs to be implemented by other agencies in forest areas. The guideline emphasized the need of carrying out an EIA/IEE study of development projects and programs proposed for implementation in forest areas.

4.6.4 Forest Production, Collection and Sales Distribution Guidelines, 2057 (1998)

The Clauses 3 to 10 of the Guidelines have specified various procedure and formats for getting approval for vegetation clearance, delineation of lands for vegetation clearance, evaluation of wood volume etc. and government offices and officials responsible for the approval, delineation and evaluation. These provisions have a direct relevance to the development of the project and need compliance to these provisions. These provisions have a direct relevance to the development of the project and need compliance to these provisions. It is obligation to the

project for getting approval in view of vegetation clearance and evaluation of wood volume from district forest office prior to the construction phase.

4.6.5 Community Forest Guidelines, 2058 (2001)

This guideline has been prepared by including amendments of acts, rules by officials of GoN and related experts. Through these guidelines persons involved in the development and management of community forest like facilitators, User Groups, forester and managers etc. will get help to understand about the process and stages of development of community forest. Forest Users Group, forest officials, NGOs and INGOs are getting benefit by this guideline. Till date, more than 15000 Community Forests have been handed over to the Community Forest Users Groups.

4.6.6 Community Forest Inventory Guideline, 2005

The guideline for inventory of community forests advice to classify the forest into timber trees, pole size trees and regeneration on the basis of diameter. It has recommended using 20m x 20m size of quadrant for timber trees, 10m x10m for shrub and 5m x 5m for regeneration plots in the community forest. Plants having DBH (Diameter at breast height, i.e. 1.3m above ground) greater than 30 cm are considered as trees. Trees having DBH between 10 to 30 cm are categorized as pole and plants having less than 10 cm DBH belong to regeneration species.

4.6.7 शासकीय तथा आर्थिक सुधारको तत्कालीन कार्ययोजना, २०६९

This working plan was devised to speed up the hydropower development process. So, the plan states that until the installed capacity of the country reaches 5,000 MW, instead of doing compensatory plantation at the ratio of 1:25, it is said to do such plantation at the ratio of 1:2.

4.6.8. वन क्षेत्रको जग्गा अन्य प्रयोजनको लागि उपलब्ध गराउने कार्यविधि, २०७४

The guideline addresses conditions required to make forest lands available to development projects and required compensatory measures for the loss of forest land use and forest products. Guideline for the use of the forest area for development projects reiterates the use of the forest area only if other options are not available. The projects requiring the forest land area have to make alternative studies to minimise the forest land use areas. Development projects of national priority will be allocated with such lands on the decision of the Ministry of Forest. To compensate the forest area and resource lost the project proponent has to comply with the following provisions:

- The proponent has to afforest the area equal to the forest area lost at the minimum, if the forest area occupied by the project is a barren land. The land area for afforestation will have to be decided based on the discussion with the district forest office. Or the proponent could deposit the required amount as per the forest norms to the district forest office.
- The proponent should plant 25 trees for every lost tree in areas designated by the district forest office and look after the plantation for 5 years to ensure their protection and growth

of every planted tree. Or the proponent should deposit the required amount for plantation and protection for five years to the district forest office.

- The proponent will have to compensate the lost forest land for 30 years. The compensation amount for the forest land per ha will be as per the provisions of leasehold forest.

4.6.9. राष्ट्रिय ऊर्जा सङ्कट निवारण तथा विध्दुयत् विकास दशक सम्बन्धी अवधारणा पत्र एवम् कार्य योजना, २०७२

National Energy Crises Policy, 2073 or राष्ट्रिय ऊर्जा सङ्कट निवारण तथा विदयुत विकास दशक सम्बन्धी अवधारणा पत्र एवम् कार्य योजना, २०७२ indorsed provisions to minimize current electricity crisis situation. The policy has outlined the generation of 1450 MW of electricity in coming three year. The policy has emphasized on connection of solar of 25 MW to national grid with urgency. The policy encourage power generation through solar and wind energy through various concession and facilities. Likewise, policy has forwarded the plan of connecting excess electricity generated by sugar industries to national grid. Similarly, plan has emphasized on use of bio-fuel in electricity generation.

The construction of transmission line like Marsyandi Marsyangdi Corridor (Udipur-New Bharatpur) 220 kV will be given priority with target of project completion as soon as possible. The policy has forwarded the plan to control on leakage in distribution within a year.

4.6.10 Convention on International Trade in Endangered Species of Wild Flora and Fauna, 1975

Nepal became a contracting party to the convention on June 18, 1975.That aims to control the trade of certain wildlife species to prevent further endangered of their survival. CITES classified species according to the following criteria:

- Species threatened with extinction
- Species which could become endangered.
- Species that are protected.

As Nepal is party to the convention related to species conservation, attention should be given to evaluate the impacts of the project activities on meeting their obligation. It is relevant to IEE study that species protection list could also be used to evaluate the significant of the identified and predicted impacts. Plant and wild animal species under legal protection provides a basis to purpose EMPs for their conservation and for least damaging them during project implementation.

Nepal is signatory to this agreement, which classified species according to criteria where access or control is important (eg. I-species threatened with extinction; II-species which could become endangered; III-species that are protected).

4.6.11 International Labor Organization (ILO) Convention of Indigenous and Tribal People (No. 169)

Nepal ratified ILO Convention No. 169 on September 14, 2007. In 2007 the UN Declaration on the Rights of Indigenous Peoples was adopted by the General Assembly. The declaration reaffirms the importance of the principle and approaches provided for under Convention No. 169 and its adoption therefore provide a fresh impetus for promoting the ratification and implementation of 169. ILO Convention No. 169 highlights the need to recognize indigenous and tribal people's specific knowledge, skills and technologies as the basis for their traditional economies and self-determined development process. Article-1 of the convention provides definition of the tribal indigenous people. Article-6 deals the consultation of the people concerned through appropriate procedure in particular through their representative institutions. Whenever, consideration is being given to legislative or administrative measures which may affect them directly.

In Article 15, the rights of the people concerned to the natural resources pertaining to their lands shall be covers the total environments of the areas which the peoples concerned occupy or other use. The peoples concerned shall wherever possible participate in the benefit of such activities and shall receive fair compensation for any damage which they may sustain as a result of such activities. Article 16 (2) clearly mention that where the relocation of these peoples is considered necessary as an exceptional measure such as relocation shall take place only with their free and inform consent.

Where their consent cannot have obtained, such relocation shall take place only following appropriate procedures established by national laws and regulations, including public inquiries where appropriate, which provide the opportunity for effective representation of the peoples concerned. Article 16 (3) mention that whenever possible these peoples shall have the right to return their traditional land as soon as the grounds for relocation cease to exist. Article 16 (5) elaborated the persons thus relocated shall be fully compensated for any resulting loss or injury.
The ILO Convention on Indigenous and Tribal Peoples, 1989 (No.169) is relevant for the proposed project as there are indigenous and tribal families in the project affected area. The project will acquire and utilize most of the natural resources belonging to those families. Hence, the project has obligation to have consultation and taking consensus from them before the implementation of the project.

Article-15 states that the rights of the people concerned to the natural resources pertaining to their lands shall be specifically safeguarded. Provision includes the people to participate in the use, management and conservation of these resources. This provision creates some confusion and ultimately brings conflict between the project proponent and resources owners. Project share distribution and employment priority to these people will somehow reduce the possible conflict. The provision made in the ILO Convention on Indigenous and Tribal Peoples, 1989 (No.169) is

not line fully with the prevailing acts and rules regarding environmental study of the proposed project.

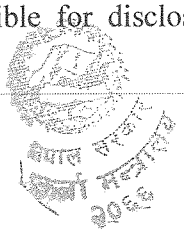
4.6.12. ADB Safeguards Policy Statement, 2009

Under the ADB Safeguard Policy Statement 2009, the proposed Project has been assigned environment Category B. The project is classified as resettlement category B, since some land acquisition and resettlement may be required for the project; and is classified as indigenous peoples category C. This environmental assessment has been also carried out in accordance with the ADB Safeguard Policy Statement 2009. According to the ADB Safeguard Policy Statement (2009), Appendix 1, paragraph 27, "the project mitigation measures should be designed to achieve at least no net loss of biodiversity," which could be achieved by post-project restoration of habitats or "through the creation or effective conservation of ecologically comparable areas," i.e. an ecological "offset." The ADB Safeguard Policy Statement (2009), Appendix 1, paragraph 12, notes that "The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the project's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties", the polluter pays principle, the precautionary approach, and adaptive management."

4.6.13. EIB Environmental and Social Standards

EIB promotes the application of strategic environmental assessment as a tool for identifying and evaluating potential impacts of plans and programmes. The assessment of environmental and social impacts and risk, including their significance and materiality, as well as the development of adequate management plans and programmes are key tools for achieving sound environmental and social performance. In this respect, all EIB-financed operations shall comply with national legislation and international conventions and agreements ratified by the host Country. In addition, operations outside the EU, candidate and potential Candidate countries must meet best international practice with regards to the assessment and management of environmental and social impacts and risks promote good environmental and social governance and align with relevant EU principles and standards. The overall objective of this Standard is to outline the promoter's responsibilities in the process of assessing, managing and monitoring environmental and social impacts and risks associated with the operations, specifically: policy commitment, assessment, management, monitoring and evaluation as well as stakeholder engagement. This Standard applies to all operations likely to have significant and material environmental and social impacts and risks. These impacts and risks need be taken into account at the earliest possible stage in all the technical planning and decision-making processes.

The promoter is responsible for achieving compliance with relevant legal standards and policies and managing the environmental and social impacts and risks associated with its project to this end. The promoter is responsible for providing the information required by the EIB to carry out its due diligence and for structuring the project to meet the EIB's environmental and social (E&S) standards and requirements. The promoter is also responsible for disclosing project-



related environmental and social information, as well as carrying out any stakeholder engagement and consultation required, and/or verifying that any project-related stakeholder engagement and consultation activities carried out by third parties (e.g. host government agencies) meet the standards expected by the EIB.



CHAPTER FIVE: EXISTING ENVIRONMENTAL CONDITION

5.1 Physical Environment

5.1.1 Physiography and Topography

The overall alignment of transmission line passes through three physiographic regions, i.e. Terai, Siwalik and Mahabharat region. The lowest elevation at the Aaptari substation is 225 m above mean sea level (amsl), while the highest elevation is 1450 m amsl at Chhimkeshwori hill. The overall alignment of the transmission line passes varying kind of topography ranging from flat land in the terai region to steep slopes of Mahabharat hills, river valleys to ridges of hills. Figure 5.1 shows the elevation profile along the alignment of the proposed transmission line.

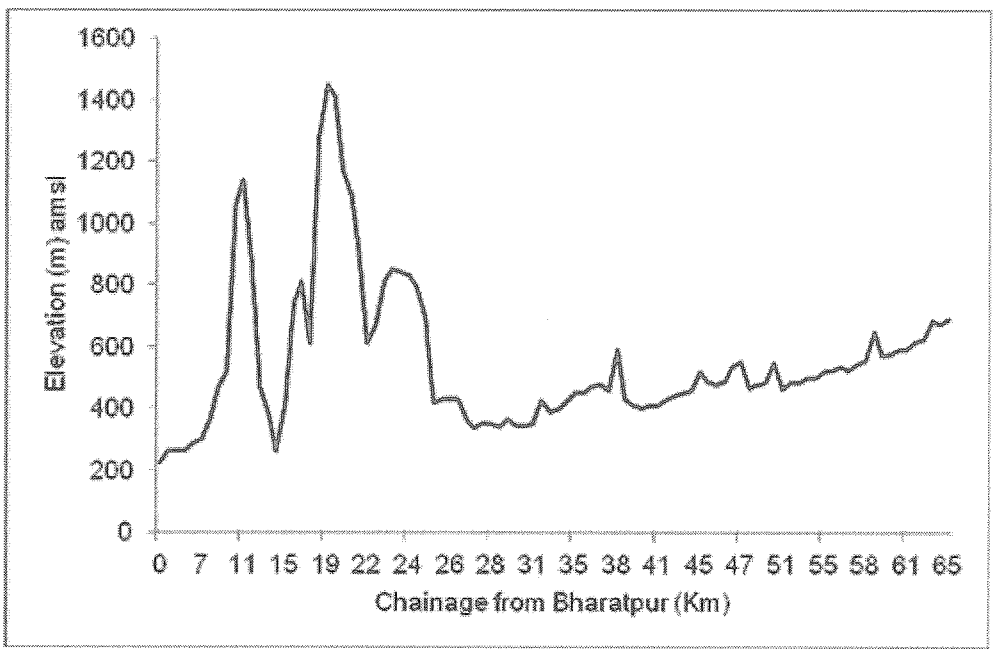


Figure 5.1: Elevation profile of the proposed transmission line alignment

The overall alignment of the proposed project has been divided into two sections as discussed below:

a. Udipur-Markichowk Section

The total length of the TL alignment within this section is 36.46 Km, large part of which runs along the left bank of Marsyangdi River. From the physiographic point of view, the alignment passes along the foot of Mahabharat Hills, parallel to Marsyangdi River Valley. The proposed substation (around AP-27) at Udipur lies within the Middle Marsyandi Hydropower Project's Land. From the substation, the alignment passes from right bank and cultivated land avoiding settlements near Bhoteodar. Due to narrow topography near Middle Marsyandi Powerhouse, route passes from opposite (left bank) to the powerhouse crossing 132 kV transmission line and

again alignment from AP-36, runs through right bank along the Marsyandi. Area from AP-0 to AP-50 lies in Lamjung district. Chepe Khola is the boundary of Lamjung and Gorkha district. From AP-51, Gorkha district starts and alignment runs through cultivated land passing Palungtar and Gaikhur VDC of Gorkha district. Opposite to Chepetar Khola, there is a Tanahaun district. The stretches between AP-51 and AP-60 run through cultivated land of Palungtar and Gaikhur VDC. From alignment turns east and follows settlement avoiding houses, by passing mainly through cultivated land. From AP-73, an alignment passes along Marsyandi up to proposed Markichowk substation.

Details of this section are presented in table 5-1.

Table 5-1: Detail of Udipur-Markichowk Section

APs	Easting	Northing	RL	Span	Chainage	VDCs/Places
AP-27	541947.00	3118344.00	674.00	824.80	16182.76	Udipur/L
AP-28	542644.00	3117903.00	683.00	829.57	17007.56	Udipur/L
AP-29	543331.00	3117438.00	622.00	505.37	17837.13	Chiti/L
AP-30	543417.00	3116940.00	616.00	708.07	18342.50	Chiti/L
AP-31	543875.00	3116400.00	585.00	259.62	19050.57	Chiti/Shivaratri
AP-32	543805.00	3116150.00	565.00	427.75	19310.19	Udipur/Balithumbesi
AP-33	543759.47	3115724.68	530.00	439.23	19737.94	Udipur/Balithumbesi
AP-33A	543808.31	3115288.17	580.00	394.90	20177.17	Udipur/Balithumbesi
AP-33B	543968.00	3114927.00	638.00	278.49	20572.07	Archalbot/Sakhar
AP-33C	543913.00	3114654.00	636.00	237.26	20850.56	Archalbot/Sakhar
AP-33D	543736.00	3114496.00	574.00	243.46	21087.82	Archalbot/Belghari
AP-33E	543721.00	3114253.00	553.00	39.82	21331.28	Bhoteodar
AP-33F	543696.00	3114222.00	524.00	687.24	21371.11	Bhoteodar
AP-34	543678.00	3113535.00	570.00	926.22	22058.34	Bharte/L
AP-35	543459.00	3112635.04	650.00	528.19	22833.37	Tarkughat/L
AP-36	542988.00	3112396.00	557.00	956.53	23361.56	Bhoteodar/L
AP-37	542895.00	3111444.00	542.00	788.75	24318.09	Sundarbazar/L
AP-38	542614.00	3110707.00	522.00	553.18	25106.84	Sundarbazar/L
AP-39	542962.00	3110277.00	535.00	464.81	25660.02	Tarkughat/L
AP-40	543238.00	3109903.00	521.00	331.89	26124.83	Tarkughat/L
AP-41	543520.00	3109728.00	519.00	696.46	26456.72	Tarkughat/L
AP-42	543973.00	3109199.00	498.00	301.50	27153.18	Tarkughat/L
AP-43	544195.00	3108995.00	497.00	959.64	27454.67	Tarkughat/L
AP-44	544812.00	3108260.00	482.00	885.84	28414.32	Dhamiikuwa/L
AP-45	545416.00	3107612.00	484.00	484.15	29300.16	Dhamiikuwa/L
AP-46	545662.00	3107195.00	463.00	677.71	29784.31	Dhamiikuwa/L

APs	Easting	Northing	RL	Span	Chainage	VDCs/Places
AP-47	546180.00	3106758.00	546.00	776.38	30462.03	Dhamiikuwa/L
AP-48	546522.00	3106061.00	484.00	1190.74	31238.41	Dhamiikuwa/L
AP-49	547128.00	3105036.00	480.00	330.29	32429.15	Dhamiikuwa/L
AP-50	547059.00	3104713.00	465.00	862.67	32759.44	Dhamiikuwa/L
AP-51	547330.00	3103894.00	550.00	978.50	33622.11	Palunghat-9/G
AP-52	546919.00	3103006.00	534.00	567.81	34600.61	Palunghat-9/G
AP-53	546518.00	3102604.00	488.00	538.21	35168.42	Palunghat-9/G
AP-54	546291.00	3102116.00	480.00	351.25	35706.63	Palunghat-9/G
AP-55	546362.00	3101772.00	487.00	420.08	36057.88	Palunghat-9/G
AP-56	546444.00	3101360.00	517.00	695.43	36477.96	Palunghat-9/G
AP-57	546564.00	3100675.00	460.00	1073.46	37173.39	Gaekhur/G
AP-58	546068.00	3099723.00	449.00	559.66	38246.86	Gaekhur/G
AP-59	545907.00	3099187.00	443.00	627.34	38806.51	Gaekhur/G
AP-60	545487.00	3098721.00	429.00	267.20	39433.85	Gaekhur/G
AP-61	545253.00	3098592.00	408.00	835.11	39701.06	Gaekhur/G
AP-62	544629.00	3098037.00	408.00	561.74	40536.16	Bhanu-1/T
AP-63	544245.00	3097627.00	402.00	547.46	41097.90	Bhanu-1/T
AP-64	543812.00	3097292.00	410.00	905.46	41645.37	Bhanu-1/T
AP-65	543428.00	3096472.00	431.00	387.42	42550.83	Changling/G
AP-66	543410.00	3096085.00	590.00	734.76	42938.24	Changling/G
AP-67	543657.00	3095393.00	460.00	635.58	43673.00	Changling/G
AP-68	544146.00	3094987.00	477.00	492.54	44308.58	Changling/G
AP-69	544252.00	3094506.00	469.00	506.61	44801.12	Changling/G
AP-70	544655.00	3094199.00	450.00	429.13	45307.74	Changling/G
AP-71	544788.00	3093791.00	451.00	1049.21	45736.87	Changling/G
AP-72	545414.00	3092949.00	423.00	1064.62	46786.08	Changling/G
AP-73	546217.00	3092250.00	397.00	432.09	47850.69	Dhuwakot/G
AP-74	546344.00	3091837.00	390.00	978.02	48282.78	Dhuwakot/G
AP-75	546926.00	3091051.00	424.00	686.57	49260.80	Dhuwakot/G
AP-76	547164.00	3090407.00	349.00	627.01	49947.37	Abukhaireni/T
AP-77	547780.00	3090290.00	346.00	196.33	50574.38	Deurali/G
AP-78	547869.00	3090115.00	346.00	879.20	50770.71	Deurali/G
AP-79	548732.00	3089947.00	365.00	384.30	51649.91	Deurali/G
AP-80	549114.00	3089989.00	340.00	712.83	52034.21	Deurali-3/G
AP-81	549641.00	3089509.00	353.00		52747.05	Abukhaireni(Markhichok)./T

Source: Marsyandi Corridor 220 kV T/L (Khudi-Markichok) Field Survey Report, 2015

b. Markichowk-Bharatpur Section

The project starts from Markichowk of Tanahaun District and ends at Aptari of Chitwan District. The tower route alignment mainly passes through the top part of the hills of Mahabharat Range of Tanahaun and Siwalik Hills of Chitwan District. The total line length of the project is 27.99 Km.

Mostly the alignment passes through the terrain of hill-slope covering cultivated and forest land. It crosses mainly Marsyangdi and Trishuli Rivers. The alignment passes through Tanahaun and Chitwan Districts. The alignment varies the elevation ranges from 1450 m (AP-16) to 22 m (AP-35) amsl.

The project starts from Markichowk of Tanahaun District where substation is under construction by Nepal Electricity Authority and the alignment runs south-east direction through hilly terrain as well as Terai. AP-0 is located inside the substation at the right bank of the Marsyangdi River near Markichowk, Tanahaun District. From AP-0, the alignment crosses Marsyangdi and tower AP-1 is placed at eastern slope of the part of the hill near sharp bend of the Marsyangdi River.

Then, the alignment again crosses the Marsyangdi River and the Prithvi Highway and climbs up to Dhakaltar. Dhakaltar is a flat land. AP-2 to AP-4 are located in Dhakaltar avoiding settlements. The alignment from AP-4 goes up and AP-5 tower is located at the edge of hill of Aduwakharka.

Likewise, AP-5 to AP-7 passes through cultivated land avoiding houses. The alignment from AP-8 to AP-10A passes through gengle slope and covers forest partially. This place is called Dharapani. From AP-10A, the alignment crosses Siudi Khola and goes up gradually up to AP-15 though cultivated land. This section has been proposed mainly to avoid houses. AP-15 is located near Kapahal Danda. The section from AP-5 to AP-15 is accessible from Abukhairni - Chimekswori Road. AP-16 lies at the highest level of the route from the mean sea level. Now the alignment from AP-16 goes down in the southern direction through sloppy land dominated by bushes. The alignment goes down up to AP-21 A which is placed at the left bank of Trishuli River. From AP-21 A, the alignment crosses Trishuli river and enters the Chitwan District.

The alignment from AP-21 A goes up to AP-26 near Chauki of Kabilash Danda avoiding houses. The whole section of Chitwan part lies in Kabilash VDC. The section between AP-23 and AP-26 is located in the residual soil and colluvial deposits near Rigdikhola, Lamagaun and Kabilas Danda in Chitwan District. The slope of the section is gentle ($15\text{-}20^0$) near Lamagaun. 132 kV T/L lies between AP-22 and AP-23. From AP-23, the alignment runs parallel to 132 kV T/L of Marsyangdi's left side.

The alignment from AP-26 goes down vertically to AP-27 through bushes and forested sloppy land. AP-27 is placed beside the small stream and covered by colluvial deposits. Siwalik range starts from AP-26. AP-28 to AP-30 are placed on cultivated land in Jugedi avoiding settlements.

The alignment meets another 132 kV T/L (which comes from Tanahaun) near AP-30 at Jugedi. Now the alignment passes parallel to both 132 kV T/L along the Muglin-Narayanghat Highway. From AP-30, the alignment runs through dense forest and enters the flat Terai Region. AP-34 is placed on a dense forest near Ramnagar.

The details of route alignment are presented in table 5-2.

Aps	Easting	Northing	RL	Span	Chainage	Places
AP-0	549840.68	3089195.146	337		0.00	Markichok
AP-1	550086.4	3088727.989	432	527.84	527.84	Jumlan Deurali
AP-2	550723.92	3087973.438	430	987.81	1515.65	Dhakaltar
AP-3	550939.35	3087896.052	429	228.91	1744.56	Dhakaltar
AP-4	551300.02	3087734.823	418	395.06	2139.62	Dhakaltar
AP-5	551674.68	3086907.619	698	908.10	3047.72	Abugaun
AP-6	552036.05	3086106.05	795	879.26	3926.98	Aduwakharka
AP-7	552311.67	3085904.854	830	341.24	4268.22	Aduwakaharka
AP-8	552440.59	3085737.032	842	211.62	4479.84	Aduwakharka
AP-9	552534.98	3085644.468	850	132.21	4612.05	Aduwakharka
AP-10	552697.02	3085406.24	810	288.11	4900.16	Aduwakharka
AP-10 A	552677.96	3085048.37	670	358.38	5258.54	Dharapani
AP-11	552526.65	3084649.303	610	426.79	5685.33	Bhage
AP-12	552115.9	3084241.311	905	578.94	6264.27	Bhage
AP-13	551854.91	3083894.547	1090	434.01	6698.28	Bhage
AP-14	551601.09	3083398.061	1170	557.61	7255.89	Bhage
AP-15	551210.53	3082740.544	1410	764.76	8020.65	Kaphaldanda
AP-16	550488.43	3082107.582	1450	960.25	8980.9	Baspani
AP-17	550578.06	3081640.473	1280	475.63	9456.53	Baspani
AP-18	550463.5	3080479.127	610	1166.98	10623.51	Khasran
AP-19	549983.28	3079746.271	810	876.18	11499.69	Barlungol
AP-20	549945.81	3079247.633	740	500.04	11999.73	Barlungol
AP-21	549887.81	3078613.013	405	637.26	12636.99	Barlungol
AP-21A	549598.06	3078204.076	260	501.18	13138.17	9 km, Kabilas
AP-22	549141.73	3077644.044	380	722.41	13860.58	Lamagau
AP-23	548690.51	3077084.942	470	718.47	14579.05	Lamagau
AP-24	547976.29	3076580.872	870	874.18	15453.23	Chauki
AP-25	547362.99	3075789.628	1143	1001.10	16454.33	Chauki
AP-26	546773.73	3075407.757	1060	702.18	17156.51	Kabilash

Aps	Easting	Northing	RL	Span	Chainage	Places
AP-27	546869.2	3074442482	518	969.99	18126.5	Bharlan
AP-28	546950.75	3073755.47	465	691.84	18818.34	Jugedi
AP-29	547085.9	3073070.07	370	698.60	19516.94	Kholaghari
AP-30	547231.52	3072071.001	300	1009.63	20526.57	Kabilash
AP-31	547266.21	3070486.5	290	1584.88	22111.45	Kabilash
AP-32	546825.75	3069787.057	265	826.58	22938.03	Ramnagar
AP-33	546111.49	3069601.73	263	737.91	23675.94	Ramnagar
AP-34	545492.77	3068866.618	264	960.84	24636.78	Aaptari
AP-35	544183.76	3065853.731	225	3284.96	27921.74	Aaptari

Source: Marsyandi Corridor 220 kV T/L (Markichok-Bharatpur) Field Survey Report, 2015

The overall topographic feature of both the section is presented in figure 5-2.

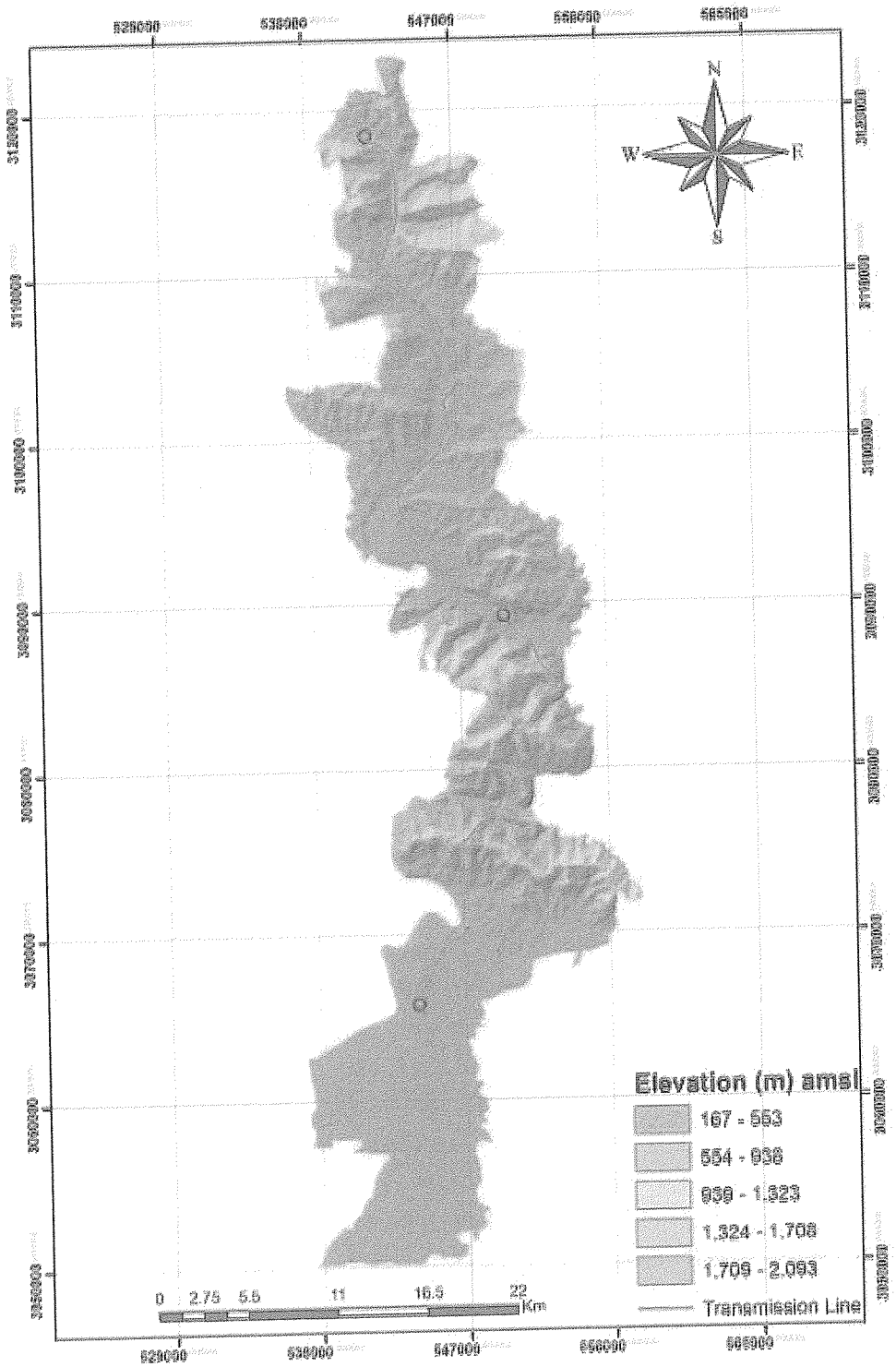


Figure 5.2: Hill shade map along the proposed transmission line alignment

5.1.2. Climate

The climate along the proposed transmission line alignment ranges from tropical to sub-tropical. The climate around the Bharatpur region is of tropical nature. The atmospheric temperature during summer season exceeds 34^0C, while the minimum temperature during winter season remains above 10^0C. Similarly, sub-tropical climate is prevalent along the Udipur-Marki Chowk section. In this region summer temperature exceeds 30^0C, while the minimum temperature during winter season remains above freezing temperature. Furthermore, maximum rainfall is observed during monsoon season, which averages around 1500mm.

5.1.3. Hydrology

The general hydrology of the project alignment is characterized by the presence of Perennial River like Marsyandi and small streams. The Marsyangdi river originating from Marsyangdi basin is a tributary of the Narayani River system which ultimately confluence with the Ganges River. The small streams along the alignment are seasonal streams.

5.1.4. Geology

The geology along the TL alignment has been divided into two sections, i.e., Udipur to Markichowk Section and Markichowk to Bharatpur Section which are discussed separately here below:

Udipur to Markichowk Section

The Udipur – Markichowk section traverses along the wide Marsyangdi River valley. Major land use observed along the alignment is forest and cultivated land. Geologically, the transmission line alignment runs through the rocks of Lesser Himalayan Zone and Siwalik Group as well as Chitwan Dun Valley Sediments. The transmission line alignment mainly passes through Lesser Himalayan Rocks such as grey greenish phyllites and white massive quartzite of Ranimata Formation near Markichok substation. Similarly, it also passes through white fine to medium grained quartzite with green phyllite of Naudada Formation, purple calcareous quartzite of Syanja Formation, black slate of Sangram Formation, Slates and dolomites of Galyang Formation and limestone and dolomites intercalated with black slate of Larkarpata Formation. Similarly, transmission line alignment is abruptly located in rocks of Siwalik Group near Jugedi separated by MBT, which mainly consists of fine to medium grained sandstone and variegated mudstone up to Ramnagar area. Finally, the alignment passes toward the soft sediments of Chitwan Dun Vally, which is mainly comprised of sand, slit, clay and mud near Bharatpur Substation. The geological map along the proposed alignment is presented in figure 5.3.

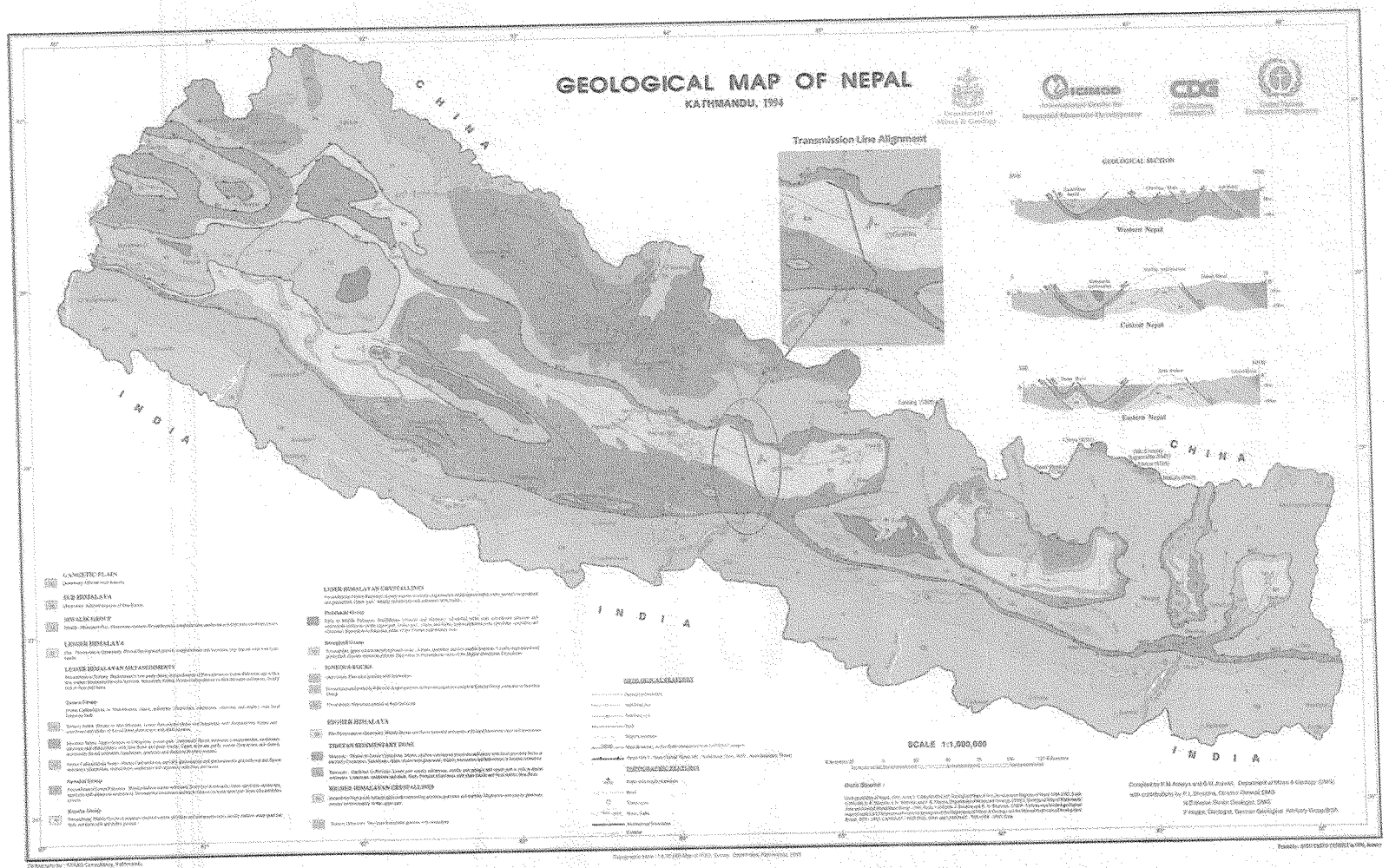


Figure 5.3: Geological map of the along the project alignment

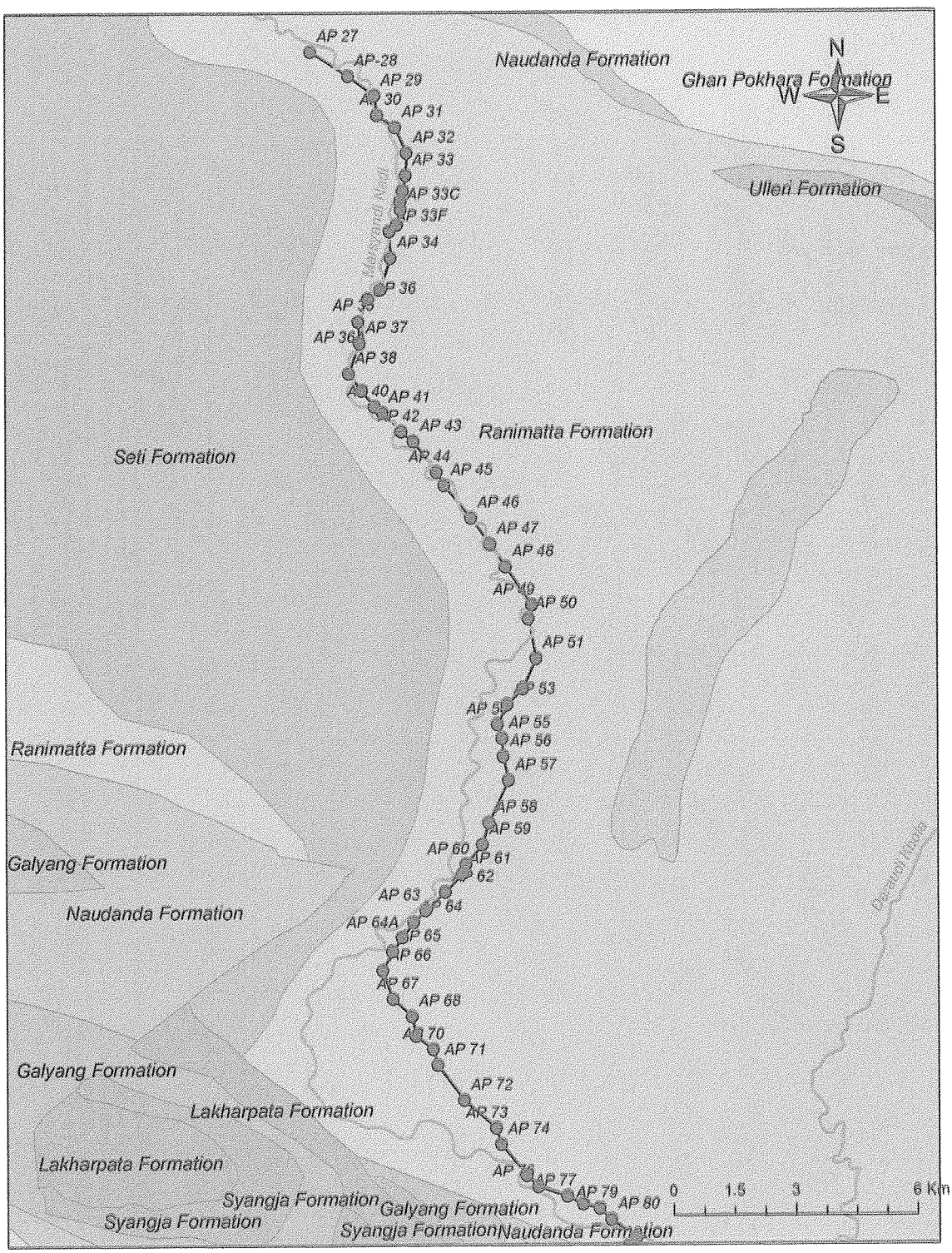


Figure 5.4: Geological map along Udipur-Markichowk section

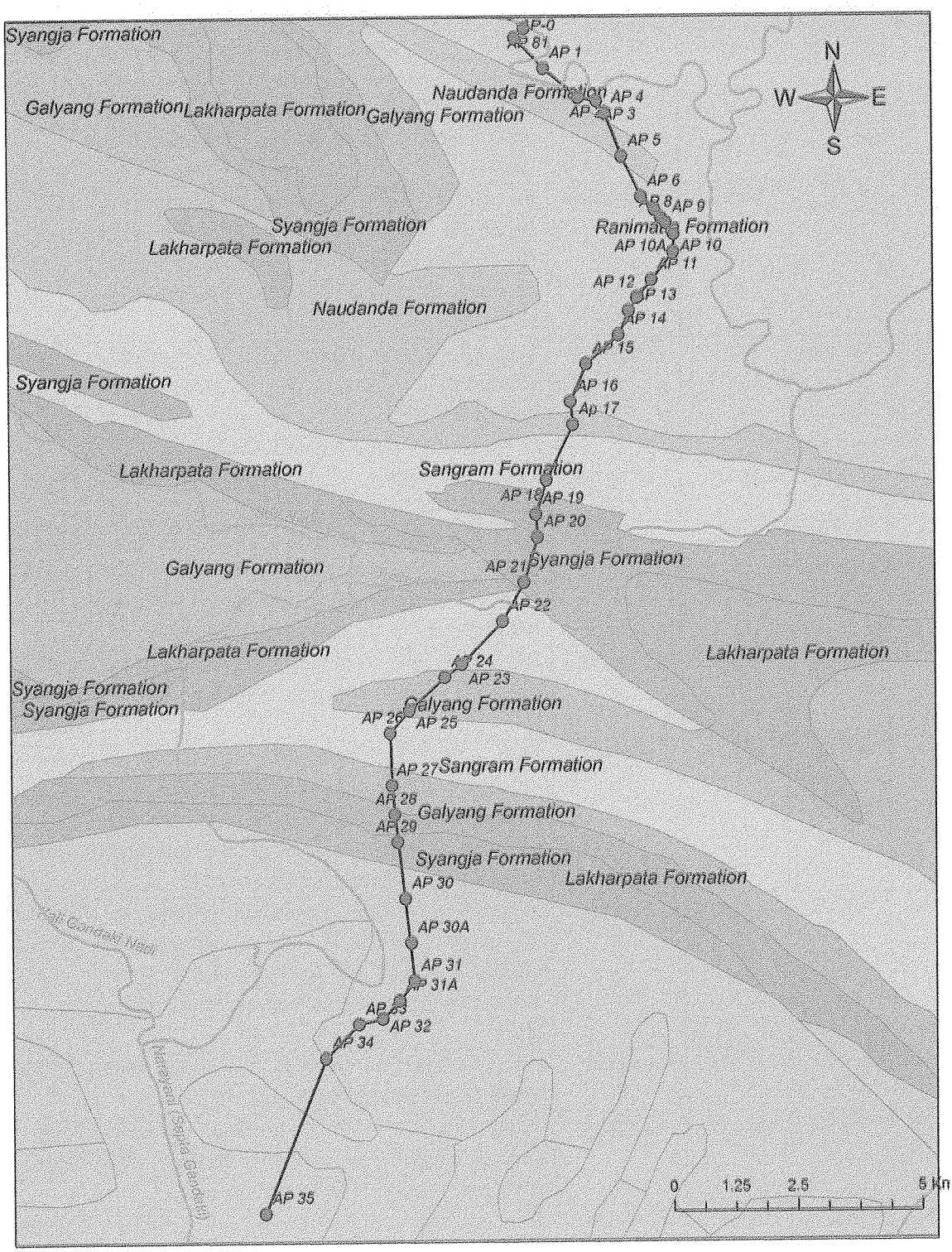


Figure 5.5: Geological map along Markichowk-Bharatpur section
Reference: Geological Map of Nepal, Department of Mines and Geology, GoN, Nepal, 1994

Details about the section wise geology are presented in the Table below:

Table 5.3: Chainagewise Geology of the project area

S.N.	Chainage		Surface Geology		Land Use
	From	To	Formation	Rock types	
1	0+000	0+ 112	Syangja	White pale orange pinkish or purplish or calcareous quartzites & quartzitic limestones intercalated with dark grey purple & green shales strongly ripple marked quartzites at the base.	Forest
2	0+ 112	0+ 689	Lakharpata	Fine grained,light blue,grey limestones & dolomites with thin interactions of grey shales,white,pink dolomite limestones,purple quartizes & green shales at the top.Algal structure & stromatotites are present.	Forest
3	0+ 689	0+ 689	Galyang	Dark grey slates intercalated with thin grey calcareous slates & lamillqe of carbonates.Thick beds of grey siliceous dolomites are found at place(Baitadi beds).	Forest
4	0+ 689	2+593	Sangram	Black,dark grey to greenish grey shales with interaction of limestones & quartzites.	Forest
5	2+593	3+930	Galyang	Dark grey slates intercalated with thin grey calcareous slates & lamillqe of carbonates.Thick beds of grey siliceous dolomites are found at place(Baitadi beds).	Cultivation and bushes
6	3+930	6+016	Sangram	Black,dark grey to greenish grey shales with interaction of limestones & quartzites.	Cultivation, bushes and sand
7	6+016	6+201	Lakharpata	Fine grained,light blue,grey limestones & dolomites with thin interactions of grey shales,white,pink dolomite limestones,purple quartizes & green shales at the top.Algal structure & stromatotites are present.	Cultivation and bushes
8	6+201	8+123	Syangja	White pale orange pinkish or purplish or calcareous quartzites & quartzitic limestones intercalated with dark grey purple & green shales strongly ripple marked quartzites at the base.	Bushes and cultivation
9	8+123	9+342	Sangram	Black,dark grey to greenish grey shales with interaction of limestones & quartzites.	Cultivation
10	9+342	9+432	Naudanda	White massive fine to medium grained quartzites with ripple marks interbedded with green phyllites.Basic intrusions are noted.	Bush and Cultivation
11	9+432	16+032	Ranimatta	Grey greenish grey gritty phyllites grilstones with conglomerates & white massive quartzites in the upper parts.Basic intrusions are abundant.	Cultivation, Cliff, Buit up area, forest

S.N.	Chainage		Surface Geology		Land Use
	From	To	Formation	Rock types	
12	16+032	16+721	Naudanda	White massive fine to medium grained quartzites with ripple marks interbedded with green phyllites.Basic intrusions are noted.	Forest
13	16+721	64+154	Ranimatta	Grey greenish grey gritty phyllites grilstones with conglomerates & white massive quartzites in the upper parts.Basic intrusions are abundant.	Built up area, cultivation, sand, forest, barren land

Source: Geological Survey of Soil, Rock & Concrete Laboratory, NEA, 2016

5.1.4. Seismic Analysis

Udipur-Bharatpur 220 kV transmission line forms the part of seismic belt. The earthquake in the Himalya is the result of thrust faulting associated with the sub ducting Indian Plate beneath the Eurasian Plate. The main "decollement" plane along which thrusting takes place in Himalayan is Main Himalayan Thrust (MHT). The April 25, 2015 M 7.8 Nepal earthquake occurred to north east of the Udipur-Bharatpur transmission line.

The location, size and focal mechanism of this earthquake are consistent with its occurrence on the main subduction thrust interface between the India and Eurasia plates. Just four events of M 6 or larger have occurred on the April 25, 2015 earthquake over the past century (USGS, 2015). One, M 6.9 earthquake in August 1988, the south east of the April 25 event and the other M 8.0 event known as the 1934 Nepal-Bihar earth quake, occurred in a similar location to the 1988 event.

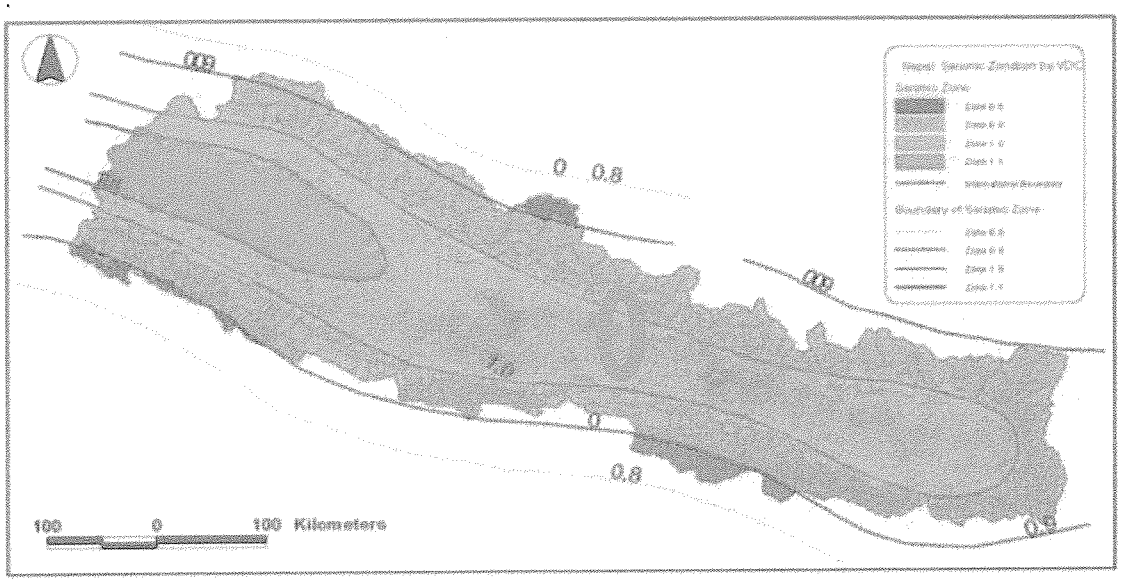


Figure 5.6: Seismic map of Nepal

The above figure shows the seismic zone factor in Nepal and where this project alignment lies in the map. As the seismic zoning factor increases the level of seismicity increases. So from above map, the proposed Udipur-Bharatpur 200 kV transmission line alignment passes through the zone which has seismic zone factor 1.

5.1.5. Land Use

The land requirement for the proposed project has been calculated based on the RoW of the project and has been divided into two parts as follows:

a. Udipur - Markichowk Section

The entire alignment of the route passes through cultivated, forest, bushes/grass land and river bank. The alignment covers about 60% of cultivated land, followed by 25% of forest land, 6% of bushes/grass land and 8% of river/streams portions. Marsyangdi is the major river in the alignment. Overall land use pattern is presented in table below:

Table 5.4: Land use type along Udipur-Markichowk Section

S.N.	Land Type	Percent
1	Cultivated Land	60
2	Forest Land	25
3	Grass-Bushes	6
4	River and flood plain	8

The detail land use within this section is presented below:

Udipur Substation (AP 27) to AP 43

The proposed substation at the Udipur is currently used by the Nepal Army as a football ground. There are two community forests (Mandali CF and Kalika CF) within AP 27 and AP 28. AP 28 lies on the agricultural land. Between AP 28 and 29, the transmission line crosses the Marsyangdi River and AP 29 is proposed over the agricultural land. The transmission line passes above agricultural land until AP 33 at Archalbot VDC. There are Raniswara and Jugepani community forests within AP 33 and 33 D. The T/L crosses the Marsyangdi River twice up to 33 F and 34. AP 33 F is located on private agricultural land.

b. Markichowk – Bharatpur Section

The entire alignment of the route passes through cultivated, forest and bushes/grass land. The alignment covers about 54% of forest land, followed by 41% of cultivated land, 3% of bushes/grass land and 2% of river/streams and others. Marsyangdi and Trishuli rivers are the major rivers in the alignment. Prithvi Highway and Muglin - Narayanghat Highway are also crossed. The detail land use pattern along the transmission line is presented in table below:

Table 5.5: Land use type along Markichowk-Bharatpur section

S.N.	Land Type	Percent
1	Cultivated Land	41

2	Forest Land	54
3	Grass-Bushes	3
4	River and flood plain	2

5.1.6. Erosion and Land Stability

Several landslides and erosional features are observed along the alignment of the proposed transmission line. Among those, landslide observed near the Kabilas Hill (500m from the alignment) is of major concern. Moreover, due to high vulnerability of Siwalik Hills land surfaces are highly susceptible to erosion. The construction of transmission towers should take special attention over those regions. The slope map (figure 5.7) also reveals the highly sloppy regions of Chimkeswori Hill and Kabilas Hill, which are highly vulnerable to erosion.

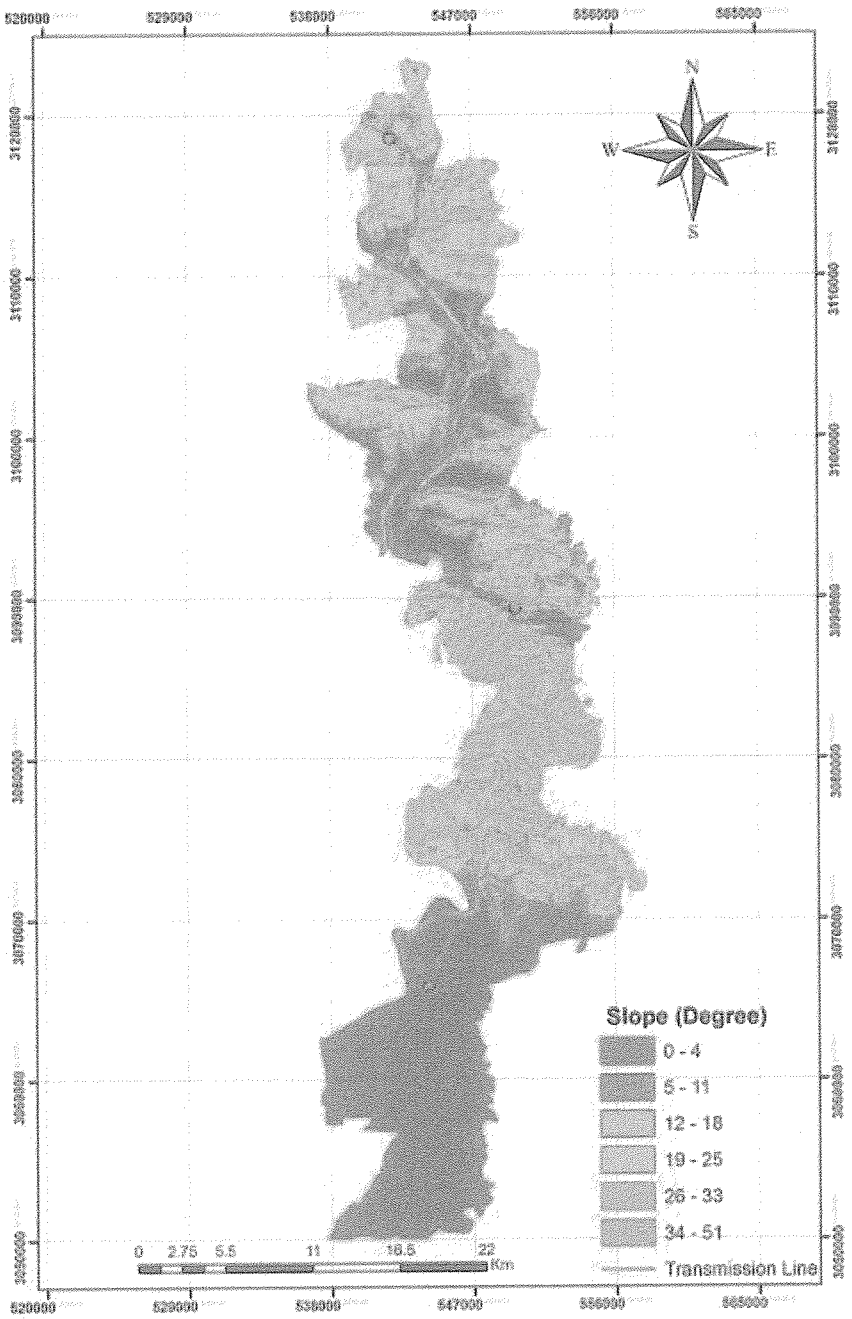


Figure 5.7: Slope map along the Udipur-Bharatpur 220 kV T/L project

5.1.7. Rivers and Crossings

Trishuli and Marsyangdi are the major rivers along the T/L alignment that drains all the rain falling around the project area, and the T/L alignment crosses both the rivers. Similarly, other crossings include 132 kV, 33 kV and 11 kV T/L, roads, bridges, few houses and small streams.

All crossings of existing transmission and distribution lines will be designed with standard safe vertical and horizontal clearances for 132 kV lines. Design clearances for communication lines will be maintained.

The list of crossings has been presented in table below:

Table 5.6: Major crossings along the Udipur-Markichowk alignment

Chainage	Natural Drainage	Road/ Track	Power Line	House/other structures	Remarks
16+650			33 kV		
16+770		Road			
17+200		Foot track			
17+315 to 17+370	Marsyangdi River				
18+180		Foot track			
18+795 to 18+920	Marsyangdi River				
19+360	Stream				
19+980 to 20+040	Marsyangdi River				
20+680		Road			
20+710		Road			
20+785	Stream				
20+850		Road			
20+920		Foot track			
20+945 to 21+005	Marsyangdi River				
21+280 to 21+390	Marsyangdi River				
22+140 to 22+320	Marsyangdi River				
22+430 to 22+500	Marsyandi River				
22+775 to 22+850	Marsyandi River				
22+782			132 kV T/L		
23+040	Marsyangdi River	Road			
23+125 to 23+530	Marsyangdi River				
24+320 to 24+360	Marsyangdi River				
24+710 to 24+777	Marsyangdi River				
25+035			132 kV/TL		
25+055				Suspension bridge	
25+080 to 25+180	Marsyangdi River				
25+240		Road			
26+430 to 26+480	Marsyangdi River				
26+625 to 26+700	Marsyangdi River				
25+240		Road			
26+625 to 26+700	Marsyangdi River				

Source: Field Survey 2016

5.1.8. Air, Noise and Water Quality

The status of air and noise quality along the transmission line alignment is fair. Due to rural settings and lack of polluting sources, natural environment has not been significantly changed.

Contrarily, solid waste dumping practice around the river bank has added the water pollutant to some extent.

5.2. Biological Environment

The climate of the proposed project area ranges from tropical climate around the Bharatpur Region to sub-tropical climate around the Marsyangdi Corridor. The elevation and aspect of the slope are the governing factors that determine the climate of the area. In particular, the variation in the bioclimatic zones along the alignment of the transmission line largely governs the distribution of vegetation and wildlife around the region.

The proposed project area does not fall in protected area (national parks, wildlife sanctuary, buffer zone and conservation area) or environmentally sensitive area. However, some area in Chitwan district falls in Chure Conservation Area. Further, considering Barandabhar Corridor Forest, Udipur-Bharatpur Transmission line does not cross the area which is verified by the following image.

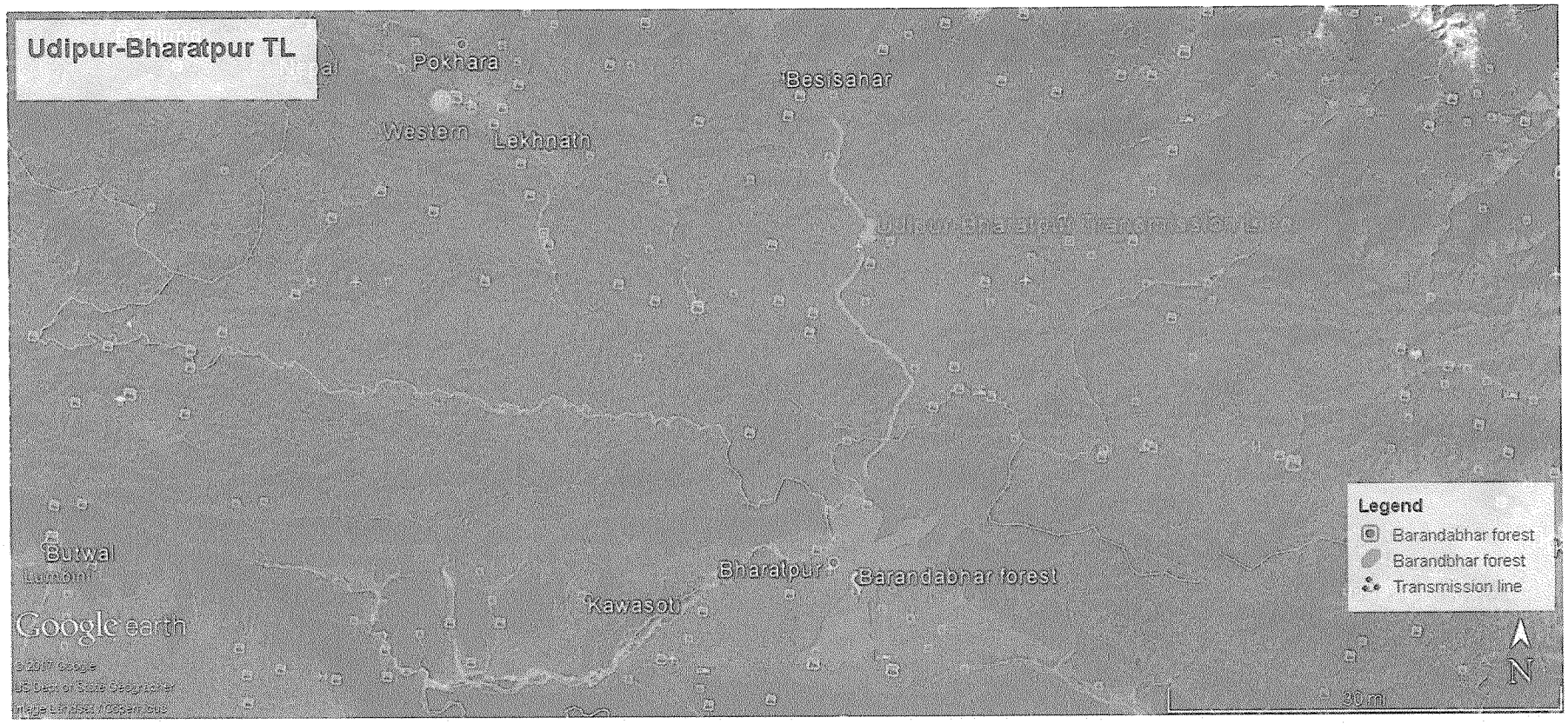


Figure 5.8: Transmission line alignment and Barandabahar forest

5.2.4. Vegetation

Chitwan District

The forest around the Bharatpur and Kabilas are largely dominated by Sal (*Shorea robusta*), with the presence of some scattered Saj (*Termialia alata*) pine (*Pinus roxhurghii*) forest too. Similarly, some scattered Simal (*Bombax cebia*) are also present near to the agricultural land and settlement. The tropical species mentioned above are present below the elevation of 1000 m amsl. Further, the forest around the Rampur Region in Chitwan district, dominated by Sal is very significant in terms of wildlife movement as the forest serves as a corridor for the movement of wildlife species from Terai to Chure Hills.

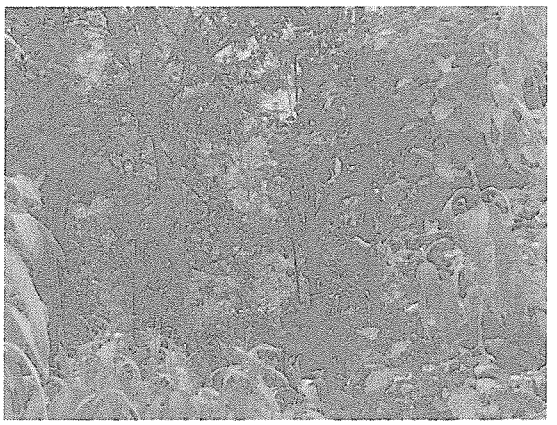


Figure 5.9: Sal forest in Tanahu along the TL alignment

Gorkha District

Chilaune (*Schima wallichi*), Katus (*Castanopsis indica*), Chirepine (*Pinus roxburghii*), Tooni (*Toona ciliata*), Kadam (*Anthocephalus chinensis)* etc are the some of the major vegetation around the project area of this district.

Tanahu District

Chilaune (*Schima wallichi*), Katus (*Castanopsis indica*), Uttis (*Alnus nepalensis*), Rhododendron (*Rodhodendron arboretum*), Chire pine (*Pinus roxburghii*), Kaphal (*Myrica esculenta*), Tooni (*Toona ciliata*), etc are the some of the major of Tanahu district.

Lamjung District

The forest around the Lamjung district is characterized by the presence of mixed forest consisting of Chilaune (*Schima walichii*) and Katus (*Castonopsis indica.*). Likewise, other vegetation present around this forest include Salla (*Pinus roxburghii*), Khashru (*Quercus semicarpifolia*), Oak (*Quercus lanata*), Kaphal (*Myrica esculenta*), Rhododendron (*Rhododendron arboreum*), Tooni (*Toona ciliata*).

Among the above mentioned tree species, Sal (*Shorea robusta*) and Simal (*Bombax cebia*) are of conservation significance as these species are declared as protected species by the Government of Nepal.

5.2.5. Community Forest/Leasehold Forest/Government Forest

There are 20 community forest (CF), 16 national forest (NF) and 3 leasehold (LHF) along the AP and TL RoW in all districts. Likewise, leasehold forests (LHF) are affected in Chitwan and Gorkha districts only. Total 90.65 ha of forest area from 39 forests will be acquired by the

project along Right of Way (RoW) and AP locations in which CFs area is 43.84 ha, NFs area is 43.50 ha and LHFs area is 3.31 ha. List of forests is given in table 5.7 and summary of forest status is given in table 5.8 Refer Annex H for the details about the individual forests.

Table 5.7: List of project affected CFs/LHFs/NFs

District	Address	Name of CF/LHF/NF	Affected area (ha)	Remarks
Chitwan	Dhakani VDC-7	Hariyali LHF	0.69	
	Kabilas VDC-8	Salbisna CF	0.0225	
	Kabilas VDC-7	Pachakanya NF	0.15	
	Kabilas VDC-2	Jurethum NF	5.49	
	KabilasV DC-1	Indreni CF	6.54	
	Bharatpur Municipality-1	Satanchuli NF	14.163	
	Bharatpur Municipality	Jaldevi NF	4.47	
	Sub-total	7	**31.52**	
Gorkha	Deurali VDC	Akala CF	5.52	
	Palungtar Municipality	Banthumpakha CF	2.769	
	Dhuwakot VDC	Government	0.39	
	Palungtar Municipality	Johithum CF	0.216	
		Kalika CF	0.33	
		Kanyadevi CF	2.757	
	Palungtar Municipality-2	Nagytar LHF	1.422	
		Pareghat LHF	1.194	
		Thuloban CF	1.47	
	Palungtar Municipality - 10	Chisipane CF	0.351	
		Government-Janjyoti Primary School	0.69	
		National Forest 1	0.435	
		National Forest 2	0.204	
		National Forest 3	0.24	
		National Forest 4	0.345	
	Sub-total	15	**18.333**	
Lamjung	Sundar bazar-9	Fulbari CF	0.8	
		Marsyangdipakha CF	4.86	
	Bhoteodar-4,8	National Forest	4.17	
	Bharate-2	Jugepani CF	2.06	
	Archalbot-9	Raniswara Sakharpakha CF	2.63	
	Beshishar-2	Kalika CF	0.888	
	Beshishar-2	Mandali CF	0.432	

District	Address	Name of CF/LHF/NF	Affected area (ha)	Remarks
	Dhamilikuwa	Simalchaur Naringhat CF	0.46	
	Dhamilikuwa	Nabjoyti CF	3.271	
	Rainas-3	Grambeshi CF	3.531	
	Sub-total	**10**	**23.102**	
Tanahu	Aabu-7	National Forest 1	0.56	
	Aabu-8	National Forest 2	2.64	
	Chhimkeswari-3	National Forest 3	5.68	
	Chhimkeswari-3	National Forest 4	2.44	
	Chhimkeswari-3	National Forest 5	1.44	
	Chhimkeswari-2	Baralung CF	3.26	
	Aabu-6	Paharepani CF	1.67	
	Sub-total	**7**	**17.69**	
	Total	**39**	**90.65**	

Source: Forest Survey, 2016

Table 5.8: Summary of forest status in project affected districts

District	Affected CF		Affected NF		Affected LHF		Total	
	No	Area (ha)	No	Area (ha)	No	Area (ha)	No	Area (ha)
Chitwan	2	6.56	4	24.27	1	0.69	7	31.52
Gorkha	7	13.41	6	2.30	2	2.262	15	18.33
Lamjung	9	18.93	1	4.17			10	23.10
Tanahu	2	4.93	5	12.76			7	17.69
Total	**20**	**43.84**	**16**	**43.50**	**3**	**3.31**	**39**	**90.65**

Source: Field survey, 2016

5.2.3. Leasehold forest

The concept of leasehold forestry came into implementation in 1993 through the Hills Leasehold and Forage Development Project with objectives to alleviate poverty and improve ecological conditions of hills. With the implementation of leasehold forestry; there had been improvement in the socio-economic condition of people associated with leasehold forest. As the leasehold forestry is effective poverty alleviation mechanism which targets the poorest section of the community. The increment in the fodder sources due to the forest, livestock rearing had been intensified providing better source of income. Likewise, commercialization of NTFPs through Leasehold forestry had improved the economic condition of poor and vulnerable.

The TL alignment passes through the two leasehold forests Nagytar LHF and Pareghat LHF in Gorkha district and Hariyali LHF in Chitwan district which affects 2.262 ha and 0.69 ha of forest in respective district.

5.2.4.1. Wildlife

5.2.4.1 Mammals

Lamjung District

The variation in topography, along with existing forest cover provides wide range of habitats for wildlife in the district. As per consultation with local people, barking deer (*Muntiacus muntjak*), Leopard (*Panthera* pardus), Wild Boar (*Sus scrofa*), Lynx (Flelix lynx), Bear (*Ursus thibetanus laniger)* Chari bagh (*Felis bengalensis*) are some of wildlife present around the project district.

Chitwan District

The alluvial flood plain along with tropical and sub-tropical forest cover has provided very favourable habitat for Royal Bengal tiger (*Panthera tigris*), Bengal fox (*Vulpes bengalensis)*, striped hyenas (*Hyaena hyaena*), wild dogs (*Cuon alpinus*), golden jackal (*Canis aureus)*, sloth bear (*Melusus ursinus)*, hog deer (*Axis porcinus)*, Rhesus monkeys (*Macaca mulatta)* are some of the major wildlife present in the district according to consultation with the local people.

Gorkha District

Leopards (*Panthera pardus*), wild dogs (*Cuon alpinus)*, jackels (*Canis aureus)*, porcupines (*Erethizon dorsatum*), ghoral (*Naemorhedus goral*), wild boar (*Sus scrofa*), black bears (*Ursus thibetanus laniger),* weasels (*Mustela sibirica*), etc are the major mammals found around the project district.

Tanahu District

As per the consultation with the local people, common Leopard (*Panthera pardus*), Barking Deer (*Muntiacus muntjack*), Porcupine (*Hystrix indica*), Wild Boar (*Sus* scrofa), Fox (*Vulpes vulpes*), Rhesus Monkey (*Macaca mullata*), Common langur (*Presbytes entellus*), jackal (*Canis aureus*) are some of the wildlife present around the project district.

5.2.4.2 Birds

Chitwan District

The alluvial grassland has provided important habitats for critically endangered Bengal florican *(Houbaropsis bengalensis*), swamp francolin (*Francolinus gularis*), grass warblers (*Chaetornis striata*), grey-crowned prinia (*Prinia cinereocapilla).* Likewise, egrets (*Nettapus coromandelianus*), storks (*Ciconiidae sps*) and kingfishers (*Alcedo atthis),* spotted eagle (*Clanga hastata*) are known be inhabiting around the project district as per the information collected through public consultation.

Lamjung District

Titra (*Francolinus pondicerianus*), Myna (*Acridotheres tritis),* Nepal Wren Babbler (*Pnoepyga immaculate*), Spiny Babbler (*Turdoies nepalensis*), Kalij Pheasant (*Lephura leucomelanos*), etc are the some of the bird species around the project district.

Gorkha District

Munal (*Triagopan satyra*), Jureli (*Pycnonotus focusus*), Kokle (*Centropus sinesis*) and jungle crows (*Corvus macrorhynchos levaillantii)* are the bird species found around the project area of this district. Likewise, Himalayan griffin (*Gyps himalayensis*) and lammergeyer (*Gypaetus barbatus*) are found in the alpine zone of the district.

Tanahu District

The consultation with the local people reveals that Crow (*Corvus splendens*), House Sparrow (*Passer domesticus*), Kalij (*Lephura leucomelana*), Chibe *(Dicrurus adsimilis),* Ban Kukhura, Cuckoo (*Plantative cuckoo*), Kalij Phesant (*Lephura leucomelanos)*, Dhukur *(Streptopelia chinensis),* Jureli *(Pycnonotus cafer),* Titra *(Francolinus spp.),* Kalchaudo *(Myophonus caeruleus),* Bakulla *(Bubulcus ibis),* Koili *(Surniculus lugubris),* Suga *(Psittacula cyanocephala)* are the common bird species observed in the project district.

5.2.4.3 Ethno botany/ Plant resource use pattern

Various vegetation is used by the local people for different purposes as per their tradition and culture. In general, Titepati (*Artemisia* spp.), Amala (*Phyllanthus emblica*), Kurilo (*Aspargus officinails*), etc. are widely used for medicinal purpose. Fruits of Kaphal (*Myrica esculenta*), Ainselu (*Rubus ellipticus*), Amaro (*Spondias pinnata*) and Amala (*Phyllanthus emblica*) are edible fruits with medicinal value reported in the project area. Similarly, Sal (*Shorea roubusta*) and Saj (*Termialia alata*), etc are extensively used for timber.

5.2.4.4 Protected species of flora and fauna

Table 5.9 shows the status of protected flora and fauna according the Government of Nepal legislation, CITES appendixes and IUCN red list data.

Table 5.9: Protected species of flora and fauna

S. N.	Local Name	Scientific Name	IUCN Red list data	CITES category	GoN
1	Royal Bengal Tiger	*Panthera tigris*	VU	I	VU
2	Monkey	*Macaca mulatta*	LC	LC	LC
3	Leopard	*Panthera pardus*	VU	I	VU
4	Chinese pangolin (Salak)	*Manis pantadactyla*	CE	II	Protected by National Park and Wildlife and Conservation Act, 2029 (1973)

5	Dumsi	*Hystrixindica*	LC		
6	Bengal Florican	*Houbaropsis bengalensis*	NT	I	VU
7	Sal	*Shorea robusta*	LC		Banned for commercial extraction, transportation and export

Note:

CITES *I)* : *Species threatened with extinction*
II) : *Species not necessarily threatened out but could be so*
III) : *Species requires international cooperation to control trade*

IUCN *LC* : *Least Concerned*
NT : Not Threatened
GoN *(VU)* : *Vulnerable*

5.3. Socio-economic and Cultural Environment

5.3.1. District Level Information

Lamjung District

According to National Census 2011, the total population of Lamjung District is 167,724 with 75,913 male and 91,811 female populations. Similarly, the total household and household size of the district are 42,079 and 3.99 respectively. The population density of the district is 99 individuals per square kilometer. Gurung, Chhetri, and Brahmin are the dominant ethnic groups in Lamjug district. Gurung are in general the followers of Buddhism, while Chhetri and Brahmin follow Hinduism.

Chitwan District

According to National Census 2011, the total population of Chitwan District is 579,984 with 279,087 male and 300,897 female populations. Likewise, the total household and household size of the district are 132,462 and 4.38 respectively. And the population density of Chitwan district is 261 persons per square kilometer. In Chitwan district mixed ethnic communities are observed such as Chhetri, Gurung, Magar, Chepang, Brahmin, Newar, etc

Tanahu District

According to National Census 2011, the total population of Tanahu District is 323,288 with 143,410 male and 179,878 female populations. Similarly, the total household and household size of the district are 78,309 and 4.13 respectively. The population density of the district is 209 individuals per square kilometer. In Tanahu district Magars are the dominant ethnic group representing more than 80% of the total population.

Gorkha District

According to National Census 2011, the total population of Chitwan District is 271,061 with 121,041 male and 150,020 female populations. Likewise, the total household and household size

of the district are 66,506 and 4.08 respectively. And the population density of Chitwan district is 75 persons per square kilometer. Gorkha district Chhetri is the dominant ethnic group followed by Magars.

5.3.2. VDC Level Information

5.3.2.1. Population Characteristics of Project Area

The population characteristics around the project affected area suggest the highest population in Bharatpur Municipality among all the project affected VDCs. The male and female populations in Bharatpur Municipality are 71,175 and 72,661 respectively, with female population slightly greater than male population. Similarly, the Chhimkeshwori VDC of Tanahau district has the least population compared to other project affected VDCs. The remoteness of the area could be the potential cause behind such least population. The demographic characteristic of project impact VDCs as per the project affected districts is given in table below:

Table 5.10: Demographic Characteristics of the project area

District	VDC/ Municipality	Total Household	Population			Average Household size	Sex Ratio
			Total	Male	Female		
Chitwan	Bharatpur Municipality	36,939	143,836	71,175	72,661	3.89	97.95
	Dahakhani	939	4,803	2,304	2,499	5.12	92.2
	Kabilas	1,164	5,815	2,818	2,997	5	94.03
Gorkha	Deurali	1,422	5,514	2,449	3,065	3.88	79.9
	Dhunwakot	1,110	4,259	1,850	2,409	3.84	76.8
	Chyangli	1,532	6,286	2,715	3,571	4.1	76.03
	Gaikhur	1,276	5,003	2,189	2,814	3.92	77.79
	Palungtar	2,108	8,143	3,460	4,683	3.86	73.88
Lamjung	Chiti	1,299	5,166	2,348	2,818	3.98	83.32
	Archalbot	424	1,605	703	902	3.79	77.94
	Bhorletar	1,033	4,059	1,832	2,227	3.93	82.26
	Bharte	584	2,239	963	1,276	3.83	75.47
	Dhamilikuwa	1,154	4,425	1,909	2,516	3.83	75.87
	Mohoriyakot	571	2,269	976	1,293	3.97	75.48
	Sundarbazar	1,795	6,715	2,940	3,775	3.74	77.88
	Tarkughat	772	2,893	1,266	1,627	3.75	77.81
Tanahu	ChokChisapani	1,028	3,835	1,678	2,157	3.73	77.79
	Bhanu	3,476	13,175	5,766	7,409	3.79	77.82
	Anbukhaireni	4,034	16,382	7,573	8,809	4.06	85.97
	Chhimkeshwori	356	1,887	841	1,046	5.3	80.4
	Purkot	1,894	7,188	3,044	4,144	3.8	73.46

Source: CBS, 2011

5.3.2.2. Caste/Ethnicity/Religion

There is a large diversity in caste and ethnicity among the people of the project affected VDCs. Gurung, Chhetri, and Brahmin are the dominant ethnic groups in Lamjug district. Gurung are in general the followers of Buddhism, while Chhetri and Brahmin follow Hinduism. Similarly, in Gorkha district Chhetri are the dominant ethnic group followed by Magars. Furthermore, around the project affected areas of Tanahu district Magars are the dominant ethnic group representing more than 80% of the total population (*Field Survey, 2016*). Both Magar and Chhetri are the follower of Hinduism. Finally, around the project affected regions of Chitwan district mixed ethnic communities are observed. Chhetri, Gurung, Magar, Chepang, Brahmin, Newar, etc. are the major ethnic communities around this region.

Among these Chepangs are the earliest known inhabitants of Nepal and one of most backward indigenous nationalities of Nepal. The total population of Chepang is 68,399 (2011, CBS) out of which male population is 34,620 and that of female population is 33,779. Chepangs live in the wildest imaginable state of nature and many of them still lead a primitive life. In case of project affected areas of Chitwan District total population of 556; 271 male and 285 female are residing in Kabilas VDC.

Chepang are the marginalized communities and are very backward in terms of livelihood status. Moreover, Gurung, Magar, and Newar are the indigenous people residing around the project area.

5.3.2.3. Mother Tongue

Nepali language is the mother tongue for large fraction of population around the project affected VDCs, which is followed by Magar, Gurung, Newar, and Chepang. The wide use of Nepali language for communication in every sector has negatively affected the native mother tongue in some ethnic communities around the project area.

5.3.2.4. Education

Among the project affected VDCs/Municipality, Bharatpur Municipality has the highest literacy rate, i.e. 85.34%. Furthermore, in case of Bharatpur Municipality the male literacy rate is 90.58% while the female literacy rate is 80.27% (CBS, 2011). Likewise the least literate VDC is the Chhimkeshwori VDC whose literacy rate is 55.29%. In this VDC 66.44% male and 46.70% female are literate (CBS, 2011).

5.3.2.5. Occupation

Agriculture is the main occupation of the local people around the project affected areas. Food crops are the dominant agricultural product in the project area. Similarly, in several parts of the project affected areas, local people have started to grow vegetables, which they sell in the nearest market centers. Moreover, large numbers of local people are even engaged in foreign employment as a part of their occupation.

5.3.2.6. *Income Pattern*

During the field survey, it was observed that the main sources of household income are agriculture, animal husbandry, and off-farm (non-agricultural) activities. Off-farm activities include professional services, petty trade, business (hotel and restaurant), cottage industry, pensions, wage labor and sale of non-timber forest products in the settlements along the proposed 220 kV TL route. Foreign remittance is now one of significant income sources to many households in the project area as in other parts of Nepal. Since the alignment is the touristic route, so tourism is another major income source of the people of project area. Annual income differs by caste/ethnic group and gender of the household head, with Magar, Gurung, Dalit (socially excluded castes), and female-headed households earning the lowest incomes. Cash expenditure in non-food item (education, medicine, festival, purchasing assets and consumption goods) as well as unproductive items (land, house, luxurious things) is higher in recent years.

5.3.2.7. *Agriculture and Livestock*

The project area consists of fertile cultivated land, forests, grazing land and barren land. The agricultural products mainly include food crops (paddy, wheat, maize, millets, and potato) and cash crops (oilseeds, fruits and vegetables). The cropping pattern in the project area is paddy-wheat, paddy-wheat-vegetable, paddy-oilseed-vegetable, paddy-pulses, paddy-vegetable, and maize-pulses–oilseed. People are mostly involved in agricultural activities. Livestock and poultry farming are also common in the project affected VDCs.

Livestock including goats, cattle, and buffalos, chickens are sold in the local market for supplementary income. Chemical fertilizers, insecticides and improved seeds for agriculture purposes are normally used in the project area. The main local markets in the project area are Besishar, Dumre, Abukhairini, Mugling, and Narayanghat.

5.3.2.8. Drinking Water Sources

The major sources of drinking water in the project affected VDCs is tapped or piped water followed by covered/uncovered well and spout water. And few households are using stream water as drinking water. The sources of drinking water supply are represented in the table below:

Table 5.11: Sources of Drinking Water

District	VDC/ Municipality	Total Household	Drinking Water Supply					
			Tapped	Tube well/ Hand pump	Covered well/Kuwa	Uncovered well/kuwa	Spout water	River/ Stream
Chitwan	Bharatpur Municipality	36,939	19,236	13,466	3,443	404	40	160
	Dahakhani	939	843	28		49		17
	Kabilas	1,164	893			117	72	82
Gorkha	Deurali	1,422	1293		61	55		
	Dhunwakot	1,110	831		22	208	18	27
	Chyangli	1,532	722		126	336	302	45
	Gaikhur	1,276	1068		12	144	51	
	Palungtar	2,108	1029		686	61	323	

Lamjung	Chiti	1,299	932	2		56	309	32
	Archalbot	424		2	18	22	15	4
	Bhorletar	1,033		870		56	102	
	Bharte	584		377	1	58	148	1
	Dhamilikuwa	1,154	860	6	10	99	144	32
	Mohoriyakot	571	504	1	12	27	19	2
	Sundarbazar	1,795	1607	25	9	2	117	16
	Tarkughat	772	726	1	5	13	16	9
Tanahu	ChokChisapani	1,028	911	1	13	68	25	5
	Bhanu	3,476	2,793	67	295	196	79	40
	Anbukhaireni	4,034	3,865	32	10	10	63	32
	Chhimkeshwori	356	274		1	27	8	46
	Purkot	1,894	941	11	97	280	547	1

Source: CBS, 2011

5.3.2.9. Types of fuel used for cooking

Majority of households around the project in all the districts are dependent on fuel wood for cooking purpose followed by LP Gas and bio-gas. The detail of type of fuel for cooking purpose is given in the table below:

Table 5.12: Types of fuel used for cooking

District	VDC/ Municipality	Total Household	Types of fuel used for cooking					
			Firewood	LP gas	Bio gas	Kerosene	Electricity	others
Chitwan	Bharatpur Municipality	36,939	7,205	27,421	1,416	468	31	108
	Dahakhani	939	934			3		
	Kabilas	1,164	1,089	61	6	1		
Gorkha	Deurali	1,422	1019	213	177			
	Dhunwakot	1,110	945	38	120			
	Chyangli	1,532	1356	38	132			
	Gaikhur	1,276	1129	76	56			
	Palungtar	2,108	1490	393	210			
Lamjung	Chiti	1,299	915	101	266	5	3	
	Archalbot	424	376	24	20		4	
	Bhorletar	1,033	623	289	179		2	
	Bharte	584	530	18	36			
	Dhamilikuwa	1,154	609	53	485		3	
	Mohoriyakot	571	517	11	25	9		
	Sundarbazar	1,795	597	882	260	19	13	
	Tarkughat	772	461	125	94		12	
Tanahu	ChokChisapani	1,028	725	56	233	6		
	Bhanu	3,476	2,109	655	656	23	7	
	Anbukhaireni	4,034	1,827	1885	243	9	50	
	Chhimkeshwori	356	349	4	3			
	Purkot	1,894	1,073	220	564	5	6	

Source: CBS, 2011

5.3.2.10. Sanitation

Sanitation prospective of the project area is only in satisfactory condition since there are still households without toilet facilities: the scenario of sanitary condition had been drawn on the basis of CBS, 2011 National Survey. The details of toilet facilities available in the project affected VDCs are given below:

Table 5.13: Types of toilet facilities

District	VDC/ Municipality	Total Household	Types of Toilet Facilities		
			Households without toilet	Flush Toilet	Ordinary Toilet
Chitwan	Bharatpur Municipality	36,939	323	32,952	3,462
	Dahakhani	939	144	254	540
	Kabilas	1,164	199	493	468
Gorkha	Deurali	1,422	36	1266	116
	Dhunwakot	1,110	331	476	303
	Chyangli	1,532	681	373	476
	Gaikhur	1,276	190	274	811
	Palungtar	2,108	333	1213	558
Lamjung	Chiti	1,299	188	737	374
	Archalbot	424	105	256	63
	Bhorletar	1,033	88	608	332
	Bharte	584	129	227	228
	Dhamilikuwa	1,154	57	626	471
	Mohoriyakot	571	117	252	202
	Sundarbazar	1,795	48	1483	145
	Tarkughat	772	166	455	151
Tanahu	ChokChisapani	1,028	137		688
	Bhanu	3,476	595	2091	787
	Anbukhaireni	4,034	295	3169	556
	Chhimkeshwori	356	244		112
	Purkot	1,894	238	1098	540

Source: CBS, 2011

5.3.3. Project Affected Families

5.3.3.1 Demography

The total households affected by the project are 48. Households' survey conducted from the affected households reveals that the total population of the project affected families is 285, where the female population is greater than that of male. Similarly, the average household size of the project affected families is 6.42. The detail of the demographic characteristics of the project affected families is tabulated in the table below:

Table5.14: Demographic characteristics of the project affected families.

SN	Total Households	Total Population	Male	Female	Average Family Size	Sex ratio
1	48	285	146	138	6.42	105.8

Source: Field Survey, 2016

Likewise, the majority of the population falls in the age group of 15-59 year, which is 65.86% and the rest are the dependent population of the age group 0-14 and senior citizen of age group 60 years and above.

Table5.15: Distribution of population by age group.

SN	Age Group (%)		
	0-14 years	15-59 years	60 and above
1	18.07	65.86	14.86

Source: Field Survey, 2016

Similarly, nuclear type of family is dominant in the project affected households. Out of the total 48 households, about 71% are nuclear family whereas, rest 29% are joint type of family.

Table5.16: Type of family of the project affected households.

Type of family	Frequency	Percent
Nuclear	34	70.8
Joint	14	29.2
Total	48	100.0

Source: Field Survey, 2016

Likewise, out of the 193 population belong to the age 15 and above, about 54% are married and about 39 are unmarried. Similarly, some are widow, divorced as well as living separately. The detail is tabulated below:

Table5.17: Marital status of the project affected population.

Status	Frequency	Percent
Unmarried	75	38.9
Married	104	53.9
Widow	11	5.7
Living Separately	2	1.0
Divorced	1	.5
Total	193	100.0

Source: Field Survey, 2016

5.3.3.2 Religion and Ethnicity

Hinduism and Buddhism are the only two religion followed by the project affected families. Besides, these two, no other religion are followed. Majority of the population are Hindus (89.6%) followed by Buddhist (10.4%).

Table5.18: Distribution of the affected households by religion.

Religion	Frequency	Percent
Buddhist	5	10.4
Hindu	43	89.6
Total	48	100.0

Source: Field Survey, 2016

Likewise, the project affected families are diverse in ethnic group and caste. About 31% of the households are Brahmin, 18.75% are Magar, 16.67% are Dalit, 14.58% are Newar, 10.42% are Chhetree and so on.

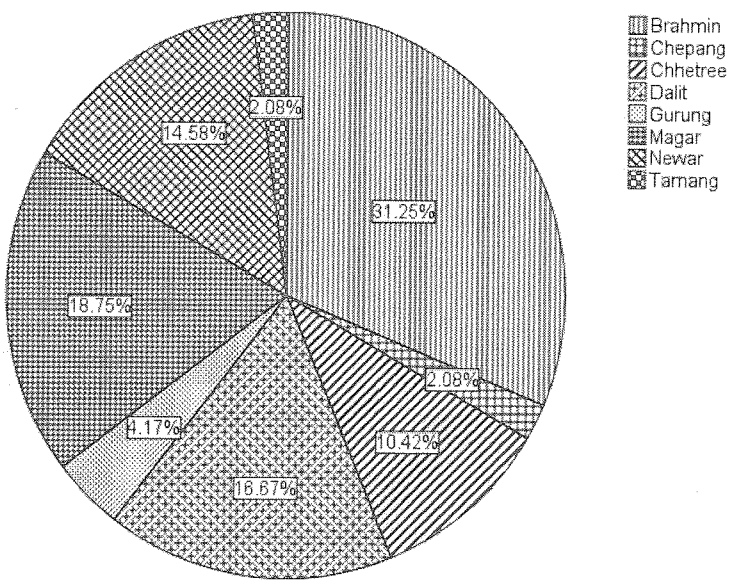


Figure 5.11: Ethnic composition of the project affected families (Source: Field Survey, 2016)

5.3.3.3 Mother Tongue

Nepali is the main mother tongue spoken by majority of the affected households. About 96% of the affected populations have Nepali as their mother tongue whereas; only about 4% of the population has Magar as their mother tongue.

Table 5.19: Distribution of the affected households by Mother Tongue.

Mother Tongue	Frequency	Percent

Magar	2	4.2
Nepali	46	95.8
Total	48	100.0

Source: Field Survey, 2016

5.3.3.4 Occupation

Agriculture is the main occupation of the project affected households. About 45% of the affected households have adopted agriculture as their main occupation. The other occupations rather than agriculture are foreign employment (10.3%), service (5.4%), wage labor (1.3%), cottage industries (1.8%), and students (30.9%) and so on. The table below depicts the detail of the occupational distribution of the affected households.

Table 5.20: Occupational composition of the affected population.

Occupation	Frequency	Percent
Agriculture	101	45.3
Wage labor in Nepal	3	1.3
Service	12	5.4
Foreign Employment	23	10.3
Cottage industries	4	1.8
Tea shop/Restaurant/Hotel	3	1.3
Store	4	1.8
Household works	2	.9
Student	69	30.9
Others	2	.9
Total	223	100.0

Source: Field Survey, 2016

5.3.3.5 Literacy

The household survey revealed that out of the total population, about 93% of the population is literate whereas, the rest 7% are illiterate. Likewise, out of the total population, 16.74% of people attended the primary education, 11.16% attended lower secondary, 18.145% attended the secondary, 11.16% attended higher secondary and only 2.33% attended bachelor level of education. The education attainment of the project affected population is presented in the figure below:

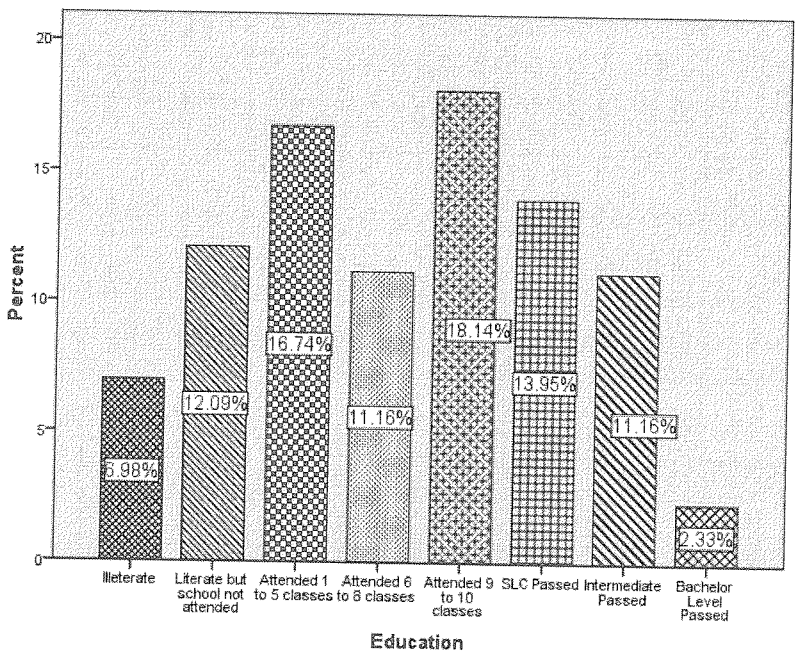


Figure 5.12: Educational attainment of the project affected population (Source: Field Survey, 2016)

5.3.3.6 Land Ownership status and Holding size

Household survey shows that about 15% of the affected households do not have their own land for cultivation. About 85% of the affected households have their own land for cultivation. The average land holding size of the households owing the land is estimated to be 16.06 ropani. The total and average land holding size of the project affected households is presented in the table below:

Table 5.23: Land holding of the project affected households.

Land Types	Total (Ropani)	Ropani/HH
Own Irrigable Khet	183.12	4.46634
Own Non-irrigable Khet	80.8	1.97073
Own Bari	346.11	8.44171
Own other land type	36.5	0.89024
Farmed others land	12	0.29268
Total	658.53	16.0617

Source: Field Survey, 2016

5.3.3.7 Drinking water

Public tap, well and piped water supply is the three major sources of drinking water of the project affected households. The household survey showed that 58.3% of the households relied on piped water supply, 31.2 on public tap and 10.4% on well. Likewise, the supply of drinking water is sufficient for 89.6% of the households and the remaining 10.4% of the households have

to rely on river and spout water during the dry months. The drinking water sources of the project affected households are presented in the table below:

Table 5.21: Drinking water sources of the project affected households.

Sources	Frequency	Percent
Well	5	10.4
Public Tap	15	31.2
Pipeline	28	58.3
Total	48	100.0

Source: Field Survey, 2016

5.3.3.8 Source of Energy

a. Cooking Fuel

Fuel wood is the main source of energy for cooking purpose of the affected households. About 83% of the households use fuel wood for cooking purpose while about 10% use LPG, about 2% use cow dung and about 4% use other sources. The source of energy of the affected households for cooking is tabulated below:

Table 5.23: Source of energy of affected households for cooking purpose.

Source of Energy	Frequency	Percent
Firewood	40	83.3
Cow dung	1	2.1
LPG	5	10.4
Others	2	4.2
Total	48	100.0

Source: Field Survey, 2016

Firewood is mostly collected from the community forest (56.41%), followed by private forest (17.95%). Likewise, about 8% collect the firewood from the government forest whereas about 10% of the households purchase from the market.

b. Lightning Fuel

Out of the total affected households, about 94% of the households use electricity for lightning. Likewise, about 4% use solar for lightning and about 2% use candles.

Table 5.24: Sources of Lighting

Source of Energy	Percent
Electricity	94%

Solar	4%
Candles	2%

Source: Field Survey 2016

5.3.3.9 Health and Sanitation

About 98% of the affected households have their own toilet facility for defecation, whereas, the remaining 2% used open field for the defecation purpose. Solid waste management of the area is found to be satisfactory. Out of the total affected households, about 44% burn the wastes, about 25% dump the waste in safe place, about 10% burry the waste whereas about 21% use other management practices such as composting, dumping in rivers, etc.

Table 5.25: Defecation Practice of the project affected households.

Defecation	Frequency	Percent
Own Toilet	47	97.9
Open land	1	2.1
Total	48	100.0

Source: Field Survey, 2016

Table5.26: Solid waste management practice of the project affected households.

Solid waste management	Frequency	Percent
Dumping	12	25.0
Burning	21	43.8
Burying	5	10.4
Others	10	20.8
Total	48	100.0

Source: Field Survey, 2016

The major health problems faced by the project affected families are asthma, goiter, jaundice, kidney stone, piles, stomach problems, urine problems, heart and brain problems, etc. The project affected families consult doctors and use medicine for the treatment of the diseases rather than consulting to the quake doctors. The patients visit to the hospitals and clinics around Chitwan, Bharatpur, Dumre, Kathmandu, Pokhara for their treatment.

5.3.3.10 Knowledge and attitude regarding the project

Out of the total affected households, 83.3% of the households are aware about the proposed project and its activities. The main sources of the information about the project activity are through neighbors, friends and survey. Likewise, all the households showed their positive attitude towards the proposed project.

5.3.3.11 *Expectation from the project*

The expectation of the project affected families from the project is mainly for good compensation for the land and property, employment and access to electricity. The detail of the expectation of the project affected families from the project is tabulated below:

Table 5.27: Expectation from the project.

Expectation	Frequency	Percent
Good compensation	21	43.8
Employment	17	35.4
Access to electricity	4	8.3
Total	48	100.0

Source: Field Survey, 2016

5.3.3.12 *Description of the house of the project affected families*

About 98% of the project affected households have their own house for residence and remaining 2% lived in the rented house. The wall of the houses is usually constructed with mud and stone/ brick (60.4%), wood (4.2%), Hollow Brick (2.1%), and cement and brick/ stone (33.3%). Likewise, mud (56.2%), Stone/ brick (4.2%) and cement (39.6%) are used on their floor.

Table 5.28 Materials used in the wall of the house.

Wall of the house	Frequency	Percent
Cement and Brick/Stone	16	33.3
Mud and Brick/Stone	29	60.4
Wooden	2	4.2
Hollow Block	1	2.1
Total	48	100.0

Source: Field Survey, 2016

Table 5.29Materials used in the floor of the house

Floor of the house	Frequency	Percent
Mud	27	56.2
Stone/Brick	2	4.2
Cement/Tayel/Marbel	19	39.6
Total	48	100.0

Source: Field Survey, 2016

CHAPTER SIX: ENVIRONMENTAL IMPACTS ASSOCIATED WITH PROJECT IMPLEMENTATION

This chapter deals about both positive and negative impacts associated with the implementation of the proposed project. For these overall environmental impacts due to project implementation has been divided into two broad sections, i.e. beneficial impacts and adverse impacts. Among those two broad sections, adverse impacts are further classified into three environmental domains, viz. Physical Environment, Biological Environment and Socio-economic and Cultural Environment.

6.1 Beneficial Impacts

6.1.1 Construction Phase

A. Benefit due to utilization of local resources and manpower

The implementation of proposed project will require the utilization of locally available resources and manpower. Local resources will include locally available construction materials and goods and services for construction workers. Similarly, the completion of the proposed project will require about 300 workers, which can be sourced locally to the extent possible. This will enhance the local business, local economic activities and revenue. Hence, the local economy during the construction phase will be uplifted to some extent.

This impact is anticipated to be direct, medium in magnitude, regional in extent and short term in duration.

B. Benefit due to increase in local skills in the project area

During the implementation of the proposed project, both skilled and unskilled manpower will be sourced from the local area to the extent possible. The major activities during the construction phase would be the civil works associated with the construction of tower foundation, steel works related to tower erecting and conductor fitting. While working together with the skilled manpower, unskilled people will also get chance to learn and enhance their skills, which would bring positive aspect in their life.

This impact is anticipated to be direct, low in magnitude, regional in extent and short term in duration.

C. Benefit due to upgrading of existing road

For the transportation of project related materials, upgrading of existing roads around the project area is essential. Almost all of the road sections are to be upgraded for the movement of vehicles carrying construction materials. In particular, road alignment from Abukhairini Municipality to Chhimkeswori VDC requires special attention. The up gradation of existing road will be beneficial to both project and local people, as there will be enhanced transportation facilities with minimized accidental risk.

This impact is anticipated to be direct, medium in magnitude, regional in extent and long term in duration.

D. Benefit due to landslide and soil erosion control

There are several spots along the T/L route and tower location that are particularly vulnerable to landslides and soil erosion. Project will implement erosion and slides control measures before constructing the transmission line tower. This will even benefit the surrounding land owners.

This impact is anticipated to the direct, medium in magnitude, site specific in nature and medium term in duration.

6.1.2 Operation Phase

A. Provide opportunities for hydropower development due to construction of power transmission line

Lamjung district is a hub for hydropower generation. Several power project are under study, many are under construction and even some have started production. Thus, in this context construction of proposed transmission line will be crucial for the evacuation of the power produced and further adds the opportunities for the development of new projects.

This impact is anticipated to be direct, high in magnitude, regional in extent and long term in duration.

B. Increase in forest area and restoration of biodiversity due to compensatory plantation

The trees that need to be cleared due to the project will be compensated through the compensatory plantation in the ratio 1:25. In this context for every trees cut, two other trees will be planted. Likewise, management and maintenance of those planted trees will also be done for next 5 years. Hence, the greenery shall be increased and the forest shall be expanded due to the compensatory plantation. Similarly, the local plants especially those species felled during the forest clearance will be planted during compensatory plantation so this will help to restoration of biodiversity.

This impact is anticipated to be indirect, high magnitude, local in extent and long term in duration.

6.2 Adverse Impacts

6.2.1 Physical Environment

6.2.1.1 Pre-Construction Phase

A. Land clearance

Prior to the excavation for foundation and other construction works, site clearance is essential. Site/land clearance will involve cutting trees, bushes and other ground vegetation. In case of

agricultural land, site clearance will involve the leveling terraces, removing crops (if any), etc. Thus, this pre construction activity will particularly cause the loss of trees, and other ground vegetation, removal of crops and even slight alteration in the topography of the tower locations. *This impact is anticipated to be direct, medium in magnitude, site specific in extent and long term in duration.*

B. Setting labor's and contractor's camp

The project has proposed to set temporary labor's camp at 12 different locations. The duration of operation of each of that camp is very less and the number of workers involved for the construction of tower pad will be low. Moreover, while setting labor's camp vegetation clearance will not be done. So, the impact associated with labor's camp will not significant. The details of labor's camp are presented in table 2.4.

Furthermore, there will be three contractor's camp which will be set within the substation premises so that no additional land has to be cleared to set contractor's camp.
This impact is envisaged to be low in magnitude, site specific in extent and short term in duration.

C. Land clearance for stockpiling

The project has proposed six different locations for the material stockpiling. All the proposed sites are located on barren land, where vegetation clearance, land labeling and earth works are not required. *Hence the impact is insignificant.* The details of the stockpiling sites are presented in table 6.1.

Table 6.1: Proposed sites for material stockpiling

District	VDC/Municipality	Place	Area (ha)
Lamjung	Besisahar	Udipur SS	0.34
Lamjung	Sundarbazar	Bhoteodar	0.42
Gorkha	Palungtar	Old Airport	0.5
Tanahaun	Aabukhaireni	Markichowk SS	0.3
Chitwan	Bharatpur	Aaptari SS	0.4

Source: Field Survey, 2016

D. Quarrying of construction materials

The project will not require tremendous quantities of coarse and fine aggregates. Due to the presence of dams/diversions for hydropower generation, river bank deposits at an extractable quantity are not present along the banks of Marsyangdi River. Trishuli River (between Muglin and Narayanghat) has deposited fine aggregates along this bank. However, extraction and transportation of those materials will only be feasible for the towers located near the Narayanghat – Muglin Highway. For all other angle towers, both coarse and fine aggregates have

to be derived from licensed suppliers. *Thus, the project will not operate quarry itself and this impact is not significant.*

E. Clearance for approach road

Almost all of the angle towers can be approached by the motorable track to its close vicinity, except for five angle towers in Chhimkeswori VDC. However, all of the angle towers are accessible through foot trails. The project will not construct additional motorable track to transport the construction materials up to the tower location. Hence, all the construction materials will be transported up to the nearest road head through vehicles and then the up to the construction site manually by the workers through foot trails. **(while transportation of construction materials and towers to the site manually, the OHS standard will be followed strictly)** While clearing the approach roads for the smooth transportation of construction materials bushes and ground vegetation would be cleared, but none of the trees will be cut.
This impact is anticipated to be low in magnitude, site specific in extent and short term in duration.

6.2.1.2 Construction Phase

A. Change in topography, land management and land use pattern

The land interference during construction of the T/L is related to the tower foundation, substations and lack of restraint of the RoW. This may result in the change in landscape. No other change in topography is envisaged during this phase.

However, project will bring significant change in land use. There will be both permanent and temporary changes in land use; the permanent change includes the land where tower pad structures are located. Similarly, other is the restriction in certain activities under ROW. Likewise, temporary land use changes during transmission line construction are due to construction of camp site and storage of construction materials. *Thus, the impacts are long term, local and moderate in magnitude.*

B. Impact on Air, Noise and Water Quality

The construction activities consist of site clearance, excavation for the tower, concreting and stringing of the line. These activities will generate dust in the surrounding area. Apart from these activities, movement of transporting vehicles carrying the construction materials along the gravel roads will generate fugitive as well as combustion emissions and will cause temporary impact on air quality.

Since the construction activities are limited to small area, the impact on the ambient air quality will be low in magnitude, site specific in terms of extent and of short duration. The emission of noise and vibrations are inevitable during construction though only insignificant interruption in noise quality has been expected for TL projects. The location of the Angle towers especially in the hilly region are relatively far from the settlements except for angle towers which are close to

settlement area will feel the noise disturbances due to vehicular movement and construction activities. Noise pollution will be temporary and will not be different from the prevailing conditions due to low traffic movement along the roadside. *The impact is expected to be low in magnitude, site specific and for a short duration.*

C. Impact on Drainage System

Marsyangdi, Trishuli and Narayani are the major rivers near the transmission line alignment. The portion of transmission line from Udipur to Markichowk traverses along the Marsyangdi Corridor. The tower pads along the Marsyangdi Corridor are proposed over a flat stable river terraces with land use either agricultural or forested. As the tower pads are located at a significant distance from rivers, streams, gullies, etc. over the stable land, interference with drainage system due to construction of tower pads will be minimal. However, the activities like site clearing, stringing of the line and excavation for foundation would create some alteration in drainage condition as such activities would enhance erosion due to vegetation removal.

Likewise, the transmission line traverses through a very complex topography from Markichowk to Bharatpur. Construction of tower pads over the Mahabharat Hills of Chimkeswori VDC and Chure Hills of Kabilas would trigger soil erosion and even alter small drainage networks. However, the tower location selection is done in such a way that there would be minimal environmental hazards associated with tower construction.

Though the area required for tower pad construction may vary depending on gradient, location and weight of towers, approximately 225 m^2 of land will be disturbed for each tower pad. The earth work associated with tower construction will be confined to the tower base area with low impact on the adjoining areas. Nevertheless, the cultivated area around the tower pads may be affected due to compaction during the construction and transportation of materials.

Disruption of natural drainages system and soil erosion while stringing the line across the river can be anticipated during the construction phase. However, since Angle towers are not located near the river or streams the probability of the disruption of natural drainages will be insignificant. Since, the requirement of land for the construction of tower foundation is limited, the impact on drainage and soil erosion is envisaged to be low. *Therefore, the impact is expected to be site specific, low in magnitude and for short term.*

D. Impact due to landslide and soil erosion

The Udipur – Markichowk section of the Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL passes through the flat stable river terraces. The transmission line alignment from AP-62 to AP-63 locates beside Marsyangdi River, where flooding and sagging problem may be occurred. Similarly, AP-75 is located in near the top of the hill, and the excavation for the tower pad construction would result in soil erosion and small slides. Furthermore, the transmission line alignment from AP-75 to Ap-79 traverses along the base of steep hill slope. Thus, the

construction of foundation and stringing of conductor would cause small landslides and soil erosion.

On the other hand, due to the rugged topography over the Markichowk – Bharatpur section; there are several critical Angle towers from the landslide and erosion perspectives. In particular AP-1, AP-12, AP-13, AP-16, AP-17, AP-20, AP-21, AP-27, AP-28 and AP-30 are particularly vulnerable to slope failure and special treatment is required for those particular locations. *This impact is anticipated to be of medium in magnitude, site specific in nature and short term in duration.*

E. Impact due to storage of construction materials

Haphazard storage of construction materials would result in land degradation and even sometimes water and air pollution. Steel bars, cement, aggregates, etc. are the major construction materials that are used for the construction of transmission towers. For an individual tower, the amount of construction material required will not be huge to cause significant alteration in the environmental components. Furthermore, the construction materials will be stored in prescribed site, and the materials will be transported to the construction site on need basis. The risks associated with the storage of construction materials are; if the construction materials are stored without spreading the tarpaulin on the ground, it may degrade the land, uncovered sand and aggregate may be blown by wind adding particulate matters in the atmosphere and during rainy season runoff could flush the construction materials from the storage site, which would cause sediment deposit in downstream region, with possibility over agricultural land. *This impact is anticipated to be low in significance, site specific in extent and short term in duration.*

F. Impact due to waste and spoil disposal

The improper disposal of solid waste like cement bags, iron bars and other leftover construction materials, kitchen waste and waste generated by the temporary labor camp would cause adverse impact in the environment. The spoil generated due to excavation of tower pad is also detrimental to land and water quality of the area. However, more than 90% of the volume of spoil generated from the excavation of foundation for tower pad will be used for back filling and compaction and remaining 10% of the volume of spoil will be deposited near foundation site, back fill around the slope protection structures and gravel the access road. Likewise, the Udipur substation is proposed over a football ground used by Nepal Army. The spoil excavated during the construction of substation will be used by Nepal Army to prepare another football ground. *The magnitude of impact is considered to be low, extent is site specific and duration is short term.*

G. Safety measures and precaution to minimize the risk associated with construction related accidents

The construction activities of Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV TL will involve excavation of foundation, slope protection, erection of towers and stringing conductor. There are physical risks associated with each of the activities. In particular, tower erection and

conductor stringing requires specialized manpower and technologies. The project will deploy technical manpower during construction period with complete occupational health and safety measures. Further, the construction activities (particularly excavation of foundation) could trigger slope failure around the geologically fragile tower locations, which would even adversely affect the settlements downhill. The project will take necessary steps over those vulnerable sites to minimize the risk during construction period. *This impact is anticipated to be medium in magnitude, site specific in nature and short term in duration.*

H. Impact due to hazardous waste and chemical

The major hazardous waste that will be generated during construction phase is paint. Handling of the paint is crucial since its haphazard handling or leakage can impact land and water adversely. The impact is low in magnitude, site specific in extent and short term in duration. *Thus, this impact is not significant.*

6.2.1.3 Operation Phase

I. Interference to road crossing, transmission line, telecommunication, radio, TV and other utilities

The proposed transmission line alignment crosses road, rivers, TL of 132 & 32 kV and other structures. Crossings of communication utilities and transmission and distribution lines will result in the interferences to the communication system. Radio interference can disrupt television and AM (amplitude modulated) radio reception close to the line. Interference can sometime be noticed at a distance of 150 m away. By contrast, FM (frequency modulated) system is affected very little by interference. Interference varies according to the position of the TL between transmitter and receiver. In some cases, receiving condition can be improved due to the reflections caused by the TL. Since, the towers height and conductor height (upon sagging) has been proposed in such a way that standard minimal crossing height with roads, rivers, TL, settlements, forests, etc. have been maintained. Furthermore, along the large fraction of its alignment, the TL traverses at about a distance of 500 m from the settlement and for most of the settlement the magnitude of this impact is insignificant.
Hence, this impact is anticipated to be low, local and long term.

***J.* Change in land use pattern along the RoW of the transmission line alignment**

There will be permanent change in land use on the land acquired for substation and towers, where the magnitude of impact will be high. Similarly, the land under the RoW will be restricted for the erection of any type of public and private structures except for the plantation of dwarf tree species, and cultivation. All the temporary land acquired will be converted to its original use or agreed new uses towards the end of the construction period and handed over to their owners.
This impact is anticipated to be high in magnitude, local in extent and long-term in duration.

K. Impact on aviation

The nearest airport from the proposed project alignment is the Bharatpur Airport. The Aaptari substation is at an aerial distance of 4 Km from the Bharatpur Airport. Although the transmission line alignment and substation is at a closest distance from the airport, the alignment does not line below the flight route which would alter landing and takeoff of the aircrafts in Bharatpur Airport. Furthermore, the Markichowk – Udipur section being proposed along the Marsyangdi corridor will not affect the Kathmandu – Pokhara flight route. The rest of the section (Markichowk – Bharatpur) doesn't lie below the aviation route and will not affect the movement of aircrafts. Similarly, reflectors will be used to locate TL so as to avoid any accidents regarding immediate landing of helicopters. *So, there will be no any significant impact.*

L. Direct/Indirect Electromagnetic Field Impact

The electromagnetic fields are associated with high voltage transmission line. The strength of electromagnetic decreases significantly with increasing distance from the source. The effect of electromagnetic field is seen prominent with living things like human, plants, animals along with vehicles, fences and buried pipes under & close to these lines. Similarly, the transmission line may cause disturbance in communication and electronic equipment due to high voltage. However, transmission line alignment has avoided human settlement area as far as possible, and has provision of 30 m ROW, which is sufficient line clearance across the structure. *The envisaged impact is of long term duration, site specific in extent and low in magnitude.*

M. Impacts on Aesthetic Values

The galvanized lattice steel structures and strung cable across the landscape decreases the aesthetic value along the project alignment which is a concern to nature admirers. *This impact is unavoidable which is long term in duration, site specific (along ROW of TL) and low in magnitude.*

6.2.2 Biological Environment

6.2.2.1 Pre-construction Phase

A. Vegetation clearance for setting workers camp

Since, all the worker's camps are proposed over a location where vegetation clearance is not required, *this impact is insignificant.*

B. Vegetation clearance during site clearance

Based on the detailed survey of the proposed TL alignment, out of 70 APs 32 are located in the forest which will require total 0.72 ha forest area (area occupied by each tower pad = 15 m ×15 m). Thus, the vegetation present within above mentioned 0.72 ha occupied by the tower pad have to be cleared. The details of forest loss will be discussed in subsequent sections.

This impact is anticipated to be medium in significance, local in nature and long term in duration.

C. Disturbance to wildlife due to construction works

The overall transmission line alignment except for the Aaptari area traverses through the settlement and the edges of community forests which are not the habitat of wildlife and even the movement of wildlife is limited. The transmission line alignment from the Jugedi area to Aaptari substation is parallel to Narayanghat – Muglin Highway. Furthermore, the construction works will be limited to daylight hours only and the probability of disturbing the movement of wildlife, particularly during pre-construction phase is *insignificant*.

6.2.2.2 Construction Phase

A. Loss of forested land, vegetation and biodiversity

The total forest area falling under the RoW of TL alignment including area occupied by APs is 30.2 ha. About half (47%) of the transmission line alignment passes through the forest area which is highest in Chitwan district occupying three forth (74%) of total alignment length.

Based on the available detailed survey report of the proposed TL alignment, out of 70 angle towers (APs) 32 are located in the forest which will require total 0.72 ha forest area (area occupied by each tower pad = 15 m x 15 m). The TL including AP passes through different community forest, leasehold forest and national forests. In addition to 32 APs, an estimated number of suspension towers are to be placed in forest area, though the exact number shall only be finalized in detail survey. One third of the transmission line passes through the forest area.

Based on the total enumeration of forest vegetation in AP and under RoW of TL, total of 2,785 trees 2,739 poles and 222,364 regenerations (seedlings and saplings) of different species will be removed. Estimated volume of timber and fuel wood from the removal of forest vegetation will be 135,354.12 cubic feet (equivalent to 3,834.39 cubic meter) and 126.13 chatta (stacks) respectively during the project construction period as illustrated in table 6.2.

Table6.2: Total forest vegetation loss according to district and forest

SN	Type of forest	District	No. of forest	Forest area (ha)	Loss of vegetation (number)				Standing volume	
					Regeneration (<5"dbh)	Pol(5-11" dbh)	Trees (>11" dbh)	Total	Timber (cft)	Fuel wood (chatta)
1	Community Forest	Chitwan	2	6.5625	52,550	416	466	53,432	29,264.07	49.33
		Gorkha	7	13.41	11929	802	459	13,090	8,588.23	6.47
		Lamjung	9	18.93	52077	402	366	52,845	**5,850.91**	**8.23**
		Tanahu	2	4.93	14,528	55	19	14,602	448.77	0.38
		Sub-total	**20**	**43.84**	**131,084**	**1,675**	**1,310**	**133,969**	**44,151.98**	**64.41**
2	Government Forest	Chitwan	4	24.27	11,422	656	1361	13440	88,449.20	58.78
		Gorkha	6	2.30	1409	102	48	1560	1,134.35	1.24
		Lamjung	1	4.17	22,718	44	3	22,765	53.12	0.14

SN	Type of forest	District	No. of forest	Forest area (ha)	Loss of vegetation (number)				Standing volume	
					Regeneration (<5"dbh)	Pol(5-11" dbh)	Trees (>11" dbh)	Total	Timber (cft)	Fuel wood (chatta)
		Tanahu	5	12.76	54,939	238	43	55,220	1,254.36	1.14
		Sub-total	**16**	**43.51**	**90,488**	**1,040**	**1,455**	**92,985**	**90,891.03**	**61.30**
3	Leasehold Forest	Chitwan	1	0.69	700	9	2	711	115.85	0.06
		Gorkha	2	2.62	92	15	16	123	195.26	0.35
		Lamjung	-	-	-	-	-	-	-	-
		Tanahu	-	-	-	-	-	-	-	-
		Sub-total	**3**	**3.31**	**792**	**24**	**18**	**834**	**311.11**	**0.41**
	Grand total		**39**	**90.65**	**222364**	**2739**	**2783**	**227786**	**135,354.12**	**126.13**

(*Source: Field survey, 2016*)

Forest loss will be highest in community forests (in terms of number and area) followed by national forests. Leasehold forests will be least affected (3 LHFs with 3.31 ha area). However, loss of timber volume will be more from national forest as substantial area of national forests lies under TL alignment in Chitwan district with good quality trees. Refer **Annex H** for details. Similarly, the clearance of the forest area required for the project will also impact the local biodiversity status as the linear open stretch due to transmission line will affect natural propagation of the plants.

Since all trees will be removed, it will diminish the crown cover of the forest along the TL corridor. The impact due to the loss of vegetation during project implementation is expected to be medium in magnitude, local in extent and long term in duration.

B. Issue associated with forest encroachment and forest fire

The forest land required for the completion of the proposed project includes land occupied by the tower pad (where the growth of vegetation will be restricted) and forest land under the RoW of the transmission line. The route selection for the transmission line has been done in such a way that, most of the Angle towers, except for the section between Jugedi to Aaptari and Archalbot to Garam Besi are proposed over the ridges of hills. Due to this reason, clearance between the forest crown and conductor can be achieved and very small number of trees near the tower pad has to be removed. The section between Jugedi and Aaptari traverses parallel to Narayanghat – Muglin Road and existing 132 kV transmission line alignments. The maximum distance between Narayanghat – Muglin Road and proposed alignment is 300 m. This will prevent the fragmentation of core forest area. However, as the Jugedi – Aaptari section consists of old growth Sal forest, trees under the RoW of the transmission line has to be completely cleared. Since, none of the permanent structures are made except transmission facilities there is a very minimal probability of forest encroachment from the project construction.

The mechanical activities related to tower construction with the frequent use of electrical devices could cause accidental fire hazards. Likewise, there is the chance of spreading fire from the

worker's camp which would lead to the forest fire. However, reduction in use of flammable matter as far as possible, prohibiting smoking around forest area, safe storage of fuel will reduce the probability of forest fire. *Further, short term training workers about fire hazards and prevention mechanism will reduce accidental fire from camps so the impact is anticipated to be medium in significance, local in extent and short term in duration.*

C. Loss of natural habitat and alteration of habitat

The construction of transmission line will cause the loss of trees within the tower pad location and under the RoW of the transmission line. About 90.65 ha of forest falls under the RoW of transmission line including angle towers, large sections of the transmission line passes through the forest edge, without fragmenting the core forest area. However, there will be considerable shrinking of the natural habitat which will directly or indirectly pose adverse impacts on the wildlife species.

This impact is anticipated to be medium significance, local in extent and long term in duration.

D. Impact due to increase in demand for fuel wood and timber by construction crew

Gorkha is one of the severely affected district and most of the houses along the settlement of proposed project have been destroyed by the earthquake of 12 Baisakh 2072 and aftershocks. There is an urgent need of timber for the building of the houses. So, the timber acquired from the cutting of the trees will be used by the local people that will reduce the further pressure on forests.

It is assumed that most of the labor force will be from local areas. There will be a few people from outside the project area for a short period of time. *Due to this, the increase in demand of fuel wood and timber during the construction period is expected to be low in magnitude, site specific and short-termed.*

E. Impact due to harvesting of non-timber forest products

There will be small number of work force involved in the project construction, so the chances of collection and sale of NTFPs by workers will be negligible. Furthermore, DFO in coordination with CFUGs/LHFGs impose strict rules as per Forest Regulation 1995 regarding the collection of NTFPs in community/leasehold forests. *Hence, this impact is not significant.*

F. Impact on wildlife movement, feeding and other activities

The possible adverse impacts on wildlife and avifauna population during the project construction phase are loss of physical habitat and food habitat, possibility of hunting and poaching by labor force and disturbance in the migratory movement of mammals and birds.

The construction disturbances resulting from digging of foundation, vehicle movement, transportation of materials, and other related activities would interrupt normal movements, feeding and other activities of mammals available in the surrounding areas. The linear clearance of a 30 m wide strip of habitat allows most species to migrate to adjoining areas. However,

construction activities may affect migratory movement of birds resulting in the temporary disturbance to their normal route. The possibilities of hunting and poaching by work force during the construction period will have some adverse impact on local wild fauna. However, such pressure on wildlife will be site specific and will decrease once the work is completed. *Since the project area is not observed to be the ecologically significant, core and undisturbed habitat; the magnitude of impact on wild animals and birds is considered to be low, extent is site specific and duration is of short term.*

G. Impact due to movement of labor force and their activities in forest area

The proposed transmission line does not pass through the core forested area with significantly large number of critical and endangered flora and fauna. Almost all of the Angle towers are located along the sparse forest and forest edges. The only dense forest located along the transmission line alignment is the Satanchuli and Jaldevi forest in Chitwan district. But the transmission line over that forest traverses parallel to the Narayanghat – Muglin Road and existing 132 kV transmission line and there are five Angle towers at a very close proximity with the Highway. Thus, there will not be significant impact due to the movement of labor force and their activities in forest area.

The magnitude of this impact is anticipated to be low in significance, site specific in extent and short term in duration.

H. Impact on rare, endangered, protected and threatened species of flora and fauna

Because of different construction activities and influx of outsiders, pressure on the vegetation and the forest will increase. Physical habitats, feeding habits, reproductive behaviors and movement of wild animals and birds might be disturbed due to construction activities and increased human presence in and around the project area. This might change the existing ecosystem diversity altering natural communities of plants and animals. Ultimately rare, endangered and threatened plant and animal species will be more prone to such adverse impacts. *The magnitude of impact is considered to be medium, extent will be site specific and duration will be long-term.*

I. Impact on Aquatic Life

The areas of river crossing might be affected during the construction of transmission line. Such as the addition of sediment and erosion from construction activities and storm runoff may increase turbidity of surface which ultimately impacts the aquatic life. *The impact will be site specific in extent, medium in significance and short term in duration.*

J. Illegal hunting and poaching activities

The project alignment passes along forest region. During the construction period there will be the influx of numbers of construction workers from different parts of the country. Some of the construction workers may involve in illegal hunting and poaching activities which would affect the threatened and rare plants and animals. *This impact will be medium in magnitude, local in extent and short term in duration.*

6.2.2.3 Operational Phase

A. Impact due to clearance of vegetation for RoW management

During operation phase of the project, only trees which grow under the RoW after some years might need to be cleared. Regular trimming of tall trees and allowing growing shrubs and short trees will change the vegetation cover. Similarly, Clearance of trees along the ROW will create open linear stretches in the forest. The linear open stretch thus created in the forest area may become barrier to natural propagation of plants. Thus, the biodiversity of the project area and the status of rare, endangered plants might be severely affected. This impact is low, site specific (local), and long-termed.

In terms of the biological environment, the people of project area will reap beneficial impacts from the project's forestation program that will be implemented to replenish the loss of forest and vegetation especially in the project affected CFs/LHFs/NFs.
This impact will be of medium significance, local in extent and medium term in duration.

B. Electrocution of birds and mammals

Especially high flying birds of prey such as eagles, raptors, and large vultures use river valleys as flyways. Power lines across river valleys can cause bird deaths by electrocution and collision. Birds sitting on power poles or power lines are killed if they cause short circuits between energized lines or short-to- ground. The large wingspan of some of these birds appears to be the single most important factor in their susceptibility to electrocution. In addition to their size, the perching behavior of these bird species puts them at greater risk. Species that prefer exposed high perches are more likely to be attracted to power poles, as are the species that use a "still hunting" technique in which they perch and visually search the landscape for prey rather than hunting in flight. In flight, birds can collide into power lines as power cables are often difficult to see, especially in fog-prone areas. Whereas resident birds can adapt to obstacles in their habitat birds on migration and stop overs can hardly adapt as they remain in the area only for a short time. *This impact is medium in magnitude, site specific and long time in duration.*

C. Impact on wildlife due to fragmentation of habitat

The transmission line alignment mainly passes through forest edges. Forest around the Aaptari substation is of great significance in terms of biodiversity. However, the transmission line across the Aaptari Forest has been aligned closely parallel to the Narayanghat – Muglin Road which will not further fragment the forest. Hence, the impact on wildlife is also mimimal.
This impact will be low in magnitude, site specific in extent and medium termed in duration.

D. Impact due to increased access to the forest

After the construction of the project, construction workers will not enter the forest and the management of the forest will be done by the respective community forest users group. Hence, there will not be the access of outsiders to the forest.
This impact will be low in magnitude, site specific in extent and short termed in duration.

6.2.3 Socio-economic and Cultural Environment

6.2.3.1 Pre-construction Phase

A. Issues associated with land acquisition, houses, sheds and other property

Large numbers of Angle towers of the proposed transmission line are located in either forest or cultivated land. Average land occupancy of each of the angle tower is 15 m × 15 m. Similarly, large quantity of land area and few houses and sheds fall under the RoW of the transmission line alignment. This will affect hundreds of households directly and indirectly. During the interaction with the local people, they suggested that they will only support the development of the project, unless they get cent percent compensation to the land lying below the RoW of transmission. Such demand of local people will certainly create adverse environment towards project development.

This impact is anticipated to be medium in magnitude, local in extent and short term in duration.

B. Social issues associated with route selection

There were objections from the local people around Bhanu Municipality during the TL route selection. Due to this there were several revisions in the alignment before it was finalized. However, local people even after the finalization of the transmission line route are not openly supporting towards the project development.

This impact is anticipated to be medium in magnitude, local in extent and short term in duration.

6.2.3.2 Construction Phase

A. Impact due to land encroachment and land management

Out of total 101 APs, 62 are located on the private land belonging to 48 owners (repeated owners for certain land parcels) that has been used for cultivation. The total private land requirement for the construction of APs is 1.395 ha and out of that 0.8325 ha is Khet, 0.4725 ha is Bari and 0.09 ha is others (nursery, fruit garden and barren). The project will prepare separate resettlement plan to incorporate the land under the RoW of the transmission line.

Table 6.3: Land under the RoW

S.N.	Land Use	Area (ha)
1.	Khet	0.8325
2.	Bari	0.4725
3.	Others (Nursery, fruit garden and barren)	0.09

Source: Field Survey, 2016

This impact is anticipated to be medium in significance, local in extent and medium term in duration.

B. Impact due to relocation and/or resettlement

No any structures have to be relocated because of tower construction. However, there are several houses and private structures that fall under the Row of the proposed transmission line alignment. In particular, the numbers of houses under RoW are significantly high along Markichowk – Bharatpur section compared to Udipur – Markichowk section. The detail information on houses that fall under the RoW of the transmission line alignment is presented in table 6.4 and 6.5.

Table 6.4: Houses under RoW of transmission line along Udipur – Markichowk section

Chainage	Structure	Distance from Center
19+530	House	13.6 m right from center line
21+265	House	12.6 m from center line

Source: Field survey, 2016

Table 6.5: Houses/structures under RoW of transmission line along Markichowk – Bharatpur section

Chainage	Structures	Distance from Center
1+104	House	Centerline (approx. 100 m below from the alignment)
1+128	House	1.5 m from the centerline/far below
1+542	House	13 m from the centerline/far below
1+552	House	6 m from the centerline/right side
1+564	House	2 m from the centerline/right
1+566	House	At Centerline
1+581	House	5 m from the centerline/left
1+600	House	15.5 m from the centerline/left
1+772	House	2.5 m from the centerline/right
1+802	House	7.5 m from the centerline/right
1+831	House	7 m from the centerline/left
1+916	House	Centerline
1+943	House	Centerline
2+005	House	2 m from the centerline/right
2+037	House	7.5 m from the centerline/right
2+064	House	12.5 m from the centerline/right
2+119	Hut (house)	13 m from the centerline/left
2+765	House	4 m from the centerline/left
2+936	House	9 m from the centerline/right
5+595	Goth	5.5 m from the centerline/right
7+360	House	10 m from the centerline
7+379	Goth	centerline
7+630	Goth	7 m from the centerline/left
8+653	Goth	7 m from the centerline/right

Chainage	Structures	Distance from Center
8+661	House	6 m from the centerline/left
8+662	House	4 m from the centerline/right
9+400	Goth	10 m from the centerline/right
13+454	House	10 m from the centerline/right
13+554	House	Centerline
18+214	House	12.5 m from the centerline/left
19+459	House	8 m from the centerline/left
19+680	House	14.5 m from the centerline/right

Source: Field Survey, 2016

This impact is anticipated to be medium in significance, local in extent and medium term in significance.

C. Impact due to occupation health and safety hazards

Work related injuries and vehicle accidents are likely impacts expected during the construction of the project. *The magnitude of impact is low, the extent is site specific and the duration is short term.*

D. Impact due to loss of standing crops and farming hindrances

Total annual crop loss from the agricultural land proposed for tower pad is estimated to be 8.63 MT (cereal crops 5.89 MT and cash crop potato 2.74 MT). Out of the total cereal crop loss paddy comprise 3.88 MT, wheat 0.54 MT, maize 1.04 MT and Millet 0.43 MT. Land area wise loss of production and productivity of land is presented in table 6.6.

Table 6.6: Permanent loss of crop production due to land acquisition.

Crop Types	Area (ha)	Production (MT)	Productivity (MT/ha)
Paddy	0.81	3.88	4.79
Wheat	0.459	0.54	1.18
Maize	0.4725	1.04	2.20
Millet	0.4725	0.43	0.91
Potato	0.36	2.74	7.61
Total	2.574	8.63	16.69

Source: Field Survey, 2016

The construction of TL will be carried out during lean season so that standing crops will not be damaged due to construction activities. However, it is not completely ignored that construction activities will not take place during the cropping season. Therefore, the adjoining areas of RoW may be disturbed due to movement of contractor's machine, labor force and stringing of the line. Furthermore, about 167.40 MT of crops (paddy 75.26 MT, maize 20.17 MT, wheat 10.47 MT, millet 8.34 MT and potato 53.14 MT) will be lost due to the construction of TL. This loss is

calculated considering the stringing of the line will be completed in one year and compensation will be paid for one seasonal cropping.

Table 6.7: Temporary loss of crops due to temporary project activities

Crop Types	Area	Production (MT)	Productivity (MT/ha)
Paddy	15.71	75.26	4.79
Wheat	8.90	10.47	1.18
Maize	9.17	20.17	2.20
Millet	9.17	8.34	0.91
Potato	6.98	53.14	7.61
Total	49.93	167.40	16.69

Source: Field Survey, 2016

This impact is envisaged to be medium in significance, local in extent and long term in duration.

E. Impact due to conflict of interest between construction crew and locals

The proposed project will try to acquire construction workers from the local area, which would reduce the probability of conflict between construction crew and locals. Furthermore, the project will require small number of work force, because of which chances of conflict is very minimal.
This impact is anticipated to be low in magnitude, site specific in extent and short term in duration.

F. Deterioration in law and order situation

During the construction of the TL labor from different places with different religion and faiths will be employed by the contractor and there will be possibilities of conflict of interest thus affecting the law and other situation. The past experience reveals that the local people have misunderstanding with the employer's and contractor's staff.
Since, the project is of linear type and the number of local labor for construction activities will be less the likely impact on law and order situation due to project is expected to be low in magnitude, local and short termed.

G. Impact on lifestyle due to interaction with different people and ethnic group

During the project construction, the influence of the outside workers on the local way of life and traditional cultural practice may result into cultural erosion, undesired social practices, disputes, conflicts and possible dilution of social bonds among the local people. However, the social and cultural life style of the local people will hardly be affected by the influx of workers due to nature of project. This is because of the linear type of the affected project area, low number of construction workers from outside and their fast mobility.
Thus, this impact is anticipated to be low in magnitude, local and short term in duration.



H. Impact due to increased pressure on existing health and sanitation facilities

The likely influx of construction forces during the construction phase may add further stress on the local health and sanitation situation. The increase in the noise level due to vehicular movement in the project area is likely to influence the physical and mental health of the local community. Discharge of wastes of various types including metals, paper, kitchen waste, plastic, etc. are potential to degrade the sanitary conditions particularly around the construction sites and camp sites. Considering lower number of manpower and their short termed mobility at one site the impact is considered to *be low, site specific and for short term.*

I. Impact on community infrastructures and resources

The proposed TL doesn't pass through community infrastructures and resources lie recreational areas and places of public congregation, *there will be no impact on such resources due to TL construction.*

J. Impact due to encroachment on cultural, historical and religious sites

None of the Angle towers are location on cultural, historical and religious sites; there will not be encroachment on cultural, historical and religious sites due to construction of TL.

K. Impact on gender and vulnerable groups

During the construction period of the project, local people will be employed on daily wages for non-technical works such as excavation for foundation, transportation of construction materials and other construction related works. The contractor, particularly sub-contractors, may discriminate the woman and vulnerable groups (Chepang and Dalits) while hiring the workers. Although, the government of Nepal ban on child labor, it remains a potential temptation in an economically poor region such as the project area for children to be exploited to pursue physical jobs. It is assumed that most of the labor force required for the construction of the TL will be labors and landless people from the vicinity of the actual work place moving around the alignment as the construction proceeds.

Considering the nature of construction work and manpower employed the magnitude of the impact is considered to be low, the extent is local and the duration is short term.

L. Impact on aesthetic value

During the construction phase there would not be significant impact on aesthetic value unless towers get erected. Once, the towers are erected, due to the presence of new steel structures the natural scenic value of the area would degrade.

This impact is anticipated to be medium significance, local in extent and long term in duration. This impact will be residual and mitigation is not possible.

M. Loss of firewood and fodder from community forest to the households depending on them

Although the number of households using fuel wood as a prime source of cooking fuel is considerably large in the project area, number of households adopting alternative sources like

Biogas and LPG are also increasing. The main sources of fuel wood in the project affected areas are community forests, locals are only allowed to collect dry and dead wood once a year when forests are opened for fuel wood collection. Since, the project is a line project and the RoW of the project is 15 m from the center line in each side, there will be considerable loss of trees from the community forests. In the initial construction stage due to RoW clearance the availability of fuel wood will increase, but there could be limited availability of fuel wood for certain period during operation phase due to clearance of trees under the RoW.

This impact is anticipated to medium in significance, local in extent and medium term in duration.

N. Impact on socio-economic condition of project affected families

Although none of the project affected families will be displaced due to the construction of the project, tower foundation and RoW will cover significant land area. There will be the reduced agricultural production during the construction phase as cultivation on the land under the RoW will be disturbed due to conductor stringing activities. Decrement in the agricultural products will have direct income on the socio-economic condition of the project affected families. Furthermore, houses under the RoW have to be dismantled and re-built somewhere else, which requires time and effort of the project affected families, despite they are compensated.

This impact is envisaged to be medium in magnitude, local in extent and medium term in duration.

6.2.3.3 Operation Phase

A. Loss of agricultural production

The land occupied by the tower pad cannot be used for cultivation any more. Thus, the total loss of production will be same as mentioned in table 6.5. The land under the RoW of the transmission line can be used for cultivation with the restriction to plant tall growing trees.

This impact is envisaged to be low in magnitude, local in extent and long term in duration.

B. Restriction on land use patterns under the RoW

Upon the completion of the project, there will be restriction on the land use patterns under the RoW of the TL. Local people will not be able to build any permanent structures below the RoW of transmission line nor can they plant tall trees. Hence, the land under the RoW can only be used for regular cultivation and dwarf trees. This will impose limitation to the land owners from starting new economic avenues.

This impact is anticipated to be medium in significance, local in extent and long term in duration.

C. Impact due to land fragmentation

Land fragmentation is one of the issues due to transmission line construction. A Land holding along the transmission line alignment is relatively high. Land under the RoW of the TL will be

fragmented and lose its original value upon the construction of TL. The restricted land use under the RoW will further change the scenarios as the owner could not use his land as per his will.
This impact is anticipated to be medium significance, local in extent and long term in duration.

D. Farming hindrances due to the tower foundation

There will be permanent loss of farmland within the tower foundation area, which will be fenced to restrict the movement of human and animals. A single tower pad occupies 15 m × 15 m land area, which is equivalent to 0.45 ropani land. In 0.45 ropani land average paddy production would be 100 Kg. In general, after processing 90 Kg paddy, it will produce 60 Kg rice which would be sufficient to feed a 5 member family for 1.5 months. Furthermore, there will be the production of multiple crops from the same agricultural land. The farming hindrances due to tower construction will play noticeable impact on those families which have limited land.
This impact is anticipated to be medium in magnitude, site specific in extent and medium term in duration.

E. Health and safety hazards

The people residing in the vicinity of the TL will be vulnerable to electrical hazards. Similarly, lack of operation and maintenance skill and unavailability of the essential safety equipment may add further risk with safety regards. The public can be affected principally through their own activities, such as tendency of climbing towers by children; high vehicles attempt to pass beneath the TL, surveyors using metal leveling staffs under the conductors, etc. These risk have low probability of occurrences, but a great significance to individuals involved.
The overall magnitude of impacts is considered to be medium, extent is local and duration is long term.

F. Impact on livelihood

During the operation phase of the TL project, land use under the RoW of the TL will be restricted to cultivation. Those lands will lose the economic value and no other land development activities can be planned. This will affect the land owner's livelihood as they could not sell or use the land for borrowing debts whenever necessary. Furthermore, locals who are involved in the project related construction activities will lose their job as the project comes under operation. However, very small numbers of people get unemployed as the project will require small number of manpower for its construction.
This impact is anticipated to be medium in magnitude, regional in extent and short term in duration.

G. Impact on local economy and lifestyle due to withdrawal of economic activities

Initially during the construction phase the inflow of construction workers will lead to the enhanced trade of the local products and groceries. Similarly, local people would also involve in construction activities which will further boost economy of local people with their earnings. As the project construction completes all the above mentioned economic activates will completely stop. This will certainly affect to those people who are getting direct or indirect benefit from the

project. However, the number of such people during the construction phase will be very low and the *impact is anticipated to be low in magnitude, regional in extent and short term in duration.*

H. Electricity hazard and electromagnetic field impact

Electric power TL create electric and magnetic field together known as electromagnetic field or EMF. Electric field is created by the presence of voltage and is expressed in volt per meter (V/m). Magnetic field is produced by the present of current in the line and is expressed in terms of ampere per meter (A/m). Power lines EMFs are strongest beneath the lines and diminish rapidly with distance. Numerous researches have been done abroad to investigate the effect of EMF associated with TL but none has proved and quantify about the health risks. Scientific research on the effects of EMFs on public health has not demonstrated clearly the existence of a significant risk, nor has it proven the complete absence of risk.

Electric field of high voltage line gives rise to corona effect causing ionization leading to the generation of ozone and oxides of nitrogen, possible radio and television interference and audible noise at high levels. Such noise will increase under rain and smog conditions. Similarly, there will be impact on pacemaker users.

The magnitude of this impact is considered to be low, local in extent and long term in duration.

I. Devaluation of land in residential/commercial area

The proposed TL mostly passes through rural and semi urban sections. However, the TL even passes through some developed areas of Palungtar and Aabukhairini Municipality which belongs to growing up market setting. This creates the land devaluation.

Due to the implementation of TL, land near by settlement and road will be affected mostly. It restricts the multipurpose land use potentiality of the area. Plan and programs proposed by concerned VDCs/Municipalities and DDCs will be affected. Hence, impact is expected to affect future land use development. *The nature of impact is high, local and long term.*

J. Impact on aesthetic value

Impacts to visual resources are examined in terms of changes between the existing landscape character and proposed actions, sensitivity of viewing points available to the general public, their viewing distances and visibility of proposed changes. Some section of the TL passes nearby market centers and settlements (particularly Bhoteodar, Palungtar and Aanbukhaireni). The existence of tower and Tl will likely to create aesthetic impact on natural and manmade resources by hindering the natural view. *Hence, the magnitude of impact on aesthetic will be medium in significance, local in nature and long term in duration.*

K. Cumulative effects of the Project with other planned developments

There are several development activities going on within ZoI of the proposed T/L alignment. These development activities include construction of 132 kV, 33 kV and 11 kV T/L, hydropower projects, roads, bridges, urban development. Similarly, planning and construction of rural road,

foot trail, suspension bridge, irrigation canal, community building including school, health post etc. are ongoing activities at local level. Construction of this 220kV transmission line may cause to shift in site location or variation in planning and implementation of above-mentioned development activities. *The impact will be long term in duration, site specific in extent and medium in significance.*

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Impact Analysis

Numerical Scale mentioned in National EIA Guidelines (1993) is used to analyze the impact of the proposed subproject. The numerical scale is presented in table below:

Table 6.8: Impact Evaluation Matrix

Magnitude		Extent		Duration	
High (H)	60	Regional (R)	60	Long term (T)	20
Medium (M)	20	Local (L)	20	Medium term (M)	10
Low (L)	10	Site specific (SS)	10	Short term (ST)	5

The combine score below 40 shall be termed as insignificant impact (IS); scores ranging between 40 and 79 shall be termed as significant impact (S), scores ranging between 80 and 99 shall be termed as very significant (VS) and scores above 100 shall be termed as highly significant impact (HS).

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
Socio-economic and Cultural Environment						
Construction Phase						
	Benefit due to utilization of local resources and manpower	Direct	Medium 20	Regional 60	Short term 5	VS 85
	Benefit due to increase in local skills in the project area	Direct	Low 10	Regional 60	Short term 5	S 75
	Benefit due to upgrading existing road	Direct	Medium 20	Regional 60	Long term 20	HS 100
	Benefit due to landslide and erosion control	Direct	Medium 20	Site Specific 10	Medium term 10	S 40
Operation Phase						
	Provide opportunities for hydropower development due to construction of power transmission line	Direct	High 60	Regional 60	Long term 20	HS 140
	Increase in forest area and restoration of	Indirect	High 60	Local 20	Long term 20	HS 100

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
	biodiversity due to compensatory plantation					
Adverse Impacts						
Physical Environment						
Pre-Construction Phase						
	Land Clearance	Direct	Medium 20	Site Specific 10	Long term 20	S 50
	Setting Labor's and Contractor's Camp	Direct	Low 10	Site Specific 10	Short term 5	IS 25
	Land clearance for stockpiling	Direct	Low 10	Site Specific 10	Short term5	IS 25
	Quarrying of Construction materials	Direct	Low 10	Site specific 10	Long term 20	IS 30
	Clearance for Approach Road	Direct	Low 10	Site Specific 10	Short term 5	IS 25
Construction Phase						
	Change in topography, land management and land use pattern	Direct	Medium 20	Local 20	Long term 10	S 50
	Impact on Air, Noise and Water Quality	Direct	Low 10	Site specific 10	Short term 5	IS 25
	Impact on Drainage System	Direct	Low 10	Site Specific 10	Short term 5	IS 25
	Impact due to landslide and soil erosion	Direct	Medium 20	Site specific 10	Short term 5	IS 35
	Impact due to storage of construction materials	Direct	Low 10	Site specific 10	Short term 5	IS 25
	Impact due to waste and spoil disposal	Direct	Low 10	Site Specific 10	Short term 5	IS 25
	Safety measures and precaution to minimize the risk associated with construction related accidents	Direct	Medium 20	Site specific 10	Short term 5	IS 25
	Impact due to hazardous waste and chemical	Direct	Low 10	Site Specific 5	Short term 5	IS 25
Operation Phase						
	Interference to road	Direct	Low 10	Local 20	Long term	S 50

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
	crossing, transmission line, telecommunication, radio, TV and other utilities				20	
	Change in land use pattern along the ROW of the transmission line alignment	Direct	H 60	Local 20	Long term 20	HS 100
	Impact on aviation					
	Electromagnetic Field Impact	Direct/ Indirect	Low 10	Site Specific 10	Long term 20	IS 30
	Impact on Aesthetic values	Direct	Low 10	Site specific 10	Long term 20	IS 30
Biological Environment						
Pre-Construction Phase						
	Vegetation clearance for setting workers camp					
	Vegetation clearance during site clearance	Direct	Medium 20	Local 20	Long term 20	S 60
	Disturbance to wildlife due to construction works	Direct	Low 10	Site specific 10	Short term 5	IS 25
Construction Phase						
	Loss of forested land, vegetation and biodiversity	Direct	Medium 20	Local 20	Long term 20	S 60
	Issue Associated with forest encroachment and forest fire	Indirect	Medium 20	Local 20	Short term 5	S 45
	Loss to natural habitat and alteration of habitat	Direct	Medium 20	Local 20	Long term 20	S 60
	Impact due to increase in demand for fuel wood and timber by construction crew	Direct	Low 10	Site specific 10	Short term 5	IS 25
	Impact due to harvesting of non-timber forest projects	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Impact on wild life movement, feeding and other activities	Direct	Low 10	Site Specific 10	Short term 5	IS 25
	Impact due to movement of labor force and their	Indirect	Low 10	Site specific 10	Short term 5	IS 25

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
	activities in forest area					
	Impact on rare, endangered, protected and threatened species of flora and fauna	Direct	Medium 20	Site specific 10	Long term 20	S 50
	Impact on Aquatic Life	Indirect	Medium 20	Site specific 10	short term 10	S 40
	Illegal hunting and poaching activities	Direct	Medium 20	Local 20	Short term 10	S 50
Operational Phase						
	Impact due to clearance of vegetation for RoW management	Direct	Low 10	Site Specific 10	Long term 20	S 40
	Electrocution of birds and animals	Direct	Medium 20	Site specific 10	Long term 20	S 50
	Impact on wildlife due to fragmentation of habitat	Indirect	Low 10	Site specific 10	Medium 10	IS 30
	Impact due to increased access to the forest	Indirect	Low 10	Site specific 10	Short term 5	IS 25
Socio-economic and Cultural Environment						
Pre-Construction Phase						
	Issues associated with land acquisition, houses, shed and other property	Direct	Medium 20	Local 20	Short term 5	S 45
	Social issues associated with route selection	Direct	Medium 20	Local 20	Short term 5	S 45
Construction Phase						
	Impact due to land encroachment and land management	Direct	Medium 20	Local 20	Medium 10	S 50
	Impact due to relocation and/or settlement	Direct	Medium 20	Local 20	Medium10	S 50
	Impact due to loss of standing crops and farming hindrances	Direct	Medium 20	Local 20	Long term 20	S 60
	Impact due to conflict of interest between construction crew and locals	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Deterioration in law and order situation	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Impact on life style due to interaction with	Indirect	Low 10	Site specific 10	Short term 5	IS 25

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
	different people and ethnic group					
	Impact due to increased pressure on existing health and sanitation facilities	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Impact on community infrastructures and resources	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Impact due to encroachment on cultural and religious sites	Indirect	Low 10	Site specific 10	Short term 5	IS 25
	Impact on gender and vulnerable groups	Indirect	Low 10	Local 20	Short term	IS 35
	Impact on aesthetic value	Direct	Medium 20	Local 20	Long term 20	S 60
	Loss of firewood and fodder from community forest to the households depending on them	Direct	Medium 20	Local 20	Medium term 10	S 50
	Impact on socio-economic condition of project affected families	Indirect	Medium 20	Local 20	Medium term 10	S 50
Operation Phase						
	Loss of Agricultural Production	Direct	Low 10	Local 20	Medium term 10	S 40
	Restriction on land use patterns under RoW	Direct	Medium 20	Local 20	Long term 20	S 60
	Impact due to land fragmentation	Indirect	Medium 20	Local 20	Long term 20	S 20
	Farming hindrances due to tower foundation	Direct	Medium 20	Site specific 10	Long term 20	S 50
	Health and safety hazards	Indirect	Medium 20	Local 20	Long term 20	S 60
	Impact on livelihood	Indirect	Medium 20	Regional 60	Short term 5	VS 85
	Impact on local economy and lifestyle due to withdrawal of economic activities	Direct	Low 10	Regional 60	Short term 5	S 75
	Electricity hazard and electromagnetic field impact	Direct	Low 10	Local 20	Long term 20	S 50

Aspect	Impacts	Nature	Magnitude	Extent	Duration	Rating
	Devaluation of land in residential/commercial land	Direct	High 60	Local 20	Long term 20	HS 100
	Impact on aesthetic value	Direct	Medium 20	Local 20	Long term 20	S 60
	Cumulative effects of the Project with other planned developments	Direct	Medium 20	Site specific 10	Long term 20	S 50

CHAPTER 7: ALTERNATIVE ANALYSIS

7.1 Introduction

A key aspect of good environmental practice is the evaluation of potential alternatives. In order to achieve this goal, the environmental and social considerations need to be brought into the planning from the very early stages. In case of this project, a range of route alternative was investigated and the lowest and highest impacts on engineering, environmental and social of these routes were determined to select the best route.

A number of alternatives were considered from the desk study for the selection of T/L route, the alternative alignments of the proposed T/L were selected taking into consideration of the following criteria.

- Right-of-way which have minimal environmental impact
- Improvement of reliability of the power system
- Provide the shortest straight route as far as possible with minimum number of angle towers
- Minimum number of structure crossings
- Avoid built up, swampy and unstable areas
- Provide easy access for construction and maintenance works
- Proximity of road, etc.

7.2 Alternatives Considered

Some of the major alternatives considered during the feasibility and IEE studies are:

1. Route alternative;
2. Design alternative
3. Construction alternatives in terms of technology, procedures, schedules and raw materials to be used
4. No forest option, and
5. No project option

7.2.1 Route Alternative

For both Udipur to Markichowk and Markichowk to Bharatpur sections three different alternatives were studies and among them best alignment from was selected based on engineering, environmental and economic perspectives. Table 7.1 and 7.2 reveal the three different alternatives studied while selecting the TL alignment.

Among the three different alternatives considered, alternative 1 is selected for the Markichowk – Udipur section. This alternative involves the routes along both banks of Marsyangdi River with frequent river crossing to avoid private land and structures. Large section of the route traverses

along the left bank of Marsyangdi River through various VDCs/Municipalities of Tanahaun, Gorkha and Lamjung districts.

Table 7.1: Alternatives considered for Markichowk – Udipur section.

Alternative 1	Alternative 2	Alternative 3
Markichowk-(Abunkhaireni), Golpinghat-(Deurali), Devighat-(Deurali), Tallao Majhigau-(Dhuwakot), Bhattaphat-(Dhuwakot), Kumaltari-(Dhuwakot), Chunighat-(Chhyalin), Majhuwa-(Chhyalin), Satighat-(Gai Khur), Kaushilatar-(Gai Khur), Parighat-(Gaikhur), Pawatar-(Gaikhur), Kaseri-(Gaikhur), Kalamata-(Palumtar), Dadathok-(Palumtar), Tallophat-(Palumtar), Bagar-(Palumtar), Dhobhan-(Palumtar), Saidada-(Dhamilikuwa), Naringhat-(Dhamikuwa), Gaulitar-(Dhamilikuwa), Tarukaghat-(Tarukaghat), Dhude-(Tarukaghat), Pangre-(Tarukhaghat), Harrabot-(Tarukaghat), Harrabot Bagaicha-(Tarukaghat), Majhigaun-(Tarukaghat), Kalleri-(Bharate), Shivaratri-(Bhotewodar), Badarephat-(Chiti), Bajarkhutta-(Chiti), Phaliya-(Udipur)	Markichowk-(Abunkhaireni), Golpingghat-(Abunkhaireni), Eklephat-(Abunkhaireni), Tallo Duwar-(Dhuwakot), Yamphat-(Dhuwakot), Kholaghat-(Dhuwakot), Bhattaphat-(Dhuwakot), Chunighat-(Chhyalin), Majuwa-(Chhyalin) , Bhansar-(Bhanu), Bhotegaun-(Bhanu), Khaharesthan-(Bhanu), Khahare-(Bhanu), Bagar-(Bhanu), Chambas-(Bhanu), Kalamata-(Palumtar), Dhukurdi-(Purkot), Turture-(Purkot), Baliphat-(Purkot), Chhuchi Bagar-(Plumtar), Kadelphat-(Purkot), Jhinuwaphat-(Purkot), Kalamata-(Purkot), Talbagaicha-(Purkot), Sangrale Bagar-(Purkot), Khare Kalimati-(Purkot), Gaulitar-(Purkot), Dila Chalio-(Purkot), Naubise-(Raginas Mohoriyakot), Parevatar-(Raginas Mohoriyakot), Majhigaun-(Tarukaghat), Kalleri-(Tarukaghat), Ghokreswara-(Bhotewodar), Balthumbesi-(Bhotewodar) Gairi Udipur-(Udipur)	Markichowk-(Abunkhaireni), Golpingghat-(Abunkhaireni), Devighat-(Abunkhaireni), Mujhelgau-(Abunkhaireni), Kholaghat-(Chyanlin), Kumaltari-(Chyanlin), Majuwa Bagar-(Chyanlin), Botgau-(Bar Bhanjyang), Ambote-(Bar Bhanjyang), Chambas-(Bhanu), Kalamata-(Gaikhur), Dadathok-(Palumtar), Tallophat-(Palumtar), Royale-(Palumtar), Bagar-(Palumtar), Jhimwaphat-(Purkot), Tal Bagaicha-(Purkot), Sangrale Bazar-(Purkot), Dilechelis-(Chokchisapani), Tarukaghat-(Tarukaghat), Pangre-(Tarukaghat), Harrabot-(Tarukaghat), Tarukabesi-(Sundar Bazar), Kalleri-(Bhotewodar), Bhotewodar-(Bhotewodar), Balthumbesi-(Udipur), Gaire Udipur-(Udipur), Phaliya sangu-(Udipur)

(*Source: Marsyangdi Corridor 220 kV/TL Project)*

For the Markichowk – Bharatpur section too, alternative 1 has been selected. There is a sharp elevation changes within the Markichowk – Bharatpur section until the TL alignment reaches the flat land of Chitwan. Alternative 1 is very appropriate among other surveyed route as it is highly feasible from engineering, environmental and economic perspective. The socio-economic loss through this alignment is also smaller compared to other two.

Table 7.2: Alternatives considered for Markichowk – Bharatpur section

Alternative 1	Alternative 2	Alternative 3
Markichowk-(Abunkhaireni), Chyasidada -(Abunkhaireni), Khanikholagau -(Abunkhaireni), Sangraula Dhad -(Abunkhaireni), Chainpur -(Abunkhaireni), Abugau -(Abunkhaireni), Aduwakharka -(Abunkhaireni), Liutpakha -(Abunkhaireni), Dharapani -(Abunkhaireni), Abchaur -(Abunkhaireni), Aklan-(Abunkhaireni), Gyansini-(Abunkhaireni), Amdada-(Abunkhaireni), Dunsidhunga-(Chimkeshwori), Bhoteswora-(Chimkeshwori), Donaran-(Chimkeshwori), Sitan-(Chimkeshwori), Oaran-(Chimkeshwori), Dumregau-(Chimkeshwori), Chipleti-(Chimkeshwori), Chaukigau-(Kabilash), Bharlan -(Kabilash), Devitar -(Kabilash), Jugedibazar -(Kabilash), Bhateri -(Kabilash), Aptari -(Kabilash)	Markichowk-(Abunkhaireni), Chyasidada -(Abunkhaireni), Khanikholagau -(Abunkhaireni), Kharkagau -(Abunkhaireni), Ghokrin-(Abunkhaireni), Aduwakharka-(Abunkhaireni), Dharapani -(Abunkhaireni), Bhage -(Abunkhaireni), Aklan -(Abunkhaireni), Kaphaldada -(Abunkhaireni), Baspani -(Abunkhaireni), Dumsidhunga -(Chimkeshwori), Lakhupakha -(Chimkeshwori), Bhagondi -(Chimkeshwori), Kheusin -(Chimkeshwori), Chautara -(Chimkeshwori), Majuwa -(Chimkeshwori), Sitan -(Chimkeshwori), Oaran-(Chimkeshwori), Chipleti-(Kabilash), Dumregau-(Kabilash), Chaukigaun-(Kabilash), Tundran -(Kabilash), Dasdhunga-(Kabilash), Devitar -(Kabilash), Jugedibazar -(Kabilash), Bhateri -(Kabilash), Aptari -(Kabilash)	Markichowk-(Abunkhaireni), Chyasidada -(Abunkhaireni), Nayagau -(Abunkhaireni), Gaganswara-(Abunkhaireni),Jharepuri-(Abunkhaireni),Kalunkholagau-(Abunkhaireni), Bhage-(Abunkhaireni), Ghyansin -(Abunkhaireni), Amdada -(Abunkhaireni), Khashran -(Abunkhaireni), Barlunghol-(Chimkeshwori), Barlungbesi -(Chimkeshwori), Bangesal -(Chimkeshwori), Lamagau -(Chimkeshwori), Manchan -(Chimkeshwori), Bharlan –(Kabilash), Jugedi bajar-(Kabilash), Bhateri -(Kabilash), Aptari -(Kabilash)

7.2.2 Design Alternative

Different design alternatives of tower structure, tower foundation and its protection, ruling span and voltage level have been also carried out during the feasibility and IEE study. In order to simplify the erection procedures and make the project cost-effective towers mentioned in table 7.3 have been selected.

Table 7.3: Type of tower selected for the proposed project

Tower Type	Angle	Reason
DA	0 to 2 degrees	As suspension tower
DB	2 to 15 degrees	As angle/Section tower
DC	15 to 30 degrees	As angle/Section tower
DD	30 to 60 degrees	As angle/Dead end tower
DDS	0 to 60 degrees	As angle/Dead end tower for longer span

In the rocky area along the route alignment, rock bolt foundation is preferred to normal concrete foundation due to its less excavation, drilling advantage and low environmental impact. Conventional pad and chimney type concrete foundation will be constructed.

The design of tower and foundation design are very much dependent on the selection of ruling span. The number of tower will be minimized by increasing the ruling span but it leads to heavier and higher tower structures to maintain the necessary ground clearances whereas shorter ruling span means increased number of towers which will further lead to increased land acquisition. Therefore, optimum standard ruling span of 350 m has been adopted.

7.2.3 Construction Alternatives

Manual excavation will be adopted since it provides opportunities for the local employment and will have less impact on topography, low disturbance to surrounding areas and does not require wide access road. Moreover, concreting will be done using mixer and vibrator in order to maintain the quality.

Erection will be done manually. Helicopter stringing is an alternative but such method would be costly. Furthermore, use of helicopter will create noise pollution and may disturb the fauna of the area. Internationally accepted standard technology will be applied for the installation and procurement of the goods and equipment.

Since 220 kV T/L require strong and durable poles self-supporting galvanized steel tower will be used. Wooden poles will not be used because tremendous amount of forest needs to be cleared which will create environmental problems.

The construction activity shall be planned in off-season (dry period) to minimize the unnecessary damage and disturbances. This will reduce the project impact on physical, biological and socio-economic resources of the area. Construction in rainy season will cause soil erosion, blockage of drain and difficulty in crossing rivers and excavation of tower foundation, as a result of which smooth project construction activities could not be run. The indoor works of substation may be carried out in rainy season.

7.2.4 No Forest Option

Although it is not practically possible to avoid the forested area during the construction of the proposed T/L project, route that because minimal damage to the forested area has been selected. The proposed alignment has been routed nose to nose, valleys and ridges so as to avoid forest clearance to the extent possible. Furthermore, the locations for the angle towers have been selected at elevated spots to avoid felling and trimmings of trees. Efforts to avoid the dense forest area have been made.

The compensatory plantation in the ratio 1:25 trees will be carried out in the project areas to mitigate the loss of trees with due consideration with District Forest Office (DFO) and the Forest

User Groups of the concerned district. The implementation of the project will be done by following the existing forest acts, rules and regulations.

7.2.5 No Project Option

The unprecedented growth in power consumption has led to severe imbalance in demand and supply of electricity power in the country which has resulted in load shedding in Nepal since last few years and will be continued in the country in the years to come. This load shedding has resulted in economic loss to the country.

If the proposed project is not implemented then there will be no project induced loss/effect on vegetation, cultivated area and other environmental and socio-economic impacts. But such 'No Action' alternative would result in heavy deficit of power and energy in the country. Besides, the construction of the proposed project will also reduce system loss and provide reliable power to the load centers of Nepal. This project will also be helpful for the expansion of rural electrification program. The likely increase in electricity supply to local people will help to switch energy consumption trend and pressure on local vegetation will be minimum. Socio-economic conditions of the local people are likely to be increased through employment opportunities and income generation activities.

Since, the construction of this T/L will play a major role not only solving the power crisis in the country, but also in improving the socio-economic status of the people, the construction of Udipur-Bharatpur 220kV T/L is essential.

CHAPTER EIGHT: MITIGATION AND ENHANCEMENT MEASURES

The mitigation and enhancement measures outlined in this chapter have been proposed to curtail potential adverse impacts and enhance beneficial impacts identified during the study. Those adverse and beneficial impacts not identified or predetermined during the study if later discovered during the construction phase will be explicitly mitigated or enhanced by the project. The discussion is organized in three categories of physical, biological and socio-economic and cultural aspects, and has been split into pre-construction, construction and operation phases in an equivalent manner as for Chapter 6 Environment Impact Associated with Project Implementation.

Nepal Electricity Authority as the project proponent will implement all the proposed mitigation measures and enhancement measures, monitoring plans described in the respective chapters as NEA's prime responsibility. In addition, the project will take responsibility of compensating as per the prevailing law for any losses or damage caused to lives and property during construction and operation phases.

8.1 Physical Environment

8.1.1 Pre-construction Phase

A. Land clearance

During the land clearance for the construction of transmission towers following measures will be adopted:

- The natural slope disturbances will be minimized during the site clearance.
- Re-vegetation and slope maintenance will be carried out in the disturbed areas to avoid erosion. Bioengineering with combination of retaining structures will be done as per the requirement.
- Proper landscaping will be done at each tower site.
- In order to avoid the land fragmentation, the tower will be located at the RoW of road and at the end of the land parcel as far as possible.
- In order to avoid the hindrance to agricultural activities the construction activities will be done during the period of less agro-activity **(avoiding rice cultivation season)**

B. Setting labor's and contractor's camp

Following considerations will be made while setting labors' and contractor's camp:

- Barren land will be given preference to set labors' and camp.
- If agricultural land is hired for labors' and contractor's camp, less productive land will be preferred.
- No any vegetation will be harmed while settling labor's and contractor's cam.

- There will be the provision of safe drinking water and sanitary toilet in the labor's camp.
- No any permanent structures will be built around the labor's camp, except for the project structures.
- Labor's camp will be located at a considerable distance from the settlement to avoid conflict with the local people.

C. Land clearance for construction materials

Land clearance will not be done for stockpiling construction materials alone. Six different locations have been proposed for the stockpiling of construction materials and among them four are under the ownership of Nepal Electricity Authority. The stockpiled construction materials will be transported to the tower locations on need basis. Small quantity of construction materials will be stockpiled near the construction site over the land cleared for construction. Cement will be stored within the labor's camp. Vegetation clearance will not be done for material stockpiling.

8.1.2 Construction Phase

A. Changes in topography, land management and land use pattern

The permanent land use changes due to tower pad construction cannot be mitigated. However, the land under the RoW will not be restricted for the current use except that the construction of any type of structure will be prohibited. The construction area will be reinstated to the present condition after the construction is over. Land for temporary facilities will be rehabilitated to original status to minimize the land use impacts. The camp sites are proposed mostly in barren land to minimize the impact on land use pattern of cultivated land. The private land required for the project will be compensated through agreement with the land and property owners.

The following mitigation measures are proposed to avoid unnecessary changes in topography and land use pattern:

- The stability of the tower locations will be examined before excavation and special foundation design will be selected for the susceptible locations.
- Erection of tower foundation in the unstable land and/or in steep slopes will be avoided.
- Proper landscaping will be done at each tower site.
- In order to avoid the land fragmentation, the tower will be located at the RoW of road and at the edge of the land parcel as far as possible.
- Land acquiring will also be limited to the requisite.

B. Impact on air, noise and water quality

The project will not lead to a significant deterioration in air quality except in much localized instances and localized areas during the construction phase. Vehicles utilized for construction will be compiled with GoN mass emission standards. Regular checkup; up keeping and maintenance of the equipment will be carried out as per the Manufacturer's Specifications to meet the emission standards. Proper maintenance of all vehicles and construction machineries will be done regularly.

Helmets and air mask will be provided to labor force working in areas susceptible to dust pollution. The working houses will be limited near the settlements and temporary relocation of particularly vulnerable people (old/sick, etc.) to acceptable location will be done if required. Construction work will not be carried out during the night time so as to minimize the noise and vibrations. Ear mufflers will be provided to labor force working in the areas susceptible to noise pollution.

The waste generated from the mixing concrete will be disposed in pits and filled with soil. Such pits will be made in barren land at a distance of more than 500 m from water bodies. Dykes are proposed around the storage tanks to avoid water pollution. Toilets will be provided to workforce. Care will be taken to locate the temporary construction worker sheds away from the water bodies. Garbage and solid wastes generated by the workforce will be dumped safely away from water bodies.

Good construction practices and site management will be adopted to avoid impacting soil and ground water, and pollution of water bodies from accidental spills from fuels and lubricants, etc. All waste oils and chemicals will be collected and stored in suitable storages tanks and disposed through appropriate techniques.

C. Impact on drainage system

Proper management of the spoil volume will be done. The spoil generated during the excavation of tower pads and substation will be used for backfilling and the area will be restored.

The following mitigation measures will be used during the construction phase:

- Vegetation clearing and ground disturbances will be confined within the foundation and required RoW.
- Proper compaction of the excavated soil will be done. After compaction 10% of the remaining soil will be disposed properly in the vicinity so as not to disturb the natural drainage.
- Adequate surface and sub-surface drainage will be provided at all the Angle Tower area and at substation area to drain away the excess water and prevent water logging.
- Excavation will be done in phases with higher number of laborers so that the required target stretch is completed on time.
- Restoration of the area around the tower pad for cultivation and regeneration of vegetation will be done.
- Erection of pole and stringing of line will be carried out in dry season if possible.
- Pile foundation or matt foundation will be used for Lattice towers at river crossings.

D. Impact due to landslides and soil erosion

The Udipur - Markichowk section traverses through Marsyangdi corridor which is relatively stable. However, few APs, particularly AP-33F, AP-63 and AP64 requires slope protection as they are located over the steep slope near the river bank.

However, the Markichowk – Bharatpur section traverses through a very rugged terrain with large altitudinal variation. The high sloppy hills of Chhimkeswori and Kabilas are particularly susceptible to erosion. Thus, slope protection measures (both civil engineering and bioengineering) are proposed for those unstable locations. The detail list of Angle towers within Markichowk – Bharatpur section requiring protection are listed in table 8.1.

Table 8.1: Geological conditions around the Angle towers within Markichowk – Bharatpur section and the proposed slope protection measures:

Towers	Geology	Stability Condition (Slope)	Recommendation	Cost (Nrs.)
AP-0	Alluvial deposits	Stable		
AP-1	Colluvial deposits	Moderately stable (chances of slope failure)	Require protection wall (Gabion wall)	180,000
AP-2	Residual soil	Stable	Pit (SPT/DCPT)	
AP-3	Residual soil	Stable		
AP-4	Residual soil	Stable		
AP-5	Residual soil	Moderately Stable	PIT (SPT/DCPT)	
AP-6	Residual soil	Stable	Retaining structure	220,000
AP-7	Residual soil	Stable		
AP-8	Bedrock (Quartzite)	Moderately stable		
AP-9	Residual soil+colluvium	Moderately stable	Bioengineering, Pit (SPT/DCPT)	75,000
Ap-10	Residual Soil	Stable		
AP-11	Residual soil (paddy field)	Stable		
AP-12	Colluvial deposits	Moderately stable	Require protection wall (Retaining wall)	170,000
Ap-13	Colluvial deposits	Moderately stable	Require protection wall (Retaining wall)	175,000
AP-14	Bedrock (Quartzite)	Moderately stable		
AP-15	Bedrock (Quartzite)	Moderately stable		
AP-16	Bedrock (Quartzite)	Less stable	Require protection wall (Retaining wall) + Bio-engineering	230,000
AP-17- 18	Colluvial deposits	Less stable	Require protection wall + Bio-engineering(Retaining wall)	235,000
AP-18	Residual soil (paddy	Stable	Pit (SPT/DCPT)	

Towers	Geology	Stability Condition (Slope)	Recommendation	Cost (Nrs.)
	field)			
AP-19	Residual soil (paddy field)	Stable		
AP-20	Bedrock (Schist)	Moderately stable	Require protection wall (Gabion wall)+ Bio-engineering	225,000
AP-21	Colluvial deposits	Moderately stable		
AP-21A	Alluvial deposits	Stable		
AP-22	Slate and Quartzite	Less stable	Require protection wall (Retaining wall) + Bio-engineering	230,000
AP-23	Colluvial deposits	Stable		
AP-24	Residual soil	Stable		
AP-25	Residual soil	Stable	Pit (SPT/DCPT)	
Ap-26	Residual soil	Stable		
AP-27	Alluvial deposit	Moderately stable	Require protection wall from landslide ((Retaining wall)	265,000
AP-28	Bedrock (slate+dolmite)	Moderately stable	Require protection wall from landslide (Retaining wall)	275,000
AP-29	Residual soil	Stable		
AP-30	Bedrock (sandstone+mudstone)	Moderately stable	Require protection wall (Retaining wall)	175,000
AP-31	Terrace (Flat)	Stable		
AP-32	Terrace (Flat)	Stable		
AP-33	Soil (Flat)	Stable	Pit (SPT/DCPT)	
AP-34	Soil (Flat)	Stable		
AP-35	Soil (Flat)	Stable		
AP-36 (Substation)	Soil (Flat)	Stable	ERT/Pit (SPT/DCPT)	
			Total	**24,55,000**

E. Impact due to storage of construction materials

Construction materials like sand, gravel, cement, steel bars, etc. will be stored within proposed six different storage sites. Similarly, oil, grease, lubricants, etc. required for the smooth operation of machineries will be stored safely in a container within the worker's camp premises. Following measures will be adopted to prevent/mitigate the environmental release of construction materials.

- Plastic sheet or tarpaulin will be spread on ground before stockpiling sand and gravel, and will be covered to avoid atmospheric contamination.
- Oil, grease, lubricants, etc. will be stored in a closed container and accidental spillage of those substances will be cleaned up immediately.

- Material storage site will be fenced properly to prevent children, animals, etc. to reach.
- The location for the material storage will be selected at degraded or lower value land.
- Cement will be stored in closed storage site.

F. Impact due to solid waste and spoil disposal

The domestic waste will primarily consist of organic food waste. Because this is easily biodegradable and non-hazardous, it will be managed by burying in pits at reasonable distance from water bodies and subsequently covered with soil.

Waste generated from construction activities are usually inert materials which are non-biodegradable, e.g. empty cement bags and containers, rejected materials, plastic, wooden planks, etc. These waste materials will be stored out and kept separated instead of throwing haphazardly elsewhere. Some of these items (cement bag, plastic drum, etc.) can be sold in the market in order to be re-used or recycled. The contractor will be responsible for the establishment of the waste management system at the construction and camp areas.

G. Safety measures and precaution to minimize the risk associated with construction related accidents

Safety around the construction location is of prime concern for any kind of physical and mechanical activities. In order the safeguard the safety of construction workers, they will be provided with personal safety measures like gloves, masks, helmets, etc. The construction site will be fenced and only the construction crew will be allowed to enter. Lighting facilities will be installed around the construction site to avoid accidents during night time. Sign posts indicating work under process and/or danger will be installed around the construction location.

8.1.3 Operational Phase

A. Interference of road crossing, transmission lines, telecommunication, radio, TV and other utilities

All crossings of existing transmission and distribution lines will be designed with standard safe vertical and horizontal clearances for 220 kV lines. Design clearances for communication lines will be maintained. For this, the standards referred by the Electricity Regulation 1993 (Rule 48,49, 50 and 55) shall be followed.

B. Change in land use pattern along the RoW of transmission line

The impact on the land use changes under the RoW and permanent land take for the towers will remain forever. The restriction for the erection of any type of structure on the land under the RoW and plantation of trees of tall species cannot be mitigated. However, cultivation will be allowed. All temporary land acquired will be converted to its original use or agreed new uses towards the end of the construction period and handed over to their owners.

C. Issues Associated with chemicals

Paints will be used for coloring. The project management office will be responsible for the safely handling of the paints.

D. Direct/Indirect Electromagnetic Field Impact

To mitigate the direct and indirect impact of electromagnetic field following measures will be employed:

- Assessing the potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection
- Siting the power transmission facilities to avoid or minimize exposure to the public. Avoiding installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g. schools or offices), should be avoided
- If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include:
  - Shielding with specific metal alloys
  - Increasing height of transmission towers
  - Modifications of size, spacing, and configuration of conductors.

8.1.4 Physical Mitigation and Enhancement Cost

The total cost for the mitigation of physical environment is presented in table 8.1

Table 8.2: Physical Mitigation and Enhancement Cost

S.N.	Description	Cost (NPR)
1	Construction of protection wall and Bioengineering	2,455,000
2	Watershed and Drainage Management	500,000
	Total Cost	2,950,000

8.2 Biological Environment

8.2.1 Pre-construction Phase

A. Vegetation clearance for setting workers camp

Vegetation clearance is not required for worker's camp and hence mitigation measures are not proposed for this impact.

B. Vegetation Clearance during site clearance

The loss of vegetation during site clearance for the construction of tower pad will be compensated in the ratio 1:25 (the details of which are discussed in section 8.2.2).

C. Disturbance to wildlife due to construction works

This impact is not significant for the proposed project and hence no specific mitigation measures have been proposed. However, the construction work will be limited to daylight hours only, so that wildlife will not be disturbed during their dwelling period.

8.2.2 Construction Phase

A. Loss of forest land, vegetation and biomass

The Project will ensure compliance to provisions of all acts, rules, regulations and directives as applicable to the forest. Forestry clearance and tree cutting approval will be obtained according to Forest Act 2049, Forest Regulations 2051, Government of Nepal: राष्ट्रिय वन क्षेत्रको जग्गा प्रयोग गर्ने सम्बन्धी कार्यविधि, २०७४.

As a compensatory measure for the loss of trees due to the site clearance, plantation in 1:25 ratio plants plus equivalent to forest area cleared (1600 plants/ha) in the CFs, LHFs and National forests will be carried out in the area provided by the District Forest Offices/CFUGs/LHFGs according to new provision made in 2074 BS (it was at the ratio of 1:2 before).

Separate Plantation Action Plan will be prepared before implementing the plantation program. The Action Plan will figure out the potential plantation sites, seedling production and availability, plant species and mode of plantation program in consultation with affected CFUGs/LHFGs and District Forest Office.

DFO nurseries could be used in the project site to meet the seedling requirement for the compensatory plantation. As per the Government of Nepal: Work Procedure for Providing Forest Land for Other Use 2063, plantation site shall be managed by the proponent for five years or required cost for such management must be paid to Department of Forest. So, the compensatory plantation and protection cost (fencing provision) has been estimated according to MoFSC Norms and will be provided to concerned CFUGs/LHFGs through DFO.

The cost of plantation of 311,399 Saplings is listed in table below:

Table 8.3: Compensatory Plantation with 5Year Cost

S.N.	Description	Unit	Quantity	Unit Rate (NRs)	Amount NRs.	Remarks
1	**Plantation Program**					
1.1	Nursery Establishment	No.s	10	600,000	6,000,000	
1.2	Seedling Production	No.s	311,453	20	6,229,060	
1.3	Plantation and site Management	ha	90.7	45,000	40,81,500	
1.4	Fencing with RCC pole and barbed wire	ha	90.7	150,000	13,605,000	
2.	**Human Resources**					
2.1	Ranger	Man-	20	45,000	900,000	

S.N.	Description	Unit	Quantity	Unit Rate (NRs)	Amount NRs.	Remarks
		month				
2.2	Nursery Naike	Man-month	33	15,000	495,000	
2.3	Watchman for 5 year	Man-month	30x5x 12	8,000	14,400,000	Assuming one watchman for 3 ha.
				Sub-total	**45,710,560**	
3	Monitoring & technical Support	Year	5	lump sum	10,01,990	DFO and other line agencies will be involved
				Total	**46,712,550**	

Note: Cost estimate is based on Rate Analysis Norms 2070 of Ministry of Forest and Soil Conservation, Government of Nepal and prevailing market rates

Selective felling of tress under RoW will minimize the forest loss. Similarly, the trees in the gully and valley will be avoided from felling as far as possible. In such area, it is proposed that the minimum forest clearance for laying and stringing of conductor will be maintained and remaining trees under RoW will be kept intact. Further forest clearance will be done manually as well as tower will be placed in ridges to avoid the forest clearance as far as possible. These methods not only minimize the forest loss but also indirectly contribute to conserve biodiversity along the transmission line alignment (project area). Moreover, the project will plant the native species; more specifically those species removed during the project construction so as to maintain species richness of the area. This approach can be very beneficial to restore the biodiversity of the region.

B. Issues associated with illegal hunting and poaching

The project will train its workers regarding the importance of biodiversity and the consequences of illegal hunting and poaching. Similarly, strict code of conduct will be formulated by the project, so that workers involving in illegal hunting and poaching will be punished or fined. Furthermore, the construction work in community/leasehold forest area will be coordinated through DFO and CFUGs/LHFGs. In addition, informative and warning sign boards will be placed at relevant construction sites.

C. Issues associated with forest encroachment and forest fire

In order to minimize the probability of forest fire, each of the worker's camp will be provided with fire extinguishers. Construction site will be cleaned and even dry leaves that catch fire easily will not be left. Workers will be warned not to throw pieces of burnt cigarettes around the vegetated area. Special attention will be given to avoid undesired accidental forest fires

throughout the construction period. Similarly, short term forest fire hazard training will be given to construction workers to minimize the risk of fire as well as control any fire hazard at initial level to avoid any major damages.

D. Loss of natural habitat and alteration of habitat

The project will avoid unnecessary forest clearance. Project route alignment has been selected in such a way that the alignment would avoid core forest areas, which are the habitat of several wildlife species. In particular, forest near the Aaptari substation serves as wildlife movement corridor and transmission line alignment in that forest traverses parallel to Narayanghat – Muglin Highway. This will help to avoid forest fragmentation at another location.

E. Impact due to increase in demand of fuel wood and timber by construction crew

In order to reduce the demand of fuel wood, the construction camp will be supplied with LPG and/or Kerosene. Forest product will not be used to set the labor camp so that there would not be the demand of timber.

F. Impact on wildlife movement, feeding and other activities

The TL alignment does not pass through the core forest area to pose significant impact on wildlife. However, to reduce the probability of this impact following mitigation measures will be adopted:

- Construction camp will be set outside the forested area.
- Construction activities will be limited to daylight hours only.
- Any kind of noise producing activities around the construction site and labor's camp will be restricted.
- Construction area will be fenced to prevent wildlife from entering within the construction location which could be result in accidents by falling into the excavated foundation.
- Similarly, to minimize the impact on wildlife movement, Udipur-Bharatpur Transmission has been proposed to merge with Transmission line to be constructed to evacuate the power generated by Tanahu (Upper Seti) Hydropower Project.

G. Impact due to movement of labor force and their activities in forest area

The project will require few workers and there will be limited movement of workers within the core forest area. Furthermore, the construction period of each tower is very low and strict code of conduct will be made for construction workers so that they would not be allowed to undertake restricted activities within the forested areas.

H. Impact on rare, endangered, protected and threatened species of flora and fauna

The clearing of trees will be done manually causing less impact on adjoining vegetation. As far as possible construction work will be labor based. The project proponent will be responsible to avoid unnecessary machinery disturbances and lighting. The construction work in community/leasehold forest area will be coordinated through DFO and CFUGs/LHFGs. In

addition, informative and warning sign boards will be placed at relevant construction sites. The workers will strictly be prevented from hunting and poaching.

I. Issues Associated with Electrocution

The impact on bird due to Transmission line can be mitigated using following measures:

- Install and maintain reflectors and other features at all major river crossings of the transmission line to enhance the visibility of the lines and reduce collisions.
- For the longer term, plant tall growing trees where these will grow outside of the TL ROW to encourage birds to fly higher and avoid both the trees and the lines.
- The tower design shall include platforms or other features that can be used by raptors and vultures to nest safely on the TL towers.
- The tower design shall include suspended insulators (instead of upright insulators) and power lines below the cross arm
- Stringing of the power lines shall be planned to obstruct only a minimum of air space in vertical direction by single level arrangement of conductor cables and "burying" the neutral cable; Attaching black and white markers on to cables in particular to the neutral cable, at river valleys (bird flyways);

8.2.3 Biological Mitigation and Enhancement Cost

The total biological mitigation and enhancement cost is estimated to be NRs. 25,184,924 and NRs. 4,600,000 respectively. Training programs will be provided to the selected users and members of the affected CFUGs/LHFGs. The number of training programs to be conducted will be determined depending upon the number of participants, demand from communities and availability of resource persons. Technical resource persons and experts shall be deployed for the training programs from DFOs and other relevant offices.

Table 8.4: Cost for compensatory tree plantation

SN	District/Activity	Compensatory plantation in forest including protection							Cost for trees in private land (NRs)	Signboard cost (NRs)	Total cost (NRs)
		No. of trees to be felled	No. of plants to be planted (1:25 ratio)	Area affected (ha)	No. of plants to be planted	Total plants for plantation +10% for replacement	Per plant cost (NRs)	Total cost (NRs)			
1	Chitwan	2,910	72,750	31.53	50,448	135,518	150	20,327,700	15,000	100,000	20,442,700
2	Gorkha	1,442	36,050	18.33	29,328	71,916	150	10,787,400	20,000	100,000	10,907,400
3	Lamjung	815	20,375	23.10	36,960	63,069	150	9,460,350	40,000	100,000	9,600,350
4	Tanahu	355	8,875	17.69	28,304	40,896	150	6,137,100	70,000	100,000	6,307,100
	Total	**5,522**	**138,100**	**90.65**	**145,040**	**311,399**		**46,712,550**	**175,000**	**400,000**	**47,287,550**

Table 8.5: Cost for benefit augmentation measures

SN	Augmentation Measures	Unit rate	Districts								Total
			Chitwan		Gorkha		Lamjung		Tanahu		
			Event	Cost	Event	Cost	Event	Cost	Event	Cost	
1	Forest management training to CFUGs/LHFGs	100,000	2	200,000	2	200,000	2	200,000	2	200,000	**800,000**
2	NTFPs cultivation training and seedling support under TL	200,000	2	400,000	2	400,000	2	400,000	2	400,000	**1,600,000**
3	Conservation Awareness Raising training (Biodiversity, wildlife and bird conservation)	100,000	2	200,000	2	200,000	2	200,000	2	200,000	**800,000**
4	Forest based income generation & entrepreneurship training	150,000	2	300,000	2	300,000	2	300,000	2	300,000	**1,200,000**
5	Orientation workshop to concerned DFO staff	50,000	1	50,000	1	50,000	1	50,000	1	50,000	**200,000**
	Total		**9**	**1,500,000**	**9**	**1,500,000**	**9**	**1,500,000**	**9**	**1,500,000**	**4,600,000**

8.3 Socio-economic and Cultural Environment

8.3.1 Construction Phase

A. Impact due to land encroachment and land management

The project will acquire 1.395 ha of private land for angle towers and 49.93 ha under the RoW of TL.

- **Compensation for permanently acquired land**

The compensation cost for 1.395 ha land proposed for 62 APs belonging to 61 owners have been calculated for the study purpose. Hence, mitigation cost for 1.395 ha of land is estimated to be NRs. 16,650,000. The detail of cost for permanent land acquisition is given in table 8.6.

Table 8.6: Cost of permanently acquired private land (for angle towers)

Section	Number of land parcels	Area (ha)	Rate (NRs./ha)	Total Amount (NRs.)
Irrigated land (Khet)	41	0.9225	16,000,000	14,760,000
Non-Irrigated Land (Bari)	21	0.4725	4,000,000	1,890,000
Total	62	1.395		16,650,000

- **Compensation for RoW (Restricted Land)**

The land used for TL and camp sites is considered as restricted land. The total private lane to be restricted for use during project period is 49.93ha. On the basis of surveyed household for the unit rate of irrigated and non-irrigated land, Total compensation cost for private land for the restricted use of land within RoW is Nrs.17,441,440. As per NEA Practice, compensation for restricted land use is calculated as 10% of total land value.

Table 8.7: Compensation Cost for RoW (restricted land use)

Section	Area (ha)	Rate (10% of unit rate) (NRs./ha)	Total Amount (NRs.)
Khet	8.25	1,600,000	13,200,000
Bari	41.68	400,000	16,672,000
Total	49.93		29,872,000

Hence, the total compensation of land to be acquired permanently and temporarily used is **Nrs.46,522,000.**

B. Impact due to relocation and/or resettlement

There are 34 private structures falling under the RoW of the transmission line alignment. The project will prepare separate resettlement plan to address the issues associated with the relocation and/or resettlement of houses under the RoW of the TL.

C. Impact due to occupational health and safety hazards

The project will ensure adequate safety gears for workers (Personal Protective Equipment, accommodation, First Aid Box, etc.). There will be training for contractors and workers regarding occupation health and safety measures. Construction site will be fenced and safety signboards written in Nepali language will be installed.

Safety training will be implemented and any loss of life or injury will also be compensated as per prevailing rules. The safety training for the project workers will be conducted prior to the construction work. Community safety awareness program about the TL and potential risks

associated with TL construction will also be implemented in nearby settlements and school area. Hoarding board will be placed in the sensitive area (school and other public places). Project will fence the towers in the sensitive area through civil work. The project workers involved in construction work will also be trained for health and occupational measures.

D. Impact due to loss of standing crops and farming hindrances

The total compensation of the project affected HHs for production loss of 8.63 MT is estimated to be NRs. 298,400. The value of total loss of crops is estimated based on their yield, production, and local market rate. The crop wise value with area is shown in table 8.8.

Table 8.8: Cost for the compensation of one year crops planted over tower pad location

Crop Types	Area (ha)	Production (MT)	Amount (NRs.)
Paddy	0.81	3.88	13,5800
Wheat	0.459	0.54	21,600
Maize	0.4725	1.04	41,600
Millet	0.4725	0.43	17,200
Potato	0.36	2.74	82,200
	Total	8.63	298,400

(Note: rate of per kg paddy, wheat, maize, millet and potato are NRs. 35, 40, 40, 40 and 30 respectively)

The project requires 49.93 ha of cultivated land for RoW. The total loss of crops produced in this land is estimate to be 167.40 MT which will cost NRs. 5,787,500 for one year. The crop wise area allocation, production and cost is shown in table 8.9.

Table 8.9: Cost for compensation of crops for one year under the RoW

Crop Types	Area	Production (MT)	Amount (NRs.)
Paddy	15.71	75.26	2,634,100
Wheat	8.90	10.47	418,800
Maize	9.17	20.17	806,800
Millet	9.17	8.34	333,600
Potato	6.98	53.14	1,594,200
	Total	167.40	5,787,500

(Note: rate of per kg paddy, wheat, maize, millet and potato are NRs. 35, 40, 40, 40 and 30 respectively)

E. Deterioration of law and order situation

During the construction of the TL, labor from different places with different religions and faith with their own norms and values will be employed by the project contractor and there may arise conflict of interest between locals and the outsiders affecting law and order situation in the project area. Local employment, water/labor rate, working hours, use of local resources by project workers, etc. are the major factors that may create conflict in the project area which may pose threat to law and order situation. The proponent will implement a strict code of conduct for

the workforces. In case any worker is found as drunkard or soliciting prostitution and gambling, etc. will be penalized and terminated too. The existing facilities of GoN from Lamjung, Gorkha, Tanahaun and Chitwan districts will be used to maintain law and order situation as when required basis. The proposed awareness program will also minimize this impact to some extent.

F. Impact on lifestyle and social conflict due to interaction with different people and ethnic group

The impact on lifestyle and practices in the project area are related mostly with the influx of construction workforce and their number. Besides, to minimize the impacts on local communities, following code of conduct will be enforced to the outside construction workers:

- The labor force will be instructed about the conducts and manners to be maintained while working along the TL. No discrimination in terms of salary or nature of job among local and migrant workers will be allowed.
- Respecting the rights, properties and practices of local people.
- Prohibiting all the outside labors to live outside construction camps.
- Prohibiting the use of alcohol in the project site, camp and nearby villages.
- Management of the short term influx of the labors during construction and stringing phases will include communication about the technical aspect of the construction and operations, and to allay fears about any apprehensions of perceived accidents during the operational phase of the project.
- The project proponent will demonstrate its concerns about the health and safety of the workers as well as the community through awareness programs and grievance redressed.
- The workers will be briefed about the health risk of communicable diseases due to unhygienic environment as well as sexually transmitted diseases.
- No child labor or the forced labor would be engaged by the project proponent.

G. Impact due to increased pressure on existing health and sanitation facilities

The project will keep the project area clean and hygienic to ensure the project activities will not cause the spread of communicable diseases. The labor camp will be provided with simple dry pit toilet constructed on hard ground and far from water sources. Toilets will be made in temporary camps at the rate of approximately a single toilet for 6 people. First aid kits will be maintained for preliminary treatment in emergencies. The domestic solid waste generated in the project area will be either buried in designed landfill areas or converted into compost.

To minimize the impact on water supply at least one drinking water supply system will be installed at each camp site to cope the demand of the drinking water supply for the labors and technicians. The water supply of the project area will be strengthened by installation of new pipe lines, keeping taps at a regular interval, and by improving the storage of water at the source. The quantity of drinking water will be increased by distributing the water of existing perennial stream. This water supply system will be handed to the local community after the project is over.

H. Impact on community infrastructures and resources

The TL alignment does not pass through community infrastructures and resources. However, it passes close to the structures like suspension bridge over Marsyangdi and Trishuli River, cremation, chautara and other public and private properties. Such structures will be impacted due to the construction activities of the project. Protection measures like placement of signboard, fencing of structures, and community awareness program will be carried out during construction period. There are no recreation area and places of public congregation that lies under the proposed TL and close to it. Hence, no mitigation measures required.

I. Impact on gender and vulnerable groups

The project will ensure not to discriminate the local people based on their gender, caste, color and place of origin. Similarly, priority for jobs will be given to the vulnerable group as per their ability and skills and willingness to work in the project area. Child labor will be prohibited in the project area. Projects proponent will consult and assist the local NGO working for the welfare of the women and children to monitor and control Child Labor Act, 2049 will be effectively implemented during construction period.

J. Impact on aesthetic value

Unnecessary intervention in the local environment will not be done during project construction. After the erection of the transmission towers, there will be permanent change in the aesthetic of the area which cannot be reversed back.

K. Loss of firewood and fodder from community forest to the households depending on them

During the construction period due to clearance of RoW there will be adequate availability of fire wood. The project will provide compensation to the loss of trees and the CFUGs can plant fast growing trees in order to meet fuel wood and fodder requirement.

L. Impact on socio-economic condition of project affected families

To minimize the adverse impacts on local economy and enhance the living standards of the affected households following measures will be implemented:

- Compensation for the hindrance due to use of land for the TL has been done through private negotiation route. Replacement value has been added to the average value of the land to bring it closer to or at par with the prevailing market rate. The disturbance allowances will be provided to the affected households;
- To minimize the impacts of loss of agricultural products due to the land acquisition, and any effect on the occupation will be compensated through appropriate agricultural extension program, livelihood skill training programs, etc.;
- Maximum job opportunities will be provided to the local people in prudential order and assistance to local communities into the planning through coordination with district level and local government office of the respective district.

8.3.2 Operation Phase

A. Loss of agricultural production

There will be permanent loss of agricultural production over the land occupied by the tower pad, while the land under the RoW will only be used for fixed time in order to string the conductor. Upon the completion of project construction land under RoW can again be used for cultivation. Loss of production will be compensated as mentioned in table 8.3 and 8.4.

B. Restriction on land use patterns under the RoW

Land under RoW can only be used for cultivation and no further land development projects can be forwarded. Thus, the land owner will be partially compensated based on the mutual agreement between the land owners and the proponent.

C. Impact due to land fragmentation

This is a residual impact of the TL project and hence no mitigation measures are proposed for this impact. However, project will provide partial compensation to land under RoW.

D. Farming hindrances due to the tower foundation

Compensation to land proposed for tower foundation along with one-year agricultural production will be provided to land owner to mitigate this impact.

E. Health and safety hazards

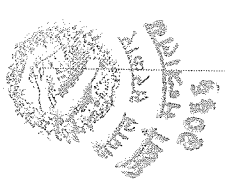
Safety equipment required for the operation of the TL will be provided. During the maintenance, the maintenance area will be restricted for entry of unauthorized person to avoid disturbances and risk. Safety helmet and glass, safety boot, ear plugs, good electric light system, good earthling devices, fire-fighting accessories, caution signals, safety belt and other safety equipment as required at particular site and working area will be provided. The 30 m RoW shall be strictly maintained to minimize the likely risks of conductor breakage, induced voltages, etc. Appropriate protection system and equipment will be installed at the substation to ensure the automatic isolation of the line in case of abnormal conditions.

F. Electricity hazard and electromagnetic field impact

In order to reduce the impact of the EMF effect, phase split in either of the circuit will be considered during the Detail Design Stage. Market centers are far from the TL, which will itself reduce the impact of EMF to certain extent. However, for the safeguard of the local people, an awareness program about the concept of EMF and the risk of neglecting the maintenance of the RoW will be conducted.

G. Devaluation of land in residential/commercial area

This is a residual impact of TL project and hence no mitigation measures are proposed.



H. Impact on aesthetic value

This is a residual impact of TL project and hence no mitigation measures are proposed.

8.3.3 Benefit augmentation measures

8.3.3.1 Vegetable and citrus fruit Farming

The proposed project will itself provide the local communities and the region with numerous opportunities for socio-economic development. As more than 65% of the TL traverses through the cultivated land and agriculture farming is the major occupation of these areas, the environment team after the extensive field investigation has concluded that the project area will benefit from the training program on improved agricultural farming system. To increase the agricultural production in the area, improved techniques and methods need to be introduced. A training program on improved seasonal, off-seasonal vegetable farming, mushroom farming program will be conducted for the local affected farmers, which will provide opportunities for increasing agricultural production in their farmlands. This program is especially focused for those households who lose their land 10 – 50% in the assumption that they can improve production and productivity by applying new methods and techniques. The proposed training programs are: fruits cultivation, use of organic fertilizer; irrigation techniques; appropriate cropping patterns; and methods of harvesting, processing and storage. Such training programs will be conducted in coordination with District Agriculture Development Office, District Livestock Office, District Forest Office and District Development Committee of the corresponding VDCs. Since the TL route is very long, such vegetable farming programs should be done in 3 different places. The total cost allocated for training programs regarding agriculture is NRs 1,635,000 (including cost for trainee's allowance, expert hiring, training materials, logistic support, etc.).

Table 8.10: Cost for vegetation Farming and Mushroom Farming.

S.N.	Particulars	No. of persons	No. of days	Unit cost (daily allowance)	Total Cost (NRs)
1	Training Coordinator	1	5	5000	25,000
2	Local Farmers/ participants	20	5	700	70,000
3	Agronomist/ Horticulturist/ trainer	4	5	2500	50,000
4	Distribution of seed/ improved materials			LS	2,00,000
5	Training Materials and Logistics			LS	2,00,000
				Total Cost	5,45,000
				Total Vegetable Farming Cost (3 places)	1,635,000

**Out of three places, seasonal and off-seasonal vegetable farming program will be conducted 2 places and in one mushroom farming program will be done*

8.3.3.2 Skill Development Program

Construction related training programs such as electrical wiring, cable stringing, tower assemblage, mobile repairing, driving, masonry (with focus on earthquake resistant structure) and automobile maintenance and repairing training will be conducted for the affected people (special focus for those households who lose land more than 50% and households who lose their residential structure) to tackle the adverse impact of the project. Duration of training will be 2 months (390 hrs) and it aims to expertise them. A total of NRs. 25,00,000 has been allocated for this program.

8.3.3.3 Community Development Program

The project will support for the development of several community infrastructures like roads, water supply system, schools, etc. Likewise, the socio-economic survey of the project affected families showed 83.3% of households use firewood for cooking purpose. The project has proposed to assist in installation of ICS for those households. Furthermore, project will support in installation of water treatment technology for the project affected area. The program will be done on the basis of demands of the local people. As per the need survey done during the baseline collection people of Udipur-Markichowk section had demanded the upgrading of existing roads while, the people of Markichowk-Bharatpur section had demanded the improvement of water supply system. Benefit augmentation measures proposed under this topic are as follows:

Table 8.11: Benefit Augmentation Measures under Community Development Program

S.N.	Benefit Augmentation Measures	Amount (Nrs.)
1.	Improvement of Irrigation Facility	600,000
2.	Installation of Improved Cook Stoves	700,000
3.	Installation of Solar Lighting	200,000
4.	Improvement in rural electrification system	1,500,000
5.	Improvement in drinking water supply system	800,000
	Total	3,800,000

The total cost for social enhancement is **NRs. 79,35,000.**

9.6. Resettlement and Rehabilitation Plan (RRP)

- **Relocation of House**

There's no relocation of houses.

- **Applicable policy and legislation**

Land Acquisition Act 1977 will be the main legislative system for land and other physical asset acquisition. The procedure defined in the Act will be followed for the acquisition; Compensation

Fixation Committee (CFC) will determine the compensation rates of each unit at replacement cost. Project proponent is the responsible for the implementation of RRP.

- **Entitlement framework**

The entitlement framework accordingly specifies compensation and /or rehabilitation measures for two units of entitlement individuals including affected individuals and their households, and groups. Loss of private assets will be valued and compensated based on the entitlement policy matrix (Table no: 8.8).

- **Government Property**

Government infrastructures and facilities affected by the project will be repaired or replaced in consultation with the relevant department authorities. Government forest land will be acquired by getting approval from Ministry of Forest and Soil Conservation.

- **Displacement Allowance**

In addition to the compensation for asset losses, households who are losing houses will qualify for the displacement allowances. Households, which required to be displaced will receive a housing displacement allowance equal to per capita income (per capita income is taken as $550 which is equivalent to NRs.53,460 (@ 1$= NRs.97.2) of one month based on the calculation for a household. Titleholders, tenants in own accommodation and squatters will be entitled to this allowance, to be paid at the time of compensation payment.

- **Rehabilitation Measures**

Apart from the provision of displacement allowance, the rehabilitation of PAFs will additionally be supported through preferential access transmission line construction employment opportunities to the extent possible. The project will, in addition, provide some support allowances to the vulnerable or marginalized project affected households. In this project, Indigenous, Dalit and Tribal households are categorized into this category.

There is potentially for two types of grievances: grievances related to land acquisition and resettlement requirements, and grievance related to compensation or entitlement. Special project grievance mechanisms such as site provision of complain hearings allows project affected persons to get fair treatment on time.

The project authority will ensure that funds are delivered on time to CFC and the implementing consultants for timely preparation and implementation of the proposed, as applicable. The compensation issues and rehabilitation measures will be completed before civil work starts.

Civil works contracts will not be awarded unless required compensation payment has been completed.

Table 8.12: Entitlement Policy Matrix

Type of loss	Entitlement unit	Description of Entitlements	Implementation measure
House			
Loss of own house and residential plot	• Title holder • Tenant • Squatter on public land	Cash compensation for full or partial loss of house at replacement cost according to house type	• Land valuation undertaken by CDC, house and other structure valuation by project authorities, compensation rate established by CDC • Material may be salvaged with on deduction form compensation • Displaced households will receive housing displacement allowance • Notice to vacate will be served at least 35 days prior to acquisition • An appropriate compensation advance and housing displacement allowance to be paid at time of notice to vacate, balance payable prior to acquisition • To ensure fair compensation, determination of rates will be done not more than one year prior to property acquisition • All transfer cost and taxes till be responsibility of project • Formal resettlement planning will be undertaken where more than 10 households from one settlements/residential area are displaced
	Title Holder	Where displaced, cash compensation (at replacement value) for residential plot, or provision of suitable replacement residential pot in the vicinity if available.	
	Tenant	Assistance with identification of alternative residential land	
Loss of commercial establishment	Titleholder	• Cash compensation for full or partial loss at replacement cost according to building type • Where displaced, cash compensation for plot or provision of suitable replacement plot in the vicinity if available • Assistance with identification of alternative business	• Compensation determination, notice to vacate and compensation payment • Owners of displaced commercial establishments will receive a business displacement allowance

Type of loss	Entitlement unit	Description of Entitlements	Implementation measure
Loss of other Privately owned Structures	Titleholders, Tenant	• Cash compensation for full partial loss at replacement cost according to building type • Cash compensation for damages to structure resulting from temporary occupation of land	• Other structures: sheds, water tank, etc. • Loss of structures other than houses and commercial establishment does not entail payment or displacement allowances • Compensation determination, notice to vacate
Cultivable land			
Loss of private land	Title holder	• Provide compensation at replacement cost • provide full title to land of equal area and productivity acceptable to owner in the vicinity • If land is not available elsewhere then provide cash compensation at full replacement cost based on market rate or government rate whichever is higher • Resettlement assistance in lieu of compensation for land occupied (land, other assets, employment) at least restore their livelihoods and standards of living of pre-displacement levels • In the case of farm land, the SPAPS will be entiled the cultivation disruption allowance equal on one year production	• A list of affected and entitled persons and the area of land loss is required • Notice to vacate will be served at least 35 days prior to acquisition date • If any owner having significant impacts receives cash compensation for farm land and purchases replacement farmland within 1 year from the date of receiving compensation, all related land registration fees, taxes and duties will be borne by the project • Case-wise compensation will be either by cash or by cheque, depending on the owner's preferences • To ensure fair compensation, determination of rates will be established not more than one year prior to property acquisition
Vulnerable social categories	Adults 18 years and older in the vicinity	• Assistance in reestablishment and improvement of livelihood	• Vulnerable social categories actually affected by the project will be identified • Tribal groups

Type of loss	Entitlement unit	Description of Entitlements	Implementation measure
		• Training in life skills • Preferential employment on project construction and maintenance to the extent possible	• Dalits • Landless households • Women headed households
Government Property			
Loss of infrastructure and facilities	Relevant	• Facilities will be repaired or replaced	• To be undertaken in consultation with the relevant department or ministry
Loss of forest areas	Department of Forest	• Mitigation by means of a Forestation	• An assessment of maintaining that kind of vegetation • To be undertaken in consultation with Department of Forestry
Loss of Government land	Relevant agency	• No provision of compensation	• Consultation with relevant government agencies
Other privately owned resources			
Building and structures	Local community	• Restoration of affected community buildings and structures to at least previous conditions or replacement in areas identified in consultation with affected communities and relevant authorities	• Community buildings and structures includes: tempos, water tank, irrigation canals trails and bridges
Rehabilitation Assistance			
Displacement of households	Titleholders, tenants	• Housing displacement allowance for loss of own residential accommodation	• The housing displacement allowance will be based on two months per capita income. The value of the allowance will be adjusted annually for price escalation • Allowance will be paid at the time of serving the notice to vacate • Displacement allowances will be paid severely
General Counseling			
All project impacts	Households within RoW or outside the RoW	• General counseling on project impacts, constructor schedules and acquisition dates, valuation compensation	• This will be achieved through the periodic distribution of information sheets and consultation with local officials

Type of loss	Entitlement unit	Description of Entitlements	Implementation measure
		and grievance Resolution mechanisms procedures and local development initiatives	• Cooperation with GoN line agencies such DAO, DFO to support effective resource utilization and community development

8.4 Environment Benefit Augmentation and Adverse Impact Mitigation Matrix

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
Construction and Operation Phase					
Community development programme	• Vegetable and citrus fruit farming training program. • Improvement of Irrigation Facility • Installation of Improved Cooking Stove • Improvement of Rural Electrification • Improvement in drinking water supply system	Project	Project management office	Approved IEE report	During construction and operation phase
Environmental improvement programme	• Sanitation improvement and waste management programme. • Afforestation programme.	Project	Project management office	Approved IEE report	During construction and Operation phase
Skill development program	• Construction related training such as electrical wiring, cable stringing, tower assemblage, mobile repairing, driving, masonry and automobile maintenance.	Project	Project management office	Approved IEE report	During construction and operation phase
Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standard	Time of Action
Pre-Construction Phase					
Land Clearance	• Re-vegetation • Bioengineering with combination of retaining wall, • Locating tower under the RoW of road as far as possible to avoid land fragmentation	Project/Contractor	Project EMU	Approved IEE report, Contract Document	During construction

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
Construction Phase					
Landslides and soil erosion	• Construction of adequate drainage systems • Re-vegetation of the disturbed slopes • Bioengineering techniques along with retaining wall	Project/Contractor	Project EMU	Approved IEE report, Contract Document	During Construction
Change in topography, land management and land use pattern	• The stability of the tower locations will be examined before excavation and special foundation design will be selected for the susceptible locations. • Erection of tower foundation in the unstable land and/or in steep slopes will be avoided. • Proper landscaping will be done at each tower site. • In order to avoid the land fragmentation, the tower will be located at the RoW of road and at the edge of the land parcel as far as possible. • Land acquiring will also be limited to the requisite.	Project/Contractor	Project EMU	Approved IEE report, Contract Document	During Construction
Drainage pattern	• Vegetation clearing and ground disturbances will be confined within the foundation and required RoW. • Proper compaction of the excavated soil will be done. After compaction 10% of the remaining soil will be disposed properly in the vicinity so as not to disturb the natural drainage. • Adequate surface and sub-surface drainage	Project/Contractor	Project EMU	Approved IEE report, Contract Document	During Construction

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
	will be provided at all the Angle Tower area and at substation area to drain away the excess water and prevent water logging. • Excavation will be done in phases with higher number of laborers so that the required target stretch is completed on time. • Restoration of the area around the tower pad for cultivation and regeneration of vegetation will be done. • Erection of pole and stringing of line will be carried out in dry season if possible. • Pile foundation or matt foundation will be used for Lattice towers at river crossings.				
Soil erosion and Landslide	• Minimal disturbances to the slope. • Construction of adequate drainage systems • Re-vegetation of the disturbed slopes	Project/Contractor	Project EMU	Approved IEE report, Contract Document	During Construction

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
Water quality	• The waste generated from the mixing concrete will be disposed in pits and filled with soil. Such pits will be made in barren land at a distance of more than 500 m from water bodies. • Dykes are proposed around the storage tanks to avoid water pollution. • Toilets will be provided to workforce. Care will be taken to locate the temporary construction worker sheds away from the water bodies. • Garbage and solid wastes generated by the workforce will be dumped safely away from water bodies. • All waste oils and chemicals will be collected and stored in suitable storages tanks and disposed through appropriate techniques.	Contractor	Project EMU	Approved IEE report, Contract Document	During Construction
Air quality	• The project will not lead to a significant deterioration in air quality except in much localized instances and localized areas during the construction phase. • Vehicles utilized for construction will be compiled with GoN mass emission standards. • Regular checkup; up keeping and maintenance of the equipment will be carried out as per the Manufacturer's Specifications to meet the emission standards. Proper maintenance of all vehicles and construction machineries will be done regularly	Contractor	Project EMU	Approved IEE report, Contract Document	During Construction

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
Noise and Vibration	• Construction work will not be carried out during the night time so as to minimize the noise and vibrations. Ear mufflers will be provided to labor force working in the areas susceptible to noise pollution.	Contractor	Project EMU	Approved IEE report, Contract Document	During Construction
Solid Waste, Muck Disposal and Sedimentation	• The kitchen waste will primarily consist of organic food waste. Because this is easily biodegradable and non-hazardous, it will be managed by burying in pits at reasonable distance from water bodies and subsequently covered with soil. • Waste generated from construction activities are usually inert materials which are non-biodegradable, e.g. empty cement bags and containers, rejected materials, plastic, wooden • Planks, etc. These waste materials will be stored out and kept separated • Instead of throwing haphazardly elsewhere. Some of these items (cement bag, plastic drum, etc.) can be sold in the market in order to be re-used or recycled.	Contractor	Project EMU	Approved IEE report, Contract Document	During Construction
Safety measures and precaution to minimize the risk associated	• In order the safeguard the safety of construction workers, they will be provided with personal safety measures like gloves, masks, helmets, etc. • The construction site will be fenced and only the construction crew will	Contractor	Project EMU	Approved IEE report, Contract Document	During Construction

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
with construction phase	• be allowed to enter. • Lighting facilities will be installed around the construction site to avoid accidents during night time. • Sign posts indicating work under process and/or danger will be installed around the construction location.				
Operation Phase					
Interference of road crossing, transmission lines, telecommunication, radio, TV and other utilities	• All crossings of existing transmission and distribution lines will be designed with standard safe vertical and horizontal clearances for 220 kV lines. • Design clearances for communication lines will be maintained. For this, the standards referred by the Electricity Regulation 1993 (Rule 48,49, 50 and 55) shall be followed.	Project	Project EMU	Electricity Regulation 1993	During Operation Phase
Change in land use pattern along the RoW of Transmission line	• The impact on the land use changes under the RoW and permanent land take for the towers will remain forever. • The restriction for the erection of any type of structure on the land under the RoW and plantation of trees of tall species cannot be mitigated. • Cultivation will be allowed. All temporary land acquired will be converted to its original use or agreed new uses towards the end of the	Project	Project EMU	Electricity Regulation 1993	During Operation Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guidelines Document/Standard	Time of Action
	construction period and handed over to their owners.				
Issues Associated with Chemicals	Safe handling and storage of paints	Project/Contractor	Project EMU	Contract document	During operation phase
Direct/Indirect Electromagnetic Field Impact	• Assessing the potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection • Siting the power transmission facilities to avoid or minimize exposure to the public. Avoiding installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g. schools or offices), should be avoided • If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include: ❖ Shielding with specific metal alloys ❖ Increasing height of transmission towers ❖ Modifications of size, spacing, and configuration	Project	Project EMU	Contract document	During operation phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Pre-Construction Phase					
Vegetation clearance for setting workers camp	Vegetation clearance is not required for worker's camp and hence mitigation measures are not proposed for this impact.	Project/Contractor	Project EMU	Contract document	Pre-Construction
Vegetation Clearance during site clearance	The loss of vegetation during site clearance for the construction of tower pad will be compensated in the ratio 1:25	Project	Project EMU/CFUGs/ DFO/DoED	Approved IEE	Pre-construction
Disturbance to wildlife due to construction works	This impact is not significant for the proposed project and hence no specific mitigation measures have been proposed.	Project	Project EMU/CFUGs/ DFO	Approved IEE	Pre-construction
Construction Phase and Operation Phase					
Loss of forest area and Vegetation	As a compensatory measure for the loss of trees due to the site clearance, plantation in 1:25 ratio plants plus equivalent to forest area cleared (1600 plants/ha) in the CFs, LHFs and National forests will be carried out in the area provided by the District Forest Offices/CFUGs/LHFGs according to new provision made in 2074 BS.	Project	DFO, CFUGs, DoED	Approved IEE	Construction and Operation Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Issues Associated with illegal hunting and poaching	• The project will train its workers regarding the importance of biodiversity and the consequences of illegal hunting and poaching through awareness campaign. • Strict code of conduct will be formulated by the project, so that workers involving in illegal hunting and poaching will be punished or fined. • The construction work in community/leasehold forest area will be coordinated through DFO and CFUGs/LHFGs. In addition, informative and warning sign boards will be placed at relevant construction sites	Project	DFO, CFUGs, Local NGOs	Approved IEE/Contract document	Once every in three months during construction
Issues associated with forest encroachment and forest fire	• In order to minimize the probability of forest fire, each of the worker's camp will be provided with fire extinguishers. • Construction site will be cleaned and even dry leaves that catch fire easily will not be left. • Workers will be warned not to throw	. Project/Contractor	Project EMU, CFUGs, DFO, Local NGOs	Approved IEE/Contract Document	Construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	pieces of burnt cigarettes around the vegetated area. • Short term forest fire hazard training will be given to construction workers to minimize the risk of fire as well as control any fire hazard at initial level to avoid any major damages				
Loss of natural habitat and alteration of habitat	• The project will avoid unnecessary forest clearance. • Project route alignment has been selected in such a way that the alignment would avoid core forest areas, which are the habitat of several wildlife species. • In particular, forest near the Aaptari substation serves as wildlife movement corridor and transmission line alignment in that forest traverses parallel to Narayanghat – Muglin Highway. This will help to avoid forest fragmentation at another location.	Project/Contractor	CFUGs, DFO, Local NGOs	Approved IEE	During Construction And Operation Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Impact due to increase in demand of fuel wood and timber by construction crew	• In order to reduce the demand of fuel wood, the construction camp will be supplied with LPG and/or Kerosene. • Forest product will not be used to set the labor camp so that there would not be the demand of timber.	Project/Contractor	Project EMU, CFUGs, DFO, Local NGOs	Approved IEE/Contract document	Construction Phase
Impact on wildlife movement, feeding	• Construction camp will be set outside the forested area. • Construction activities will be limited to daylight hours only. • Any kind of noise producing activities around the construction site and labor's camp will be restricted. • Construction area will be fenced to prevent wildlife from entering within the construction location which could be result in accidents by falling into the excavated foundation. • Similarly, to minimize the impact on wildlife movement, Udipur-Bharatpur Transmission has been proposed to merge with Transmission line to be constructed to evacuate the power generated by Tanahu (Upper Seti)	Project	CFUGs, Project EMU, DFO	Approved IEE/Contract document	During Construction Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	Hydropower Project.				
Impact due to movement of labor force and their activities in forest area	• The project will require few workers and there will be limited movement of workers within the core forest area. • Furthermore, the construction period of each tower is very low and strict code of conduct will be made for construction workers so that they would not be allowed to undertake restricted activities within the forested areas.	Project/Contractor	CFUGs, DFO	Approved IEE/Contract document	During Construction
Impact on rare, endangered, protected and threatened species of flora and fauna	• The clearing of trees will be done manually causing less impact on adjoining vegetation. As far as possible construction work will be labor based. The project proponent will be responsible to avoid unnecessary machinery disturbances and lighting. • In addition, informative and warning sign boards will be placed at relevant construction sites. The workers will strictly be prevented from hunting and poaching.	Project/Contractor	CFUGs, LHFGs, DFO	Approved IEE/ Contract Document	During Construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Issues Associated with Electrocution	❖ Install and maintain reflectors and other features at all major river crossings of the transmission line to enhance the visibility of the lines and reduce collisions. ❖ For the longer term, plant tall growing trees where these will grow outside of the TL ROW to encourage birds to fly higher and avoid both the trees and the lines. ❖ The tower design shall include platforms or other features that can be used by raptors and vultures to nest safely on the TL towers. ❖ The tower design shall include suspended insulators (instead of upright insulators) and power lines below the cross arm ❖ Stringing of the power lines shall be planned to obstruct only a minimum of air space in vertical direction by single level arrangement of conductor cables and "burying" the neutral cable; Attaching black and white markers on to cables in particular to the neutral cable, at river valleys (bird flyways);	Project/Contractor	CFUGs, LHFGs, DFO	Approved IEE/ Contract Document	During Operation phase

Type/phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Time of Action
Impact due to land encroachment and land management	The project will acquire 1.395 ha of private land for angle towers and 49.93 ha under the RoW of TL. • Compensation for permanently acquired land • Compensation for RoW (Restricted Land)	Project	Concerned government agencies and local communities	Approved IEE/Resettlement Plan	Pre-Construction
Impact due to relocation and/or resettlement	• There are 34 private structures falling under the RoW of the transmission line alignment. • The project will prepare separate resettlement plan to address the issues associated with the relocation and/or resettlement of houses under the RoW of the TL.	Project	Concerned government agencies and local communities	Resettlement Plan	Pre-Construction
Impact due to occupational health and safety hazards	• The project will ensure adequate safety gears for workers (Personal Protective Equipment, accommodation, First Aid Box, etc.). • There will be training for contractors and workers regarding occupation health and safety measures. • Construction site will be fenced and safety signboards written in Nepali language will be installed.	Project/Contractor	Project coordination committee	Contract Document	Regularly during construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	• Safety training will be implemented and any loss of life or injury will also be compensated as per prevailing rules. • The safety training for the project workers will be conducted prior to the construction work. • Community safety awareness program about the TL and potential risks associated with TL construction will also be implemented in nearby settlements and school area. • Hoarding board will be placed in the sensitive area (school and other public places).				
Impact due to loss of standing crops and farming hindrances	• The total compensation of the project affected HHs for production loss of 8.63 MT is estimated to be NRs. 298,400. The value of total loss of crops is estimated based on their yield, production, and local market rate • The project requires 49.93 ha of cultivated land for RoW. The total loss of crops produced in this land is estimate to be 167.40 MT which will	Project	Concerned government agencies/Local Communities	Approved IEE	During construction and operation phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	cost NRs. 5,787,500 for one year				
Deterioration of law and order situation	• Local employment, water/labor rate, working hours, use of local resources by project workers, etc. are the major factors that may create conflict in the project area which may pose threat to law and order situation. • The proponent will implement a strict code of conduct for the workforces. In case any worker is found as drunkard or soliciting prostitution and gambling, etc. will be penalized and terminated too. • The existing facilities of GoN from Lamjung, Gorkha, Tanahaun and Chitwan districts will be used to maintain law and order situation as when required basis. The proposed awareness program will also minimize this impact to some extent.	Project	Local communities, Local NGOs	Approved IEE/Contract Document	During Construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Impact on lifestyle and social conflict due to interaction with different people and ethnic group	○ The labor force will be instructed about the conducts and manners to be maintained while working along the TL. No discrimination in terms of salary or nature of job among local and migrant workers will be allowed. ○ Respecting the rights, properties and practices of local people. ○ Prohibiting all the outside labors to live outside construction camps. ○ Prohibiting the use of alcohol in the project site, camp and nearby villages. ○ Management of the short term influx of the labors during construction and stringing phases will include communication about the technical aspect of the construction and operations, and to allay fears about any apprehensions of perceived accidents during the operational phase of the project. ○ The project proponent will demonstrate its concerns about the health and safety of the workers as well as the community through awareness programs and grievance	Project/Contractor	Local Communities and NGOs	Approved IEE/Contract Document	During Construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	redressed. ○ The workers will be briefed about the health risk of communicable diseases due to unhygienic environment as well as sexually transmitted diseases. ○ No child labor or the forced labor would be engaged by the project proponent.				
Impact due to increased pressure on existing health and sanitation facilities	• The project will keep the project area clean and hygienic to ensure the project activities will not cause the spread of communicable diseases. • The labor camp will be provided with simple dry pit toilet constructed on hard ground and far from water sources. • Toilets will be made in temporary camps at the rate of approximately a single toilet for 6 people. First aid kits will be maintained for preliminary treatment in emergencies. • The domestic solid waste generated in the project area will be either buried in designed landfill areas or converted into compost. • To minimize the impact on water	Project/Contractor	Local Communities and Project Management Office	Approved IEE/Contract Document	During Construction Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
	supply at least one drinking water supply system will be installed at each camp site to cope the demand of the drinking water supply for the labors and technicians.				
Impact on community infrastructures and resources	• The TL alignment does not pass through community infrastructures and resources. However, it passes close to the structures like suspension bridge over Marsyangdi and Trishuli River, cremation, chautara and other public and private properties. Such structures will be impacted due to the construction activities of the project. • Protection measures like placement of signboard, fencing of structures, and community awareness program will be carried out during construction period. • There are no recreation area and places of public congregation that lies under the proposed TL and close to it. Hence, no mitigation measures required.	Project/Contractor	Concerned government agencies/Local communities	Approved IEE	During Construction Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Impact on gender and vulnerable groups	• The project will ensure not to discriminate the local people based on their gender, caste, color and place of origin. • Priority for jobs will be given to the vulnerable group as per their ability and skills and willingness to work in the project area. Child labor will be prohibited in the project area.	Project/Contractor	NGO working for the welfare of the women and children	Child Labor Act, 2049	During Construction phase
Impact on aesthetic value	• Unnecessary intervention in the local environment will not be done during project construction. • After the erection of the transmission towers, there will be permanent change in the aesthetic of the area which cannot be reversed back.	Project/Contractor	Local Communities/Concerned government agencies	Approved IEE	During Construction phase
Loss of firewood and fodder from community forest to the households depending on them	• During the construction period due to clearance of RoW there will be adequate availability of fire wood. • The project will provide compensation to the loss of trees and the CFUGs can plant fast growing trees in order to meet fuel wood and fodder requirement.	Project/Contractor	CFUGs, Local Communities	Approved IEE/Contract Document	During Construction phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Impact on socio-economic condition of project affected families	○ Compensation for the hindrance due to use of land for the TL has been done through private negotiation route. Replacement value has been added to the average value of the land to bring it closer to or at par with the prevailing market rate. The disturbance allowances will be provided to the affected households; ○ To minimize the impacts of loss of agricultural products due to the land acquisition, and any effect on the occupation will be compensated through appropriate agricultural extension program, livelihood skill training programs, etc.; ○ Maximum job opportunities will be provided to the local people in prudential order and assistance to local communities into the planning through coordination with district level and local government office of the respective district	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Construction Phase
Operational Phase					

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Loss of agricultural production	• There will be permanent loss of agricultural production over the land occupied by the tower pad, while the land under the RoW will only be used for fixed time in order to string the conductor. • Upon the completion of project construction land under RoW can again be used for cultivation. Loss of production will be compensated as mentioned in table 8.3 and 8.4.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase
Restriction on land use patterns under the RoW	Land under RoW can only be used for cultivation and no further land development projects can be forwarded. Thus, the land owner will be partially compensated based on the mutual agreement between the land owners and the proponent.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase
Impact due to land fragmentation	This is a residual impact of the TL project and hence no mitigation measures are proposed for this impact. However, project will provide partial compensation to land under RoW.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase
Farming hindrances due to the tower foundation	Compensation to land proposed for tower foundation along with one-year agricultural production will be provided to land owner to mitigate this impact.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Health and safety hazards	Safety equipment required for the operation of the TL will be provided. During the maintenance, the maintenance area will be restricted for entry of unauthorized person to avoid disturbances and risk. Safety helmet and glass, safety boot, ear plugs, good electric light system, good earthling devices, fire-fighting accessories, caution signals, safety belt and other safety equipment as required at particular site and working area will be provided. The 30 m RoW shall be strictly maintained to minimize the likely risks of conductor breakage, induced voltages, etc. Appropriate protection system and equipment will be installed at the substation to ensure the automatic isolation of the line in case of abnormal conditions.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase
Electricity hazard and electromagnetic field impact	In order to reduce the impact of the EMF effect, phase split in either of the circuit will be considered during the Detail Design Stage. Market centers are far from the TL, which will itself reduce the impact of EMF to certain extent. However, for the safeguard of the local people, an awareness program about the concept of EMF and the risk of neglecting the maintenance of the RoW will be conducted.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase

Type/ phase	Environmental Protection Measures	Responsible Agency	Supporting Agency	Guiding Document/Standards	Timing of Action
Devaluation of land in residential/commercial area	This is a residual impact of TL project and hence no mitigation measures are proposed.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase
Impact on aesthetic value	This is a residual impact of TL project and hence no mitigation measures are proposed.	Project	Local communities and NGOs, Concerned government agencies	Approved IEE	During Operational Phase

8.5 Total Environmental Mitigation and Enhancement Cost

The total cost for environmental impact mitigation and enhancement measures are presented in the following table:

Table 8.13: Total environmental impact mitigation and enhancement cost

SN	Mitigation and enhancement program	Unit/Rate	Amount NRs			Remarks
			Construction phase	Operation phase	Total	
Physical Environment						
	Construction and maintenance of the civil structures for slope protection and bioengineering works				2,955,000	
	Sub Total					
Biological Environment						
	Cost of compensatory plantation @1:25 of trees including transportation cost of sapling, nursery development, fencing and protecting/growing cost for five years				46,712,550	
	Compensation for felled private trees		175,000		175,000	
	Signed board cost		400,000		400,000	
	Sub Total				47,287,550	
Socio-economic and Cultural Environment						
	Compensation for private land		46,522,000		46,522,000	
	Displacement Allowance for affected people		53,460 x 48		2,566,080	
	Occupational health and safety measures (such as masks, helmets, gloves, safety glasses) and training to the worker for safety health including first aid, health and hygiene and insurance				It will be included in Contractor's Agreement.	
	Compensation for privates structures (house, shed etc.)				It will be included Resettlement plan separately.	

SN	Mitigation and enhancement program	Unit/Rate	Amount NRs			Remarks
			Construction phase	Operation phase	Total	
	Compensation to crop loss		6,085,900		6,085,900	
	Compensation for acquisition of private land temporarily (on lease)		2,500,000		2,500,000	
	Sub Total				57,673,980	
Enhancement Measures						
	Benefit Augmentation Measures for biological environment (table 8.3)		4,600,000		4,600,000	
	Social Enhancement Measures					
	Skill Development Program			2,500,000	2,500,000	
	Community Development (table 8.8)			3,800,000	3,800,000	
	Vegetable and mushroom farming (table 8.7)			1,635,000	1,635,000	
	Sub Total				12,535,000	
	Total				115,851,530	

Particular	Cost (NPR)
Physical Impact Mitigation Measures	2,955,000
Biological Impact Mitigation Measures	47,287,550
Biological Enhancement Measures	46,00,000
Social Impact Mitigation	57,673,980
Social Enhancement Measures	7,935,000
Total Cost	115,851,530

CHAPTER NINE: ENVIRONMENTAL MONITORING PLAN

9.1 Introduction

This section discusses and outlines the environmental monitoring program of Udipur-Bharatpur 220 kV T/L project. It also assists to ensure compliance with environmental laws and in ameliorating and eliminating adverse impacts. This chapter on monitoring is formulated in accordance with Environmental Protection Rules, 1997 and its amendment.

9.2 Requirements for Environmental Monitoring in Nepal

An Environmental Monitoring Plan will be required to define the responsibilities for the monitoring, the parameters that will be monitored, where the monitoring will take place and its frequency. Effective monitoring of the whole project cycle, particularly the resettlement related aspects, will assist in the identification of unexpected problems/outcomes, and facilitate the correction of these. Monitoring of socio-economic impact indicators should wherever possible be participatory, involving local groups assessing their own situations as part of the process. This will assist local communities raise their awareness about their situations and the chain of causality bringing about their situations of relative gain or loss.

Social monitoring will also be incorporated in the scope of work for construction management, so that the local labor recruitment norms and requirements, their operating conditions, rights and penalties can be closely observed in order to avoid inequities and conflicts. Social monitoring is the most effective if local community leadership and administration structures are involved in a process that is participatory, and provides recourse to recognized authority structures. Involving community leaders and local authorities often provides the means to resolve social problems identified in a direct, efficient and effective manner.

The monitoring plan for this project will be prepared directly by Project Proponent during the construction phase. Project proponent will primarily be responsible for the implementation of monitoring program. MoEn, DoED, NGOs, CBOs and local bodies will also be involved during the monitoring.

The environmental monitoring will be carried out at all the project impact areas in a regular or intermittent schedule. Compliance monitoring will be carried out regularly whereas the impact monitoring will be done at the middle and at the end of construction phase or as prescribed in the monitoring plan and schedule. (In general, observation, inspection, review of official records, interview, counting and/or measurements will be used for monitoring. Furthermore, scientific methods will be used for the monitoring requirements, where and whenever necessary.



9.3 Environmental Monitoring Unit

An Environmental Monitoring Unit (EMU) will be formed which will consist of experts from NEA, Ministries, local administrators and other qualified personnel working in this sector. EMU will be responsible for day-to-day environmental monitoring works. This unit will consist of experts including the following:

- Environmentalist
- Sociologist
- Civil engineer
- Electrical engineer
- Statistician
- Field technicians
- Public relation officer
- Legal officer

This unit will have two principal functions. The first is to conduct community related mitigation measures on behalf of the project (which are not specifically related to the activities of the construction contractors); while the second is the implementation of mitigation measures. The Unit will work in close co-ordination with the Project Manager/Director and NEA. The Unit, in addition of foreseeing mitigation and monitoring will also take care of the community problems arising during project construction. Furthermore, the Unit will use EMP as the guideline for implementing the mitigation specified in IEE, Tender Documents and Technical Specifications such that the deleterious environmental impacts were minimized.

The co-ordination of the compliance monitoring and mitigation program allocated under the contractor will be the responsibility of the project proponent. As already stated, the Environmental Unit will work for the monitoring of compliance issues of construction contractors. The Unit will be responsible for the approval of contractors Environmental Protection Plan (EPP) and Environmental Safety Plans. In addition, the Unit in coordination of Project Manager will have the authority to penalize contractors for violation of environmental tender clauses and non-performances.

9.4 Environmental Monitoring Plan

A monitoring program required for the project to evaluate the application and effectiveness of mitigation measures is formulated in three phases.

9.4.1 Baseline Monitoring

The primary concern during this phase will be to implement field data collection programs needed to enhance the knowledge of baseline conditions. Focus will be on the gathering of scientific and sociological information needed to verify and update the data provided by this IEE process.

9.4.2 Compliance Monitoring

In this monitoring, the GoN licensing entity (MoEn/DoED) oversees and ensures the implementation of the required mitigation measures according to GoN guidelines and approved mitigation plan. The Unit will be delegated the day-to day responsibilities in this respect.

9.4.3 Impact Monitoring

Impact monitoring will focus on key indicators to assess whether the impacts have been accurately predicted, and whether the mitigation measures are sufficient and effective. The monitoring of the proposed 220 kV T/L Project will include:

9.4.3.1 Physical Environment

- Watershed monitoring/land use
- Stability of the area around the tower pads

9.4.3.2 Biological Environment

- Vegetation Clearing
- Plantation
- Casualty replacement/re-vegetation
- Tree management
- Stability along river crossings

9.4.3.3 Socio-economic and Cultural Environment

- Employment monitoring
- Land-use along the RoW
- Economic status of the affected people and relocated people
- Adaptation of resettlement households to their new homes and communities
- Public safety and security monitoring
- Health and sanitation monitoring
- Compensation

9.5 Grievance Redress Mechanism (GRM)

The GRM for any infrastructure project provides an effective approach for complaints and resolution of issues made by the affected community in a reliable way. Considering this, a Grievance Redressal Cell (GRC) will be established at the district level to address the social issues associated with the project. The cell will have representation from the project, local administration, civil society and the Project Affected Families. The GRC will look into complaints and concerns about ownership disputes, inheritance of assets, distribution of compensation among heirs, missing affected assets and persons in the census etc. The GRC will seek to resolve the issues quickly in order to expedite the receipt of compensation, without resorting to expensive and time-consuming legal actions. The budget for setting up the grievance cell will be provided by the Project Manager Office itself.

In addition to the above, if there are any grievances related to environmental management issues in the project area, the GR cell will record these grievances and suggestions and pass it on to the relevant authorities for necessary action and follow-up.



Table 9.1: Environmental Monitoring Plan

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
			Baseline Monitoring				
	A. Physical Environment						
1	Land use	Changes in land use pattern	Site observation	RoW and nearby areas	Pre-Construction	MoEn/MoPE	Proponent
2	Stability	Stability of tower pads	Site observation	Near tower pads	Pre-Construction	MoEn/MoPE	Proponent
	Biological Environment						
3	Vegetation/forest cover	Observation of vegetation and maintenance of RoW	Discussion with User's Group, observation, local people and District Forest Office	Under the RoW and in the vicinity of the corridor	Pre-Construction	MoFSC/DFFO/CFUG	Proponent/DFO
4	Wildlife	Wildlife habitat and clearance	Observation, discussion with local people	RoW and near project area	Prior to Construction	MoFSC/DFFO/CFUG	Proponent/DFO
	Socio-economic and Cultural Environment						
5	Settlement/ infrastructure	Increase in settlement/ infrastructure, migration	Discussion with local people, VDCs, observation	Project affected VDCs	Pre-Construction	RM/DDC/Local NGO/CBS/DoED	Proponent
6	Socio-economic and cultural	Under socio-economic/	Discussion with local	Project affected areas	Prior to construction	RM/DDC/Local NGO/CBS/DoED	Proponent

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
	baseline	cultural baseline	people, observation, review				
				Impact Monitoring			
	Physical Environment						
1	Land use	Stability/land use changes from the baseline	Observation	Around the tower pad area	Thrice a year	MoFSC, Local NGOs, DCC, RM	Consultant/Proponent
2	Waste disposal	Unpleasant odor and visual impact	Observation	Temporary camps/ construction sites	Weekly during construction	Local NGOs, DCC, RM	Proponent
3	Air quality/ noise quality	Presence of dust in the atmosphere and increase in ambient noise	Observation	Project area	Weekly during construction	Local NGOs, DCC, RM	Proponent
	Biological Environment						
4	Vegetation clearance	Number of trees felled, ground cover	Observation of the area, discussion, counting	Under the RoW	During site clearance	DFO, CFUGs, MoFSC	Proponent
5	Pressure on forest	Forest cover	Observation and survey of forest area before and after	Along T/L	Regular basis during construction and annually during operation	DFO, CFUGs, MoFSC	Proponent/DFO

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
			construction, discussion with local people and FUGs				
6	Wildlife	Number of wildlife seen	Observation, keeping records on wildlife, birds and reptiles killed	In the vicinity of the corridor	Regular basis during construction and annually during operation	DFO, CFUGs, MoFSC	Proponent/DFO
	Socio-economic and Cultural Environment						
7	Compensation	Socio-economic parameters like economic status, living conditions, etc. of the affected people	Housing assets, living conditions, income, etc.	Affected local people	Regularly for at least three years following acquisition	DCC, RM, Local NGOs	Proponent
8	Land loss	Acquisition of land, lease of land and temporary disturbances in land	Cross checking the compensation list	Tower pad, RoW and the leased area	Quarterly during construction and once during operation	DCC, RM, Local NGOs	Proponent

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
9	Health issues	Types of diseases and record of outbreak of diseases	Record of diseases, inspection of camps	Project area and particularly camps	Quaterly	DCC, RM, Local NGOs/MoH	Proponent
10	Safety	Number of casualties	Records of accidents	Project area	At least once in a year	DCC, RM, Local NGOs/DoED	Proponent
11	Employment	Number of local people employed by the project	Record kept by management	Project area	Continuous during construction period and annually during operation	DCC, RM, Local NGOs/DoED	Proponent
12	Impact on women/children	Status of women and children	Record on women employment; children employment; inspection on child labor	Project area	Continuous during construction period	DCC, RM, Local NGOs/DoED	Proponent
13	Indirect economic benefit	Economic activities in the area	Trade and business revenues	Project affected VDCs	Twice a year during construction and once during operation	DCC, RM, Local NGOs/DoED	Proponent
Compliance Monitoring							
1	Incorporation of recommendations of IEE into project documents	Yes/No	Review/Cross Checking of tender and design documents	Kathmandu Office	During and after the project design stage, completion of tender documents	MoPE	Consultant

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
2	Incorporation of environmental considerations mentioned in tender documents in the contractors proposed work plans	Yes/No	Review of proposed work plan submitted by the contractor	Kathmandu Office/Site office	During contract negotiations	MopE	Consultant
3	Integration of mitigation measures in the detail design and contract document	Yes/No	Review process	Kathmandu Office	During project approval	MoPE/DoED	Consultant
4	Allocation of adequate budget for implementation of environmental mitigation measures and monitoring works	Yes/No	Review, inquiry and consultation	Kathmandu Office	During detail design and contract agreement	MoPE/DoED	Proponent
5	Clean-up and reinstatement of the project area	Muck disposal, drainage around the tower	Site observation and inspection	Around tower area, substation area	At the end of construction period	MoPE/MoEn/DoED	Proponent/Consultant

SN	Parameter	Indicator	Method	Location	Schedule	Agency to be consulted	Agency Responsible for Monitoring
6	Compensatory plantation of native species and conservation of plated seedlings for 5 years	Type of planted species, survival of seedlings	Site observation/ sampling	Corridor inspection, tower area, plantation areas	Periodically during construction and operation phase	MoFSC/CFUGs/DFO	Consultant
7	Land/property acquisition procedures	Compliance with national legal requirements	Discussion with local people	Affected VDCs/site office	At the time of acquisition	DCC, RM, Local NGOs/DoED	Consultant
8	Trainings and trainees	Number of trainings and trainees	Survey/observation	Project affected areas/VDCs	Period during construction and operation	MoPE/RM/DCC/DoED	Consultant

9.6 Agencies Responsible for Environmental Monitoring

As per the EPR, Ministry of Energy will be responsible for monitoring. However, the project proponent is NEA and the project is funded by ADB, a team of experts from both proponent and funding agencies will bear the responsibility for carrying out the monitoring activities. The Udipur-New Bharatpur 220kV T/L Environmental Management Unit will comprise the experts from NEA, ADB, and consultants from various disciplines. This unit will work on behalf of Udipur-New Bharatpur 220 kV T/L Project. The unit will be responsible for compliance and impact monitoring works.

9.7 Monitoring Cost

The total cost for the monitoring of proposed Udipur-New Bharatpur 220 kV T/L project is presented in following table 9.2. The total cost for the monitoring activities (for preconstruction and construction phase) has been estimated as NRs. 16,966,500.

Table 9.2: Environmental Monitoring Cost

S.N.	Item	Man-month	Rate/Month (NRs.)	Amount (NRs.)
1	**Pre-Construction Phase**			
	Human Resources			
	Team Leader	1.5	33000	49500
	Environmental Expert	1	28000	28000
	Socio-economist	1	28000	28000
	Support Staff	2	24000	48000
	Sub-total			190500
	Out of Pocket Expenses			
	TA/DA		LS	120,000
	Field Assistant		LS	100,000
	Transportation		LS	100,000
	Report Production		LS	25,000
	Miscellaneous		LS	25,000
	Sub-total			370,000
	Total of Pre-construction Phase			560,500
2	**Construction Phase**			
	Human Resources			
	Team Leader	12	33000	396,000
	Unit Chief	36	42000	1,512,000
	Civil Engineer	8	28000	224,000
	Environmental Expert	15	28000	420,000
	Socio-economist	15	28000	420,000
	Community Liaision Officer	6	25000	150,000
	Supervisor/Monitors-4	144	25000	3,600,000
	Support Staff Site Office-2	72	15000	1,080,000
	Support Staff Kathmandu Office-1	36	12000	432,000

S.N.	Item	Man-month	Rate/Month (NRs.)	Amount (NRs.)
	Cost for line agencies monitoring		LS	20,000
	Joint monitoring team		LS	200,000
	Sub-total			8,676,000
	Out of Pocket Expenses			
	TA/DA		LS	50,000
	Transportation Vehicle purchase - Pickup	1	4500000	4,500,000
	Motorcycle-2 Nos	2	180000	360,000
	Fuel and Maintenance		LS	1,000,000
	Report Production		LS	150,000
	Field Assistant		LS	250,000
	Office Rent (Site Office)	36×2	10000	720,000
	Computer and Printer		LS	200,000
	Community Consultation		LS	100,000
	Office Accessories and Operation Cost (Site Office)		LS	200,000
	Miscellaneous		LS	200,000
	Sub-total			7,730,000
	Total of Construction Phase			1,418,600
	Grand Total (Pre-construction and construction monitoring)			16,711,500

9.8 Total Environmental Cost

The total environmental cost is the cost of environmental mitigation and environmental monitoring which is NRs. 132,563,030. (Note: environmental impact mitigation and enhancement cost NRs. 115,851,530 and environmental monitoring cost NRs. 16711500, for more details refer table 8.13 and 9.2.

CHAPTER TEN: CONCLUSION

This chapter sums up the findings and conclusions of the Environmental Team responsible for carrying out the Initial Environmental Examination (IEE) report of the Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL Project. An overall assessment is provided first, followed by sections giving specific conclusions and recommendations.

The environmental issues/impacts identified during the IEE study can be mitigated and manageable. The finding of IEE shows that the adverse impacts on physical, biological, socio economic and cultural environment due to the implementation of the proposed project low/medium, local and short term. Wherever possible, efforts have been made by the project planning team to limit adverse impacts on the environment by selecting environmentally benign design options and otherwise suggesting appropriate mitigation measures. Mitigation measures has been proposed for all identified/predicted adverse impacts and enhancement measures are developed for maximize the project benefits. However, those impacts/issues now not predicted/documented in this IEE report but might appear later; will be also undertaken by Environmental Management Unit during the construction phase.

The proponent NEA will have obligation to carry out the mitigation, enhancement and monitoring activities of the project. The environmental impact mitigation measures will be incorporated in detail design of the substation and so on, contract documents. The project proponent will be primarily responsible for following acts, rules, regulations (legislation and other relevant directive of GoN) while implementing the project.

In overall, this IEE study concludes that the proposed Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL Project shall not have significant impacts on physical, biological; socio-economic and cultural environment of the project area. Therefore, the proposed project is environmentally and socially feasible, with adoption of suggested mitigation and enhancement measures. The IEE study is adequate and no further study is supposed to be required regarding environmental assessment of the proposed project.

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ANNEXES

ANNEX 1: SURVEY LICENSE



नेपाल सरकार
ऊर्जा मन्त्रालय
विद्युत विकास विभाग
अनुमतिपत्र महाशाखा

फोन नं. ४४७४८५२, ४४८०२७६, ४४७८०८५, ४४८०३२६, ४४८०४२५, ४४९६८००, ४४८१६१४, ४४७६१९०
फ्याक्स (९७७-१)-४४८०२५७
पोष्ट बक्स नं. २५०७
थापागाउँ, अनामनगर
काठमाडौं, नेपाल

नेपाल विद्युत प्राधिकरण
गो.द. नं. ९५८९
मिति ०८/१२

पत्र संख्या :- ०७३/७४
च.नं. ३५२

मिति: २०७३/०८/०५

विषयः- मर्स्याङ्गदी कोरिडोर (उदिपुर-न्यू भरतपुर) २२० के.भी. प्रसारण लाईन विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (प्रथम संशोधन)को नविकरण तथा संशोधन सम्वन्धमा।

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, दरबारमार्ग, काठमाण्डौ।
फोन नं. ०१-४१५३०५४, ४१५३०५५, पो.ब.नं. १००२०
फ्याक्स नं. ०१-४१५३००९, ४१५३०१३

Regd. No. 490
Date 2073/8/20

प्रस्तुत विषयमा तँहाले मर्स्याङ्गदी कोरिडोर (उदिपुर-न्यू भरतपुर) २२० के.भी. प्रसारण लाईन आयोजनाको विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (संख्याः वि.वि.वि. ०७१/७२ वि.प्र.स. २११, प्रथम संशोधन) को नविकरण तथा संशोधनको सम्वन्धमा पेश गर्नुभएको निवेदन उपर कारवाहि हुँदा नेपाल सरकार, ऊर्जा मन्त्रालय, विद्युत विकास विभाग (महानिर्देशकस्तर) को मिति २०७३/०७/१८ को निर्णयानुसार प्रस्तावित प्रसारण लाईन आयोजनाको विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्रको वहाल अवधि मिति २०७४/०६/०४ सम्म रहने गरि नविकरण गरिएको तथा सोही अनुमतिपत्रको प्रकरण ४(ग) मा लमजुङ्ग जिल्लाको मोहरियाकोट गा.वि.स. थप हुने गरि संशोधन गरिएको व्यहोरा निर्देशानुसार जानकारी गराईन्छ।

विजय पुरी
ईन्जिनियर

श्री वि.ग्रा.से. निर्देशनालय
श्री प्रशासन निर्देशनालय
श्री उत्पादन निर्देशनालय
श्री अर्थ निर्देशनालय
श्री प्रसारण निर्देशनालय
श्री का.नि.को सचिवालय
श्री योजना, अ. तथा सु.प्र. निर्देशनालय
श्री आ.ले.प. विभाग
श्री इन्जिनियरिङ्ग सेवा निर्देशनालय
श्री वि.चु.नि. महाशाखा
श्री आयोजना व्यवस्थापन निर्देशनालय
१. आ.का.गर्ने २. छलफल गर्ने ३. परिपत्र गर्ने ४. बैठकमा राख्ने ५. [illegible] ६. पर्दा पेश गर्ने ७. फाइल गर्ने ।

बोधार्थः
श्री ऊर्जा मन्त्रालय, सिंहदरबार।
श्री विद्युत विकास विभाग
- आयोजना अध्ययन महाशाखा
- निरीक्षण महाशाखा
- योजना महाशाखा
- आर्थिक प्रशासन शाखाः मिति २०७३/०५/१७ मा आ.र.नं. ४८७९ ध.बै.भौ.नं. ०७६२७० बाट विद्युत प्रसारण सर्वेक्षण अनुमतिपत्र नविकरण दस्तुर बापत प्राप्त धरौटी रकम जम्मा रु १,००,०००/- (रुपैया एक लाख मात्र) राजश्व खातामा जम्मा हुन।

श्री जिल्ला जलश्रोत समिति, लमजुङ्ग।
श्री जिल्ला जलश्रोत समिति, गोरखा।
श्री जिल्ला जलश्रोत समिति, तनहुँ।
श्री जिल्ला जलश्रोत समिति, चितवन।

पुनश्चः यस अघि प्रेषित गरिएको पत्रमा प्रेषित मिति २०७४/०७/२६ हुन गएकोले उक्त मिति सच्याई पत्र पुनः प्रेषित गरिएको।

श्री मर्स्याङ्गदी कोरिडोर आयोजना
अ.वि.का.

नेपाल सरकार

ऊर्जा मन्त्रालय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (प्रथम संसोधन)

(मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर २२० के.भी. प्रसारण लाईन आयोजना)

२०६६

अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११ प्रथम संसोधन

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, काठमाडौं ।

महाशय,

मनाङ्ग जिल्लाको थारपानी सवस्टेसन देखि चितवन जिल्लाको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म निर्माण गरिने मर्स्याङ्दी कोरिडोर २२० के.भी. प्रसारण लाईन आयोजनाको विद्युत प्रसारण सर्वेक्षण अनुमतिपत्र (अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११, यस पछि मुल अनुमतिपत्र भनिएको) को संशोधनका लागि मिति २०७२/०६/०६ मा दिनु भएको दरखास्त अनुसार मुल अनुमतिपत्रको प्रकरण ७ (ङ) को प्रावधान अनुरूप उक्त अनुमतिपत्रको अन्य प्रकरण यथावत रहने गरि मुल अनुमतिपत्रको शिर्षक, प्रकरण ३, ४(क), (ख), (ग) र ५ मा देहाय बमोजिमको हुने गरी प्रथम संसोधन गरिएको छ ।

३. विद्युत प्रसारण कहाँबाट कहाँ गर्ने हो सो को विवरण :-
प्रस्तावित उदिपुर सवस्टेसन, तनहुँको मार्किचोक सवस्टेसन हुँदै चितवनको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म ।

४. सर्वेक्षण गर्ने क्षेत्र :

(क) अञ्चल : गण्डकी र नारायणी ।

(ख) जिल्ला : लमजुङ्ग, गोरखा, तनहुँ र चितवन ।

(ग) गा.वि.स.र नगरपालिका:
लमजुङ्ग जिल्ला: चिती, उदीपुर, भोटेओडार, अर्चलवोट, भरते, तारकुघाट, सुन्दरबजार र घमिलिकुवा गा.वि.स.हरू ।
गोरखा जिल्ला: पालुङटार, गाईखुर, चाङलिङ्ग, धुवाकोट र देउराली गा.वि.स.हरू ।
तनहुँ जिल्ला : भानु, पुर्कोट, चोकचिसापानी, बन्दिपुर, आबुखैरेनी र छिमकेश्वरी गा.वि.स.हरू ।
चिवन जिल्ला : चण्डीभन्ज्याङ्ग, कविलाश र दहखानी गा.वि.स. र भरतपुर नगरपालिका ।

पुर्व	: ८४° ३४' ००" E पुर्वी देशान्तर
पश्चिम	: ८४° १५' ००" E पुर्वी देशान्तर
उत्तर	: २८° ११' १०" N उत्तरी अक्षांश
दक्षिण	: २७° ४१' ००" N उत्तरी अक्षांश

५. विद्युत प्रसारणको भोल्टेज र परिमाणहरू :-
भोल्टेज : २२०,००० भोल्ट (अधिकतम चार सर्किट) ।
परिणाम : १६०० मेगावाट ।

अनुमतिपत्र दिने अधिकारीको :

सही :
नाम : सुमन प्रसाद शर्मा
पद : सचिव
ऊर्जा मन्त्रालय
मिति : २०७२।०९।०२

नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय
वन विभाग

☎ ४-२२७५७४
४-२२०३०३
४-२२१२३१
४-२१६३७९
४-२२१७४४
फ्याक्स : ४-२२७३७४

(कृपया पत्रोत्तरमा प्राप्त पत्र संख्या र मिति उल्लेख गर्नुहोला ।)

बबरमहल,
काठमाडौं, नेपाल

मितिः २०७३।२।६

प्राप्त पत्र संख्या र मिति :
पत्र संख्या :- ०७२/७३, पातावरण
च. नं. :- ४२२

नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय
वन विभाग
बबरमहल, काठमाडौं

श्री नेपाल विद्युत प्राधिकरण,
आयोजना व्यवस्थापन निर्देशनालय,
आयोजना व्यवस्थापन विभाग,
मर्स्याङदी-कोरिडोर २२० के.भी. प्रा.लि.
मातातिर्थ, काठमाडौं ।

विषयः IEE अध्ययन सहमति सम्बन्धमा ।

प्रस्तुत विषयमा तहाँको प.स.०७२/०७३ च.नं. २१२ मिति २०७२।१।१४ को प्राप्त पत्र अनुसार नेपाल विद्युत प्राधिकरण, दरबारमार्ग प्रस्तावक रहेको मर्स्याङदी कोरिडोर २२० KV Transmission Line Project को प्रारम्भिक वातावरणीय परिक्षण (IEE) अध्ययनको लागि सहमति दिने सम्बन्धमा सम्बन्धित सरोकारवाला जिल्ला वन कार्यालयहरुबाट अनुमतिको लागि सिफारिस पेश भएकोमा तपशिलका सुझावहरु समावेश गर्ने गरी IEE अध्ययनको लागि सहमति दिने भनी वन विभागको मिति २०७३।२।६ मा निर्णय भएको हुंदा निर्णयानुसार अनुरोध छ ।

तपशिल

१. वातावरणीय प्रभाव अध्ययन गर्दा वन क्षेत्र कम पर्ने, जैविक विविधता र वातावरणमा कम हानी पुग्ने विकल्पहरुको विश्लेषण गर्नु पर्ने ।
२. वातावरणीय अध्ययन गर्दा सम्बन्धित जिल्ला वन कार्यालयहरुको प्राविधिक प्रतिनिधिहरु, सामुदायिक/कबुलियती वनका प्रतिनिधिहरु अनिवार्य रुपमा सहभागी गराउनु पर्ने ।
३. अध्ययन गरिने Transmission line Project क्षेत्र सामुदायिक/कबुलियती वन क्षेत्र परेमा सम्बन्धित सामुदायिक/कबुलियती वन समूहहरुको अनिवार्य रुपमा सहमति लिनु पर्ने ।
४. वातावरणीय प्रभाव अध्ययन गर्दा मौजुदा वन ऐन २०४९, वन नियमावली २०५१, वन क्षेत्रको जग्गा अन्य प्रयोजनको लागि प्रयोग गर्ने सम्बन्धी कार्यविधि २०६३, र वातावरण संरक्षण ऐन २०५३, वातावरणीय संरक्षण नियमावली २०५४, को प्रावधानको पालना हुनुपर्ने ।
५. आयोजना क्षेत्रमा पर्ने पानीको मुहानहरु संरक्षणको प्रावधानहरु र भू-क्षय नियन्त्रणको कार्यक्रमहरु समावेश गर्नुपर्ने ।
६. वातावरणीय अध्ययनको क्रममा जिल्ला वन कार्यालयको रायसुझाव समावेश गर्नुपर्ने ।

०७३।२।६

मोहनराज काफ्ले
वातावरण अधिकृत

बोधार्थ
श्री वन तथा भू-संरक्षण मन्त्रालय
सिंहदरबार, काठमाण्डौं ।
श्री वन विभाग, वन संरक्षण शाखा
श्री जि.व.का., गोरखा, लमजुङ, चितवन, तनहुँ ।

नेपाल सरकार
राष्ट्रपति चुरे-तराई मधेश संरक्षण विकास समिति
खुमलटार, ललितपुर

☎ ५५३१३११
५५२६७७७
फ्याक्स: ५५३७५११

प. सं.: ०७२।७३
च. न.: ३६६

मिति:- २०७२/१२/१६

विषय:- सहमति सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण,
मर्स्याङ्गदी कोरिडोर २२० के.भि. प्रशारण लाईन आयोजना,
मातातिर्थ, काठमाडौं ।

प्रस्तुत बिषयमा ताहां आयोजनाको प.सं. ०७२/७३ मिति २०७२/११/२७ को पत्र प्राप्त भई व्यहोरा अवगत भयो । सो सम्बन्धमा **वातावरण संरक्षण ऐन, २०५३ र वातावरण संरक्षण नियमावली, २०५४ को शर्तहरु पालना हुनेगरी सहमति दिने** भनी मिति २०७२/१२/१६ मा निर्णय भएको हुंदा सोही व्यहोरा जानकारीको लागि अनुरोध छ ।

९२।१६

योगेन्द्र कुमार कर्ण
उप-सचिव
उप सचिव

ANNEX 2: APPROVED TOR

नेपाल सरकार
ऊर्जा मन्त्रालय
विद्युत विकास विभाग
(.....)
वातावरण शाखा

फोन नं. ४४७४८५२, ४४८०२७६
४४७८०८५, ४४८०३२६
४४८०४२५, ४४९६८००
४४८१६१४, ४४७६१९०
फ्याक्स (९७७-१)-४४८०२५७
पोष्ट बक्स नं. २५०७
थापागाउँ, अनामनगर
काठमाडौं, नेपाल

२०६३/६८
पत्र संख्या :- ९२९८

मिति: २०७३/१०/०६

विषयः- मर्स्याङ्दी कोरिडोर (उदीपुर –भरतपुर) २२० के.भी. प्रसारण लाइन आयोजना को प्रारम्भिक वातावरणीय परिक्षण (IEE) को TOR प्रतिवेदन स्विकृत भएको सम्बन्धमा ।

श्री नेपाल बिद्युत प्राधिकरण
रत्नपार्क , काठमाडौँ

उपरोक्त संबन्धमा तहाँबाट पेश भएको मर्स्याङ्दी कोरिडोर (उदीपुर –भरतपुर) २२० के.भी. प्रसारण लाइन आयोजना को प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूची (TOR) प्रतिवेदन श्री उर्जा मन्त्रालयको मिति २०७३/१०/०३ को सचिवस्तरीय निर्णय अनुसार निम्न शर्तहरु पालना हुने गरि स्विकृत भएको व्यहोरा निर्देशानुसार अनुरोध छ ।

.....
शंकर शम्भु चौधरी
इन्जिनियरिंग जियोलोजिस्ट

शर्तहरु :

१. आयोजनाले प्रारम्भिक वातावरणीय परिक्षणको अध्ययन गर्दा सरोकारवाला निकाय सँग आवश्यक समन्वय गरि गर्नु पर्ने । ।
२. स्वीकृत प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनको कार्यसूचीमा उल्लेखित आयोजनाको संरचना तथा क्रियाकलापहरुको स्थल,डिजाइन,आकार वा प्रकारमा उल्लेखनीय परिवर्तन गर्नु परेमा सो को जानकारी बिद्युत विकास विभागमा गराई थप अध्ययन गर्ने विषय वस्तुहरुका बारेमा अनुमति लिनु पर्ने छ ।

बोधार्थ

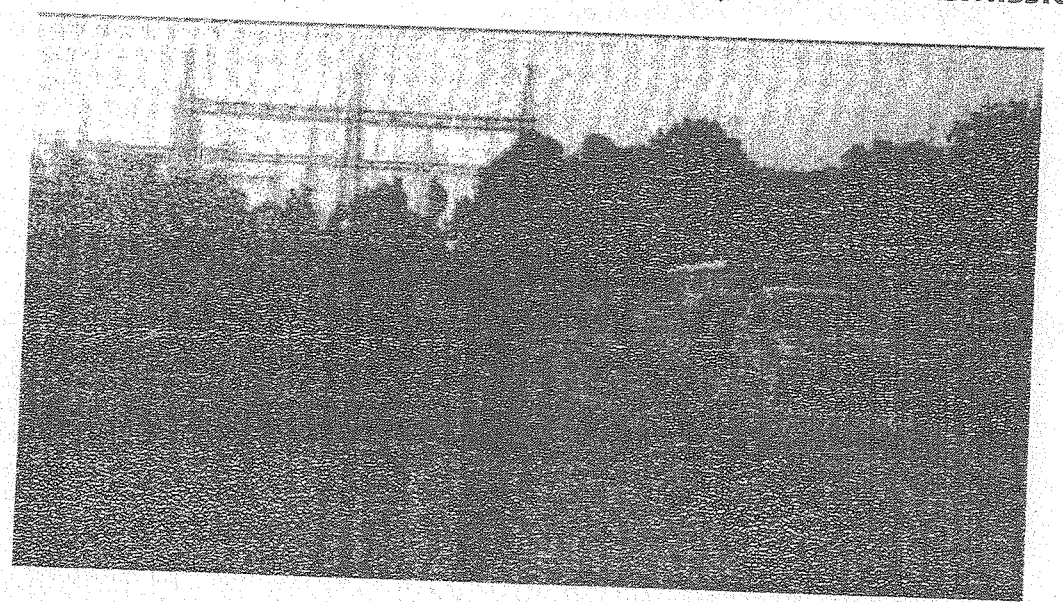
श्री उर्जा मन्त्रालय
सिंहदरबार ,काठमाडौँ , स्विकृत प्रतिवेदनको एक थान यसै साथ संलगन छ ।
श्री वन तथा भू संरक्षण मन्त्रालय
सिंहदरबार ,काठमाडौँ , स्विकृत प्रतिवेदनको एक थान यसै साथ संलगन छ ।

Terms of Reference

for

Initial Environmental Examination of

Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV Transmission Line



Submitted to:

Ministry of Energy
Singhdurbar, Kathmandu

Submitted through:

Department of Electricity Development (DoED)
Bijulibazar, Kathmandu

Submitted by:

Nepal Electricity Authority (NEA)
Ratnapark, Kathmandu

Prepared by:

Environmental Services Nepal (ESN) Pvt. Ltd.
Kupondol, Lalitpur

December, 2016

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ToR	Terms of Reference
VDC	Village Development Committee
ZoI	Zone of Influence

- Define role and responsibilities of the different institutions in Environmental Monitoring Plan
- Setting out a time frame, with required expert manpower for carrying out the IEE study, together with estimated budget required; and
- Technical guidance relating to the main aspects of the environment that will require delineation during the courses of the IEE study.

1.4 Objectives of IEE

The aim and objective of the IEE is to assess and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate mitigation measures to mitigate and/or minimize the adverse impacts so that the project is implemented in an environmentally sound manner. The specific objective of the study is to prepare an IEE report. The other general objectives of the study are to:

- To collect physical, biological, socio-economic and cultural baseline conditions of project area;
- To familiarize various stakeholders with the IEE outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues in environmental mitigation plan;
- To identify, predict and analyses the adverse and beneficial environmental impacts of the transmission line in project affected areas in terms of magnitude, extent and duration during project construction and operation phases;
- To analyze various alternatives including transmission line routes;
- To suggest appropriate and pragmatic mitigation and enhancement measures for potential adverse impacts;
- To prepare an environment monitoring plan; and
- To facilitate informed decision making including setting the environmental terms and conditions for implementing the proposed project.

1.5 Rationality for Conducting IEE Study

Environment Protection Rules (EPR), 1997 and the subsequent amendment (published in 2066/10/13 BS on Nepal Gazette) mandates the Initial Environmental Examination (IEE) study for transmission line with its capacity 132 kV or above. Thus, the proposed project having the voltage level of 220 kV requires undergoing IEE study. Moreover, the proposed transmission line does not pass through any National Parks, Conservation Areas, Wildlife Sanctuary, Buffer Zone, Wetlands or any other environmentally sensitive and fragile zones and hence IEE is sufficient to forward the project. Since the amendment in EPR, 2054 (as published in Nepal Gazette in 2066/10/13 BS) has removed the provision of forest area threshold for IEE/EIA categorization, forest area along the TL route alignment, hence, is not attracted for conducting IEE study.

2.2 Salient Features of the Project

The salient features of the proposed project are presented in table 2.1.

Table 2.1: Salient features of the proposed project

S.N.	Project Component	Description
1	Name of Project	Marsyangdi Corridor (Udipur – New Bharatpur) 220 kV/TL Project
2	Project Affected VDCs	**Lamjung District:** Chiti, Udipur, Archalbot, Mohoriakot, Bhoteodar, Bharte, Sundarbazar, Tarkughat, Dhamilikuwa **Gorkha District:** Palungtar, Gaikhur, Chyangli, Dhuwakot, Deurali **Tanahau District:** Chokchisapani, Purkot, Bhanu, Anbukhaireni, Chhimkeshwori, Bandipur **Chitwan District:** Chandibhangyanj, Kabilas, Dahakhani, Bharatpur Municipality
3	Number of Angle Points	99
4	System Voltage	220 kV
5	Capacity	1600 MW
6	Number of circuit	Double circuit
7	Length of T/L	Approx. 63.754 Km
8	Nominal Span	400 m
9	Tower Type	Lattice tower A, B,C,D and Special Type Tower
10	Tower Height	40 m and extension +3,+6,+9,+18,+25
11	Tower Foundation Area	A 214 m^2 B 282 m^2 C 375 m^2 D 400 m^2

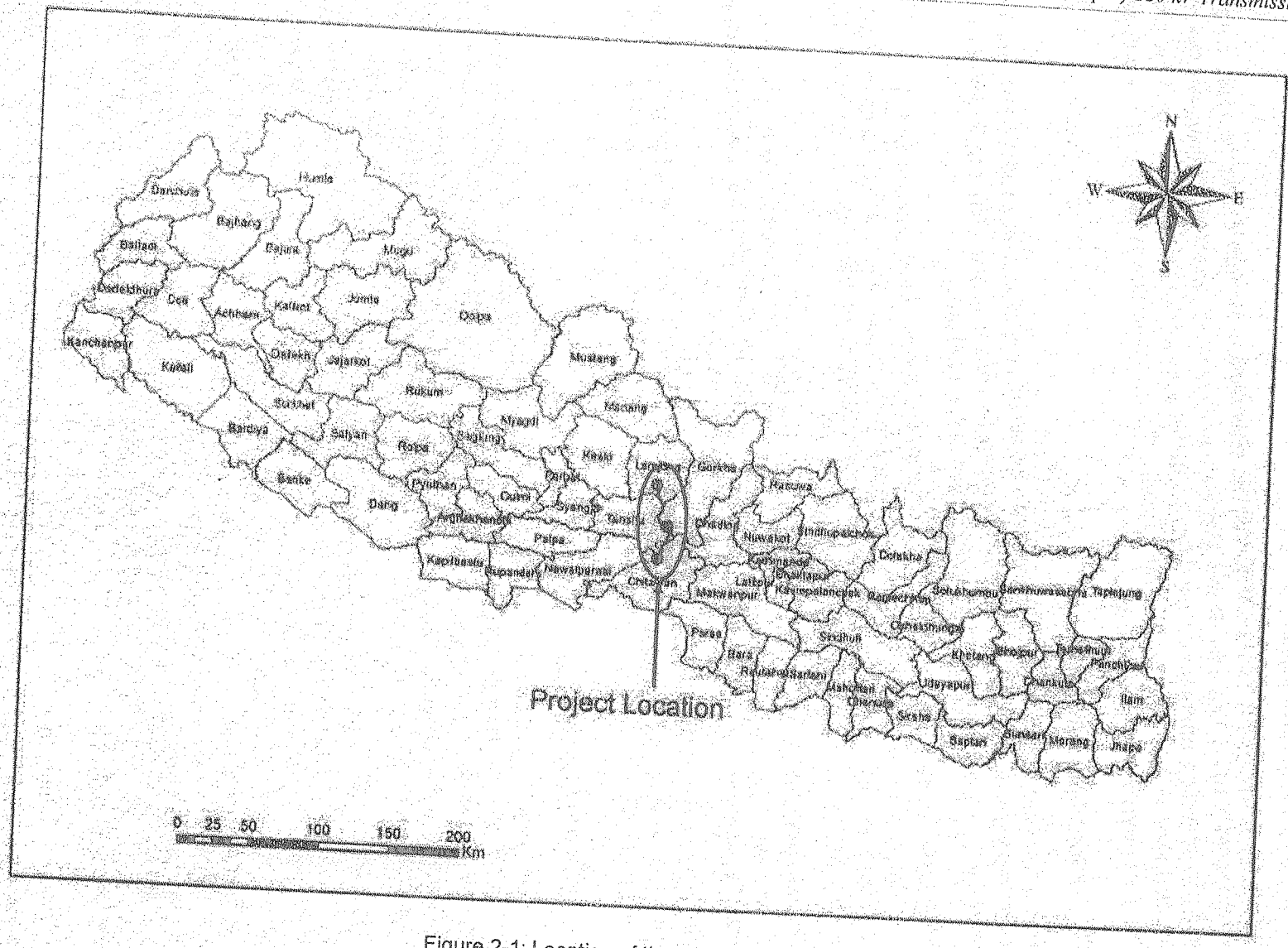

Figure 2-1: Location of the proposed project

2.4 Access to the Project

Almost all of the Angle Points (AP's) can be approached through motorable road. Largely, Narayanghat-Mugling Highway, Prithvi Highway, and Dumre-Beshisahar Highway are the road networks providing approach to the APs. To get into the actual locations of the APs, either graveled road or foot track have to be followed. The Chhimkeshwori section of the proposed alignment does not have easy access.

2.5 Impact Area Delineation

The study area is defined as the project area consisting of the alignment as well as the area that will be impacted due to the construction and operation of the project. The project impact area that will be considered during IEE study has been defined as follows:

Direct Impact Area (DIA): This consists of 30 m Right-of-Way (RoW) comprising 15m on either side of the center line of the transmission line alignment. Thus, the settlement area, forests or other vegetation and places having built up infrastructures or facilities that fall within the RoW constitute the 'Direct Impact Area' of the project.

Indirect Impact Area (IIA): This consists of the area within 100m of stretch from the edge of the 15 either side of the centerline which is DIA any built-up community infrastructures and facilities, forests, etc within 100 m of stretch will be studied in this impact area.

Zone of Influence (ZOI): The area outside the IIA and within the project affected VDCs are termed as the Zone of Influence for this project. The information on ZOI will include the information on project VDCs.

2.6 Construction Method

Due to the linear nature of the construction works, smaller storage facilities shall be built at appropriate locations along the transmission line alignment. These details shall be worked out during the IEE. The linear nature of the transmission line construction suggests that the construction work will be carried out by manually, where possible, for each location in various works such as land clearing, excavation, concreting, transporting tower and other materials.

Logistics support will be provided with the temporary establishment at appropriate location in the vicinity of the existing communities along the transmission line alignment. Since the construction of transmission line towers require clearing and excavation of fairly small areas at tower locations, the construction works will not require spoil dumping sites. The spoils will be filled up and compacted in the tower base area. No permanent access road needs to be constructed to tower site from the existing road head. Only the existing roads and tracks will be used for the construction and maintenance where available. The materials required for civil construction works related to the transmission line and substation will be:

a. Steel reinforcement

b. Cement

c. Coarse aggregate

CHAPTER 3: DATA REQUIREMENT AND METHODOLOGY FOR DATA COLLECTION

3.1 Type of Data

Primary and secondary data shall be acquired on physical, biological, and socio-economic and cultural environment of the project area for preparing IEE. Primary information shall be obtained by field visit whereas secondary information by consulting the project maps, transmission line survey report and other project and project area related documents. The data of the core project area or direct impact area shall be site specific and quantitative. Information on project affected VDCs shall also be collected. Following are the types of data to be collected on physical, biological and socio-economic and cultural environment.

3.1.1 Physical Environment

- Meteorological data: Temperature, rainfall, and humidity of the project area;
- Water, air and noise quality of the project area (based on visual observation);
- Land use and land use pattern;
- Geological data: Rock type, slope stability, erosion, and landslides along the proposed TL corridor;
- Spoil materials: Total volume of spoil for disposal and potential disposal area;
- District level physical information;

3.1.2 Biological Environment

- Collection and classification of forest type, distribution, frequency, basal area, and species in the core project area.
- Presence and distribution of rare, endangered/ protected species;
- Presence and current use of vegetation-ethno-botany, medicinal plants and other related uses;
- Information about the non-timber forest in the project area; and
- Estimated number of trees, shrubs and herbs to be cleared including wood volume;
- Community forests through which the TL passes, and number of trees to be cleared in consultation with CFUGs.

3.1.2.1 Wildlife

- Presence of wildlife and birds in and around the DiA and IIA including rare, endangered/protected species;

- Economy: occupation, agriculture and livestock, trade and commerce of Project Affected Families;
- Land ownership: list of landowners likely to be affected by land acquisition and resettlement;
- Income and expenditure of the Project Affected Families;
- Planned developments that may be affected by transmission line;
- Measurement and valuation of houses, cowsheds and other structures to be acquired by the project in coordination with resettlement plan preparation team;
- Compensation rates for land, agriculture products, forest, houses and other private infrastructures in coordination with resettlement plan preparation team.

3.1.3.3 Cultural Features

- Places of cultural importance; historic, religious or cultural sites in the project affected area and the special occasions of celebrations/gathering, including the relative importance of these sites (local, regional or national);
- Aesthetic value of the affected landscape;
- Cultural practices of the project area.

3.2 Data Collection Method

The EPR, 1997 and other environmental provisions shall govern the methodology of the IEE study. Literature review, filed investigation (households' survey, observation, photographs) and stakeholders meetings shall be used to collect and triangulate the facts and figures.

3.2.1 Literature Review

Topographic maps, land use maps, CBS publications; district profile published by DDCs, project survey report and other hydropower related environmental reports shall be reviewed. Information on climate (temperature, rainfall, and relative humidity), shall be obtained from department of hydrology and meteorology. Similarly, data on geology and hydrology shall be obtained from project report as well as field survey. District level data on forests, species and the community identification, and identification of wildlife and birds will initially be gathered from literature review. The literatures published by the Ministry of Forest and Soil Conservation will be collected and reviewed for the data. Information will also be consulted with district forest office, district soil conservation office and community forest users groups. DDC and VDC profiles will be referred for collecting data on socio-economic and cultural environment.

3.2.2 Field Investigation

Field visit by multidisciplinary experts to collect baseline information on physical, biological, and socio-economic and cultural environment shall be conducted during IEE report preparation. The following methods shall be adopted to collect the baseline information.

$$\text{Density (D)/hectare} = \frac{\text{No. of individuals of a species}}{\text{Size of the plot} \times \text{Total no. of plots sampled}} \times 10{,}000$$

$$\text{Relative Density (RD)} = \frac{\text{No. of individual species}}{\text{Total number of all species}} \times 100$$

$$\text{Frequency (F) \%} = \frac{\text{Total no. of plots in which the sp. occurred}}{\text{Total no. of plots sampled}} \times 100$$

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of individual species}}{\text{Frequency of all species}} \times 100$$

$$\text{Relative Dominance (Rdom)} = \frac{\text{Total basal area of particular species}}{\text{Total basal area of all species}} \times 100$$

$$\text{Basal Area (BA)} = \pi (\text{dbh}/2)^2$$

$$\text{Average BA/Tree} = \frac{\text{Total Basal Area of all trees}}{\text{Number of trees}}$$

$$\text{Wood Volume of Standing Tree} = 1/2 \times \text{BA} \times \text{Height}$$

The valuation of standing biomass will be calculated as per the Forest Act, 2049. Moreover, the loss of forest species, its type, volume and number of trees to be cut, etc shall be identified and calculated.

Appropriate computer software will be used for the analysis of socio-economic data to be collected during households' survey at the project affected site.

3.4 Identification, Evaluation and Prediction of Impact

The main basis for the identification of the impacts will be the baseline information, which will be carefully collected. Checklists, questionnaires, matrices and expert judgment will be used, as appropriate, to identify the impacts. The Primary and secondary data will be analyzed qualitatively and quantitatively. Qualitative data analysis will employ the checklist (tabulation, cross-checking, circumstantial evidences, case studies and inferences) and matrix methods for impact predication.

Local Level Agency: Village Development Committees, Community Forest Groups, Health/sub-health posts, non-governmental organizations, Community Based Organization, school, affected people..

3.5.2 Public Notice

As per EPR, 1997, all the stakeholders including local and affected people will be notified by publishing a 15 day public notice in national daily newspaper. Fifteen days' notice will be given to local people to raise concerns or issues regarding the IEE in written. Deed of Public Inquiry (*"Muchulka"*) will be collected from local concerning bodies. The comments raised by local people/stakeholders/institutions will be incorporated in the IEE report. The public notice will be published after the approval of ToR from Ministry of Energy and preparation of draft IEE report as well. A copy of the notice will be pasted at the DDCs office, VDCs offices, local schools, clubs, health posts and local NGOs. If the project requires land from government forest/community forest or trees are needed to be cut down from government/ community forests, then comments and suggestions from them will be attached in the IEE along with their recommendation letters.

4.5 Guidelines and Convention

- National Environmental Impact Assessment Guideline, 1993;
- EIA Guidelines for Forestry Sector, 1995;
- Forest Produce collection and sale / Distribution Guidelines, 1998;
- Procedures for Community Forest Inventory Guidelines, 2005;
- Bio-diversity convention, 1992;
- Convention on International Trade in Endangered Species of Wild Fauna & Flora
- Manual for Preparing Environmental Management Plan (EMP) for Hydropower Projects.
- Community Forest Guidelines, 2058; and
- National Health Care and Waste Management Guidelines, 2002
- International Labor Organization (ILO), Article, 169
- Department of Electricity Development Manuals
  - Manual for preparing Terms of Reference (ToR) Environmental Impact Assessment (EIA) of Hydropower Projects, with Notes on EIA Report Preparation (2001)
  - Manual for Preparing Environmental Management Plan (EMP) for Hydropower Projects (2002)
  - Manual for developing and Reviewing Water Quality Monitoring Plans and Results for Hydropower Projects (2002)
  - Manual for conducting Public Hearing in the Environmental Impact Assessment Process for Hydropower Projects (2004)
  - Manual for Addressing Gender Issues in Environmental Impact Assessment/Initial Environmental Examination for Hydropower Projects (2005)
  - जलविद्युत तथा प्रशारण लाईन आयोजनाको प्रारम्भिक वातावरणीय परिक्षण र वातावरणीय प्रभाव मुल्याङ्न सम्बन्धि कार्यविधि, २०७३

Table 5.2: Human resource involved in the IEE study

Name	Position	Specialization
Niranjan Shrestha	IEE Team Leader/ Environmental Expert	M.Sc (Environmental Engineering)
Padam Bahadur Chand	Biologist	MSc (Forestry)
Geologist Team	Soil, Rock and Concrete Laboratory, NEA	
Ujjwal Tiwari	Environmentalist	M.Sc. Environmental Science
Saroj Shrestha	Electrical Engineer	Bachelor in Electrical Engineering
Munesh Bhakta Upadhyaya	Socio-Economist	Masters in Sociology

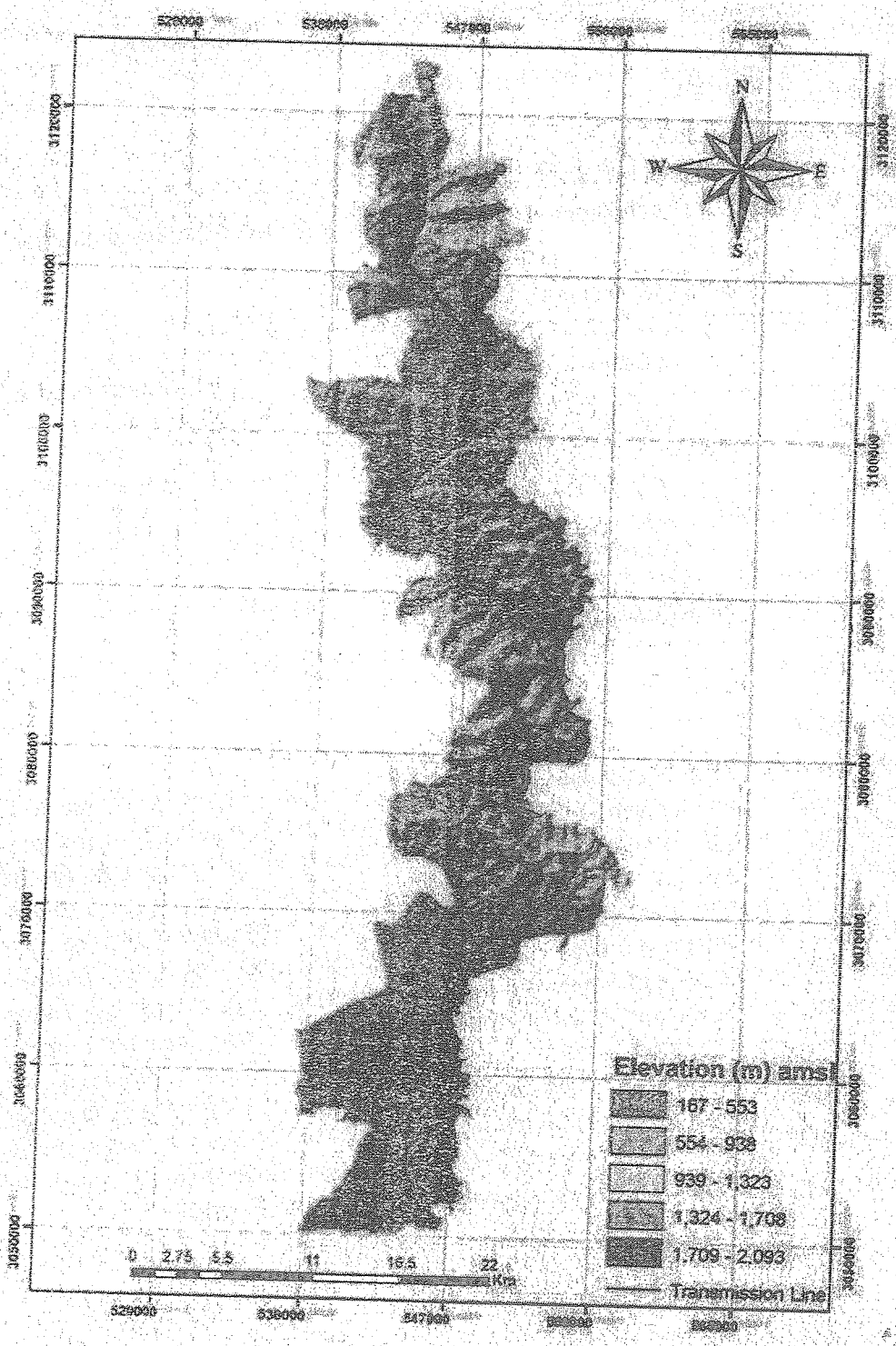

Figure 6-2: Hill shade map along the proposed transmission line alignment

Table 6.1: Land use percentage within the project VDCs

Land use	Percentage
Forest	45
Cultivation	43
Bush	7
Others (water bodies, river bank, grassland, etc.)	5

Similarly, the number of towers that are located in similar land use type are presented in the following table:

Table 6.2: Number of APs with similar land use

S.N.	Land Use	Number of APs
1	Agricultural land	50
2	Forest	23
3	Barren	20
4	NEA/Government	6

(Source: Survey report)

6.1.3 Geology and Soil

Geologically the transmission line alignment runs through the rocks of Lesser Himalayan Zone and Siwalik Group as well as Chitwan Dun Valley Sediments. The transmission line alignment mainly passes through Lesser Himalayan Rocks such as grey greenish physslites and white massive quartzite of Ranimata Formation near Markichok substation. Simiarly, it also passes through white fine to medium grained quartzite with green phyllite of Naudada Formation, purple calcareous quartzite of Syanja Formation, black slate of Sangram Formation, Slates and dolomites of Galyang Formation and limestone and dolomites intercalated with black slate of Larkarpata Formation. Similarly, transmission line alignment is abruptly located in rocks of Siwalik Group near Jugedi separated by MBT, which mainly consists of fine to medium grained sandstone and variegated mudstone up to Ramnagar area. Finally the alignment passes toward the soft sediments of Chitwan Dun Vally, which is mainly comprised of sand, slit, clay and mud near Bharatpur Substation. The geological map along the proposed alignment is presented in figure 6-4. Details about the section wise geology will be provided in IEE report.

6.1.4 Erosion and Land Stability

Several landslides and erosional features are observed along the alignment of the proposed transmission line. Among those, landslide observed near the Kabilas Hill (500m from the alignment) is of major concern. Moreover, due to high vulnerability of Siwalik Hills land surfaces are highly susceptible to erosion. The construction of transmission towers should take special attention over those regions. The slope map (figure 6-5) also reveals the highly sloppy regions of Chimkeswori Hill and Kabilas Hill, which are highly vulnerable to erosion.

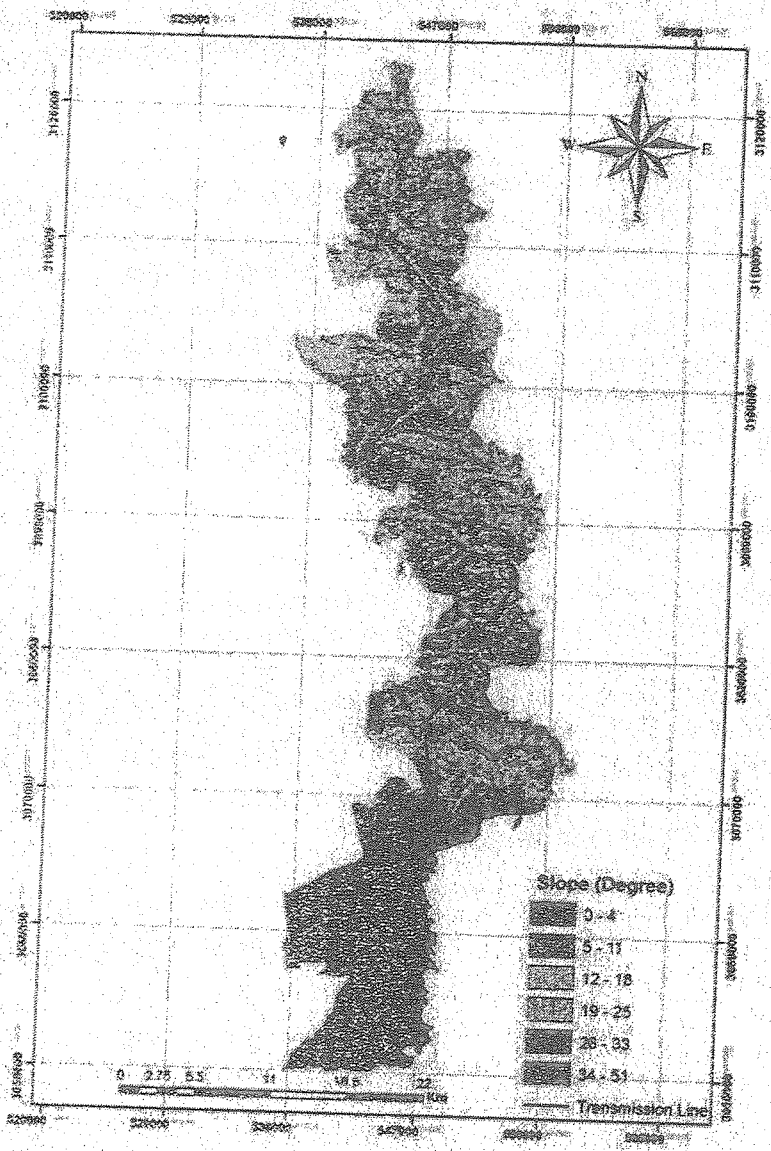

Figure 6-5: Slope map along the transmission line alignment

Among the above mentioned tree species, Sal (*Shorea robusta*) and Simal (*Bombax cebia*) are of conservation significance as these species are declared as protected species by the Government of Nepal.

6.2.2 Wildlife

6.2.2.1 Mammals

The project area representing varying climatic zonation harbours large diversity of wildlife. As per the consultation with the local people, common Leopard (*Panthera pardus*), Barking Deer (*Muntiacus muntjack*), Porcupine (*Hystrix indica*), Wild Boar (*Sus* scrofa), Fox (*Vulpes vulpes*), Rhesus Monkey (*Macaca mullata*), Common langur (*Presbytes entellus*), jackal (*Canis aureus*) are some of the wildlife present around the project area.

6.2.2.2 Birds

Varying species of birds (both residential and migratory) can be observed around the project area. The consultation with the local people reveals that Crow (*Corvus splendens*), House Sparrow (*Passer domesticus*), Kalij (*Lephura leucomelana*), Chibe (*Dicrurus adsimilis*), Baj (*Buteo spp.*), Baudai (*Falco tinnunculus*), Lampuchchhre (*Cissa erythrorhyncha*), Ban Kukhura, Cuckoo (*Plantative cuckoo*), Kalij Phesant (*Lephura leucomelanos*), Dhukur (*Streptopelia chinensis*), Jureli (*Pycnonotus cafer*), Titra (*Francolinus spp.*), Kalchaudo (*Myophonus caeruleus*), Bakulla (*Bubulcus ibis*), Koili (*Surniculus lugubris*), Pani Hans (*Podiceps cristatus*), Haleso (*Treron spp.*), Suga (*Psittacula cyanocephala*) are the common bird species observed in the project area.

6.2.3 Ethno botany/NTFPs/ Plant resource use pattern

Various vegetation is used by the local people for different purposes as per their tradition and culture. In general, Titepati (*Artemisia* spp.), Amala (*Phyllanthus emblica*), Kurilo (*Aspargus officinails*), etc. are widely used for medicinal purpose. Fruits of Kaphal (*Myrica esculenta*), Ainselu (*Rubus ellipticus*), Amaro (*Spondias pinnata*) and Amala (*Phyllanthus emblica*) are edible fruits with medicinal value reported in the project area. Similarly, Sal (*Shorea roubusta*) and Saj (*Termialia alata*), etc are extensively used for timber.

6.2.4 Protected species of flora and fauna

Some of the wild flora and fauna found around the project area are protected by GoN, and enlisted in IUCN red list and CITES Appendices. Those flora and fauna are enlisted in the table below:

CITES Categories: I -Appendix I (are species that are threatened with extinction and are or may be affected by trade), II - Appendix II (re species that are not necessarily threatened with extinction, but may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with the survival of the species in the wild), and III - Appendix III (are species that are listed after one member country has asked other CITES Parties for assistance in controlling trade in a species).

6.3 Socio-Economic and Cultural Environment

The terms of reference document only incorporate the socio-economic information of the project affected VDCs only. The detailed socio-economic survey will be carried out during the IEE study and will be incorporated in the report. The initial survey of the report suggests that the project will not require the displacement of any of the household, which will be further verified in the detailed study during IEE study.

6.3.1.1 Population Characteristics of the Project Area

The population characteristics around the project affected area suggest the highest population in Bharatpur Municipality among all the project affected VDCs. The male and female populations in Bharatpur Municipality are 71,175 and 72,661 respectively, with female population slightly greater than male population. Similarly, the Chhimkeshwori VDC of Tanahau district has the least population compared to other project affected VDCs. The remoteness of the area could be the potential cause behind such least population. The demographic characteristic of project impact VDCs as per the project affected districts is given in table 6.4.

Table 6.4: Demographic characteristics of the project affected VDCs

District	VDC/ Municipality	Total Household	Population			Average Household size	Sex Ratio
			Total	Male	Female		
Chitwan	Bharatpur Municipality	36,939	143,836	71,175	72,661	3.89	97.95
	Dahakhani	939	4,803	2,304	2,499	5.12	92.2
	Kabilas	1,164	5,815	2,818	2,997	5	94.03
	Chandibhanjyang	847	4,978	2,460	2,518	5.88	97.8
Gorkha	Deurali	1,422	5,514	2,449	3,065	3.88	79.9
	Dhunwakot	1,110	4,259	1,850	2,409	3.84	76.8
	Chyangli	1,532	6,286	2,715	3,571	4.1	76.03
	Gaikhur	1,276	5,003	2,189	2,814	3.92	77.79
	Palungtar	2,108	8,143	3,460	4,683	3.86	73.88
Lamjung	Chiti	1,299	5,166	2,348	2,818	3.98	83.32
	Archalbot	424	1,605	703	902	3.79	77.94
	Bhorletar	1,033	4,059	1,832	2,227	3.93	82.26
	Bharte	584	2,239	963	1,276	3.83	75.47
	Dhamilikuwa	1,154	4,425	1,909	2,516	3.83	75.87

nearest market centers. Moreover, large numbers of local people are even engaged in foreign employment as a part of their occupation.

6.3.1.6 Income Pattern

During the field survey, it was observed that the main sources of household income are agriculture, animal husbandry, and off-farm (non-agricultural) activities. Off-farm activities include professional services, petty trade, business (hotel and restaurant), cottage industry, pensions, wage labor and sale of non-timber forest products in the settlements along the proposed 220 kV TL route. Foreign remittance is now one of significant income sources to many households in the project area as in other parts of Nepal. Since the alignment is the touristic route, so tourism is another major income source of the people of project area. Annual income differs by caste/ethnic group and gender of the household head, with Magar, Gurung, Dalit (socially excluded castes), and female-headed households earning the lowest incomes. Cash expenditure in non-food item (education, medicine, festival, purchasing assets and consumption goods) as well as unproductive items (land, house, luxurious things) is higher in recent year.

6.3.1.7 Agriculture and Livestock

The project area consists of fertile cultivated land, forests, grazing land and barren land. The agricultural products mainly include food crops (paddy, wheat, maize, millets, and potato) and cash crops (oilseeds, fruits and vegetables). The cropping pattern in the project area is paddy-wheat, paddy-wheat-vegetable, paddy-oilseed-vegetable, paddy-pulses, paddy-vegetable, and maize-pulses–oilseed. People are mostly involved in agricultural activities. Livestock and poultry farming are also common in the project affected VDCs.

Livestock including goats, cattle, and buffalos, chickens are sold in the local market for supplementary income. Chemical fertilizers, insecticides and improved seeds for agriculture purposes are normally used in the project area. The main local markets in the project area are Besishar, Bandipur, Dumre, Abukhairini, Mugling, and Narayanghat.

7.3 Issues to be considered in IEE Study

The environmental issues that are likely to occur during the construction as well as the operation and maintenance phases of the proposed project are discussed hereinafter. The issues are based on the stakeholder's suggestion and expert's field based information. The IEE study shall also include alternatives of the route alignment with due consideration for minimization of use of forest area, compensatory plantation and other aspects as stated by the Procedural Guidelines for Use of Forest Land, 2063 BS. However, the IEE will not be limited to the issues mentioned below. Additional issues identified during the course of the study shall also be covered in detail. Issues relating to enhancement measures based on the local community consultation during IEE study will also be proposed.

7.3.1 Beneficial Issues

A. Construction Phase

- Benefit due to utilization of local resources and manpower;
- Benefit due to increase in local skills in the relevant area;
- Technical and financial support for the improvement of infrastructures located in the project affected VDCs (while proposing capacity building training programme for project affected families, need based program will be proposed. Enhancement training program proposed will be related to vocational training, skill development, livelihood improvement, agricultural etc. as per need

B. Operation Phase

- Provide opportunities for hydropower development due to construction of the proposed transmission line
- Impact due to plantation of trees

7.3.2 Adverse Issues

7.3.2.1 Physical Environment

A. Pre-Construction Phase

- Land clearance
- Setting labor's and contractor's camp
- Land clearance for material stockpiling
- Quarrying of construction materials
- Clearance for approach road

B. Construction Phase

- Changes in topography, land management and land use pattern;
- Impact on air, noise and water quality;
- Impact on drainage system;

B. Construction Phase

- Impact due to land encroachment and land management;
- Impact due to relocation and/or resettlement;
- Impact due to occupational health and safety hazards;
- Impact due to loss of standing crops and farming hindrances;
- Impact due to conflict of interest between construction crew and locals, and deterioration in law and order situation;
- Impact on lifestyle due to interaction with different people and ethnic group and availability of cash income;
- Impact due to increased pressure on existing health and sanitation facilities;
- Impact on community infrastructure, and resources;
- Impact due to encroachment on cultural, historical and religious sites;
- Impact on gender and vulnerable groups; and
- Impact on aesthetic value.
- Loss of firewood and fodder from community forest to the households depending on them
- Impact on socioeconomic condition of project affected families

B. Operation Phase

- Loss of agricultural production;
- Restriction on land use patterns under the RoW;
- Impact due to land fragmentation;
- Farming hindrances due to the tower foundation;
- health and safety hazards;
- Impacts on livelihood;
- Impact on local economy and lifestyle due to withdrawal of economic activities
- Electricity hazards and electromagnetic field impact
- Devaluation of land in residential /commercial area

CHAPTER 9: MITIGATION AND ENHANCEMENT MEASURES

9.1 Introduction

The IEE shall recommend appropriate and pragmatic mitigation measures for all of the identified environmental impacts. These actions shall be designed to eliminate or minimize adverse environmental impacts to reasonable levels or to the levels as indicated by national standards. Similarly, enhancement measures shall be proposed to enhance the beneficial impacts. The cost required for mitigation and enhancement measures shall be identified in detail and incorporated in IEE.

The cost for mitigation and enhancement measures shall be provided separately differentiating into "Physical Environment", "Biological Environment", and "Socio-economic and Cultural Environment". Further, the mitigation measures will be classified according to "Construction Phase" and "Operation Phase. For Biological Environment, number of trees, cost of tree tagging, felling, and transportation shall be proposed along with compensatory plantation program.

All the proposed mitigation and enhancement measures are the prime responsibility of the proponent. Summary of Cost Benefit Assessment shall be given which shall include the followings:

- Cost of Environmental Mitigation Measures
- Cost of Enhancement Measures
- Cost of Environmental Monitoring
- Total Project Cost, and
- Percentage of Total Environmental Cost to the Total Project Cost

9.2 Types of Mitigation Measures

The IEE team shall recommend the following types of mitigation measures:

- Preventive measures
- Design and corrective measures
- Compensatory measures

Moreover, the IEE report shall propose the organizational structures and agencies to be consulted while implementing the mitigation programs. A matrix including identified impacts and proposed mitigation measures shall also be included in IEE report. Protection of safety measures around the tower pads and road crossings will be proposed in consultation with the local people and expert and will be proposed in IEE report. The proposed impact mitigation measures matrix shall be categorized in terms of physical, biological, socio-economic and cultural environments. Protection of safety measures around the tower pads and road crossings

CHAPTER 10: ENVIRONMENTAL MONITORING

The monitoring plan shall be required for assessing the actual impacts during project construction and operation. The plan shall specify the physical, biological and socio-economic and cultural environment in terms of parameters, indicators, location, sampling and measurement variables.

The IEE report shall also be specify the nature of monitoring required, agency carrying out these activities, the cost and any other necessary inputs. In monitoring plan the following areas shall be described for the construction as well as operation phase:

- The monitoring plan shall be categorized in terms of "Physical", "Biological" and "Socio-economic and Cultural Environment". Moreover, Impact and Compliance Monitoring Plan shall be categorized in terms of construction and operation phases.
- Baseline and impact monitoring plan shall include parameters, indicators, methods, schedule, and location.
- Compliance monitoring plan shall include parameters, indicators, method and schedule.
- Organization set-up, budget and manpower required for carrying out monitoring plan shall be proposed. Furthermore, the monitoring cost includes cost of impact and compliance monitoring activities at least for 2 years of project operation phase.
- Agencies to be consulted while implementing monitoring plan shall also be identified.

All the proposed monitoring plans are the prime responsibility of the proponent.

ANNEX I: SURVEY LICENCE AND IEE STUDY PERMISSION

नेपाल सरकार
ऊर्जा मन्त्रालय
विद्युत विकास विभाग
अनुमतिपत्र महाशाखा

फोन नं. ४४१४८६५, ४४१४८६६, ४४१४८०५५, ४४१४८०२५, ४४१६८८०, ४४८१६१४, ४४७६१०८
फ्याक्स (९७७-१-४४८८१५९
पोष्ट बक्स नं. २५७७
थापागाउँ, अनामनगर
काठमाडौं, नेपाल

पत्र संख्या :- ०७३/७४
च.नं. ३२१

(.....नेपाल विद्युत प्राधिकरण.....)
गो.ब. नं. ९५२९
मिति ०८/१७

मिति: २०७३/०८/०५

विषय:- मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर) २२० के.भी. प्रसारण लाईन विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (प्रथम संशोधन)को नविकरण तथा संशोधन सम्वन्धमा।

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, दरबारमार्ग, काठमाण्डौं।
फोन नं. ०१-४१५३०५४, ४१५३०५५, पो.ब.नं. १००२०
फ्याक्स नं. ०१-४१५३००९, ४१५३०१३

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2073/12/23

प्रस्तुत विषयमा तँहाले मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर) २२० के.भी. प्रसारण लाईन आयोजनाको विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११, प्रथम संशोधन) को नविकरण तथा संशोधनको सम्वन्धमा पेश गर्नुभएको निवेदन उपर कारवाहि हुँदा नेपाल सरकार, ऊर्जा मन्त्रालय, विद्युत विकास विभाग (महानिर्देशकस्तर) को मिति २०७३/०७/१८ को निर्णयानुसार प्रस्तावित प्रसारण लाईन आयोजनाको विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्रको वहाल अवधि मिति २०७४/०६/०४ सम्म रहने गरि नविकरण गरिएको तथा सोही अनुमतिपत्रको प्रकरण ४(ग) मा लमजुङ्ग जिल्लाको मोहरियाकोट गा.वि.स. थप हुने गरि संशोधन गरिएको व्यहोरा निर्देशानुसार जानकारी गराईन्छ।

विजय पुरी
ईन्जिनियर

बोधार्थ:
श्री ऊर्जा मन्त्रालय, सिंहदरबार।
श्री विद्युत विकास विभाग
- आयोजना अध्ययन महाशाखा
- निरीक्षण महाशाखा
- योजना महाशाखा
- आर्थिक प्रशासन शाखा: मिति २०७३/०५/१७ मा आ.र.नं. ४८७९ ध.बै.भौ.नं. ०७६२७० बाट विद्युत प्रसारण सर्वेक्षण अनुमतिपत्र नविकरण दस्तुर बापत प्राप्त धरौटी रकम जम्मा रु १,००,०००/- (रुपैया एक लाख मात्र) राजश्व खातामा जम्मा हुन।

श्री जिल्ला जलश्रोत समिति, लमजुङ्ग।
श्री जिल्ला जलश्रोत समिति, गोरखा।
श्री जिल्ला जलश्रोत समिति, तनहुँ।
श्री जिल्ला जलश्रोत समिति, चितवन।
पुनश्च: यस अघि प्रेषित गरिएको पत्रमा प्रेषित मिति २०७४/०७/२६ हुन गएकोले उक्त मिति सच्याई पत्र पुन: प्रेषित गरिएको।

नेपाल सरकार

ऊर्जा मन्त्रालय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (प्रथम संसोधन)

(मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर २२० के.भी. प्रसारण लाईन आयोजना)

अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११ प्रथम संसोधन

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, काठमाडौं ।

महाशय,

मनाङ्ग जिल्लाको धारपानी सवस्टेसन देखि चितवन जिल्लाको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म निर्माण गरिने मर्स्याङ्दी कोरिडोर २२० के.भी. प्रसारण लाईन आयोजनाको विद्युत प्रसारण सर्वेक्षण अनुमतिपत्र (अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११, यस पछि मुल अनुमतिपत्र भनिएको) को संशोधनका लागि मिति २०७२/०६/०६ मा दिनु भएको दरखास्त अनुसार मुल अनुमतिपत्रको प्रकरण ७ (ड) को प्रावधान अनुरूप उक्त अनुमतिपत्रको अन्य प्रकरण यथावत रहने गरि मुल अनुमतिपत्रको शिर्षक, प्रकरण ३, ४(क), (ख), (ग) र ५ मा देहाय बमोजिमको हुने गरी प्रथम संसोधन गरिएको छ ।

३. विद्युत प्रसारण कहाँबाट कहाँ गर्ने हो सो को विवरण :-
प्रस्तावित उदिपुर सवस्टेसन, तनहुँको मार्किचोक सवस्टेसन हुँदै चितवनको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म ।

४. सर्वेक्षण गर्ने क्षेत्र :

(क) अञ्चल : गण्डकी र नारायणी ।

(ख) जिल्ला : लमजुङ्ग, गोरखा, तनहुँ र चितवन ।

(ग) गा.वि.स.र नगरपालिका:

लमजुङ्ग जिल्ला: चिती, उदीपुर, भोटेओडार, अर्चलबोट, भरते, तारकुघाट, सुन्दरबजार र घमिलिकुवा गा.वि.स.हरू ।

गोरखा जिल्ला: पालुङ्गटार, गाईखुर, चाङ्गलिङ्ग, धुवाकोट र देउराली गा.वि.स.हरू ।

तनहुँ जिल्ला : भानु, पुर्कोट, चोकचिसापानी, बन्दिपुर, आबुखैरेनी र छिमकेश्वरी गा.वि.स.हरू ।

चिवन जिल्ला : चण्डीभन्ज्याङ्ग, कविलाश र दहखानी गा.वि.स. र भरतपुर नगरपालिका ।

पुर्व	: ८४° ३४' ००" E पुर्वी देशान्तर
पश्चिम	: ८४° १५' ००" E पुर्वी देशान्तर
उत्तर	: २८° ११' १०" N उत्तरी अक्षांश
दक्षिण	: २७° ४१' ००" N उत्तरी अक्षांश

५. विद्युत प्रसारणको भोल्टेज र परिमाणहरू :-

भोल्टेज : २२०,००० भोल्ट (अधिकतम चार सर्किट) ।

परिणाम : १६०० मेगावाट ।

अनुमतिपत्र दिने अधिकारीको :

सही :

नाम : सुमन प्रसाद शर्मा

पद : सचिव

ऊर्जा मन्त्रालय

मिति : २०७२।०९।०२

नेपाल सरकार

ऊर्जा मन्त्रालय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र (प्रथम संसोधन)

(मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर २२० के.भी. प्रसारण लाईन आयोजना)

२०६८

अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११ प्रथम संसोधन

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, काठमाडौं ।

महाशय,

मनाङ जिल्लाको धारपानी सवस्टेसन देखि चितवन जिल्लाको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म निर्माण गरिने मर्स्याङ्दी कोरिडोर २२० के.भी. प्रसारण लाईन आयोजनाको विद्युत प्रसारण सर्वेक्षण अनुमतिपत्र । अनुमतिपत्र संख्या: वि.वि.वि. ०७१/७२ वि.प्र.स. २११, यस पछि मुल अनुमतिपत्र भनिएको) को संशोधनका लागि मिति २०७२/०६/०६ मा दिनु भएको दरखास्त अनुसार मुल अनुमतिपत्रको प्रकरण ७ (ङ) को प्रावधान अनुरूप उक्त अनुमतिपत्रको अन्य प्रकरण यथावत रहने गरि मुल अनुमतिपत्रको शिर्षक, प्रकरण ३, ४(क), (ख), (ग) र ५ मा देहाय बमोजिमको हुने गरी प्रथम संसोधन गरिएको छ ।

३. विद्युत प्रसारण कहाँबाट कहाँ गर्ने हो सो को विवरण :-
प्रस्तावित उदिपुर सवस्टेसन, तनहुँको मार्किचोक सवस्टेसन हुदै चितवनको आँपटारी स्थित न्यू भरतपुर सवस्टेसन सम्म ।

४. सर्वेक्षण गर्ने क्षेत्र :

(क) अञ्चल : गण्डकी र नारायणी ।

(ख) जिल्ला : लमजुङ, गोरखा, तनहुँ र चितवन ।

(ग) गा.वि.स.र नगरपालिका:

लमजुङ जिल्ला: चिती, उदीपुर, भोटेओढार, अर्चलवोट, भरते, तारकुघाट, सुन्दरबजार र घर्मिलिकुवा गा.वि.स.हरू ।

गोरखा जिल्ला: पालुङटार, गाईघुर, चाङलिङ, धुवाकोट र देउराली गा.वि.स.हरू ।

तनहुँ जिल्ला : भानु, पुर्कोट, चोकचिसापानी, बन्दिपुर, आबुखैरेनी र छिमकेश्वरी गा.वि.स.हरू ।

चिवन जिल्ला : चण्डीभन्ज्याङ, कर्विलाश र दहखानी गा.वि.स. र भरतपुर नगरपालिका ।

पूर्व	: ८४° ३४' ००" E पुर्वी देशान्तर
पश्चिम	: ८४° १५' ००" E पुर्वी देशान्तर
उत्तर	: २८° ११' १०" N उत्तरी अक्षांश
दक्षिण	: २७° ४१' ००" N उत्तरी अक्षांश

५. विद्युत प्रसारणको भोल्टेज र परिमाणहरू :-

भोल्टेज : २२०,००० भोल्ट (अधिकतम चार सर्किट) ।

परिणाम : १६०० मेगावाट ।

अनुमतिपत्र दिने अधिकारीको :

सही :
नाम : सुमन प्रसाद शर्मा
पद : सचिव
ऊर्जा मन्त्रालय
मिति : २०७२।०९।०२

नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय

वन विभाग

☎ ४-२२७५७८
४-२२०३०३
४-२२१२३१
४-२१६३७१
४-२२१७४४
फ्याक्स ४-२२७३७४

(कृपया पत्रोत्तरमा प्राप्त पत्र संख्या र मिति उल्लेख गर्नुहोला ।)

बबरमहल,
काठमाडौं, नेपाल

प्राप्त पत्र संख्या र मिति
पत्र संख्या :- ०७२/०७३, वातावरण
च. नं. :- ४२२

मिति: २०७३।२।६

श्री नेपाल विद्युत प्राधिकरण,
आयोजना व्यवस्थापन निर्देशनालय,
आयोजना व्यवस्थापन विभाग,
मर्स्याङदी-कोरिडोर २२० के.भी. प्रा.लि.
मातातिर्थ, काठमाडौं ।

विषय: IEE अध्ययन सहमति सम्बन्धमा ।

प्रस्तुत विषयमा तहाँको प.स.०७२/०७३ च.नं. २१२ मिति २०७२।१।१४ को प्राप्त पत्र अनुसार नेपाल विद्युत प्राधिकरण, दरबारमार्ग प्रस्तावक रहेको मर्स्याङदी कोरिडोर २२० KV Transmission Line Project को प्रारम्भिक वातावरणीय परिक्षण (IEE) अध्ययनको लागि सहमति दिने सम्बन्धमा सम्बन्धित सरोकारवाला जिल्ला वन कार्यालयहरुबाट अनुमतिको लागि सिफारिस पेश भएकोमा तपशिलका सुझावहरु समावेश गर्ने गरी IEE अध्ययनको लागि सहमति दिने भनी वन विभागको मिति २०७३।२।६ मा निर्णय भएको हुँदा निर्णयानुसार अनुरोध छ ।

तपशिल

१. वातावरणीय प्रभाव अध्ययन गर्दा वन क्षेत्र कम पर्ने, जैविक विविधता र वातावरणमा कम हानी पुग्ने विकल्पहरुको विश्लेषण गर्नु पर्ने ।
२. वातावरणीय अध्ययन गर्दा सम्बन्धित जिल्ला वन कार्यालयहरुको प्राविधिक प्रतिनिधिहरु, सामुदायिक/कबुलियती वनका प्रतिनिधिहरु अनिवार्य रुपमा सहभागी गराउनु पर्ने ।
३. अध्ययन गरिने Transmission line Project क्षेत्र सामुदायिक/कबुलियती वन क्षेत्र परेमा सम्बन्धित सामुदायिक/कबुलियती वन समूहहरुको अनिवार्य रुपमा सहमति लिनु पर्ने ।
४. वातावरणीय प्रभाव अध्ययन गर्दा मौजुदा वन ऐन २०४९, वन नियमावली २०५१, वन क्षेत्रको जग्गा अन्य प्रयोजनको लागि प्रयोग गर्ने सम्बन्धी कार्यविधि २०६३, र वातावरण संरक्षण ऐन २०५३, वातावरणीय संरक्षण नियमावली २०५४, को प्रावधानको पालना हुनुपर्ने ।
५. आयोजना क्षेत्रमा पर्ने पानीको मुहानहरु संरक्षणको प्रावधानहरु र भू-क्षय नियन्त्रणको कार्यक्रमहरु समावेश गर्नुपर्ने ।
६. वातावरणीय अध्ययनको क्रममा जिल्ला वन कार्यालयको राय सुझाव समावेश गर्नुपर्ने ।

०७३।२।६
मोहनराज काफ्ले
वातावरण अधिकृत

बोधार्थ
श्री वन तथा भू-संरक्षण मन्त्रालय
सिंहदरबार, काठमाण्डौ ।
श्री वन विभाग, वन संरक्षण शाखा
श्री जि.व.का., गोरखा, लमजुङ, चितवन, तनहुँ ।

नेपाल सरकार
राष्ट्रपति चुरे-तराई मधेश संरक्षण विकास समिति
खुमलटार, ललितपुर

☎ ५५३१३११
५५२६७७७
फ्याक्स: ५५३७५११

प. सं.: ०७२।७३
च. नं.: ४६८

मिति:- २०७२/१२/१६

विषय:- सहमति सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण,
मर्स्याङ्दी कोरिडोर २२० के.भि. प्रशारण लाईन आयोजना,
मातातिर्थ, काठमाडौं ।

प्रस्तुत बिषयमा ताहां आयोजनाको प.सं. ०७२/७३ मिति २०७२/११/२७ को पत्र प्राप्त भई व्यहोरा अवगत भयो । सो सम्बन्धमा वातावरण संरक्षण ऐन, २०५३ र वातावरण संरक्षण नियमावली, २०५४ को शर्तहरु पालना हुनेगरी सहमति दिने भनी मिति २०७२/१२/१६ मा निर्णय भएको हुंदा सोही व्यहोरा जानकारीको लागि अनुरोध छ ।

योगेन्द्र कुमार कर्ण
उप-सचिव
उप-सचिव

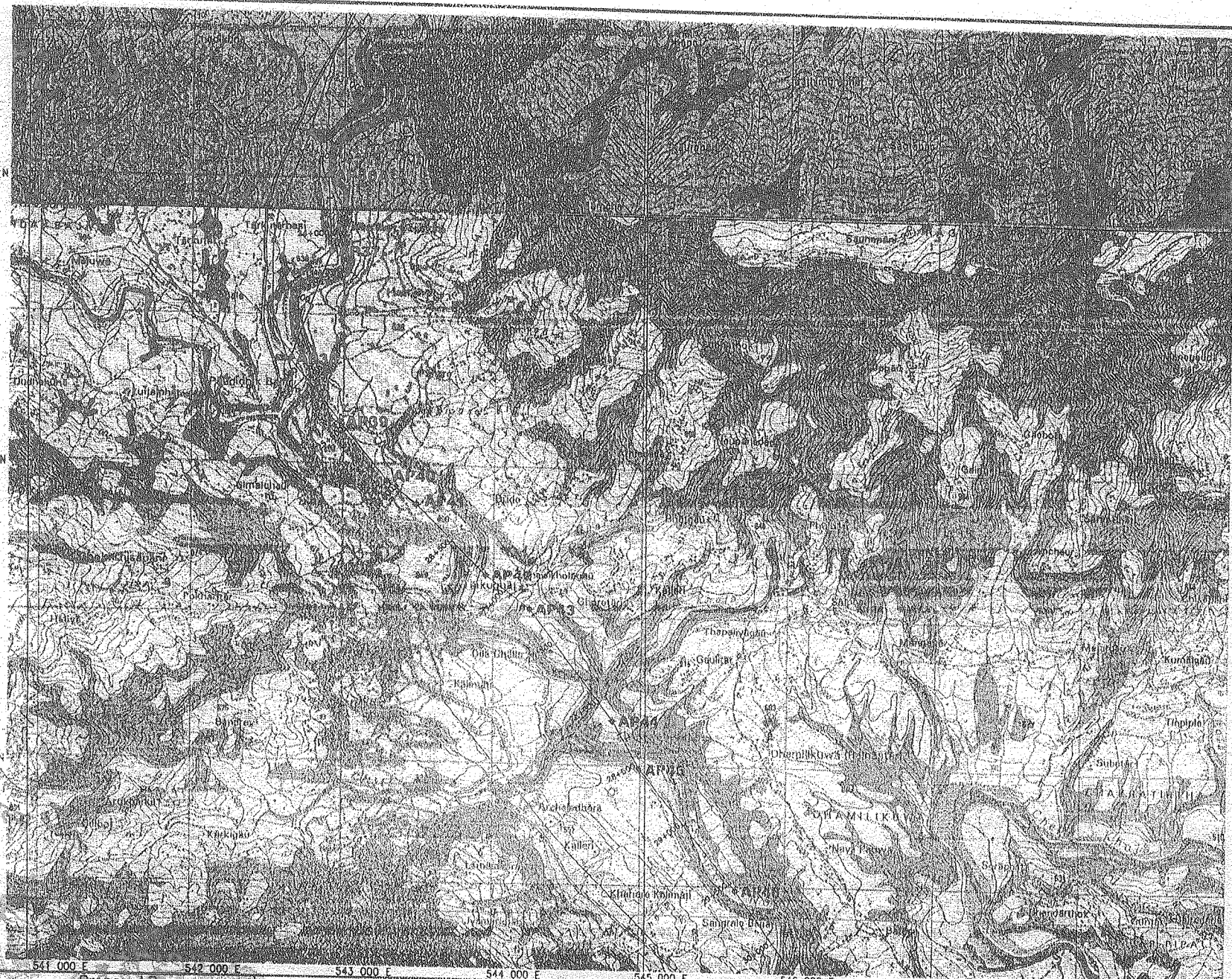
ANNEX II: CONSTRUCTION SCHEDULE

Table: Tentative Schedule for Construction Planning

SN	Activities	2017												2018												2019					
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
1	Contract Agreement																														
2	Contractor Mobilization																														
3	DIA																														
4	Material Supply																														
5	Construction																														
6	Testing and commissioning																														
7	H/O																														

ANNEX III: ROUTE ALIGNMENT IN TOPOGRAPHIC MAP


311 8000 N
311 6000 N
311 4000 N
539 000 E
541 000 E
543 000 E
545 000 E
AP29
AP30
AP31
AP32
AP33
AP33A
AP33B
AP33C
AP33D
AP34
AP34A
Udipur
Bharatpur
Ratanpur
Kharaspur
Ghuiyabari
Kalikamai
Kalikamai Bridge
Kalikamai Khola
Kalikamai Khola Bridge
Kalikamai Khola Bridge
Kalikamai Khola Bridge



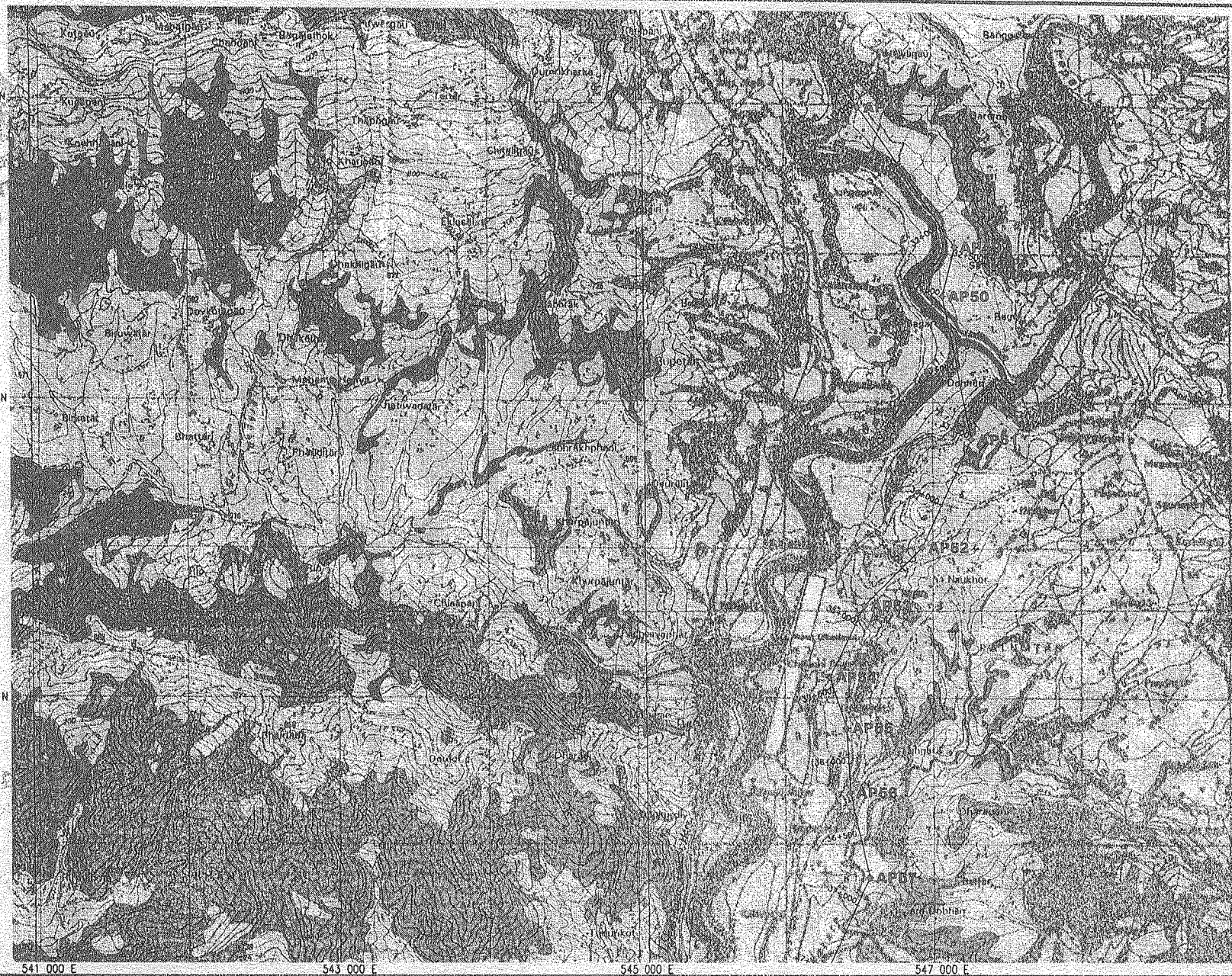
LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
- Main Foot Trail with Bridge
- Minor Foot Trail with Bridge
- Road under construction
- Ropeway line
- Built-up area
- Building or house
- Factory, Chimney
- School, Post office
- Hospital, Health post
- Cemetary
- Temple or Stupa, Mane
- Mosque , Church
- Orchard, Nursery
- Trees:Scattered, Prominent, Row
- Tea or coffee plantation
- Forest
- Bush , Grass , Bamboo
- Swamp
- Lake, pond or water tank
- Streams
- River
- Canal, Ditch
- Dam,Sluice gate,Weir
- Water tank or pond, Well
- Sand and Gravel area
- Aqueduct
- Ferry, Ford, Twin service
- Water tap, well, Water tower
- Spring, Cave entry place
- Triangulationpoint, Bench mark
- Mountain pass, Spot height
- Fence or wall
- Index contour
- Intermediate contour
- Supplementary contour
- Embankment
- Cutting
- Depression: Big
- Depression: Small
- Soil cliff: Large, Small
- Rocks: Large, Small
- Cliff: rock, ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radiotransmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

Sheet Index

1 2 3 4 5 6 7 8 9

Prepared By:	Submitted To:	Title			Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	0 250 500 750 1000 1250m SCALE 1:25,000 Date : July - 2015	2/9


310 8000 N
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547 000 E
AP50
AP52
AP54
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AP58
AP60
AP62
AP64
AP66
AP68
AP70
Kotgaon
Marshidhar
Bhadaure Tamak
Kuwagati
Kuspani
Thapakot
Chautharia
Chandibas
Dhapkot
Dhapkot
Bhujung
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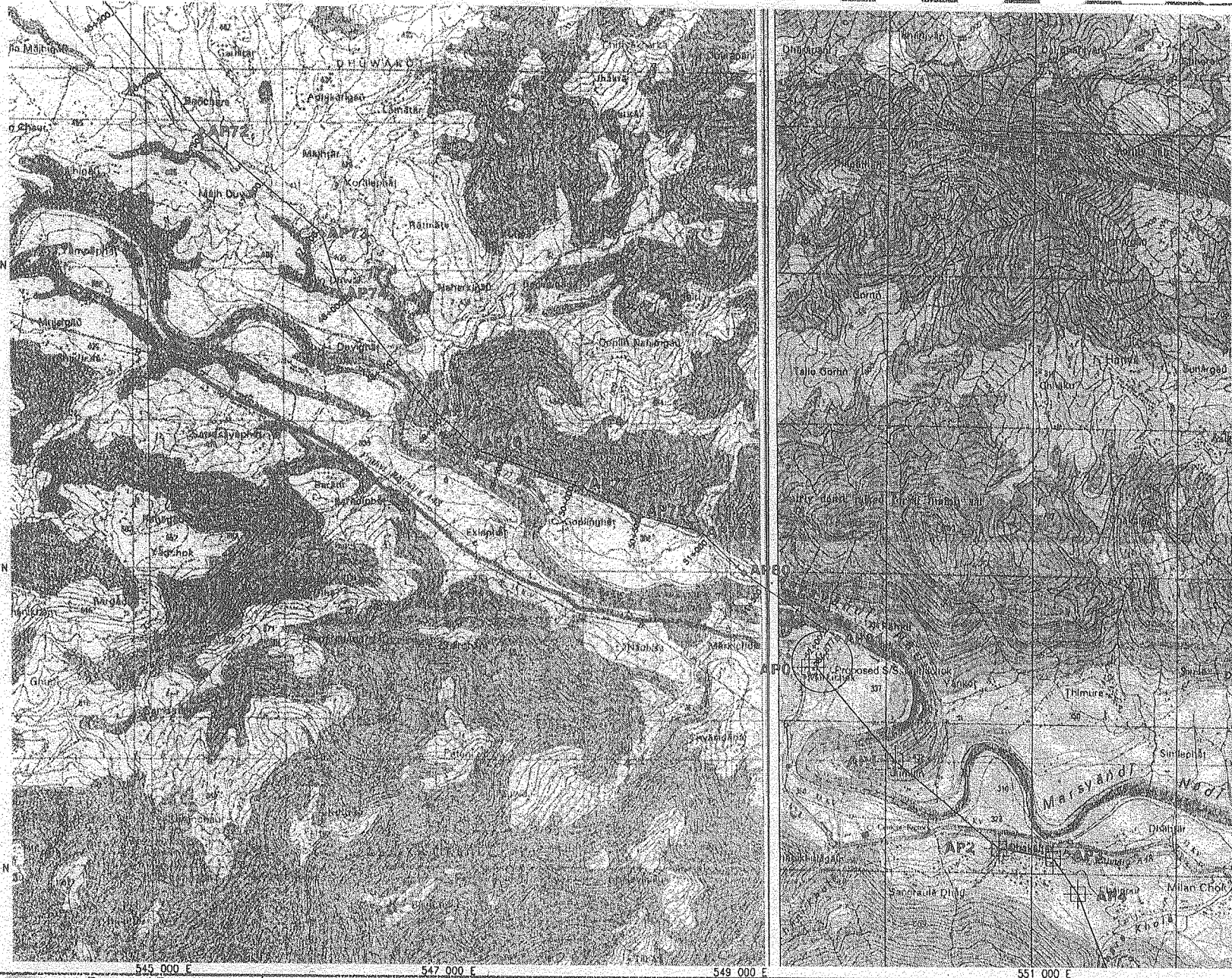
Bhujung


309 2000 N
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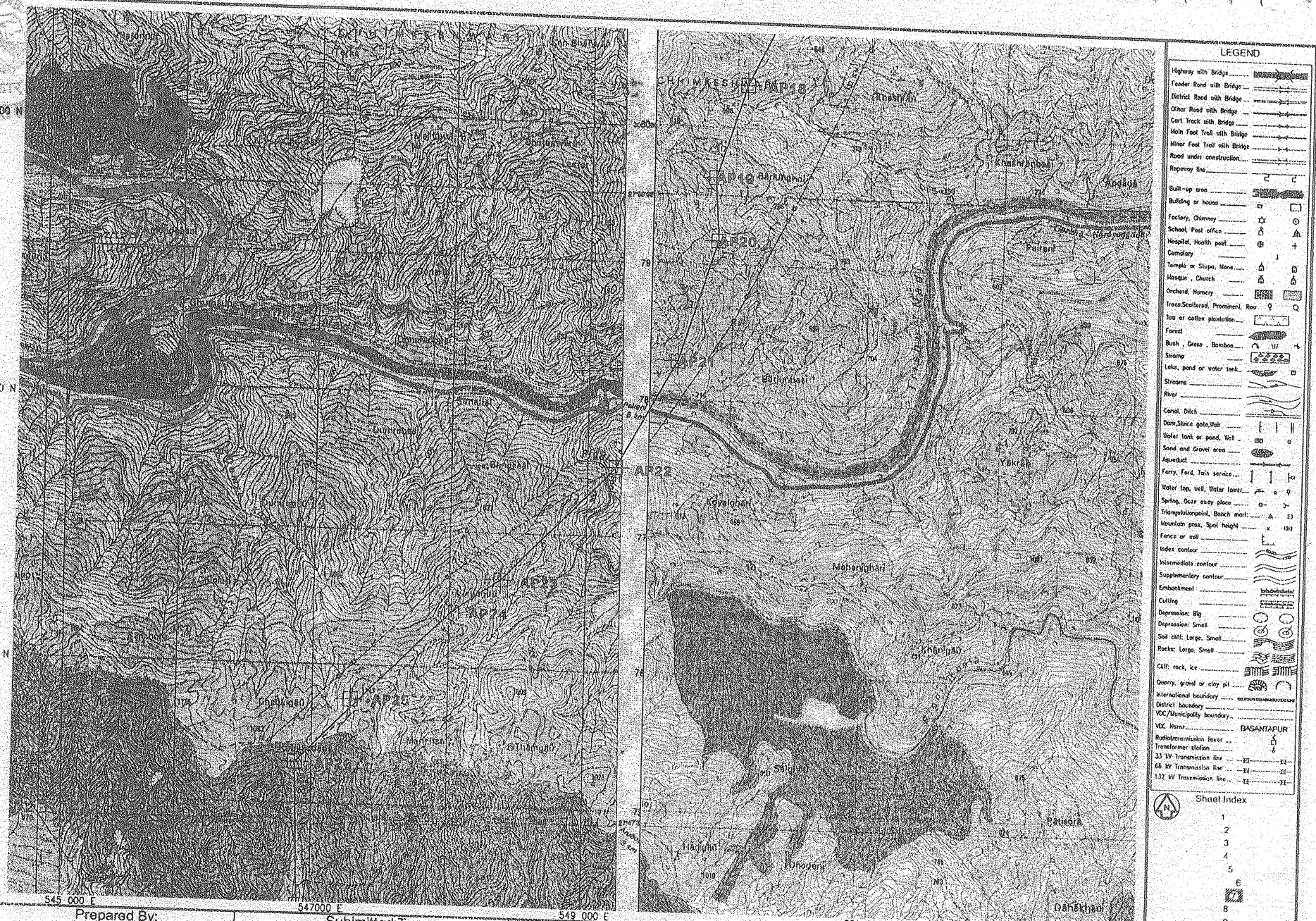
308 8000 N
545 000 E
547 000 E
549 000 E
551 000 E
AP72
AP73
AP74
AP75
AP76
AP77
AP80
AP81
AP82
AP1
AP2
AP3
DHUWAKOT
Proposed S/S
Marshyangdi
Udipur
Bharatpur
Sundrawati
Milan Chok
Khoela
Sanchaula Dihi
Thimure
Simlepati
Yankot
Dhuwakot
Bachchare
Aptighatkot
Lamatar
Majh Dunga
Kotlephal
Ratimate
Devighat
Mahendrapul
Bhedetar
Bathlaibas
Ekleghat
Gopaligaun
Nibuwa
Ghumi
Tallo Gamn
Chhuikur
Sunkrgad
Sirubari
Dhadaure
Jhaure
Gaunsari
Gaunkhar
Gaidhar
Kalyaphedi
Bhirkot
Mahadevsthan
Bhimsen Mandir
Bhimsen Than
Tilk
Ghumi
Bargad
Ghiring



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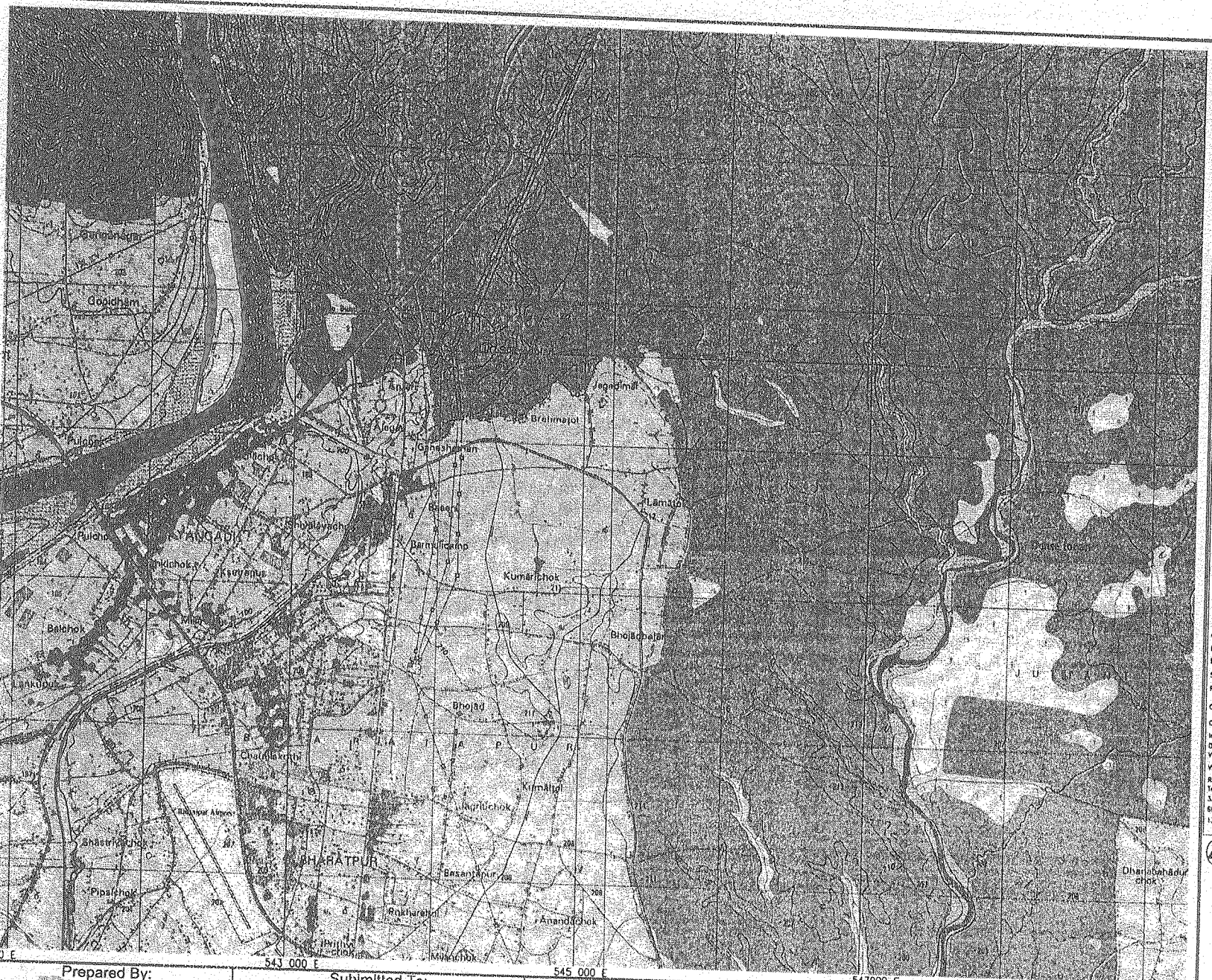
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	0 250 500 750 1000 1250m SCALE 1:25,000 Date : July - 2015	7/9



Prepared By:	Submitted To:	Title		
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	0 250 500 750 1000 1250m SCALE 1:25,000 Date : July - 2015 Sheet. No. 9/9

ANNEX IV: CHECKLIST AND QUESTIONNAIRE FOR DATA COLLECTION

A: Table for Physical Information of IEE Work

SN	AP TL Alignment	Distance in meters					Crossing Details in between APs
		Span	Forest	Cultivation	Barren	Others	

B: Key Informant Interview Guidelines

Nepal Electricity Authority

Udipur-New Bharatpur 220 kV TL Project

Initial Environmental Examination

2016

A. Background information

1. District:..... 2. VDC:..... 3. Ward No:..... 4. Village/Tole:.....

5. Name of Respondent:..... 6. Age..... 7.Sex:.....

8. Education:..... 9. Main Occupation:..... 10. Position (if any):.....

11. Interviewer:..... 12. Date: ..... 13: Checked by:.....

B. Major Settlements, Caste/Ethnic Groups and Housing Pattern

1. Major settlements and dominant caste/ ethnic groups in the VDC

SN	Major Settlements in th VDC		Settlements Near the Major Project Structure.....<500m				
	Name of Settlement	Dominant Caste/Ethnic Group (In Priority)	Name	Estimated HHs	Caste/Ethnic Group (%)		
					Janjati	Dalit	Others
1							
2							
3							
4							
5							
6							

7							
8							
9							

2. How do you assess relationship between Dalit/ethnic minorities with other caste/ethnic groups in VDC?

   1. Good 2. Average 3. Poor

3. Explain housing pattern of the area (scattered/dense, types of houses by cast/ethnicity etc.)

   .....

   .....

   .....

C. Education

1. What is the literacy status of local people of this VDC? Over all literacy:.....%
2. What is the literacy status of women of this VDC? Literacy:.....%
3. What is the literacy status of ethnic minor (Dalit/Janjati) groups of this VDC? Literacy:.....%
4. What are the existing educational facilities in the VDC? 1.....
   2..... 3.....
5. What is the overall status of physical facilities of educational institutions of your VDC?.

   1. Good 2. Average 3. Poor

6. What are the major problems of educational institutions of your VDC?

   1..... 2..... 3.....

7. What could be done to strengthen the educational facilities of your VDC?

1..... 2..... 3.....

8. Are there NGOs/INGOs working in the education sector in your VDC? 1. Yes
   2. No.

9. Has their work contributed to increase the educational status of local people? 1. Yes
   2. No.

10. What are the strengths and Weaknesseses of their programs/activities?

    Strengths: 1..... 2..... .....
    3.....

    Weaknesses: 1..... 2..... .....
    3.....

D. Health

1. What are the existing health facilities in your VDC?

   1..... 2..... 3.....

2. What are the prevalent diseases and their common treatment practice in your VDC?

Disease	Treatment Practices
1.....	1.....
2.	1.....
3.....	1.....

3. How do you assess service quality provided by the government health facilities in your VDC ?

   1. Good 2. Average 3. Poor

   3.1. If poor, why? 1..... 2.....
   3.....

4. How the government health facilities of your VDC could be strengthen?

   1..... 2.....
   3.....

5. How do you assess the awareness level of local people regarding STD/HIV AIDS?

   1. High 2. Average 3. Low

6. What is the prevalence rate of STD/HIV AIDS in your VDC? STD:.....%. HIV AIDS:.....%.

7. Are there NGOs/INGOs working in the health sector in your VDC? 1. Yes

   2. No.

   7.1. If Yes, pls provide the following details

   Name of NGOs/INGOs Focus areas

   1..... 2.....

   3.....

   1..... 2.....

3.....

   1..... 2.....

3.....

8. Has their work contributed to increase the health status of local people? 1. Yes

   2. No.

9. What are the strengths and weaknesses of the programs/activities of the NGOs/INGOs ?

   Strengths: 1..... 2..... .....

   3.....

   Weaknesses: 1..... 2..... .....

   3.....

E. Drinking Water

1. What are the main sources of drinking water for the households of the VDC? (Priority order)

   1. Public piped water 2. Private piped water 3. Spring/well 5.Others.....

2. How do you assess the quality of the drinking water? 1. Good 2. Average

   3. Poor

3. Percentage of population covered by piped water in the VDC.....%

4. Are the existing drinking water sources sufficient to fulfill the demand of the households?
   1. Yes 2. No

   4.1 If no, what could be done to fulfill the water demand of the households?

   1..... 2.....

   3.....

5. What percentage of HHs has constructed toilets in this the VDC? .....%

6. How do you assess condition of environmental sanitation in your VDC? 1. Good 2. Average 3. Poor

7. What could be done to improve drinking water and sanition condition of your VDC?

   Drinking water: 1..... 2.....

   3.....

   Env. Sanitation : 1..... 2.....

   3.....

8. Are there NGOs/iNGOs working in the drinking water and sanitation sectors in your VDC?

   Drinking water : 1. Yes 2. No.

   Sanitation : 1. Yes 2. No.

9. Has their work contributed to improve the health status of local people? 1. Yes
   2. No.

10. What are the strengths and weaknesses of the programs/activities of the NGOs/INGOs?

    Strengths: 1..... 2..... .....

    3.....

    Weaknesses: 1..... 2..... .....

    3.....

F. Gender

1. What are the major activities of women of your VDC?

   1..... 2.....

   3.....

2. Are there cultural/social/religious barriers/areas for women to work in certain areas of certain caste/ethnic groups? 1. Yes 2. No

2.1 If yes, what barriers/area and how break the barriers?

Caste/ethnic group	Barriers	Suggestions for improvement
1.....	1.....	1..... 2..... 3.....
2.....	1.....	1..... 2..... 3.....

3. Are there potential income generating activities for women in your VDC? 1. Yes 2. No

3.1 If yes, what are they?

1..... 2.....

3.....

4. Do women of your VDC have special interesta/capacity to undertake certain enterprise?

1. Yes 2. No

Areas of interest: 1..... 2..... 3.....

Existing capacity: 1..... 2..... 3.....

5. What are the potential income generating activities (agriculture/ off farm/ forest, local skill based activities etc.) for women in this VDC?

1..... 2.....

3.....

6. Are there NGOs/INGOs mainly working for women empowerment in VDC? 1. Yes 2. No.

6.1. If Yes Pls provide the following details.

Name of NGOs/INGOs	Focus areas
1.....	1..... 2..... 3.....

2..... 1..... 2.....
3.....

3..... 1..... 2.....
3.....

7. Has the work of NGOs/INGOs contributed to empower the women of your VDC? 1. Yes 2. No.

8. What are the strengths and weaknesses of the programs/activities of the NGOs/INGOs?

Strengths: 1..... 2..... .....
3.....

Weaknesses: 1..... 2..... .....
3.....

9. What are the major issues of women? (probe for abuse, discrimination, domestic violence etc.)

1..... 2.....
3.....

G. Livelihood

1. What are the major economic activities of male and female of your VDC for their livelihood?

Male : 1..... 2..... .....
3.....

Female : 1..... 2..... .....
3.....

2. What % of HHs of your VDC is able to produce enough food to meet their requirement? .....%

2.1. How the food deficit households of your VDC fulfill their food requirements?

1..... 2.....
3.....

3. What percentage of households in your VDC is landless? .....%

3.1 What are the main activities of the landless households for their livelihood?

1..... 2.....

3.....

3.2 What could be done to increase the livelihood of poor and landless households?

1..... 2.....

3.....

4. What are the main agriculture products of your VDC?

1..... 2.....

3.....

5. What important commodities are exported from this VDC?

Commodities: 1..... 2.....

3.....

6. Please provide following inform regarding cropping pattern and area of following in your VDC?

Khet irrigated: 1 ..... 2. ..... 3.....

4.....

1 ..... 2..... 3.....

4.....

1 ..... 2..... 3.....

4.....

Khet un-irrigated: 1 ..... 2..... 3.....

1 ..... 2..... 3.....

1 ..... 2..... 3.....

Bari: 1 ..... 2..... 3.....

1 ..... 2..... 3.....

1 ..... 2..... 3.....

Government Land

7. Are there NGOs/INGOs working to improve livilihood of local people in your VDC? 1. Yes 2. No

7.1. If Yes, pls provide the following details.

Name of NGOs/INGOs	Focus areas
1.....	1..... 2.....
3.....	
2.....	1..... 2.....
3.....	
3.....	1..... 2.....
3.....	

7. Has the work of NGOs/INGOs contributed to improve livilihood of local people? 1. Yes 2. No.

8. What are the strengths and weaknesses of the programs/activities of the NGOs/INGOs?

Strengths: 1..... 2..... .....

3.....

Weaknesses: 1..... 2..... .....

3.....

H. Migration

1. What is the status of migration (family member away from home for more than two months for work reason) in your VDC? 1. High 2.Medium 3. Low

2. Which are the popular destinations of the migrants? 1..... 2.....

3.....

3. What is the status of remittance flow in your VDC? 1. High 2.Medium 3. Low

3.1 Where the households normally use the remittance?

1 Food/clothing 2. Education 3. Health 4. Purchase land/plot

5. House/building construction/repair 6. House assets 7. Others specify).....

What are the positive and negative impacts of migration in your VDC? (Probe for negative impacts such as work load to women, problem of STD/HIV AIDS, family dispute etc.)

Positive: 1..... 2. .....

3.....

Negative: 1..... 2.....

3.....

4.1 How the negative impacts of migration could be minimized? (Probe for negative impacts such as work load to women, problem of STD/HIV AIDS, family dispute etc.)

1..... 2. .....

3.....

I. Natural Resources

1. What are the main natural resources of your VDC? 1. ..... 2.....

3.....

2. Who are the main users of the resources?

1..... 2. .....

3.....

3. Is there right (dfecto/dejure) to use the resources by the people of your VDC? 1. Yes

2. No

4. Pls provide the following details of natural resources of your VDC ?

Resource	Distance from VDC	Accessibility		Availability		
		Accessible	Inaccessible	High	Average	Low
Forest						
Water						

izing land					
blic land					
Mine					
Other.....					

5. Are the households of your VDC satisfied regarding the accessibility and availability of the natural resources? 1. Yes 2. No.

5.1 If no, why? 1..... 2.....

3.....

6. Do the people of your VDC have conflict with people of other VDC regarding use of natural resources?

1. Yes 2. No.

7. If yes, for which resource and why? Probe for use of forest resources, grazing, public land, mine and water resources and the cause of conflict?

Natural Resource	VDC	Cause of Conflict
1.....	1.....	1.....
2.....	3.....	
2.....	1.....	1..... 2.....
3.....		
3.....	1.....	1..... 2.....
3.....		

J. Cultural Features

1. What are the major festivals of your area VDC?

1.....2..... 3.....

2. Is any festival is unique in your VDC? 1. Yes 2. No

1.1 If yes, which festival and why?

Festival	Reason

1..... 1..... 2.....

3.....

2..... 1..... 2.....

3.....

3..... 1..... 2.....

3.....

3. How do you assess the relationship of various ethnic minorities and high caste groups in the your VDC?

1. Good 2. Average 3. Poor

4. Are there important historical, religious, archeological and cultural sites in your area? 1. Yes 2. No.

3.1. If yes, what are the historical, religious, archeological and cultural sites and why they are important?

Name	Location	Importance
1.....	1.....	
1.....		
2.....	1.....	
1.....		
3.....	1.....	
1.....		

5. Do you think the proposed project will affect religious, archeological and cultural sites of your VDC/area?

1. Yes 2. No.

4.1. If yes, what are the historical, religious, archeological and cultural sites and how to protect it?

Name	Location	Measures to Protect
1.....	1.....	1.....
2.....		

K. Development Activities/Programs in the VDC

1. Has any major development activities/programs implemented in your VDC during the last 12 months?

1. Yes 2. No.

1.1. If yes, please provide the following information?

Implementing agency	Activity/program	Beneficiary (group & HHs)
1.....	1.....	1.....
2.....		
2.....	1.....	1.....
2.....		
3.....	1.....	1.....
2.....		

2. How do you assess its implementation process of the development activities/programs?

1. Good 2. Average 3. Poor

3. What should be the appropriate process to implement development activity/program in your VDC?

1..... 2.....

3.....

4. What are the source of information on new development activities/other recent happenings in your VDC?

1..... 2.....

3.....

L. Governmental Institutions and NGOs/CBOs

1. Are there government institutions, important NGOs/CBOs working in your VDC? If, yes pls provide the following information.

S.N.	Name	Type	Focus Area	Major activity/prog.	Target Group	Beneficiaries (%)				
						All	Women	Janjati	Dalit	Others
1										

C: Household Questionnaire

नेपाल विद्युत प्राधिकरण

उदीप्र- न्यू भरतपुर २२० के.भी. प्रसारण लाइन आयोजना को

प्रारम्भिक वातावरणीय परीक्षण

घरधुरी प्रश्नावली

२०७२

यस प्रश्नावलीमा सोधिएका सबै व्यक्तिगत सूचना तथ्याङ्क ऐन २०१५ अनुसार गोप्य राखिने छन् र तथ्याङ्कित प्रयोजनका लागि मात्र प्रयोग गरिनेछन् ।

आयोजना क्षेत्र सम्बन्धि सामान्य जानकारी:

१. जिल्ला: ..... २. गा.वि.स./न.पा. .....

३. वडा नं. ..... ४. गाउँ टोल .....

५. आयोजना स्थल: ५.१ सबस्टेशन ५.२. एङ्गल टावर (टावर नं. .....)

परिवार सम्बन्धी जानकारी :

१. घरमूलीको नाम: .....

२. लिङ्ग: १. पुरुष २. महिला

३. धर्म: ..... ४. जात जाति .....

५. परिवारमा बोलिने भाषा: ..... ६. परिवार संख्या: .....

७. तपाई यस गाउँमा कहिलेदेखि बसिरहनु भएको छ ?

१. जन्मदेखि नै बसोबास गर्दै आएको २. बसाई सरी आएको

७.१. यदि यस गाउँमा बसाईसरी आएको भए आएको कति वर्ष भयो ? वर्ष.....

७.२. कहाँबाट आउनु भएको ?

जिल्ला..... गा.वि.स. .....

८. तपाई यस गाउँमा बसाईसरी आउनुको कारण के हो ?

१. परिवारसँगै आएको २. गरिबी ३. दैवीप्रकोप

४. जागिर ५. व्यापार ६. शिक्षा

७. अन्य(खुलाउने).....

९. परिवारको प्रकार:

१. एकल परिवार (छुट्टिएर बसेका)



नेपाल सरकार ऊर्जा मन्त्रालय २०६६

२. संयुक्त परिवार:

१० पारिवारिक बिबरण :

कृपया तपाईंको परिवारको सदस्यहरुवारे (मानो नछुट्टिई बसेका) विस्तृत विवरण दिनुहोस् (घरमुलीबाट शुरु गर्ने)

क्र. सं.	नाम	घरमुली संगको नाता (१)	लिङ्ग (२)	उमेर (वर्ष)	शिक्षा (३)	वैवाहिक स्थिति (३.१)	पेशा (४)		सिप/तालिम (५)	६ महिना भन्दा बढी समय बाहिर बसेको भए		
							मु.	स.		समय (महिना)	कारण (६)	ठाउँ
१.												
२.												
३.												
४.												
५.												
६.												
७.												
८.												

संकेत

१. घरमुलीसंग नाता

१. घरमुली २. जहान ३. छोरा/छोरी ४. नाती/नातिना ५. बुवा/आमा

६. दाजु/भाई/दिदी/बहिनी ७. भतिजा/भतिजी ८. छोरीज्वाइ/बईनीज्वाइ/भेराजु ९. भाइबुहारी/छोराबुहारी/भाउजु

१०. सासु/ससुरा ११. बाजे/बज्यै १२. अन्य नातापर्ने १३. घरेलु कामदार १४. अन्य नाता नपर्ने

२. लिङ्ग

१. पुरुष २. महिला

३. शिक्षा

१. असाक्षर २. स्कूल नगएको तर साक्षर ३. १ देखी ५ कक्षा पढेको

४. ६ देखी ८ कक्षा पढेको ५. ९ देखी १० कक्षा पढेको

६. एस.एल.सी. उत्तीर्ण ७. आइ.ए. ८. बि.ए. बि.ए. भन्दा माथी

हेक स्थिति

विवाहित २ विवाहित ३ विधुवा विधुर ४ छुटाछुटै बसेको [illegible]

[illegible]

कृषी	११	[illegible]
पशुपालन	१२	[illegible]
माछा मार्ने	१३	[illegible]
भारि बोक्ने	१४	[illegible]
नेपालमा ज्याला मज्दुरी	१५	[illegible]
नेपाल बाहिर ज्याला मज्दुरी	१६	[illegible]
वन पैदावार जम्मा गर्ने र बेच बिखन गर्ने	१७	[illegible]
नेपालमा नोकरी गर्ने	१८	[illegible]
नेपाल बाहिर नोकरी गर्ने	१९	[illegible]
घरेलु तथा साना उद्योग गर्ने		

प तालिम

ढुङ्गाको काम गर्ने	७ ड्राइभर
सिलाई सम्बन्धी काम गर्ने	८ निर्माण सम्बन्धी काम गर्ने
काठको काम गर्ने	९ सुनको काम गर्ने
फलामको काम गर्ने	१० माटोको भाँडा बनाउने
जुत्ता बनाउने	११ [illegible]
उनका कपडाहरु बुन्ने काम गर्ने	१२ अन्य

६. बाहिर बस्नुको कारण

१ नोकरी (नेपाल भित्र) २ नोकरी (नेपाल बाहिर) ३ अध्ययन

कृषि, पशुपालन तथा व्यापार व्यवसाय:

३.१ कृषि

कृपया तपाईको आफ्नो वा परिवारको नाममा भएको जग्गा जमीन बारे निम्न विवरण दिनुहोस् ।

जग्गाको	सिंचीत खेत	असिंचीत खेत	बारी	अन्य (खुलाउने).....

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स्वामित्व	ईकाइ	क्षेत्रफल	ईकाइ	क्षेत्रफल	ईकाइ	क्षेत्रफल	ईकाइ	क्षेत्रफल
आफ्नै								
अरुको कमाई आएको								
अरुलाई कमाउन दिएको								

९.९ के तपाईले गत वर्षमा कुनै जग्गा बेच्नुभयो

१. बेचे २. बेचेको छैन

९.९ यदि बेचेको भए खेत ..... ईकाइ .....

बारी ..... ईकाइ .....

९.१ प्रति ईकाइ दर खेत रु..... बारी रु .....

३.९.२ गत वर्षमा तपाईले खेती गर्नुभएको जग्गामा कुन कुन खाद्यान्न बाली/तरकारी बाली/फलफूलहरु लगाउनु भयो, तिनीहरुको उत्पादन, उत्पादन खर्च एवं आम्दानी बारे बताउनुहोस् ।

बालीहरु	खेती गरेको जमिन				उत्पादन		मूल्य (रु/ईकाई)	जम्मा आम्दानी (रु)	उत्पादन खर्च (रु)	जम्मा खुद आम्दानी (रु)
	खेत		बारी		ईकाइ	परिमाण				
	ईकाइ	क्षेत्रफल	ईकाइ	क्षेत्रफल						
	१	२	३	४	५	६	७	८	९	१० (८-९)
धान										
मकै										
कोदो										

गाउँडी

३ ३ के तपाईको जग्गामा भएको गत वर्षको उत्पादनले तपाईलाई पर्याप्त पर्याप्त भयो ?

१. भयो २. भएन

३.४ यदि अपर्याप्त भयो भने कति महिनाको लागि पुग्छ ? ..... महिना

३.५ आफ्नो उत्पादित खाद्यान्न अपर्याप्त भएको बेला आफ्नो परिवारलाई तपाईं कसरी खुवाउनु हुन्छ ?

१. ऋण गरेर
२. घरको अन्य सामान बेचेर
३. दैनिक ज्यालादारी काम गरेर
४. जंगली खाद्य पदार्थ खाएर
५. भारी बोक्ने काम गरेर
६. अन्य .....

३.६. के तपाईको परिवारको ऋण छ ?

१. छ २. छैन

३.७. यदि ऋण छ भने, ऋण लिनुको कारण के हुन् ? (३ भन्दा बढीमा चिह्न लगाउने)

१. घर निर्माण/सुधार
२. खेतीको लागि जग्गा किन्न
३. घडेरी किन्न
४. आपतकालको लागि

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५. शिक्षाको लागि ६. औषधोपचारको लागि

७. विहे ब्रतबन्ध आदि काम ८. खाद्यान्न व्यवस्थाको लागि

३.१.८ तपाईको परिवारको न्यूनतम आधारभूत आवश्यकताहरु पूरा गर्न मासिक आम्दानी कति जति हुनुपर्छ जस्तोलाग्छ?

मासिक आम्दानी रू .....

३.२ पशुपालन :

३.२.१ तपाईले गाईवस्तु पालनु भएको छ ?

१. छ २. छैन

३.२.२ यदि पालनुभएको छ भने निम्न विवरण दिनुहोस् ।

पशु/पंशुपंक्षी को प्रकार	संख्या	दुध/अण्डा उत्पादन			पशु बेची बिकी			पशु/पंक्षी पालनबाट वार्षिक आम्दानी रु. (क+ख)
		परिमाण बाना, गोटा/वर्ष	मूल्य रु./ इकाई	जम्मा मुल्य (क)	परिमाण गोटा वर्ष	मुल्य रु./ इकाई	जम्मा मुल्य/ईकाई x (ख)	
१.१ गाई (दुध दिने)								
१.२ गाई (दुध नदिने)								
१.३ गोरु								
१.४ बाच्छा/बाच्छी								
२.१ भैसी (दुध दिने)								
२.२ भैसी (दुध नदिने)								
२.३ राँगा								
२.४ पाडा/पाडी								



।/बाख्रा/खसी/बोका							
सँगुर/बंगुर							
कुखुरा/हाँस							
य							

पंक्षीपंक्षी लाई मारेरमासु चेको भए त्यस्तो पशुपंक्षीको उल्लेख गर्ने ।

३. व्यापार तथा सानो उद्योग :

३.१ पाईको परिवारका सदस्यहरुमध्ये कसैको आफ्नै व्यापार वा घरेलु उद्योग छ कि :

१. छ २. छैन

३.२ छ भने तलको विवरण दिनुहोस् ।

व्यवसायको किसिम	पकार खुलाउने	औषत आम्दानी मासिक

३.३ सायको किसिम

१ घरेलु उद्योग २. वर्कसप ३.चिया पसल रेस्टुरेन्ट लज ४ खुद्रा पसल ५ अन्य पसल ६. अन्य .....

४. घर र घरायसी सामाग्रीहरुको विवरण

४.१ यो घर तपाईको आफ्नै हो ?

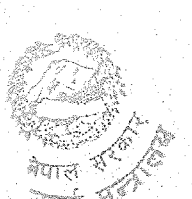
१. हो २. होईन

[यदि हो भने प्रश्न ४.३, ४.४, ४.५ र ४.६ सोध्ने]

४.२ यदि होईन भने तपाईले भाडामा लिनु भएको हो ?

१. हो २. होईन ३. अरुको घरमा बसेको

४.३ आफ्नो घरको भित्ताको सामाग्री ४.४ छाईको सामाग्रीहरु



१. सिमेन्ट र ईंटा छुगा
२. माटो र ईंटा छुगा
३. काठ / दाउरा
४. होलोब्लक सिमेण्ट
५. कांचो ईंटा
६. बांस / सिट्ठा / नल / छोड
७. भित्ता नभएको
८. अन्य खुलाउने .....

१. ढाकी
२. छाड
३ छुगा ईंटा
४ सिमेन्ट ढाकल छाडल
५ अन्य खुलाउने

४.५ छानाको सामग्री

१. खर / पराल
२. माटो
३. काठ फल्याक
४. जस्ता पाता

५ सिमेण्ट ढलान
६ टायल सिमेण्ट ढायल
७. छुगा
८. अन्य खुलाउने

४.६. घरको तला

१. एक तला २. दुइ तला ३ तिन तला ४ तिन भन्दा माथि

आम्दानी तथा खर्चको विवरण :

५.१ खर्च :

गत महिना तपाईको घरमा निम्न शिर्षक अन्तर्गत भएको खर्चको विवरण दिन होस् ।

शिर्षक	मासिक रु.	वार्षिक रु.
१. खाना खर्च		
२. लत्ता कपडा		
३. घरभाडा		
४. शिक्षा		

५. यातायात		
६. इन्धन (मट्टितेल, ग्यास, दाउरा आदि)		
७. टेलिफोन, पत्रपत्रिका, केबुल टि.भी.		
८. पानी, बिजुली		
९. अन्य खुलाउने		
जम्मा		

५.२ आम्दानी

विगत १२ महिना यता तपाइको परिवारले निम्न श्रोतबाट प्राप्त आम्दानी गर्यो ।

आम्दानीका श्रोतहरु	रु	
१. कृषिजन्य उत्पादनको बिक्रि		(३.९.२ बाट लिने)
२. कृषिजन्य उत्पादन उपभोग (आफ्ले उत्पादन गरेको मात्र)		
३. पशुपालनबाट आम्दानी		(३.२.२ बाट लिने)
४. उद्योग व्यवसाय		
५. ठेक्कापट्टा		
६. व्यापार		
७. होटेल व्यवसाय (रेष्टुरेण्ट, लज)		
८. यातायात व्यवसाय		
९. नोकरी (तलब)		
१०. दैनिक ज्याला मजदूरी		
११. बैदेशिक रोजगारीको कमाई (विप्रेशण)		

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१२. बहाल ब्याज/लाभांश		
१३. पेन्सन		
१४. सामाजिक सुरक्षा भत्ता (वृद्ध, एकल महिला, अपांग आदि)		
१५. अन्य आम्दानी (खुलाउने)		
जम्मा		

६. ऊर्जा तथा खानेपानीको आपूर्ति:

६.१ तपाईको खानेपानीको मुख्य श्रोत के हो ?

१. ईनार कूवा २. ट्यूब वेल ३. सार्वजनिक धारा ४. पाइपबाट आपूर्ति ५. अन्य.....

६.२ हाल भईरहेको पानीको स्रोतले तपाईको खानेपानी आवश्यकता पुरा गर्छ ?

१. पुरा गर्छ २. पुरा गर्दैन

६.२.१ यदि पुरा गर्दैन भने कति महिनाको लागि पुग्दैन ? .....महिना

६.२.२ ति अपुग महिनामा खानेपानीको आवश्यकता कसरि पुरा गर्नुहुन्छ ?

१..... २..... ३.....

६.३ तपाई प्रायजसौ घरमा बेलुका के बाल्नुहुन्छ ?

१. टुकी (मट्टितेल) २. तेल (दियो)

३. बिजुली बत्ती ४. सौर ऊर्जा

५. ब्याट्री ६. अन्य .....

६.४ तपाई खाना पकाउनको लागि निम्न मध्ये के प्रयोग गर्नु हुन्छ ?

१. दाउरा २. मट्टितेल

३. गुईठा ४. पराल, ढोड आदि

५. बिजुली ६. ग्यास: .....

७. अन्य : .....

६.४.१ यदि तपाई दाउरा बालुहुन्छ भने एक महिनामा कति भारी दाउरा बाल्नुहुन्छ ?

परिणाम भारीमा ..... अन्दाजी नौला १ भारी बराबर २५ के.जी

मूल्य १ भारी =

६.४.२ तपाई घरमा बाल्नको लागि दाउरा कहाँबाट ल्याउनुहुन्छ

१. सरकारी वन

२. निजी वन

३. सामूदायिक वन

४. किनेर

५ अन्य .....

४.३ तपाइलाई घाँसपात, स्याउला, दाउरा, काठ आदिको लागि नजिक पर्ने वन कुन हो ?

१. वनको नाम : ..... सा.वि.स वडा नं : .....

२. ठाँउ : ..... दुरि ..... घन्टा

३ वनको प्रकार: सामुदायिक राष्ट्रिय कदुलियती नीजि धार्मिक अन्य.....

६.५ तपाईको गाउँघरमा बिजुली बत्ती छ ? छ । छैन ।

७. स्वास्थ्य र सरसफइ :

७.१ तपाई वा तपाईका परिवारका सदस्यहरु दिशापिसाव कहाँ गर्नुहुन्छ ?

१. आफ्नै चर्पीमा २. खुला चौरमा ३ नदीको किनारामा

४. वनजङ्गलमा ५. अन्य ... .

७.२ सडेगलेको वा ठोसपदार्थ फोहोरमैला कहाँ फाल्ने गर्नु भएको छ ?

१. सुरक्षित ठाउँमा थुपारेर २. जलाएर ३ गाडेर ४ अन्य .....



७.३ के तपाईंको परिवारको कुनै सदस्य गत वर्ष सिकिस्त किसिमको भएका थिए ?

१. थिए २. थिएनन्

७.४ कस्तो किसिमको रोग लागेको थियो र कुन उपचार विधि अपनाउन भएको थियो ?

रोग	उपचार विधि	उपचार गराएको स्थान
१.....		
२.....		
३.....		

८. प्रसारण लाइन आयोजनाबाट पर्ने प्रभावहरु :

८.१ जग्गा/जमिन बारे

८.१.१ यस आयोजनाबाट तपाईंको प्रभावित हुने जग्गा जमिनको निम्नलिखित विवरण दिनुहोस् ?

वि.स. वर्ड नं.	ठाउको नाम	कित्ता नं.	कुल क्षेत्रफल	हाल जग्गाको प्रयोग	जग्गाको स्वामित्व	प्रभावित क्षेत्रफल र मूल्य रु.हजारमा					
						खेत	मूल्य	बारी	मूल्य	अन्य	मूल्य

(नोट : जग्गाको मूल्य चलन चल्तीको भाऊ बमोजिम राख्ने ।)

८.२ घर/गोठ बारे

८.२.१ यो तपाईंको आफ्नै घर हो ?

१ हो २ होइन

८.२.२ तपाईको जम्मा कति वटा घर गोठ छन् ? संख्या

८.२.३ यस आयोजनाबाट तपाईको घर प्रभावित हुने छ ?

१. छ २. छैन

यदि छ भने, प्रभावित हुने घरको बारेमा निम्न विवरण दिनुहोस

१. प्रभावित हुने घरको : ल (मिटर) चौ

किसिम :.....

गारोको किसिम :..... छानोको किसिम :.....

घरको तला :.....

२. प्रभावित हुने घरको : ल (मिटर) चौ

किसिम :.....

गारोको किसिम :..... छानोको किसिम :.....

घरको तला :.....

२.४ के यस आयोजनाबाट तपाईको गोठ प्रभावित हुने छ ?

१. छ २. छैन

यदि छ भने, प्रभावित हुने गोठको बारेमा निम्न विवरण दिनुहोस:

१. प्रभावित हुने गोठको : ल (मिटर) चौ

किसिम :.....

गारोको किसिम :..... छानोको किसिम :.....

गोठको तला :.....

२. प्रभावित हुने गोठको : ल (मिटर) चौ

किसिम :.....

गारोको किसिम :..... छानोको किसिम :.....

गोठको तला :.....

९. घर जग्गाको मुआब्जा/पुनर्वास सम्बन्धि

९.१ तपाई घर-जग्गाको मुआब्जा निम्न मध्ये कुन चाहनु हुन्छ ?

१. नगद २. जग्गाको सट्टा जग्गा ३. घरको सट्टा घर ४. अन्य

९.२ यदि तपाईले मुआब्जा नगदमा पाउनु भयो भने उक्त मुआब्जा रकम के मा प्रयोग गर्नु हुन्छ ?

१. जग्गा किन्ने २. घर बनाउने ३. ऋण तिर्ने

४. व्यापार गर्ने ५. घरेलु उद्योग ६. अन्य

९.३ यहाँ बाहेक अन्यत्र तपाईको घर वा जग्गा छ ?

१. छ २. छैन

९.४ यदि छ भने के र कहाँ छ ?

किसिम	ठाँउ
घर	.....
जग्गा	.....
घडेरि	.....

९.५ तपाईले उचित मुआब्जा पाएमा अन्यत्र बसाई सर्न हुन्छ ?

१. सर्छु २. सर्दैन

९.६ यदि बसाई सर्न चाहनु हुन्न भने किन ?

१..... २..... ३.....

१०. आयोजनाप्रतिको अवधारणा

१०.१ तपाईलाई यस प्रस्तावित प्रसारण लाइन आयोजनाको बारेमा केही जानकारी छ ?

१. छ २. छैन

यदि छ भने कुन श्रोतबाट जानकारी प्राप्त गर्नुभयो ?

१..... २..... ३.....

१०.२ प्रस्तावित प्रसारण लाइन आयोजना प्रति तपाईको कस्तो अवधारणा छ ?

१. सकारात्मक २. नकारात्मक ३ तटस्थ

४. केही पनि थाहा छैन ५.आयोजना प्रति अवधारणा बनाउने केहि आधार छैन

१०.२.१ यदि नकारात्मक धारणा भएमा किन होला ? कारण उल्लेख गर्नु हुन्छ कि ?

१..... .... २ ..... ३ .....

१०.३ यस प्रसारण लाइन आयोजनाबाट तपाईले कुनै फाइदा आशा राख्नु भएको छ ?

१. छ १. छैन

१०.३.१ यदि छ भने के फाइदा आशा राख्नु भएको छ ?

१. घर जग्गाको मुआब्जा राम्रो २. रोजगारी पाउने

३ विद्युत सुविधा पाउने ४ स्थानीय क्षेत्रको विकास हुने ५.अन्य .....

११.स्थानिय सहभागिता :

११.१ तपाईं वा तपाईको परिवारको कुनै सदस्य यस क्षेत्रमा संचालित सरकारी, गैह्रसरकारी वा अन्य संस्थाहरुमा सहभागी हुनु हुन्छ ?

१. छु १. छैन

११.२ यदि सहभागी हुनु हुन्छ भने निम्न विवरण दिनु होस् ।

संस्थाको नाम	सहभागीता को किसीम	स्थापना भएको साल	संस्थाले गर्ने काम/उद्देश्य	कार्यान्वयन पद्धति	कार्यान्वयन गर्ने संस्था

१. प्रभावित घरको जोखिमिको स्थिती

क्र.स	जोखिमि प्रकार	मिलेमा टिक (√) चिन्ह लाउने

१	घर मुली एकल महिला	
२	घरमा अपाँग सदस्य भएको	
३	प्रति व्यक्ति सरदर आय गरिबीको रेखामुनी भन्दा कम भएको	
४	आयोजनाबाट सबै घर जग्गा प्रभावित भएको	
५	अन्यत्र आफ्नो नामको घर जग्गा नभएको	
६	दलित परिवार	
७	आदिवासि परिवार	

उत्तरदाताको नाम: ..... सम्पर्क टेलिफोन: .....

प्रश्नावली भर्नेको नाम र सही: ..... मिति: .....

रुजु गर्नेको नाम र सही: ..... मिति: .....

ANNEX V: LIST OF PEOPLE CONSULTED

List of people consulted

S.N.	Name of persons contacted and consulted	Address
1.	Ram Prasad Paudel	Archalbot-9, Lamjung
2.	Asha Kaji Shrestha	Archalbot-9, Lamjung
3.	Ambar Bahadur Thapa	Bharte-2, Lamjung
4.	Govinda Panta	Sundar Bazar-9, Lamjung
5.	Tak Bahadur Gurung	Sundar Bazar-8, Lamjung
6.	Krishna Man Shrestha	Tarkughat-3, Lamjung
7.	Shiva Nidhi Chilwal	Tarkughat-9, Lamjung
8.	Resham Bilas Kadel	Tarkughat-8, Lamjung
9.	Bhaba Nidhi Pandey	Dhamilikuwa-4, Lamjung
10.	Nava Kumar Shrestha	Dhamilikuwa-3, Lamjung
11.	Kaji Babu Devkota	Palungtar-10, Gorkha
12.	Dhan Bahadur Darji	Palungtar-10, Gorkha
13.	Rajendra Bahadur Thapa	Palungtar-10, Gorkha
14.	Prem Thapa	Gaikhur-2, Gorkha
15.	Dhan Bahadur Adhikari	Gaikhur-9, Gorkha
16.	Bhoj Raj Baral	Gaikhur-1, Gorkha
17.	Hira Shrestha	Chyangli-5, Gorkha
18.	Shiva Kumar Shrestha	Chayngli-4, Gorkha
19.	Krishna Pathak	Dhuwakot-1, Gorkha
20.	Rita Khadka	Dhuwakot-1, Gorkha
21.	Karna Bhadur Pant	Deurali-3, Gorkha
22.	Krishna Khatri	Aanbu Khaireni-1, Tanahu
23.	Kul Bahadur Magar	Chhimkeswori-7, Tanahu
24.	Narayn Gurung	Kabilas-9, Chitwan

ANNEX VI: SITE PHOTOGRAPHS

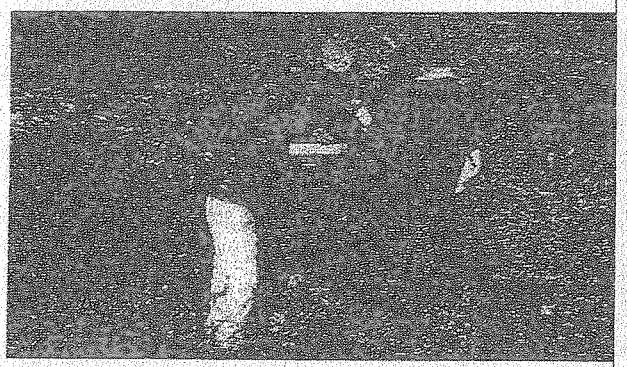


Photo 1: Identification of APs	Photo 2: Collection of environmental baseline

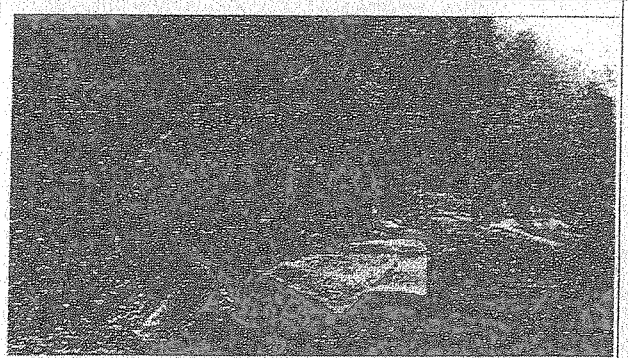



Photo 3: Map reading	Photo 4: Tower spotting
	
Photo 5: Tower spotting	Photo 6: IEE study team

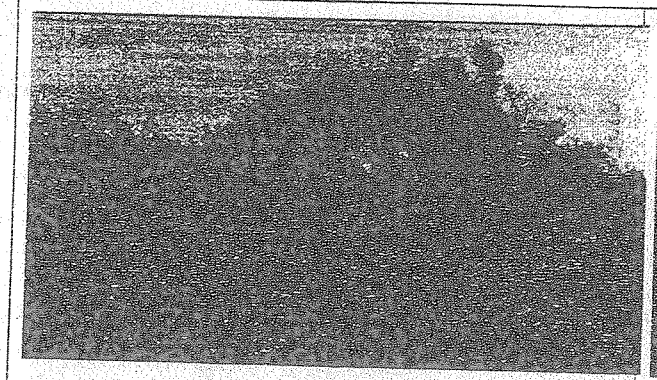


Photo 7: Environmental baseline collection



Photo 8: Aaptari Substation

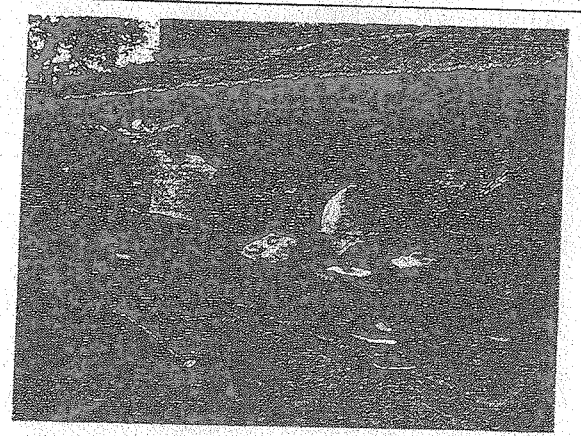


Photo 9: Interaction with the local people in Kabilas



Photo 10: Interaction with local people near Gaikhur

Comment Matrix of Udipur-Bharatpur Transmission Line Project

S.N.	Comments	Comment Addressed	Remarks
1	Write the name of consultant in cover page.	• Name of consultant added in cover page	
2	Please Add all missing acronyms.	• All the mission acronyms were added	
3	Please write about Relevancy of the proposal.	• Relevancy written in section 2.2, page number 3	
4	Elaborate the background under project description, Name the source or salient features and attach clear project location map distinctly showing the project affected VDCs, mention about ZOI (Zone of Influence) under project area delineation.	• Background in section 2.1, page number 3 has been elaborated. • Source of salient features added, page number 5 • Location maps showing project location and affected VDCs added in figure 2-1 and 2-2, page 7 and 8 • Zone of Influence added in section 2-5, page 9	
5	**Please review "जल बिद्युत तथा प्रसारण लाईन आयोजनाको प्रारम्भिक batabaraniya parikxyan (IEE) ra batabaraniya pravav mulyankan (EIA) samandhi karyabidhi , २०७३", Forest Policy-2071, National park and conservation act, 2030 BS, Plant Protection Act, 2071, Bio-Diversity and Conservation strategy, Manuals for Hydropower and other relevant.**	Suggested Legal Instruments are listed in Chapter 4, page 18 and 19	
6	Please add new chapter 'Estimate Time Schedule, Budget and Study team' for IEE study.	New chapter added as Chapter 5, to	

	Management Plan (EMP) for IEE study.		mandatory of IEE study and EPR, 1997 suggests IEE study only requires monitoring plan
15	Mention shortly about Environmental Monitoring Agencies		Environmental Monitoring Agencies will be determined during IEE stage and will be mentioned in IEE report
16	Strictly follow the EPR, 1997 schedule -3 for TOR preparation		ToR has been prepared as per the schedule-3 of EPR, 1997
17	Include photo of public consultant with location details.	Photos of public consultation added in Annex VI, photo 7 and 8	
18	Mention how many household to be displaced as per alignment survey.	There are no any households that are to be displaced due to project implementation which is clearly mentioned in section 6.3, first paragraph, page 31	
19	Mention number of Aps with similar land use with Aps name.	Number of APs with similar land use are mentioned in table 6.2, page 25	
20	Existing Environment chapter should be added up with primary data obtained during field visit.	Existing environment chapter is fed with primary data to the extent possible	
21	There are two copies of license, which one is needed only insert that.	The final one in inserted in Annex I	
22	कुन कुन sub-station study को scope मा पर्छ तेसको बरेमा अलि रामरी लेखने।	Sub-station under the scope of this IEE is mentioned in last paragraph of section 2.1, page 3	
23	Construction planning is very limited, at least should be elaborated.	Construction planning elaborated in section 2.7, page	

	(ज) म उल्लेख भए अनुसारको शर्तहरु वातावरणीय अध्ययनको सिलसिलामा अनिवार्य ध्यान दिइएको हुनु पर्ने। यी शर्तहरु बारे प्रतिबेदनमा अनिवार्य रुपमा स्पष्टयाइएको हुनु पर्छ।		
36	There is no letter from MoFSC granting approval for the feasibility and environmental study attached in the report.	Department of Forest has granted the approval for the feasibility and environmental study which is attached in annex I	
37	State compulsorily that the project description and components listed in the salient features confirm with the design and the technical reports.	Suggestion incorporated in section 2.1 third paragraph, page 3	
38	A Statement shall be given confirming the proposed transmission line project alignment does not affect in any way the hydropower projects, transmission line projects or other development projects be it in planned, proposed, feasibility stages, construction stage or operation stage. It shall be clearly explained appropriately.	Suggestion incorporated in section 2.1 third paragraph, page 3	
39	If there are crossings with other existing transmission lines or proposed transmission lines, such issues shall be studied and presented. There shall be a clear statement regarding the topic.	This issue has been mentioned in section 7.3.2.1 (C) first bullet, page 35	
40	This is of utmost importance that the equilibrium of the hill slope is maintained so as not to aggravate instability problems. People living on the slope or nearby settlements/houses should not be made vulnerable to landslide hazards at later stages of project. Precautionary methods to be taken to maintain the slopes shall be described.		This issue will the addressed in IEE study
41	Detail explanation must be presented on likelihood of triggering existing slides, formation of new slide/slope instabilities and further aggravating soil erosion due to construction activities, proximity of such slides to the existing settlements and likelihood of settlements getting into the hazard zone.		This issue will the addressed in IEE study
42	Salient Features of the proposed project shall be added (if not added) with more information confirming them from the project survey report. It shall be provided with information like area of land necessary for each tower (in hectare also); conductor properties, configuration, and bundling; tower type (make a distinction among - deviation / angle tower, straight tower]; Tower height and span for - river/road/power cable		This issue will be addressed in IEE report

	○ Handling of hazardous materials in safe area that employ containment measures ensuring that these materials are not released to soil or water bodies. ○ De-mobilization and cleanup ○ Returning of temporary land and restoration of private and public properties (if any).		
45	Add the following in subchapter 3.1.1: • (i) Existing condition of landslide-phenomenon of occurrence, dimension, activity; condition of slope stability and soil erosion in and around tower pads; ii) Geological and geomorphological condition in and around tower pads located close to the settlements, places of human activities, and close to the physical and social infrastructures; iii) Likelihood of triggering - existing slide, formation of new slides/slope instabilities, and further aggravating soil erosion due to construction activities, • Identification of water body, springs, and rivers in proximity of the construction sites, storage facilities where it is likely to get toxic and hazardous chemicals leak.		This issue is beyond the scope of ToR and will be finalized in IEE report
46	Add the following in subchapter 3.1.2: • While describing existing forest and vegetation area at the project level, presentation shall be based on line segments and types of forest management (Government, Community, Leasehold or Religious Forests). • Data on Wildlife Habitat shall be collected pertaining to: a) Habitat of wild fauna affected by the project; b) movement/migration corridor affected by the project; c) mapping of habitat in project area affected by project components and construction activities and surrounding area. To account full habitat condition following information shall be gathered in the direct project impact area transmission and surrounding area: • Site Description, • Important Habitat Type/Features-Tree/Herb/Shrub/Epiphyte/others, • Habitat Use-a) Active/Temporary/Migratory Corridor; b) breeding/feeding or hunting/resting/, and others, • Habitat Continuity, either side of Row • Habitat Connectivity, either side of Row • state of habitat in terms of Degradation /Fragmentation /Human encroachment		This issue is beyond the scope of ToR and will be finalized in IEE report

48	In chapter 4, first give baseline information covering the VDC region and/or affected districts, which shall then be followed by the baseline where project components/activities are proposed.		This will be incorporated in IEE report
49	While describing the existing environmental condition, try to be specific in relation to the project components, facilities, activities so that issues and impacts identified for the project are fury justified. Please remember that environmental impacts depend on the location of project components and sensitivity of recipient environment to the change.	The ToR was prepared based on walkover survey throughout the alignment and general environmental features observed along the alignment has been incorporated in the ToR document, however during IEE study all the information will be collected in detail as per the project exact site.	
50	Location of following within the project and in the vicinity. If located outside the project influence zone, approximate distance to them from project structures, ancillary-structures, facilities, activities, and project component access shall be given. The information shall be sufficient to help identify impacts. • Houses and Settlements • Educational institutions: schools colleges • Health institutions • Sources of - energy(firewood), fodder • NTFPs • Other local infrastructures: communication, transport (foot trials, trekking trial) • Cultural/religious/archaeological/pilgrimage/ • Community services centers, local market, social congregation sites • Foot trails/trekking routes/Village, District, or National Roads • Public/government institutions • Power lines/telecommunication lines • Nearest aircraft fly-path/route		This will be incorporated in IEE report
51	There is no baseline information gathered for project-affected families and seriousiy project affected families. Moreover, PAF and SPAF shall be defined from the perspective of the proposed project.		The suggestion is a scope under IEE study and will be incorporated in IEE report

	(physical, biological, and socio-economic and cultural). • Issues/Impacts related to changes in land use (agricultural, forest, and others) with respect to the existing land use availability in project affected VDCs/district shall be assessed (for both construction and operation phases). • In the beginning of the chapter STATE - "Adverse and beneficial Impacts" that are not identified or anticipated at this stage, if rater discovered during IEE Report preparation study phase, shall be duly incorporated in the report. • State in the introductory paragraph: "Proponent will compensate the affected parties for losses of lives or properties due to the implementation of the project as per prevailing law." • "Generic impacts will be avoided; the impact will have clear bearing on the project activities location, and existing environmental components sensitivity to the change." • While describing environmental impact, the data requirement that is identified above in "Data requirement and study methodology" must be used together with the information as per the attached tables. • Impact will be discussed with quantified information of likely changes, alteration, and losses; and are further assessed based on characteristics of existing condition and sensitivity of environmental components (physical, biological, and socio-economic and cultural). • State-Summary impact-Matrix for each environment shall be prepared at the end of respective sections.		
56	Carry out the following in chapter 6: • Issues identified by the stakeholders through comments and suggestion shall be listed in the impact chapter. • Add the following impacts in subchapter 6.6.3: - If tower pads are to be constructed in close proximity to houses and settlements, then impacts on houses, social infrastructures, and settlements because of land stability shall be analyzed. (construction and operation stage)	This issues have been incorporated in Chapter 7 with their proper sense and will be detailed in IEE report	

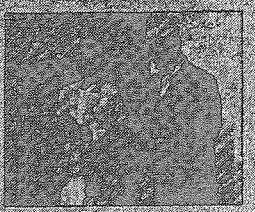
	passing through hill forest area. • Different route alternative shall be assessed to avoid proximity (keeping line conductors by at least 100m) from houses, settlements, schools, hat bazars, and places of congregation. • "No Forest Option" shall be assessed. For this, all the project components requiring forest area like: substation, ROW clearance, Tower pad locations, Temporary forest and vegetation clearance for cable stringing, and project-facility sites that need to clear forest area must be critically evaluated with respect to land availability in the area other than forest. Simply the cost and technical consideration shall not be sufficient to justify the forest area requirement. • Alternative horizontal and vertical clearance options in sections of ROW passing through forest area. Possibility of adopting selective, felling, zone felling, pruning, or only hazardous tree felling shall be analyzed in detailed. Please note that, discarding selective clearance options simply on cost and difficulty ground will not be accepted. Those costs shall be covered under O&M costs. • Alternative route alignment to avoid crossing of migratory route of terrestrial and avian fauna. The analysis shall touch upon the location and extent of existing habitat on either side of the alignment.		
58	Alternative construction methodologies /procedures shall be critically assessed to avoid loss of houses and properties,	ToR has made provision for Alternative Analysis in Chapter 8 and the alternative analysis during IEE period will be carried as per the suggestion.	
59	Alternative design options shall be considered and analyzed to achieve low field design and appropriate options shall be proposed to minimize EMF related health hazard. The options to be looked into – phase splitting, conductor configuration, reverse phasing, taller tower configuration, and alignment re-routing far from settlements, places of congregation, schools, and Health centers/hospitals.	ToR has made provision for Alternative Analysis in Chapter 8 and the alternative analysis during IEE period will be carried as per the suggestion.	

	Management/Gaurishankar Conservation Management committee. • STATE: "The study shall also review the responsibilities of the local, district and central level institutions and those affected by the project construction and propose steps to ensure necessary coordination during the project implementation." • STAE: "Those mitigation measures that can be or are part of contractual obligation for project construction shall be clearly identified. Mechanisms of ensuring implementation of those mitigation measures, from the proponent part, as a compliance of contractors shall be categorically proposed." • STATE: "The report shall propose - i) procedures of lodging complaints of project affected people/families/institutions, and ii) grievance redress mechanism."		
62	All the Questionnaires, Checklists, Data acquisition forms, and Charts, etc. to be used in IEE study must be attached in the annex.		The suggestion will be incorporated in IEE report
63	Tables attached herewith for accounting the loss of forest/vegetation, land, properties, and agricultural production shall be kept in the annex referring them appropriately wherever necessary in the main text.		The suggestion will be incorporated in IEE report
Editing and Others			
1	Relevancy of ILO 169 shall not only be limited in the legislation review chapter. It shall also be considered during the preparation of the IEE Report.		The suggestion will be incorporated in IEE report
2	Adequately state that RECOMMENDATION AND CONCURRENCE LETTERS shall cover the following: गा.वि.स. बाट आयोजना प्रवर्धकले प्राप्त गर्ने राय सुझाव हरु तथा सिफारिस पत्रमा अनिवार्य रूपमा उल्लेख हुनु पर्ने विषयहरु: • आयोजनाले स्थानिय स्कुल ,हेल्थपोस्ट, र अन्य सामुदायिक संरचनामा पार्ने प्रभावहरु र ति बारे प्रस्तावित निराकरणका उपायहरुको सम्बन्धमा। • आयोजनाले स्थानीय स्तरमा पार्ने अन्य		The suggestion will be incorporated in IEE report

ANNEX B: PUBLIC NOTICE



समाचार



मर्स्याङ्ग्दी कोरिडोर (उदीपुर–न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको निर्माण तथा संचालन गर्ने सिलसिलामा प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा

सार्वजनिक सूचना

(प्रकाशित मिति २०७३/१०/०७)

मर्स्याङ्ग्दी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि.मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालनका लागि यो प्रस्ताव तयार गरिएको छ। यस प्रसारण लाइन आयोजनाको अधिकार सीमाक्षेत्र (Right of Way) ३० मी. (केन्द्ररेखादेखि दुवैपट्टि १५ मी.) हुनेछ।

प्रस्तावको नाम: मर्स्याङ्ग्दी कोरिडोर (उदीपुर–न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइन आयोजना

प्रस्तावकको नाम : नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं

प्रस्ताव निर्माण तथा संचालन गरिने स्थानहरु :

जिल्लाहरु	लमजुङ	गोरखा	तनहुँ	चितवन
गाविस/ नगरपालिकाहरु	बेंसीशहर नगरपालिका (साबिकको उदीपुर गाविस), चिती, अर्चलबोट, भार्ते गाविस, सुन्दरबजार नगरपालिका (साबिकको भोटेओडार र सुन्दरबजार गाविस) राइनास नगरपालिका (साबिकको मोहरियाकोट, ताकुंघाट, धमिलीकुवा गाविसहरु)	पालुङटार नगरपालिका (साबिकको पालुङटार, गाइखुर, च्याङली, गाविस) धुँवाकोट, देउराली गाविसहरु	चोकचिसापानी, पुर्कोट गाविस, भानु नगरपालिका (साबिकको भानु गाविस), बन्दिपुर नगरपालिका) (साबिकको बन्दिपुर गाविस), आँबुखैरेनी नगरपालिका (साबिकको आँबुखैरेनी गाविस) र छिम्केश्वरी गाविस	चण्डिभन्ज्याङ, कविलास, दाहाखानी गाविसहरु र भरतपुर उपमहानगरपालिका

सो प्रस्ताव कार्यान्वयन गर्नु अघि उक्त प्रस्तावको वातावरण संरक्षण नियमावली, २०५४ (पहिलो संशोधन, २०५५) को नियम ७(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण अध्ययन गर्ने सिलसिलामा प्रस्ताव कार्यान्वयन गर्दा आयोजना प्रभावित क्षेत्रहरुको १. भौतिक प्रणाली, २. सांस्कृतिक प्रणाली, ३. जैविक प्रणाली, ४. आर्थिक तथा सामाजिक प्रणाली, ५. मानवीय क्रियाकलाप, यिनका अवयवहरुको अन्तरक्रिया तथा अन्तरसम्बन्धमा के कस्तो प्रभाव पर्दछ भनी यकिन गर्न उक्त आयोजना प्रभावित क्षेत्रमा पर्ने जि.वि.स., गा.वि.स./नगरपालिका वा सरोकारवाला व्यक्ति तथा त्यस क्षेत्रका संघसंस्थाहरु (विद्यालय, स्वास्थ्य संस्था, सामुदायिक वन तथा अन्य सरकारी, गैरसरकारी) संघसंस्थाहरु को रायसुझाव लिनु आवश्यक भएकोले यो सूचना प्रकाशित भएको मितिले १५ (पन्ध्र) दिनभित्र निम्न ठेगानामा आईपुग्ने गरि आफ्नो रायसुझाव उपलब्ध गराई दिनुहुन यसै सूचनामार्फत् अनुरोध गरिन्छ। यस सम्बन्धी रायसुझाव विद्युत विकास विभाग, अनामनगर, काठमाडौंलाई समेत दिन सकिनेछ।

राय सुझाव पठाउन सकिने ठेगाना:

प्रस्तावक:
नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं
फोन: ०१-४१५३०२५
फ्याक्स: ०१-४१५३०४०
Url: www.nea.org.np

परामर्शदाता:
Environmental Services Nepal Pvt. Ltd. (ESN),
कुपण्डोल, ललितपुर, पोष्ट बक्स नं. ११६०५, काठमाडौं
फोन: ०१-५२६०९८२
E-mail: info@esn.com.np
Url: www.esn.com.np

नेपाल सरकार ऊर्जा मन्त्रालय २०६६

ANNEX C: DEEDS OF INQUIRY

LIST OF INSTITUTIONS/OFFICES WHERE IEE PUBLIC NOTICE PASTED

SN	NAME OF INSTITUTION AND OFFICES	CHAIRPERSON	DATE
1	Bhanu Municipality	Arjun Bahadur Bohora	2073/10/14
2	Palungtar Municipality	Rakesh Gurung	2073/10/12
3	Bharate VDC	Ananta Khana	2073/10/11
4	Deurali VDC	Ganesh Bhakta Tripathi	2073/10/113
5	Shree Dhuwakot VDC	Dhruba Raj Barabusi	2073/10/13
6	Rainas Municipality	Nur Raj Kadariya	2073/10/12
7	Jogi Thum CFUG	Ram Bahadur Thap	2073/10/14
8	Shree Mandali CFUG	Prasad Gurung	2073/10/113
9	Shree Kalika CFUG, Chyanglo (4&7)	Ganesh Lal Shrestha	2073/10/13
10	Bandipur Municipality	Netra Prasad Paudyal	2073/10/14
11	Shree Kalika CFUG, Udipur (3,4&6)	Bharat Dev Joshi	2073/10/13
12	Shree Navajyoti CFUG	Krishna Bahadur Bishwakarma	2073/10/12
13	Shree Rani Swara Sakhar CFUG	Parbati Dhakal	2073/10/12
14	Shree Purkot VDC	Cham Narayan Shrestha	2073/10/12
15	Shree Chiti VDC	Shovakanta Pokhrel	2073/10/11
16	Archalbot VDC	Tikakumari	2073/10/11
17	Shree Jugepani CFUG	Ram Krishna Giri	2073/10/13
18	Shree Fulbari CFUG	Krishna Prasad Dungana	2073/10/13
19	Bharatpur Sub-Metropolitan Office	Maduram Dawadi	2073/10/12
20	District Forest Office, Chitwan	Krishna Prasad Paudyal	2073/10/11
21	Chandivanjhyang VDC		2073/10/11
22	Besisahar Municipality	Dharmaraj Lamsal	2073/10/11
23	Shree Balthum Pakha Thulo CFUG	Ved Prasad Adhikari	2073/10/13
24	Shree Nagetar LHF	Laxmi Kumal	2073/10/11
25	Indreni CFUG	Aaeta Bahadur Gurung	2073/10/12
26	Kabilas VDC	Pradhuk Kumar Khadka	2073/10/11
27	Shree Thulo CFUG	Rajendra JC	2073/10/15
28	District Forest Office	Kasiraj Pandit	2073/10/11
29	Kanya Devi CFUG	Hariram Khadka	2073/10/14



30	Aabukhaireni Municipality	Banduraj Regmi	2073/10/14
31	Shree Chimkeshowri VDC	Ram Prasad Sapkota	2073/10/14
32	Pahare Pani CFUG	Mukti Bahadur K.C.	2073/10/14
33	Shree Satanchuli CFUG	Radha Neupane	2073/10/12
34	District Forest Office, Tanahu	Himlal Dhungana	2073/10/14

Information on Disclosure of IEE Report

SN	Institution	Chairperson	Date
1	Ichchakama Rural Municipality	Pusparaj Khana	2074/01/19
2	Gorkha Municipality	Jiban Bahadur Aale Magar	2074/01/14
3	Besisahar Municipality	Rajendra Prasad Paudyal	2074/01/15
4	Bandipur Rural Municipality	Gir Bahadur Rana	2074/01/17
5	Palungtar Rural Municipality		2074/01/14
6	Rainas Municipality	Nur Raj Kadariya	2074/01/15
7	Bhanu Municipality	Shiva Prasad Lamsal	2074/01/15
8	Simalchaur Naringhat CFUG	Subash Silwal	2074/01/14
9	Shree Mandali CFUG	Ram Bahadur Gurung	2074/01/11
10	Shree Kalika CFUG	Bharat Dev Joshi	2074/01/08
11	Shree Jugepani CFUG	Ram Krishna Giri	2074/01/13
12	Shree Chisapani CFUG	Chhetra Bahadur Adhikari	2074/01/16
13	Shree Rani Swara Sakhar Pakha CFUG	Ram Prasad Paudyal	2074/01/13
14	Shree Fulbari CFUG	Krishna Dhungana	2074/01/19
15	Shree Pareghat LHF	Bimala Kumal	2074/01/16
16	Shree Nagetar LHF	Meena Nepali	2074/01/16
17	Shree Kalika CFUG	Ganesh Lal Shrestha	2074/01/16
18	Shree Garambesi CFUG	Dambar Raj Bhatta	2074/01/14
19	Shree Jogi Thum CFUG	Ram Bahadur Thapa	2074/01/16
20	Pahare Pani CFUG	Mukti Bahadur K.C.	2074/01/17
21	Shree Salbisna CFUG	Purna Bahadur Gurung	2074/01/18

22	Baralbung CFUG	Mann Bahadur Gurung	2074/01/18
23	Shree Panchakanya Devi CFUG	Bhat Gurung	2074/01/18
24	Shree Satanchuli CFUG	Radha Puri	2074/01/17
25	Jaladevi CFUG	Sarita Subedi	2074/01/17
26	Indreni CFUG	Aaeta Bahadur Gurung	2074/01/17
27	Shree Jurethum CFUG	Sak Bahadur Gurung	2074/01/18
28	Shree Marsyandi Pakha CFUG	Krishna Prasad Pandey	2074/01/13



ANNEX D: RECOMMENDATION LETTER

RECOMMENDATION FROM COMMUNITY FOREST

स.व.नं. ३२ सा.व.व.नं. ५०/०६४/०६८ कोड नं. CHI/AP/01/04

श्री सतनचुली सामुदायिक वन उपभोक्ता समूह

भ.न.पा-१, रामनगर, ठिमुरा, देवघाट, (चितवन)

ए.सं. : 062/068 मिति 2068/9/96

च.नं. : ९६

विषय:- सिफारीस गरिदिएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्गदी कोरीडोर २२० के.भी. प्र.ला. आयोजना ।

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरूको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खियोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिदिएको व्यहोरा जानकारी गराइन्छ ।

राधा पुरी
का. सचिव
सचिव

नेपाल सरकार
कर्जा मन्त्रालय
२०६६

पहरे पानी सामुदायिक वन उपभोक्ता समितिको कार्यालय

आँबुखैरेनी-६, खान्टोक, तनहुँ

स्था: २०५५

पत्र संख्या:

चलानी नं.:

मिति: २०६४-१-१६.

विषय:- सिफारिस गरिएको सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क काठमाण्डौ

उपरोक्त सम्बन्धमा यस सा. व. उ. समूहमा प्राप्त त्यस कार्यालयको प. स. ०६३/०६४/च. नं. १५१ अनुसार ने. वि. प्रा. प्रस्तावक रहेको मर्स्याङ्दी कोटिडोर (उदिपुर - न्यू भरतपुर) २२० के. भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षणको सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागी यो सिफारिस गरिन्छ ।

मुक्ती बहादुर केसी
(अध्यक्ष)

श्री सालविरुवा सामुदायिक वन उपभोक्ता समूह

कविलास-८, बाईसाल, चितवन

स्था. : ००६०

प. सं. :

च. नं. : ०७३/०७४ मिति: २०७४/०१/१८

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं ।

विषय : सिफारिश गरिएको सम्बन्धमा

उपरोक्त सम्बन्धमा यस सा.व. कार्यालयमा प्राप्त त्यस कार्यालयको प.स. ०७३/७४ च.नं. १५१ को पत्र अनुसार नेपाल विद्युत प्राधिकरण प्रस्तावक रहेको मस्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाईनको प्रारम्भिक वातावरणीय परीक्षणको अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिश जानकारी गरिन्छ ।

पूर्ण बहादुर गुरुङ
अध्यक्ष
अध्यक्ष

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री जोगी थुम सामुदायिक बन उपभोक्ता समूह

च्याङलाङ - १, ६ गोरखा

गण्डकी अञ्चल

पत्र संख्या :-

चलानी नम्बर :-

मिति २०७४।०१।१६

विषय :- सिफारिश गरिएको सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्दी कोरिडोर २२० के.भी. प्र.ला. आयोजना ।

उपरोक्त सम्बन्धमा यस सा.व.उ. समूहको कार्यालयमा प्राप्त पत्र संख्या ०७३।७४ च.नं. १२१ को पत्र अनुसार ने.वि.प्रा. प्रस्तावक रहेको मर्स्याङ्दी कोरिडोर (उदीपुर-न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाईनको प्रारम्भिक वातावरणीय अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिश गरिएको छ ।

रामबहादुर

राम बहादुर थापा
अध्यक्ष

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री गरमवेसी सामुदायिक वन उपभोक्ता समूह

धमिलिकुवा-२, लवमुह

स्थापित: २०४२

प्रेस संख्या:-

जानकी नं.:

मिति: २०७४/०१/१४

विषय: सिफारिश गरिएको सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्गदी कोरिडोर २२० के.भी. प्र.वा. आयोजना।

उपरोक्त सम्बन्धमा यस सा.वन कार्यालयमा प्राप्त त्यस कार्यालयको प.स. ०७३/७४ च.नं. १५१ को पत्र अनुसार ने.वि.प्रा. प्रस्तावक रहेको मर्स्याङ्गदी कोरिडोर। उदीपुर-न्यू भरतपुर १२२० के.भी. विद्युत प्रसारण लाईनको प्रारम्भिक वातावरणीय परीक्षणको अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिश गरिन्छ।

डम्बर राज गह
अध्यक्ष
अध्यक्ष

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री ..... कबुलियती वन समुह

नागेश्वर

पालुङ्गटार गोरखा

२०६४

पत्र.सख्या :-

चलानी नं.

गण्डकी अञ्चल

मिति: २०७४/०१/१६...

विषय : सिफारिस पारिएको सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं।

नेपाल विद्युत प्राधिकरण प्रस्तावक रहेको मर्स्याङ्दी कोरिडोर (उदीपुर-न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाईनको प्रारम्भिक वातावरणीय अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिश अनुरोध साथ पेश गरिन्छ।

मिना

मिना नेपाली
सचिव

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री ..... पारेघाट ..... कबुलियती वन समुह

पालुङ्गटार गोरखा
२०७४

पत्र.सख्या :-
चलानी नं.

गण्डकी अञ्चल
मिति: २०७४/०९/१६

विषय : सिफारिस गरिएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं ।

उपरोक्त सम्बन्धमा यस क. वन समुहको कार्यालयमा प्राप्त त्यस कार्यालयको पत्र संख्या ०७३/७४ च.नं १५१ को पत्र अनुसार ने.वि.प्रा प्रस्तावक रहेको मर्स्याङ्दी कोरिडोर (उदीपुर-न्यू-भरतपुर) २२० के.भी. विद्युत प्रसारण लाईनको प्रारम्भिक वातावरणीय अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिस गरिएको जानकारी गराईन्छ ।

विमला

विमला कुमाल
अध्यक्ष

सरस्वती
सरस्वती विश्वकर्मा
अध्यक्ष
पारेघाट 'ख'

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री रानी स्वांरा सांखर पासा सामुदायिक वन उपभोक्ता समूह

अर्चलबोट-७, ८ र ९, समजुड

स्वा

पत्र संख्या:- ०६३/०६४

चलानी नं.- १४

मिति- ०६४/१/१४ गा

विषय- सिफारीस गरीएको बारे।

श्री नेपाल विद्युत प्राधीकरण, काठमाण्डौ।

उपरोक्त सम्बन्धमा यस वन कार्यालयमा [illegible] तपस्ता का० को प.सं. ०६३/०६४ च.नं. १४१ को प्राप्त पत्र अनुसार मरुपाङ्गदी बोरीडोर (उदीपुर-५ भरतपुर) २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षण अध्ययन प्रतिवेदन लेखा नागी यो सिफारीस गरीएको व्यहोरा जानकारी गराइन्छ।

सचिव

(राम प्रसाद पौडेल)

कोड नं. : GOR/M1/51/01 उ.स.द.नं. : १०७

श्री विसापानी सामुदायिक वन उपभोक्ता समूह

वाहर्घुर-२, गोरखा

गण्डकी अञ्चलन

पत्र संख्या :-
चलानी नं. :-

मिति : २०७४।०१।१६

विषय : सिफारिस गरिएको सम्बन्धमा।

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्दी कोरिडोर २२० के.भी प्र.ला आयोजना।

उपरोक्त सम्बन्धमा यस सा.व.उ. समूहमा प्राप्त पत्र संख्या ०७३।०७४ च.नं. १४१ को पत्र अनुसार ने.वि.प्रा प्रस्तावक रहेको मर्स्याङ्दी कोरिडोर (उदिपुर-न्यू भरतपुर) २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षणको अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागी यो सिफारिस गरिएको जानकारी गराईन्छ।

क्षेत्र बहादुर अधिकारी
सचिव

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री जुगेपानी सामुदायिक वन उपभोक्ता समूह
भरतपुर, ढाक, लमजुङ

पत्र संख्या:- ०७४/०७८
चलानी नं.:-

मिति:- २०७४/१-१३

विषय:- सिफारिस गरिएको सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
मध्यान्दी कोरिडोर २२० के.भि प्रा.ली
नेपाल विद्युत प्राधिकरण प्रस्ताव मा रहेको मध्यान्दी कोरिडोर — (उदीपुर न्यू भरतपुर) २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययन प्रतिवेदन का लागी यो सिफारिस गरिएको व्यहोरा जानाकारी गराइन्छ

रामकृष्ण गिरी
अध्यक्ष

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री कालिका सामुदायिक वन उपभोक्ता समूह

उदिपुर [illegible] ६ लमजुङ

पत्र संख्या :- ०७३/०७४ मिति २०७४/०९/०८

चलानी नम्बर :- १८

विषय :- सिफारिश गरीदिएको बारे।

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्दी कोरिडोर 220 K.B प्र.ली आयोजना
रत्नपार्क काठमाडौं।

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा योदी कोरिडोरका विद्युत आयोजन एकको लागी विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदिपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने माटिबचाके सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यु भरतपुर सबस्टेशन लाई जोड्दै Integrated Nepal Power system मा जोड्नका लागी लमजुङ जिल्लाको उदिपुर सबस्टेशन देखी चितवन जिल्लाको न्यु भरतपुर सबस्टेशनसम्म १६००० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि.मी लम्बाइको विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नेका लागी प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर 220 K.B विद्युत प्रसारण लाइन को निर्माणका लागी प्रारम्भिक वातावरणीय परीक्षण अध्ययन गर्ने सिलसिलामा सिफारीश गरिदिएको व्यहोरा जानकारी गराइन्छ।

अध्यक्ष
भरत देव जोशी

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

श्री मण्डली सामुदायिक वन उपभोक्ता समुह

उदीपुर-१ र २ लमजुङ

पत्र संख्या

चलानी नं.

मिति: २०६४-९-११

बिषय: सिफारिस सम्बन्धमा

श्री नेपाल विद्युत प्राधिकरण
मध्यान्दी कोरिडोर २२० के.भि. प्र.ला.

नेपाल विद्युत प्राधिकरण प्रस्तावक रहेर मध्यान्दी तथा दोदी विद्युत आयोजनाहरूको विद्युत प्रसारण लाइन मध्यान्दी कोरिडोर लमजुङ जिल्लाको उदीपुर देखी सितुवन जिल्लाको भरतपुर सम्म को प्रसारण लाइनको प्रारम्भीक वातावरणिय परिक्षण अध्ययनको सिलसिलामा निमार्णको लागी सिफारिस गरिन्छ

मुखिया
अध्यक्ष
गुम बहादुर गुरुङ

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६४

श्री सिमलचौर [illegible] सामुदायिक वन उपभोक्ता समूह

[illegible] लमजुङ

दर्ता नं.

पत्र संख्या:- २०८

चलानी नम्बर:-

मिति:- २०७४-०१-१४

विषय:- सिफारिस गरिदिएको बारे।

श्री नेपाल विद्युत प्राधिकरण
मर्स्याङ्गदी कोरिडोर २२० के.भी.प्र.ला. आयोजना

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौंको प्रस्तावक रहेर मर्स्याङ्गदि तथा दोर्दी कोरिडोरका विद्युत आयोजना हरुको लागी विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदिपुर सबस्टेसन, तनहुँ जिल्लामा पर्ने मार्किचोक सबस्टेसन तथा चितवन जिल्लामा पर्ने न्यु भरतपुर सबस्टेसनलाइ जोडदै Integrated Nepal Power System मा जोडनाका लागी लमजुङ जिल्लाको उदिपुर सबस्टेसन देखी चितवन जिल्लाको न्यु भरतपुर सबस्टेसन सम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि.मि लम्बाइको विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नको लागी प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षण अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणिय अध्ययन प्रतिवेदनको लागि यो सिफारिस गरिदिएको व्यहोरा जानाकारी गराइन्छ।

सचिव: सुवास चिलुवाल

[illegible] सरकार
[illegible] मन्त्रालय
२०६६

श्री मर्स्याङ्दी पाखा सामुदायिक वन उपभोक्ता समूह

सुन्दरबजार-६, लमजुङ दर्ता नं. २११/०५८/०५९

२०५९

पत्र संख्या :-

चलानी नं. :-

मिति: २०७४/१/१३

विषय: सिफारिश गरिदिएको बारे।

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क काठमाडौं।

नेपाल विद्युत प्राधिकरण प्रस्तावक रही मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरूको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लाको उदीपुर देखी चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशन जोड्ने १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१२४ कि.मी. प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणिय परिक्षण अध्ययन गर्ने सिलसिलामा तयार पारिएको वातावरणीय अध्ययन प्रतिवेदनका लागि यो सिफारिश गरिन्छ।

[signature]
अध्यक्ष
कृष्ण प्र. पाण्डे
मर्स्याङ्दी पाखा सा.व.

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६९



भरतपुर महानगरपालिका
नगर कार्यपालिकाको कार्यालय
भरतपुर, चितवन, नेपाल
BHARATPUR METROPOLITAN CITY
Office of Municipal Executive
Bharatpur, Chitwan, Nepal

च.नं. ३९२२

मिति:२०७४/०१/२१

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौँ

विषय: सिफारिस गरिएको बारे ।

उपरोक्त विषयमा यस कार्यालयमा प्राप्त प.स ०७३/०७४ च.नं. १५१ को पत्र अनुसार नेपाल विद्युत प्राधिकरण, रत्नपार्क काठमाडौँ प्रस्तावक रहेर मर्स्याङदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सब-स्टेसन, तनहुँ जिल्लामा पर्ने मार्किचोक सबस्टेसन तथा चितवन जिल्लामा पर्ने न्यु भरतपुर सब-स्टेसनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यु भरतपुर सब-स्टेशन प्रसारण लाइन खण्डको भानु नगरपालिकामा पर्ने विद्युत प्रसारण लाइननिर्माण तथा संचालनगर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर- न्यु भरतपुर) २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षण अध्ययनका लागि सिफारिस माग भएकोमा प्रचलित कानुनको परिधि भीत्र रही कार्य गर्न सिफारिस गरिएको व्यहोरा अनुरोध छ ।

प्रेमराज जोशी
कार्यकारी अधिकृत
भरतपुर महानगरपालिका
कार्यकारी अधिकृत

056-520167, 521467, 530062, 526951, 522252, Fax: 056-520014
E-mail: bmc@ntc.net.np / website: bharatpurmun.gov.np



भानु नगरपालिका

नगर कार्यपालिकाको कार्यालय

फुस्रेटार, तनहुँ

८ नं. प्रदेश, नेपाल

२०७३

पत्र संख्या : ०७३/०७४

चलानी नं. ४६

मिति : २०७४/०१/१५

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौँ

विषय: सिफारिस गरिएको बारे ।

उपरोक्त विषयमा यस कार्यालयमा प्राप्त प.स ०७३/०७४ च.नं. १५१ को पत्र अनुसार नेपाल विद्युत प्राधिकरण, रत्नपार्क काठमाडौँ प्रस्तावक रहेर मर्स्याङदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सवस्टेसन, तनहुँ जिल्लामा पर्ने मार्किचोक सबस्टेसन तथा चितवन जिल्लामा पर्ने न्यु भरतपुर सबस्टेसनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यु भरतपुर सबस्टेशन प्रसारण लाइन खण्डको भानु नगरपालिकामा पर्ने विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर- न्यु भरतपुर) २२० के.भी विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षण अध्ययनका लागि सिफारिस साथ अनुरोध छ ।

(शिव प्रसाद लम्साल)
कार्यकारी अधिकृत

शिव प्रसाद लम्साल
कार्यकारी अधिकृत

नेपाल सरकार
अर्थ मन्त्रालय
२०६६

Tel +977-65620216, 9856005111, Email: bhanumunicipality@gmail.com, web: www.bhanumun.gov.np

राइनास नगरपालिका
नगर कार्यपालिका कार्यालय
तिनपिप्ले, लमजुङ
४ नं. प्रदेश, नेपाल

पत्र संख्या:- ०७३/०७८
चलानी नम्बर:- ४६९३

मिति:- २०७४।०१।१५

विषय: सिफारिश गरिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण

रत्नपार्क,काठमाण्डौ

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिएको व्यहोरा जानकारी गराइन्छ ।

२०७४।१।१५

(नुर राज कडरीया)
प्रमुख एंब कार्यकारी अधिकृत

पालुङटार नगरपालिका
..... नं. वडा कार्यालय
पालुङटार, गोरखा
४ नं. प्रदेश, नेपाल

पत्र संख्या:- २०७९/०६४
चलानी नम्बर:- ४९८५

मिति:- २०७९/१/१९

विषय: सिफारिश गरिदिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण

रत्नपार्क, काठमाडौं

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिदिएको व्यहोरा जानकारी गराइन्छ ।

२०७९।१।१९८
कार्यकारी अधिकृत

बन्दिपुर गाउँपालिका

गाउँ कार्यपालिकाको कार्यालय

बन्दिपुर, तनहूँ
४ नं. प्रदेश, नेपाल

प.सं. : ०७३/७४ मिति : २०७४/०१/१७
च.नं. : ४४८८

विषय: सिफारिश गरिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क,काठमाण्डौं

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर — न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिएको व्यहोरा जानकारी गराइन्छ ।

(गिर वहादुर राना)
नि. कार्यकारी अधिकृत
प्रमाणित कार्यकारी अधिकृत

बन्दिपुर, तनहुँ, फोन नं. ०६५-५२०१२३, फ्याक्स नं. ०६५-५२०१७७
ईमेलः bandipurmunicipality@gmail.com, फेसबुकः www.facebook.com/hellobandipurmun
वेभसाइट : www.bandipurmun.gov.np

Website : besishaharmun.gov.np
Email: info@besishaharmun.gov.np
eo@besishaharmun.gov.np

वेसीशहर नगरपालिका
नगर कार्यपालिकाको कार्यालय

बेसीशहर, लमजुङ
४ नं. प्रदेश, नेपाल

फ्याक्स न. ०६६-५२०२०४
फोन न. ०६६-५२०१५०

प.नं. ०७३/७४
च.नं. ३४८२

मिति : २०७४/ १/१५

बिषय:- सिफारिस गरिएको सम्वन्धमा ।

श्री नेपाल विद्युत प्राधिकरण,
रत्नपार्क, काठ्माण्डौ ।

नेपाल विद्युत प्राधिकरण,, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिएको व्यहोरा जानकारी गराइन्छ ।

०७४।१।१५

राजेन्द्र प्रसाद पौडेल
प्रमुख तथा कार्यकारी अधिकृत

गोरखा नगरपालिका

नगर कार्यपालिकाको कार्यालय

डुम्रिडाँडा, गोरखा, जिल्ला

पत्र संख्या :-
चलानी नं.:- ७४८४

मिति :- २०७४/०१/१४

विषय : सिफारिश गरिदिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौं ।

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशन प्रशारण लाईन खण्डको साबिक देउराली गा.बि.स. वडा नं ३ हाल गोरखा नगरपालिका वडा नं १४ को विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि यो सिफारिश गरिएको व्यहोरा जानकारी गराइन्छ ।

जीवन बहादुर आले मगर
प्रमुख एवं कार्यकारी अधिकृत

ईच्छाकामना गाँउपालिका

गाँउ कार्यपालिकाको कार्यालय
चण्डिभन्ज्याङ चितवन
३ नं. प्रदेश, नेपाल

प.सं. : ०७३।०७४
च.नं. : ८२

मिति : २०७४।१।१९

विषय : सिफारिस गरिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण
रत्नपार्क, काठमाडौँ

उपरोक्त विषयमा यस कार्यालयमा प्राप्त प.स ०७३/०७४ च.नं. १५१ को पत्र अनुसार नेपाल विद्युत प्राधिकरण, रत्नपार्क काठमाडौँ प्रस्तावक रहेर मर्स्याडदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सवस्टेसन, तनहुँ जिल्लामा पर्ने मार्किचोक सबस्टेसन तथा चितवन जिल्लामा पर्ने न्यु भरतपुर सबस्टेसनलाई जोड्दै Integrated Nepal Power Systemमा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यु भरतपुर सबस्टेशन प्रसारण लाइन खण्डको साविक चण्डिभन्ज्याङ तथा दाहाखानी गा.वि.स.हाल पर्ने विद्युत प्रसारण लाइननिर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर- न्यु भरतपुर) २२० के.भीविद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परिक्षण अध्ययनका लागि सिफारिस साथ अनुरोध छ ।

पुष्पराज खनाल
कार्यकारी अधिकृत

ANNEX E: PROJECT CONSTRUCTION SCHEDULE



Sl. No.	Description	Month 1
		0 - 30
A	SURVEY, SOIL INVESTIGATION & CONSTRUCTION	
A.1	ROUTE ALIGNMENT	
A.2	DETAILED SURVEY	
A.3	SUBMISSION OF PROFILES	
A.4	SOIL INVESTIGATION	
A.5	EARTH RESISTIVITY MEASUREMENT	
A.6	CHECK SURVEY	
A.7	TREE ENUMERATION	
B	DESIGN WORK	
B.1	DESIGN OF TOWER TYPE DA	
B.2	DESIGN OF TOWER TYPE DB	
B.3	DESIGN OF TOWER TYPE DC	
B.4	DESIGN OF TOWER TYPE DD	
B.5	DESIGN OF TOWER TYPE DD SPECIAL	
B.6	DESIGN OF TOWER TYPE MA	
B.7	DESIGN OF TOWER TYPE MD	
B.8	DESIGN OF FOUNDATIONS FOR TOWER TYPE DA	
B.9	DESIGN OF FOUNDATIONS FOR TOWER TYPE DB	
B.10	DESIGN OF FOUNDATIONS FOR TOWER TYPE DC	
B.11	DESIGN OF FOUNDATIONS FOR TOWER TYPE DD	
B.12	DESIGN OF FOUNDATIONS FOR TOWER TYPE DD SPECIAL	
B.13	DESIGN OF FOUNDATIONS FOR TOWER TYPE MA	
B.14	DESIGN OF FOUNDATIONS FOR TOWER TYPE MD	
B.15	TESTING OF TOWER TYPE DA	
B.16	TESTING OF TOWER TYPE DB	
B.17	TESTING OF TOWER TYPE DC	
B.18	TESTING OF TOWER TYPE DD	
B.19	TESTING OF TOWER TYPE DD SPECIAL	
B.20	TESTING OF TOWER TYPE MA	
B.21	TESTING OF TOWER TYPE MD	
C	SUPPLY OF STUBS & TOWERS	
C.1	TOWERS	
C.1.1	PLACEMENT OF PURCHASE ORDER	
C.1.2	PROTO INSPECTION	
C.1.3	MANUFACTURE OF STUBS	
C.1.4	MANUFACTURE OF SUPERSTRUCTURE & ACCESSORIES	
C.1.5	DELIVERY TO SITE - STUBS	
C.1.6	DELIVERY TO SITE - SUPERSTRUCTURE & ACCESSORIES	
D	FOUNDATION	
D.1	EXCAVATION	
D.2	CUTTING, BENDING & PLACEMENT OF STEEL	
D.3	CONCRETING	
D.4	BACK FILLING	
D.5	INSTALLATION OF TOWER EARTHING	
E	ERECTION OF TOWERS	
E.1	ERECTION OF TOWERS	
F	SUPPLY OF LINE MATERIAL	
F.1	DELIVERY TO SITE - HTLS CONDUCTOR	
F.2	DELIVERY TO SITE - ACSR BISON CONDUCTOR	
F.3	DELIVERY TO SITE - OPGW & FITTINGS	
F.4	DELIVERY TO SITE - COMPOSITE LONG ROD INSULATORS	
F.5	DELIVERY TO SITE - HARDWARE & ACCESSORIES	
G	STRINGING	
G.1	STRINGING OF HTLS CONDUCTOR	
G.2	STRINGING OF ACSR BISON CONDUCTOR	
G.3	STRINGING OF OPGW	
H	PROTECTION OF TOWER FOOTINGS	
H.1	PROTECTION OF TOWER FOOTINGS	
I	TESTING, COMMISSIONING & HANDING OVER	
I.1	PRE COMMISSIONING CHECKS	
I.2	RECTIFICATION OF PUNCH POINTS	
I.3	ENERGIZATION OF TRANSMISSION LINE	
I.4	HANDING OVER	

NEPAL ELECTRICITY AUTHORITY
MARSYANGDI CORRIDOR TRANSMISSION PROJECT
PROJECT MANAGEMENT DIRECTORATE
SATUNGAL - BAUTHALI CHOWK MARGA
CHANDRAGIRI MUNICIPALITY, MATATIRTHA
KATHMANDU, NEPAL

ANNEX F: LIST OF SURVEYED HOUSEHOLD

S.N.	Name	S.N.	Name
1	Maiya Pariyar	24	Yash Raj Thapa Magar
2	Rupesh Pariyar	25	Shiva Nidhi Silwal
3	Santa B. pariyar	26	Dhan B. Ranabhat
4	Sukalal Sunar	27	Resham Bilash kadel
5	Umakanta paudel	28	Bhaba Nidhi Pandey
6	Kriti B. Khatri	29	Kul Chandra Chilwal
7	Dipak K. Shestha	30	Nawa Kumar Shrestha
8	Tirtha B. Magar	31	Harka B. Sarki
9	Bhim B. Ale	32	Pakku Ramtel
10	Dhana Singh Thapa Magar	33	Raju Tamang
11	Sukha B. Chepang	34	Kaji Babu Devkota
12	Pancha B. Gurung	35	Dhan Bdr
13	Kalu Magar	36	Matrika Bahadur parajuli
14	Krishna B.K	37	Rajendra B. ThaPa
15	Chitra B. Gurung	38	Prem Thapa
16	Harka B. Budathoki	39	Narayan P. Regmi
17	Bhim B. Sedai	40	Hira Shrestha
18	Tul Kumari Shrestha	41	Shiva Kumar Shrestha
19	Maiya Sedai	42	Saune Kumal
20	Bishnu Suyal	43	Krishna Pathak
21	Hari K. Shrestha	44	Bir B. Khadka
22	Ram prashad paudel	45	Karna B. Panta
23	Shree Bhakta Regmi	46	Tika Bote
24	Yash Raj Thapa Magar	47	Asha Kaji Shrestha
		48	Hom B. Khawas



ANNEX G: MINUTES OF PUBLIC CONSULTATION

वातावरणीय सवाल तथा रायसुझावहरु:

१. तारमुनि पर्ने जग्गाको स्रोत उचित मूल्याकन गरी
क्षतीपूर्ती दिनुपर्ने

२. जग्गाको मूल्य निर्धारण स्थानिय सहभागीता मा हुनुपर्ने

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मखिंचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नेका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: भारते २ बेलघारी
मिति: २०७३।१०।१३

क्र.स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	भिमलाल क्षेत्रक	रत्न प्राप्ति	भारते - २	[signature]
२	सानुमायाँ वि०क०	रत्न प्राप्ति	"	[signature]
३	सम्झना रोजी	"	"	[signature]
४	मनिला थापा	"	"	[signature]
५	ग्रुष्मा गुरुङ	"	"	Krishna
६	गंगा रवनी	"	"	[signature]
७	सोमबहादुर गुरुङ	स्थानिय	"	[signature]
८	हरि बहादुर परियार	अर्चलबोट स्थानिय	अर्चल बोट	[signature]
९				
१०				

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
12	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोदी कोरिडोरको विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्स्याङ्दी सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्ने Integrated Nepal Power System मा जोड्नको लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १८०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा सञ्चालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: धार्मिकोट्टा ४ (२डिलाल बि.का ४)
मिति: २०७३।१०।१३

क्र.सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	रामे वेदाली	व्यापारि	वडा २डिलाल-४	
२	सरिता गौली	व्यापारि	"	
३	गोकर्ण पाण्डे	"	"	
४	पदुराम भण्डारी	"	"	
५	धनबहादुर हुडेल	"	"	
६	हरिहर पो.कोइराला	"	"	
७	गोविन्दराज भोलाडि	"	"	

नेपाल सरकार
जिल्ला सम्पदाकार्य
2073

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुं जिल्लामा पर्ने मर्स्याङ्दी सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्ने (Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय संवेदनशीलहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन उद्देश्यका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: हरिवोल, रत्नपार्क -9
मिति: 2073/10/12

क्र.सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	कृष्ण प्र. रुजाल	लमजुङ्ग जि.स.स.	हरिवोल	
२	हरि प्रसाद घिमिरे	"	हरिवोल	
३	राजकुमार दोवाड	स्थानिय	हरिवोल	
४				
५				
६				
७				

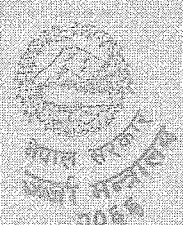
नेपाल विद्युत प्राधिकरण

वातावरणीय सवाल तथा रायसुझावहरु:

१. टावर बस्ने र तारभुनि पर्ने हुवै जग्गाको स्थानिय स्तरमा मूल्यांकन गरी दातीपूर्ती दिनु पर्ने ।

२. सामुदायिक वनमा दाती हुने रूखको उचित दातीपूर्ती र नया बिरूवाको व्यवस्था गर्नु पर्ने

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६



नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मस्र्याङ्गदी तथा दोदी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोडदै Integrated Nepal Power System ना जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा सञ्चालन गर्नेका लागि प्रस्ताव गरिएको **मस्र्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: चितवन, रामनगर पालिका

मिति: २०७३।१०।१७

क्र.स.	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	रामबाबु रेग्मी	नेपाल विद्युत प्राधिकरण	चितवन	
२	तुलसी रेग्मी	स्थानिय	चितवन	
३	रत्ना निधि तिवारी	स्थानिय	चितवन	
४	सुरेन्द्र रेग्मी	स्थानिय	〃	
५	गोविन्दराज रेग्मी	〃	चितवन	
६	नविनकुमार देव	〃	चितवन	
७	राधा पौडेल	शिक्षक, 〃	〃	
८	उदय हलचन्द्र रेग्मी (9845911634)	〃 वडा नं ७ सचिव	〃	
९	सुदि चन्द्र गिरी	व्यवसायि	〃	
१०	रमेश कुमार रेग्मी	व्यवसायी	〃	

वातावरणीय सवाल तथा रायसुझावहरु:

१. जग्गाको उचित दातीपूर्ती, स्थानियको रहोवर मा दिनुपर्ने

२. जग्गाको मूल्याकन स्थानिय मूल्याकन समिती गठन गरी गर्नु पर्ने

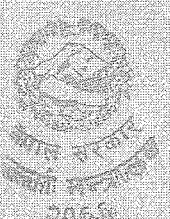
३. अन्य विकासका पूर्वाधार निर्माण मा समेत ध्यान दिनुपर्ने

वातावरणीय सवाल तथा रायसुझावहरु:

१. आयोजन निमार्ण गर्ने क्रममा घडेरीहरू छल्ने गरी निमार्ण गर्ने।

२. यस गाविसको आयोजना निमार्ण स्थल वरपर बाँदर धेरै भएकाले सो कुरा विचार गर्नु पर्ने।

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	[illegible]	[illegible]	[illegible]	[illegible]
१३	[illegible]	[illegible]	[illegible]	[illegible]
१४	[illegible]	[illegible]	[illegible]	[illegible]



क्र स	नाम थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	पुरन बहादुर	व्यापारि	धनुषा	
१३				

Sl. No.	Description	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30	Month 31	Month 32	Month 33	Month 34	Month 35	Month 36
		0 - 30	31 - 60	61 - 90	91 - 120	121 - 150	151 - 180	181 - 210	211 - 240	241 - 270	271 - 300	301 - 330	331 - 360	361- 390	391 - 420	421 - 450	451 - 480	481 - 510	511 - 540	541 - 570	571 - 600	601 - 630	631 - 660	661 - 690	691 - 720	721 - 750	751 - 780	781 - 810	811 - 840	841 - 870	871 - 900	901 - 930	931 - 960	961 - 990	991 - 1020	1021 - 1050	1051 - 1080
A	SURVEY, SOIL INVESTIGATION & CONSTRUCTION																																				
A.1	ROUTE ALIGNMENT																																				
A.2	DETAILED SURVEY																																				
A.3	SUBMISSION OF PROFILES																																				
A.4	SOIL INVESTIGATION																																				
A.5	EARTH RESISTIVITY MEASUREMENT																																				
A.6	CHECK SURVEY																																				
A.7	TREE ENUMERATION																																				
B	DESIGN WORKS																																				
B.1	DESIGN OF TOWER TYPE DA																																				
B.2	DESIGN OF TOWER TYPE DB																																				
B.3	DESIGN OF TOWER TYPE DC																																				
B.4	DESIGN OF TOWER TYPE DD																																				
B.5	DESIGN OF TOWER TYPE DD SPECIAL																																				
B.6	DESIGN OF TOWER TYPE MA																																				
B.7	DESIGN OF TOWER TYPE MD																																				
B.8	DESIGN OF FOUNDATIONS FOR TOWER TYPE DA																																				
B.9	DESIGN OF FOUNDATIONS FOR TOWER TYPE DB																																				
B.10	DESIGN OF FOUNDATIONS FOR TOWER TYPE DC																																				
B.11	DESIGN OF FOUNDATIONS FOR TOWER TYPE DD																																				
B.12	DESIGN OF FOUNDATIONS FOR TOWER TYPE DD SPECIAL																																				
B.13	DESIGN OF FOUNDATIONS FOR TOWER TYPE MA																																				
B.14	DESIGN OF FOUNDATIONS FOR TOWER TYPE MD																																				
B.15	TESTING OF TOWER TYPE DA																																				
B.16	TESTING OF TOWER TYPE DB																																				
B.17	TESTING OF TOWER TYPE DC																																				
B.18	TESTING OF TOWER TYPE DD																																				
B.19	TESTING OF TOWER TYPE DD SPECIAL																																				
B.20	TESTING OF TOWER TYPE MA																																				
B.21	TESTING OF TOWER TYPE MD																																				
C	SUPPLY OF STUBS & TOWERS																																				
C.1	TOWERS																																				
C.1.1	PLACEMENT OF PURCHASE ORDER																																				
C.1.2	PROTO INSPECTION																																				
C.1.3	MANUFACTURE OF STUBS																																				
C.1.4	MANUFACTURE OF SUPERSTRUCTURE & ACCESSORIES																																				
C.1.5	DELIVERY TO SITE - STUBS																																				
C.1.6	DELIVERY TO SITE - SUPERSTRUCTURE & ACCESSORIES																																				
D	FOUNDATION																																				
D.1	EXCAVATION																																				
D.2	CUTTING, BENDING & PLACEMENT OF STEEL																																				
D.3	CONCRETING																																				
D.4	BACK FILLING																																				
D.5	INSTALLATION OF TOWER EARTHING																																				
E	ERECTION OF TOWERS																																				
E.1	ERECTION OF TOWERS																																				
F	SUPPLY OF LINE MATERIAL																																				
F.1	DELIVERY TO SITE - HTLS CONDUCTOR																																				
F.2	DELIVERY TO SITE - ACSR BISON CONDUCTOR																																				
F.3	DELIVERY TO SITE - OPGW & FITTINGS																																				
F.4	DELIVERY TO SITE - COMPOSITE LONG ROD INSULATORS																																				
F.5	DELIVERY TO SITE - HARDWARE & ACCESSORIES																																				
G	STRINGING																																				
G.1	STRINGING OF HTLS CONDUCTOR																																				
G.2	STRINGING OF ACSR BISON CONDUCTOR																																				
G.3	STRINGING OF OPGW																																				
H	PROTECTION OF TOWER FOOTINGS																																				
H.1	PROTECTION OF TOWER FOOTINGS																																				
I	TESTING, COMMISSIONING & HANDING OVER																																				
I.1	PRE COMMISSIONING CHECKS																																				
I.2	RECTIFICATION OF PUNCH POINTS																																				
I.3	ENERGIZATION OF TRANSMISSION LINE																																				
I.4	HANDING OVER																																				

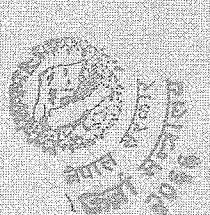
NEPAL ELECTRICITY AUTHORITY
MARSYANGDI CORRIDOR TRANSMISSION PROJECT
PROJECT MANAGEMENT DIRECTORATE
SATUNGAL - BAUTHALI CHOWK MARGA
CHANDRAGIRI MUNICIPALITY, MATATIRTHA
KATHMANDU, NEPAL

PROJECT TIME SCHEDULE - DESIGN, SUPPLY & CONSTRUCTION ACTIVITIES
(Udipur- Markichowk-Bharatpur Section)

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: उदिपुर, वेसिटार, वा.पा. ९
मिति: २०७३/१०/१३

क्र.सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	मिना पाल	आदर्श पालक	उदिपुर	
२	हिमाल पाल	ठेकेदार	उदिपुर	
३	कुल बहादुर दोरु	ठेकेदार	उदिपुर	
४	धन प्रसाद पुरुष	होटल	उदिपुर	
५	लक्ष्मी बहादुर पुरुष	कृषी	उदिपुर	
६	रामकुमार दोरु	कृषी	उदिपुर	
७	गोरेखुलाल दोरु	व्यापार	उदिपुर	
८	रुद्र प्रसाद भण्डारी	शिक्षक (अंग्रेजी)	"	
९	रामचन्द्र पाल	सामाजिक अगुवा	"	
१०	दामोदर पुरुष	व्यापार	"	



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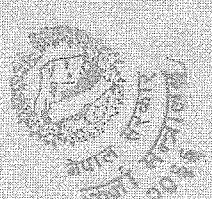
स्थान: पालुङटार,
मिति: २०७३।१०।०५

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	यम बहादुर भण्डारी	स्थानिय, कृषी	पालुङटार १०	[signature]
२	विकास तामाङ	"	"	[signature]
३	सन्दीप तामाङ	स्थानिय	"	[signature]
४	कमल ब. भण्डारी	"	"	[signature]
५	सविन रानामगर	"	"	[signature]
६	सुरज तामाङ	"	"	[signature]
७	प्रशान्त बटाली	"	"	[signature]
८	सोम ब. तामाङ	"	"	[signature]
९	विशाल तामाङ	"	"	[signature]
१०	नर जङ गुरुङ	"	"	[signature]

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

वातावरणीय सवाल तथा रायसुझावहरु:

१. समुदाय सगँडो उचित समन्वयमा आयोजना अघि बढाउनु पर्ने।
२. सामुदायिक वनमा पर्ने क्षतीको उचित क्षतीपूर्ती दिनु पर्ने।
३. नियमअनुसार क्षती हुने रूखको नया बिरूवाको व्यवस्था गरी हुकाउने व्यवस्था समेत गर्नुपर्ने।

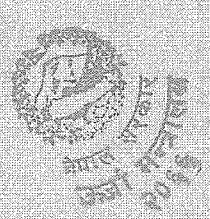


वातावरणीय सवाल तथा रायसुझावहरु:

१. जग्गाको उचित क्षतीपूर्ती दिया स्थानियको रहोवरमा मूल्याकन गरि दिनुपर्ने

२. सके सम्म कम क्षती गर्ने प्रविधीको विकास गर्नु पर्ने ।

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१२	कल्पना परियार	हजारिया		[illegible]
१३	तप बहादुर परियार	"		तपबहादुर
१४	मिना डेक्क	"		मिना
१५	चमेली परियार	"		चमली
१६	किरण परियार	"		[illegible]
१६				
१८				
१९				
२०				



क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	शिवदेव जोशी	〃	अदिघर	
१३	शैलेन्द्र कार्कीबाबाद	〃	अदिघर	
१४	गोपाल दत्त त्रिपाठी	〃	अदिघर	
१५	गणेश दत्त पन्त	अध्यापक	अदिघर	

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मखिंचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: अर्चलबोट गा.वि.स., वडा-९

मिति: २०७३।१०।१२

क्र.सं.	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	राम प्रसाद पौडेल	रानी स्वारा सा.व. नं.को सचिव	अर्चलबोट-९	[signature]
२	राम प्रसाद पौडेल	सल्लाहाकार	अर्चलबोट-९	[signature]
३	केशव लामिछाने	रानी स्वारा स.व.नको सदस्य	" " ९	[signature]
४	पार्वती ढकाल (अधिकारी)	रानी स्वारा सा.व. उ.स. अध्यक्ष	अर्चलबोट-९	[signature]
५	देवि अधिकारी	रा.स्व. सा.व. सदस्य	" ९	देवी
६	शान्ता रेग्मी	"	" ९	शान्ता
७	शोभित / कुँवर	"	" ९	शोभित
८	सत्यदेवी ढकाल	"	" ९	सत्य
९	सुकमाया वि.क.	"	" ९	सुक
१०	विष्णु प्रसाद रेग्मी	रानी स्वारा सिंचाइ सामुदायिक उपाध्यक्ष	अर्चलबोट ९	[signature]

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर सर्प्याङ्गदी तथा दाँदी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्दिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.९५ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **सर्प्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०८ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय संचालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: पोटरवा, पाल्पुङटार - ३ मालेबजार
मिति: २०७३।१०।१४

क.स.	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	रण बहादुर कुँवर	स्थानिय	पाल्पुङटार-३ मालेबजार	
२	मेघ नारायण दोरेठ	"	"	
३	विल बहादुर कुमाल	"	"	
४	रामहरि परियार	"	"	
५	विष्णु प्रसाद दोरेठ	"	"	
६	विरेन्द्र कुमाल	"	"	
७	हरि हलवाइ परियार	"	"	

वातावरणीय सवाल तथा रायसुझावहरु:

१. जग्गाको (टावर ~~बसने~~ रहने तथा तार मुर्ती पर्ने) स्थानीय दरमा पूर्ण क्षतीपूर्ती प्रदान गर्नु पर्ने।

२. सामुदायिक वनको हकमा रूख काट्नु परेमा नियम अनुसार नयाँ बिरूवा रोप्नु पर्ने।

३. जग्गाको मुल्य निर्धारण स्थानीय सहभागितामा गर्नु पर्ने।

४. सामुदायिक वनमा क्षतिपुर्ती स्वरूप नयाँ बिरूवा रोप्ने क्रममा वन उपभोक्ता समूहको रहोवरमा रोप्नु पर्ने। रोपिएका बिरूवाको हकमा पाँच वर्षसम्म सम्भाहर गर्ने खर्च विनियोजन गर्नु पर्ने।

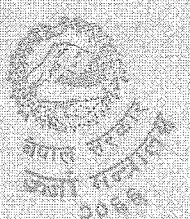
वातावरणीय सवाल तथा रायसुझावहरु:

१. जग्गाको क्षतीपूर्ती दिया स्थानियको सल्लाह सुझाव अनुसार मूल्याकन हुनुपर्ने

२. तारमुनीपर्ने जग्गाको हकमा सैमेत उचित क्षतीपूर्ती व्यवस्था गर्नुपर्ने

३. सामुदायिक बनमा कपिले तिरुवाको क्षतीपूर्ती र नया बिरुवाको व्यवस्था हुनुपर्ने

नेपाल सरकार
फर्जी मन्त्रालय
२०६६



सचिवको सुझाव

यस देखराली र गोप्लीङ, श्री कवा देवी सा.वं. उ. समितीमा त्यान परामर्शदाता Enviromental services Nepal Pvt, Ltd (ESN), संग मोटा मोटी कुरा कुदछा यस हाइटेन्सन लाइनको ३० मीटर बरीपरी कुनै रुख बिरुवा हुँदा नहुने र लाइन प्रसारणको लागी तयारीमा गोंडमा कुनै छलफल र जानाकारी पनी नभएको कुरा अवगत गराउन चाहान्छु। यसको लागी विस्तृत जानाकारीको आवश्यकता रहेको कुरा पुनः जानाकारी गराइदिनुहुन।

क्र.सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	कृष्ण पौडेल	कृषि	[illegible]	[illegible]
१३	अमृत लामिछाने	कृषि	अर्चलवार	[illegible]
१४	ऋषिराम पौडेल	"	"	[illegible]
१५	श्रीमत रेग्मी	"	"	[illegible]
१६	नीलनाथ पौडेल	"	"	[illegible]

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: रामनगर -१

मिति: २०७३-१०-१२

क्र.स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	द्रुपराज भट्टराई	कृषी	भ.उ.न.पा.-१ रामनगर	[signature]
२	यमबहादुर वाचेमगर	नेपाली कांग्रेस, कार्यकर्ता	"	[signature]
३	सोमराज आचार्य	समाजसेवा	"	[signature]
४	राममाया गुरुङ	नेपाली कांग्रेस कार्यकर्ता	"	[signature]
५	गोविन्द प्रसाद देवकोटा	कृषी	"	[signature]
६	सुरज ब. खड्का	समाजसेवा	"	[signature]
७	स्वीकार देवकोटा	विद्यार्थी	रामनगर १	[signature]
८	इन्दिरा नहर्की	चियापसले	" १	[signature]
९	यामदेवी मगर	गृहिणी	" १	यामदेवी
१०	जमुना पन्त	कुखुरा पालन	" १	जमुना

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: देउराली-१, गोविलङ फाँट

मिति: २०७३/१०/१४

क्र.स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	हरी नहर्की	कृषी/समाजसेवी	देउराली-३	[signature]
२	सोम पन्त	व्यापार	देउराली-३	[signature]
३	धनलाल भुजेल	किसानी	देउराली-३	[signature]
४	शिरबहादुर दराई	भु.पु. सैनिक	देउराली-३	[signature]
५	नरबहादुर आले मगर	कृषी	देउराली-३	[signature]
६	सुर्य भुजेल	कृषी/किसान	देउराली-३	
७	हरिराम खड्का	"	"	[signature]
८	तोप ता महत	"	"	[signature]
९	पुरेश अधिकारी	"	"	[signature]
१०				

वातावरणीय सवाल तथा रायसुझावहरु:

१. पर्यावरणीय असर कम गर्नेगरि लग्नुपर्यो

२. रुख काट्ने अनुपातमा रोप्नु पनि पर्‍यो

३. खाली जग्गाको प्रयोग

४. जँगली जनावरको ख्याल जस्तै पानीको व्यवस्था गरिदिने

५. सिमसारको व्यवस्था

६. मुहानको संरक्षण (प्रभावित क्षेत्र भित्रका)

७ पिडितलाई जग्गाको उचित मुल्याङ्कन होस्

वातावरणीय सवाल तथा रायसुझावहरु:

१. कुन कुन बिन्दु थकिन भएको छ प्रस्ट होस्

२. उचित क्षतिपूर्तिको व्यवस्था होस्

३. गाउँलाई खासै असर नहुने गरि line लाई पहिले माथि डाँडामा पुऱ्याउने अनि बस्तीभन्दा परबाट लग्ने

४. मुआब्जाको ~~जग्गा कति छो र~~ थकिन होस् चाँडै।

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
९१	विरेन्द्र गुरुङ	कृषी	कविलास - ७	
९३	धुव्र बहादुर दुर्गा	कृषी	कविलास - ७	
९४.	श्रीराम चेडिल	शिक्षक	कविलास - ७	

क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	[illegible]	गृहणी	[illegible]	[illegible]
१२	[illegible]	[illegible]	[illegible]	[illegible]
१४	[illegible]	सिलाई	[illegible]	[illegible]

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा सचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: कविलास-१, कविलास ३, माल्ति अफाडी
मिति: २०७३/१०/११.

क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	शोभा रावतेल	डाले दार अ.उ.मे.	कविलास-१	शोभा
२	मिन प्रकाश मल्ल (धनम)	कृषि प्राविधिक	धोभा-८ लमजुङ	
३	ध्यानप्रसाद पौडेल	पशु स्वास्थ्य प्राविधि	४-७-प.१८	
४	[illegible]	आयुर्वेद अ.प्रा.	डलेटार अफिस	
५	सुदिप्त पोखरेल	वि.प.से.स्व., चितवन	भरतपुर-१०	
६	मल बहादुर गुरुङ	कृषी	कविलास-८	मलबहादुर
७	भरत भक्त भट्ट	नौकरी	घरेलु	
८	देउ बहादुर गुरुङ	नौकरी	कविलास	
९	शुशिला गुरुङ	कृषी	कविलास-१	शुशिला
१०	विकास गुरुङ	विद्यार्थी	कविलास	

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाइको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: कविलास - ७, चौकी डाडा

मिति: २०७३/१०/१२

क्र.स.	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	गोविन्द सापकोटा	व्यापार	कविलास-७	गोविन्द
२	तेजु गुरुङ	कृषि	कविलास-७	[signature]
३	सविन गुरुङ	डकमी	कविलास-७	सविन
४	विमल गुरुङ	"	कविलास-७	विमल
५	सुक बहादुर गुरुङ	"	कविलास-७	[signature]
६	दिवस गुरुङ	शिक्षक	कविलास-७	[signature]
७	सौगात गुरुङ	वैदेशिक रोजगार	कविलास-७	Sangathurung
८	काजिमान गुरुङ	"	कविलास-७	काजीमान
९	सन्त कुमार गुरुङ	"	कविलास-७	सन्तकुमार
१०	सागर गुरुङ	"	कविलास-७	[signature]

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६

वातावरणीय सवाल तथा रायसुझावहरु:

१. घर जग्गा माथि बाट तार जाने भएकाले विशेष ध्यान दिनुपर्ने।
२. उचित मुआब्जाको व्यवस्था होस् । (घर जग्गा माथि बाट तार लगेमा) ।
३. पिडित पक्षको लागि केहि विशेष कार्यक्रम ल्याइनु पर्ने ।
४. घर जग्गा माथि बाट सकभर नलगियोस् र लगिए पुरै भरपाई हुनु पर्ने ।
५. केहि प्रत्यक्ष लाभ हुने काम गरियोस् ।
६. लोड सेडिङ् कम हुने आशा ।

वातावरणीय सवाल तथा रायसुझावहरु:

१. हाई पावरको लाइनले गर्दा टेलिफोन नेटवर्कमा समस्या पर्ने ।
२. स्कुल नाजकै रहेकाले केही समस्या पर्ने हो कि ।
३. लोड सेडिङ घटाउनकालागि सहयोग पुग्नु पर्ने ।
४. विकासका काम भएकाले सकरात्मक धारणा ।
५. घर जग्गा पर्ने (पिडित पक्षले) उचित मुआवजा पाउनु पर्ने ।
६. तार तल पर्ने जग्गा बिक्रि हुन मुस्कील हुने ।
७. पुर्वाधारका अन्य स्रोतहरु विस्तार हुनु पर्ने ।

नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६



क स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
८	धन बहादुर मगर	कृषी	अस्तु -४	धन ब मगर
९.	प्रकास के.सी	तेलरी	"	
१०.	लाल बहादुर अलि मगर	कृषी	"	
११.	नन्दु पाधा	"	"	
१२.	राम बहादुर अलि	"	"	
१३.	सुजन के.सी	तेलाची	"	

क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	सरोज गुरुङ	विद्यार्थी	काभ्रेलाप-१	
१३	मनोज गौतम	जेष्ठरी	काभ्रेलाप-३	

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्न ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: हिम्केश्वरी २, तनहुँ
मिति: २०७३।१०।१२

क्र सं	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	सुक माया भुजेल	कृषी	हिम्केश्वरी	सुकमयाँ
२	माया भुजेल	"	"	माया
३	मनु भुजेल	"	"	मनु
४	सुकमति भुजेल	"	"	सुकमति
५	मोतिराम भुजेल	"	"	[illegible]
६	सुजन भुजेल	"	"	सुजन
७	कुम्भ सिंह भुजेल	"	"	कु.भ.सि.
८	सुक बहादुर भुजेल	"	"	सुक
९	पुर्ण बहादुर ~~भुजेल~~ गुरुङ	"	"	पुर्ण
१०	सविना भुजेल	"	"	सविना

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विद्युत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मर्खिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा संचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर – न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव संकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, संस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: आबुखैरेनी-५, तनहु
मिति: २०७३/१०/१४

क्र.सं.	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	①च्चु माया के.सी	कृषी	आब-५	[illegible]
२	बुद्धि सारा सुनार	कृषी	"	बुद्धी
३	कृष्ण माया आले	"	"	कृष्ण
४	विष्णु के.सी	व्यापार	आबु-५	[illegible]
५	मिना भण्डारी	"	आबु-५	मिना
६	जानु अधिकारी	कृषी	"	जानु
७	सुर्य कुमार जोशी	कृषी	"	[illegible]

नेपाल विद्युत प्राधिकरण, रत्नपार्क, काठमाडौं प्रस्तावक रहेर मर्स्याङ्गदी तथा दोर्दी कोरिडोरका विद्युत आयोजनाहरुको लागि विदयुत प्रसारण लाइन निर्माण गरि लमजुङ जिल्लामा पर्ने उदीपुर सबस्टेशन, तनहुँ जिल्लामा पर्ने मखिचोक सबस्टेशन तथा चितवन जिल्लामा पर्ने न्यू भरतपुर सबस्टेशनलाई जोड्दै Integrated Nepal Power System मा जोड्नका लागि लमजुङ जिल्लाको उदीपुर सबस्टेशन देखि चितवन जिल्लाको न्यू भरतपुर सबस्टेशनसम्म १६०० मेगावाट क्षमतासम्मको विद्युत प्रवाह गर्ने ६४.१५४ कि. मि. लम्बाईको (अधिकतम चार सर्किटसम्मको) विद्युत प्रसारण लाइन निर्माण तथा सचालन गर्नका लागि प्रस्ताव गरिएको **मर्स्याङ्गदी कोरिडोर (उदीपुर - न्यू भरतपुर) २२० के.भी. विद्युत प्रसारण लाइनको** प्रारम्भिक वातावरणीय परीक्षण अध्ययनका लागि राय सुझाव सकलन गर्ने सम्बन्धमा मिति २०७३।१०।०७ को 'आर्थिक अभियान' नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना अनुसार सार्वजनिक परामर्श गर्ने सिलसिलामा सम्बन्धित वातावरणीय सवालहरुका बारेमा प्रस्ताव कार्यान्वयन हुने क्षेत्रका सरोकारवाला व्यक्ति, सस्थाको लिखित राय सुझाव लिन देहायका स्थान र मितिमा सार्वजनिक बैठक आयोजना गरि छलफल गर्ने तथा रायसुझावहरु लिने कार्य सम्पन्न भयो ।

स्थान: कविलास-८, चितवन (लामा गाउँ)

मिति: २०७३।१०।१३

क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
१	मन बहादुर गुरुङ	डकर्मी	कविलास-८	मन
२	हस्त बहादुर गुरुङ	"	"	[illegible]
३	बुद्धि मान गुरुङ	"	"	बुद्धिमान
४	दान बहादुर गुरुङ	"	"	
५	गुन बहादुर गुरुङ	"	"	
६	देउ राज गुरुङ	"	कविलास-८	[illegible]
७	सुक बहादुर गुरुङ	कृषी	कविलास-८	सुक
८	प्रकाश गुरुङ	विद्यार्थी	कविलास-८	[illegible]
९	माईला गुरुङ	डकर्मी	कविलास-८	[illegible]
१०	सुक माया गुरुङ	कृषी	कविलास-८	सुक

वातावरणीय सवाल तथा रायसुझावहरु:

१. घर जग्गाको उचित मुल्य गरी मुआब्जा पाउनु पर्ने।
२. खेतको माझबाट अन्दा छुट्टै बाट राखिदिनु पर्ने।
३. खेतीपाती लगाउन गाह्रो पर्ने।
४. समयसमयमा त्यस्ता तार चुडिने र समस्या पर्ने अएको।
५. खेतीको नास हुने।
६. जग्गा बिक्रि गर्ने गाह्रो हुने।
७. खेतीपाती गर्दा पनि त्रास हुने।

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वातावरणीय सवाल तथा रायसुझावहरु:

१. वर्षाको बेलामा चट्याङ पर्दा समस्या हुने ।
२. टावरमा आगो बल्ने समस्या रहेको ।
३. विद्युतीय सामाग्रीलाई समस्या पर्ने ।
४. गाँउलेलाई रोजगार दिए उपयुक्त हुने ।
५. बिजुलीको व्यवस्था राम्रो हुनु पर्ने ।
६. जग्गाको उचित मुआब्जा दिईनु पर्ने ।

वातावरणीय सवाल तथा रायसुझावहरु:

१. पावरले गर्दा जग्गा बिक्रि गर्न गाह्रो हुने ।

२. चट्याङ् पर्दा क्रास हुने ।

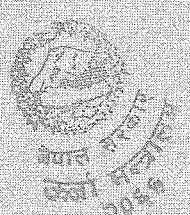
३. रोजगारी पाउने आशा रहेको ।

४. विद्युतको सहज आपुर्ती हुनु पर्ने ।

५. जग्गाको उचीत मुआब्जा पाउनु पर्ने ।

		Phant				community users group • Compensation of number of tree lost as per regulation
10	2073/10/12	Ramnagar-1	10	4	14	• Protection of wildlife and watershed conservation • Compensation of number of tree lost as per regulation
11	2073/10/12	Kabilas-7, Chowkidada	14		14	• Skill improvement training for CFUGs • Compensation of tree loss as per rule
12	2073/10/11	Kabilas-1	12	1	13	• Compensatory plants should be properly managed and protected for 5 years
13	2073/10/14	Aabukhaireni-5, Tanahu	9	4	13	• Construction work should carried out in close coordination with community • Compensatory plants should be properly managed and provision of protection for 5 years
14	2073/10/14	Bhanu Municipality	5		5	• Trees that need to be felled from any community forest should be carried out under the supervision of member CFUG
15	2073/10/13	Shree Duwakot VDC	4	2	6	• Compensatory plants should be properly managed and protected for 5 years
16	2073/10/14	Palungtar-3	5		5	• Compensatory plants should be properly managed and protected for 5 years
17	2073/10/14	Aabu VDC, Dhakaltar	2	3	5	
18	2073/10/14	Chimkeshowri VDC, Barallung	3	2	5	• Construction work should carried out in close coordination with community
19	2073/10/15	Palungtar-10	5		5	• Compensatory plants should be properly managed and protected for 5 years
20	2073/10/13	Kabilas-8	5		5	• Provision of compensatory plantation cost with 5 year protection should be made • Commercial NTFPs training for

क्र स	नाम, थर	सम्बन्धित कार्यालय, पेशा	ठेगाना	हस्ताक्षर
११	आहती गुरुङ	कृषी	कावेलास - ८	आहती
१३	धनी राज गुरुङ	कृषी	कावेलास - ८	धनी



						planted saplings
31	2073/10/11	Chiti-6	5		5	• Commercial NTFPs farming training • Compensation of tree loss as per rule • Disturbance on wildlife should be mitigated.
32	2073/10/11	Chiti-7	5		5	Compensation of loss trees of community forest and proper management of new planted saplings
33	2073/10/15	Palungtar-2	1	4	5	• Trees that need to be felled from any community forest should be carried out under the supervision of member CFUG
34	2073/10/12	Palungtar-6	4	1	5	• Compensation of resources loss of community forest • Provision of compensatory plantation cost with year protection should be made
35	2073/10/13	Sundar Bazar	3	1	5	• Provision of compensatory plantation cost with 5 year protection should be made • Commercial NTFPs training for community users group

LIST OF PLACES AND NUMBER OF PARTICIPANTS OF PUBLIC CONSULTATION

S.N.	Date	Location	Male	Female	Total Participants	Major Issue
1	2073/10/13	Bharate 2 Belghari	3	5	8	• Compensation of resources loss of community forest
2	2073/10/13	Dhamilikuwa-4, Rainas Municipality	13		13	• Compensation of loss trees of community forest and proper management of new planted saplings
3	2073/10/12	Haribot, Rainas Municipality	3		3	• Compensatory plants should be properly managed and protected for 5 years
4	2073/10/11	Chiti-6, Ramchowk Besi	10	4	14	• Compensation of resources loss of community forest • Provision of compensatory plantation cost with year protection should be made
5	2073/10/15	Palungtar	11		11	• Provision of compensatory plantation cost with 5 year protection should be made • Protection of wildlife and watershed conservation
6	2073/10/13	Udipur, Besisahar Municipality ward no.1	14	1	15	• Construction work should carried out in close coordination with community forest • Compensatory plants should be properly managed and protected for 5 years
7	2073/10/14	Gorkha, Palungtar-3	13	3	16	• Trees that need to be felled from any community forest should be carried out under the supervision of member CFUG • Provision of compensatory plantation cost with year protection should be made
8	2073/10/12	Archalabot	10	6	16	• Provision of compensatory plantation cost with 5 year protection should be made
9	2073/10/14	Deurali-1, Gobling	9		9	• Commercial NTFPs training for



						community users group
21	2073/10/11	Kabilas-1	5		5	• Compensation of resources loss of community forest • Provision of compensatory plantation cost with year protection should be made
22	2073/10/11	Kabilas-7	5		5	• Compensation of loss trees of community forest and proper management of new planted saplings
23	2073/10/12	Bhanu Municipality	5		5	• Provision of compensatory plantation cost with 5 year protection should be made • Protection of wildlife and watershed conservation
24	2073/10/12	Rainas Municipality	3	1	4	• Compensation of resources loss of community forest
25	2073/10/13	Sundar Bazar	5		5	• Skill improvement training for CFUGs • Compensation of tree loss as per rule
26	2073/10/13	Rainas VDC	5		5	• Compensation of resources loss of community forest • Provision of compensatory plantation cost with year protection should be made
27	2073/10/12	Archalbot VDC	3	2	5	• Construction work should carried out in close coordination with community
28	2073/10/13	Bharate-2	1	4	5	• Compensation of loss trees of community forest and proper management of new planted saplings
29	2073/10/12	Bharate-3	3	2	5	• Compensation of resources loss of community forest • Provision of compensatory plantation cost with year protection
30	2073/10/13	Besisahar-1	4	1	5	• Compensation of loss trees of community forest and proper management of new

21	Marsyangdi-Udipur	56-57	National forest (janjyoti school), Palungtar	Aappipal	Gorkha	13	82	95	276	371	411.72	0.379	0.69	Chilaune, Sal	
22	Marsyangdi-Udipur	57-59	Chisipani CF, Palungtar-10	Aappipal	Gorkha	4	6	10	1057	1067	40.879	0.05	0.351	Sal	
23	Marsyangdi-Udipur	61-62	National forest, Palungtar-10	Aappipal	Gorkha	6	2	8	60	68	52.96	0.053	0.24	Khayer	
24	Marsyangdi-Udipur	65, 66-67	Banthumpakha CF, Palungtar	Mirkot	Gorkha	98	345	443	4944	5387	1930.68	1.336	2.769	Sal	
25	Marsyangdi-Udipur	66-67	Jogithum CF, Palungtar	Mirkot	Gorkha	17	17	34	62	96	402.32	0.237	0.216	Sal	
26	Marsyangdi-Udipur	63-64	Pareghat LHF, Palungtar-2	Mirkot	Gorkha	8	8	16	61	77	37.37	0.094	1.194	Chilaune	
27	Marsyangdi-Udipur	64-65	Nagytar LHF, Palungtar-2	Mirkot	Gorkha	8	7	15	31	46	157.89	0.257	1.422	Chilaune	
28	Marsyangdi-Udipur	73-74	National Forest, Dhuwakot	Mirkot	Gorkha	16	4	20	62	82	151.74	0.468	0.39	Chilaune	
29	Marsyangdi-Udipur	74-76	Thuloban CF, Palungtar	Mirkot	Gorkha	72	24	96	744	840	1876.00	0.951	1.47	Sal	
30	Marsyangdi-Udipur	75-78	Akala CF, Deurali	Mirkot	Gorkha	218	230	348	1672	2020	3249.44	3.162	5.52	Sal, Botdhanero	
31	Marsyangdi-Udipur	78-79	Kalika CF, Palungtar	Mirkot	Gorkha	22	147	169	2896	3065	656.61	0.389	0.33	Sal	
32	Marsyangdi-Udipur	78-80	Kanyadevi CF, Palungtar	Mirkot	Gorkha	28	33	61	554	615	432.30	0.34	2.757	Sal	
	Sub-total					**524**	**919**	**1343**	**13430**	**14773**	**9917.85**	**8.05**	**18.333**		
33	Bharatpur-Marsyangdi	22-23	Hariyali Leasehold Forest, Dhakani-7	Haripur	Chitwan	2	9	11	700	711	115.85	0.0622	0.69	Sal	
34	Bharatpur-Marsyangdi	24	Salbisna CF, Kabilas-8	Haripur	Chitwan	2	1	3	150	153	44.07	0.0292	0.0225	Chilaune	
35	Bharatpur-Marsyangdi	25-26	Packakanya Devi National Forest, Kabilas-7	Haripur	Chitwan	3	2	5	400	405	14.03	0.021	0.15	Chilaune	
36	Bharatpur-Marsyangdi	26-27	Jurethum National Forest, Kabilas-2	Haripur	Chitwan	50	100	150	150	300	8134	2.1	3.12	Sal	
37	Bharatpur-Marsyangdi	27-28	Jurethum National Forest, Kabilas-3	Haripur	Chitwan	43	9	52	6500	6552	2868.50	1.8753	1.65	Khayer, Karma	
38	Bharatpur-Marsyangdi	28-29	Jurethum NF, Kabilas-2	Haripur	Chitwan	32	19	51	1400	1451	666.25	0.8472	0.72	Karma	
39	Bharatpur-Marsyangdi	29-30	Indreni CF, Kabilas-1	Haripur	Chitwan	12	9	21	400	421	1142.24	0.5957	0.42	Sal, Kyamuna	
40	Bharatpur-Marsyangdi	30-30A	Indreni CF, Kabilas-1	Haripur	Chitwan	194	239	433	21000	21433	11718.55	7.0253	2.67	Sal, Kyamuna	
41	Bharatpur-Marsyangdi	30A-31	Indreni CF, Kabilas-1	Haripur	Chitwan	149	152	301	17000	17301	10045.21	6.4607	2.259	Sal, Kyamuna	
42	Bharatpur-Marsyangdi	31-31A	Indreni CF, Kabilas-1	Haripur	Chitwan	109	15	124	14000	14124	6314.00	35.221	1.191	Sal, Kyamuna	

ANNEX H: DETAILS OF VEGETATION SURVEY

Summary of Forest Details

SN	Alignment	AP-AP	Name of Forest & Address	Ilaka Forest Office	District	No. of trees	Pole	Sub total	Regeneration	Total	Timber (cft)	Fuelwood (chatta)	Affected Area (ha)	Main Species	Remarks
1	Marsyangdi-Udipur	25,26,27	Mandali CF, Beshishar-2	Beshishar	Lamjung	11	3	14	44	58	106.29	0.312	0.432	Chilaune	
2	Marsyangdi-Udipur	27-28	Kalika CF, Beshishar-2	Beshishar	Lamjung	-	7	7	103	110	21.38	0.023	0.888	Sisso	
3	Marsyangdi-Udipur	32-33F, 34 partial	National Forest, Bhoteodar-4,8	Sundar Bazar	Lamjung	3	44	47	22718	22765	53.1194	0.1422	4.17	Bakaino, Padke	
4	Marsyangdi-Udipur	33B-33A, 33B-33 C,D	Raniswara sakharpkha CF, Archalbot-9	Archalbot	Lamjung	59	83	142	10737	10879	801.3473	1.4968	2.63	Chilaune, Padke	
5	Marsyangdi-Udipur	33 D-33 E, 34-33F 34-35	Jugepani CF, Bharate-2	Archalbot	Lamjung	106	42	148	11842	11990	1205.1501	2.6581	2.06	Sal, Chilaune	
6	Marsyangdi-Udipur	35-36A	Fulbari CF, Sundar bazar-9	Sundar Bazar	Lamjung	19	76	95	6785	6880	326.0146	0.4385	0.8	Sisso, Botdhanero	
7	Marsyangdi-Udipur	36A-38	Marsyangdi Pakha CF, Sundar bazar-9	Sundar Bazar	Lamjung	14	58	72	22406	22478	102.7582	0.5301	4.86	Khair, sisoo	
8	Marsyangdi-Udipur	37-39, 44-45	Nabjyoti CF	Dhamilikuwa	Lamjung	71	50	121	49	170	912.66	1.0489	3.271	Botdhanero, Padke	
9	Marsyangdi-Udipur	47-48	Simalchaur Naringhat CF	Dhamilikuwa	Lamjung	7	0	7	10	17	445.3234	0.4453	0.46	Padke	
10	Marsyangdi-Udipur	47-48, 48-49	Grambeshi CF, Rainas-3	Dhamilikuwa	Lamjung	79	83	162	101	263	1929.99	1.2776	3.531	Botdhanero, Padke	
	Sub-total					**369**	**446**	**815**	**74795**	**75610**	**5904.03**	**8.3725**	**23.102**		
11	Bharatpur-Marsyangdi	4-5	Paharepani CF, Aabu-6	Aabu	Tanahu	25	46	71	16154	16225	362.97	0.52	1.67	Sal, Chilaune	
12	Bharatpur-Marsyangdi	12-13 (partial)	National Forest, Aabu-7	Aabu	Tanahu	-	23	23	3718	3741	62.09	0.08	0.56	Chilaune, Mahuwa	
13	Bharatpur-Marsyangdi	14-15 (partial)	National Forest, Aabu-8	Aabu	Tanahu	2	28	30	12288	12318	90.3278	0.1206	2.64	Chilaune, Sal	
14	Bharatpur-Marsyangdi	15-16	National Forest, Chhimkeswari-3	Aabu	Tanahu	15	67	82	12803	12885	420.85	0.3509	2.44	Katus, Chilaune	
15	Bharatpur-Marsyangdi	16-17 (partial)	National Forest, Chhimkeswari-3	Aabu	Tanahu	6	27	33	8981	9014	150.15	0.1381	1.44	Sal, Chilaune	
16	Bharatpur-Marsyangdi	17-19 (partial)	National Forest, Chhimkeswari-3	Aabu	Tanahu	20	93	113	17149	17262	530.93	0.4553	5.68	Sal, Barro	
17	Bharatpur-Marsyangdi	20-21	Baralung CF, Chhimkeswari-2	Aabu	Tanahu	19	55	74	14528	14602	448.77	0.3793	3.26	Sal, Chilaune	
	Sub-total					**62**	**293**	**355**	**69467**	**69822**	**1703.12**	**1.52**	**17.69**		
18	Marsyangdi-Udipur	50-51	National forest, Palungtar-10	Aappipal	Gorkha	4	14	18	777	795	45.92	0.095	0.435	Chilaune	
19	Marsyangdi-Udipur	55-56	National forest, Palungtar-10	Aappipal	Gorkha	5	0	5	80	85	140.13	0.077	0.345	Sal	
20	Marsyangdi-Udipur	56-57	National forest, Palungtar-10	Aappipal	Gorkha	5	0	5	154	159	331.89	0.166	0.204	Sal	

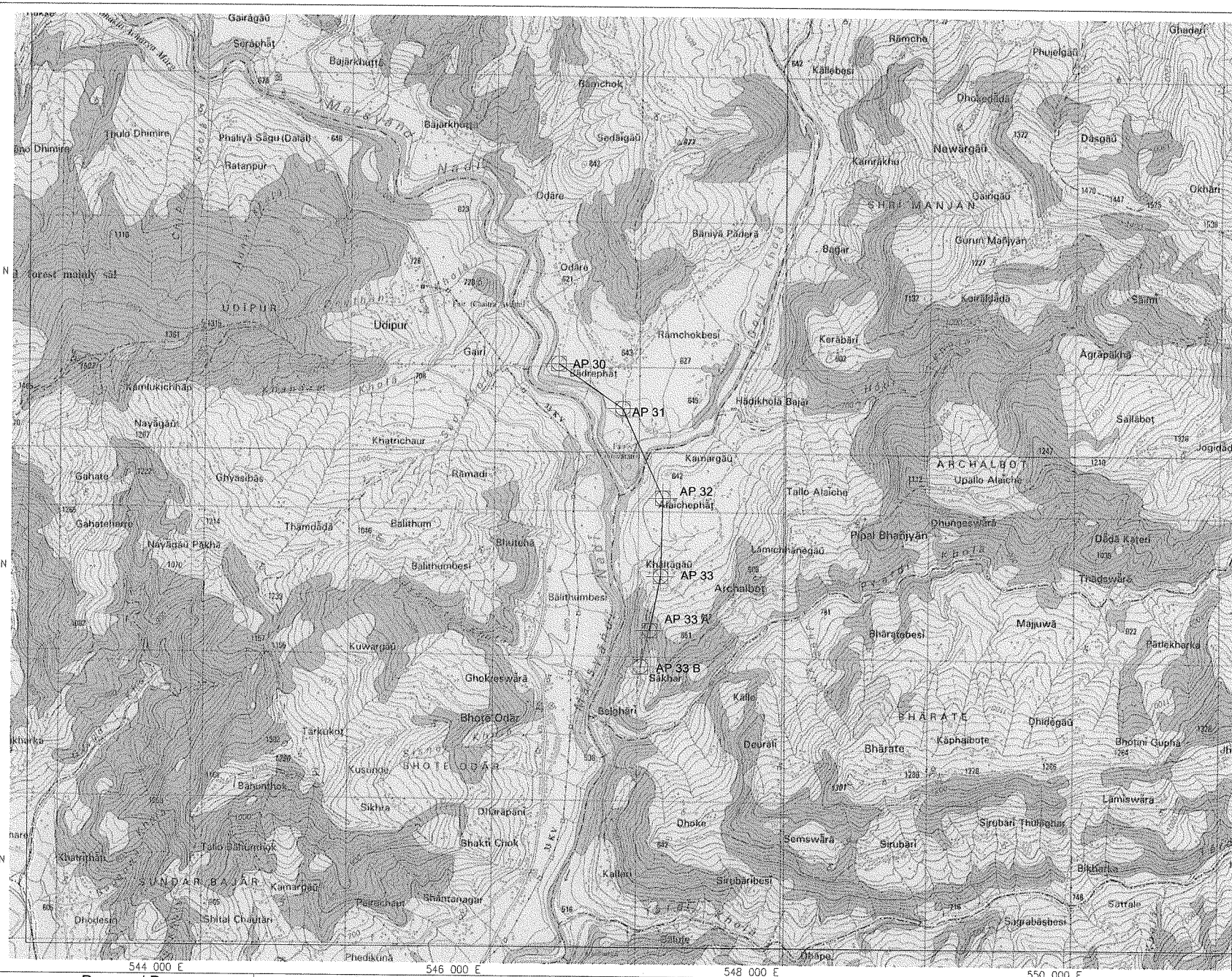


43	Bharatpur-Marsyangdi	AP 31, 31A, 32, 33, 34, 35	Satanchuli National Forest, Bharatpur Municipality-1	Aaptari	Chitwan	1,013	348	1674	1674	3035	62957.34	45.1792	14.163	Sal	
44	Bharatpur-Marsyangdi	34-35	Jaldevi National Forest, Bharatpur	Aaptari	Chitwan	221	178	399	1298	1697	13809.08	8.7557	4.47	Sal	
	Sub-total					**1,830**	**1081**	**3224**	**64672**	**67583**	**117829.11**	**108.1725**	**31.5255**		
	Grand Total					**2,785**	**2,739**	**5,737**	**222,364**	**227,788**	**135354.11**	**126.12**	**90.65**		


भारत सरकार
ऊर्जा मन्त्रालय

ANNEX I: MAPS





LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
- Main Foot Trail with Bridge
- Minor Foot Trail with Bridge
- Road under construction
- Ropeway line
- Built-up area
- Building or house
- Factory, Chimney
- School, Post office
- Hospital, Health post
- Cemetery
- Temple or Stupa, Mane
- Mosque , Church
- Orchard, Nursery
- Trees:Scattered, Prominent, Row
- Tea or coffee plantation
- Forest
- Bush , Grass , Bamboo
- Swamp
- Lake, pond or water tank
- Streams
- River
- Canal, Ditch
- Dam,Sluice gate,Weir
- Water tank or pond, Well
- Sand and Gravel area
- Aqueduct
- Ferry, Ford, Twin service
- Water tap, well, Water tower
- Spring, Ooze away place
- Triangulationpoint, Bench mark
- Mountain pass, Spot height (x 4312)
- Fence or wall
- Index contour (1500, 1200)
- Intermediate contour
- Supplementary contour
- Embankment
- Cutting
- Depression: Big
- Depression: Small
- Soil cliff: Large, Small
- Rocks: Large, Small
- Cliff: rock, ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radiotransmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

Sheet Index

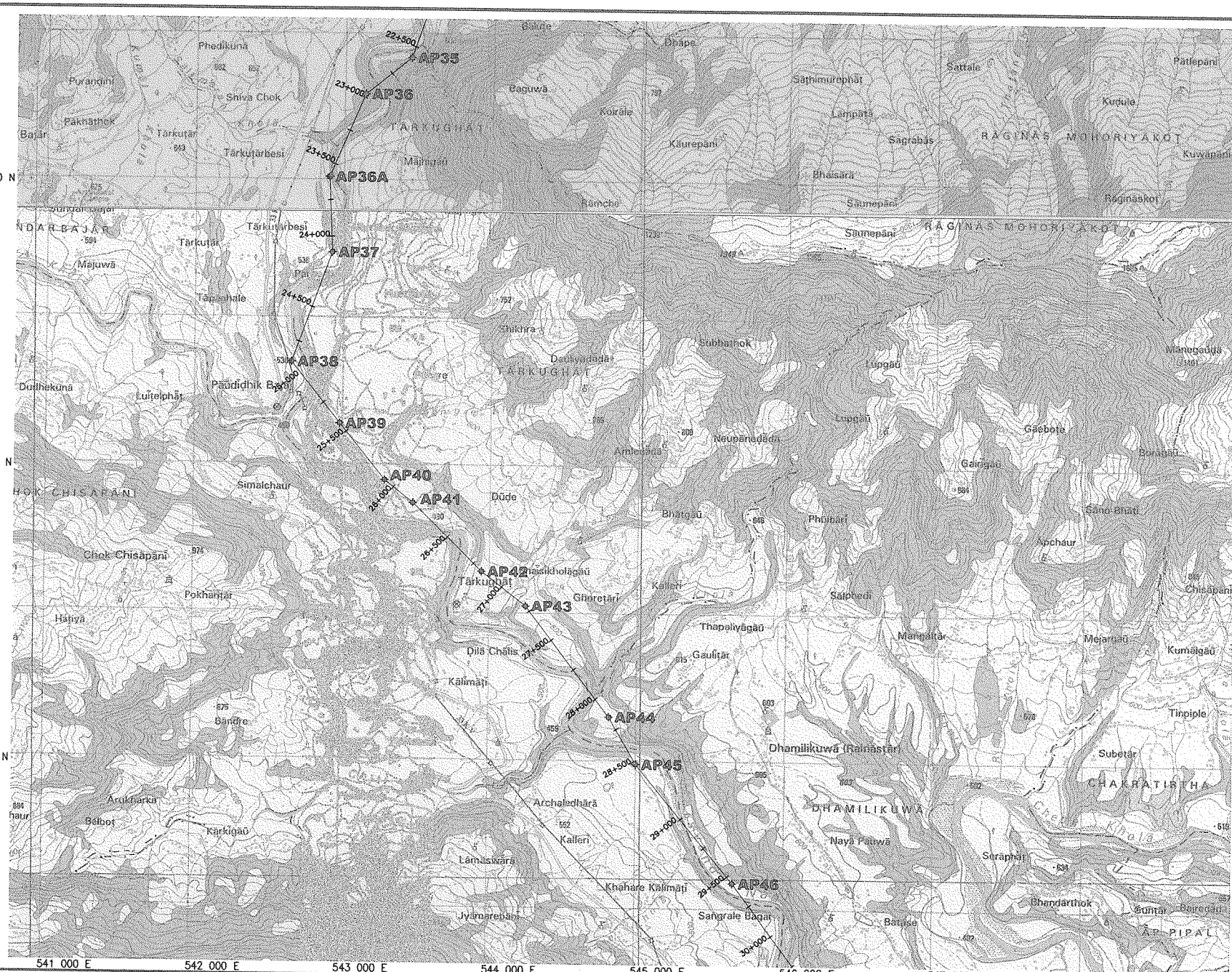
2

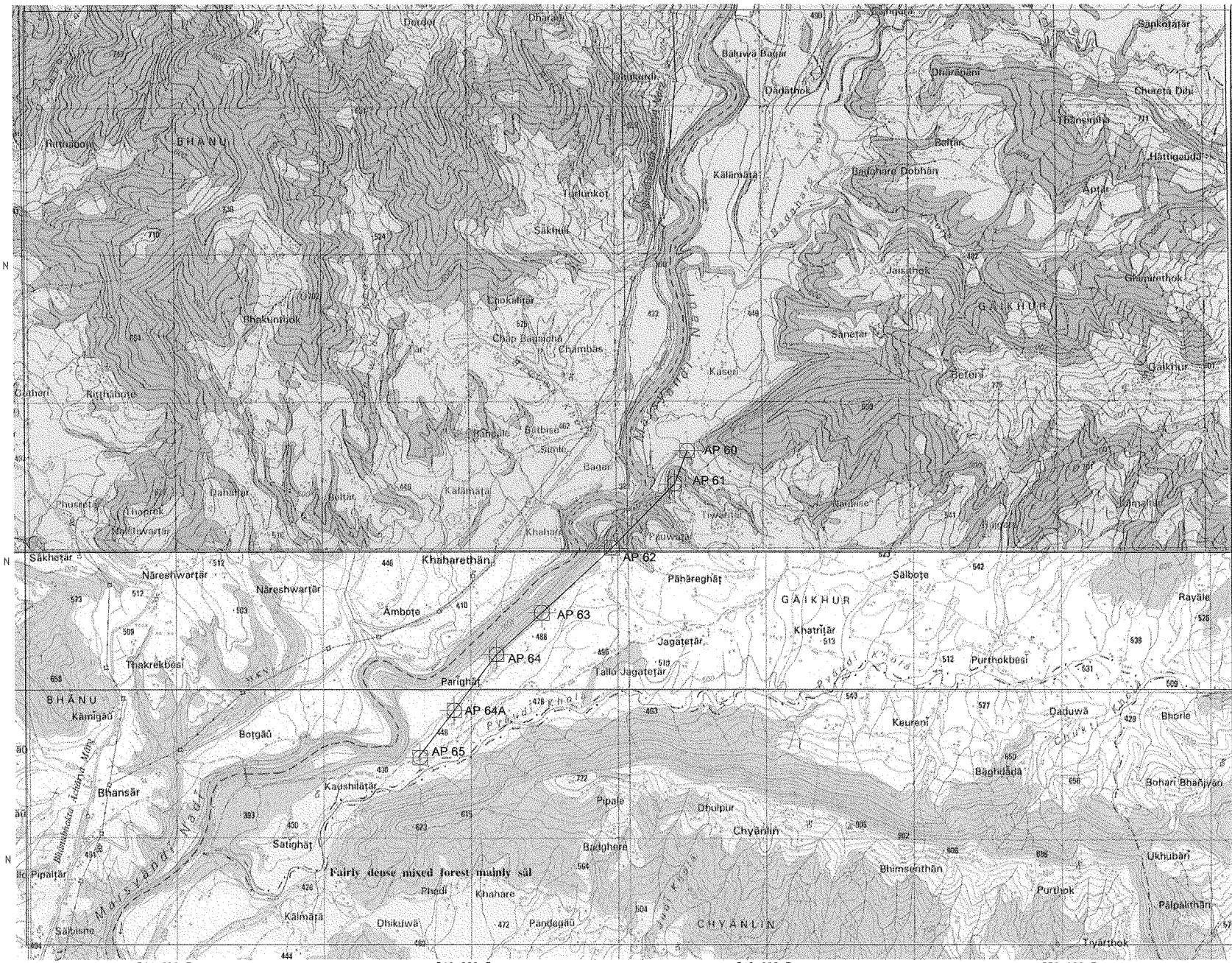
Prepared By:	Submitted To:	Title		Sheet. No.
MARSYANGDI CORRIDOR 220 KV T/L PROJECT	MARSYANDI CORRIDOR T/L PROJECT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TRANSMISSION LINE CORRIDOR PROJECT	1/2

0 250 500 750 1000 1250m

SCALE 1:25,000




AP35
AP36
AP36A
AP37
AP38
AP39
AP40
AP41
AP42
AP43
AP44
AP45
AP46
22+500
23+000
23+500
24+000
24+500
25+000
25+500
26+000
26+500
27+000
27+500
28+000
28+500
29+000
29+500
30+000
3112 000 N
3110 000 N
3108 000 N
541 000 E
542 000 E
543 000 E
544 000 E
545 000 E
546 000 E
547 000 E
548 000 E
TARKUGHAT
RAGINAS MOHORIYAKOT
CHAKRATIRTHA
DHAMILIKUWA
Phedikuna
Purandini
Shiva Chok
Pakhathok
Bajar
Tarkutar
Tarkutarbesi
Majuwa
Tapashale
Dudhekuna
Luitelphat
Paudidhik Ba
Simalchaur
Chok Chisapani
Pokhariar
Haniya
Bandre
Arukharka
Belbot
Karkigau
Lamaswara
Jyamarepani
Khahare Kalimati
Kalimati
Dila Chalis
Kalleri
Archaledhara
Ghoretari
Tarkughat
Dudeli
Ambesana
Neupanedada
Dadiyadada
Shukhra
Subhathok
Lupgau
Bhatgau
Phuhari
Gaibote
Gangau
Sandi Bhati
Apchaur
Chisapani
Salphedi
Thapaliyagau
Mangaltar
Gaulitar
Mejaruau
Kumalgau
Tinpiple
Subetar
Naya Patwa
Seraphati
Bhendarthok
Kuntar
Baregau
Batase
Sangrale Bagar
Kuvanpani
Ragmasko
Saunepani
Sathimurephat
Sattale
Patlepani
Kudule
Lampata
Sagrabas
Kalurepani
Bhaisara
Ranche
Kotre
Baguwa
Bhape
Majhuwa
Tarkutarbesi
Pari
Tapashale
Paudidhik Ba
Dudhekuna
Luitelphat



LEGEND

Highway with Bridge
Feeder Road with Bridge
District Road with Bridge
Other Road with Bridge
Cart Track with Bridge
Main Foot Trail with Bridge
Minor Foot Trail with Bridge
Road under construction
Ropeway line
Built-up area
Building or house
Factory, Chimney
School, Post office
Hospitol, Health post
Cemetery
Temple or Stupa, Mane
Mosque , Church
Orchard, Nursery
Trees:Scattered, Prominent, Row
Tea or coffee plantation
Forest
Bush , Grass , Bamboo
Swamp
Lake, pond or water tank
Streams
River
Canal, Ditch
Dam,Sluice gate,Weir
Water tank or pond, Well
Sand and Gravel area
Aqueduct
Ferry, Ford, Twin service
Water tap, well, Water tower
Spring, Ooze away place
Triangulationpoint, Bench mark
Mountain pass, Spot height
Fence or wall
Index contour
Intermediate contour
Supplementary contour
Embankment
Cutting
Depression: Big
Depression: Small
Soil cliff: Large, Small
Rocks: Large, Small
Cliff: rock, ice
Quarry, gravel or clay pit
International boundary
District boundary
VDC/Municipality boundary
VDC Name BASANTAPUR
Radiotransmission tower
Transformer station
33 kV Transmission line
66 kV Transmission line
132 kV Transmission line

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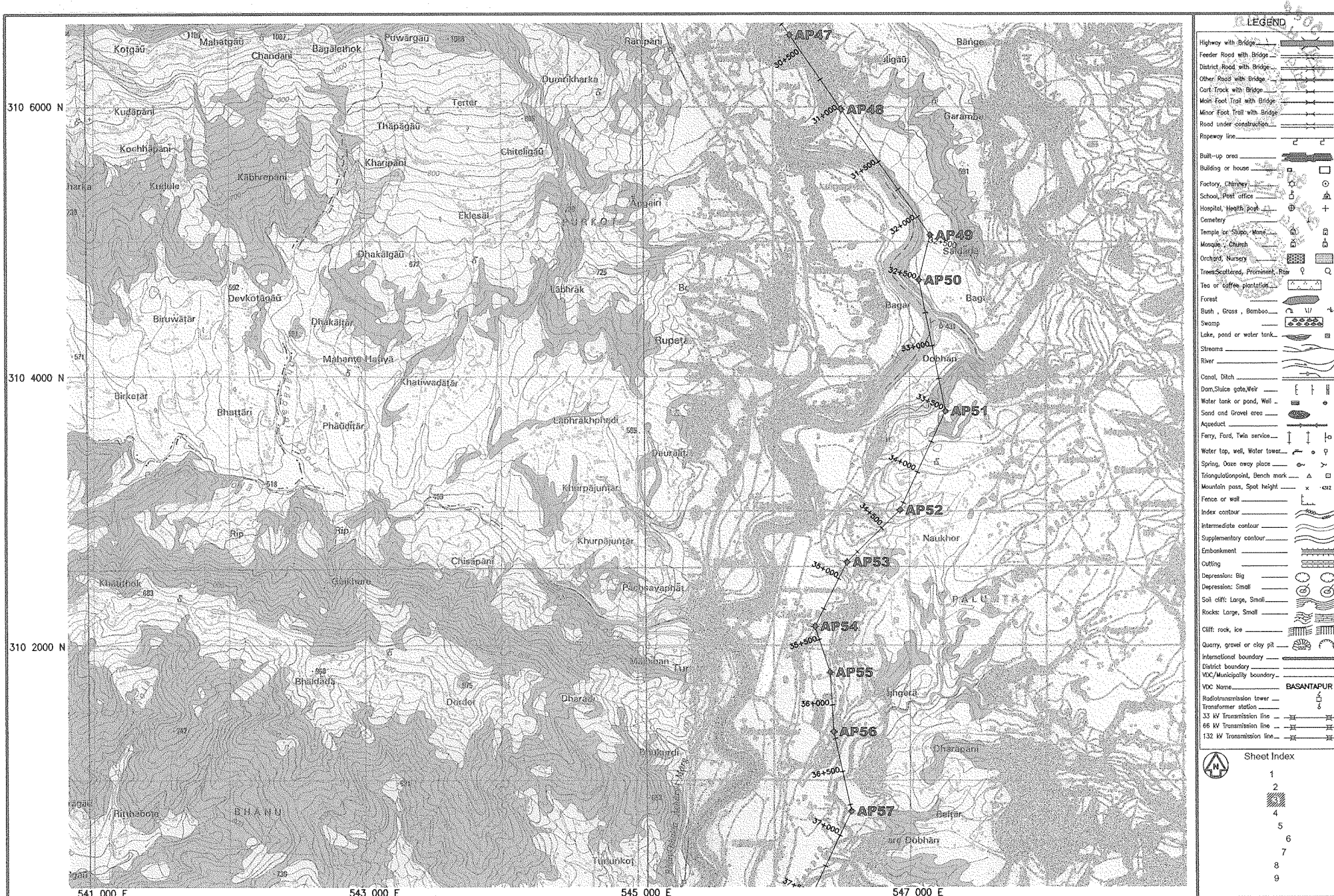
1

Prepared By:	Subimitted To:	Title		Sheet. No.
MARSYANGDI CORRIDOR 220 KV T/L PROJECT NEA ENGINEERING COMPANY LTD. Durbar Marg, Kathmandu (Nepal)	MARSYANDI CORRIDOR T/L PROJECT TRANSMISSION	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV T MISS INE C DOR JECT 0 250 500 750 1000 1250m 1:25,00 Date : February - 2016	2



LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
- Main Foot Trail with Bridge
- Minor Foot Trail with Bridge
- Road under construction
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- Hospital, Health post
- Cemetery
- Temple or Stupa, Mane
- Mosque , Church
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- Aqueduct
- Ferry, Ford, Twin service
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- Depression: Small
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- Rocks: Large, Small
- Cliff: rock, ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radiotransmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

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1 2 3 4 5 6 7 8 9

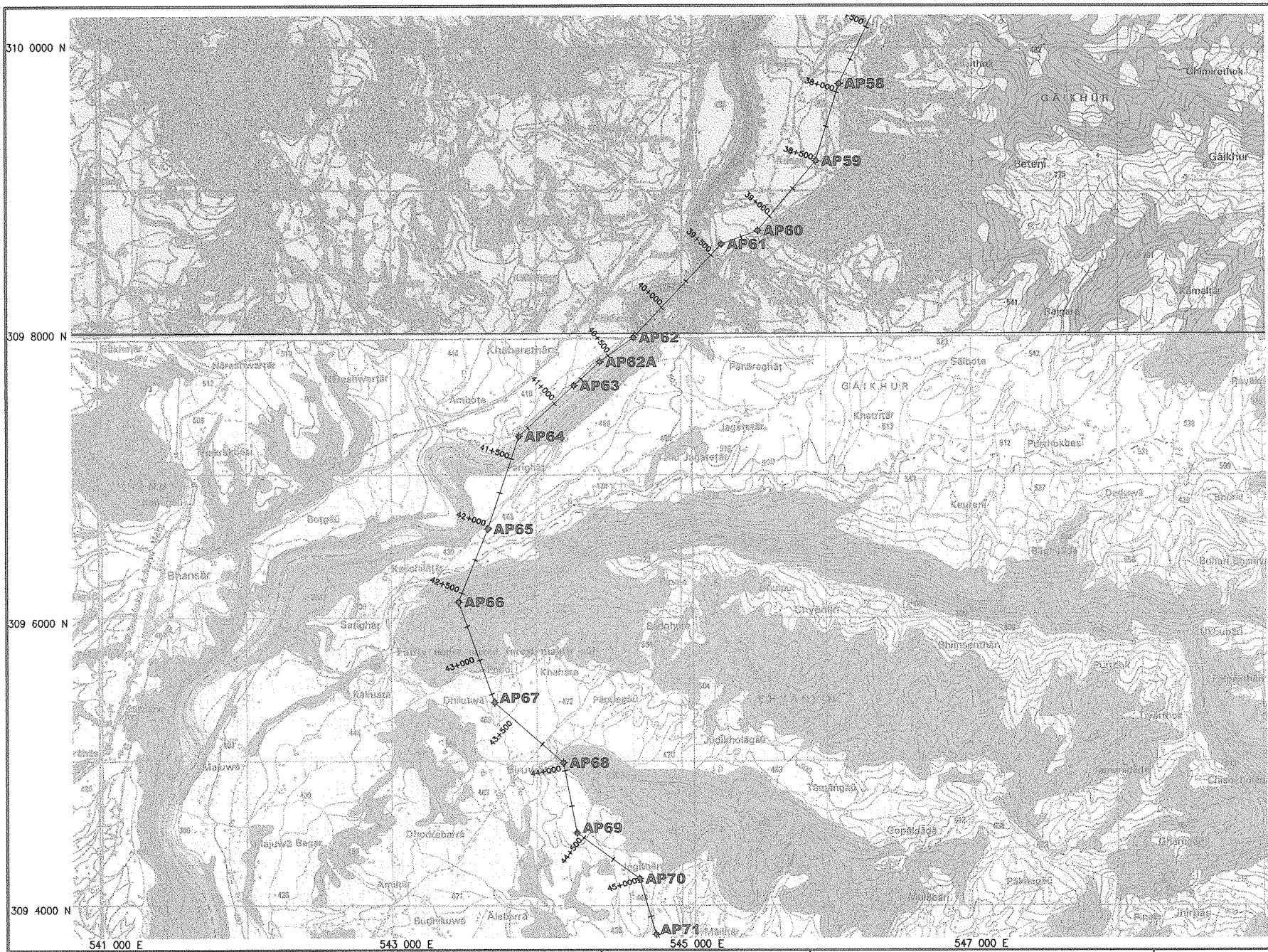
Prepared By:	Submitted To:	Title		Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar [illegible] Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVE ENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	3/9

0 250 500 750 1000 1250m

SCALE 1:25,000

July - 20


नेपाल सरकार
श्रम मन्त्रालय
२०६५



LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
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- Water tap, well, Water tower
- Spring, Ooze away place
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- Depression: Small
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- Rocks: Large, Small
- Cliff: rock, ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radio/transmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

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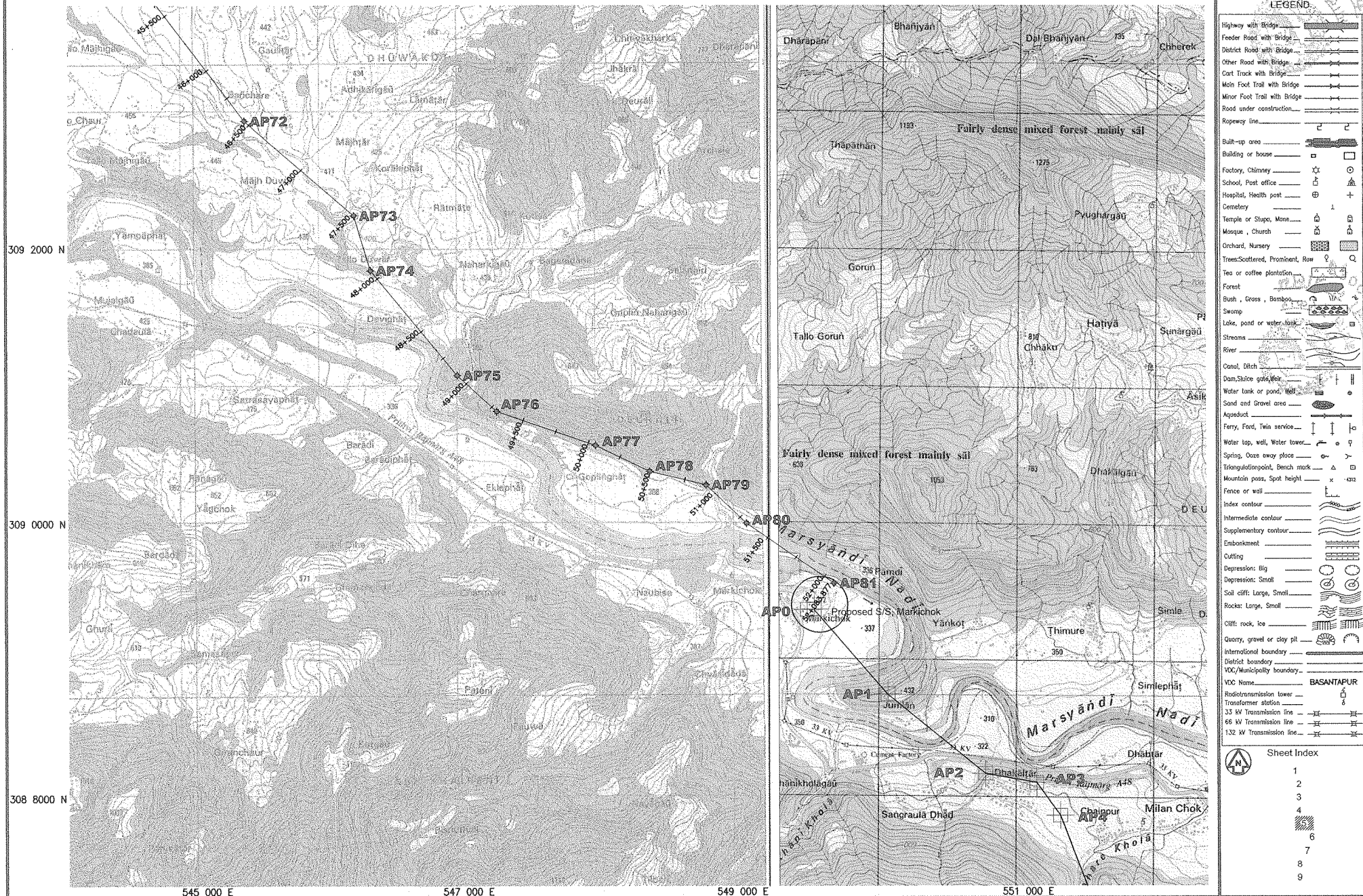
Prepared By:	Submitted To:	Title		Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	4/9

0 250 500 750 1000 1250m

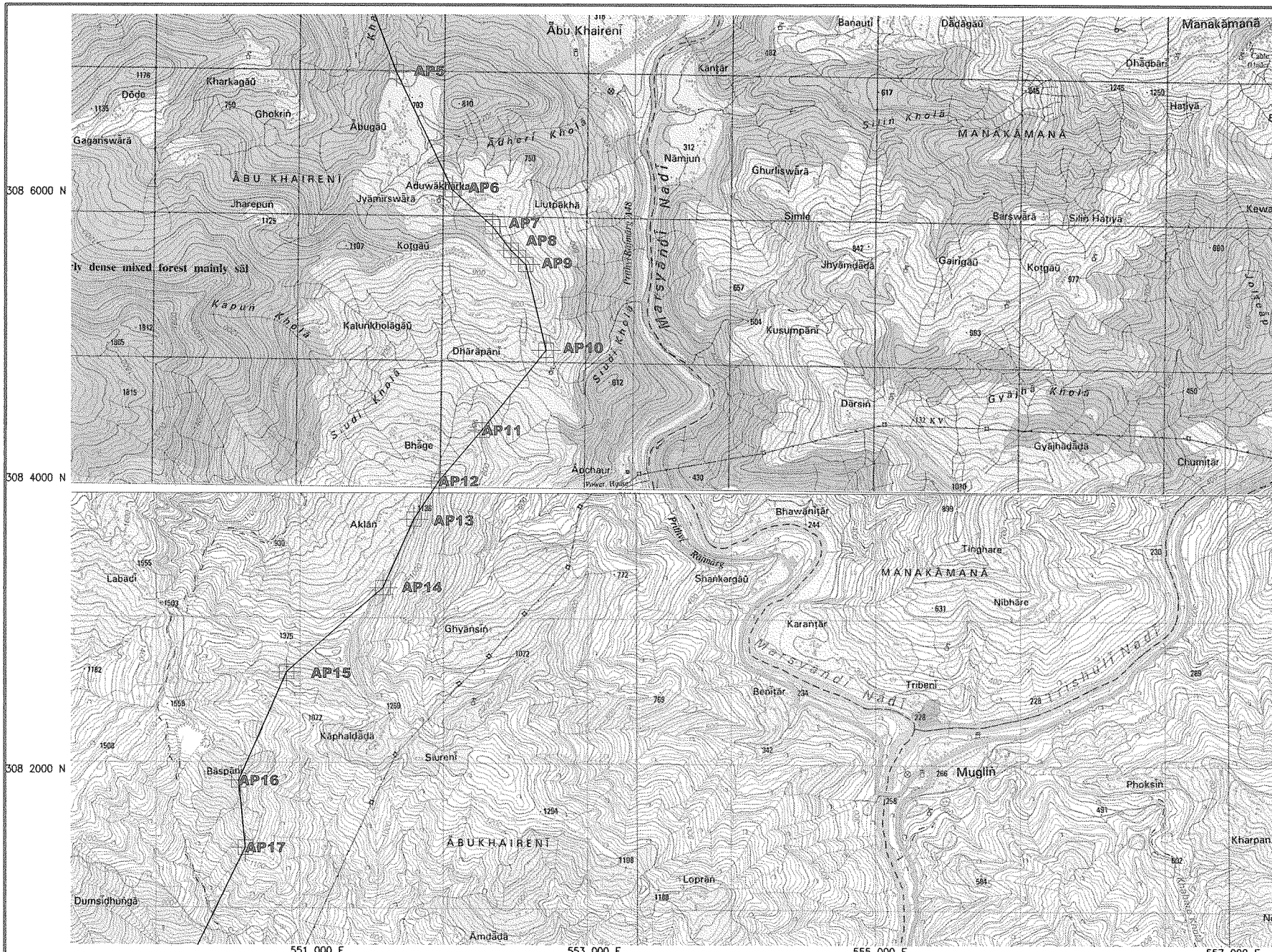
SCALE 1:25,000

July - 2


भारत सरकार
वित्त मन्त्रालय



Prepared By:	Submitted To:	Title			Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durba Kathm epal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIP BHARATPUR SECTION	0 250 500 750 1000 1250m SCALE 1:25,000 July - 2	5/9



LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
- Main Foot Trail with Bridge
- Minor Foot Trail with Bridge
- Road under construction
- Ropeway line
- Built-up area
- Building or house
- Factory, Chimney
- School, Post office
- Hospital, Health post
- Cemetery
- Temple or Stupa, Mane
- Mosque , Church
- Orchard, Nursery
- Trees:Scattered, Prominent, Row
- Tea or coffee plantation
- Forest
- Bush , Grass , Bamboo
- Swamp
- Lake, pond or water tank
- Streams
- River
- Canal, Ditch
- Dam,Sluice gate,Weir
- Water tank or pond, Well
- Sand and Gravel area
- Aqueduct
- Ferry, Ford, Twin service
- Water tap, well, Water tower
- Spring, Ooze away place
- Triangulationpoint, Bench mark
- Mountain pass, Spot height
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- Supplementary contour
- Embankment
- Cutting
- Depression: Big
- Depression: Small
- Soil cliff: Large, Small
- Rocks: Large, Small
- Cliff: rock, Ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radiotransmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

Sheet Index

1 2 3 4 5 6 7 8 9

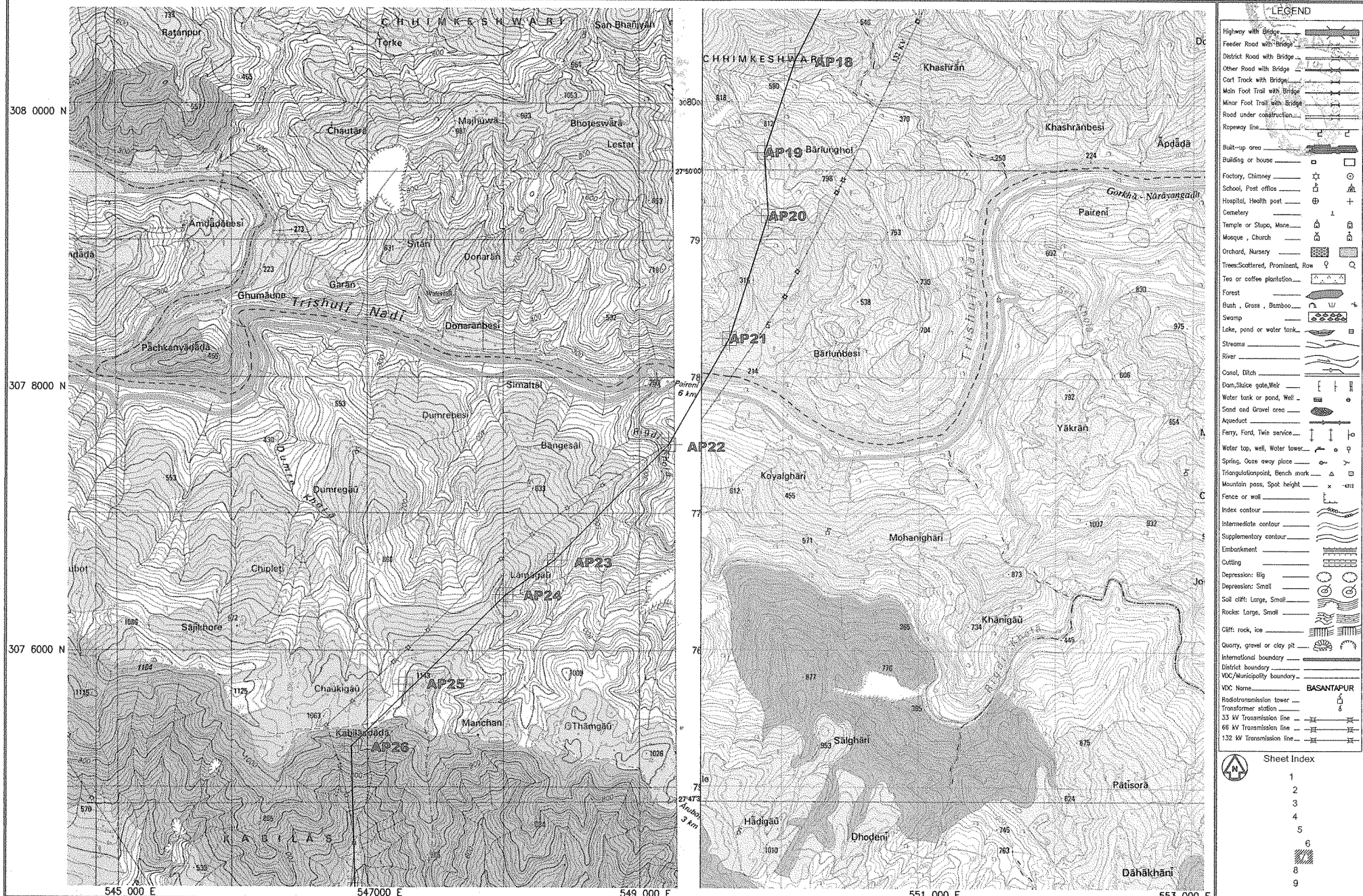
Prepared By:	Submitted To:	Title		Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar Kathmandu, Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR CHARTER SECTION	6/9

0 250 500 750 1000 1250m

SCALE 1:25,000

Date : July - 20





LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
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- Minor Foot Trail with Bridge
- Road under construction
- Ropeway line
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- VDC Name — BASANTAPUR
- Radiotransmission tower
- Transformer station
- 33 kV Transmission line
- 66 kV Transmission line
- 132 kV Transmission line

Sheet Index

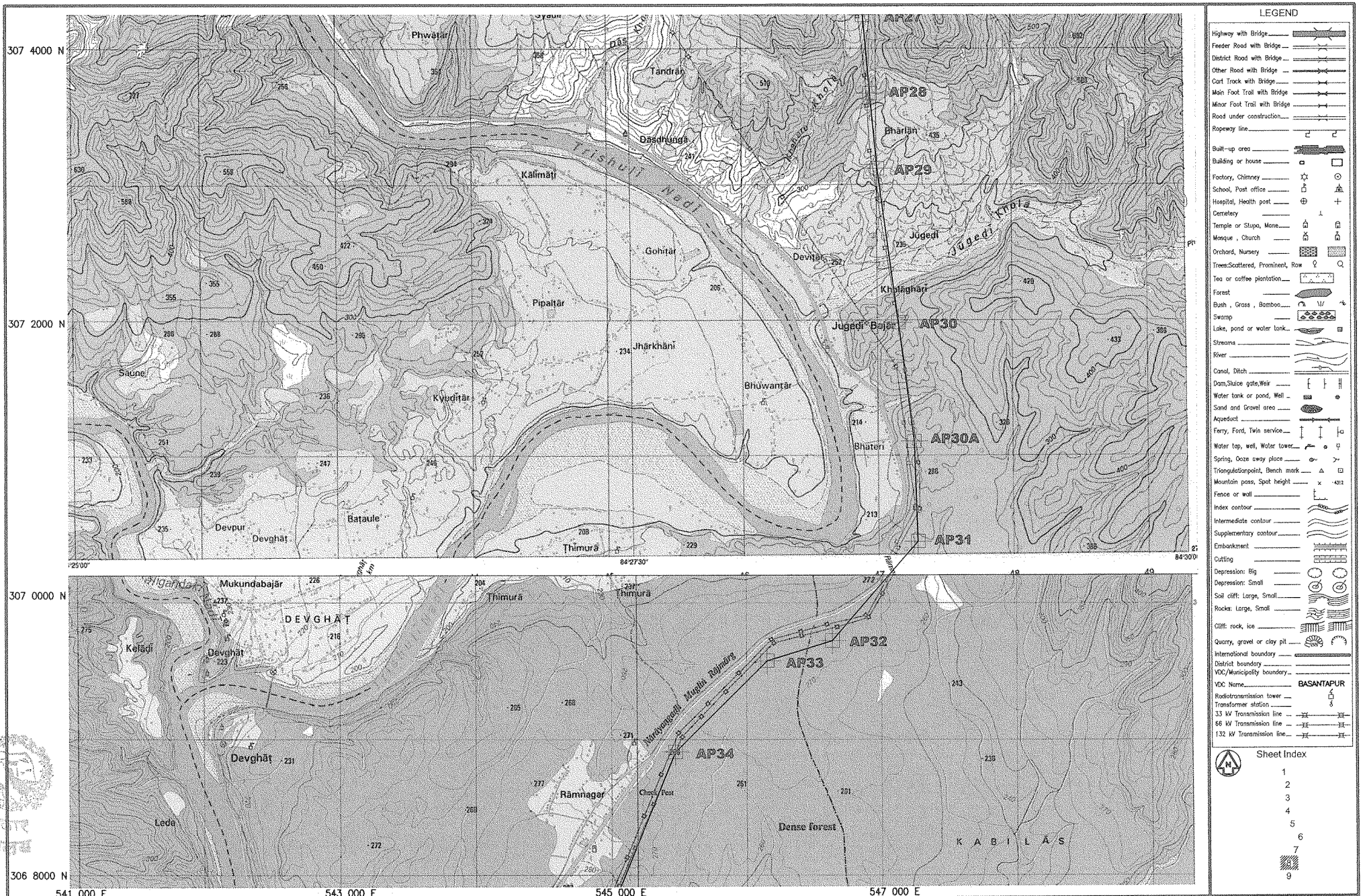
1 2 3 4 5 6 8 9

Prepared By:	Submitted To:	Title			
NEPAL ELECTRICITY AUTHORITY (Durbar ... Kathma... ...pal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPU... BHARATPUR SE...TION	0 250 500 750 1000 1250m SCALE 1:25,000 Date : July - 20..	Sheet. No. 7/9



REVISED SECTION





Prepared By:	Submitted To:	Title		Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	8/9

0 250 500 750 1000 1250m

SCALE 1:25,000

Date : July - 2015





Prepared By:	Submitted To:	Title		Sheet. No.
NEPAL ELECTRICITY AUTHORITY Durbar Marg, Kathmandu (Nepal)	DEPARTMENT OF ELECTRICITY DEVELOPMENT	ROUTE ALIGNMENT MAP	MARSHYANGDI 220 kV TLP UDIPUR - BHARATPUR SECTION	9/9

0 250 500 750 1000 1250m

SCALE 1:25,000

Date : July - 2015

ANNEX J: PHOTOGRAPHS





Photo 1: Public consultation at Archalbot



Photo 2: Forest and agricultural land along the alignment near Archalbot

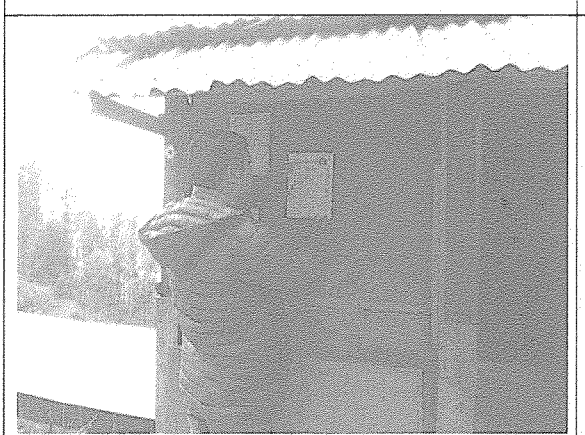


Photo 3: Pasting public notice

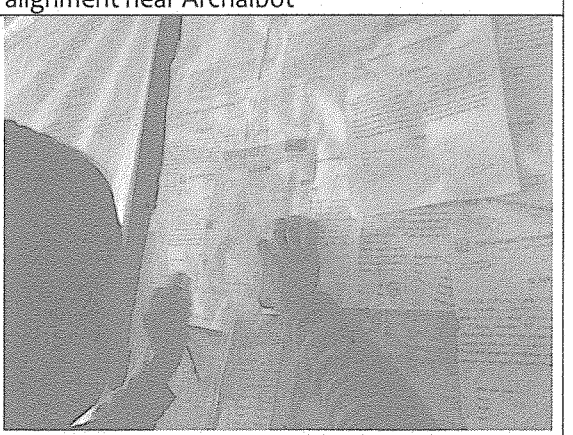


Photo 4: Pasting public notice on the notice board of Phurkot, Tanahaun

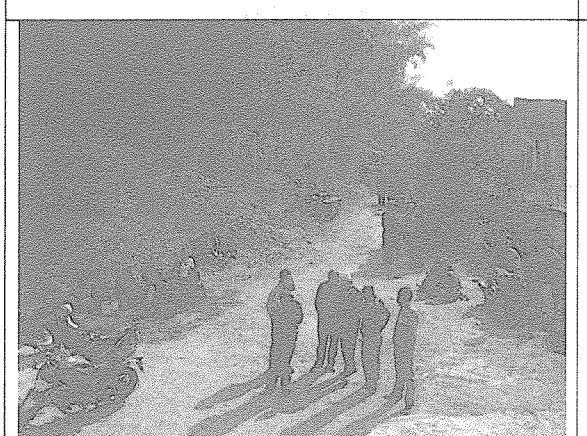


Photo 5: Local people gathering for public consultation



Photo 6: Urban health center at Palungtar Municipality

	(section 6.2.1.2) should be backed up with baseline. Such as flooding and sagging problem from AP - 62 to AP - 63 should be supported with hydrological information of Marsyangdi River. It would have been better if landslide hazard map of project area is provided as some towers (mentioned in section 6.2.1.2 - D) are vulnerable to slope failure.		APs' location had been carried and suitable location was specified as per suggestion of Geologist team. (Soil, Rock & Concrete Laboratory, NEA, Geological Survey, 2015)
8	It would have been better if impact on generation of existing hydropower projects while crossing the TL through 132 kV and 33 kV line is also included	Pg.79	Updated (I. Interference to road crossing, transmission line, telecommunication, radio, TV and other utilities)
9	Section 6.2.1.3 (no C) should also consider possible impact on flying of helicopters.	Pg.80	Updated (K. Impact on aviation)
10	In section 8.1.1 "the construction activities will be done during the period of less agr-activities", this should be reflected in construction schedule.	Pg.105	Rice cultivation period will be avoided. • In order to avoid the hindrance to agricultural activities the construction activities will be done during the period of less agro-activity (avoiding rice cultivation season)
11	It would have been better if the following GIS colored maps were included in the report a. Project Layout map (showing the tower or tower foundations if possible) b. Project area VDC map c. Project area Delineation map with respect to rivers, roads, highways, conservation area, forest and periphery features d. Synoptic view of Land use type, showing existing structures, muck disposal area, settlements, rivers from where proponent want to extract river bed material etc e. Project layout map showing details on access	Annex I	• Layout map with TL has been included. • Project area VDC map has been included pg. 5 • Google image showing TL alignment and neighboring protect forest corridor has been include in pg. 54



Geologically unstable and landslide prone area between Chhimkeshowri and Dahakhani along the TL route

	legislation i.e page 22, forestry sector	Pg. 32	4.6.8. वन क्षेत्रको जग्गा अन्य प्रयोजनको लागि उपलब्ध गराउने कार्यविधि, २०&$ 4.6.9. राष्ट्रिय ऊर्जा सङ्कट निवारण तथा विध्दुयत् विकास दशक सम्बन्धी अवधारणा पत्र एवम् कार्य योजना, २०७२
19	Existing Environment 5.1. Section 5.2 biological environment page 46, better to list species considering the climatic condition e.g. Kharsu etc. 5.2. Section 5.2.2. table 5.5, elaborate section, date of HH, main species occurred and management status: 5.3. Section 5.2.2 summarize section district wise total numbers of mammals, reptiles and amphibians, bird and fish species with major dominant species occurred at the project structure sites more focusing protected species and place table 5.7. 5.4. All sections of biological environment there still exist errors in scientific names please recheck and represent in correct forms.	Pg 55-60	Updated
20	Environmental Impacts 6.1. Section 6.2.2, the identified impacts could be practical and site specific, avoid mitigation measures mixed with the impacts. 6.2. Describe in the text considering table 6.2 which species will mostly loss during construction. More specific Page 69 C-Species, D-Quantity E-impacts of operation phase? And F-	Pg.82 Pg.84	**Details of vegetation loss is given in ANNEX H** **Issue associated with forest encroachment and forest fire** **Illegal hunting and poaching activities**

COMMENTS RECEIVED FROM DOED ON DATE 2074/01/19

S.N	Comments from DoED	Changes made pg	Remarks
1	Please clarify whether the survey license covers Markischok and Aptari Substations or not? If those substations are under same license condition, the IEE should covers environmental issue of construction and operation of all substations. Section 2.1 paragraph two mentions that all three substations are under construction (without approval of IEE ??).	Pg.3	Separate survey license were issued & separate Environment Assessment had been carried out
2	There is discrepancy in information mentioned in chapter 3 and chapter 5. The baseline does not mentions hydrology, meteorology (temperature, rainfall, moisture), air, noise and water quality etc	Pg. 42,53	Updated
3	Please review section 3.4.2 and section 3.5, might have been copy/paste from ToR. It would have been better if the study cost was also provided	Pg.21-22	3.4.2.&3.5 corrected
4	Section 5.1.2 is incomplete. 5	Pg.43	Updated
5	The statement "The status of air, water, noise along the transmission line alignment is fair" (section 5.16) contradicts with the following statements in same section such as noise and air pollution due to vehicular movement and dust and water pollution due to solid waste dumping. It would have been better if such statement were backed up with measurement of air, water and noise quality	Pg. 53	corrected
6	It would have been better if hydrology and associated impacts of Marsyangdi and Trishuli river is provided (such as 100 years flood level) as number of towers pass along their banks		None of APs are located in river flood plain.
7	Elaboration on impact due to landslide and soil erosion		Detail Geological study about the land stability of

	as "Limitation of Study' at the end of this chapter or in a separate section of certain chapter of this IEE Report. Otherwise, it will create confusion during the implementation of the proposed project		
25	Chapter 2, section 2.4, pg no. 7 Mention about the detail accessibility status of various Towers as the project may require construction of foot trails along forest and cultivated land for the installation of towers in construction phase which can arise various environmental issues; such environmental issues needs to be addressed in the IEE Report		Existing foot trail used by locals will be used by project so there will be no any environmental issues.
26	Chapter 2, section 2.7.7, pg no. 10 Present human resource in man-days	Pg. 10	Included (2.8.7 Human Resource Requirement)
27	Chapter 2 • Provide the summarized version in a new section "land requirement" for permanent and temporary acquisition for tower, RoW and facilities (camp, storage, disposal site) in tabular form • Moreover, provide the tentative land requirement (both permanent and temporary in hectare or Ropani) in tabular form for various category of land such as agricultural land, forest, pakho, river, etc which will provide the clear picture of environmental issues addressed in this IEE Report • Additionally, Barren land can be private land as well • government owned and can be forest land as well. It would be better to verify the category of land through cadastral Map to avoid any confusion regarding acquisition of land during project implementation	Pg.10 Pg. 87 & 88	Updated (Table 2.5: Details of Land Requirement) Table 6.5 &6.4: Houses/structures under RoW of transmission line along Markichowk – Bharatpur section

12	Provide the brief information about how the project will manage the construction power for construction and maintenance of the project?	Pg. 8	National Grid
13	The baseline information on seismicity, its influence to the project considering the effective design seismic coefficient and its associated issues has to be provided in the reports	Pg.48	Seismic analysis has been updated.
14	Executive Summary: Better to make similarities between Nepal and English summary i.e. 8.0 third para.	Executive Summary	Updated
15	Chapter 1 Introduction 1.1. Page 1 section 1.3 Rationality of IEE study-specify rationality concerning Rules of 1997 in IEE perspectives.	Pg.1	The proposed transmission line project does not cross any protect areas, wetlands, historically and archaeologically important sites and environmentally sensitive/fragile areas. Further, proposed TL project does not displace more than one hundred people.
16	Chapter 2: Project Description 2.1. Section 2.6 Page 8 impact area: Specify impact area concerning permanently forestland occupied by the tower and other land use required for immediate influence area as per baseline and identified impacts. Does 30m. ROW of TL alignment DIA and 100m IIA cover all information's described under baseline and impacts?	Pg.8	The detail baseline covers the information regarding DIA zone and 100 m IIA.
17	Methodology 3.1. Section 3.2.2 biological environment, include data collection and analysis methods as illustrated in ToR. 3.2. Page 15, 18 Elaborate data collection and analysis methods for wildlife and avifauna in separate heading.	Pg. 15-17	Updated
18	Policies 4.1. Revise relevant policies including amended policies and	Pg.24 Pg. 31	**4.3.2. Forestry Sector Policy, 2071(2014)**

	religion, mother tongue, education in tabular format with comparative analysis ■ Provide information regarding energy use, water supply, sanitation (can be refereed from CBS, 2011) ■ The write-up presented for occupation, Income generation, agriculture & livestock is quite generic; It shall be presented with quantified data.		Socio-economic information is site specific.
34	Chapter 5, Section 5.3.2, pg 53 ■ Why household survey was not carried out with the owners of affected housing structures?? It shall be better conducted to know their socioeconomic status ■ No list of affected households due to land acquisition; It is missing in the reportp ■ No list of affected households due to acquisition of Housing Structures, Cowshed, etc; It is missing in the Report	Pg.65-72 Pg.87-88	It is included in 5.3.3. Information on houses/cowshed under RoW (Table no 6.4 & 6.5)
35	Chapter 5, Section 5.3.3.8.b, Page No.58 ■ Present tabular format for energy use for lighting	Pg70-71	Updated
36	Chapter 6, Section 6.2.3:2.A, Page No.72 ■ It is written as 61 owners will be affected by APs but only 42 are mentioned in household survey. Make uniformity of both of write-up or clearly mentioned that only 48 households were interviewed out of 61 affected households and give adequate reason why other was not interviewed??		61 land parcel will be affected whereas owners are only 48; some of land parcels' owners are repeated.
37	Chapter 6, Section 6.2.3.2.B, Page No.73 ■ Give description about the type of affected housing structures (permanent/ temporary type; wall type, foundation type, floor type, slab type, nos. of storeys, etc)		It will be included in resettlement plan
38	Chapter 6, Section 6.2.3.2.K, Page 76 Clearly mention about the vulnerable groups??? It is better to	Pg.62	Among these Chepangs are the earliest known inhabitants of Nepal and one of most backward

	main species. 6.3. Section 6.2.2.3; A Revise, How?, Add hunting poaching, fire hazard etc		
21	Mitigation and Enhancement Measures 7.1. Page 90. 8.2.2 Statement is vague and irrelevant so better to simplify such sentences with site specific details in other sections also. 7.2. Mention compensatory plantation/ afforestation activities with 5 years cost and other required details reflecting table 8.2 in the text.	Pg. 105-152 Pg.112-113	Mitigation measures are site specific as far as possible **Compensatory Plantation with 5Year Cost (Table 8.3)**
22	Environmental Monitoring 8.1. Need for elaboration considering impact types, prepare comprehensive monitoring plan considering identified and predicted impacts and mitigation measures, parameter, schedule methods with responsibility for implementation page 104, Revise table 9.1 8.2. Cost estimate for mitigation and monitoring should be appropriate as per IEE format such as breakdown of experts cost, monitoring agencies cost, etc.	Pg. 128& pg. 152 Pg 153-154 Pg. 165-166	Section 8.4 (Mitigation Matrix) Monitoring cost is presented in table 8.13 Environmental monitoring cost is presented in table 9.2 (with detail breakdown) Table 9.1 revised (159-164)
23	Conclusion and Recommendation 9.1. Better to address Page 11, 3.1.2.2 of ToR in Baseline, impact mitigation and monitoring 9.2. Consider Page 35 C of Tor in IEE study	Pg.167	Addressed
24	Chapter 2, Section 2.2, Pg 3 & 4 Address about the dissolution of VDCs in the current context by GoN regarding the formation of new 'Rural Municipality' and 'Municipality' in this section or the same can be addressed	Pg.6 Pg. 11	Updated (Table 2.2) 2.10. Limitation of EIA Study The EIA study had been limited to project affected then VDCs.

42	Chapter 9, Section 9.7, Page No.108 Table 9.2: Mention the environmental expert involved in monitoring; why to include project coordinator in monitoring? ■ Team leader shall be environmental expert ■ No Biologist in the monitoring team? Mention Botanist/Forester as they can address the issues related to affected community forest user groups	Pg.165-166	Monitoring table updated (Table 9.2) • Forester was involved during EIA study for the assessment of biological environment, detail of study team is given in section 3.5
43	Overall- Replace angle point by angle tower		Replaced by angle tower
44	What about the construction power	Pg.8	Project area is already electrified region so power will be supplied through National Grid.
44	Write the VDC name in nepali font as well		Updated
45	In 5.1.1.a pg 36 missing AP in table 9		Included
46	In baseline survey study add the details of houses under the TL	Pg.87-88	It has been included in table 6.5
47	Check in executive summary Nepali ch-6		Updated
48	In English Executive summary check " A total of 48 households are affected by the project" while in Nepali summary "६२ वटा टावर बस्ने जग्गा धनी मध्ये ४८ घरदुरीको सर्वेक्षण गरूएको"		Updated
49	Add the details table of land use in given tabular form	Pg. 10	Included
50	Give the details about the source of construction materials	Pg.9	**Construction materials will be collected from Marsynadi and Trishuli Rivers. The detail impact assessment (IEE) study of construction materials collection will be done separately by DCC Lamjung, Gorkha, Tanahu and Chitwan.**
51	Insert geological map of Nepal and show the project location,	Pg 44	Included

	• Provide brief detail about physical infrastructures (house, cowshed, etc) acquired by the project; The physical infrastructures acquired by RoW needs to be briefly io tt presented as it is clearly mentioned that the project will affect such structures (Section 6.2.3.1.1, Page No.72)		
28	Chapter 2, Section 2.3, Page No,6 ▪ Include Project Affected District in Salient Feature (Table 2.2)	Pg.6	Included
29	Chapter 3, Section 3.2.3.1, Page No.16 ▪ The data mentioned in this section is not presented completely in socioeconomic Baseline (Section 5.3 page No. 50 to 60); Correct this section as per Section 5.3	Pg.17-18	Updated
30	Chapter 3, section 3.2.3.3 pg no 17 ▪ Briefly mention how the landowners (PAFs and SPAFs) are identified?? Is it through cadastral Map or any other method???	Pg.18	The landowners (PAFs & and SPAFs) were identified through social survey. (3.2.3.3 Identification of PAFs and SPAFs)
31	Chapter 3, Section 3.2.3.3, Page No.17 ▪ Focus group discussion (FGD) is not carried out with affected Community Forest User Groups to know their key issues & concerns; is it missing??? Better to include their issues through FGD	Annex K	Detail table of FGD location, issues is incorporated in annex.
32	Chapter 5, Section 5.3, pg 50 ▪ Present brief socioeconomic information (Households, Population, caste/ethnic group) in tabular format and brief write-up of project affected districts namely Lamjung, Tanahau, Gorkha and Chitwan; Better to provide information of project affected settlement	Pg 60	Included brief write-up of project affected districts namely Lamjung, Tanahau, Gorkha and Chitwan
33	Chapter 5, Section 5.3.1, pg 50 ▪ Provide the data related to caste/ethnic composition,	Pg.69 Pg.70	*5.3.3.7 Drinking water* *5.3.3.8 Source of Energy*

	existing reservoir project		arises due to implementation of planned storage projects, proponent will relocate the tower on its cost.
64	Work schedule given are somewhere for 30 month somewhere it is 36 months in salient feature it is 24 months		Updated
65	Details of Annexes are required in table of contents		Included (Table of contents)
66	Provide shape files of the alignment separately		Included (ANNEX I)
67	Mention land requirement /forest loss during development of foot trails for accessing APs if required		There won't be any forest clearance activities for foot trails.
68	Include details of suspension tower and requirement land/vegetation loss due to the suspension tower	Pg. 10 Pg. 81-82	Table 2.5 & table 6.2
69	Consistency of TL length throughout report		Updated
70	Inconsistency in length of TL		Updated
71	No of angle points in salient features is 99 where as in map it is 80. Review it		After final survey 101 angle points had been purposed considering suitable route and avoiding houses as far as possible. It is updated in report with comments incorporated.
72	No of Ap in 8.3.1 section and in tubular format 5.1 differ from each other. Recheck it		After final survey 101 angle points had been purposed considering suitable route and avoiding houses as far as possible. it will be updated in report with comments incorporated
73	ToR approval letter is required		Updated
74	In section 2.7.7 human resource requirement: Mention no of skilled, semi-skilled and un-skilled human resources required	Pg.10	Included
75	Construction schedule is different in annex than the approved ToR		Project activities mentioned in Approved ToR are more elaborated in construction schedule given in EIA Report.
76	Include list of annexes also		Included

	provide as per the project context		indigenous nationalities of Nepal. The total population of Chepang is 68,399 (2011, CBS) out of which male population is 34,620 and that of female population is 33,779. Chepangs live in the wildest imaginable state of nature and many of them still lead a primitive life. In case of project affected areas of Chitwan District total population of 556; 271 male and 285 female are residing in Kabilas VDC. Chepang are the marginalized communities and are very backward in terms of livelihood status. Chepang are the most vulnerable group residing around the project area.
39	Chapter 8, Section 8.3.1.A, Page No.94 ■ Any reason for variation of rate of land in Udipur-Markichowk and Markichowk-Bharatpur Section? The reason can be presented in by adding one new Remark Column		Variation was because of different proportion of khet and bari.
40	Chapter 8 ■ Better to provide mitigation measures in matrix form at the end of assessment of each environment (Physical, Biological and Socioeconomic & Cultural)	128& pg. 152	Section 8.4
41	Chapter 8, Section 8.3.1.B, Page No.94 ■ Brief resettlement plan needs to be prepared in this section as well; and detail analysis can be provided in resettlement plan ■ Mitigation measures/Cost regarding acquired housing structures needs to be provided	Pg.123-128	Updated Further detail of cost of housing structure will be included in Resettlement Plan



	give brief description about geology along the TL alignment		
52	Give legends of the fig 5.3 and 5.4		It has been labeled.
53	5.1.2.1, the mentioned fig 4.3 is not related with description so it should be rechecked? Also it is mentioned that " Details about the section wise geology will be provided in the IEE report" so,rephrase the sentence which IEE will be done later?	Pg. 47-48	Updated
54	5.1.4 As mentioned "Several landslides and erosional features are observed "so photographs and characteristics of landslides should be clearly mentioned?		Included in Annex J
55	Fig 5.4 mentioned in 5.1.4 does not match with description	Pg.44	Updated
56	5.1.5 give detail about how many crossings of road, river, Tl etc in Tl alignment (5.4 table)	p.49	A detail of crossing has been included in table 5.5.
57	Impacts due to the landslides and soil erosion; only bioengineering is proposed for slope protection as it is mentioned that TL passes through rugged terrain with large altitudinal variation, high sloppy region so only bio engineering should not b only the appropriate method?	Pg. 107-108	Required slope stabilization practice has been recommended
58	Annex F; मा भनिएका नामहरुको Detail information i.e. कति जग्गा पर्छ रामरी खुलाउने		It will be included in RRP.
60	Recommendation letters from CAAN is required. Recommendation from other relevant agencies is required		Updated
61	Letter of Ministry of Energy while approving the ToR of this IEE		Updated
62	There is different details of APs, in salient feature, it is 99, in layout map it is 80 and in presentation it is 101 APs		Number of angle points had been changed during final survey considering more suitable route and avoiding housing or other structures as far as possible.
63	Declare about not lying submergence area of proposed and		If the situation of any angle tower submergence



77	Include rationality in relation to protected areas also		Updated
78	Update the forest related legislation such as Forest sector policy. Include other relevant forest related legislation	Pg.24 Pg. 31 Pg. 32 Pg.1	Updated
79	As leasehold forest is given to poor people, address the issue related to the leasehold forest in relation to poor people	Pg.57	**5.2.3. Leasehold forest**
80	Include issue related to Chepang people	Pg.90	**Impact on gender and vulnerable groups**
81	Include the recommendation letter for each VDC/municipalities affected		Updated
82	Include ToR approval letter		Updated
83	Include color topographic maps. Also, include the vulnerable areas in the color Topo maps		updated
84	In pp 18 it is stated that market survey result in shown in appendix EIII. However, not available		Market survey was carried out according to the checklist presented in Approved ToR.
85	The families whose house need to be relocated (housing structure also), i.e. fall under ROW should be listed as SPAF. Include the details about the SPAF as they are more affected than the PAF	Pg-65-72	It is included in section 5.3.3.
86	The biological environment (in existing environment condition) needs to be rewrite. The biological environment should be written as district wise and by describing environmental sensitive areas (eg migration route) clearly. More information about wildlife including herpetofauna and fishes should be included. The scientific name should be made italic. Include IUCN, CITES and national legislation status of all flora and fauna.	Pg55-60	Updated



