༄༅། །ཁུམ་བུ་པ་སངས་ལྷ་མོ་གཱ་ཨུཾ་པཱ་ལི་ཀཱ།
खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
गाउँ कार्यपालिकाको कार्यालय, चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Churikharka, Solukhumbu, 1 No. Province, Nepal

प.स: ०७९।८०
च.नः ६६

खुम्बु पासाङल्हामु गाउँपालिका कार्यपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल

मितिः २०७९।०४।१६

श्री मोन्जो खोला मिनि हाइड्रो प्रा.लि.,
तिलगंगा, काठमाण्डौ ।

विषयः प्रतिवेदन स्वीकृति सम्बन्धमा ।

यस खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ३ (साविक चौंरीखर्क गा.वि.स. वडा नं. १) मा निर्माण हुने ९४२ कि.वा. क्षमता भएको मोन्जो खोला मिनि जलविद्युत आयोजना प्रबर्द्धनको लागि त्यस प्रा. लि. ले पेश गरेको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन **"संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि, २०७८"** को दफा ७ को उपदफा ४ बमोजिम स्वीकृत गरिएको व्यहोरा अनुरोध छ ।

मोहन प्रसाद चापागाईं
प्रमुख प्रशासकीय अधिकृत

BRIEF ENVIRONMENTAL STUDY (BES) STUDY

Of

MONJO KHOLA MINI HYDRO PROJECT (942 kW)

Submitted To

Khumbu Pasang Lhamu Rural Municipality
Office of Rural Municipality Executive
Nachipang, Solukhumbu
Province No. 1

Submitted By

Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga
Bagmati Province
Tel: 01-4464222, 01-4464333

June 2022

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

कार्यकारिणी सारांस

१. आयोजना प्रस्तावक

सोलुखुम्बु जिल्लाको खुम्बु पासाङ्गल्हामु गाउँपालिका वडा नं. ३ मा प्रस्ताव गरिएको मोन्जो खोला मिनी हाइड्रो योजनाको प्रस्तावक तथा त्यसको कार्यकारिणी संस्था मोन्जो खोला मिनी हाइड्रो प्रा. लि. रहेको छ । प्रस्तावकको ठेगाना यस प्रकार रहेको छः

प्रस्तावकको ठेगाना

मोन्जो खोला मिनी हाइड्रो प्रा. लि.
काठमाडौं-८, तिलगंगा
बागमती प्रदेश, नेपाल
टेलिफोनः ०१-४४६४२२२, ०१-४४६४३३३
ईमेलः monjokholaminihydro@gmail.com

२. प्रस्ताव तथा संक्षिप्त वातावरणीय अध्ययनको सान्दर्भिकता

प्रस्तावित परियोजनाको मुख्य उदेश्य नै मोन्जो खोलाबाट ९४२ कि.वा. विद्युत उत्पादन गरि छ्युमा, मोन्जो, ब्यांकर, टोकटोक, ठुलो गमेला, सानो गमेला, फाक्दिंग, छेर्मादिंग, घाट, ठाडोकोशी, छेप्लुंग, चौरीखर्क सहित खुम्बु पासाङ्गल्हामु गाउँपालिकाको वडा नं. ३ का अन्य वस्तीहरु साथै वडा नं. २ को मुसे वस्तीमा उज्यालो, खान पकाउन र तताउने प्रयोजनको लागि आवश्यक पर्ने विद्युत आपूर्ति गर्नु रहेको छ । हाल संचालनमा रहेका माइक्रो हाइड्रो बाट उत्पादित विद्युतबाट उज्यालोको लागि समेत अपर्याप्त रहेको छ । खाना पकाउन र तताउने प्रयोजनमा प्रयोग गर्ने कुरा असम्भव रहेको छ । तसर्थ प्रस्तावित परियोजना बाट उत्पादित बिजुली उज्यालोको लागि मात्र नभई पकाउन, कोठा तताउन र अन्य विद्युतीय सामाग्रीहरु संचालन गर्न समेत प्रशस्त पुग्ने देखिन्छ र हाल प्रयोगमा रहेको जैविक इन्धनमा आधारित उर्जालाई स्वच्छ उर्जा द्वारा विस्थापित गर्न सकने छ । साथै एल.पी.जी. अत्याधिक प्रयोग भए पनि महँगो ढुवानीको कारण असाध्यै महँगो पर्ने गरेको छ । प्रस्तावित परियोजनाबाट उत्पादित विद्युत पर्यटकीय सेवा संग सम्बन्धित लघु उद्योगहरु जस्तै बेकरी, हस्तकला उद्योग, सामाजिक संस्था तथा रेस्टुरेन्टको संचालन गर्न सकिने छ। तसर्थ वन पैदावार तथा एल.पी.जी. मा आश्रित इन्धन घटाई हरित गृह ग्यासको उत्पादन घटाउन समेत प्रस्तावित परियोजना महत्वपुर्ण हुने देखिन्छ।

नेपालको संविधान तथा स्थानीय सरकार संचालन ऐन २०७४ अनुसार प्रस्तावित परियोजना खुम्बु पासाङ्गल्हामु गाउँपालिकाको अधिकार क्षेत्र भित्र पर्ने देखिन्छ। संघीय सरकारको वातावरण संरक्षण नियमावली २०७७ को अनुसूची १ (क) १४ अनुसार मध्यवर्ती क्षेत्र भित्र पर्ने १ मेगा वाट भन्दा कम क्षमता भएको विद्युत उत्पादनको लागि संक्षिप्त वातावरणीय अध्ययन गर्नु पर्ने प्रावधान रहेको साथै खुम्बु पासाङ्ग ल्हामु गा.पा. को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ को अनुसूची १ गाउँको अधिकार क्षेत्र भित्रका सम्भाव्य प्रस्तावहरुको वातावरणीय अध्ययनको सिमा (थ्रेस होल्ड) अनुसार समेत प्रस्तावित परियोजना निर्माणार्थ संक्षिप्त वातावरणीय अध्ययन गर्नु पर्ने

देखिन्छ । प्रास्तावित मोन्जो खोला मिनी हाइड्रो परियोजना (९४२ कि.वा.) सगरमाथा राष्ट्रिय निकुन्जको मध्यवर्ती क्षेत्रमा पर्दछ र यसको क्षमता १ मेगा वाट भन्दा कम भएकोले संक्षिप्त वातावरणीय अध्ययन गर्नु पर्ने देखिन्छ ।त्यसैगरी वातावरण संरक्षण नियमावली २०७७ को अनुसूची १ को (क) ८ अनुसार वन क्षेत्र, वन संरक्षण क्षेत्र, मध्यवर्ती क्षेत्र र वातावरण संरक्षण क्षेत्रको वन क्षेत्र १ हे. भन्दा कम प्रयोग हुने विद्युत प्रसारण परियोजना बाहेकको अन्य परियोजनाको लागि संक्षिप्त वातावरणीय अध्ययन गर्नु पर्ने देखिन्छ । खुम्बु पासाङ्ग ल्हामु गा.पा. को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ को अनुसूची १ मा समेत यहि नै कुरा उल्लेख गरिएको छ। तसर्थ प्रस्तावित परियोजनाको लागि संक्षिप्त वातावरणीय अध्ययन गर्नु पर्ने देखिन्छ ।

३. उदेश्य

यस संक्षिप्त वातावरणीय अध्ययनको मूख्य उद्देश्य प्रस्तावित आयोजनाको कार्यान्वयनवाट आयोजना क्षेत्रको भौतिक, जैविक, सामाजिक आर्थिक, सास्कृतिक वातावरणमा पर्न सक्ने सकारात्मक तथा नकरात्मक प्रभावहरुको अध्ययन गरी सकारात्मक प्रभावहरुको वढोत्तरी तथा नकरात्मक प्रभावहरुलाई न्युनिकरण गर्ने अथवा निराकरणका उपायहरु प्रस्ताव गर्नु रहेको छ।

४. कार्यविधि

यो अध्ययन प्रतिवेदन खुम्बु पासाङ्ग ल्हामु गा.पा. को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ को प्रावधान अनुसार तथा यसै प्रस्तावको खुम्बु पासाङ्ग ल्हामु गा.पा. को कार्यपालिकाको निर्णयले मिती २०७८/०७/०८ मा स्विकृत गरेको कार्यसूची (ToR) मा उल्लेख गरिए अनुसार तयार पारिएको हो । यसका लागि सान्दर्भिक ग्रन्थहरुको पुनरावलोकन तथा आयोजना प्रभावित क्षेत्रको निर्धारण गर्ने कार्य गरियो । अध्ययन टोली द्धारा सामूहिक रुपमा २०७८ साल कार्तिक/मङ्सिर महिनामा स्थलतग सर्वेक्षण गर्ने, आवश्यक सूचनाहरु संकलन गर्ने र स्थानीय समुदाय र सरोकारवालाहरु सँग समूहगत छलफल, परामर्श गर्ने कार्य पनि गरियो ।

५. आयोजना विवरण

यो योजना ९४२ कि.वा. विद्युत उत्पादन गरि ११ के. भी. ए. को प्रसारण तथा १.१ के. भी. ए. को वितरण लाइन वाट स्थानीय समुदायमा वितरण गर्ने सम्वन्धि रहेको छ । त्यसर्थ यो परियोजनाको दुई वटा अवयवहरु रहेकाछन्: (अ) उर्जा उत्पादन तथा (आ) प्रसारण तथा वितरण । प्रस्तावित परियोजना नदि प्रवाहमा आधारित परियोजना हो र यस परियोजनाले दुध कोशीको सहायक खोला मोन्जो खोलाको पानी प्रयोग गर्नेछ ।मोन्जो खोला बाहैंमास पानी हुने खोला हो । २९५९.५७ मि. उचाईमा बाँध बाँधी मोन्जो खोलाको पानी फर्काइने छ भने इन्टेक २९६०.५० मि. उचाइमा वनाइने छ । यसरि फर्काइएको पानीलाई १४४० मि. लामो पेनस्टक पाईप मार्फत २७४४ मि. उचाईमा रहेको विद्युत गृहमा पठाईने छ। $Q_{80\%}$ मा डिजाइन डिस्चार्ज ०.५६ घन मि./ प्रतिसेकेन्ड हुने र ग्रसहेड २१५.५० मि. हुने छ ।४९६ कि.वा. क्षमता भएको दुईवटा टर्वाइन प्रयोग गरि ९४२ कि.वा. विद्युत उर्जा उत्पादन गरिने छ । उत्पादित विद्युत ११ के. भी. ए. प्रशारण लाइन तथा १.१ के. भी.ए. वितरण

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

लाइन मार्फत् छ्युमा, मोन्जो, ब्यांकर, टोकटोक, ठुलो गमेला, सानो गमेला, फाक्दिंग, छेर्मादिंग, घाट, ठाडोकोशी, छेप्लुंग, चौरीखर्क सहित खुम्बु पासाङ्गल्हामु गाउँपालिकाको वडा नं. ३ का अन्य वस्तीहरु साथै वडा नं. २ को मुसे वस्तीमा रहेका ५८२ घरधुरीमा वितरण गरिने छ । यहाँ मुख्यतः आदिवासी जनजातिहरुको बसोवास रहेको छ भने राष्ट्रिय विद्युत प्रसारण लाइन समेत पुगेको छैन । सम्पूर्ण वस्तीहरु सगरमाथा राष्ट्रिय निकुन्जको मध्यवर्ती क्षेत्रमा रहेको छ ।प्रस्तावित परियोजनाको जम्मा लागत रु. ५७,१६,१५,३६०.४६ रहेको छ ।

६. विद्यमान वातावरणीय अवस्था

६.१ भौतिक वातावरण

प्रस्तावित परियोजना क्षेत्र नेपालको उत्तरपूर्वी हिमाली क्षेत्रमा पर्दछ ।भौगर्भिक रुपले प्रस्तावित परियोजना क्षेत्र पूर्वी नेपालको ट्रान्स हिमालय तथा उच्च हिमालयन क्रिस्टलाईन क्षेत्रमा पर्छ । परियोजना क्षेत्रमा उच्च ग्रेडको मेटामोर्फिक चट्टान पाइन्छन् । यस क्षेत्रमा उच्च हिमाली क्षेत्र तथा टेथिएन सेडिमेन्टको नाईस, सिस्ट तथा मार्वलहरु रहेका छन् । धेरैजसो क्षेत्रहरुमा पातलो कोलुभिएल माटोले ढाकिएको बेडरक नै देखिएका छन् । कोलुभिएल माटोमा नाइस चट्टानको बोल्डर, ग्राभेल, कोवल तथा पेवल र बालुवा रहेका छन् ।डाइभर्सन वेर २९६०.५० मि. उचाइमा रहेको छ भने विद्युत गृह २७४४ मि. उचाइमा रहेको छ । प्रसारण तथा वितरण लाइन २५३३ मि. देखि २८१० मि. उचाई सम्म फैलिने छ ।परियोजना क्षेत्रको हावापानी शितोष्ण किसिमको रहेको छ भने वार्षिक औसत वर्षा २१०० मि.मि. रहेको छ । पुस-माघ सबै भन्दा चिसो महिना हुन् भने असार-साउन सबै भन्दा न्यानो वा गर्मि महिना हुन । मोन्जो क्षेत्रमा वर्षको करिव ६ महिना जति त तापक्रम 0°C भन्दा तल नै हुन्छ ।

वडा नं. ३ को वर्तमान भूउपयोगमा हिउँ क्षेत्र (३८.६६%) मुख्य रहेको छ भने बाँझो जमिन १६.९०%, जंगल १६.२८%, घाँसे मैदान १६.०९, वुट्यान क्षेत्र ले १०.४०%, पानी ०.८८%, निर्माण क्षेत्र ०.६५% र खेति ०.१५% रहेको छ ।डाइभर्सन वेर खोलामा रहेने छ भने पेनस्टक पाइपको धेरै जसो भाग जंगलमा र केहि खेति गरेको जमिनमा पर्ने देखिन्छ । विद्युत गृह खेति गरेको जमिनमा वन्नेछ भने प्रसारण तथा वितरण लाइन हाल प्रयोगमा भइरहेको ट्रेकिंग रुट भएर भूमिगत बनाई लगिने छ ।

मोन्जो खोला क्यासर ग्लेसिएर बाट शुरु भई पुर्व बाट पश्चिम बग्ी मोन्जोमा पुगेपछि दुध कोशीमा मिसिन्छ ।यो बाहैंमास पानी बग्ने हिम नदि हो ।यसको जलाधार क्षेत्रको सवैभन्दा उच्च विन्दु ६६२८ मि. हो भने तल्लो विन्दु २९५९ मि. (आयोजना वन्न शुरु हुने स्थानसम्ममा) रहेको छ ।जम्मा ४३.२६ वर्ग कि.मि. जलाधार क्षेत्र रहेकोमा ४३.५३% क्षेत्र चाहिं स्थायी हिमरेखाको उचाई ५००० मि. भन्दा माथि रहेको छ । हावा, पानी र ध्वनिको गुणस्तर त्यहाँ कुनै प्रदुषणका श्रोत नभएकोले राम्रै देखिएको छ ।

६.२ जैविक वातावरण

परियोजना क्षेत्र सगरमाथा राष्ट्रिय निकुन्जको मध्यवर्ती क्षेत्रमा रहेको छ । सगरमाथा राष्ट्रिय निकुन्जलाई युनेस्कोले विश्व सम्पदा सुचिमा सुचिकृत गरेको छ भने मध्यवर्ती क्षेत्रलाई पनि नेपालको कानुनले संरक्षित क्षेत्रमा समेटेको छ भने आई.यु सी.एन. व्यवस्थापन श्रेणीको चौंथो वर्गको रिजर्व श्रेणीमा पर्दछ। व्यवस्थापन श्रेणीको चौंथो वर्गमा पर्ने संरक्षित क्षेत्रमा दिगोरुपले प्राप्त हुने प्राकृतिक श्रोतहरु स्थानीय जनताहरुले उपभोग गर्न पाइने व्यवस्था गरेको छ। परियोजना क्षेत्र शीतोष्ण जीवन क्षेत्रमा पर्दछ । इन्टेक तथा पेनस्टक पाइपको केहि भाग फिर-बर्च-रोडोडेन्ड्रन वन क्षेत्रमा पर्दछ भने उर्जा उत्पादन गर्ने बाँकी अयवयहरु अपर टेम्परेट ब्ल्यु पाइन वन क्षेत्रमा पर्दछ । प्रसारण तथा वितरण लाइनहरु अपर टेम्परेट ब्ल्यु पाइन वन क्षेत्र तथा टेम्परेट ओक वन क्षेत्रमा पर्दछन् । परियोजना क्षेत्र सगरमाथा राष्ट्रिय निकुन्जको मध्यवर्ती क्षेत्रमा पर्दछ । परियोजना क्षेत्र चौरीखर्क मध्यवर्ती उपभोक्ता समिति अन्तर्गत रहेको छ । उर्जा उत्पादन गर्ने अवयवहरुको भौतिक संरचनाहरु मध्ये डाइभर्सन वेर, इन्टेक र पेनस्टक पाइपको केहि भाग यसै समिति अन्तर्गत पर्ने हिमालय मध्यवर्ती सामुदायिक वन भित्र रहेको छ । हिमालय मध्यवर्ती सामुदायिक वन उपभोक्ता समुहको कार्य क्षेत्र वेंकर सम्म पर्छ भने त्यहाँ देखि फक्दिंग सम्म कोंग्दे मध्यवर्ती सामुदायिक वन उपभोक्ता समुहको पर्दछ । त्यसै गरि फाक्दिंग देखि छुथुवा सम्म पेमाछोलिंग मध्यवर्ती सामुदायिक वन उपभोक्ता समुहको अधिकार क्षेत्रमा पर्दछ भने घाट क्षेत्र चाहिं दुधकुण्ड मध्यवर्ती सामुदायिक वन उपभोक्ता समुहको अधिकार क्षेत्रमा पर्छ। ठाडोकोशी देखि लुक्ला सम्म रेड पाण्डा मध्यवर्ती सामुदायिक वन उपभोक्ता समुहको अधिकार क्षेत्रमा पर्छ। यसरी वडा नं. ३ मा पांच वटा मध्यवर्ती सामुदायिक वनहरु पर्दछन् भने मुसे मध्यवर्ती सामुदायिक वन चाहिं वडा नं. २ को मुसे बस्ति नजिकै रहेको छ । सम्पूर्ण प्रसारण तथा वितरण लाइनहरु ट्रेकिंग रुटको जमिन मुनि बिछ्याएर लैजाने गरि डिजाइन गरिएको छ । नदि तथा खोला तर्दा खेरि पुल संग संगै लैजाने व्यवस्था गरिएको छ । तसर्थ प्रस्तावित परियोजनाले हिमालय मध्यवर्ती सामुदायिक वन बाहेक अन्य वनलाई प्रत्यक्ष रुपले असर पार्दैन । यस क्षेत्रमा पाइने प्रमुख रुख प्रजातिहरुमा भोजपत्र, गोब्रे सल्लो, ठिन्गुरे सल्लो, फिरफिरे, रानी सल्लो, अन्गेरी, लेख आरु, लेख मयल, खराने, ठिन्ग्रे सल्लो र विभिन्न प्रजातिका गुँरासहरु पर्दछन् । स्थानीय मानिसहरुले पचास भन्दा बढी बोटबिरुवाहरुका प्रजातिहरु विभिन्न प्रयोजनका लागि प्रयोग गर्ने गरेको पाइएको छ । मुख्य रुपमा गैहकाष्ठ वन पैदावारको रुपमा प्रयोग हुने बोटबिरुवाहरुमा विख, वुकी फुल, वांको, चुत्रो, जुंगे लहरा, ढल्के फुल, निगालो, सोमलता, दुधे, धसिंग्रे, धुपी, क्यासर, चाँप, जटामसी, इसाफगोल, पदमचाल, सुनपाती, पहेंलो चिमाल, हलहले, सिस्नो आदि हुन् । जंगली खानयोग्य च्याऊहरुमा चिप्ले च्याऊ, मर्तिप च्याऊ, कस्तुरी च्याऊ, चे स्यामो, घांमा स्यामो र क्याक्ति च्याऊ स्थानीय मानिसले बढी प्रयोग गर्ने च्याऊहरु हुन्।

स्थानीयहरुको भनाई अनुसार मोन्जो खोलामा माछा पाइन्दैन। झारल, ब्वाँसोको दिशा र मृग प्रजातिको दिशा स्थलगत अध्ययनको क्रममा भेटिएको थियो । पन्ध्र भन्दा बढी स्तनधारी जनवार रिपोर्ट भएको थियो । घोरल प्रशस्त पाइने स्तनधारी जनवार हो भने अन्यमा हाव्रे, झारल र कस्तुरी पनि पाइन्छ। लेकाली खस्रे भ्यागुता, हिमाली धर्के सर्प, हिमाली ट्रीन्केट सर्प र हिमाली भाले सुन्ग्रो जस्ता घस्रने

जीवहरु पाइन्छ । परियोजना क्षेत्रबाट ९० भन्दा वढी चराहरु रिपोर्ट भएका छन् । चिल, बाज, हिमाली गिद्ध, भादवाज, हिमाली गौंथली, हिमाली मलेवा, राज काग, कालो काग, जुरे कोईली, बौंडाई, भिर गौंथली, नेपाली भिर गौंथली, हिमाली भद्राई, टिकटिके, हिउँ चरी, घर भंगेरा, लेखचरी, लेर्वान, डाँफे, मुनाल, मुडुले तोरीगाँडा, जुरे चरा, फाप्रे चरा आदि यस परियोजना क्षेत्रमा पाइने प्रमुख चराहरु हुन् ।

६.३ सामाजिक-आर्थिक तथा सांस्कृतिक वातावरण

खुम्बु पासाङ्ग ल्हामु गा. पा. को वडा नं. ३ मा ४८० घरधुरीमा सरदर ३.६५ जनाको दरले १,७५२ जनसंख्या रहेको छ । २३ वटा बस्तीहरु जसलाई भार केन्द्रको रुपमा पहिचान गरिएको छ, त्यहाँ सरदर प्रति परिवार संख्या ३.७३ का दरले २,१७१ जनसंख्या रहेका छन् । मुख्य जातिमा शेर्पा जाति (६२.९७%) बसोबास गर्दछन् भने अन्य जातिमा तामाङ्ग (१२.२०%), राई (१३.३०%), मगर (२.८८%), दलित (४.६६%) र अन्य ३.९९% रहेका छन् । धर्मको आधारमा भन्ने हो भने बौद्ध धर्म मान्ने मानिसहरु धेरै छन् (५३.१३%) र अन्य धर्म मध्ये हिन्दु (४०.५०%), क्रिस्टियन (५.४३%) र किराँत (०.९४%) रहेका छन् । मुसेमा पनि बौद्ध धर्म मानिसहरुको नै बाहुल्यता रहेको छ । यहाँका मानिसहरुको मुख्य पेशामा कृषि, पर्यटन, वैदेशिक रोजगार तथा व्यापार रहेको छ । विद्युतीय भार केन्द्र पहिचान गरिएका वस्तीहरुमा प्रति घर सरदर ७.८९ रोपनी जमिन रहेको भए पनि खाद्यान्नको उपलब्धता दयनीय देखिन्छ । प्रायः सबै घर धुरीले खानको लागि अन्न किन्नु नै पर्ने देखिन्छ। आलु उत्पादन भने प्रशस्तै हुने गरेको देखिन्छ । उज्यालोको लागि त्यहाँ भएका लघु विद्युत आयोजनाले मुस्किलले धानेको देखिन्छ भने सोलार प्यानल समेत राखेका घरहरु प्रशस्तै भेटिन्छन् । एल.पी.जी., मट्टीतेल, तथा दाउरा खान पकाउने प्रमुख इन्धन रहेको छ । भार केन्द्रमा पर्ने ५८२ घरधुरी मध्ये ४५६ घरधुरीले एल.पी.जी., २४८ घरधुरीले मट्टीतेल तथा २७१ घरधुरीले दाउरा प्रयोग गर्ने गरेका छन् । परियोजना क्षेत्र (वडा नं. ३) को साक्षरता दर ७०.४१% रहेको छ । परियोजना क्षेत्रमा एउटा माध्यामिक र तिन वटा आधारभूत सहित ४ वटा विद्यालय रहेका छन् । यस क्षेत्रमा मोन्जो क्लिनिक र चौरीखर्क हेल्थ पोस्ट गरि दुईवटा स्वास्थ्य संस्था रहेका छन् भने गास्ट्रिक, उच्च रक्तचाप, मुटु रोग र युरिक एसिड जस्ता दिर्घ रोग रहेका छन् । सबै घरधुरीमा सुविधाजनक शौचालयहरु छन् भने प्रत्येक घरधुरीमा खानेपानीको लागि धारा पुगेको छ । सगरमाथा प्रदुषण नियन्त्रण कमिटीले मध्यवर्ती व्यवस्थापन समिति, सगरमाथा राष्ट्रिय निकुन्ज, स्थानीय मानिस तथा गाउँपालिका संग मिलेर वस्ति तथा ट्रेकिंग रुटको फोहोर व्यवस्थापनको कार्य गर्दै आएको छ । यस क्षेत्रमा 3G वा 4G मोबाइल नेटवर्कको सुबिधा भए पनि नेटवर्कको गुणस्तर त्यति राम्रो भने छैन । त्यसैगरी परियोजना क्षेत्रमा ६ वटा गुम्बा रहेको छ ।

७. प्रभावहरुको पूर्वानुमान वा पहिचान

७.१ सकारात्मक प्रभावहरु

आयोजनाबाट निर्माणको बेलामा तत्कालै हुने लाभमा स्थानिय जनसमुदायमा रोजगारीको सिर्जना गर्दछ। निर्माणको कार्यले गति लिंदा अन्दाजी २५० अदक्ष तथा १०० दक्ष कामदारहरु आवश्यकता पर्ने देखिन्छ । यस चरणमा हुने अन्य लाभहरुमा आयोजना निर्माण कार्यमा सहभागी भई स्थानिय जनताले

सीप बृद्धि गर्ने अवसर, वातावरण व्यवस्थापन योजना कार्यान्वयन गर्दा हुने फाईदा, आर्थिक गतिविधि बढ्ने, तथा स्थानीय मानिसहरुले नयाँ प्रविधि सँग हुने साक्षात्कार रहेका छन् । संचालन अवधिमा मिनी हाइड्रो प्लान्ट संचालन तथा मर्मत गर्न कम्तिमा ५ जना मानिसले रोजगारी पाउने देखिन्छ भने ९४२ कि.वा. विद्युत उत्पादन हुने र स्थानीयहरुको माग अनुसारको विद्युत आपूर्ति तथा स्थानीय तहले आफ्नो नियमानुसार रोयल्टी उठाई लाभ समेत लिन सक्ने देखिन्छ ।

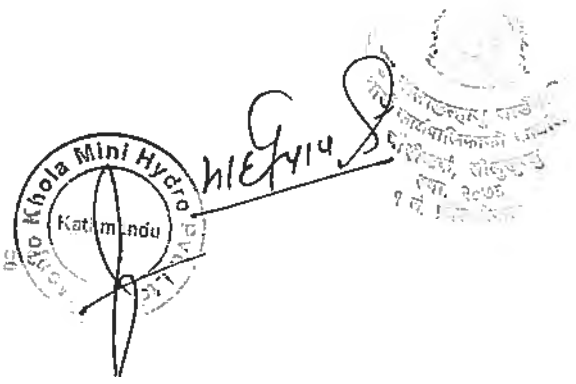
७.२ नकारात्मक प्रभावहरु

७.२.१ भौतिक वातावरण

भू—उपयोगमा परिवर्तन, भुसतहमा हुने परिवर्तन ,भुक्षय तथा नदीको पानीमा थिग्रको मात्रा बढ्ने, स्प्वाइलको उत्पादन तथा तिनको विसर्जन सम्वधि मुद्दाहरु, उत्खनन सम्वधि क्रियाकलापले पर्ने प्रभावहरु, माटो प्रदुषण, ध्वनि प्रदुषण, हावा प्रदुषण, पानी प्रदुषण जलविज्ञान र नदी आकार विज्ञान , मा पर्नेप्रभाव ,र मलिलो माटोको क्षति नै मुख्य नकरात्मक प्रभावहरु हुन् । करिव ५.८३ हे. जमिन अस्थायी वा स्थायी रुपले आयोजनाको लागि आवश्यक पर्ने देखिन्छ । ०.७५८ हे. जमिन परियोजनाको विभिन्न अवयव निर्माणको लागि स्थायीरुपले आवश्यक पर्ने देखिन्छ । माइक्रो क्लाइमेटमा हुने परिवर्तन, खोलाको पानीको गुणस्तरमा पर्ने प्रभाव, विद्युत गृहमा हुने ध्वनि तथा कम्पन, टेलरेसबाट निस्कने पानीबाट हुने भूक्षय तथा सेडीमेन्ट फाल्दा तल्लो तटीय क्षेत्रमा पर्ने प्रभाव नै संचालन चरणमा पर्न सक्ने प्रमुख प्रभावहरु हुन् ।

७.२.२ जैविक प्रभावहरु

परियोजनाको विभिन्न अवयव निर्माणको करिव ०.६७४ हे वन क्षेत्र आवश्यक पर्ने देखिन्छ जसमा ०.४४ हे. अस्थायी रुपमा र ०.२३४ हे. स्थायीरुपमा आवश्यक पर्ने देखिन्छ । यो वन क्षेत्र हिमालय मध्यवर्ती वन उपभोक्ता समुहको अधिकार क्षेत्र भित्र रहेको छ । त्यसैगरी ३० वटा पोल साइज तथा ३ वटा रुख साइजको गरि जम्मा ३३ वटा रुख काट्नु पर्ने देखिन्छ । ती रुखहरु काट्दा रुखको ९.९२ वर्ग मि. बेसल एरिया, ११.५६ घना मि. खादा रुखको आयतन, २.२१ घना मि. काठ, ५.२३ घन मि. दाउरा र ४,३०५.६३ रुखको बायोमास क्षति हुने देखिन्छ। काठको मूल्य रु. ७,७५,०००.०० र दाउराको मूल्य रु. १,५०,०००.०० पर्ने अनुमान गरिएको छ । दाउराको लागि वनमा पर्न सक्ने चाप, वन्यजन्तुको आवागमनमा पर्ने प्रभाव, जलीय वनस्पति र जीवजन्तुमा पर्न सक्ने प्रभाव, गैह्र काष्ठजन्य वन पैदावारमा पर्न सक्ने प्रभाव, संभावित डढेलो, वन्यजन्तुको चोरीसिकारी, र मानव र वन्यजन्तु बिचको द्वन्दमा हुन सक्ने वृद्धि जस्ता नकारात्मक प्रभावहरु निर्माण चरणमा पर्न सक्ने देखिन्छ। पानीको बहाव घट्नुले हुने प्रभाव,, कामदारका कारण वन्यजन्तुमा पर्न सक्ने असर,, सम्भावित आगलागी र दाउराका लागि वनमा पर्ने चाप जस्ता नकारात्मक प्रभाव संचालन चरणमा पर्ने प्रभावहरु हुन् ।



७.२.३ सामाजिक-आर्थिक तथा सांस्कृतिक प्रभावहरु

निर्माणको क्रममा जग्गा अधिग्रहण गर्नु पर्ने एउटा प्रमुख चुनौती हो। आयोजनाका अवयवहरु निर्माणका लागि करिब ५.८३ हेक्टर जमिन आवश्यक पर्ने देखिन्छ ।आयोजना सुविधाहरूको व्यवस्था गर्न ०.०५५ हेक्टर स्थायी रूपमा र ०.५२ हेक्टर अस्थायी रूपमा (उत्खननको लागि तथा स्प्वाइल बिषर्जनको लागि) आवश्यक हुनेछ। स्थायी रूपमा अधिग्रहण गरिने ५.३१ हेक्टर जग्गामध्ये ०.१९ हेक्टर खेतीयोग्य, ०.३ हेक्टर सामुदायिक वन र बाँकी ४.८२ हेक्टर सार्वजनिक जग्गा जसमा अधिकांश ट्रेकिंग रुट पर्दछन्। खेतीयोग्य जमिन (०.१९ हेक्टर) को क्षति, अन्नबाली र तरकारीको क्षति,, मोन्जो खोला माइक्रो हाइड्रोमा पर्ने असर (निर्माण गतिविधिले हेडवर्क र नहर क्षेत्रमा प्रभाव पर्ने देखिएको), आयोजना क्षेत्रका विद्यमान सुविधा, सेवा र स्रोतमाथि पर्ने चाप,, स्वास्थ्य तथा सरसफाइ र सार्वजनिक सुरक्षाका मुद्दाहरू,, पेशागत स्वास्थ्य तथा सुरक्षाका समस्याहरू, स्थानीय र बाहिरका श्रमिकहरूबीचको सामाजिक-सांस्कृतिक द्वन्द्व,, असामाजिकक्रियाकलापहरु जस्तै जुवातास,, मदिरा सेवन,, बालबालिका बेचबिखन तथा वेश्यावृत्ति आदिको ,वृद्धिको सम्भावना, लैङ्गिक भेदभाव, सरोकारवालाको संलग्नता र सूचनाको पारदर्शिताका कुराहरु,, गुनासो व्यवस्थापन र लैङ्गिक हिंसा, समुदायमा पर्न सक्ने अवरोधहरु, कोभिड—१९ र बाल श्रमका समस्या जस्ता प्रभावहरु निर्माण चरणमा पर्ने देखिन्छ ।

कामदारको पेशागत स्वास्थ्य र सुरक्षा, सार्वजनिक सुरक्षाको समस्या, अचानक पानी तल्लो तटीय क्षेत्रमा छोड्दा पर्ने असर, पानीको प्रयोगको अधिकार (मोंजोखोला माइक्रो हाइड्रो भत्काउन आवश्यक), लाभ बाँडफाँडको समस्या, विद्युत महसुलको समस्या र विद्यमान ४ वटा माइक्रो हाइड्रोको व्यवस्थापन सञ्चालन चरणका प्रमुख मुद्दाहरू हुन्।

७.२.४ सगरमाथा राष्ट्रिय निकुन्ज तथा उत्कृष्ट विश्वव्यापी मूल्य)OUV)

स्तावित परियोजनाले सगरमाथा राष्ट्रिय निकुन्जलाई असर गर्दैन किनकि यो निकुन्ज भन्दा बाहिर छ। यसले केही हदसम्म निर्माण गतिविधिका कारण परियोजना क्षेत्रको प्राकृतिक सौन्दर्यमा असर गर्छ, तर पार्क क्षेत्रमा भने होइन। स्थानीय सामाजिक र सांस्कृतिक अखण्डतामा प्रभाव पार्ने सम्भावना कम हुनेछ किनभने स्थानीयहरू विगत ७५ वर्षदेखि विविध समूहका मानिसहरुको सम्पर्कमा आएका छन्। त्यसैगरी, भूमिगत आर्मर्ड तारको व्यवस्था भएकाले चरा तथा वन्यजन्तुलाई विद्युतीय झट्का लाग्ने सम्भावना पनि छैन ।

८. सकारात्मक प्रभावहरुको अभिबृद्वी तथा नकारात्मक प्रभावहरुको न्यूनीकरणका उपायहरु

८.१ सकारात्मक प्रभावहरुको अभिबृद्वीका उपायहरु

स्थानीयलाई रोजगारीमा प्राथमिकता दिइनेछ । आयोजना क्षेत्रका गरिब, जोखिममा परेका र सामाजिक बहिष्कारमा परेका जनतालाई ठेकेदारमार्फत आयोजनासँग सम्बन्धित काममा प्राथमिकता दिइनेछ । परियोजना प्रभावित परिवार र आयोजना क्षेत्रका जनतालाई सीप अभिवृद्धि तालिम दिइनेछ । विद्युतीय तथा प्लम्बिङ तालिम, मिस्त्री तालिम, पर्यटन आतिथ्यता तथा खाना पकाउने तालिम र स्थानीयको हितका लागि अन्य तालिम दिइनेछ । तालिम कार्यक्रमका लागि रु.१,८८५,०००.०० विनियोजन गरिएको

छ। निर्माण अवधिमा कार्यान्वयन गरिने वातावरण व्यवस्थापन योजनाले स्थानीय समुदायलाई फाइदा पुग्नेछ। शिक्षा, स्वास्थ्य, खानेपानी र पदमार्ग जस्ता सामुदायिक सुविधाहरूमा गरिने सहयोगले स्थानीय जनतालाई पक्कै फाइदा पुग्छ। सबैले सुपथ मूल्यमा विद्युत उपभोग गर्न सक्ने गरी समुदायसँग निकट समन्वयमा विद्युतको महसुल निर्धारण गरिनेछ । त्यसैगरी १० प्रतिशत सेयर स्थानीयलाई दिइनेछ ।

८.२ न्यूनीकरणका उपायहरु

८.२.१ भौतिक वातावरण

सकेसम्म न्यूनतम जग्गा अधिग्रहण गरिनेछ। अस्थायी रूपमा अधिग्रहण गरिएको जग्गा पुनर्स्थापना गरिनेछ। रुख कटानलाई सम्भव भएसम्म रोकिनेछ र क्षतिपूर्ति स्वरूप वृक्षारोपण गरिनेछ। स्प्वाईल तथा मक तोकिएको क्षेत्रमा मात्र राखिनेछ। खाडलहरू, उत्खनन साइटहरू र डिस्पोजल साइटहरू तुरुन्तै पुनर्स्थापित गरिनेछ। भूक्षय र पहिरो नियन्त्रण गर्न न्युनतम जग्गा प्रयोग गरिने छ । उत्खनन गरिएका सबै क्षेत्र र भिरालो जमिनलाई बायोइन्जिनियरिङ कार्यहरू लागू गरेर स्थिर गरिनेछ। खानु पर्ने ठाउँको माथिल्लो मलिलो माटोलाई पछि जग्गा पुनर्स्थापना, डिस्पोजल साइटहरू र परियोजना क्षेत्रको अन्य जीर्ण भूमिमा पुनः प्रयोगको लागि भण्डारण गरिनेछ। उत्खनन सामग्रीहरू भूमि व्यवस्थापन तथा पुनर्स्थापनाको लागि प्रयोग गरिनेछ। केमिकल र तेलहरू सावधानीपूर्वक ह्यान्डल गरिनेछ र पानी प्रदूषणबाट बच्न सुरक्षित ठाउँमा भण्डारण गरिनेछ। खुला दिसा र पिसाब फेर्न निषेध गरिनेछ। पानीको गुणस्तर नियमित रूपमा अनुगमन गरिनेछ। ध्वनी उत्पन्न गर्ने मेसिनरी तथा उपकरणहरू जस्तै जेनेरेटर तथा क्रसर आदिलाई आवाजको प्रभाव कम गर्न आवासीय क्षेत्रबाट टाढा राखिनेछ। त्यसैगरी रातिको समयमा निर्माण कार्य गरिने छैन । शिविरबाट निस्कने फोहोरलाई स्थानीय सरकारसँगको समन्वयमा पृथकीकरण गरी उचित व्यवस्थापन गरिनेछ । धुलो उड्नबाट जोगिनको लागि स्पोइल्स कम्प्याक्ट गरिनेछ। नदी किनारका सामाग्री निकालेपछि नदीको आकारमा परिवर्तन नआओस् भनी उचित योजना बनाइनेछ । हिमताल बिस्फोटन बाट उत्पन्न हुने बाढीसँग सम्बन्धित प्रभावहरू कम गर्न, मानिसहरूलाई पूर्व चेतावनी प्रणाली र आपतकालीन तयारी योजना बारे सचेत गराइनेछ। मोन्जो खोलाको माइक्रो क्लाइमेट कायम राख्न सञ्चालन गर्दा औसत मासिक प्रवाहको न्यूनतम १०% प्रवाह कायम गरिनेछ। नदी किनारको कटान नियन्त्रण गर्न डाइभर्सन वेयर जस्ता महत्वपूर्ण क्षेत्रमा किनार संरक्षण गर्ने कार्य गरिनेछ। शिविरबाट निस्कने फोहोरको उचित व्यवस्थापन गरिनेछ । ध्वनी प्रदूषणको प्रभावलाई कम गर्न,विद्युत गृहका कर्मचारीहरूलाई इयर मफ उपलब्ध गराइनेछ। शिविरबाट निस्कने फोहोर पानीको स्रोतमा छोडिने छैन। पानी प्रदुषण हुन नदिन केमिकल, पेन्ट, स्पेन्ट आयल र लुब्रिकेंटलाई सुरक्षित स्थानमा भण्डारण गरिनेछ ।

८.२.२ जैविक वातावरण

रुख कटानको क्षतिपूर्तिको लागि १:२५ को अनुपातमा वृक्षारोपण गरिनेछ। हेरचाहकर्ताहरु सहित वृक्षारोपण लागत रु. ७,०८,८५२.०० अनुमान गरिएको छ। अनावश्यक रुपमा रुख काटिने छैन । वातावरण, जैविक विविधता र वन्यजन्तु संरक्षणमा जनता, विद्यालयका बालबालिका र आयोजनाका कर्मचारीहरूलाई सचेत बनाइनेछ। जङ्गलमा आगलागीको सम्भावित जोखिमलाई न्यूनीकरण गर्न वन

क्षेत्रमा अनावश्यक रूपमा घुम्न निषेध गरिनेछ र वन क्षेत्रमा धुम्रपान निषेध गरिनेछ । परियोजनाका कर्मचारीहरूलाई चोरी शिकारी र शिकारमा संलग्न हुन दिइने छैन। रातिको समयमा निर्माण कार्य गर्न पाइने छैन । मोन्जो खोलाको जलचर संरक्षणका लागि फोहोर पानीमा फालिने छैन । मोन्जो खोलाको जलीय जीवनलाई निरन्तरता दिन सञ्चालन गर्दा औसत मासिक प्रवाहको न्यूनतम १०% प्रवाह कायम गरिनेछ। सबै कामदार र आयोजनाका कर्मचारीलाई खाना पकाउन एलपी ग्याँस उपलब्ध गराइने छ र जङ्गलमा पर्ने चाप कम गर्न खान पकाउन दाउरा प्रयोग गर्न दिइने छैन ।

८.२.३ सामाजिक-आर्थिक तथा सांस्कृतिक वातावरण

भुमि र बालीको मुआब्जा स्थानीयसँगको वार्ताबाट टुंगो लगाइनेछ । विद्यमान माइक्रो हाइड्रोमा पर्ने असरलाई न्यूनीकरण गर्न साझा समझदारी बनाई विद्युतीकरणमा पनि प्रयोग गरिनेछ । सेवामा पर्ने चाप व्यवस्थापन गर्न स्वास्थ्य तथा शैक्षिक संस्थालाई सहयोग गरिनेछ । त्यसैगरी ट्रेकिङ ट्रेललाई आवश्यकता अनुसार मर्मत गरिने छ । सबै कामदार र कर्मचारीहरूलाई व्यक्तिगत सुरक्षा सामग्री उपलब्ध गराइनेछ। कार्यस्थल र शिविरमा प्राथमिक उपचारको व्यवस्था गरिनेछ। त्यसैगरी सम्भावित दुर्घटना विरुद्ध सबै कामदारको बिमाको व्यवस्था गरिनेछ । जनस्वास्थ्य, सरसफाइ र सुरक्षामा उचित ध्यान दिइनेछ। साइन बोर्ड र अस्थायी तारबार बनाइनेछ। दुर्घटना हुन नदिन विशेष गरी प्रसारण र वितरण लाइनका लागि बनाइएका खाडल तुरुन्तै पुनर्स्थापना गरिनेछ। श्रमिक र स्थानीयबीचको द्वन्द्व कम गर्न आचारसंहितालाई कडाइका साथ लागू गरिनेछ, कामदारलाई नैतिक आचरण बारे सचेत गराइनेछ र कार्यस्थल तथा शिविरमा जुवा खेल्न र मदिरापान निषेध गरिनेछ । लैङ्गिक हिंसा, लैङ्गिक शोषण तथा दुव्यवहार र यौन दुव्यवहारलाई दण्डनीय बनाइने र यी समस्यालाई सम्बोधन गर्न परियोजना स्तरमा गुनासो निवारण समिति गठन गरिनेछ। बालबालिकालाई काममा प्रयोग गरिने छैन। स्थानीय जनता र समुदायलाई पर्न सक्ने अशान्ति कम गर्न कामदारहरूलाई छुट्टै शिविर, शौचालय र अन्य सुविधा उपलब्ध गराइनेछ। कोभिड-१९ को सम्भावित जोखिम न्यूनीकरण गर्न व्यक्तिगत सुरक्षा सामग्रीको प्रयोग र आवश्यक आचारसंहिताको पालना गरिनेछ। सञ्चालनको क्रममा, कर्मचारीहरूलाई सुरक्षा सामाग्रीहरु प्रदान गरिनेछ। आवश्यकता अनुसार सुरक्षा चिन्ह र बोर्डहरू जडान गरिनेछ। मानिसहरूलाई आयोजना क्षेत्रको जोखिमपूर्ण ठाउँमा जान अनुमति दिइने छैन। तल्लो तटीय क्षेत्रमा अचानक पानी छोड्न पूर्व चेतावनी प्रणाली स्थापना गरिनेछ। स्थानीयसँगको वार्तामा विद्युतको महसुल निर्धारण गरिने छ । सगरमाथा राष्ट्रिय निकुन्जको उत्कृष्ट विश्वव्यापी मूल्य (OUV) मा पर्ने प्रभावहरूलाई कम गर्न वा निराकरण गर्न चोरी शिकारी तथा शिकार गर्न अनुमति दिइनेछैन; अनुमति विना वन क्षेत्रमा भ्रमण गर्न रोक लगाइने छ; कुनै पनि वन पैदावार संकलन गर्न अनुमति दिइने छैन; वन क्षेत्रमा आगो लगाउन निषेध गरी जैविक विविधता संरक्षणका लागि सबै कामदार, आयोजनाका कर्मचारी र स्थानीय समुदायलाई सचेत गराइनेछ ।

अधिकांश न्यूनीकरण उपायहरूको लागत परियोजना लागतमा समावेश गरिएको छ। यी बाहेक विभिन्न न्यूनीकरण उपायहरूको लागि कुल रु. २,३४५,८५२.०० विनियोजन गरिएको छ।

९. वातावरणीय व्यवस्थापन योजना

यस प्रतिवेदनमा वातावरणीय व्यवस्थापन योजना अन्तगत आयोजनाबाट पर्ने संभावित असरहरु, असरहरुको प्रभाव, न्युनिकरण विधि, अनुगमन विधि तथा कार्यतालिकाको प्रस्ताव गरिएको छ । यसका साथै न्युनिकरणका उपायहरुको तथा अनुगमन कार्यको कार्यान्वयन गर्ने जिम्मेवार निकायहरुको पनि पहिचान गरिएको छ । अनुगमनका लागि आवश्यक भौतिक, जैविक, सामाजिक आर्थिक तथा साँस्कृतिक वातावरणका विभिन्न अनुगमन सुचकहरुको पनि पहिचान गरिएको छ ।

१०. अनुगमन

खुम्बु पासाङ्ग ल्हामु गा.पा. को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ को आधारमा छुट्टै अनुगमन योजना प्रस्ताव गरिएको छ। संक्षिप्त वातावरणीय अध्ययन प्रतिवेदनमा अनुगमन योजना र सूचक, कार्यतालिका र जिम्मेवारी पहिचान गरिएको छ। अनुगमन गतिविधिका लागि कुल रु. ७,५०,०००.विनियोजन गरिएको छ।

११. निष्कर्ष

पहिचान गरिएका प्रायः वातावरणीय प्रभावहरु स्थानिय क्षेत्रमा तथा मुख्य गरि निर्माण कार्यका वेला सीमित रहने देखिन्छ । प्रस्तावित न्युनिकरणका विधिहरुको पालना गरिएमा पहिचान गरिएका वातावरणीय प्रभावहरुको न्युनिकरण गर्न सकिनेछ । वातावरणीय व्यवस्थापन योजना अन्तगत उल्लेख गरिएका उपायहरुको कार्यान्वयन गरिएमा यस आयोजनाको कार्यान्वयनले आयोजना क्षेत्रको भौतिक, जैविक, सामाजिक आर्थिक तथा साँस्कृतिक वातावरणमा उल्लेखनीय नकारात्मक प्रभाव नपर्ने देखिन्छ। यस संक्षिप्त वातावरणीय अध्ययनको आधारमा प्रस्तावित मोन्जो खोला मिनी हाइड्रो परियोजना अन्तर्गत विद्युतीय उर्जा उत्पादन तथा त्यसको स्थानीय समुदाय तथा बस्तिहरुमा प्रसारण तथा वितरण गर्दा यस प्रतिवेदनमा उल्लेख गरिएका वातावरणीय व्यवस्थापन योजनालाई पूर्ण रुपमा लागू गरि प्रस्तावित आयोजना कार्यान्वयन गरिनेछ र प्रस्तावित आयोजनाको लागि संक्षिप्त वातावरणीय अध्ययन नै पर्याप्त हुने देखिन्।

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

EXECUTIVE SUMMARY

1. Project Proponent

Monjo Khola Mini Hydro Pvt. Ltd. is the proponent and executing agency of Monjo Khola Mini Hydro Project (MKMHP), located in Khumbu Pasang Lhamu Rural Municipality (KPLRM)-3, Solukhumbu district. The address of the proponent is as follows:

Address of proponent:
Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga,
Bagmati Province, Nepal
Telephone No: 01-4464222, 01-4464333
Email: monjokholaminihydro@gmail.com

2. Relevancy of the Proposal and BES Study

The main purpose of the proposed project is to generate 942 kW electrical energy from Monjo Khola and supply energy to meet household demand for electricity, cooking and space heating in Chyuma, Byankar, Tok Tok, Thulo Gamela, Phakding, Sano Gamela, Chermading, Ghat, Thadakoshi, Chheplung, Chaurikharka and other settlements of ward number 3 along with Muse (ward No. 2). At present, it is difficult to meet the demand of electricity for light only from the existing micro hydro. There is no possibility for cooking and heating from existing sources of electricity. Therefore, the proposed proposal will produce sufficient energy to supply electricity to fulfill the demand in the area not only for lighting but also for cooking and heating purposes, thus replacing biomass based energy with clean energy. LPG gas is also used but is very expensive because of high cost of transportation. Beside these, micro enterprises related to tourism service industry such as bakeries, handicrafts shops, social institutions, restaurants can be operated due to electricity generated from the proposed project. Therefore, the proposed proposal has been considered as very important project to reduce the dependency on forest resources as well as the LPG thus reducing the emission of greenhouse gases.

As per the Constitution of Nepal and Local Government Operation Act 2074, the proposed proposal comes under the jurisdiction of Khumbu Pasang Lhamu Rural Municipality (KPLRM). As per EPR 2020, Annex 1, KA-14, it is mandatory conduct BES for the proposed proposal of construction of hydropower generating electricity less than 1 megawatt (MW) within buffer zone. Similarly, as per threshold of environmental study of possible proposals of rural municipality jurisdiction given in Annex 1 of the Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, BES is required for the proposed proposal of construction of hydropower generating electricity less than 1 megawatt (MW) within buffer zone. The MKMHP (942kW) lies in buffer zone (BZ) area of Sagarmatha National Park (SNP), hence BES is required for the implementation. On the same way, as per Annex 1, KA-8 of EPR 2020, BES is required to those proposals using up to 1 ha of forest area, forest conservation area, conservation area, buffer zone and forest of environmental conservation area except for transmission line. Same thing has been mentioned in Annex 1 of Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078.

3. Objectives

The main objective of the BES study is to identify both positive and negative impacts of proposed project implementation on physical, biological, socio-economic and cultural environment of the

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project area and propose augmentation measures for beneficial impacts and mitigation measures for adverse impacts.

4. Methodology

This BES Report has been prepared following the Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, and methodology described in ToR of the proposal, approved by Working Committee of Khumbu Pasang Lhamu Rural Municipality on 2078/07/08 BS. Relevant literatures were reviewed and Zone of Influence of the Project was delineated. BES Study team made the field visit in November 2021 for public hearing, field survey, collection of necessary information and public consultation with local people and concerned stakeholders.

5. Project Description

The project is about generation of 942 kW energy and distribution at local communities through 11 kV transmission and 1.1 kV distribution lines. Thus it will have basically two components— (i) power generation and (ii) transmission and distribution. The proposed project is a run-off-river scheme and uses water from Monjo Khola, a perennial river and tributary of Dudh Koshi River. Water will be diverted at elevation of 2959.57 m amsl and intake will be made at elevation of 2960.50 m amsl. Thus diverted water will be streamed down to power house located at 2744 m amsl through 1440 m long penstock pipe. The gross head will be of 215.50 m with design discharge 0.56 m^3/s at $Q_{80\%}$. Two turbines with the rated output of 496 kW will be used to generate 942 kW energy. Thus generated electricity will be transmitted through 11 kVA transmission lines and distributed through 1.1 kVA distribution lines to 582 households in Chyuma, Byankar, Tok Tok, Thulo Gamela, Phakding, Sano Gamela, Chermading, Ghat, Thadakoshi, Chheplung, Chaurikharka and other villages of Ward No. 3, and Muse village of ward no. 2 of Khumbu Pasang Lhamu Rural Municipality (KPLRM) where majority of residents are indigenous people and the area is off-grid areas. All the settlements lie in buffer zone of Sagarmatha National Park. The total project cost is NPR 571,615,360.46.

6. Existing Environmental Condition

6.1 Physical Environment

The proposed project area is located in north eastern mountain region of Nepal. The project area geologically lies on the Trans and Higher Himalayan Crystalline Zone in the eastern part of Nepal. The project area possesses the high-grade metamorphic rocks. The project area has gneisses, schists and marbles of the Higher Himalayan Zone and Tethyan sediments (limestone, shale, sandstone etc.) belonging to the Tibetan-Tethys Zone. Most of the area is exposed with bedrock with thin colluvial soil cover. The colluvial soil comprises boulders, gravels, cobble and pebbles of gneiss with sand. The elevation of diversion weir is 2960.50 m while the powerhouse will be at 2744 m. The elevation of transmission and distribution lines ranges from 2533 to 2810 m. The project area lies in temperate climatic zone. The average annual rainfall is 2100 mm. January is the coldest month and July is the warmest month of the project area. The minimum temperature of Monjo area goes down below 0°C about 6 month of a year

The current land use pattern of ward no. 3 is dominated with glacier (38.66%), followed by barren land (16.90%), forest (16.28%), grassland (16.09%), shrub land (10.40%), water body (0.88%), built up (0.64%) and agriculture (0.15%). The weir will be in river while most of the penstock pipe lies in forest area and some part will be in cultivated land. Power house will be in agriculture land. Transmission and distribution lines pass through trekking routes.

The Monjo Khola starts from Kyasar Glacier and flows from east to west direction. It then merges with Dudh Koshi river at Monjo. It is a snow fed perennial river with maximum catchment elevation

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of 6628 m while minimum elevation of catchment being 2959 m. The total catchment area is 43.26 km^2. Out of the total catchment 43.53% of the catchment lies in permanent snowline above 5000 m. Air, water and sound quality has been observed and seems good. There is no major air, water and sound polluting sources.

6.2 Biological Environment

The project area lies in Buffer Zone of Sagarmatha National Park (SNP). The SNP is recognized by UNESCO as the world heritage site, whereas the Buffer Zone qualifies as a legally protected area of Nepal, listed as an IUCN Management Category IV reserve. A Management Category IV listing recognizes the continued sustainable use of resources by local communities. The project area lies in Temperate Life Zone. The intake area and some part of penstock lies in Fir Birch Rhododendron Forest while remaining project structures of power generation lie in Upper Temperate Blue Pine Forest Zone. Transmission and distribution lines lies in Upper Temperate Blue Pine Forest Zone as well as in Temperate Mountain Oak Forest Zone. The project area lies in buffer zone Sagarmatha National Park (SNP). The project area falls within *Chaurikharka Buffer Zone User Committee*. Under this committee, the forest in and around the physical structures of power generation has been managed by Himalaya Buffer Zone Community Forest User Groups. The Jurisdiction of Himalaya Buffer Zone Community Forest User Group (BZCFUG) is up to Banker area. From there, Kongde BZCFUG manages the foret areas up to Phakding. Similarly, Pemachholing BZCFUG manages from Phaking to Chhuthuwa. Dudhkunda BZCF lies in and around Ghat while Red Pand BZCF from Thadokoshi to Lukla. Thus there are 5 BZCFs in ward number 3 of KPLRM while Muse BZCF in ward number 2. All the transmission and distribution lines have been designed to be underground passing through foot trails except river crossings where it passes with bridges. There will not be direct impact on forest except in Himalaya BZCF in Monjo. The major trees species are *Betula utilis, Abies spectabilis, Abies pindrow, Acer caesium, A. campbellii, Pinus wallichiana, Lyonia ovaliifolia, Prunus cornata, Sorbus cuspidata,* Symplocus sp., *Tsuga dumosa and* a number of Rhododendron species are found in project area. More than 50 plants species have been used by locals for various purposes. Some commonly used NTFPs by locals are Aconitum sp., Anaphilis sp., *Arisaema flavum, Barberis sp.*, Clematis sp., *Cotoneaster microphyllus,* Drepanostachyum sp., *Ephedra gerardiana, Euphorbia sikkimensis, Gaultheria fragrantissima,* Juniperus sp., *Meconopsis horidula, Michelia champaca, Nardostachys grandiflora, Plantago erosa, Rheum austtrale, Rhododendron anthopogon, Rhododendron campylocarpum, Rumex nepalensis, Urtica dioica* etc. Wild edible mushrooms such as *Armillarie llamellea,* Boletus sp., *Hydnum repandum,* Ramaria sp., *Paxillus involutus and Tylopilus eximus* are extensively used by local people.

According to locals, there are no fish seen till date. During the field visit, Himalayan Tahr, scats of carnivore (may be of grey wolf), and deer sp. are recorded. More than 15 mammals were reported from the project areas. As the most of the project area is covered by forest, *Naemorhedus goral* is very common in the area. Beside this, *Ailurus fulgens, Hemitragus jemlahicus and Moschus chrysogaster* are also common in the area. *Bufo himalayanus, Amphiesma platyceps, Elaphe hodgsonii* and *Scincella ladecense himalayanus* are reported from the project area. More than 90 different bird species have been reported in the project area. Some common birds are *Aquilla heliacal, Buteo buteo, Gyps himalayensis, Eremophila alpestris, Collocalia brevirostris, Columba leuconota, Corvus corax, Corvus macrorhynchos, Clamator jacobinus, Falco tinnunculus,* Carpodacus sp., *Delichon dasypus, Delichon nepalensis, Lanius tephronotus,* Luscinia sp., *Zoothera dixoni,* Motacilla sp., Montifringilla sp., *Passer domesticus,* Prunella sp., *Lerwa lerwa, Lophophorus impejanus, Tragopan satyra, Garrulax ocellatus,* Yuhina sp, *Upupa epops* etc.

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6.3 Socio-Economic and Cultural Environment

The total population of ward No. 3 of the RM is 1752 in 480 households with average family size of 3.65. In all 23 settlements, identified as load center, have 2,171 populations with average family size of 3.73. The most dominant ethnic group is Sherpa (62.97%). Other Castes are Tamang (12.20%), Rai (13.30%), Magar (2.88%), outcaste (4.66%) and others (3.99%). Based on religion, majority of HHs are Buddhists (53.13%), followed by Hindu (40.50%), Christian (5.43%) and Kirant (0.94%). In Muse majority of people follow Buddhism. Major occupations are agriculture, tourism, services, foreign employment and business. Average land holding per household in load center is 7.89 ropani in project area. Food sufficiency is very poor in the area. Crop diversity is very poor. Potato and wheat are major food crops. Most of the HHs has to buy food grains. Potato is sufficient to majority of HHs. Majority of HHs have access on electricity (only for lighting purposes) from various micro hydro. People also use solar panel for electricity. LPG, Kerosene and fuelwood are major cooking fuel. Out of 582 HHs surveyed for load centers, 456 HHs use LPG, 248 kerosene and 271 fuelwoods. The literacy rate in project area, Ward No.-3, is 70.41%. In project area, there are four schools—one secondary and three basic. There are two health institutions in ward number 3: Monjo clinic and Chaurikharka Health Post. Chronic diseases found in the area are gastritis, blood pressure, heart diseases and uric acid. All the HHs have well facilitated toilets and also have access on piped drinking water. Sagarmatha Pollution Control Committee with support from Buffer Zone Management Committee, SNP, locals and Rural Municipality manages the waste along the foot trails. The project area has facility of 3G services. 4G mobile network facilities are also available in the project area although network quality is poor. Similarly, internet facilities are also available in major settlements. There are 6 Gumba in project area.

7. Identification/Prediction of Impacts

7.1 Positive Impacts

The immediate beneficial impact from the project during construction phase is employment opportunities for the local population. Approximately 250 unskilled and 100 skilled human resources will be employed during peak construction period. Other advantage during this phase is opportunity to improve technical skills, benefits from implementation of environmental management plan, increase in economic activities and exposure of local population to new technologies. In operation phase, at least 5 people will be employed for the operation and maintenance of the mini hydro plant. There will be generation of 942 kW electrical energy and demand of energy of locals will be met. Local government can fix royalty for mini hydro and get benefited.

7.2 Negative Impacts

7.2.1 Physical Environment

Change in land use, change in topography, soil erosion and sedimentation in river water, spoil generation and disposal issues, quarrying activities, soil pollution, sound pollution, air pollution, water pollution, impact on hydrology and river morphology, and loss of top soil are major adverse impacts on physical environment during construction phase. About 5.83 ha of land is planned to be acquired temporarily and permanently for project infrastructure construction. Out of the total land to be acquired, project requires 0.758 ha permanently for the construction of different project component thus changing the land use category. During operation, change in microclimate, change in river water quality, noise and vibration at powerhouse, soil erosion due to discharge from tailrace and impact on downstream due to sediment flushing are major impacts.

7.2.2 Biological Impacts

About 0.674 ha of forest area will be required for the various project components. Out of this 0.234 ha land is required for permanently while 0.44 ha. temporarily. This land is under the jurisdiction

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of Himalaya Buffer Zone Community Forest User Group. Similarly, a total of 33 trees (30 poles and 3 trees) needs to be fell down. Due to felling of these trees, 9.92 m^2 tree basal area, 11.56 m^3 tree standing volume, 2.21 m^3 timber volume, 5.23 m^3 fuelwood and 4,305.63 kg tree biomass will be lost. Total value of lost timber is estimated to be NRs. 775,000.00 and for fuelwood NRs. 150,000.00. Pressure on forest for fuelwood, impact on wildlife movement, impact on aquatic flora and fauna, impacts on NTFPs, possible risk of forest fire, wildlife hunting and poaching and increase in human wildlife conflict are negative impacts during construction period. Impacts due to reduced water flow, disturbance to wildlife due to resident workers, possible forest fire and pressure on forest for fuelwood are the impacts during operation.

7.2.3 Socio-economic and Cultural Impacts

Land acquisition is one of the major issue during construction. An estimated land area of about 5.83 ha is required for construction of the project components. Project facilities requires 0.055 ha land permanently and 0.52 ha temporarily (for quarry, borrow and spoil disposal sites). Out of the 5.31 ha land to be permanently acquired, 0.19 ha is cultivated land, 0.3 ha is community forest land and remaining 4.82 ha is public land, mostly trails. Loss of agriculture land (0.19 ha) and standing crops (Estimated loss of major crops (potato) in terms of monetary value is about NPR 25,000.00 while valuation of vegetables is about NPR 40,000.00), impact on Monjo Khola Micro Hydro (MKMH) (as construction activities effects on headworks and canal areas), pressure on existing facilities, services and resources of project area, health and sanitation and public safety issues, occupational health and safety issues, socio-cultural conflicts between locals and outside workforce, possible increase in unsocial activities like gambling, alcoholism, girl trafficking and prostitution, gender discrimination, issues of stakeholder engagement and information disclosure, issues of grievances management and gender based violence, issues related to disturbances to community, COVID-19 and child labour issues are major impacts during construction period.

Occupational health and safety of workers, issues of public safety, impacts due to sudden release of water to downstream, water use right (Monjo Khola Micro Hydro needs to be dismantled), issues of benefit sharing, issues of electricity tariff and management of existing 4 micro hydro in project areas are the major concerns or issues during operation phase.

7.2.4 SNP and Outstanding Universal Value (OUV)

The proposed project will not impact SNP as it is outside the SNP. It will impact on scenic beauty in some extent in the PIA due to construction activities, but not park area. There will be less chances to impact on local social and cultural integrity as locals are already exposed to diverse group of people since last 75 years. Similarly, there is no possibility of electroshocking to bird and wild animals due to provision of underground armored cables.

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8. Benefit Augmentation/Adverse impact Mitigation Measures

8.1 Benefit Augmentation Measures

Priority for employment will be given to locals. The poor, vulnerable and socially excluded people of the project area will be given priority in the project related job through the Contractors.Skill enhancement training will be provided to project affected families and people of project area. Electrical and plumbing training, mason training, training on tourism hospitality and cooking and other training as local's interest will be provided. A total of NPR. 1,885,000.00 has been allocated for the training programmes. Implementation of EMP during the construction period will benefit the local community. Support on community facilities such as education, health, drinking water and trekking trails will certainly benefit the local people. Tariff for electricity will be made in close coordination with community so that all can use the electricity at affordable cost. Similarly, 10% of shares will be provided to locals.

8.2 Mitigation Measures

8.2.1 Physical Environment

Minimum land will be acquired as possible. Temporarily acquired land will be rehabilitated. Tree felling will be avoided as possible and compensatory plantation will be done. Spoils and muck will be placed in designated areas only. Trenches, quarry sites and disposal sites will be rehabilitated immediately. Land clearance will be minimized as possible to check erosion and landslide. All the excavated areas and slopes will be stabilized with the application of bioengineering works. Top soil from the affected area will be scrapped and stored for later reuse in land development at disposal sites and other degraded land in the project area. Excavated materials will be used for land reclamation and rehabilitation. Chemicals and oils will be handled with care and stored in safe place to avoid water pollution. Open defecation and urination will be prohibited. Water quality will be monitored regularly. The noise generating machineries and equipment such as generators, crushers etc. will be placed far from the residential areas to reduce the impact of noise. Similarly, construction will not be done during night time. Waste generated from camps will be segregated and managed properly in coordination with local government. Spoils will be compacted to avoid dust blowing. The extraction of river bed materials will be planned properly in such a way that river morphology does not change after the removal of the materials. To minimize the impacts related with GLOFs, people will be made aware about early warning system and emergency preparedness plan. A minimum flow of 10% of the mean monthly flow will be maintained during operation to maintain microclimate of the Monjo Khola. River bank protection will be done in critical areas such as diversion weir to check bank erosion. Waste generated from camps will be managed properly. Ear muffs will be provided to powerhouse workers to reduce the impact of noise pollution. Effluents from camps will not be discharged in water sources. Chemicals, paints, spent oils and lubricants will be stored in safe place to avoid water pollution.

8.2.2 Biological Environment

To compensate the tree felling, plantation will be done in the ratio 1:25. The cost for plantation along with care takers has been estimated to NPR 708,852.00. Trees will not be fell down unnecessarily. People, school children and project workers will be sensitized on conservation of environment, biodiversity and wildlife. Unnecessarily visit in forest areas will be prohibited and smoking will be prohibited in forest area to reduce the possible risk of forest fire. Project staffs will not be allowed to be involved in poaching and hunting. Construction works will not be done during night time. Spoils will not be disposed in water body to protect aquatic life of the Monjo Khola. A minimum flow of 10% of the mean monthly flow will be maintained during operation to sustain the aquatic life of Monjo Khola. All the workers and project staffs will be provided LPG for cooking and fuelwood will not be allowed to reduce the pressure in the forest.

8.2.3 Socio-economic and Cultural Environment

Compensation of land and crops will be proved as per negotiation with locals. To reduce the impacts on existing micro hydro, common understanding will be made and these will be also used for electrification. Support will be provided to health and educational institution to manage the pressure on the services. Similarly, trekking trails will be maintained as per requirement. All the workers and staffs will be provided PPEs. And there will be provision of first aid in work site as well as in camp. Similarly, there will be provision of insurance to all workers against possible accidents. Due consideration will be given for public health, sanitation and safety. Sign board and temporary fencing will be made. Trenches especially made for transmission and distribution lines will be reclaimed immediately to avoid accidents. To reduce the conflict between workers and locals, code of conduct will be strictly implemented, workers will be made aware about ethical behaviors and gambling and alcohol drinking will be prohibited in work site as well in camp. Gender based violence, sexual exploitation and abuse, and sexual harassment will be made punishable and

Grievance Redress Committee at project level will be made to address these issues. Children will not be used in works. Separate camps, toilets and other facilities will be provided to workers to minimize the disturbance to local people and community. PPEs and other necessary code of conduct will be followed to minimize the possible risk of COVID-19. During operation, staffs will be provided with safety gears. Safety sign and boards will be installed as per required. People will not be authorized to visit dangerous project area. Early warning system will be established for sudden release of water to downstream. Tariff on electricity will be fixed in negotiation with locals. To reduce or mitigate the impacts on OUV of SNP, no poaching and hunting will be allowed; no visit on forest area without permission; no forest resources collection will be allowed; use of fire in forest area will be prohibited and all the workers, project staffs and local community will be made aware on biodiversity conservation.

Cost for most of the mitigation measures are included in project cost. Beside these, a total of NPR 2,345,852.00 has been allocated for different mitigation measures.

9. Environment management Plan

An Environmental Management Plan (EMP) has been proposed with present report including issues identified, possible effects and impacts, measures for their mitigation and monitoring method and schedule. In addition, agencies responsible for executing environmental mitigating measures and monitoring have been identified as part of EMP. Different monitoring indicators on Physical, Biological, Socio-economic and Cultural environment have also been identified.

10. Monitoring

Separate monitoring plan has been proposed based on Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078. Monitoring plans and indicators, schedules and responsibility has been identified in the BES report. A total of NPR 750,000.00 has been allocated for monitoring activities.

11. Conclusion

Most of the identified environmental adverse impacts are locally confined and are limited to construction period. With the set of proposed mitigation measures, most of the identified adverse impacts can be minimized and/or compensated. There is very less risk for residual impacts on physical, biological, socio-economic and cultural environment of the project area while implementing the proposal based on EMP. Based on this BES study, electrical energy production and transmission and distribution to local community and settlements from the proposed Monjo Khola Mini Hydro will be implemented with incorporation of the measures suggested in the EMP, and BES is sufficient for the proposed proposal.

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ANNEXES

ACRONYM/ABBREVIATION

AC	Alternate Current
ACSR	Steel Reinforced Aluminum Conductor
AEPC	Alternative Energy Promotion Centre
amsl	Above Mean Sea Level
B	Breath
BA	Basal Area
BOD	Biological Oxygen Demand
BS	Bikram Sambat
BZ	Buffer Zone
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CDO	Chief District Officer
CFUG	Community Forest User Groups
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
cm	Centimeter
COD	Chemical Oxygen Demand
CSR	Corporate Social Responsibility
CTs	Current Transformers
D/ha	Density per hectare
dB	Decibel
DBH	Diameter at Breast Height
DCC	District Coordination Committee
DHM	Department of Hydrology and Meteorology
DIA	Direct Impact Area
dia.	diameter
DNPWC	Department of National Park and Wildlife Conservation
DO	Dissolved Oxygen
DoED	Department of Electricity Development
E	East
E&S	Environmental and Social
EA	Environmental Assessment
EIA	Environmental Impact Assessment
El	Elevation
EMAP	Environmental Management Action Plan
EMP	Environmental Management Plan
EMIMAP	Environmental Management Implementation Management Action Plan
EPA	Environment Protection Act
EPR	Environment Protection Rule
ESCOs	Energy Service Companies
BES	Brief Environmental Study
FGD	Focus Group Discussion
GIS	Geographical Information System
GLOF	Glacier Lake Outburst Flood
GoN	Government of Nepal

GRM	Grievance Redress Mechanism
GWh	Giga Watt hour
Ha	Hectare
HHs	Households
Hz	Hertz
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IIA	Indirect Impact Area
INGO	International Non-Government Organization
INPS	Integrated Nepal Power System
IUCN	International Union for Conservation of Natural
IVI	Important Value Index
KII	Key Informant Interview
Km	Kilometer
kV	Kilovolt
kVA	Kilovolt Ampere
kW	Kilo Watt
L	Length
L/C	Letter of Credit
lps	liter per second
m	Meter
MAPs	Medicinal and Aromatic Plants
MGEAP	Mini Grid Energy Access Project
MKMH	Monjo Khola Mini Hydro
MKMHSP	Monjo Khola Mini Hydro Project
mm	millimeter
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MoFE	Ministry of Forest and Environment
MoST	Ministry of Science and Technology
mVA	Milli Volt Ampere
MW	Mega Watt
N	North
NGO	Non Governmental Organization
No.	Number
NRs	Nepalese Rupees
NTFPs	Non-Timber Forest Products
ONAN	Oil Natural Air Natural
OPs	Operation Plans
pH	Potential of Hydrogen
PID	Proportional Integrative Derivative
KPLRM	Khumbu PasangLhamu Rural Municipality
ppm	Parts per Million
PTs	Potential Transformers
RCC	Reinforced Cement Concrete
RD	Relative Density
RF	Relative Frequency
RM	Rural Municipality
RoR	Run of River
RPM	Revolutions per Minute
s	Second

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SNP	Sagarmatha National Park
TDS	Total Dissolved Solids
ToR	Terms of Reference
TV	Television
VCBs	Vacuum Circuit Breakers
WB	World Bank
WECS	Water and Energy Commission Secretariat

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CHAPTER 1: NAME AND ADDRESS OF THE INSTITUTION PREPARING THE REPORT

1.1 NAME AND ADDRESS OF THE PROPONENT

Monjo Khola Mini Hydro Pvt. Ltd. is the proponent of Brief Environmental Study (BES) for the development of Monjo Khola Mini Hydro Project (MKMHP) in Solukhumbu district. Khumbu Pasang Lhamu Rural Municipality (KPLRM) is the concerned authority for the approval of BES report. The Address of the proponent is as follows:

The name and address of the proponent of the proposal:
Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga,
Bagmati Province, Nepal
Telephone No: 01-4464222, 01-4464333
Email: monjokholaminihydro@gmail.com

1.2 NAME AND ADDRESS OF THE CONSULTANT

Monjo Khola Mini Hydro Pvt. Ltd. has entrusted for Eco Friend International Pvt. Ltd. (EFI) for BES of the proposed MKMHSP (942 kW). Thus EFI is responsible to conduct the necessary desk and field study and preparing BES report on behalf of the proponent adhering with the prevailing legislations and facilitation for approval from KPLRM. The address of the consultant is as follows:

Eco Friend International Pvt. Ltd.
Lalitpur-2, Sanepa,
Lalitpur, Nepal
Tel: +977-9851127867
Email: ecofriend.nepal@gmail.com

1.3 STUDY TEAM AND SELF DECLARATION

The study team member for BES is as given in Table 1 and self-declaration has been given in **Annex I**. The study team has assessed the physical and chemical environment, biological environment and socio-economic and cultural environment of project area as per approved Terms of Reference (ToR) of BES of MKMHP (**Annex** II).

Table 1: BES Team Composition

SN	Name	Expertise	Academic Qualification	Experience
1	Dhan B. Shrestha	Environment/ EIA/Team Leader	MSc, Environmental Science	14 Years
2	Lokesh Sapkota	Physical Environment Expert	ME, Environmental Engineering	10 Years
3	Ramji Bogati	Biodiversity Expert	MSc, Zoology	10 Years
4	Heramba Adhikari	Socio-economic and Cultural Expert	MA, Sociology/RD	10 Years
5	Toya Nath Ghimire	Geologist	MSc, Geology	10 years

1.4 OBJECTIVES OF BRIEF ENVIRONMENTAL STUDY

The objectives of the proposed BES include:

- Collection of baseline data on bio-physical, socio-economic and cultural resources of the project area and identify the major issues that may arise as a result of proposed works on bio-physical, socio-economic and cultural environment of the project area,
- Prediction and evaluation of environmental impacts.
- Recommendation of practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan for the proposal,
- To provide platform for public to raise the issues about implementation of project
- To ensure if BES is sufficient for the project and
- Preparation of BES Report as per Working Procedure for Brief Environmental Study and Initial Environmental Examination of Khumbu Pasang Lhamu Rural Municipality.

1.5 RELEVANCY OF BRIEF ENVIRONMENTAL STUDY

According to Clause 3-2-GA of Environment Protection Act, 2019, for the development work or proposal falling under the jurisdiction of local level, Brief Environmental Study (BES) or Initial Environmental Examination (IEE) report should be to the concerned body specified by local law and Environmental Impact Assessment (EIA) report should be submitted to provincial government body specified by state law. As per the Constitution of Nepal and Local Government Operation Act 2074, the proposed proposal comes under the jurisdiction of Khumbu Pasang Lhamu Rural Municipality (KPLRM). In the Same way, as per EPR 2020, Annex 1, KA-14, it is mandatory conduct BES for the proposed proposal of construction of hydropower generating electricity less than 1 megawatt (MW) within buffer zone. Similarly, as per threshold of environmental study of possible proposals of rural municipality jurisdiction given in Annex 1 of the Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, BES is required for the proposed proposal of construction of hydropower generating electricity less than 1 megawatt (MW) within buffer zone. The MKMHSP (942kW) lies in buffer zone (BZ) area of Sagarmatha National Park (SNP), hence BES is required for the implementation. On the same way, as per Annex 1, KA-8 of EPR 2020, BES is required to those proposals using up to 1 ha of forest area, forest conservation area, conservation area, buffer zone and forest of environmental conservation area except for transmission line. Same thing has been mentioned in Annex 1 of Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078.

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CHAPTER 2: INTRODUCTION

2.1 BACKGROUND

The proposed project, Monjo Khola Mini Hydro Project (942 kW) is being developed under Mini Grid Energy Access Project (MGEAP) program of Alternative Energy Promotion Centre (AEPC), a Government institution established on 3 November 1996 under the Ministry of Science and Technology (MoST) with the objective of developing and promoting renewable/alternative energy technologies to meet the energy needs in Nepal. At present, it is under the Ministry of Energy, Water Resources and Irrigation (MoEWRI). AEPC has been implementing the Private Sector-Led Mini-Grid Energy Access Project (MGEAP) since September 2019 with support from the Government of Nepal (GoN) and the World Bank (WB) as loan and grant. The objective of the MGEAP is to increase electricity access and delivery from renewable energy mini-grids (Micro/Mini Hydro, Solar, Wind and Solar/Wind Hybrid Projects) by mobilizing private Energy Service Companies (ESCOs). The project will deliver financial support to the ESCO (here proponent) to facilitate financial closure and enhance financial viability of the projects, provided in the form of subsidy from the GoN and loans from the WB through Partner Banks (PBs). It is calculated that subsidy from GoN through AEPC will be 23.40% of the total project cost, loan from PBs will be 56.60% and proponent will invest 20% of the project cost.

Monjo Khola Mini Hydro Pvt. Ltd. (MKMHPL), at Kathmandu Metropolitan City, ward number 8, Tilganga is a private Energy Service Company (ESCO), registered at Ministry of Industry, Commerce and Supplies, office of company registrar office, Kathmandu on ward number 8, Tilganga (**Annex III**) has proposed to develop the proposed project 'Monjo Khola Mini Hydro Project (MKMHP) (942 kW)' under MGEAP. MKMHPL has been selected by AEPC through open call from throughout the Nepal. Thus MKMHPL is the proponent of the proposed MKMHP and has received technical clearance from the Department of Electricity Development (DoED) on on 18/11/2076 (1 March 2020) (**Annex IV**). Khumbu Pasang Lhamu Rural Municipality has provided generation license on 03/12/2076 (16 March 2020) (**Annex V**). Department of National Park and Wildlife Conservation (DNPWC) provided consent letter for environmental assessment study on 18th August 2021 (**Annex VI**).

2.2 BRIEF INTRODUCTION OF THE PROPOSAL

The proposed proposal MKMHP is the generation of 942 kW energy and distribution at local communities through 11 kV transmission and 1.1 kV distribution lines. Thus it will have basically two components— (i) power generation and (ii) transmission and distribution. The proposed project is a run-off-river scheme and uses water from Monjo Khola, a perennial river and tributary of Dudh Koshi River. Water will be diverted at elevation of 2959.57 m amsl and intake will be made at elevation of 2960.50 m amsl. Thus diverted water will be streamed down to power house located at 2744 m amsl through 1440 m long penstock pipe. The gross head will be of 215.50 m with design discharge 0.56 m^3/s at $Q_{80\%}$. Two turbines with the rated output of 496 kW will be used to generate 942 kW energy. Thus generated electricity will be transmitted through 11 kVA transmission lines and distributed through 1.1 kVA distribution lines to 582 households in Chyuma, Byankar, Tok Tok, Thulo Gamela, Phakding, Sano Gamela, Chermading, Ghat, Thadakoshi, Chheplung, Muse and Chaurikharka Villages of Ward No. 3, Khumbu Pasang Lhamu Rural Municipality (KPLRM) where majority of residents are indigenous people and the area is off-grid areas. All the settlements lie in buffer zone of Sagarmatha National Park.

2.3 OBJECTIVES OF THE PROPOSAL

The objective of the project is to develop a mini hydro project with the installed capacity of 942 kW from Monjo Khola and to distribute to local people of KPLRM-3 of Solukhumbu district to reduce the dependency on traditional use of fuelwood and dung cake of animals along with liquefied petroleum gas (LPG).

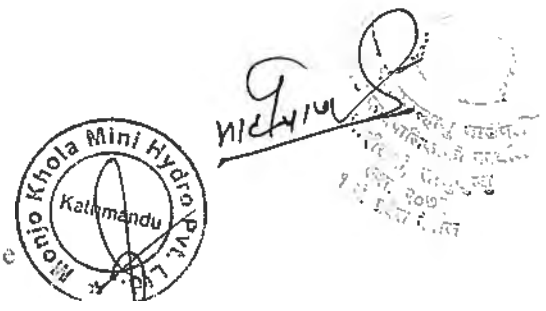
2.4 RELEVANCY OF THE PROPOSAL

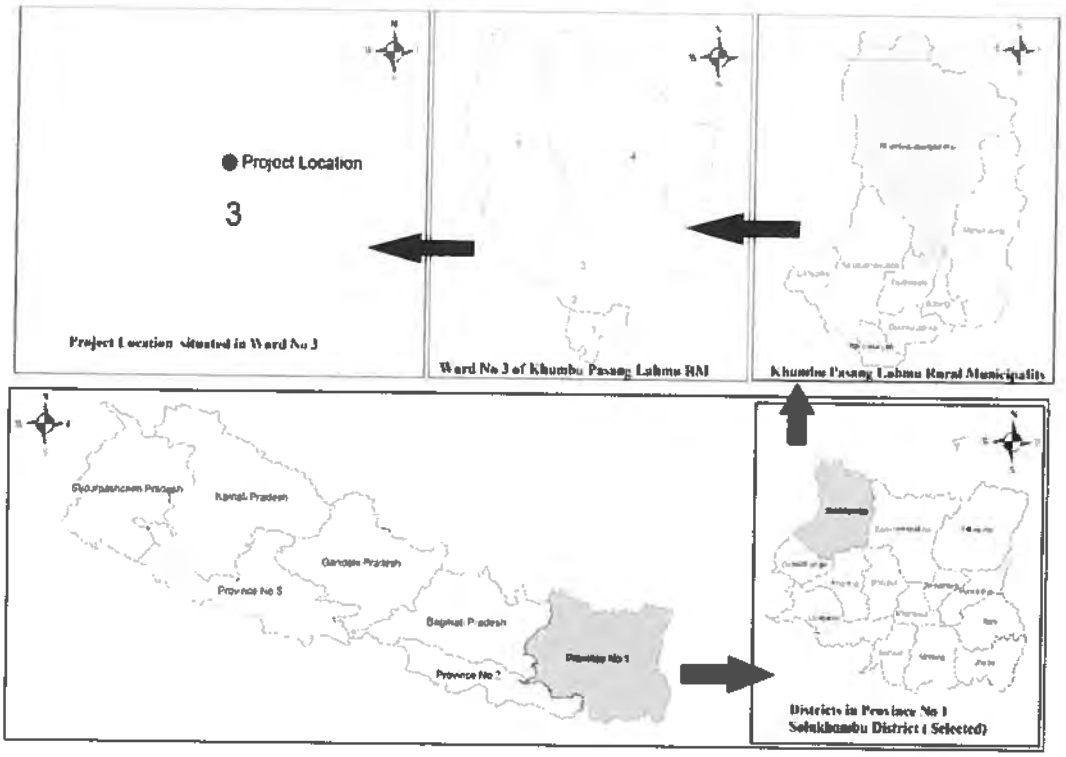
The main purpose of the proposed project is to supply energy to meet household demand for electricity, cooking and space heating in Chyuma, Byankar, Tok Tok, Thulo Gamela, Phakding, Sano Gamela, Chermading, Ghat, Thadakoshi, Chheplung, Muse, Chaurikharka and other settlements of ward number 3. The local demand for energy is very high in the area due to tourism activities and cold weather. Therefore, the proposed proposal will produce energy to supply electricity to fulfill the demand in the area. Currently, it is difficult to meet the demand of electricity for light from the existing micro hydro. Household energy demand for cooking is being met by seasonal harvesting of fuelwood, and LPG. Forest products are insufficient as the households lie in the buffer zone of Sagarmatha National Park. Thus, use of forest products is very limited. Yak dung is a traditional source for cooking but aggressive use of dung for heating and cooking has led to problems such as decrease in agricultural productivity because of the scarcity of manure in the fields. LPG gas is also used but is expensive because of high cost of transportation of LPG cylinders. On the same way, hotels use LPG gas for cooking and small solar home system for lighting. Electricity from project can fulfill the basic need of electricity along with replacement of expensive LPG gas for cooking in hotels. Excess electricity can be used for space heating in winter. Micro enterprises related to tourism service industry such as bakeries, handicrafts shops, social institutions, restaurants can be operated due to electricity generated from the proposed project. Therefore, the proposed proposal has been considered as very important project to reduce the dependency on forest resources as well as the LPG thus reducing the emission of greenhouse gases.

2.5 LOCATION AND ACCESS

2.5.1 LOCATION

The project has been proposed to implement in Monjo, Ward No. -3, Khumbu Pasang Lhamu Rural Municipality, Solukhumbu District, Province 1 of Republic of Nepal. Major project components such as headworks (including intake, desanding basin) and some part of penstock pipe are proposed to be located on the left bank of Monjo Khola while remaining part of penstock, tailrace and powerhouse facility as well as the switchyard station are proposed to be located on the right bank of Monjo Khola, which is a tributary of DhudhKhosi River. Geographically, the proposed project lies between 27°46'00"N to 27°46'30"N latitude and 86°43'20.00"E to 86°44'30.00"E longitude. The elevation within the project area varies between 2744 m to 2960 m amsl.





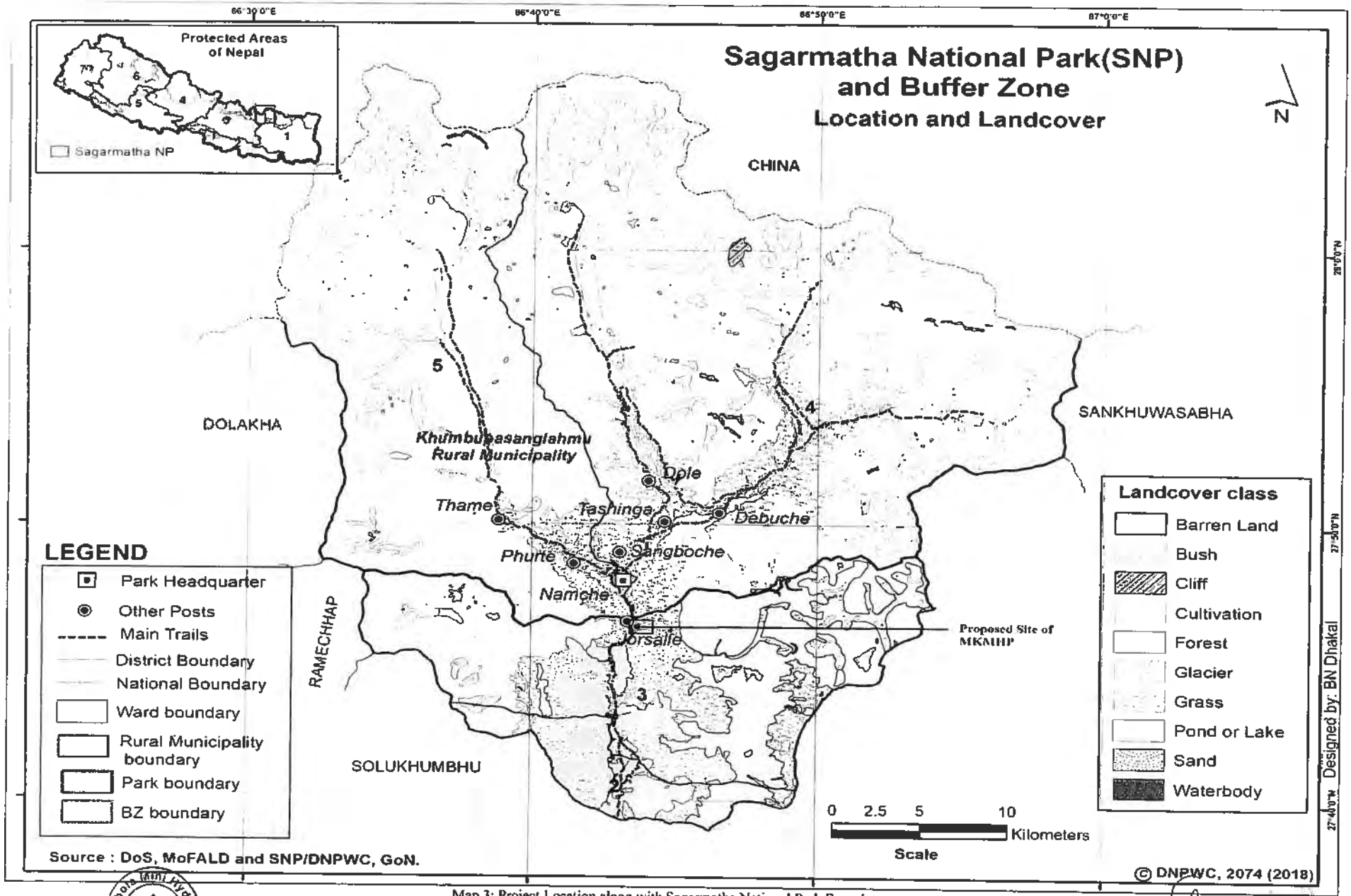
Map 1: Project Location in District Map

(Shape file modified by CED)

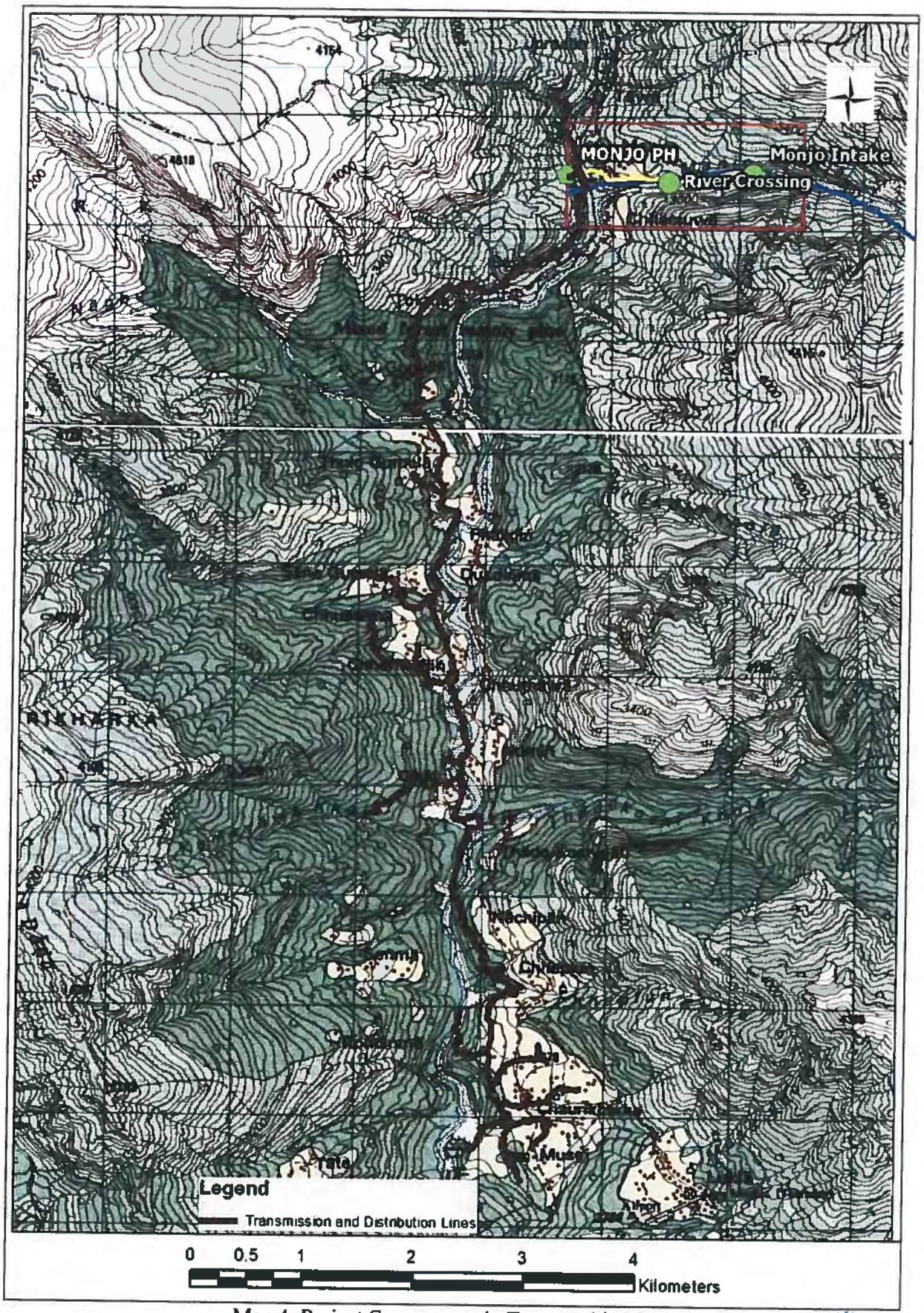
Map 2: Project Location on Google Earth Map

(Map Source: Over lay on Google map, Modified by CED)

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu



Map 3: Project Location along with Sagarmatha National Park Boundary



Map 4: Project Components in Topographic Map

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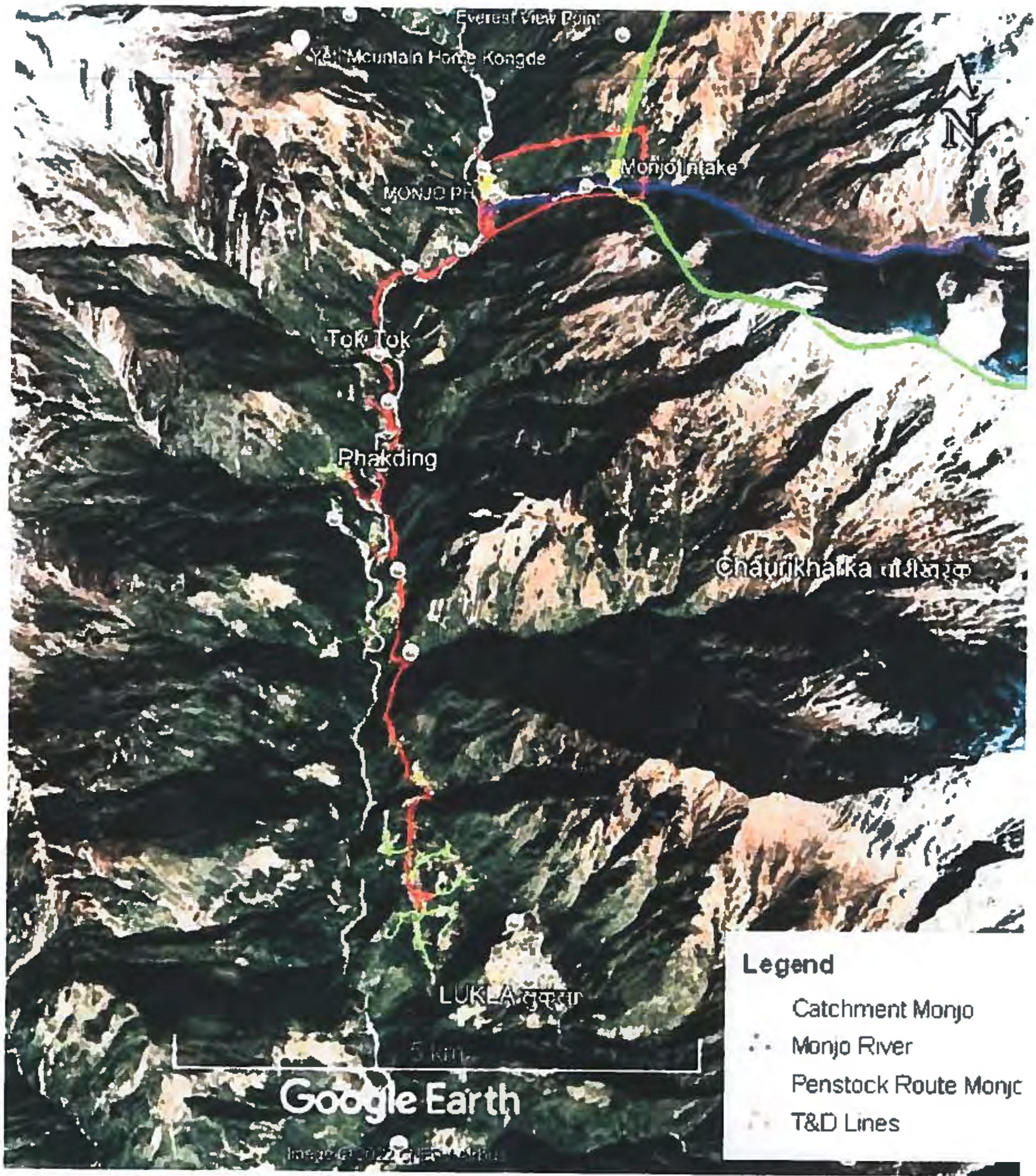

Map 5: Project Components in Google Earth

2.5.2 ACCESS

From Kathmandu, the project site is accessible by commercial air flight and on foot. Flight from Kathmandu to Lukla takes around 30 minutes. From Lukla, the site is either accessible by helicopter or on foot. Travel on foot from Luklato project site is about 9.5 km. Materials and equipment to the project site can be transported either by helicopter or mules. Alternatively, the project site can be accessed by road along with walk on foot. Amotorable road of 216 km from Udaypur connects to Salleri bazaar. From Salleri Bazaar there is seasonal road to Buksa which is 48 km long. From Buksa, the project site is accessible either by helicopter or on foot. Travel distance on foot from road head via Luklato project site is around 45 km and requires 3 days for a loaded porter. From Lukla to Monjo, it is about 13 Km foot trail.

2.6 NATURE AND TYPE

It is a mini hydro project with installed capacity of 942 kW generating energy of 7,243,292.16 kWh annually. It is a Run-of-River (RoR) type power generation scheme in which water will be diverted at the rate of 0.56 m^3/s. Thus generated energy will be evacuated or distributed in more than 20 different settlements of ward number 3 of Khumbu Pasang Lhamu RM through a 40.80 km long 11kV transmission lines and 1.1 kV distribution lines with 400/230 V as distribution voltage.

2.7 SALIENT FEATURES

The salient feature of the proposed project is as follows given in **Table 2.**

Table 2: Salient feature of the Project

1	**Location**		
	Province	:	1
	District	:	Solukhumbu
	Rural Municipality	:	Khumbu Pasanglhamu Rural Municipality Ward:3
	Project Boundary	:	27°46'00"N to 27°46'30"N and 86°43'20.00"E to 86°44'30.00"E
	Intake	:	**27°46'15.20"N and 86°44'15.80"E, elevation 2960 m amsl**
	Power House	:	**27°46'15.00"N and 86°43'20.18"E,elevation 2744 m amsl**
2	**General**		
	Name of River	:	Monjo Khola
	Nearest Town	:	Lukla (9.5 km)
	Type of Scheme	:	Run of River
	Gross Head	:	215.50 m
	Installed Capacity	:	942 kW
	Annual Energy	:	7,243,292.16 kWh
3	**Hydrology**		
	Catchment Area at Headworks Site	:	43.26 km^2 (Total), 18.83 km^2 (>5000 m) 24.43 km^2(A> 2959, A < 5000 m)
	Measured Discharge	:	427 lps (5 March 2020)
	Design Discharge ($Q_{80\%}$)	:	0.560 m^3/s
	Design Flood (1 in 100 year)	:	15 m^3/s (Intake) , 31 m^3/s (Powerhouse)
	Compensation flow	:	10% of discharge of driest month (Min)
4	**Diversion Weir**		
	Type	:	Concrete gravity type weir
	Length	:	8.5 m
	Height	:	1.45 m
	Crest level	:	El. 2960.50 m
5	**Intake**		
	Type	:	Bottom/Drop intake
	No of Orifice	:	1 No.
	Size of trashrack	:	6.0 m (L) x 0.71 m (B)
	Inclination of trashrack	:	10°
6	**Gravel Trap**		
	Size (L x B x H)	:	6 m x 1.5 m x 2.15 m
	Bed load size to trap	:	2mm

7	**Approach Canal**		
	Type	:	Rectangular RCC canal
	Length	:	2.4 m
	Size (B x H)	:	0.7 m x 1.3 m
	Bed Slope	:	1:100
8	**Desanding Basin cum Forebay**		
	Type	:	Conventional with head pond
	Size (L x B x H)	:	28.5 m x 3.2 m x 2.34 m
	Number of Bay	:	1 No.
	Nominal size of trapped particle	:	0.2 mm
9	**Penstock Pipe**		
	Type	:	Mild Steel Pipe (Exposed & Buried)
	Internal Diameter	:	600 mm
	Pipe Thickness	:	4 mm thick 234.33 m long 6 mm thick 299.14 m long 8 mm thick 182.38 m long 10 mm thick 649.93 m long 12 mm thick 45.57 m long
	Branch pipe	:	MS 300 mm dia., 12 mm thick 10 m long (Each)
	Total Length of the pipe	:	1410 m
	No of Anchor Block	:	44 Nos
10	**Powerhouse**		
	Type of powerhouse	:	Surface Type
	Size (L x B x H)	:	21 m x 8.73 m x 6.7 m
	Turbine Axis Level	:	El. 2745.00 m
11	**Tailrace Conduit**		
	Type	:	Pipe and Canal
	Canal Size (L x B x H)	:	24.71 m x 0.66 m x 0.82 m
	Pipe		MS 600 mm dia, 4 mm thick, 47.22 m long
12	**Turbines**		
	Type	:	Horizontal Shaft Pelton Turbine Double Jet
	Number of Units		2 No.
	Discharge per unit	:	0.280 m^3/sec
	Rated Output (Mechanical)	:	496 kW X 2
	Synchronous Speed	:	1000 rpm
	Rated Net Head	:	204.99 m
	Rated Efficiency at 100% Discharge	:	88%
13	**Generators**		
	Type	:	3-Phase, Synchronous, Brushless
	Rated Output Capacity per Unit	:	650 kVA
	Rated Efficiency	:	96%
	Frequency	:	50 Hz
	Rated Voltage	:	0.4 kV
	Number of Poles	:	6
	Speed	:	1000 rpm
	No of units	:	2 Nos.
14	**Governor**		
	Type	:	Electronic, PID Oil-hydraulic, self-closing without electric power
	No of units	:	2 Nos.
15	**Transformer**		
	A. Power Transformer		

	Type	:	ONAN Cooling, YNd11, 3 phase
	Rated capacity	:	630 kVA
	Voltage ratio	:	0.4/11 kV
	Efficiency	:	98%
	No of units	:	2 Nos.
	B. Distribution Transformer		
	Type	:	11/0.4 kV, 3-phase, oil immersed, copper owned AVR with parallel operation
	Rated Capacity	:	150 kVA- 2 Nos
			125 kVA- 5 Nos
			100 kVA- 1 Nos
			75 kVA-3 Nos
			50 kVA-3 No.
16	**Transmission & Distribution line**		
	A. Single Line Distribution		
	Total Length of 11 kV underground line (underground PVC sheathed armored 3 core 70 sq. mm aluminum)	:	16.00 km
	Total length of 11 kV overhead line during river crossings (Dog ACSR)	:	0.80 km
	1.1 kV 120 sq.mm. 4 Core XLPE Insulated Unarmored Aluminum Cable	:	8.00 km
	1.1 kV 95 sq.mm. 4 Core XLPE Insulated Unarmored Aluminum Cable	:	6.0 km
	1.1 kV 35 sq.mm. 4 Core XLPE Insulated Unarmored Aluminum Cable	:	10.00 km
	B. Distribution Transformer		
	Type	:	Outdoor installation type
	Quantity required	:	Fifteen (15)
	Type of cooling	:	ONAN
	Number of phases	:	Three phase
	Frequency	:	50 Hz
	Rated voltage	:	
	1) Primary	:	11 kV
	2) Secondary	:	0.4 kV.
	Vector group symbol (by IEC designation)	:	Dyn11
	C. Major Crossings		Length of crossing (meters)
	Jorsalle	:	80
	Monjo	:	50
	Byankar	:	110
	Toktok 1	:	30
	Toktok 2	:	30
	Rangding	:	80
	Sano Gamela	:	60
	Chermading	:	65
	Lowa	:	65
	Thadokoshi	:	40

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	D. Poles for Overhead Transmission During Crossings		
	Type	:	Galvanized Mild Steel Tubular poles
	Total Length	:	9 m
	Bottom Section	:	5m long, outer diameter 165.1 mm, thickness 4.5 mm
	Middle section	:	2m long, outer diameter 139.7 mm, thickness 4.5 mm
	Top section	:	2m long, outer diameter 114.3 mm, thickness 3.65 mm
	Minimum weight	:	120 kg
	E. Sub-Station		
	Type	:	Pole mounted
	Total Sets	:	14
	Pole Type	:	Galvanized steel tubular poles
	Length of Poles	:	9 m
	F. Conductors		
	Type	:	ACSR Conductor (Dog)
	Code Name	:	Dog
	Nominal Aluminum Area, mm^2	:	100
	Specific Weight, kg/km	:	394
	Resistance, ohm/km	:	0.2745 A
	Inductive Reactance	:	0.315
	G. Underground Cables	:	Poly Vinyl Chloride (PVC) insulated armored aluminum cable
	H. Distribution Box		
	Total Number	:	92
	Coordinate of First DB	:	X: 86.722267°E;Y:27.778681°N [North most]
	Coordinate of Last DB	:	X: 86.719913°E;Y: 27.687172°N [South Most]
	System	:	Double Door
	Size	:	L X B X H = 45 cm X 30 cm X 60 cm
17	**Switchyard**		
	Type	:	Indoor, Single Bus Configuration, 11 kV
	Dimension	:	3.55 m X 6.32 m
	Location	:	Inside Powerhouse
18	**Load Center**	:	**No. of HHs (582 Beneficiary Households)**
	Bosum	:	9
	Byankar	:	43
	Chauri Kharka	:	34
	Chaurikharka (Dungde)	:	54
	Chesurma	:	12
	Chheplung	:	59
	Chhermading	:	6
	Chyuma	:	25
	Ghat	:	40
	Ghattekhola	:	4
	Jamphutte	:	8
	Lowa	:	5
	Monjo	:	59
	Muse		40
	Muse (Bakudingma)		4
	Ngamateng		6
	Phakding		56
	Rangding		13

	Teka		5
	Thadokoshi		17
	Tok-Tok		26
	ThuloGumela		32
	Sano Gumela		25
19	**Power and Energy**		
	Type of Power Plant	:	Run-of-river
	Design Discharge	:	0.56 m^3/s
	Total Gross Head	:	215.50 m
	Rated Net Head	:	204.99 m
	Installed Capacity	:	942 kW
	Total Annual Energy	:	7,243,292.16 kWh
20	**Project Cost Estimate**		
	Total subproject Cost with VAT and Provisional Sums and IDC	:	NRs. 571,615,360.46
	Cost Per kW	:	NRs. 606,810.36
	Tariff Rates	:	NRs. 11 for HH and NRs. 18 for End use
	Net Present Value (@ 10% discount factor)	:	NRs. 6,598,702.83
	Subproject rate of return	:	10.20%
	Equity rate of return	:	11.61%
	Payback	:	8.36 years
21	**Financial Mix**	:	18 Months
	AEPC Subsidy (23.40 %)	:	136,374,000.00
	ESCO Investment (20%)	:	116,558,915.08
	Bank Loan (56.60 %)		329,861,660.32
21	**Construction Period**	:	**18 Months**

(Source: CED, 2021)

2.8 PROJECT COMPONENTS

Water of Monjo Khola will be diverted by constructing 8.5 m long and 1.45 m high diversion weir to generate annual average energy of about 7,243,292.16 kWh. The proposed project will have two components— (i) generation and (ii) transmission and distribution.

2.8.1 POWER GENERATION COMPONENTS

2.8.1.1 Headworks

The headworks of the proposed project are situated at about1.3 Km upstream from the confluence of Monjo settlement.

i) Diversion Weir

A permanent concrete gravity type weir is provided across the river to divert the required flow through the intake. The length of weir is 8.5m and its crest level is fixed at 2960.50 m amsl. The bed level of river at upstream side of weir is 2959.57 m amsl and at downstream of weir is 2959.35 m amsl. The high flood level at weir is 2961.38 m amsl for flood discharge of15 m^3/s at 100 years return period. The platform level for gates operation is fixed at 2962.38 m amsl. Upstream apron of 1.5m length is provided whereas downstream apron is of length 7.3m.

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ii) Bottom Intake

As the gradient of river is steep, the bottom intake is proposed for the diversion of water from river. The length of trashrack provided along the axis of weir is 6m and the inclined width of trashrack is 0.71m. The trashrack is capable of diverting 0.67 m^3/s of discharge which is 20% more than the design turbine discharge (0.56 m^3/s). The normal water level at intake is fixed at 2960.50 mamsl.

iii) Approach Canal

The diverted water from intake is carried through approach canal to the gravel trap. The width of canal is 0.7m and overall depth is 1.3m. The length of canal is 2.4 m.

iv) Gravel Trap

The length of gravel trap is 6m, width is 1.5m and average depth is 2.15m. The normal water level at gravel trap is 2959.80 m amsl. Side spillway of length 4m is provided at gravel trap to spill the excess flood discharge. The crest level of spillway is fixed at 2959.85 m amsl. The size of flushing gallery provided at gravel trap is 0.4m x 0.4m. The inlet transition of length 1.5m is provided whereas outlet transition of length 0.9m is provided.

v) Desanding Basin

The length of basin is 28.5m, width is 3.2m and average depth is 2.34 m. The design size of particle to settle at desanding basin is 0.2mm. The inlet transition of length 4.70m is provided to maintain the steady flow at basin. The size of flushing gallery provided at basin is 0.4m x 0.4m. The bed slope of 1:50 is provided at basin. At the end of desanding basin, head pond of length 2m, width 3.2m and depth 3.02m is provided to maintain the adequate submergence depth for penstock pipe. The normal water level at head pond is maintained at 2959.71 m amsl.

vi) Penstock Pipe and Supports

Mild steel penstock pipe with internal diameter 600mm and length 1410 m is proposed for conveying water from head pond to the turbine. The thickness of pipe varies from 4mm to 12mm. After bifurcation, two manifolds of 10.35m length and 300mm internal diameter is provided. Anchor blocks are provided at each horizontal and vertical bends to restrain the forces generated at bends. Total 44 numbers of blocks are provided (including bifurcation and branches) in the project.

vii) Powerhouse and tailrace

a. Power House

The powerhouse is located near Monjo Village on left bank of Dudh Koshi River. The powerhouse contains two units of turbine and generator, associated electrical and mechanical equipment and a maintenance bay. The powerhouse is surface type and is located at an elevation of about 2744 m. It contains two units of horizontal shaft Pelton turbine which drives a generator and generates a power of 471 kW each, with total installed capacity of 942 kW. The dimension of the powerhouse is 21m x 8.73m x 6.7m. The floor level of powerhouse is fixed at 2744.40 m amsl elevation and the turbine axis level is at 2745.00 m elevation.

b. Tailrace

The water form two units of powerhouse are conveyed to Dudh Koshi River through combination of tailrace canal and pipe. The length of tailrace canal is 24.71m and that of pipe is 47 m. The bed slope of 1:200 is provided for tailrace canal. Tailrace canal have width of

0.66m and overall depth of 0.82m. The diameter of pipe used in tailrace is 600mm. At outlet portion, gabion and boulder riprap protection are provided to prevent erosion of soil.

viii) Switchyard Area

An indoor switchyard of 3.55 m X 6.32 m has been proposed for the transmission of 942 kW of power. The generated powers from two 650 kVA alternators are transferred to a 400 V busbar. From this busbar two transformers of 630 kVA each are connected in parallel operation and the power is fed to a single bus system of 11 kV. This bus system will be used to transmit electricity in high voltage majorly through a high voltage underground cable. The transformers, transformer protection system, CTs, PTs, isolators, VCBs and bus bars are major equipment of the outdoor switchyard. The details of switchyard equipment can be viewed in the electrical single line diagram of Monjo Khola Mini Hydro Project.

2.8.2 TRANSMISSION AND DISTRIBUTION LINE

The transmission and distribution network are designed considering the following load centers:

i. 278HHs with the demand of 1.5 kW per household and 54HHs with 1 kW demand.
ii. 24 big hotels with the demand of 3 kW per hotel, 38 medium hotels with the demand of 2kW per hotel and 75 small hotels with the demand of 1.5 kW per hotel.
iii. 74 restaurants, with the demand of 1.5 kW each.
iv. 20 Social Institutions with the demand of 3 kW each
v. 1 hospital with the demand of 3 kW
vi. 3 Snooker houses and 9 shops with demand of 1 kW each.
vii. A ward office with demand of 2.5 kW.
viii. 2 bakeries with 2 kW demand each and 3 end uses with 4 kW demand each.

Further as a part of project, the power/energy to be generated at MKMHP will be evacuated and distributed to the proposed Khumbu Pasang Lhamu RM-3 through a 40.80 km long transmission and distribution with 11kV transmission line and 1.1 kV with 400/230 V as distribution voltage. The transmission line uses only public land along with foot trails through underground distribution system.

2.8.2.1 Underground Cables

The Poly Vinyl Chloride (PVC) insulated armored aluminum cable will be used in the underground transmission. 11 kV grade 3 core 70 sq. mm. PVC insulated aluminum armored cable will be used in the underground transmission. 1.1 kV grade 4 core Cross Linked Poly-Ethylene (XLPE) insulated aluminum unarmored cable of various cross-sectional areas will be used for three phase and single-phase distribution respectively. The trench for cable laying will be of 80 cm deep and 55 cm wide.

2.8.2.2 Pole-Mounted Sub-Station

The distribution transformer will be pole mounted type. There will be a total of fourteen (14) sets of pole mounted substation, each with two 9 m long galvanized steel tubular poles, transformer mounting frames, cross arms for placing insulators, lightning arresters and Drop Out fuses, two earthing sets one for transformer neutral earthing and another for equipment and

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LA earthing, 400 V distribution board including MCCBs and single core XLPE insulated copper armored cables for connecting LV bushings of transformer to MCCB.

2.8.2.3 Major Crossings

There are altogether 10 crossings for the transmission of electricity. The details of the crossings are shown in the following table:

Table 3: River Crossing Details of 11 kV Transmission Lines

SN	Location of river crossing	Length of crossing (meters)
1	Jorsalle	80
2	Monjo	50
3	Byankar	110
4	Toktok 1	30
5	Toktok 2	30
6	Rangding	80
7	Sano Gamela	60
8	Chermading	65
9	Lowa	65
10	Thadokoshi	40

(Source: CED, 2021)

Each of the crossings at the ten locations considers double pole assembly with suitable stay sets and necessary auxiliaries.

2.8.2.4 Poles for Overhead Transmission During Crossings

The ACSR conductor for overhead transmission will be suspended on the 9-meter-long Galvanized Mild Steel Tubular poles with three sections of the following specifications:

Bottom Section: 5m long, outer diameter 165.1 mm, thickness 4.5 mm
Middle section: 2m long, outer diameter 139.7 mm, thickness 4.5 mm
Top section: 2m long, outer diameter 114.3 mm, thickness 3.65 mm
Minimum weight: 120 kg.

The minimum ground clearance for 11 kV transmission line is considered to be 6.1 m and for ensuring the clearance the horizontal 3 wire configuration with the conductor spacing of 0.7 m is considered.

The minimum ground clearance for 400/230 V overhead distribution line t is considered to be 5.5 m and the vertical configuration with the conductor spacing of 0.305 m is considered.

2.8.2.5 Distribution Box

The underground distribution cables will terminate on the distribution boards placed inside the PVC box mounted on the stone masonry wall. The distribution box will be of double door system, (L X B X H = 45 cm X 30 cm X 60 cm), capacity of distributing maximum of 21 single phase users, including 1 earth fault relay, and necessary MCBs, with all complete accessories, will have the necessary arrangements for the termination of distribution cables and the connection of the service wire. A total of 92 distribution box have been considered for the distribution purpose to 582 consumers. Each of the distribution boards will be placed on a stone-masonry block of 0.75m length, 0.5 m width and 0.5 m height.

2.8.2.6 Service Wire

XLPE insulated 2 Core 10 sq. mm aluminum wire as well as 2 Core 25 sq. mm aluminum wires will be laid underground which will be used as service wire for the supply of electricity from a distribution box to the respective household. A total of 24 kilometers of 10 sq. mm. unarmored 2 core XLPE cables and 12 kilometers of 25 sq. mm. unarmored 2 core XLPE cables will be used as service wires. The maximum length of a service wire is up to 110 meters.

2.9 ANCILLARY FACILITIES

a) Site Access

Site access shall be provisioned by using existing trails from Monjo to reach to various project component sites. The details of the access trails are provided in **Table 4** hereunder.

Table 4: Site Access

SN	Description	Length	Width of trail	Remarks
1	Monjo to Powerhouse	150 m	4 ft	
2	Powerhouse to Headwork	1.5 Km	4 ft	

b) Project Camps and Storage

One project camp (near the forebay location of existing old Monjo Khola Micro hydro Project) is proposed to accommodate Contractor's construction workforce as personnel of supervising Engineers and the Employer's staff. The camp will be located at the right bank of Monjo Khola on private land.

c) Material Storage and Workshop

Material storage and mechanical workshops are located on the right bank of Monjo Khola at the camp site.

d) Quarry Site and Burrow Pits

Various probable quarry sites have been identified based on geological investigation which is discussed below in **Table 5.**

Table 5: Proposed quarry and burrow sites for MHKHP

SN	Site Code	Location	Capacity	Coordinate	
				N	E
1	Quarry Site-1	Headworks	3915 cu.m	27°46'15.20"	86°44'15.80"
2	Quarry Site-2	Powerhouse	659 cu.m	27°46'15.00"	86°43'20.18"

(Source: CED, 2021)

e) Batching Plants and Aggregate Crushing Plants

The facilities for aggregate crushing and batching plants will be located at the headwork and powerhouse sites close to the active construction sites. These facilities will be operated with provisions of air pollution control, noise control/arresting facilities, and water and waste water management facilities. These will be temporary facilities to be demolished at the end of the construction period.

f) Materials and Equipment Transportation

Materials and equipment will be transported to site by appropriate means of transportation. As the project area is lack of motorable road, air transport and manual carrying of load by man and animals will be used.

2.10 PROJECT EQUIPMENT AND CIVIL WORKS

Project equipment includes mechanical and electrical. Mechanical includes penstock pipe, turbine and governor. On the same way the electrical works or equipment are generators, transformers, transmission and distribution lines and switchyard. The civil works includes diversion weir, intake, gravel trap, approach canal, desanding basin cum forebay, anchor blocks and powerhouse (**Table 2**).

2.10.1 DESCRIPTION OF LAND REQUIRED FOR THE PROJECT

An estimated land area of about 5.83 ha is required for construction of the project components and provisioning for project facilities (**Table 6**).

Table 6: Estimated Land Requirement and Ownership for MKMHP

SN	Component	Land Area (Ha)	Acquisition (Temporary or Permanent)	Land Ownership
1	Headworks	0.054	Longterm Lease	Public
2	Penstock Alignment	0.411	Permanent for Private land and Long Term Lease for Public	Public (0.3380 ha) + Private (0.0730 ha)
3	Powerhouse, Switchyard and Tailrace	0.055	Permanent	Private
4	Spoil Disposal Sites	0.05	Temporary (Short term Lease)	Public
5	Quarry and Burrow Sites	0.39	Temporary (Short term Lease)	Public
6	Workshop and Material Storage	0.08	Temporary(Short term Lease)	Public
7	Project camps and offices	0.05	Long term Lease	Public
8	Transmission Lines	4.55	Temporary	Public
9	Electric pole Installation	0.008	Long Term Lease for Public	Public
10	Diversion weir	0.18	Long term Lease from BZCF	Public
	Total	**5.83**		

All the public land required for headworks, penstock alignments spoil disposal sites, quarry and burrow sites, workshop and materials storage, project camps and offices and electric pole installation belongs to Himalaya Buffer Zone Community Forest while the public land required for transmission lines has been used as foot trails. The transmission lines will be made underground just beneath of the existing foot trails.

The private land belongs to 8 different families of the KPLRM-3 (**Table 7**).

Table 7: Private Land Owners

SN	Name	Plot No.	Affected Land (m^2)	Remarks
1	Pasang Sherpa	3	99.81	Tailrace
		13	856.22	Power House
		16	67.48	Penstock
2	Fura Futi Sherpa	15	136.53	Penstock
3	Ngawang Gele	17	14.46	Penstock
4	Doma Sherpa	20	311.41	Penstock

SN	Name	Plot No.	Affected Land (m^2)	Remarks
5	Daali Sherpa	23	13.33	Penstock
6	Kaji Sherpa	31	33.21	Penstock
7	Pasang Temba Sherpa	32	87.5	Penstock
8	Kami Dorji Sherpa	33	66.32	Penstock
	Total		**1686.27**	

(Source: Field Work, 2021)

Table 8: Details of Public land

SN	Component	Kitta Number	Land Area (Ha)	Acquisition (Temporary or Permanent)	Land Ownership	Land Use
1	Headworks	341	0.054	Long-term Lease	Public	Forest
2	Penstock Alignment	12	0.338	Long-Term Lease	Public	Forest
3	Spoil Disposal Sites	341	0.05	Temporary (Short term Lease)	Public	Forest
4	Quarry and Burrow Sites	341	0.39	Temporary (Short term Lease)	Public	Forest
5	Workshop and Material Storage	12	0.08	Temporary (Short term Lease)	Public	Forest
6	Subproject camps and offices	12	0.05	(Long term Lease)	Public	Forest
7	Transmission Lines	115/5/11/240/2/ 385/999981/151/ 999999/36/144/ 215/15/188/3/ 117/118/7/160/ 4/236/268/237/177	4.55	Temporary	Public	Trekking Trail
8	Electric pole Installation	5,240,385,2, 999999,144, 215,15/188	0.008	Long Term Lease for Public	Public	Forest
9	Weir	341	0.18	Long term Lease from BZCF	Public	Forest/River
	Total		**5.7**			

(Source: CED, 2021)

2.10.2 SUMMARY OF PROJECT STRUCTURES AND OPERATING REGIME

Basically there will be two types of structures- power generation and distribution. Generation structures are confined from intake to powerhouse. Generation structures will be at Monjo while distribution structures spreads from Muse to Monjo.

Table 9: Project Operating Regime

1	**Project Location**			**Remarks**
	Province	:	1	
	District	:	Solukhumbu	
	Gaunpalika	:	Khumbu Pasang Lhamu Rural Municipality Ward:3	
	Project Boundary	:	27°46'00"N to 27°46'30"N and 86°43'20.00"E to 86°44'30.00"E	
2	**Structure**			
	Intake	:	27°46'15.20"N and 86°44'15.80"E, elevation 2960 amsl	Monjo
	Power House	:	27°46'15.00"N and 86°43'20.18"E,elevation 2744amsl	Monjo
	Transmission and Distribution Lines	:	27°41'11.25"N to 27°46'45.74"N and 86°43'10.66"E to 86°43'21.05"E (Elevation range 2533 m amsl to 2810 m amsl)	From Muse to Monjo

2.10.3 CONSTRUCTION, OPERATION AND MAINTENANCE ACTIVITIES

2.10.3.1 Construction Activities

- **Preparatory works:** Land acquisition, Establishment of construction facilities and Arrangement of burrow area of construction materials
- **Civil works:** Construction Activities of project components
- **Hydromechanical works:** Fabrication, transportation, erection and testing of gates, trash racks, penstock pipes etc., Civil works for steel structures and then the installation works.
- **Electromechanical works:** Equipment installation
- **Transmission Line work**
- **Commissioning of Power Plant**
- Institutional arrangement to implement ESMP and conduct
- **Continuation of consultations with stakeholders and functioning of GRM**

2.10.3.2 Operation and Maintenance Activities

- Trial Operation/Staff training;
- Defect liability maintenance;
- Adjustments and provisions;
- Final Bills and Completion Certificates;
- Review of output;
- Availability Declarations;
- & M Scheduling;
- ***Continuation of consultations with stakeholders and functioning of GRM***

2.10.4 HUMAN RESOURCES REQUIREMENTS (INCLUDING LOCAL AND MIGRANT WORKFORCE)

It has been estimated that about a total of 250 unskilled and 100 skilled workers will be involved daily during the peak construction period in two shifts. The details of workers and their type (in terms of skilled, semiskilled and unskilled) are as follows:

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Table 10: Details of Human Resources

SN	Category	Number	Remarks (Migrant/Local)
A	**Skilled Manpower**	**100**	**Migrant**
1	Site Engineer	2	
2	Overseer	3	
3	Mason	35	
4	Gabion Mistri	12	
5	Welder	4	
6	Iron Worker	10	
7	Mechanics	2	
8	Electrician	2	
9	Supervisor	5	
10	Foreman	15	
11	Painter	5	
12	Carpenter	5	
B	**Unskilled Manpower**	**250**	**Local**
1	Camp Worker	10	
2	Survey Helper	5	
3	Mechanics helper	15	
4	Watchman	2	
5	Welder helper	10	
6	Staff man	4	
7	Tape man	4	
8	Labor	200	

(Source: CED, 2021)

2.10.5 CONSTRUCTION EQUIPMENT, MATERIALS AND OTHER SUPPLIES (INCLUDING ESTIMATED NUMBERS/QUANTITIES)

Details of equipment required for execution of the proposed project has been given in **Table 11.**

Table 11: Construction Equipment

SN	Equipment	Quantity
1	Jackhammer	5 Sets
2	Shovel	100 Sets
3	Pick Axe	50 Sets
4	Rammer	30 Sets
5	Sledge Hammer	20 Sets
6	Wheel Barrow	20 Sets
7	Chisel	20 Sets
8	Gloves	200Sets
9	Helmet	300 Sets
10	Rubber Boots	300 Sets
11	Auto Level	3 Sets
12	Measuring Tape (30 m)	10 Sets

(Source: CED, 2021)

Estimated volumes 783.73 m^3 of concrete and stone masonry work of volume 287.53 m^3 are estimated to be required for the project construction. The main construction materials and their estimated quantity are presented in **Table 12**.

Table 12: Estimate of construction materials

SN	Construction materials	Quantity	Source
1	Cement (bags)	9,500	Factory
2	Aggregate (m^3)	900	Quarry Sites
3	Sand (m^3)	850	Quarry Sites
4	Boulder Stone (m^3)	2,200	Quarry Sites
5	Reinforcement Bars (ton)	63	Factory

(Source: CED, 2021)

2.10.6 POWER SUPPLY ARRANGEMENTS

As there is no National Grid, two diesel generator sets each with 10 kVA capacities will be required at the headworks site and powerhouse respectively to meet the electricity demand of the construction purpose and for lighting of construction camps.

2.10.7 WASTE GENERATION AND DISPOSAL (INCLUDING ESTIMATED QUANTITIES)

About 500 cubic meters of spoils has been estimated to be generated due to excavation for project component construction. Two disposal sites are proposed (**Table 13**).

Table 13: Proposed Spoil Disposal Sites for MKMHP

SN	Site Code	Location	Capacity	Coordinate	
				N	E
1	Spoil Deposit Site-1	Desilting Basin Area	3915 cu.m	27°46'15.25"	86°44'15.02"
2	Spoil Deposit Site-2	Powerhouse	659 cu.m	27°46'15.00"	86°43'20.18"

2.10.8 PROJECT IMPLEMENTATION SCHEDULE AND CONSTRUCTION WORK PLAN

The proposed MKMHP will require an estimated time frame of about 18 months for completion from the date of commencement to the date of commercial operation (**Annex VII**).

CHAPTER 3: METHODOLOGY OF DATA COLLECTION AND ANALYSIS

This BES of Monjo Khola Mini Hydro Project has been prepared in accordance with the methodology described in the Terms of Reference (ToR) approved by Khumbu Rural Municipality on 25 Oct. 2021 (2078/07/08). The following methodologies have been applied to collect baseline information and impact prediction:

The BES approach, methodology and procedure has been followed the provisions of the Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078. Following approach and methodology has been adopted during the BES report preparation.

3.1 LITERATURE REVIEW

The literature review process started at the beginning of the BES study and periodically carried out during the study period till the stage of draft BES report preparation. In the beginning, the approved ToR document for BES of Monjo Khola Mini Hydro Project was thoroughly studied and reviewed. The Detailed Feasibility Study including Detail Engineering Design Report 2021 prepared by Communication and Energy Developers (CED) Pvt. Ltd. was reviewed and consulted for technical information related to the project. Available published literature, documents and maps (GoN's topographic map with scales 1: 50,000, land use maps, aerial photographs, cadastral survey maps, Google maps etc.) related to the project area were also reviewed. Previously studied environmental assessment reports of hydropower projects and other related projects (EIA of Dudhkoshi 4 and 5) were looked into. Solukhumbu District Profile, 2072 BS, Rural Municipality Profile of Khumbu Pansang Lhamu 2076 BS, reports published by Central Bureau of Statistics (CBS) etc. were used for collecting existing rural municipality and district level information on physical, biological and socio-economic environment. Climate related data were sourced from Department of Hydrology and Meteorology (DHM) and website (mateoblue.com). Other sources of information were SNP Office, Department of National Parks and Wildlife Conservation (DNPWC), UNESCO, RAMSAR, Birdlife International, WWF, IUCN, ICIMOD, other line agencies, related NGOs and so on.

Topographic and Geological maps of the project area were reviewed to collect information about land use, topography, geology and other features. Study of climate data of the study area was done by analyzing the data of the nearest meteorological station and monitoring station. Other information such as Hydrology and Sedimentation, Geology and Seismicity, Watershed etc. will be collected referring from the secondary sources such as topographic, geological and seismic hazard maps and project's technical reports and data base of DHM etc.

Secondary data on forest and wildlife were also obtained from publications of the Ministry of Forests and Environment (MOFE), SNP and DNPWC Office and other institutions and research papers. District/Rural Municipality level socio-economic and cultural information such as population of affected RM, household size, male-female ratio, infrastructures, ethnicity, schools, development activities in the project area, festivals and cultural activities were collected from Central Bureau of Statistics (CBS) publication, RM profiles, district profiles and other available literatures.

Relevant laws, acts, rules & regulation, policies, guidelines, strategies were reviewed in order to avoid any form of non-compliance. The published literatures on the biomass, flora and fauna, rare/endangered /protected species in and around the project area were reviewed. To justify to the local concerns and local information available in the secondary literatures, officials of the local and district level, particularly Rural Municipality, District Coordination Committee, Sagarmatha National Park and Buffer Zone Community Forest User Groups were also consulted to seek site-specific information of the project area. Furthermore, the local and national institutions working in the project area were consulted to verify the project specific information related to environmental and social aspects.

3.2 FIELD STUDY

The BES team conducted walk through survey at the proposed project and its surrounding for the significant environmental features and made necessary measurements, inspect/observe and discuss it with the local stakeholders during Nov. 2021. The information collection was physical, biological, socio-economic and cultural aspects of the environment. Focus group discussion/public hearing were also held in the nearby settlement areas to generate the socio-economic characteristics of the area.

The baseline information data are included to the followings as presented in following sub-sections.

3.2.1 PHYSICAL ENVIRONMENT

In order to collect baseline information on the physical environment, field investigation along the proposed project area was carried out. Land use patterns, topography and soil erosion were carried out through direct observation and field mapping.

The methods employed for the data collection were indirect assessment of air quality; water sample collection at two locations on 17 November 2021(1 Mansir 2078 BS)— headworks area of Monjo Khola Mini Hydro Project and drinking water supply at Monjo Settlement and laboratory analysis on different parameters (six physical, nine chemical and one microbial parameters) for water quality of river as well drinking water supply and direct observation & measurements of sound pressure level at two locations (headworks and powerhouse) for noise quality using RT-911A Mini Sound Level Meter.

The slope stability and landslides, fan deposits and rock fall within the project area were studied thorough site observation and on-site delineation in maps. Apart from the above information, discussions were carried out with local communities to fill the information gaps such as flooding events (using HYDEST method), glacier lake outburst flood (GLOF) events, seismic history, landslide events and locations and land degradation process etc.

3.2.2 BIOLOGICAL ENVIRONMENT

Information on fauna, flora, protected, rare and endangered species and sensitive habitats in the project areas were collected through site visit and transect walk survey. Existing situation and possible impacts on wild fauna were studied in relation to risk of project implementation. Forest inventory was done through purposive sampling with nested quadrate methods within the project area to estimate number of tree and volume of timber to be cleared. Local people of the project impact area were consulted to collect information on use and management of forest

resources including availability and use of NTFPs as well as MAPs, ethno-botanical importance of the plant species, problems encountered in use and management of forest resources and the possible impacts of the project on the local flora. Agro-biodiversity of the project area is recorded in a data sheet (**Annex VIII**) through consultations with local informants. Information on availability of fauna was also collected in consultation with local informants, members of forest user groups and other knowledgeable locals. Interaction with local people and photography consultation with local communities were done for wildlife diversity. The loss of protected, rare and endangered species based on the CITES Appendix, IUCN Red Data and Government of Nepal protected lists were enumerated in the field throughout the project area.

Forest and Vegetation

Forest inventory was done with purposive sampling in the areas where project structures and facilities will be made. Broadly the samplings were done in 3 sites— i) intake and headwork site, ii) Penstock Alignment and iii) Tailrace Area

Plot Design:

Nested quadrate was prepared in each sampling point. Initially 20x20 m^2 square shaped tree plot was prepared for tree. Then 5x5 m^2 square plots for shrubs and 1x1m^2 square plots for herbs were laid down at the center of 20x20 m^2 of tree plots (Figure 4.1). Thus 3 plots were laid down in each sampling points. Altogether 27 sampling points were laid down. Thus, a total area of 10,800 m^2 for tree, 675 m^2 for shrub and 27m^2 for herb were surveyed. All tree species having DBH greater than 10 cm were considered within 20x20 m^2 pot. DBH and height of all trees were measured with the help of DBH tape and clinometer respectively. Crown cover percentage of trees within the sampling plots was estimated occularly for the determination of stocking of forest. Number of all shrub species having height greater than 10 cm, and tree species with less than 10 cm dBH and greater than 10 cm height were studied within nested quadrate of 5x5 m^2. Similarly, the number of all herb species and seedlings of shrub and tree with height less than 10 cm were counted in 1x1 m^2 nested plot.

Stand Size:

The stand size classification is presented in **Table 14**. The classification has been modified based on Forest Inventory Division (FSRC, 1995).

Table 14: Stand size classifications

Symbol	Stand Size	DBH (cm)
1	Poles	10 - 25
2	Small saw timber	>25 - 50
3	Large saw timber	> 50

Tree Volume:

Basal area and height were measured for calculation of standing trees trunk volume. This was estimated as

$$TreeVolume = \frac{BA \times H}{2} \ldots\ldots\ldots\ldots\ldots \text{(i)}$$

Where, BA is basal area at 1.3-meter height, which is πr^2, where r is radius (in meter) at 1.3 m height of the tree and H = height (in meter) of the tree (DoF 2061).

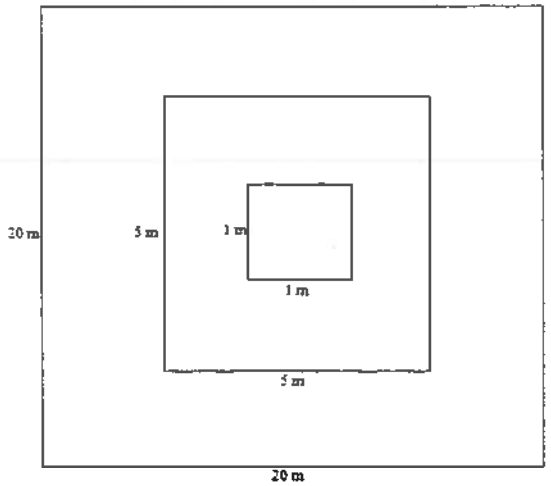

Figure 1: Plot Design (Nested quadrate plot)

Timber and Fuelwood Volume:
Timber volume is calculated as follows (DoF 2061):

$$TimberVolume = TreeVolume \times QualityofTree \ldots\ldots\ldots\ldots\ldots \text{(ii)}$$

Where, tree volume is from eq. (i) and quality of tree is based on DoF 2061. If the tree is of 1st class, tree volume is multiplied by 2/3, while 1/2 for 2nd class tree and 0 for 3rd class tree.
Fuelwood volume is calculated as follows (DoF 2061):

$$Fuelwood\ Volume = Tree\ Volume \times Quality\ of\ Tree + Branch\ Volume \ldots\ldots\ldots \text{(iii)}$$

Where, tree volume is from eq. (i) and quality of tree is based on DoF 2061. If the tree is of 1st class, tree volume is multiplied by1/3, while 1/2 for 2nd class tree and 1 for 3rd class tree.

Tree Biomass:
Tree standing volume was multiplied with its dry wood density to get stem biomass of tree. Using stem biomass, branch biomass and foliage biomass were calculated using ratio of branch to stem biomass and foliage to stem biomass for various species (HMGN, 1988).

$$Stem\ Biomass = TreeVolume\ X\ Tree\ Wood\ Density \ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

Where, tree volume is from eq. (i), and tree wood density was obtained from various sources such as DoF (2010), Sharma E.R. and Pukala T. (1990) and Master plan for forestry Sector (1988).

$$Tree\ Biomass = Stem\ Biomass + Branch\ Biomass + Leaf\ Biomass \ldots\ldots\ldots\ldots\ldots \text{(v)}$$

Importance Value Index
The dominancy of any species in an area is estimated with respect to its importance value which is the combined effect of relative density, relative frequency and relative basal area. The basal area is replaced by coverage in case of shrubs and herbs.

$$IVI = \text{RD} + \text{RF} + \text{RBA or RC} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(vi)}$$

Where,
RD = Relative Density
RF= Relative Frequency
RBA = Relative Basal Area (for tree)
RC= Relative Coverage (for shrubs and herbs)

Density:

Shrub/Herb density is calculated as follows;

$$Density\ (No./ha) = \frac{I}{AXN} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots \text{(vii)}$$

Where,
I = Total number of individuals
A = Area of each sampling plot
N = Total number of plots

$$Relative\ Density\ (\%) = \frac{D}{TD} \times 100 \ldots\ldots\ldots\ldots\ldots \text{(viii)}$$

Where, D = Density of an individual species; TD = Total density of all species

Frequency:

$$Frequency\ (\%) = \frac{E}{N} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots \text{(ix)}$$

Where,
E = Encounter (Total Number of plots in which an individual species occurred)
N = Total number of plots

$$RelativeFrequency\ (\%) = \frac{F}{TF} X100 \ldots\ldots\ldots\ldots \text{(x)}$$

Where, F = Frequency of an individual species; TF = Total frequency of all species

Coverage:

$$Coverage\ (\%) = CI \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(xi)}$$

Where,
CI = Coverage of an individual species in a sampling plot

$$Relative\ Coverage\ (\%) = \frac{TCI}{TC} X100 \ldots\ldots\ldots\ldots \text{(xii)}$$

Where, TCI = Total coverage an individual species; TC = Total coverage of all species

Basal Area:

$$Basal\ Area\ (m^2) = \frac{\pi d^2}{4} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(xiii)}$$

Where,
d (m) = diameter at breast height of an individual tree

$$Relative\ Basal\ Area\ (\%) = \frac{TIBA}{TBA} X100 \ldots\ldots\ldots \text{(xiii)}$$

Where, TIBA = Total basal area of an individual tree; TBA = Total basal area of all trees

Wildlife and Avian Fauna

Information on wildlife (including mammalian and herpetofauna as well as amphibians and avian fauna) of the project area was gathered using both direct and indirect methods.

Direct method involved transect walk which was proposed on observing status of wildlife in forest and immediate surroundings within project's impact area. Animals, reptiles and birds spotted along the route and information on their habitat were recorded. Moreover, identification of pug marks/footprints, droppings/pellets, ground digging and uprooting, tree scratching and marking, animal remains such as skin, fur, feathers, and carcasses, dwellings such as nests,

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holes and burrows etc. were used in order to document presence of particular wild animals, herpetofauna and birds. Calls and singings of birds were recorded as far as identified. The collection of the wildlife specimens was carried out whenever possible and photographs were taken of uncollected items for the purpose of identification of specimens. Such information was also validated by means of consultation with local informants. Special faunal record data sheets were prepared and used to record faunal presence, their abundance and other associated features in the project area (**Annex IX**). Additional information on animal presence, movements issues and human wildlife conflicts were obtained by using indirect methods i.e. discussions with a range of stakeholders that included local people, BZCFUGs etc.

Fish

Initially consultations were done with locals about presence of fish in the Monjo Khola. Nobody reported the presence of fish in the river which might be mainly due to high slope gradient, altitude and extreme cold water. Therefore, samplings were not done for the presence of fish.

3.2.3 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

Data on socio-economic status and cultural aspects were collected from direct and indirect impact areas. The methods utilized for collection of socio-economic data from the primary sources include followings:

Household survey: Household (HH) survey of direct and indirect impact area were conducted by using structured questionnaires to obtain baseline information on demographic and educational status, ownership patterns and farm practices, energy sources, basic health conditions, common diseases, etc. (**Annex X**). Focus Group Discussions with the peoples of the concerned wards (such as buffer zone user's group, ward office of RM, women groups etc.) and local level agencies were carried out during the field survey to gather information on socio-economic and cultural activities as well as customs & tradition of the project area communities. Similarly, Settlement information was collected through Key Informants (**Annex XI**).

3.3 LABORATORY ANALYSIS OF COLLECTED SAMPLE OF WATER

The methods employed for the data collection were indirect assessment of air quality; water sample collection at two locations— headworks area of Monjo Khola Mini Hydro Project and drinking water supply at Monjo settlement and laboratory analysis on different parameters (**Annex XII**). for water quality; and direct observation & measurements of sound pressure level at two locations (headworks and powerhouse) for noise quality on 1st of Mansir 2078 BS.

3.4 ENVIRONMENTAL IMPACTS IDENTIFICATION, PREDICTION AND EVALUATION METHODS

The information collected from different sources was processed and analyzed according to the physical, biological, socio-economic and cultural environment within the Zone of Influence (ZoI). The secondary data collected was used as the major source for verification and crosschecking of primary data during the field survey. The generated information from the primary sources were analyzed and tabulated. The likely impacts were assessed covering both adverse and beneficial ones.

Based on identification of the potential impacts, their predictions have been done to forecast the changes in local environment. Various methods have been adopted in impact predictions, such as trend analysis, cause and effect relationship, expert judgment, etc. The environmental impacts were evaluated on the basis of guidelines given in the National EIA Guidelines (1993), based on the magnitude, extent and duration of the impact. Experts' judgments and experiences from the similar types of projects was adopted for the quantification of the impacts. If the impact lasts up to 3 years,
it will be termed as short term (ST). If impact continues for 3 to 20 years, it will be termed as medium term (MT) and if it lasts beyond 20 years it will be considered as long term (LT). The impact which will occur inside the project will be termed as site specific (SS) and which goes up to municipality level will be termed as local (Lo) and which goes up to more than two RMs or Municipalities will be termed as regional (Ro). Similarly, the impact which is irreversible will be termed as high (H), which is in partly recoverable in long run will be termed as moderate (M) and which is reversible will be termed as low (L).

The impact which has direct effect will be termed as direct (D) and which has indirect effect will be termed as indirect (I). For the impact evaluation the matrix method with numerical ranking will be used for the quantitative ranking of the predicted impacts.

Table 15: Numerical scales as proposed in the National EIA Guidelines

Magnitude	Score	Extent	Score	Duration	Score
High/Major	60	Regional	60	Long Term	20
Moderate/Medium	20	Local	20	Medium Term	10
Minor/Low	10	Site-specific	10	Short-Term	05

(Source: National EIA Guidelines, 1993)

The cumulative scores on this analysis have been used to decide the significance of the impacts. **Table 16** below depicts the cumulative score of level of significance:

Table 16: Cumulative scores of level of significance

Total scores	**Significance of Impacts**
Up to 44	Insignificant
45-74	Significant
Beyond 74	Very significant

(Source: National EIA Guidelines, 1993)

3.5` PUBLIC PARTICIPATION AND INFORMATION DISCLOSURE

Consultation and discussions with locals were made at various times from the beginning of the project. Most of the discussions were informal. Interaction with Women's Group, BZCFUG, monastery, health institution, school and other relevant stakeholders were made during affixation of public hearing notice.

Similarly, a public hearing for the proposed Monjo Mini Hydro Project was done on 25th Kartik 2078. Before the public hearing program, a public notice was published in Arthik Abhiyan, a National Daily Newspaper published from Kathmandu mentioning Time, Place and Date of Public Hearing (**Annex XIII**). Similarly, a public notice from local FM was aired for the same

program (**Annex XIV**). Public notice for public hearing was affixed in notice board of various institutions and a deed of enquiry (*muchulka*) was collected from each institution (**Annex XV**). A total of 44 people participated in the public hearing. Meeting minute of the public hearing has been prepared and presented in Annex **XVI**. Major issues raised during the public hearing are as follows:

Table 17: Issues Raised during Public Hearing and Response from Proponent

SN	Issues/Concerns Raised	Response and Commitment from Proponent	Remarks
1	Priority to locals for employment	First priority will be given to locals as per their capacity and skills.	
2	Investment Opportunities for Locals	Opportunity for investment will be provided at appropriate time to locals.	
3	Provision of Minimum Tariff for Affected People or Households	Appropriate tariff will be fixed after negotiation with locals.	
4	Provision of free electricity for social and cultural institutions such as school, Gumba etc.	This issue will be discussed with board members of the company and appropriate solution will be sort out.	
5	As it seems that previous survey has not included the households of Geringma and Skangding, households from these settlements should be involved in distribution of electricity	Provision will be made to distribute electricity to each and every households from Jor Salle to Muse.	
6	Energy demand of each households should be calculated.	Has already been collected.	
7	Information has to be given to locals how they get shares from proposed project.	Will be notified to locals in appropriate time.	
8	Issues of private land should be settled down.	This issue will be addressed at mutual understanding and negotiation.	
9	There should be clear about the effects of projects on existing old micro hydro projects and peltric set and mechanism of settlement/management of these issues	Issues of existing old micro hydro projects and peltric set will be addressed with appropriate alternative.	

After Public hearing, draft BES was prepared. Then, a public notice was prepared seeking written suggestions, comments and concerns from concerned stakeholders and public in the given format of Annex 8 of Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078. The same notice was published in "Arthik" National Daily News Paper (**Annex XVII**). And the notice was affixed at notice boards of public institutions of project area and a deed of enquiry (*muchulka*) was collected (**Annex XVIII**). Then recommendation letters were also collected from concerned institutions (**Annex XIX**).

CHAPTER 4: POLICY, STRATEGY, ACTS, RULES, DIRECTIVES, STANDARDS, TREATY AND AGREEMENTS TO BE CONSIDERED WHILE PREPARING THE REPORT

Federal Government of Nepal, Provincial Government, Province 1, and Khumbu Pasang Lhamu Rural Municipality has adopted various acts, regulations and guidelines to ensure the integration of development and conservation of environment. The BES study was guided by the requirements and provisions of the following acts, rules and guidelines as applicable.:

Table 18: Relevant law, regulations and policies

SN	Acts/Regulations/ Guidelines	Relevant Details
1	**Constitution of Nepal**	It has ensured the provision of environmental protection and right to live in clean environment. The article 30 (1) of the constitution has granted 'every person shall have the right to live in clean environment' as a fundamental right for the people while the article 51 (f) (2) of the constitution in its Development policy gives priority for under-developed regions for balanced, environment-friendly, qualitative and sustainable physical infrastructure development. Similarly, Article 51 (g) (5) of the constitution in the conservation, management and use of natural resources policy, negative impacts of industrialization and physical development should be minimized for environmental cleanliness and protection. It has also defined the right of working area of Federal, Provincial and Local Government. According to Constitution of Nepal, Local Level has right over small hydropower project (Annex 8, SN. 19 of Constitution of Nepal)
2	**Plans, Policies and Strategy**	
2.1	**Plan**	
2.1.1	Fifteenth Plan (FY 2076/77-2080/81)	The plan has emphasized for development of micro and small hydropower for alternative energy promotion. It has expected to generate 13 MW electricity through micro and small hydropower development.
	First Periodic Plan of Province 1 (FY 2076/77-2080/81 BS) (FY 2019/20-2023/24 AD)	The first plan of the province has given the priority to increase the electricity production up to 1500 MW at the end of the fiscal year. It has envisioned that all the HHs will have access on electricity. It has given high priority for renewal energy development in the areas where no national grid lines are available.
2.1.2		
2.1.3	Nepal Biodiversity Strategy and Action Plan 2071-2077 BS (2014-2020 A.D.)	The overall goal of the strategy and action plan is to enhance the integrity of ecological systems by 2020, thereby contributing to human well-being and sustainable development of the country. It considers that haphazard development activity is becoming a major threat to the biodiversity. Similarly, it has prioritized for the promotion of hydropower energy to reduce the demand of firewood to protect forest. It also urges for the effective implementation of environment assessment report for conservation of biodiversity.

SN	Acts/Regulations/ Guidelines	Relevant Details
2.1.4	Nepal Environmental Policy and Action Plan, 2050 B.S. (1993 A.D.)	The Nepal Environmental Policy and Action Plan (NEPAP) endorsed in 1993 recognizes that a growing number of people are exposed to pollution from industrial enterprises and development activities. The Action Plan for infrastructure development within NEPAP recommends the finalization of draft EIA guidelines for water resources, the development of EA guidelines for road construction and the use of EA when designing hydroelectric projects.
2.2	**Policy**	
2.2.1	National Occupational Safety and Health Policy, 2076	The policy came to exist to ensure for the safety of workers through reduction of risks at works through appropriate occupational health safety gears and better working condition.
2.2.2	National Environmental Policy 2076 B.S. (2019)	GoN has endorsed the 'National Environment Policy-2019' with the goal to control pollution, manage wastes and promote greenery so as to ensure citizens' right to live in a fair and healthy environment. It has proposed 10 targets with 6 policies with strategies and working policies for esh policy. The six policies are I) Pollution Prevention, Control and Minimization, II) Environmental Mainstreaming, III) Environmental Justice. IV) Public Participation, V) Sustainable Development and VI) Good Governance, Research and Capacity Development It has ensured for the participation of all three Governments while preparation of policy, laws, implementation, monitoring and evaluation of environment sector. It targets to lessen and prevent all types of environment pollutions, manage wastes emanated from all sectors including home, industry and service, expand parks and greenery in urban area and ensure environment justice to the pollution affected population. It has mentioned for mainstreaming the environmental concerns in all phases of development works. It has mentioned the issues of adverse and beneficial impacts of development works, and their monitoring and auditing.
2.2.3	Renewable Energy Subsidy Policy,2073B.S. (2016 AD)	The policy has long term goal to achieve universal access to clean, reliable and affordable renewable energy solutions by 2030. It has taken a strategy to encourage public-private sector participation in the renewable energy technology. To promote renewable energy, it has clearly mentioned to provide subsidy in different category as per districts of Nepal.
2.2.4	AEPC Gender Equality and Social Inclusion Policy, 2075 (2018 AD)	The policy came to the existence for the mainstreaming of rural women, poor, marginalized and vulnerable population, and excluded groups in utilization of various technologies of renewable energy to support for the livelihood enhancement.
2.2.5	Public-Private Partnership Policy, 2072 (2015)	The policy was formulated to enhance public-private sector investment on development and operation of public infrastructure services through the adoption of the PPP model for comprehensive socio-economic development.
2.2.6	Land Acquisition, Resettlement and Rehabilitation Policy, 2071 BS (2015 AD)	With an aim to improve social and economic status of project affected families by providing fair and adequate compensation, appropriate resettlement and rehabilitation assistances/ allowances, the GoN has released Land Acquisition, Rehabilitation and Resettlement Policy in 2015. The Policy mission is to facilitate timely execution (completion) of

SN	Acts/Regulations/ Guidelines	Relevant Details
		development projects by minimizing adverse impacts on economic, social and cultural aspects of affected families/people and the project area. The Policy classifies projects on the basis of numbers of families to be displaced such as; i. High risk project: Project that displaces (both physical and economic) 50 or more families in the mountain region, 75 or more families in the hills and 100 or more families in the Terai plains ii. Medium risk project: Project that displaces (both physical and economic) less than 50 families in the mountain region, less than 75 families in the hills and less than 100 families in the Terai plains. iii. Low risk project: Projects with no physical displacement Project with only economic displacement and None of Affected person loose more than 10% of their productive asset Four approaches for land acquisition has to be adopted namely, voluntary donation, direct negotiation, land development program and expropriation (Use of eminent domain). The proposed MKMHP falls under low risk project as per the categorization of the Policy.
2.2.7	Rural Energy Policy 2063 BS (2006 AD)	GoN formulated the policy is to contribute to rural poverty reduction and environmental conservation by ensuring access to clean, reliable and appropriate energy in the rural areas. It has taken strategy to encourage local groups and private sector to distribute the electricity by producing the power up to 1000 kW in rural areas.
2.2.8	Hydropower Development Policy, 2058 BS (2001 AD)	The main objective of Hydropower Development is to generate/produce electric power at low cost by utilizing water resources available within the country. And to supply/extend reliable electricity service nationwide at reasonable price. Other objectives are to develop hydropower as export orientated commodity and also relate electrification with the economic activities of the country. Some of the highlights of Hydropower Development Policy 2001 are as follows: • Develop small, medium, large and reservoir type projects considering maximum and optimum benefit to the country with minimum environmental consequences. • Encourage local bodies, co-operatives and private sectors participation with clear, simple and transparent rules and regulation. • Develop hydropower as an alternative to Bio and Thermal energy with an aim to contribute in the environmental protection. • Encourage people's participation in hydropower development with a view to dissemination of benefit at local level also. Render priority to Nepalese labour, skill and resources in implementation of hydropower projects.

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SN	Acts/Regulations/ Guidelines	Relevant Details
2.2.9	Environmental and Social Safeguard Policy of AEPC, 2018	AEPC has developed its social and environmental safeguard principles to align with the International Finance Corporation's (IFC)Performance Standards (2012) with 7 principles as follows: i. ESS Policy Principle 1: Assessment and management of environmental and social risks and impacts; ii. ESS Policy Principle 2: Biodiversity conservation and sustainable management of living natural resources; iii. ESS Policy Principle 3: Human Rights; iv. ESS Policy Principle 4: Labour and working conditions; v.ESS Policy Principle 5: Community Health Safety and Security; vi. ESS Policy Principle 6: Land acquisition and involuntary resettlement; vii. ESS Policy Principle7: Resource efficiency and pollution prevention It has also provided Environmental and Social Management Frameworks to categorize the project into A, B or C as per its impact on environment and society. The proposed proposal has been considered as A category project.
2.3	**Strategy**	
2.3.1	National Energy Efficiency Strategy, 2075	One of the objective of the strategy is to maintain environmental balance and bring positive improvements in health by efficient use of energy through the strategic intervention of establishment of policy, legal and institutional frameworks for resources management, resources mobilization, infrastructure development and human resources development required 5 for energy efficiency and develop national standards for energy efficiency based on established international and regional standards as well as to develop equipment and means for measuring energy efficiency.
2.3.2	Water Resource Strategy, 2058 BS (2002 AD)	Nepal has adopted National Water Resource Strategy taking a holistic and systematic approach to develop and manage water resources for sustainable use of resources ensuring conservation and protection of the environment. This strategy underscores the interdependencies between water resource development and environment conservation, and has adopted environment principles related, inter alia, to the integration of ecological aspects at every level of hydropower development process, conserve biodiversity, watersheds and adopt ecosystem approach. The NWRS has a target of developing 820 MW of hydropower by 2063/064 to meet the domestic demand at base case scenario including export to the tune of 150 MW and achieve per capita electricity consumption of 100KWh.
3	**Act, Rules and Regulations**	
3.1	**Act**	
3.1.1	Environment Protection Act, 2076 B.S. (2019 AD).	Any development project, before implementation, to pass through environmental study report, which may be a Brief Environmental Study, an IEE or an EIA depending upon the location, type and size of the projects. It has made the provision for the approval agency of environmental study report as per prevailing laws It has

SN	Acts/Regulations/ Guidelines	Relevant Details
		also made provision for quality assurance of environmental study reports. According to Clause 3-2-GA of Environment Protection Act, 2019, for the development work or proposal falling under the jurisdiction of local level, Brief Environmental Study (BES) or Initial Environmental Examination (IEE) report should be to the concerned body specified by local law and Environmental Impact Assessment (EIA) report should be submitted to provincial government body specified by state law. The proposed proposal falls under the jurisdiction of Local Government.
3.1.2	Local Government Operation Act, 2074 (2017)	It has been formulated to assist the local governments to make clarification about their working area demarcation. Similarly, Local Government Operation Act, 2074 BS has provided authority for policy, law, standards, planning, implementation, monitoring and regulatory works (परिच्छेद-३, ११ (२), घ). Thus KPLRM has right to produce a generation license for the proposed proposal.
3.1.3	Intergovernmental Fiscal Arrangement Act, 2074	It came into the existence for the financial sharing among three level of government in Nepal. It has clearly stated the taxes may levy by Federal Government, Provincial Government and Local Government in Schedule 1, 2 and 3. It has also made the provision of distribution of royalty from natural resources in Schedule 4.
3.1.4	Act to Regulate and Control on International Trade in Endangered Species of Wild Fauna and Flora Act, 2074 (2016)	This acts states about the regulation and control of international trade of such endangered flora and fauna species. The species are protected by CITES against over exploitation and they are listed in three CITES Appendices I, II, and III for different levels or types of protection.
3.1.5	Muluki Criminal Code Act, 2074(2017)	This law has been issued to maintain law and order in the economic, social and cultural spheres in interests of the general public in the country through ethics, morality, virtue and goodness. It has the provision of penalty for various criminal activities. It is relevant to the proposed proposal if any kinds of criminal activities are prevalent.
3.1.6	National Civil Code Act, 2074	This is the law that came into force in order to maintain morality, decency, etiquette and convenience as well as economic interest of the public by maintaining law and order in the country and maintain harmonious relationship between various castes, races and communities, by making just provisions in the economic, social and cultural fields. It has described the right of person in different perspectives from marriage to property. It is also relevant in terms of proposed proposal as implementation of the proposal should not violate others' right and vice-versa. Clause 617 states that the tenure of lease contract lasts for forty years for the construction, development and operation of infrastructure like electricity generation. Clause 640 states about the age of person engaging in the manual works. It states that a person under 16 years should not be forced to engage in physically challenging works. Clause 641 states that workers should not be liable to work more than 8 hours a day and 48 hours a week without extra time payments.

SN	Acts/Regulations/ Guidelines	Relevant Details
3.1.7	Solid Waste Management Act, 2068 BS (2011 AD)	The Act clearly envisages about management of solid waste and provision of licensing for management. In such case, the article (7) on discharge of solid waste entails about the person, organization that produces hazardous waste or chemical waste shall have to manage such waste as prescribed (sub article 2). It is restricted that nobody shall do or cause to do the work relating to the solid waste management without obtaining license from the Local Body as prescribed by article 13 of chapter, miscellaneous sub article 1.
3.1.8	Plant Protection Act 2064 (2007)	The preamble of this act explains that it is expedient to make legal provisions for preventing the introduction, establishment, prevalence and spread of pests while importing and exporting plants and plant products, promoting trade in plants and plant products by adopting appropriate measures for their effective control.
3.1.9	Child labor (Prohibition and regularization) Act, 2056 BS (2000 AD)	The Act has made the provision of prohibition of engagement of child in factory, mining and similar other risky work and to make necessary provision for health. Child's safety and services and facilities while engaging them in other work.
3.1.10	Electricity Act, 2049 BS (1992AD)	Electricity Act governs the use of water for hydropower generation, establishes a system of licensing, sets out the power functions and duties of a license holder provides certain financial incentives for the license holder and sets out the powers to the government. It requires any person or corporate bodies to obtain license prior to survey, generation, transmission or distribution of electricity of more than 1000 KW. In article 24 of the Act, it states that "While carrying out electricity generation, transmission or distribution, it shall be carried out in such manner that no substantial adverse effect be made on environment by way of soil erosion, flood, landslide, air pollution etc." Article 33 deals with land acquisition. Licensed individuals can apply the government to acquire land for the purpose of electricity generation, transmission and distribution. The government shall acquire the land for the stated objectives under existing regulations the compensation incurred to acquire land and other property shall be paid by the applicant.
3.1.11	Water Resources Act, 2049 BS (1992AD)	Water Resource Act, 1992 is the umbrella Act governing water resource management, which declares the order of priority of water use, vests ownership of water in the State, provides for the formation of water user associations, establishes a system of licensing and prohibits water pollution. Article 19 (1) of the act mentions that the government through notification in the Nepal Gazette prescribe pollution tolerance limits for the water resources. Similarly, article 19 (2) requires any person to abide by the act not to pollute water resources beyond specified limit. Article 20 states that while utilizing water resources, there should not be significant adverse impact on the environment with regard to soil erosion, flood, landslide and other similar cases. Articles 16, 19, 20 of the Act are also related to land acquisition. According to article 16 (3), the government shall, according to existing laws, acquire land for the licensed person or institution

SN	Acts/Regulations/ Guidelines	Relevant Details
		and any compensation in this regard shall be paid by the licensed person.
3.1.12	Land Acquisition Act, 2034 (1977)	The Act aims at amending and consolidating current legislation relevant to the acquisition of land. The Government may acquire any land at any place for any public purpose, if it so deems necessary, according to the procedure set out by this Act. To this end it regulates the nomination of an officer responsible for preliminary action in charge of the determination of the land area to be acquired (through a survey, collection of samples of soil, demarcation of land, installation of equipment), the determination of the compensation and the submission of a report to the local officer regarding the findings of preliminary action. After having received the report, the local officer shall issue a notification containing all the particulars required (e.g. purpose of acquisition, location of the land, terms of acquisition, plot number or boundaries of the land, land area). Further provisions concern the publication of said notice, the decision by the Zonal Commissioner of complaints filed by the landowner, the occupation of the land by the local officer, the criteria for the determination of the compensation which shall be paid either in cash or by allotment of other lands in exchange, if so, required by the landowner.
3.1.13	National Parks and Wildlife Conservation Act, 2029 BS (1973AD)	This act governs the various activities inside the protected areas. Schedule 1 relating to section 10 of this act provides the list of protected wildlife, which is prohibited for hunting. According to section 11, no person shall be permitted to hunt wildlife without obtaining license. There will be punishment in terms of fine or imprisonment or both if any person illegally kills or injures wildlife within protected areas.
3.1.14	Aquatic Animal Protection Act, 2017 BS (1960 AD)	This act mainly focuses on the protection and management of aquatic ecology, aquatic fauna including fish and wetlands. This act prohibits the use of poison or harmful chemicals or materials in the water bodies or explosives to dismantle any embankment with a view to catching or killing aquatic animals including fish. However, there is no specific law for fishing and fisheries management.
3.2	**Rules/Regulations**	
3.2.1	Environment Protection Regulation, 2077 (2020 AD)	This Regulation describes the details of the processes of level and type of environment assessment of different projects as per Schedule 1, 2 and 3. As per EPR 2020, Annex 3, KA-12, it is mandatory conduct EIA for the proposed proposal of construction of hydropower within National Park as the proposed project lies in Sagarmatha National Park.
3.2.2	Labor Rules, 2075 BS (2018 AD)	This regulation is intended to provide the rights, interests and benefits of workers, to develop good labor relations by clearly defining the rights and duties of workers and employers, and to increase the productivity ending all forms of labor exploitation.
3.2.4	Electricity Regulatory Commission Rules, 2075	GoN has made these rules as per Electricity Regulatory Commission Act-2017 to clarify the key functions and duties of the Commission, and provide a more focused list of action points,

SN	Acts/Regulations/ Guidelines	Relevant Details
		mandatory requirements and guidance for the Commission on distribution lines, tariff management and electricity quality.
3.2.5	Solid Waste Management Regulation, 2070	Solid waste management rules 2070 BS have been issued by the Government of Nepal using the power conferred by section 50 of the Solid Waste Management Act 2068. Rule 3 of this Rules enforced the segregation and management of the solid waste. Sub rule 1 of this rule stipulates the segregation of solid waste at least organic and inorganic solid waste at its source under section 6 have to management and segregation of harmful and chemical waste separately. The responsibility of managing of the chemical and harmful solid waste under sub rule1 shall be a concern generator. Rule 4 of this rules endorsed the discharge the solid waste as comfortable manner for transportation, processing and final discharge by take in to account the possible adverse effect on the public health and environment and the ways of reduction of such effect.
3.2.6	Plant Protection Rules, 2067 BS (2010 AD)	It prescribes terms and restrictions relating to the trafficking and use of plants and plant products, biological control agents and beneficial organisms.
3.2.7	Child Labor (Prohibition and Regulation) Rules, 2063 BS (2006 AD)	GoN has prepared this rule as per provision of Child Labour(Prohibition and Regulation) Act, 2056 (1999 A.D). It details out various conditional arrangements for child labour use and other legal provisions related with child labour.
3.2.8	Conservation Area Management Rules, 2053	It was promulgated by the GoN pursuant to section 33 of the NPWCA provides institutional framework, systems, mechanisms and processes (management modality) for the management of the Conservation Area. It authorizes National park to establish headquarters for the management and the development of the conservation area (Rule 4), divide the area into different sub-areas (Ilakas) as per the need, and establish Unit Conservation Officers and other staff as necessary. As the project is in National Park, it attracts the rules.
3.2.9	Buffer Zone Management Regulation, 2052	If any actions being operating or to be operated within or outside the buffer zone, have or wit, have the negative impact on the land use, public health, natural environment and natural resources conservation, the warden may on the recommendation of the users' committee give an order to the concerned person or institution to stop such activities immediately or to mitigate the impacts. After necessary investigation on the application tendered under the Sub—Rule (1), the warden may hand over such buffer religious forest as demanded by the applicant, or with necessary amendment to the religious authority, group, or community with a certificate under the Appendix—6. Provision should be made so as not to affect the right of the traditional users while handing over such forest. If the Ministry wishes to operate any services or amenities within the buffer zone through any person according to the Section—6 of the Act, it shall publish a bid tender notice in major newspapers giving at least 35 days' notice with necessary specifications of such services or amenities and the terms and conditions of the operation, and it shall also mention the office or official for the submission, the opening date and time of the bid

SN	Acts/Regulations/ Guidelines	Relevant Details
		tender in such a bid notice. Any religious authority, group or community willing to develop, conserve and utilize any religious place situated in the buffer zone from ancient time or the peripheral forest of such place will have to give an application in accordance with Appendix—5 to the warden by describing the area, boundaries and programs to be carried out in such a forest.
3.2.10	Forest Regulations, 2051 BS (1995 AD)	Rule 65 of the Forest Regulation stipulates that in case the execution of any project having national priority in any forest area causes any loss or harm to any local, individual, or community, the proponents of the project itself shall bear the amount of compensation to be paid. Similarly, the entire expenses required for the harvesting, logging and transporting of the forest products in a forest area will be borne by the proponents of the projects.
3.2.11	Electricity Rules, 2050 BS (1993)	Section (छ) of Article 12 and section (छ) of Article 13 of Electricity Regulation 1992 are important from environmental viewpoint. The Environmental Impact Assessment report will address the environmental issues, measures required to mitigate the significant adverse impacts. This regulation has also made provision for the formation of Compensation Fixation Committee for compensation of the land required for the project.
3.2.12	Water Resources Regulations, 2050 BS (1993 AD)	It is mandatory under Rule 17 (e) of the regulation that any person or corporate body, who desires to obtain a license for utilization of water resources must state in his application that appropriate measures will be taken to lessen the adverse effects due to the project on the overall environment. Measures are to be taken for the conservation of aquatic life and water environment and for mitigating social and economic effects of the project in the concerned area.
3.2.13	Himali National Park Rule, 2036	It explains about the protection and conservation of National Park located in Himalayan region of Nepal. It includes the do and don'ts inside a National Park. Harm to any wildlife animals, birds or fishes as well as trees/plants are not allowed but feeding birds and fishing after permission of the national park is allowed. Any kind of pollution such as solid waste, liquid waste as well as noise pollution is restricted in this area. But, development works can be done taking permission with government.
3.2.14	National Parks and Wildlife Conservation Rules, 2030 BS (1974 AD)	The rules prohibits any activities inside the protected area without permission from the authorized persons including hunting, damaging any form of wildlife, building or occupying any form of shelter, hut or house, occupying, clearing or cultivating land, pasturing domesticated livestock, damaging, felling or removing any trees, shrubs of forest products and setting of forest fire, mining and removing stone, minerals, creating earth works using explosives, using immunization or poisons, block, diverting river or streams.
4	**Guidelines/Manuals/Directives**	GoN by virtue of the power conferred by Rule 94A of the Electricity Regulation 2050 (1993) issued the Directive Relating to Licensing of Power Projects 2075 ("Directive") replacing the previous Directives Relating to Licensing of Power Projects 2073 (2017). This directive has set various provisions on survey license of electricity generation, transmission and distribution as

SN	Acts/Regulations/ Guidelines	Relevant Details
		well as issuing license of generation, transmission or distribution or license amendment and its cancellation.
4.1	Directive Relating to Licensing of Power Projects 2075	GoN by virtue of the power conferred by Rule 94A of the Electricity Regulation 2050 (1993) issued the Directive Relating to Licensing of Power Projects 2075 ("Directive") replacing the previous Directives Relating to Licensing of Power Projects 2073 (2017). This directive has set various provisions on survey license of electricity generation, transmission and distribution as well as issuing license of generation, transmission or distribution or license amendment and its cancellation.
4.2	Hydropower Environmental Impact Assessment Manual, 2075 (2018)	Ministry of Forests & Environment has prepared this manual, in line with the National Environmental Impact Assessment Guideline. It has undergone extensive gap analysis of existing Nepali EIA related documents and legislation followed by a series of multi-stakeholder participatory processes in order to assist hydropower companies conduct better EIAs that meet international standards and aid the Government with the review and approval process. The Manual has been designed in a format that is user-friendly and aims to guide practitioners, regulators and developers in the industry understand in detail the importance of several existing gaps like meaningful engagement of stakeholders, adequate definition of areas of influence and study areas, sufficient identification of baseline studies, knowledge on identifying and quantifying impacts, need of precision on impact predictions, and suitable alternatives analysis.
4.3	Working Policy on constructing and operating physical infrastructures in Protected Area 2065 (2008)	If any activity that has been conducted or to be conducted outside of the National Park or Conservation Area has to release such quantum of water which is higher of either at least ten per cent of the minimum monthly average discharge of the river/stream or the minimum required quantum as identified in the environmental impact assessment study report. Similarly, any activity that has been conducted or to be conducted within to the National Park or Conservation Area has to release such quantum of water which is higher of either at least fifty per cent of the minimum monthly average discharge of the river/stream or the minimum required quantum as identified in the environmental impact assessment study report. Legal provisions shall be made to prevent adverse effects on the availability of water or water right of the projects for which license is not required or being operated after obtaining the license. The view of environment conservation will be required to plant and rectify 25 trees in the form of a single tree cut or removed. The public, public or service within the conservation area will be used without pre-approval of the organization for the purposes of public tree plantation (except for the purpose of planting local species).
4.4	Community Forest Inventory Guidelines, 2061 BS (2003 AD)	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 25 m x 20 m size of quadrat for timber trees, 10 m x10 m for shrub and 5 m x 5 m for sapling and 2 m x 5 m for seedling plots in the

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SN	Acts/Regulations/ Guidelines	Relevant Details
		community forest. Plants having DBH (Diameter at Breast Height, i.e. 1.3 m above ground) greater than 30 cm is considered as trees. Trees having DBH between 10 to 29.9 cm are categorized as poles and plants having less than 10 cm DBH and more than one-meter height belongs to sapling and plants having height of less than one meter categorized as seedlings. The guidelines provided the methods of calculating volume of timber and fuel wood. The guideline also advises to stratify the large areas in the hills and mountains to eliminate variations in slope aspects etc. After stratification, area of each stratum could be calculated.
4.5	National EIA Guidelines, 2050 BS (1993 AD)	The guideline provides clear directions about the process of conducting EIA. This guideline makes EIA in Nepal legally mandatory and contains process for ensuring public involvement during the preparation of EIA report. It calls for information regarding identification of physical, biological, socio-economic and cultural impacts. Impacts ranking method also suggested in this guideline. It stresses the inclusion of mitigation measures to avoid, minimize and mitigate adverse impacts and maximize beneficial impacts resulting from the development project and monitoring & environmental auditing in the EIA report. Its revision in 1997 calls for the ensuring local people's participation, collection of relevant information, identifying major issues of public concerns, evaluate them and establishing priorities for EIA study. These guidelines further provide guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants, etc.
4.6	Guideline on Environmental & Social Risk Management (ESRM) For Banks And Financial Institutions, May 2018	It is the guideline prepared by Nepal Rastra Bank for Banks and Financial Institutions those providing loans for development activities. The guideline helps to assess environmental and social risks and their management. The guideline has the exclusion lists of activities in which banks and financial institutions cannot provide the loan. The guideline is also relevant to the proposed proposal as it has to take loan from the Bank.
5	**Working Procedures/Work Plan**	
5.1	Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078	Khumbu Pasang Lhamu Rural Municipality brought this working procedure to make environmentally friendly development within the rural municipality. IT has detailed out all the requirements for environmental assessments for the developments works under its jurisdiction. It has categorized the development works requiring BES and IEE, and approval process. As per threshold of environmental study of possible proposals of rural municipality jurisdiction given in Annex 1 of the Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, BES is required for the proposed proposal of construction of hydropower

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खुम्बु पासाङल्हामु गाउँपालिका
कार्यपालिकाको कार्यालय
गौरीघर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

SN	Acts/Regulations/ Guidelines	Relevant Details
		generating electricity less than 1 megawatt (MW) within buffer zone. On the same way, as per Annex 1, KA-8 of EPR 2020, BES is required to those proposals using up to 1 ha of forest area, forest conservation area, conservation area, buffer zone and forest of environmental conservation area except for transmission line. Same thing has been mentioned in Annex 1 of Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078.
5.2	Working Procedure for the Use of National Forest Area for National Priority Project, 2017	Realizing the need to manage the provision in relation with giving approval to use forest area for operation of national priority projects, Government of Nepal has endorsed this "Working Procedures relating to use of National Forest Area for Projects of National Priority, 2017" under provisions stipulated in Clause 68 (1) of the Forest Act, 1992. This working procedure supersedes the previous "*Working Procedures relating to use of National Forest Area for other purposes, 2006*". Section 3 (1) of this procedure requires Ministry (concerning to specific national priority project) to carry out feasibility study and alternatives of the project avoiding the national forest to the extent possible. However, as per the provision of Section 3 (2), if such study carried out in accordance with Section 3 (1) requires use of forest area, then the alternative requiring minimum forest area or clearance of minimum number of trees and vegetation shall be selected. Section 4 (1) of the Procedures provisions need of preparation of an Initial Environmental Examination or an Environmental Impact Assessment Report relating to environmental impacts of such project which requires forest area for its implementation in accordance with the prevalent Environment Protection Act and Environment Protection Regulation. If the investigation carried out in accordance with Section 4 (2) reveals implementation of the project causes impacts on the environment, then the concerned Ministry shall prepare a report incorporating mitigation measures to minimize such impacts along with environmental management plans for the project. Section 4 (4) requires concerned Ministry to take approval from the Ministry of Forests and Environment prior approval of the IEE or EIA reports in accordance with prevalent law for the projects requiring national forest area. Section 5 (1) describes the procedures to submit application for the use of national forest areas. Section 10 explains provisions relating to compensatory plantation and requires 25 saplings to be planted for loss of a tree. As per Section 11, the project shall pay annual lease amount for temporary occupancy of national forest at the rate fixed for leasehold forests as per Schedule 20 of Forest Regulations, 1993. Section 12 of the Procedure mandates the project to implement mitigation measures mentioned in IEE or EIA report of the project and the cost for such measures shall be borne by the project itself.

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पासाङल्हामु गाउँपालिका गाउँ कार्यपालिकाको कार्यालय खुम्बु सोलुखुम्बु, १ नं. प्रदेश नेपाल

SN	Acts/Regulations/ Guidelines	Relevant Details
5.3	Renewable Energy Subsidy Delivery Mechanism 2016	AEPC has prepared the mechanism as per mandate given by Renewable Energy Subsidy Policy 2073 BS. It has spell out the detail mechanism of subsidy delivery mechanism in context of renewable energy provided by GoN. As the proposed proposal is also a program of AEPC under renewable energy, it is certainly relevant to the proposed project.
6	**Standards**	
6.1	National Ambient Air Quality Standard, 2012	National Ambient Air Quality Standard is established for various parameters such as TSP, PM_{10}, Sulphur Dioxide, Nitrogen Dioxide, Carbon Monoxide, Lead, Benzene, $PM_{2.5}$ and Ozone. The standard states that the maximum concentration stated for averaging time of 24 hours for TSP, PM_{10}, Sulphur Dioxide, Nitrogen Dioxide, and $PM_{2.5}$ and the maximum concentration stated for averaging time of 8 hours for Carbon Monoxide and Ozone should be under standard limit for at least 95% duration for one fiscal year and should not exceed maximum concentration for 18 days in 365 days. No any parameters shall exceed its maximum concentration limit for two consecutive days within one year
6.2	National Noise Quality Standard, 2012	National Standard for Sound Quality is established as per Rule 15 of Environment Protection Rules, 2054. The maximum limit of sound for city and residential area is 55 decibels for daytime and 50 decibels for night hours. Whereas for the industrial area, the maximum limit of sound is 75 decibels for daytime and 70 decibels for night hours. Further, for the peace zone, the maximum limit of sound is 50 decibels for daytime and 40 decibels for night hours.
6.3	Standards for Emission from in-use and Imported Diesel Generators, 2012	The MoSTE (now MoFE) introduced in October 2012 the National Diesel Generator Emission Standard (NDGES) for new and in-use diesel generators with a capacity of 8 kW-560 kW (under the 1997 Environment Protection Act). In doing so they followed the Indian standards for construction equipment rather than for diesel generator sets. Hence, the Nepal emission standards for new and in-use diesel gensets are less stringent than in India. The emissions standards set for new diesel generator imports is equivalent to Bharat Stage III standards and, for in-use diesel generators, is equivalent to Bharat Stage II. The emissions limits are set for four major pollutants: CO, HC, NOx, and PM. The emissions limit for PM for new DG sets less than 19 kW is 0.80 g/kWh; for 19 to <37 kW, the emissions limit is 0.60 g/kWh; for 37 to <75, it is 0.40 g/kWh; for 75 to <130 kW, it is 0.30 g/kWh; and for 130 to <560 kW, it is 0.20 g/kWh. MoSTE has not yet been able to monitor the compliance of emissions standards for new and in-use DG sets.
6.4	Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, 2003	The Ministry of Environment has set tolerance limits for the industrial effluents to be discharged into the inland surface water. Since the project is considered as an industry it will have to comply with the tolerance limits set in the standard prior to the discharge of the effluents into the inland surface water during the construction and operation period.

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SN	Acts/Regulations/ Guidelines	Relevant Details
7	**World Bank ESS Instruments**	
7.1	**Operation Manual**	
7.1.1	Environmental Assessment EA (OP/BP 4.01)	The policy is to ensure that Bank financed projects are environmentally sound and sustainable. As per the policy, an integrated Environmental Screening and Environmental Assessment (EA) with Environmental and Social Management Plan (ESMP) has to be prepared or developed to manage environmental risks and maximize environmental and social benefits wherever applicable.
7.1.2	Natural Habitats (OP/BP 4.04)	The policy is to support the protection, maintenance and rehabilitation of natural habitats in its project financing, as well as policy dialogue and analytical work. The Bank also expects the Borrowers to apply a precautionary approach to natural resources management to ensure environmentally sustainable development. Here the policy is triggered by the Project due to activity requiring land of buffer zone of SNP for implementation of the proposed proposal.
7.1.3	Physical and Cultural Resources (0P/BP 4.11)	This policy is to assist in the preservation of cultural property, historical, religious and unique natural value-this includes remains left by previous human inhabitants and unique environment features, as well as in the protection and enhancement of cultural properties encountered in Bank-financed project. It may be triggered by the project as the proposal has to be implemented in SNP where Sherpa communities reside with their cultural, historical, religious and unique natural value; and SNP has unique environment features.
7.1.4	Involuntary Resettlement (OP/BP 4.12)	Objective of this policy is to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs. Furthermore, it intends to assist displaced person in improving their former living standards; community participation in planning and implementing resettlement; and to provide assistance to affected people, regardless of the legality of title of land. This policy may not be attracted as the proposed proposal does not acquire any land displacing the people.
7.1.5	Indigenous People (0P/BP 4.20)	This policy aims to protect the dignity, right and cultural uniqueness of indigenous people to ensure their participation in project design and implementation, do not suffer from development activities; that they receive social and economic benefits. This policy is relevant to the proposed proposal as SNP and its BZ is the home of Sherpa Community.
7.1.6	Forests (OP/BP 4.36)	This policy aims to protect the forest in project design and implementation, do not harm from development activities; that they receive ecological benefits. This policy is relevant to the proposed proposal as the proposal lies in BZCF of SNP.
8	**International Instruments**	
8.1	The United Nations Declaration on the Rights of Indigenous	It has established a universal framework of minimum standards for the survival, dignity and well-being of the indigenous peoples of the world and it elaborates on existing human rights standards and fundamental freedoms as they apply to the specific situation

SN	Acts/Regulations/ Guidelines	Relevant Details
	Peoples, UNDRIP, 2007	of indigenous peoples. Significantly, in Article 3 the UNDRIP recognizes Indigenous peoples' right to self-determination, which includes the right "to freely determine their political status and freely pursue their economic, social and cultural development." Article 4 affirms Indigenous peoples' right "to autonomy or self-government in matters relating to their internal and local affairs," and Article 5 protects their right "to maintain and strengthen their distinct political, legal, economic, social and cultural institutions." Article 26 states that "Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired," and it directs states to give legal recognition to these territories
8.2	International Labour Organization Convention, 1998	It is the Declaration on Fundamental Principles and Rights at Work in 1998.
8.3	Convention on Biological Diversity (CBD), 1992	Nepal signed the Convention on Biological Diversity (CBD) during the Earth Summit in June 1992; ratified it in the fall of 1993; and it has entered into force since 21 February 1994. Nepal is committed to implementation of the convention. The Forest Act, 1993, Forest Rules, 1995, EPA, 1997 and EPR 1997 are enforced by GoN in response to CBD. As the state is fully committed to conserve its biodiversity, the proposed project being an entity of state itself is also full-heartedly committed to conserve biodiversity in and around project area.
8.4	Concerning Indigenous and Tribal Peoples in Independent Countries, 1991 Convention (No.169)	Article 7 of the convention provides the right to the indigenous and tribal people to decide their own priorities for the process of development. However, for the national development plans and programs, it mandates consultation with them in the formulation of the plans and programs. Article 12, 13, 14 and 15 safeguards rights of the indigenous people in the land and natural resources in territories traditionally occupied by them. In the event that the state retains the right of the natural resources in their territories, it mandates formulation of special provisions under the state legislation for participation in the decision-making process and resettlement process with full compensation of the resulting loss or injury (Article 16). As Nepal is signatory of the convention will have to comply the provisions stipulated in the conventions, if the project is to impact the safeguard rights of the indigenous people.
8.5	World Heritage Convention, 1975	This convention has been adopted to address the threats to the world's cultural and natural heritages by traditional/natural decay and socio-economical changes occurring globally. The Sagarmatha National Park of Nepal parts of which, this project will be implemented within has been designated as World Heritage Site based upon the criteria VII (UNESCO, 1979for its superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance. The convention with total of 38 articles defines and describes World Heritage Sites, responsibilities of parties for protection, conservation and presentation of heritage sites. The convention

SN	Acts/Regulations/ Guidelines	Relevant Details
		also addresses study and research, Cooperation and Funding related to World Heritage Sites. The article 1 and 2 define cultural and natural heritage sites. Article 5 urges the parties to adopt a policy which aim to give functional life to community with integration of protection and if required establishment of multiple services that assure conservation. Parties are bound to report periodically the status of world heritage sites including the threats and dangers posed by traditional decays, changing socio-economic status and natural disasters (article 11). Article 17 considers encouraging establishment of national, public or private foundations or associations that could contribute to the efforts of protection and conservation of heritage sites. Article 34 of the convention mentions that if the heritage sites belong to any federal jurisdiction, the role of that state or province towards the heritage site shall equally be that of the nation to which the state belongs. Any project in a world heritage site requires World Heritage Impact Analysis to be integrated in the EIA of the project. The guideline is given as per the IUCN's advice notes (IUCN, 2013 a).
8.6	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), (1973 amended 1979)	The convention classifies species according to criteria where access or control is important (e.g. I-species threatened with extinction, II-species which could become endangered; III-species that are protected; E- Endangered; V- Vulnerable, R-Rare (CITES 1983)). The project will have to minimize impacts to the species as far as possible.

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CHAPTER 5: EXISTING ENVIRONMENTAL CONDITION

5.1 PHYSICAL ENVIRONMENT

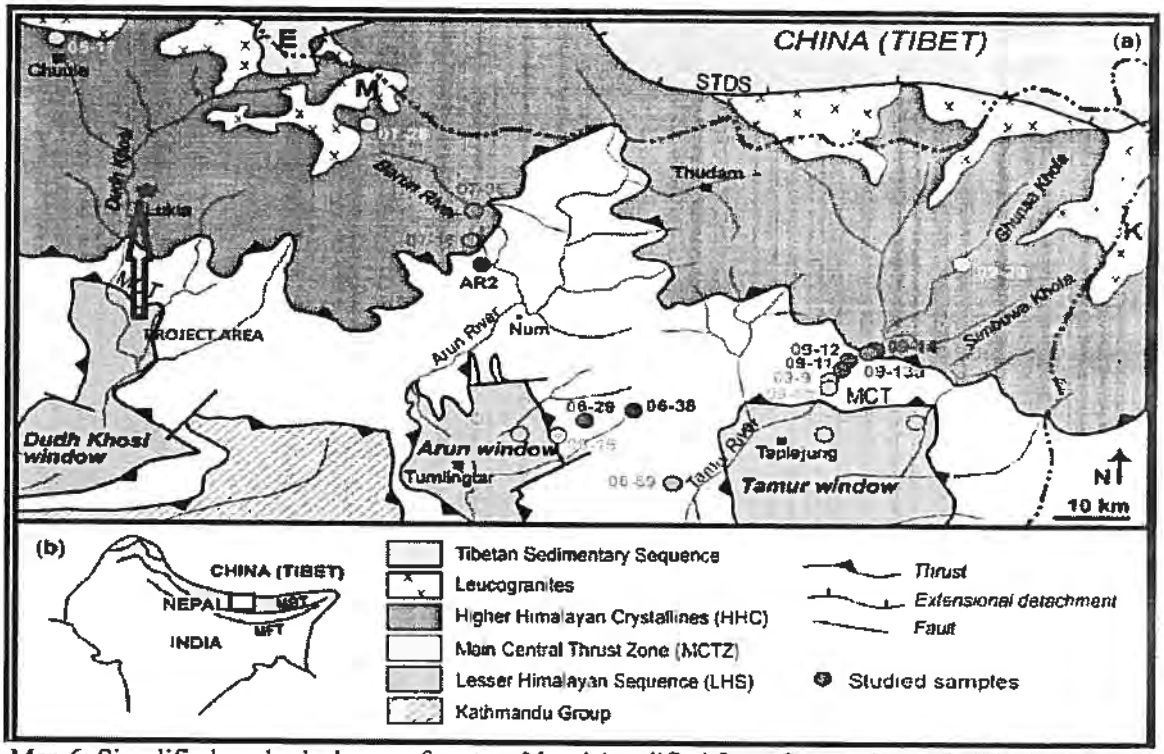
5.1.1 TOPOGRAPHY

Topographically the project area is rugged and undulated. The topography of the project area is of gentle to steep slope. The headworks lie in narrow river valley of Monjo Khola. The hill slope is steep. Monjo Khola Mini Hydro Project runs through steep to mild slope rock before some cultivated land at Monjo village. Powerhouse area is somewhat flat area, river terrace made by Dudh Koshi River.

5.1.2 GEOLOGY AND SOIL TYPE

The project area is located at around the boundary of Higher and Trans Himalaya Zone. This zone is basically created by the tectonic upliftment, wind and glacial erosion, and slope degradation by rock disintegrations. Main rock type found in this region are Gneisses, schists and marbles of the Higher Himalayan Zone and Tethyan sediments (limestone, shale, sandstone etc.) belonging to the Tibetan-Tethys Zone.

The project area geologically lies on the Trans and Higher Himalayan Crystalline Zone in the eastern part of Nepal. The project area possesses the high-grade metamorphic rocks. The project site falls within the Khumbu Migmatite Schuppe Zone. This zone is distributed widely in the upper reaches of the Bhote Koshi Khola and Dudh Koshi, occupying the main part of the crystalline Schuppen in this region.



Map 6: Simplified geological map of eastern Nepal (modified from Goscombe et al. (2006), Groppo et al. (2009), and Mosca et al. (2011)) Red Star indicates study area.

5.1.2.1 *Geology of the Headworks Area*

The diversion weir is located at narrow valley of Monjo Khola with bedrock at right bank and colluvium on the left bank. The bedrock at right bank consist of planar, parallel, continuous, slightly weathered, medium to thickly foliated, coarse grained, dark grey to white colored gneiss with wavy lamination of quartz veins with three prominent discontinuity sets . Most of the area is exposed with bedrock with thin colluvial soil cover. Hill slope at the right bank is about 65° facing NW direction. The left bank facing towards SE direction and slope is gentler (~ 30-35°) than the right bank.

The quaternery deposits that includes colluvium in the hill slopes in left bank around desander. The colluvial soil comprises boulders, gravels, cobble and pebbles of gneiss with sand. Most dominant proportion (about 60%) is of boulder and cobble . The pebble, gravel and sand deposit constitute the remaining proportion.

5.1.2.2 Geology of Water Conveyance

The main geology around the water conveyance route is gneiss as bedrock exposure, colluvium, alluvium, residual soil, gneiss with thin soil cover and scattered forest, gneiss with residual soil and forest cover and gneiss with colluvial soil and some forest. The Headworks area near dam site mostly consists of bedrock gneiss on the right bank. The water conveyance route passes through the lest bank of Monjo Khola following initially through colluvium, strong bedrock gneiss, then the soil and of residual soil in lay then bedrock and then reaches the South West sloping hillslope until it reaches the river crossing about 100 m upstream from the existing intake of Monjo Micro Hydro. Then following right bank through the existing canal upto Monjo village. Slight to moderately weathered, medium to thickly foliated, coarse grained, light to dark grey colored, gneiss is exposed near to the left bank and right bank due to cross cutting of river channel up the pipe crossing. From crossing to downstream, the alignment mostly passes through the colluvial soil formed by the weathering and erosion of the bedrock gneiss consisting of boulder, gravel sandy silt along the cultivated land. The soil is sandy silt.

5.1.2.3 *Geology of the Powerhouse Area and Tailrace*

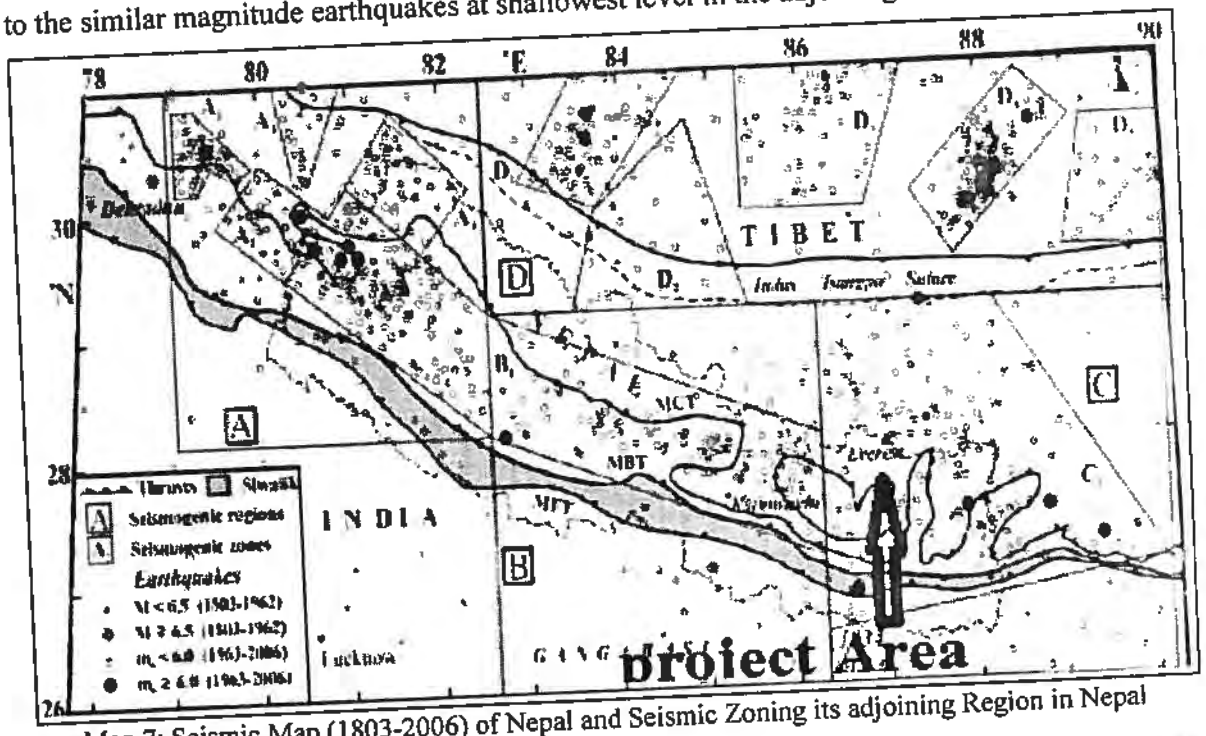
The power house site is located at downhill slope of Monjo village and 20 m upslope from Dudhkosi River. The power house lies above alluvial soil composed of loose, subrounded to rounded, gravel of gneiss with sand and silt. The thickness of soil is expected to be 20 t 25 m according to field observation.

5.1.2.4 *Geology of the Transmission and Distribution Lines*

The geology along transmission and distribution route is gneiss as bedrock exposure, colluvium, alluvium, residual soil, gneiss with thin soil cover and scattered forest, gneiss with residual soil and forest cover and gneiss with colluvial soil and some forest. The rocks along the transmission lines is mainly gneiss. The alignment mostly passes through the colluvial soil formed by the weathering and erosion of the bedrock gneiss consisting of boulder, gravel sandy silt along foot trails.

5.1.3 SEISMICITY EVALUATION

Himalayas, the Nepal Himalaya also falls in active seismic zone. Furthermore, the existence of tectonic features such as Main Central Thrust (MCT), Main Boundary Thrust (MBT) and Himalayan Frontal Fault (HFF) further increases the extent of seismic risk. The recent seismic activities are mainly due to the shallow focus events and these are mostly confined between the surface manifestations of the MBT and the MCT in the Himalayan frontal arc and to the north of the Indus Tsangpo Suture (ITS) in the South-Central Tibet. The intermediate earthquakes have occurred mostly in three localities associated with intense shallow focus activity: Western Nepal, north-northeast of Mount Everest, and north of the ITS along 88°E. The medium size earthquakes (mb≥ 6) in Himalayan thrusts occur at deeper levels as compared to the similar magnitude earthquakes at shallowest level in the adjoining Tibet region.



Map 7: Seismic Map (1803-2006) of Nepal and Seismic Zoning its adjoining Region in Nepal Himalaya.
(MCT, MBT, MFT and ITS are the major tectonic features in the region)

The project area falls in the Class (C) (**Map 7**) having high seismic risk. Considering the historical and recent earthquake and design parameter of Upper Karnali project and Arun 3 Hydropower Project, the Seismic coefficient for Monjo Khola Mini Hydropower Project is evaluated based on Nepalese and Indian Standards. During the recent earthquake 2015, the Peak Ground Acceleration recorded as 0.30g and same would be expected at the site and the same may be adopted as Maximum Credible Earthquake (MCE) value 0.30g for the project and a value of 0.18g may be appropriate as Design Base Earthquake (DBE). Further details for these parameters need to be verified during detailed design phase. The recommended value for MCE of 0.30g has been considered to be sufficient to use for the detail design purpose.

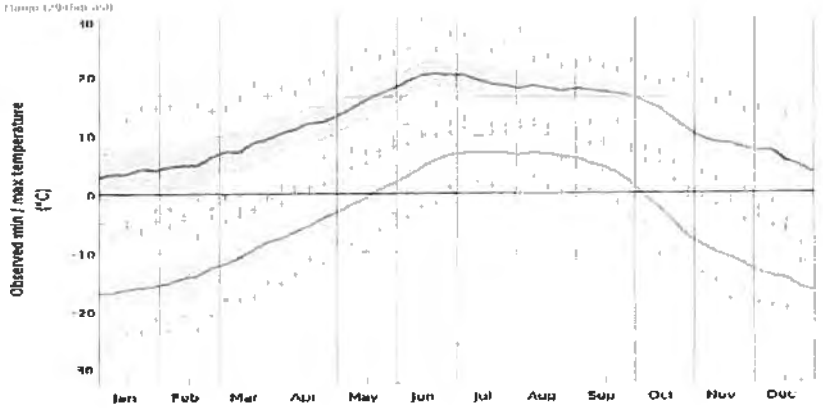


Figure 3: Average Minimum and Maximum Temperature
(Source: meteoblue.com)

5.1.4.3 Stream Flow

The discharge measured on 5th March 2020 was 447 lps (CED 2021). Medium Irrigation Project (MIP) has been considered for estimating design discharge at 80% flow exceedance. As per existing rules and regulations, 10% down-stream release of lowest flow is mandatory. Moreover 5% of design discharge as seepage and evaporation loss are also considered after river diversion.

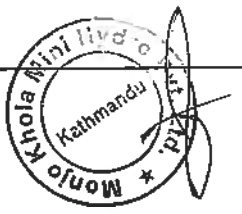
Table 21: Monthly River Discharge and Design Discharge

	Monthly River Discharge	Q Diverted after 10% D/S release	Q after 5% loss	Design discharge (Q_d)	in LPS
January	0.731	0.701	0.673	**0.560**	560
February	0.549	0.518	0.490	**0.490**	490
March	0.396	0.366	0.338	**0.338**	338
April	0.305	0.274	0.246	**0.246**	246
May	0.792	0.762	0.734	**0.560**	560
June	1.829	1.798	1.770	**0.560**	560
July	4.419	4.389	4.361	**0.560**	560
August	7.619	7.589	7.561	**0.560**	560
September	5.029	4.998	4.970	**0.560**	560
October	2.438	2.408	2.380	**0.560**	560
November	1.250	1.219	1.191	**0.560**	560
December	0.945	0.914	0.886	**0.560**	560

(Source CED 2021)

5.1.4.4 Design Flood

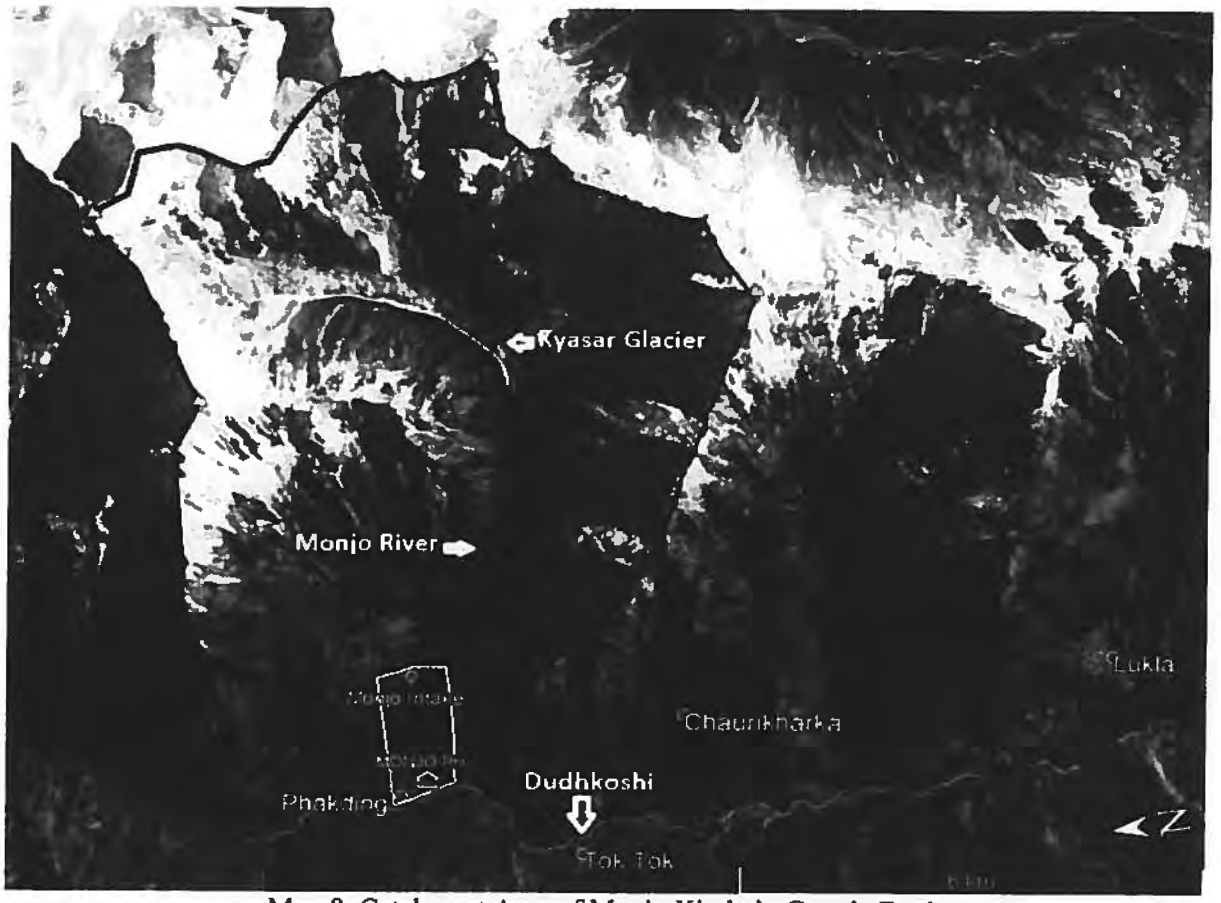
There is no any flood data of Monjo Khola. To ensure that design structures are safe from flood and to estimate flow for river diversion during construction, extreme flood has been calculated. This flood value is calculated using HYDEST. Instantaneous peak flood with a return period of 100-year adopted as design flood for power house region and is calculated as 31 m^3/se while it is 15 m^3/sec for Monjo Khola (CED 2021).



5.1.4.5 Basin Characteristics

The Monjo Khola starts from Kyasar Glacier and flows from east to west direction. It then mergers with Dudh Koshi river at Monjo. It is a snow fed perennial river with maximum catchment elevation of 6628 m while minimum elevation of catchment being 2959 m.

The intake is located at elevation of 2959 m. The total catchment area is 43.26 km^2. Out of the total catchment 43.53% of the catchment lies in permanent snowline above 5000 m. Major portion of the total catchment,56.47% lies on temporary snow line above 2900 m and below 5000 m. Map below shows the computed catchment area at proposed intake location.



Map 8: Catchment Area of Monjo Khola in Google Earth

5.1.5 AIR AND WATER QUALITY, AND NOISE LEVEL

The project area is in rural setting and there is no industry that causes air pollution. The source of air pollution is only from households and hotels from cooking and heating purposes. Thus, air quality of the area seems good. The air quality shown in meteoblue is under national ambient air quality standard (Value of PM_{10} is 120 $\mu g/m^3$ in 24 hrs) (**Figure 4**).

The noise quality was found to be within tolerable. The sound level measured at headwork area was 72 dB while 74dB in powerhouse site at noon. The recorded sound levels were higher than the value for rural residential area of National Ambient Sound Quality Standard, 2012 i.e. 45 dBA and 40 dBA during day and night respectively. The higher level of sound in the headworks and powerhouse area is due to the sound of flowing water.

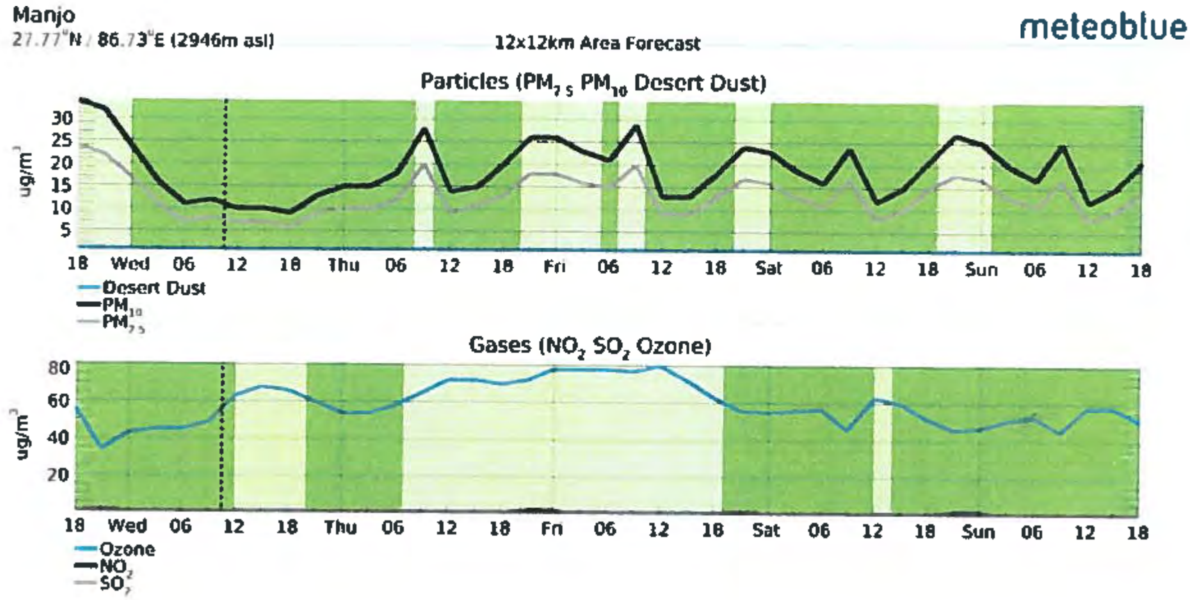


Figure 4: Air Quality Forecast of Monjo (Dec. 29, 2021 to Jan. 2, 2022)
(Source: meteoblue.com)

Two water samples were taken from field – one from headwork area of the proposed project while one from drinking water supply at Monjo to assess the water quality. Various parameters tested in laboratory of NAST (National Academy of Science and Technology), total coliform on both samples were higher than the National Drinking Water Standards 2062 **(Table 22)**.

Table 22: Water Quality of Monjo Khola and Monjo Drinking Water Supply

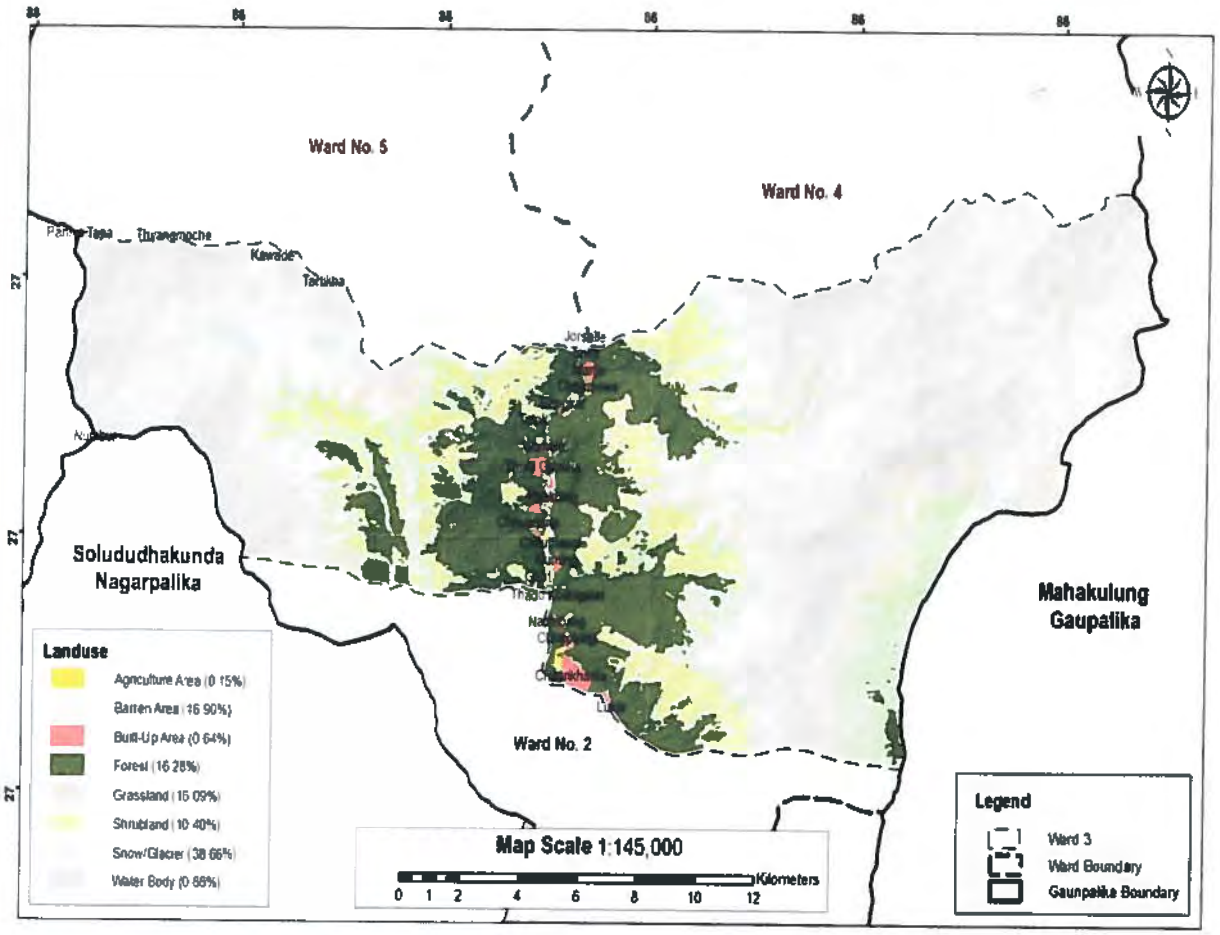
SN	Parameters	Sampling Sites		Remarks#
		River Water	Drinking Water Supply	
		Physical		
1	Temperature (°C)	18.5	18.5	
2	pH	8.07	7.92	6.5-8.5
3	Conductivity (µS/CM)	14	18	1500
4	Turbidity (NTU)	0.36	0.24	5 (10)
5	Total Dissolved Solids (mg/L)	6.84	8.95	
6	Total Suspended Solids (mg/L)	4	2	
		Chemical		
7	Total Hardness (as $CaCO_3$)	8	12	500 mg/L
8	Chloride Content (mg/L)	2.84	5.68	250 mg/L
9	Iron Content (mg/L)	ND	ND	(0.3) 3 mg/L
10	Arsenic Content (mg/L)	ND	ND	0.05 mg/L
11	Ammonia Content (mg/L)	ND	ND	1.5 mg/L
12	Nitrate (mg/L)	2	2	50 mg/L
13	Dissolved Oxygen (mg/L)	7.6	6.8	
14	Biological Oxygen Demand (mg/L)	2.8	0.4	
15	Chemical Oxygen Demand (mg/L)	41	ND	
		Microbial Test		
16	Total Coliform Count	50 ↑	300 ↑	0/100 mL

#Nepal Drinking Water Quality Standard 2062; ND-Non-Detected; number in brackets () refers the acceptable values when alternatives not available.

5.1.6 LAND USE

Out of total area 280.42 Km^2 in Ward No.3, snow/glacier is 38.66%, barren land 16.90%, forest 16.28%, grassland 16.09%, shrub land10.40%, water body 0.88%, built up 0.64% and agriculture 0.15% (KPLRM, 2019) (Map 9).

The weir will be in river while most of the penstock pipe lies in forest are and some part will be in cultivated land. Power house will be in agriculture land. Transmission and distribution lines pass through trekking routes.



Map 9: Land Use Map of Ward No. 3 of KPLRM

(Source: KPLRM 2019)

5.2 BIOLOGICAL ENVIRONMENT

The project area lies in Temperate Life Zone (elevation range: 2000-3000 m). As per The Conservation Science Programme WWF-US (1998), the project area falls under East Himalayan Broadleaved Forest Ecoregion (1500-3000 m) with Upper Temperate Blue Pine Forest and Fir Birch Rhododendron Forest. The intake area along with about 150 m of penstock pipelining area lies in Fir Birch Rhododendron Forest while remaining project structures of power generation lie in Upper Temperate Blue Pine Forest Zone. Transmission lines upto to Nurin lies in Upper Temperate Blue Pine Forest Zone while remaining lies in Temperate Mountain Oak Forest Zone.

5.2.1 VEGETATION IN PROJECT AREA

The project area lies in buffer zone Sagarmatha National Park (SNP). The area of influence falls within *Chaurikharka Buffer Zone User Committee*. Under this committee, the forest in and around the physical structures of power generation has been managed by Himalaya Buffer Zone Community Forest User Groups. The forest user group manages all the protection, conservation and utilization activities of the forest taking permission from SNP authority. Thus Locals directly participate in forest management in the area. SNP authority provides opportunity to collect fuelwood, timer and other forest products as per operation plan of community forest. The Jurisdiction of Himalaya Buffer Zone Community Forest User Group (BZCFUG) is up to Banker area. From there, Kongde BZCFUG manages the foret areas up to Phakding. Similarly, Pemachholing BZCFUG manages from Phaking to Chhuthuwa. Dudhkunda BZCF lies in and around Ghat while Red Pand BZCF from Thadokoshi to Lukla. Thus there are 5 BZCFs in ward number 3 of KPLRM while Muse BZCF in ward number 2. All the transmission lines have been designed to be underground passing through foot trails except river crossings where it passes along with bridges. There will not be direct impact on forest except in Himalaya BZCF in Monjo.

5.2.1.1 Headworks/Intake

Headworks/Intake area lies within Fir-Birch-Rhododendron Forest. As the area is ecotone of lower subalpine and temperate zone, it has mixed species of vegetation. Basically the area is dominancy of birch (*Betula utilis*) and fir (*Abies spectabilis*) along with a number of *Rhododendron* species. As the project area is confined to the river valley, the trees are sparse. Similarly, shrubs are also very few. Common shrubs found in the area are *Rosa sericea, Spiraea canescens,* Cotoneaster sp., *Ephedra gerardiana, Hydrangea heteromalla,* Lonicera sp.etc. Herbaceous and grass species in the area are *Aconitum heterophyllum, Anaphalis margaritacea, Arabis pterosperma, Astilbe rivularis, Cicerbita cyanea, Corydalis longipes,* Impatiens sp., Primula sp., Rhodiola sp., *Swertia macrosperma, Agrostis pilosula, Helictotrichon virescens etc.*

5.2.1.2 Penstocks

The penstock pipe lies in elevation zone of 2960 to 2744 m. The area falls on Fir-Birch-Rhododendron Forest and Upper Temperate Blue Pine Forest Zone. Upper portion about 150 m of penstock pipe lies in Fir-Birch-Rhododendron Forest and remaining in Upper Temperate Blue Pine Forest Zone. All the area is not forest. About 950 m of the penstock pipe falls in forest area while remaining passes through cultivated private land with settlements. The trees are *B.utilis,A. spectabilis and* a number of *Rhododendron* species in upper parts while *Abies pindrow, Acer caesium, Pinus wallichiana and* a number of Rhododendron species are found in middle of the penstock areas. In cultivated area, mostly *P. wallichiana* trees are seen. *Colquhounia coccinea,* Cotoneaster sp., Hydrangea sp., *Juniperus communis, Leptodermis lanceolata,* Lonicera sp., Potentilla sp.,Rhododendron sps., Rosa sp., Viburnum sp. etc. are found as shrubs in the area. *Aconitum heterophyllum, Anaphalis margaritacea, Arabis pterosperma, Astilbe rivularis, Cicerbita cyanea, Corydalis longipes,* Impatiens sp., Primula sp., Rhodiola sp., *Swertia macrosperma, Agrostis pilosula, Helictotrichon virescens,* Andropogon sp.etc are common herbs found in the area.

5.2.1.3 Powerhouse and Tailrace Area

The powerhouse site lies in private land with mostly blue pine (*P. wallichiana*). Similarly, the tailrace area is also dominated by blue pine with some *A. spectabilis. Colquhounia coccinea,* Cotoneaster sp., Hydrangea sp., *Leptodermis lanceolata,* Lonicera sp., Potentilla sp., Rhododendron sps. Rosa sp., Viburnum sp. etc. are found as shrubs in the area. *Aconitum heterophyllum, Anaphalis margaritacea, Astilbe rivularis, Cicerbita cyanea,* Impatiens sp., Primula sp., Rhodiola sp., *Agrostis pilosula, Helictotrichon virescens,* Andropogon sp. etc. are common herbs found in the area.

5.2.1.4 Transmission Lines

The transmission lines will be distributed to Jor Salle in north and Muse on south. The transmission lines will be made underground along the foot trails except river crossings. Therefore, there will not be impact on forest directly. Along the transmission, there are 5 BZCFs— Himalaya BZCF upto Banker, Kongde BZCF up to Phakding, Pemachholing BZCF up to Chhuthuwa, Dudhkunda BZCF in and around Ghat, and Red Pand BZCF at Thadokoshi. Transmission lines upto to Nurin lies in Upper Temperate Blue Pine Forest Zone while remaining lies inTemperate Mountain Oak Forest Zone.

The major plant species in north to the Nurin is same as of power generation area as both are in same vegetation zone— Upper Temperate Blue Pine Forest Zone.The oak, locally known as khasru (Q. semecarpifolia), forms a distinct type of forest in association with Rhododendron arboreum towards the sourthen parts of the area of influence.Beside these two species, *B .utilis, A. spectabilis, P. wallichiana, Acer caesium, A. campbellii, Ilex dipyrena,* Ligustrum sp., *Lyonia ovaliifolia, Prunus cornata, Sorbus cuspidata,* Symplocus sp., and *Tsuga dumosa* are common. *Aconogonum campanulatum, Berberis chitria, Cotoneaster acuminatus, Daphne bholua, Eurya acuminate, Gaultheria fragrantissima, Inula nervosa, Laportea terminalis, Leptodermis lanceolata, Mahonia napaulensis, Rhododendron lepidotum,* Rosa sp., *Spiraea bella, Viburnum mullaha,* Zanthoxylum sp., etc. are some common shrubs in the area. *Clematis montana, Hedera nepalensis* and *Holboellia latifolia* are common climbers. *Aconitum spicatum, Anaphalis triplinervis, Bistorta amplexicaulis, Bupleurum hamiltonii, Corydalis chaerophylla, Cuscuta reflexa, Parochetus communis, Pedicularis gracilis, Rubia manjith, Thalictrum chelidonii, Valeriana jatamansii, Agrostis pilosula* and *Eulalia mollis* are common herbs in the area.

5.2.1.5 Non-Timber Forest Products Used (NTFPs) in Project Area

There are many plants used by local communities as medicines, foods, incenses, timber, fuelwood, fodder and also decorative purposes. More than 50 plants species have been used by locals for various purposes. Some commonly used NTFPs by locals are Aconitum sp., Anaphilis sp., *Arisaema flavum, Barberis sp.,* Clematis sp., *Cotoneaster microphyllus,* Drepanostachyum sp., *Ephedra gerardiana, Euphorbia sikkimensis, Gaultheria fragrantissima,* Juniperus sp., *Meconopsis horidula, Michelia champaca, Nardostachys grandiflora, Plantago erosa, Rheum australe, Rhododendron anthopogon, Rhododendron campylocarpum, Rumex nepalensis, Urtica dioica* etc. Similarly, wild edible mushrooms are extensively used by local people. Such common mushrooms are *Armillarie llamellea,* Boletus sp., *Hydnum repandum,* Ramaria sp., *Paxillus involutus, Tylopilus eximus* etc.

5.2.2 FAUNA (MAMMALIAN AND AVIAN)

In this section, wildlife found in and around the project areas have been given. According to locals, there are no fish seen till date. During the field visit, Himalayan Tahr, scats of carnivore (may be of grey wolf), and deer sp. are recorded.

5.2.2.1 Mammals

More than 15 mammals were reported from the project areas. As the most of the project area is covered by forest, *Naemorhedus goral* is very common in the area. Beside this, *Ailurus fulgens, Hemitragus jemlahicus and Moschus chrysogaster* are also common in the area.

5.2.2.2 Herpetofauna

Bufo himalayanus, Amphiesma platyceps, Elaphe hodgsonii and *Scincella ladecense himalayanus* are reported from the project area.

5.2.2.3 Birds

More than 90 different bird species have been reported in the project area. Some common birds are *Aquilla heliacal, Buteo buteo, Gyps himalayensis, Eremophila alpestris, Collocalia brevirostris, Columba leuconota, Corvus corax, Corvus macrorhynchos, Clamator jacobinus, Falco tinnunculus,* Carpodacus sp., *Delichon dasypus, Delichon nepalensis, Lanius tephronotus,* Luscinia sp., *Zoothera dixoni,* Motacilla sp., Montifringilla sp., *Passer domesticus,* Prunella sp., *Lerwa, Lophophorus impejanus, Tragopan satyra, Garrulax ocellatus,* Yuhina sp,*Upupa epops* etc.

5.2.3 PROTECTED AREAS

The project area lies in Buffer Zone of Sagarmatha National Park (SNP). The SNP is recognized by UNESCO as the world heritage site, whereas the Buffer Zone qualifies as a legally protected area of Nepal, listed as an IUCN Management Category IVreserve.A Management Category IV listing recognizes the continued sustainable use of resources by local communities. The Buffer Zone was established to buffer and provide additional protection to the outstanding universal values of the world heritage site. Any developments within the Buffer Zone should therefore consider any potential impacts to these OUV.

The Buffer Zone and SNP are described by Birdlife International as anImportant Bird Area (IBA), which recognizes the important biodiversity value of the area.

5.2.4 CONSERVATION STATUS OF WILD FLORA AND FAUNA

Conservation status of flora and fauna has been given in Table 23 to 25.

Table 23: Conservation Status of some Flora species of Project Area

S.N.	Nepali Name	English Name	Scientific Name	CITES Appendix	IUCN Red List	GoN
1	Talispatra	Webb Fir	*Abies spectabilis*	-	NT	Protected
2	Chanp	Mangolia	*Michelia champaca*	-	LC	Protected

S.N.	Nepali Name	English Name	Scientific Name	CITES Appendix	IUCN Red List	GoN
3	Jatamansi, Bhutle	Himalayan Spikenard	*Nardostachys jatamansi(formerly N. grandiflora)*	II	CR	Protected
4	Jhyau	Lichen	*Parmelia sp. & others spp.*	-	-	Protected

Table 24: Conservation Status of Mammals potentially occurring in Project Area with updates from IBAT

SN	Nepali Name	Common Name	Scientific Name	Conservation Status		
				NRDB, NPWC	IUCN	CITES
1	Ghanse Muso	Alpine Vole	*Pitymys sikimensis*		LC	
2	Chhuchundro	Brown Toothed Shrew	*Soriculus caudatus*		LC	
3	Chituwa	Common Leopard	*Panthera pardus*	S	LC	I
4	Pani Chuchundro	Elegant Water Shrew	*Nectogale elegans*		LC	
5	Chuchundro	Golden Jackal	*Canis aureus*	S	LC	III
6	Bwasho	Grey Wolf	*Canis lupus*	V,P	LC	I
7	Kalo Bhalu	Himalayan Black Bear	*Ursusthibetanus*	V	VU	I
8	Muse Thutekharayo	Himalayan Mouse-hare	*Ochotona roylei*		LC	
9	Jharal	Himalayan Thar	*Hemitragus jemlahicus*	S	VU	
10	DuhureGhar Muso	House Mouse	*Mus musculus*		LC	
11	Ghar Muso	House Rat	*Rattus rattus*		LC	
12	Dhendu	Langur	*Presbytis entellus*	S	LR/NT	I
13	Kasturi	Musk Deer	*Moschuschrysogaster*	E,P	LR/NT	I
14	Habre	Red Panda	*Ailurus fulgens*	E,P	EN	I
15	Rato Bandar	Rhesus Monkey	*Macaca mulatta*	S	LR/NT	II
16	Saiberiyalimalasapro	Siberian Weasel	*Mustelasibirica*	S	LC	III
17	Malsapro	Yellow-throated Marten	*Mustela flavigula*	S	LC	III

Key to threatened status: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Neat Threatened; LC – Least Concern; DD – Data Deficient.

Table 25: Conservation Status of Birds in the Project Area

SN	Nepali Name	English Name	Scientific Name	CITES Appendix	IUCN Red List	Nepal Red Data Book
1	Giddha	CinereousVulture	*Aegypiusmonachus*	-	NT	EN
2	Chilime	Blood Pheasant	*Ithaginis cruentus*	II	LC	LC
3	Cheel	Osprey	*Pandion haliaetus*		LC	LC
4	Danphe	Impeyan Pheasant	*Lophophorus impejanus*	I	LC	NT
5	Tibbati Him-Kukhura	Tibetan Snowcock	*Tetraogallus tiebetanus*	-	LC	-
6	Dadi Bhayeko Giddha	Bearded Vulture	*Gypaetus barbatus*	-	NT	VU
7	Munal	Crimson-horned Pheasant	*Tragopan satyra*	III	NT	VU

SN	Nepali Name	English Name	Scientific Name	CITES Appendix	IUCN Red List	Nepal Red Data Book
8	Shahi Baaj	Peregrine Falcon	*Falco peregrines*	I	LC	LC

5.3 SOCIOECONOMIC AND CULTURAL ENVIRONMENT

5.3.1 POPULATION AND ETHNICITY

The total population of Khumbu Pasang Lhamu RM is 8989 in 2433 houses with average family size of 3.69 (KPLRM, 2019). The female population (50.02%) is slightly more than male population. The population in Ward No. 3, where the project site lies, is 1752 in 480 HHs with average family size of 6. Nearly two third of the population of Ward No. 3 is economically active. Nearly 8% people are of old age group.

Beside ward number 3, Muse settlement from ward number 2 is also a load center. It has 44 houses with 173 populations. Nearly 48% population is male and all are Sherpa ethnic people. They follow Buddhist religion.

In all 23 settlements, identified as load center, have 2,171 populations with average family size of 3.73 (**Table 26**). Population, number of households and average family size in each settlement has been given in **Table 26**. [The difference in the total number of households in ward 3 and number of households as load center is mainly due to fact that each individual entity such as residential, hotel, restaurant, lodges, shops, bakery, social institution, ward office and snooker house has been considered as separate household while the survey or census data does not take separate them as separate entity i.e. there may be many houses under single ownership.]

Table 26: Population in Affected Settlements

SN	Settlements	HHs	Population			Average Family Size
			Male	Female	Total	
1	Bosum	9	19	20	39	4.33
2	Byankar	43	82	85	167	3.88
3	Chaurikharka	34	65	59	124	3.65
4	Chaurikharka (Dhunge)	54	103	104	207	3.83
5	Chesurma	12	18	24	42	3.50
6	Chheplung	59	104	88	192	3.25
7	Chhermading	6	11	12	23	3.83
8	Chyuma	25	47	49	96	3.69
9	Ghat	40	64	77	141	3.53
10	Ghattekhola	4	10	8	18	4.50
11	Jamphutte	8	16	15	31	3.88
12	Lowa	5	6	5	11	2.20
13	Monjo and Jorsalle	59	132	91	223	3.84
14	Muse	40	77	82	159	3.98
15	Muse (Bakudingma)	4	8	6	14	3.50
16	Ngamateng	6	8	9	17	2.83
17	Phakding	56	126	109	235	4.20
18	Rangding	13	31	18	49	3.77
19	Sano Gumela	25	55	60	115	4.60
20	Teka	5	13	13	26	5.20

SN	Settlements	HHs	Population			Average Family Size
			Male	Female	Total	
21	Thadokoshi	17	35	36	71	4.18
22	Thulo Gumela	32	54	54	108	3.38
23	Tok-Tok	26	42	21	63	2.42
	Total	**582**	**1126**	**1045**	**2171**	**3.73**

(Field Survey 2021)

The most dominant ethnic group is Sherpa (62.97%) (**Figure 5**). Other Castes are Tamang (12.20%), Rai (13.30%), Magar (2.88%), outcaste (4.66%) and others (3.99%).

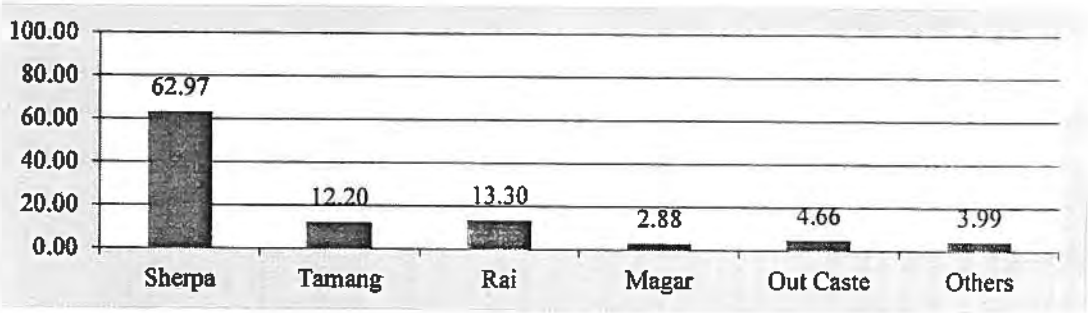


Figure 5: HHs Percentage Based on Caste/Ethnicity in Ward No. 3

(Source: KPLRM, 2019)

5.3.2 RELIGION

Based on religion, majority of HHs are Buddhists (53.13%), followed by Hindu (40.50%), Christian (5.43%) and Kirant (0.94%) (KPLRM 2019). In Muse majority of people follow Buddhism.

5.3.3 OCCUPATION

Tourism activities like trekking, mountain climbing, hotel and restaurant are the major economic activities of the area. Agriculture land is very premium and productivity is also very less. Major occupations are agriculture, tourism, services, foreign employment and business **(Figure 6).** Unemployment figure is also significant in Ward No.3 of the RM.

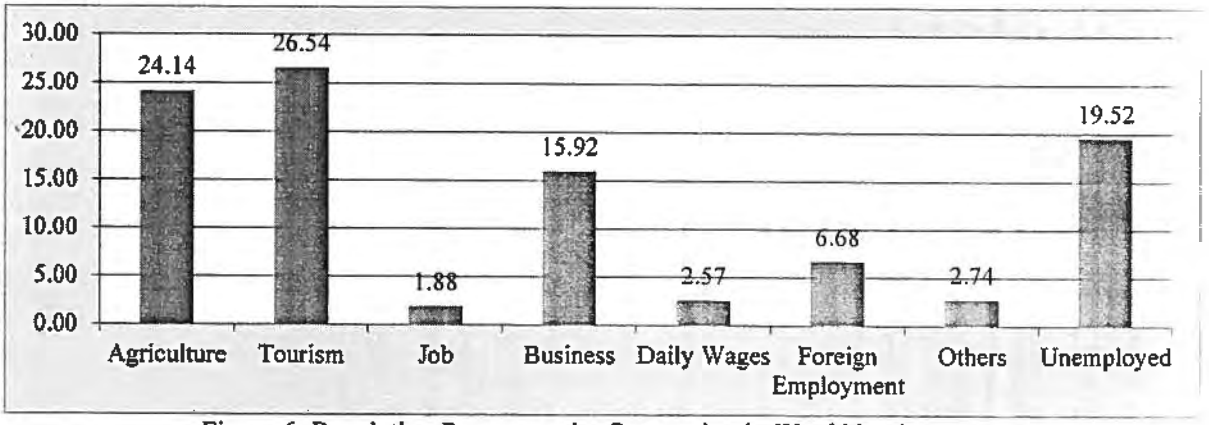


Figure 6: Population Percentage by Occupation in Ward Number 3

(Source: KPLRM, 2019)

5.3.4 LANDHOLDING AND FOOD SUFFICIENCY

Average land holding per household in load center is 7.89 ropani. Average land holding in different load center is presented in **Table 27**.

Table 27: Average Landholding in Load Centers

SN	Settlements	Average Land Holding (Ropani/HH)
1	Bosum	14.11
2	Byankar	4.12
3	Chaurikharka	12.71
4	Chaurikharka (Dhunge)	12.89
5	Chesurma	11.41
6	Chheplung	10.25
7	Chhermading	2.33
8	Chyuma	2.6
9	Ghat	5.98
10	Ghattekhola	2
11	Jamphutte	8.29
12	Lowa	2.25
13	Monjo and Jorsalle	5.62
14	Muse	10.47
15	Muse (Bakudingma)	14.25
16	Ngamateng	4.83
17	Phakding	4.17
18	Rangding	6.33
19	Sano Gumela	11.45
20	Teka	14.6
21	Thadokoshi	8.88
22	Thulo Gumela	5.27
23	Tok-Tok	2.53
	Average	**7.89**

(Field Survey 2021)

Food sufficiency is very poor in the area. Crop diversity is very poor. Potato and wheat are major food crops. Most of the HHs has to buy food grains. Potato is sufficient to majority of HHs.

5.3.5 ENERGY

Majority of HHs have access on electricity (only for lighting purposes) from various micro hydro (**Table 28**). People also use solar panel for electricity. LPG, Kerosene and fuelwood are major cooking fuel. Out of 582 HHs surveyed for load centers, 456 HHs use LPG, 248 kerosene and 271 fuelwoods.

Table 28: Existing Micro Hydro Projects

S.N.	Hydropower	Ward	Installed Capacity (kw)
1	Thadokoshi Micro Hydropower	3	100
2	Chhusema Micro Hydropower	3	35
3	Ghatte khola Micro Hydropower	3	70
4	Monjo khola Micro Hydropower	3	50

5.3.6 EDUCATION

Overall literacy rate in the RM is 67.72%. The literacy rate in project influence area, Ward No.-3, is 70.41% (KPLRM 2019). There are 15 government owned school and one private school in the RM. In project area, there are four schools—one secondary and three basic (**Table 29**).

Table 29: Educational Institutions

Ward No.	SN	Name of School	Level
3	1	Shree Mahendra Jyoti Secondary School, Chaurikharka	Secondary
	2	Shree Pemachholing Adharbhut School, Ghat	Basic
	3	Shree Jansewa Adharbhut School, Gumela	Basic
	4	Shree Yuwa Barsha Adharbhut School, Monjo	Basic

(Source: KPLRM, 2019 and Field Study 2078)

5.3.7 HEALTH AND SANITATION

There are two health institutions in ward number 3: Monjo clinic and Chaurikharka Health Post. Chronic diseases found in the area are gastritis, blood pressure, heart diseases and uric acid (KPLRM 2019). All the HHs have well facilitated toilets and also have access on piped drinking water. Sagarmatha Pollution Control Committee with support from Buffer Zone Management Committee, SNP, locals and Rural Municipality manages the waste along the foot trails.

5.3.8 COMMUNICATION

Basically, project area has facility of 3G services. 4G mobile network facilities are also available in the project area although network or quality is poor. Similarly, internet facilities are also available in major settlements. There are two post offices in the RM. Himal FM and Solu FM based on Salleri, headquarter of Solukhumbu, are aired and covers some part of project area although locals hardly listen radio.

5.3.9 RELIGIOUS, CULTURAL AND HISTORICAL SITES

There is no temple in the Ward No. 3 but 5 Gumbas (KPLRM, 2019). The nearest Gumba is Uchche Chholing Gumba in Monjo which is about 200 m up eastwards from the Monjo settlement (Field Visit 2021).

Table 30: Gumba in Project Area

SN	Name of Gumba
1	Pemachholing Gumba (Thulo Gumela)
2	Thakto Dorjiphotang (Thulo Gumela)
3	Uchchechholing Gumba (Monjo)

SN	Name of Gumba
4	Kyangma Gumba and Sanga Chholing Gumba
5	Rangdok Gumba
6	Muse Gumba (Ward No. 2)

(source: Field Visit 2021)

5.3.10 PROJECT AFFECTED HHS AND SOCIOECONOMIC STATUS

The components of project lie in public as well as private land. Thus it affects the people directly or indirectly. During construction period, the private land will be excavated for penstock pipe lining, powerhouse construction activities and other purposes such as storage, camps etc. Thus these activities affect the local people and their livelihood. Ten land plots of 8 households will be affected by the project structures. A total of about 1686 m^2 land from locals is required for the proposed project structures. The data shows that People are losing very less amount of land parcel (**Table 31**). They also have alternative for income generation. Therefore, they are less vulnerable due to proposed project.

Table 31: List of People Losing Land

SN	Name	Plot No.	Affected Land (m^2)	Total Land (m^2)	% of Affected Land in total	Remarks
1	Pasang Sherpa	3	99.81	6104.88	16.77	Tailrace
2		13	856.22			Power House
3		16	67.48			Penstock
4	Fura Futi Sherpa	15	136.53	508.74	26.84	Penstock
5	Ngawang Gele	17	14.46	4500-5000	0.31	Penstock
6	Doma Sherpa	20	311.41	2543.7	12.24	Penstock
7	Daali Sherpa	23	13.33	1526.22	0.87	Penstock
8	Kaji Sherpa	31	33.21	30524.4	0.11	Penstock
9	Pasang Temba Sherpa	32	87.5	1017.48	8.60	Penstock
10	Kami Dorji Sherpa	33	66.32	2290	2.9	Penstock
	Total		1686.27			

Demographic, occupation and economic characteristics of affected households have been given in **Table 32** while other issues in **Table 33**.

Table 32:Demography, Occupation and Economic Characteristics of Affected Households

S.N.	Name of Land Owner	Population			Major Occupation	Source of Income/Amount (NPR)			Expense (NPR)	Major Crops	Livestock
		M	F	T		Agriculture and Livestock	Tourism	Business (Hotel/ Lodge)			
1	Pasang Sherpa	2	2	4	Hotel Business/ Agriculture	HH purpose only		1000000	600000	vegetables/Potato	
2	Fura Futi Sherpa	1	2	3	Hotel Business	HH purpose only		300000	200000	vegetables/Potato/ wheat/buckwheat	Cow-2
3	Ngawang Gele	3	3	6	Hotel Business/ Agriculture	HH purpose only/Milk		300000	200000	vegetables/Potato	Cow-1
4	Doma Sherpa	3	3	6	Hotel Business/ Agriculture	HH/Hotel purpose only/Milk		300000	250000	vegetables/Potato	Cow-3
5	Daali Sherpa	1	1	2	Hotel Business/ Agriculture	HH purpose only/Milk		200000	200000	vegetables/Potato	Cow-1
6	Kaji Sherpa	4	1	5	Hotel Business/ Agriculture	200000		500000	270000	vegetables/Potato/ Wheat	Cow-2
7	Pasang Temba Sherpa	1	2	3	Tourism Business/ Agriculture	250,000.00	250000		400000	vegetables/Potato/ Wheat	
8	Kami Dorji Sherpa	2	1	3	Tourism/ Agriculture	HH purpose only	400000		300000	vegetables/Potato	Cow-2

Table 33: Willingness for compensation against land and perception towards proposed project

S. N.	Name of Land Owner	Willingness option for compensation	Importance of the proposed project	Suggestion for Project	Other Impacts
1	Pasang Sherpa	Money for Powerhouse/Tailrace while as per negotiation for penstock	Very High	1. Provision of share for residents of ward no. 3 2. Rate of electricity should be affordable and low as possible	Erosion due to tailrace if not managed properly
2	Fura Futi Sherpa	Share in project	Very High	1. Immediate implementation	Environment; Water Mill
3	Ngawang Gele	as per negotiation	Very High	1. Provision of share for residents of ward no. 3 2. Rate of electricity should be affordable and low as possible	
4	Doma Sherpa	Electricity at free of cost	Very High	1. Skill enhancement training for locals 2. Implementation of project at low impact	If penstock pipe bursts, it impacts high
5	Daali Sherpa	Money; electricity at subsidy	Very High	1. Skill enhancement training to family member and Job in project 2. Minimum impact on arable land	No
6	Kaji Sherpa	Long term Lease	Very High	1. Share for locals 2. Employment for locals	Forest; Soil erosion: River
7	Pasang Temba Sherpa	Not Sure	High	1. Employment for locals 2. Penstock pipes and transmission and distribution lines must be made underground	Environmental Impacts
8	Kami Dorji Sherpa	As per communal negotiation	Very High	1. Skill enhancement training to family member and Job in project 2. Minimum impact on arable land 3. Immediate implementation	Forest; Water mill

5.4 OUTSTANDING UNIVERSAL VALUES (OUV) OF SAGARMATHA NATIONAL PARK WORLD HERITAGE SITE

According to Operation Guideline for Implementing the World Heritage Convention (UNESCO 2017), the Outstanding Universal Value (OUV) is cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity whose permanent protection of the heritage is of the highest importance to the international community as a whole. The OUV consists of Criteria/Value, Integrity and Protection and Management at the time of nomination as a World Heritage Site. SNP has been inscribed as a UNESCO's natural World Heritage in 1979 AD. The OUV of SNP as inscribed (OUV statement), are as followings.

5.4.1 VALUE/CRITERIA

The SNP is under the criteria VII of the World Heritage Criteria for superlative natural phenomenon or areas of exceptional beauty and aesthetic importance. SNP contains the highest point of earth's surface- Mount Everest and has religious and cultural settings such as Tengboche monastery and Sherpa culture. Along with its 'unquestionable' superlative natural phenomena (Mt. Everest and its surrounding natural features) and unique Sherpa culture and Lifestyle (as in IUCN, 1979), SNP perfectly meets and falls under the UNESCO World Heritage criteria VII as evaluated by IUCN, 1979.

The site contains 7 other peaks with altitude more than 7000 m that are geologically young with deeply incised valleys by glacier giving rise to magnificent landscape that are aesthetically striking features. The zone provides the barrier between the Palearctic realm and Indo-Malayan realm. There are six altitudinal vegetation classes from oak forest at lower elevation to lichen and mosses at higher elevations that harbors some rare and endangered animals such as Snow Leopard and Red Panda. The Gokyo and associated lake group has been enlisted as Ramsar sites since 2007 that has added value to the site. The property (site) also hosts about 6000 Sherpa people and over 20 Sherpa villages whose culture and lifestyles has allowed sustaining protection of the park.

5.4.2 INTEGRITY

The SNP has an area of 124,400 ha., which was established as a national park in 1976 under the National Park and Wildlife Conservation Act, 1973(NPWC Act) and managed by the Department of National Parks and Wildlife Conservation (then under Department of Forest). The wholeness of the site is bounded by Great Himalayan range that borders the Qomolongma Nature Reserve of China, physically at Monjo in south, Makalu-Barun National Park in east and Gaurishankar Conservation Area in west. A buffer zone was established in 2002 in the south, as the name suggest itself, with objective to protect its integrity. The buffer zone is not among SNP's OUV.

The site integrity can be sought as combination of natural features with the Sherpa culture and lifestyle. The conservation-oriented Sherpa cultural elements such as 'Nawa' (pastureland regulator), 'Beyul' (sacred hidden valleys), 'Yul-lha' (Mountain protector), 'Chaam/Nyingje' (Principle of kindness among all living beings), 'Gompa' Forest (Forest sanctioned by Monasteries' etc. have contributed the integrity of the existing landscape. The

Monjo Khola Mini Hydro Pvt. Ltd.

properties related with trade and agriculture held by the Sherpa people does not come under park administration i.e. those are excluded from the park by legal definition.

5.4.3 PROTECTION AND MANAGEMENT

The NPWC Act 1973 is the principal legislation under which the site is protected supplemented by the Himalayan National Park Regulations (1978). The Sagarmatha National Park office has the administrative role of ensuring park services with conservation under the Department of National Parks and Wildlife Conservation/Ministry of Forest and Environment and Nepalese Army has been deployed for its protection. A Buffer Zone Management Committee (BZMC) manages 3 Buffer Zone Users Committee (BZUC) that have 28 Buffer Zone User Groups (BZUG) within the national park (as Village Enclaves) and outside to the south. The park provides 50% of its revenue to the local communities through the Integrated Conservation and Development Program (ICDP). The Park and Buffer Zone Management Plan (2016-2020) focuses on habitat and biodiversity conservation, Tourism and Interpretation, Buffer Zone Management and Research, Monitoring and Capacity building with special programs on species conservation for Snow Leopard, Musk Deer and Red Panda. As from the experience from the implementation of the earlier plan (2007-2012, budget constraints hindered the effectiveness (SNP/GoN, 2016).

Tourism is the main income source for the local people and the park itself that also brings immense human pressure due to tourist inflow (45,112 in FY 2016/017 AD) on UNESCO's OUV, park's ecology and impact on local culture. The effects generate in form of demand for more water, energy, lodging and fooding, solid waste generation and new trail development. Other sources for impact to the site are from the development works such newer trail construction, growing resorts and lodges. The local demand for firewood is also a major cause for deterioration of the park OUV where only 3% of the park is forested. The park is affected by air pollution, illegal activities, impacts from tourism, use of excess energy, livestock farming, visitor's accommodation, mining and querying, climate change. solid wastes and wild plant collection as in year 2018 (UNESCO, 2019).

CHAPTER 6: ALTERNATIVES OF PROJECT IMPLEMENTATION

Alternative analysis is an integral part of the project feasibility study. Alternative analysis is primarily governed by the factors like technical feasibility, economic viability and environmental acceptability. This section focuses on the assessment and evaluation of the following aspects of the available alternatives: (i) choice of design; (ii) analysis of potential alternative project sites; (iii) topography; (iv) Technology; (v) Procedures of Operation, Work Plan; (vi) Raw Materials and (vii) Use of Forest and government land be used for MKMHP.

The aim of the proposed project MKMHP is to construct and install a system having 942 kW installed capacity and to distribute electricity at local level through 11 and 1.1 kVA transmission and distribution lines respectively. The various alternatives to achieve the project objectives of MKMHP with no or minimum environmental damages are discussed in the following sections.

6.1 DESIGN ALTERNATIVE

Initially, the MKMHP was proposed as a simple run-of-river (SRoR) scheme with an installed capacity of 500 kW. Further desk studies and field investigations conducted during the initial stages of the study indicated that the project could be developed with more installed capacity as electricity is very high in the area. Accordingly, the project was studied considering different alternatives. Optimization of the installed capacity of MKMHP was carried out to establish the optimal plant size for power production from the hydropower project. For this purpose, various installed capacities of the project and the corresponding flow conveyance systems were considered for economic analyses, keeping the full supply level at the headworks and the tail water level at the powerhouse fixed. To identify the optimum installed capacity of the project, local demand, water flow and head were considered. For a fixed design head, the increase in installed capacity was achieved by varying the flow in the conveyance system through variations in the dimensions of the desanding basin, penstock, power station and tailrace canal. For each alternative scheme, preliminary cost estimates of the requisite works were prepared based on quantity takeoffs from preliminary designs and rates from projects of similar nature.

6.2 PROJECT SITES

During the desk study and survey, the survey team tried to identify potential alternative sites for intake and power house. Upstream locations of Monjo Khola from proposed intake consisted a waterfall which could give a significant head gain. But very steep slopes consisting unstable boulders on the right bank and a landslide on left bank of the river sections was unfavorable for construction of headworks structures. The right bank downstream of the proposed intake location also consisted of steep and rocky slopes. Major portions of the headrace alignment would have to go through a very steep topography if was constructed on right bank of the river. Compared to this left bank of the Monjo Khola at proposed Intake location consisted appropriate space for headworks. Also due to gentle terrain it also provided opportunity for easier waterway layout. A river crossing is also provided to avoid steep terrain for headrace.

Alternative route left bank of the river was also considered to avoid the river crossing and follow the left bank for power house location. This stretch of the river was unfeasible due to its very steep topography considering the right bank. Furthermore, appropriate and safe location for powerhouse constructing was not available at left bank of the river.

Due to landslide of at right bank of Monjo Khola just below main trekking trail, penstock pipe route does not follow the right bank of Monjo khola, and it affected on location of powerhouse. Thus penstock pipe route passes through Monjo village towards the proposed location of power house. Location for penstock layout also considered the willingness to sell the land by the locals to the project. Layout route was chosen through the land whose owners were willing to sell the land to the project.

Powerhouse locations lies on left bank of Dudhkoshi river. It is placed well above the high flood levels of the river. Flood hydrology is also carried out for power house safety. Lower elevations form proposed power house location was also not suitable as it only consisted land from river deposits. These areas were not suitable for power house construction due to possibilities of flood and landslide hazards.

Alternative study was also carried considering possibilities of not replacing existing Monjo Khola MHP. But this would result in loss of power. This was not recommended by the locals as they were willing to replace the existing micro hydro power project for a mini hydro project. The power demand at load centers were ever increasing and power generated by micro hydro was limited to lighting at household level. The local demand for electricity was much higher. Hence decreasing power was not considered.

6.3 TOPOGRAPHY

Topography has played a great role in selection of penstock pipe route and placement of powerhouse. Penstock pipe route was not feasible due to steep slope at right bank. Similarly, Penstock pipe route was also impossible without river crossing due to steep slope at left bank just below the intake of existing Monjo Khola Micro Hydro. On the same way, Penstock pipe route was also not feasible along right bank due to the presence of landslide prone area just downwards the trail in Monjo.

6.4 TECHNOLOGY

Technology alternative seeks other modes of electricity facility to fulfill similar requirements for the regional development as would be achieved by installation of hydropower. The people within the zone of influence require safe, efficient, cheap and healthy energy for daily lighting and cooking activities. At the same time, there is an urgent need to conserve the environment in terms of physical, biological, social and cultural aspects. Possible alternative options to achieve above-said prospect would include solar power, wind power, thermal power, fossil fuel and firewood. Power import from national grid is another option. Solar and wind power are also sources of clean energy which create or produce very less environmental degradation. However, the potentiality of both solar and wind power largely depends on the sunshine hour and wind velocity which may not be available all the time at Monjo. Besides, there are problems associated with these sources. Imported solar panels are complex in technology and expensive in maintenance. Power generated from solar power is very small to be used for heating and cooking purpose. Some household in the project affected area have small solar panels for lightening purpose that is

not sufficient as they need more power for cooking, lightening, heating, running electronic and electrical equipment and others. Thus, the solar and wind power could not be an appropriate alternate for this project. Thermal power plant is associated with serious environmental problems like air pollution due to CO_2 emission, sludge handling, high noise, high temperature and fire hazard. Besides, petroleum products are imported from abroad, price is continuously increasing, and there is a problem of spare parts and their high cost. The project site is remote and far from national grid and rest part of country is already in shortage of power. Various problems are stumbled during its import such as lack of high voltage transmission line, and time required for installation of such facility is quite long. Thus, it is an optimum necessity to seek out the permanent source of electricity at local level itself for the continuous supply of electricity. Considering the above alternatives, mini hydro can be the best option to serve the purpose of electricity requirement of the project area.

6.5 OPERATIONMETHOD

Operation of the project comprises of semi-automatic control system. A team of qualified staff will run the project and no adverse impact is anticipated to the local population or environment. It would rather benefit the local community through increased employment opportunities, communication facilities and supply for rural electricity.

6.6 WORK PLAN

Work Plan will be based on intensive technologies of construction equipment and maximum utilization of local resources to the extent possible. This is to ensure lowest possible cost for project development and ensure quality in the works undertaken. Due priority will be given for the recruitment of local people which will minimize the requirement of temporary camp, reduce fuel wood and timber requirement, enhance local skill and economy and develop better relationship between the project and local people. The construction work will be scheduled in daylight and construction at night will be prohibited. The implementation of the project will require sand and aggregate which will be used from the proposed quarry sites and crushing the excavated materials.

6.7 RAW MATERIALS

Various physical resources are consumed for the construction of proposed project. The materials to be used are boulders (stones) for gabion and walls, gabion wires, masonry wall, brick or concrete block, aggregates for concreting. Other local resources will be quarry and burrow used from the area. Reinforcement bars and cement will also need to be transported from other parts of the country. Electro-mechanical equipment need to be imported from overseas manufacturers. There are no other cost-effective alternatives for the above materials in construction works of the project. The construction is intended to be carried out by manually.

6.8 USE OF FOREST AND GOVERNMENT LAND

The no forest option helps to conserve and protect forest areas for optimal option selected for the project. It will obviously provide ecosystem services, soil and nutrient conservation, habitat for wildlife, source of fuel wood, forage and fodder to local people and other forest based raw materials but it will seriously undermine the development of proposed option that

is renewable and clean source of energy. The long-term operation of the project far outweighs the ecosystem and economic services provided by the forest under project effect. It will provide continuous source of clean energy that will displace existing use of fossils fuels and fuel woods, helps to conserve more forest area that will obviously degraded in the future that has negative impact on forest and human health on long run. The project's layout option is such that minimal forest area is required. Except for forest land required by reservoir, and by penstock pipe during construction as it will be buried underground after laid down, there is no requirements of forest. On the same say, the size of the project is small, forest requirement is limited which will be compensated as per Procedural Guideline for the use of Forest Land (2063) and other mitigation programs as proposed in the BES report.

6.9 CONSTRUCTION SCHEDULE

The estimated project construction period is 1.5 years from the date of commencement of the work. The construction works are mainly of surface construction works. Thus all works should be done in dry season. Similarly, the climatic condition of the area is very cold during winter. So, severe cold winter will be avoided. All the surface work will be scheduled in day light

6.10 ASSOCIATED RISKS

The project design has given due consideration to avoid risks both in terms of environment/social and project structures. While doing so, efforts were also made to minimize the project's cost. All the structures have been designed based on the surface geological investigations and has the risk associated with cost overrun during construction. Similarly, the powerhouse area is located on the terrace made by the Dudh Koshi River. It has been designed considering GLOFs from Imja and Dig Tsho. The risk of GLOF has also been accounted by referring to the potential GLOF discharge estimates.

Another major item to consider is the risk of the peaking reservoir. A reservoir with the designed storage capacity is not envisaged to pose risks to the downstream population and other natural and environmental resources in the event of normal operation. As there is no dam, risk of inundating the downstream even during a diversion weir break event is less.

Similarly, another risk associated with transmission lines is electric shock risks to birds and other wild animals where the transmission lines exposes while crossing the stream or rivers. To reduce or minimize the risks, all the transmission and distribution lines has been proposed underground.

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CHAPTER 7: ENVIRONMENTAL IMPACT DUE TO PROPOSAL IMPLEMENTATION

This section provides a description of beneficial and adverse physical, biological and socioeconomic and cultural environmental impacts and issues that have been identified to date for both construction and operation phase. The impact assessment has been focused within the coordinate (Boundary)/project influence area considering general profile at RM level. These issues have been considered based on detail field. The impacts have been classified in terms of magnitude (low, medium and high), extent (site specific, local, and regional) and duration (short term, medium term and long term) as per National EIA Guidelines 1993. The likely impact has been assessed covering both adverse and beneficial ones.

7.1 IMPACTS

7.1.1 BENEFICIAL ISSUES

7.1.1.1 Construction Phase

i) Employment generation and skill enhancement and increase in trade and business

Approximately 250 unskilled and 100 skilled human resources will be employed during peak construction period with priority given to workers from the project affected area based on their skills and qualifications. Construction jobs will provide cash income to bolster the local economy. Local workforces will get the opportunity of skill development. Once the project construction is completed, these skills will also enable people to get employment in other similar projects.

During the construction period, migrant workers will reside in the project area. They need to purchase food, beverage and other daily necessary items from local market for day to day life. To meet these demands, local and outside people may operate a number of shops and restaurant in the vicinity of the construction sites. This will increase local trade and business in the area. As a result, significant amount of cash will be channeled into the local economy. *The impact will be direct in nature, high in magnitude, local in extent and short term in duration.*

ii) Benefits from implementation of environmental mitigation programs and benefit augmentation measures

The project will implement environmental mitigation programs and benefit augmentation measures as proposed in the BES report. It will benefit the people of project affected area at large.

The impact will be indirect in nature, moderate in magnitude, local in extent and long term in duration.

iii) Increase in economic activities in the project area and associated beneficial impact in local economy

An expanded local market will be created by the in-migration of workers. Local residents can take advantage of these new opportunities by expanding their existing local industries. *The impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.*

iv) Benefits for exposure of local population to new technologies and technology transfer

The project requires professional technical persons for implementation of the construction works. Local people who will get opportunities to work with these professionals will get opportunities to learn knowledge and skills from the professionals. Thus, local people will be able to get employment in similar projects. Such knowledge and skills will be obtained, particularly in the areas of masonry, construction of dry walls, gabion walls and bio-engineering etc. *The impact will be direct in nature, low in magnitude, local in extent and long term in duration.*

v) Utilization of local resources

Construction crew utilize the local resources such as local agriculture produces, construction materials and water resources. This ultimately supports for local economy. *The impact will be indirect in nature, low in magnitude, local in extent and short term in duration.*

7.1.1.2 Operation Phase

i) Employment generation and skill enhancement

During operation, two operators, one in charge, one helper and one technician will be required for operation of the plant. This creates opportunity for employment and enhancement of skill to locals. *The impact will be direct in nature, moderate in magnitude, local in extent and long term in duration.*

ii) Benefits to be incurred from addition of 942 kW of power to local people

The implementation of the proposed MKMHP will generate 7,243,292.16 kWh of hydroelectricity per year and distributed to local community, thus will help to improve the energy situation. This will be big input in the local level power planning as there is no reliable source of electricity. Hydroelectric being clean renewable energy will also protect the environment through replacing traditional use of biomass fuel and LPG. *The impact will be direct in nature, high in magnitude, local in extent and long term in duration.*

iii) Sharing of electricity royalty to concerned authorities

As per the provisions in the Intergovernmental Fiscal Arrangement Act, 2074, 50 % of the total royalty obtained will be allocated to the Government of Nepal, 25% to the concerned state and 25% to the concerned local level. Although this will not be applicable in mini hydro projects, local government can fix the royalty from the mini hydro project. *The impact will be direct in nature, moderate in magnitude, local in extent and long term in duration.*

7.1.2 ADVERSE ISSUES

7.1.2.1 Physical Environment

7.1.2.1.1 Construction Phase

i) Change in Land Use

Areas under different land use patterns will be required for the project construction. In the case of MKMHP, forest area, private land and river banks will be utilized for the project construction. About 5.83 ha of land is planned to be acquired temporarily and permanently for project infrastructure construction. Out of the total land to be acquired, project requires

0.758 ha permanently for the construction of different project component thus changing the land use category (**Table 6; Section 2.10.1**). *The impact will be direct in nature, moderate in magnitude, site specific in extent and long term in duration.*

ii) Change in Topography

The topography of the project area will be changed since the land use will be changed in the area. The local topography of cropland and forested land will be replaced by infrastructure of project like intake, power house, and staff quarters. Impact on the topography will also occur by the disturbance of fragile slopes, clearance of land and disposal of muck. *The impact will be direct in nature, low in magnitude, site specific in extent and long term in duration.*

iii) Possible Glacier Lake Outburst Flood (GLOF) and associated impacts

The impacts of potential outbursts of glacial lakes upstream of the Dudh Koshi are expected to be significant. However, GLOFs occur in many different forms and can vary in character from catastrophic to insignificant and unrecorded. The downstream impact of any lake outburst depends on the size of the lake, depth of the lake, type of dam of the lake, distance from the project, nature of dam break, slope of the river channel downstream, possible obstruction to high floods by narrow cross sections downstream and other factors. A major lake outburst may release enormous amounts of stored water that, together with the debris flow, can causes serious flood damages downstream along the river channel. Vulnerability of people and property is higher during construction due to the number of people being exposed to the dangers of GLOF events. Impacts of GLOFs, unrelated to the Project, are expected to be low in magnitude as GLOFs may affect tailrace only. *The impact will be indirect in nature, low in magnitude, site specific in extent and short term in duration.*

iv) Landslide and Soil Erosion

Construction activities will include land excavation, slope cutting, grading, etc. which will change the existing slope of land. So these activities on slopes may induce slope failure and mass wasting.

The clearing activities of forest and agricultural land for the construction of project structures will make the soil surface loose. So, soil erosion may occur during the rainy season especially in the steep slopes. The eroded particles may be transported to the river by monsoon runoff and exacerbate sedimentation in river.

The impact is indirect, low in significant, site specific in extent and short term in duration.

v) Generation of spoils and spoil disposal related issues

The excavation will be generating about 500 m^3 of the muck. Management of the wastes would be challenging. Improper disposal of the spoil may result in destruction of productive land and vegetation, increased turbidity of river water, increased dust in project environment, adverse impact on aquatic life, and ugly scars in the landscape. *This impact is predicted to be direct in nature, low in magnitude, short term in terms of temporal coverage and site-specific in terms of spatial coverage.*

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vi) Impact due to quarrying activity

Quarrying of construction material produces some unwanted material also, thus affecting air quality due to dust, and water quality through sedimentation. Similarly, it effects on local topography.

This impact is predicted to be direct in nature, moderate in magnitude, short term in terms of temporal coverage and local in terms of spatial coverage.

vii) Impact on material quarrying sites

Due to quarrying activities, the topography of quarry sites will be changed. The site may become unstable and materials for future may be shortage. *This impact is predicted to be direct in nature, moderate in magnitude, long term in terms of temporal coverage and site specific in terms of spatial coverage.*

viii) Water Pollution and Increase in sediment loads

Changes in the water quality of surface water bodies are likely to occur due to construction activities. In major stretches of the Monjo Khola, there is limited space available on both river banks, and as most of the construction activities will be located close to the river, there is an increased possibility of water quality deterioration.

There will be a temporary increase in the turbidity and sediment content of the river due to unavoidable disturbance of river beds and banks and likely accidental spills of sediment producing material in the river. In addition, potential uncontrolled spillage of petrochemicals, oils, paints, cement slurry and hazardous substances may also have an adverse impact on the river water quality. The impacts will be felt most during the dry season. Besides this, some wastewater from labour camps are likely to pollute the water microbiologically and add inorganic elements like carbon, nitrogen and phosphorus. Such pollution will take place in spite of project efforts to contain discharges and limit the extent as far as possible. The discharge of the camps' effluent into the water bodies could be significant with far reaching implications to the water users downstream, but mitigation measures to prevent this are included in the project. Improper management of waste, both solid and liquid, generated by the people directly or indirectly involved in the project will probably take place, and increased BOD and Fecal coliform in Monjo Khola can be expected to a certain level. The potential for adverse impacts is nevertheless short-term in nature.

The impact will be indirect in nature, moderate in magnitude, short term in duration and local in terms of spatial coverage.

ix) Noise Pollution

Construction activities and aggregate crushing plants at project sites will generate noise and vibrations. The increase in ambient noise levels will have impacts on settlements in close proximity to noise sources at penstock alignment along Monjo and powerhouse site. The impact is expected to be low in magnitude and for short duration.

The impact is direct in nature, low in magnitude, site specific in extent and short term in duration.

x) Soil Pollution

Various chemicals, paints, petrochemicals etc. will be used in the different activities of project. Mishandling and spillage of different chemicals, paints, petrochemicals etc. may affect the soil of the project construction area.

The impact will be of direct in nature, low in magnitude, site specific in extent and short term in duration.

xi) Issues of Haphazard Stockpiling of Construction Material

The project has designated separate areas for the stockpiling of construction materials such as sand, aggregates, iron rods, steel frames, cement, etc. for the project construction period. However open and haphazard stockpiling is a potential to degrade the aesthetic beauty of the stockpiling areas. During the construction phase, there will be significant quantity of construction materials such as gravels, aggregates, bricks, cement, etc. around the construction area. Seepage and leakages from the stockpiled construction materials can directly impact soil and water quality of the river. Additionally, if not properly managed, the beauty of local topography might be affected.

The impact will be direct in nature, low in magnitude, site specific in extent and short term in duration.

xii) Solid Waste Generation

During the construction phase large number of labors will be required so that there might establish the camp sites for labor and construction yard. Solid waste will be generated from the camp site and construction yards. This will cause the environmental problem in and around the camp site if not managed properly. Both organic and inorganic form of wastes will be generated due to construction activities and also from camps and housing areas.

The impact is indirect, moderate in magnitude, site specific in extent and short-term in duration.

xiii) Air pollution related issues

During construction period, the activities such as transportation of man and material, excavation and operation of crushing plant will generate dust. This impact on air quality will however be short in duration and for the most part be limited to the project site. The impact will be most severe at weir site, powerhouse site, crushing plant, concrete mixing sites and the spoil disposal area. Other potential impacts on air quality are unpleasant odor due to improper management of sewage and solid waste and indoor smoke pollution due to cooking activities. Because, during construction period, there will be large number of construction workers in the project area. Increased dust in the air will impair the health of people through increased incidence of Acute Respiratory Infections (ARI), wheezing, shortness of breath and dust allergies.

However, the impact will be direct in nature, low in magnitude, local in extent and short term in duration.

xiv) Hydrology and River Morphology

The diversion of water through the pipe will have an impact on the river flow and morphology. The river will divert up to 0.560 m^3/s of flow through the pipe to the

powerhouse located downstream. Therefore, the river stretch of about 1.3 km between the proposed intake and confluence between Dudhkoshi River and Monjo Khola site can be classified as a dewatered reach.

The basin hydrology and flow regime of Monjo Khola will not be impacted by the project during the construction phase. Shortly downstream of the weir construction site, the river will be running in its natural state until dam closure and diversion to the power station commences. Possible extraction of large boulders from the riverbank for construction purposes may have some impact on the river morphology in the long run.

The impact will be direct in nature, moderate in magnitude, site specific in extent and short term in duration.

xv) Loss of Top Soil

Project requires forest and agriculture land. The top soil, estimated to be about 100 m^3will be destroyed if not removed before construction.

The impact will be direct in nature, low in magnitude, site specific in extent and short term in duration.

7.1.2.1.2 Operation Phase

i) GLOF and associated impacts

As a GLOF event could happen any time, with particular risks during the monsoon season, there is in principle no difference between construction and operation phase of the project. However, vulnerability of people and property is lower during operation due to the number of people being exposed to the dangers of GLOF events. Impacts of GLOFs, unrelated to the project, are expected to be from low to moderate in magnitude, as it has been expected to affect tailrace only.

The impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.

ii) Change in topography and land use

Change in topography and land use has not been envisioned during operation phase although it was identified during preparation of ToR.

iii) Impacts on river morphology and possible microclimatic changes

The diversion of Monjo Khola in intake site will eventually result in some impacts on the downstream dewatered zone. Low volume of water is likely to increase the temperature in the dewatered zone. The change in flow during wet season is not considered significant but in dry period (7 months) the flow will be significantly reduced which causes adverse impact on river morphology. This will be a residual impact until the project will be in operation.

There will be some change in the water quality in the dry season in the dewatered stretch of the river between weir and confluence of Monjo khola and Dudh Koshi River. Because of the reduction of the flow discharge and contribution of nutrients, there will be growth of blue filamentous algae in the dewatered stretch of the river. The dissolved oxygen level will slightly drop while the water temperature will slightly increase.

The impact will be direct in nature, moderate in magnitude, local in extent and long term in duration.

iv) Land submergence due to diversion weir and associated impacts

The diversion structure and creation of reservoir in front of the diversion structure in the operation phase divide the existing river morphology into distinct three sections as under:

(i) Undisturbed section upstream the upper limit of the reservoir
(ii) Reservoir section of about 5 m length
(iii) Dewatered section of about 1.3 km length

As the existing aquatic life are co-existing with the undisturbed river morphology will find difficulties to sustain their life cycle in the changed morphological and water conditions of the changed river stretches. Major changes in aquatic life will occur in the reservoir section and in the dewatered section through November to May every year.

The impact will be direct in nature, low in magnitude, local in extent and long term in duration.

v) Management/final disposal of solid waste and waste water (both black water and grey water)

Solid waste pollution in and around project area during operation phase will be very low as compared to that during construction period. The solid waste generation sources will reduce drastically as all of the construction work force will leave project area after project construction. However, some amount of solid waste may be generated from the project permanent camp and office.

This impact is indirect in nature, low in magnitude, site specific and long term in duration.

vi) Change in river water quality

Due to low discharge in Monjo Khola, the water quality will be changed. It cannot carry or flush the contaminated materials during dry period thus affecting physical, chemical and biological quality of river water. *This impact is direct in nature, low in magnitude, site specific and long term in duration.*

vii) Noise and vibration at power house

During operation period, the impact due to noise is expected to exist in the powerhouse due to the running of turbines. As the powerhouse is a closed system and is located away from the settlements, the impact of noise is confined to the powerhouse operating workers only.

The noise impact is direct in nature, low in magnitude, site specific and long term in duration.

viii) Soil erosion due to tailrace discharge

The confined discharge of water from tailrace might erode the soil around the tailrace during operation of the power generation plant.

The impact is direct in nature, low in magnitude, site specific and long term in duration.

ix) Impact on downstream due to sediment flushing

Sudden release of sediment from reservoir erode the river bank and surface. It may affect the public and property in downstream. *The impact is indirect in nature, moderate in magnitude, local in extent and long term in duration.*

7.1.2.2 Biological Environment

7.1.2.2.1 Construction Phase

i) Loss of forest area

Total forest land required by the project is 0.674 ha. The project will require 0.234 ha of BZCF area on long term lease and 0.44 ha of BZCF land temporarily. Clear felling will be avoided as the proposed project small and space required for penstock laying is of about 2 m width.

Impact is of direct in nature, moderate magnitude, site specific in extent and long-term duration.

Table 34: Forest Area Required for Project Components

SN	Project Component	Forest Area (Ha)	Community Forest	Remarks
1	**Headworks (weir)**			
1.1	Pondage area	0.18	Himalaya BZCF	Longterm Lease
1.2	Headworks	0.054	Himalaya BZCF	Longterm Lease
2	**Penstock**	0.28	Himalaya BZCF	Longterm Lease
3	Spoil Disposal Sites	0.05	Himalaya BZCF	Short term Lease
4	Quarry and Burrow Sites	0.39	Himalaya BZCF	Short term Lease
	Total	**0.674**		

ii) Loss of forest vegetation and overall vegetation diversity

Estimated total number of poles is 30 and trees 3 needs to be cut down for penstock laydown purpose. Due to felling of these trees, 9.92 m^2 tree basal area, 11.56 m^3 tree standing volume, 2.21 m^3 timber volume, 5.23 m^3 fuelwood and 4,305.63 kg tree biomass will be lost. Total value of lost timber is estimated to be NRs. 775,000.00 and for fuelwood NRs. 150,000.00. *The impact will be direct in nature, moderate in magnitude, site specific in extent and long term in duration.*

Table 35: Tree Basal Area, Volume and Biomass Loss

Local Name	Scientific Name	BA (m^2)	Volume (m^3)	Biomass (Kg)	Timber (m^3)	Fuelwood (m^3)
Thingure Sallo	*Abies pindrow*	3.48	4.02	2952.21	2.03	3.52
Gobre Sallo	*A. spectabilis*	0.55	0.46	302.59	0.00	0.53
Bhoj patra	*Betula utilis*	0.03	0.02	21.35	0.00	0.03
Balu	*Pieris formosa*	0.01	0.00	2.29	0.00	0.00
Rani Sallo	*Pinus wallichiana*	5.70	6.98	925.23	0.17	1.01
Gurans	Rhododendron sp.	0.16	0.08	101.96	0.00	0.14
Total		**9.92**	**11.56**	**4305.63**	**2.21**	**5.23**

Source: Field Survey, 2021

iii) Pressure on Forest for Fuelwood

As the area is cold, construction crews might use or demand fuelwood for heating as well for cooking. This increases the pressure on forest products for fuelwood. *The impact will be indirect in nature, low in magnitude, site specific in extent and short term in duration.*

iv) Impact on natural and critical habitat (wildlife and their movement route and migratory bird movement route) avian fauna

Although the proposed project area is not the core habitat, various wild animals come here for forage and water. Movement of workers and construction activities affect on the movement of these wild animals and their forage habitats. These impacts are almost unavoidable during construction. *This impact is of direct in nature, moderate in magnitude, site specific in extent and short term in duration.*

v) Impact on aquatic flora and fauna

Construction activities and wastes from labour camps may degrade the water quality affecting the aquatic flora and fauna. Spoils and other construction wastes, chemicals and organic wastes increase the sediment loads, BoD and CoD of the river waters. DO may be reduced. This ultimately affects the aquatic flora and fauna of Monjo Khola. *The impact is direct, moderate in magnitude, site specific in extent and short term in duration.*

vi) Impact on non-timber forest products/MAPs

Anaphilis sp., Barberis sp., Drepanostachyum sp., *Nardostachys grandiflora*, *Plantago erosa, Rhododendron anthopogon, Rhododendron campylocarpum*, *Rumex nepalensis, Urtica dioica* and wild edible mushrooms are are the major NTFPs that would be affected due to excavation and construction activities during project construction. The affected NTFPs are abundant in the other parts of the project area as well as outside the project area also. *The impact will be direct in nature, low in magnitude, site-specific in extent and short term in duration.*

vii) Possible Risk of forest fire

In and around the construction area, there will be many types of fuel that create fire hazards, such as slash accumulation of timber cutting, dryden grass and debris accumulation, accumulation of flammable leaves, dead trees, dry bushes etc., as well as gasoline for machinery. Fire might be set accidentally due to inadvertently thrown cigarette stub and left campfire or deliberately by some ruffian. Small fire can turn huge forest fire. Improper garbage disposal and improper storage of inflammable gases and liquids at the construction site can aggravate the situation.

The impact will be indirect in nature, low in magnitude, local in extent and short term in duration.

viii) Wildlife hunting and poaching

Workers from outside the PIA may involve in wildlife hunting and poaching as locals donot involve in hunting and poaching. *The impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.*

ix) Increased Incidence of Human Wildlife Conflict

Although wildlife prime habitat has not been reported in the project area, construction works may affect the wildlife movement, and these animals may enter to agriculture land and settlements. These may increase crop raiding and livestock loss. Villagers and workers may

encounter with wildlife occasionally. Workers may kill the wildlife those encountered in the forest area. However, human wildlife conflict is expected to decrease after the construction work is over. *The impact will be direct in nature, moderate in magnitude, site specific in extent and short term in duration.*

7.1.2.2.2 Operation Phase

i) Reduced river flow

The diversion of Monjo Khola in intake site will eventually result in some impacts on the downstream dewatered zone. Low volume of water is likely to increase the temperature in the dewatered zone. The change in flow during wet season is not considered significant but in dry period (7 months) the flow will be significantly reduced which causes adverse impact on river morphology. This will be a residual impact until the project will be in operation. There will be some change in the water quality in the dry season in the dewatered stretch of the river. Because of the reduction of the flow discharge and contribution of nutrients, there will be growth of blue filamentous algae in the dewatered stretch of the river. The dissolved oxygen level will slightly drop while the water temperature will slightly increase. *The impact will be direct in nature, moderate in magnitude, local in extent and long term in duration.*

ii) Disturbance to the wildlife due to resident workforce

Resident workers for operation and maintenance of mini hydro plant have to inspect the headwork areas and other structures on regular basis. Thus the movement of humans in forest may affect on movement and forage of wild animals *although the impact will be of indirect in nature, low in magnitude, site specific in extent and long tern in duration.*

iii) Fragmentation of wildlife habitat and disturbance to wildlife movement

During operation of the project, there will not be impact on wildlife habitat and disturbance to wildlife.

iv) Impact on rare, endangered, protected and threatened species of flora and fauna

All the excavated areas for penstock pipes and transmission lines will be rehabilated immediately. Movement of work force will be almost zilch after construction. Thus it has been expected that there will not be impact on rare, endangered, protected and threatened species of flora and fauna during operation period.

v) Bird casualties due to electrocution and collision with transmission line

Distribution of transmission line will be underground in all areas except river crossing where it will be overhead. Bird causalities may happen due to electrocution and collision with transmission lines although overhead transmission lines are very limited. It has been assumed that *the impact will be of direct in nature, low in magnitude, local in extent and long term in duration.*

vi) Forest fire

As there will be some resident workers for operation and maintenance of power plant, there is likelihood of incidence of the forest fire caused by workforce indiscipline. The grass species and pine trees present in project sites are vulnerable to fire, especially during the dry season. Even a small fire in the form of cigarettes, buds and match stick used by the resident workers could be a crucial factor for fire hazard. Likewise, short circuit of electricity could also be the cause of fire. The forest fire could create a big fire hazard affecting the whole

region. *The impact will be indirect in nature, moderate in magnitude, local in extent and long term in duration.*

vii) Pressure on forest for fuel wood

The resident workers may use fuelwood during winter for campfire, space heating and even for cooking. This may create pressure on local resources although resident workers are very few. *The impact will be indirect in nature, low in magnitude, site specific in extent and long term in duration.*

7.1.2.3 Socio-economic and Cultural Environment

7.1.2.3.1 Construction Phase

i) Land acquisition and compensation related issues

An estimated land area of about 5.83 ha is required for construction of the project components. Project facilities requires 0.055 ha land permanently and 0.52 ha temporarily (for quarry, borrow and spoil disposal sites). Out of the 5.31 ha land to be permanently acquired, 0.19 ha is cultivated land, 0.3 ha is community forest land and remaining 4.82 ha is public land, mostly trails. Temporarily leased land is mostly barren land under BZCF. The permanent structure of the project will be constructed in the permanently acquired land and temporary project ancillaries will be constructed in leased land. *The impact is direct, moderate in magnitude, local in extent and long-term in duration.*

ii) Loss of agriculture land and Crops

Utilization of agricultural lands for different project features will decrease the agricultural production in the area. As per local production trends, about 2.5 quintal of potato and the same amount of vegetables is expected to be lost in annual production due to acquisition of agriculture land. Thus, acquisition of land will also have direct impact on agriculture production and economic condition of the local people. With the implementation of the proposed project, there will be loss in annual production of agricultural products. Estimated loss of major crops (potato) in terms of monetary value is about NPR 25,000.00 while valuation of vegetables is about NPR 40,000.00. *The impact will be direct in nature, low in magnitude, site specific in extent and long term in duration.*

iii) Loss of private land and property

Beside the loss of land, there will not be loss of property of local people.

iv) Loss or restricted access of ecosystem services and its impact on livelihood

There will not be impact on access of ecosystem services and its impact on livelihood due to proposed project

v) Impact on existing social infrastructures

There are four existing micro hydro projects in PIA (**Table 28 in Section 5.3.5**). Out of four micro hydros, Monjo Khola Micro Hydro (MKMH) will be impacted during construction period, as the proposed project activities will be conducted in the periphery of MKMH. Sedimentation on water and disturbance on water supply canal will affect in power generation from MKMH. Similarly, laying of transmission and distribution lines needs to be dig along the trails. Similarly, drinking water distribution pipes may be affected. This also impacts on travel and associated risks of accidents. *The impact will be direct in nature, high in magnitude, site specific in extent and short term in duration.*

vi) Pressure on existing facilities, services and resources of the project area

There will be increased pressure in social service and facilities due to the migrant work force and outsider's population. The population of a relatively smaller project area can become crowded with addition of the outsiders. The addition of the outsider population creates pressure in social service providing institutions in the area. Experience of hydropower projects construction in Nepal, reveals pressure on the social service institutions particularly health services, water supply systems, administrative services, local law and order maintaining institutions and above all the sanitation management of the area. The implication is shortages of medicine, and medical personnel in nearby health posts: shortages in water supply; increase in thefts, quarrels over resources with a burden to local administration and law and order institutions; and above all increase in solid waste, human waste and degradation of the overall sanitation status of the area. *The impact will be indirect in nature, moderate in magnitude, site specific in extent and short term in duration.*

vii) Health and sanitation and public safety

Public safety during construction phase is also an issue of concern. People unknowingly can get into accidents during construction activities. Also, the spilled chemical, hazardous explosive materials, sharp construction materials pose threat to public safety unless adequate awareness is provided and strict regulations are formulated. Similarly, trench made for laying of transmission distribution lines may be ambush for locals and trekkers. *The impact will be indirect in nature, moderate in magnitude, site specific in extent and short term in duration.*

viii) Occupational health and safety related issues

The construction activities such as working in the river, steep slopes, may cause accidents and injuries. The most common injuries that might occur are due to accidental falls from scaffoldings or other structures, injuries due to falling objects such as rocks or other construction equipment. The victims will most probably be construction worker although injuries to local people area also possible. Similarly, construction practice without use of Personal Protective Equipment (PPE) like glove, boot and helmet results into the minor accidents. Health hazard may also occur due to unhygienic sanitation condition of camps. Work related injuries are the likely impacts predicted due to implementation of the proposed project.

The impact will be direct in nature, high in magnitude, site specific in extent and short term in duration.

ix) Social-cultural conflict between local community and the outside work force

Another socio-cultural impact in the project area during construction will be an overall disruption of the traditional cultural ways of people living in and near the project area. Disruption of social life will also be caused by the presence of the construction workforce and an anticipated influx of job seekers during construction period of the project. For example, it is likely that the influx of construction workers will result in increased cases of inter-caste marriages locally. Eventually, some changes in ethnic and community solidarity and occupational patterns can be expected in the area. It is also likely that the construction workers, contractors and engineers and their families, would interact with the local people that could expose them to wide range of information opinions and ideas outside of their areas. Thus, the project will have some impacts on social, cultural and religious features of the project areas.

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These impacts are expected to be direct, low in magnitude, local in extent and of short term.

x) Issues relating to unsocial activities like gambling, alcoholism, girl trafficking and prostitution

With the beginning of construction of projects involving numbers of migrant workforce introduced to new areas, there is always risk of introduction of new communicable diseases carried by the migrant workforce from elsewhere. While there are risks of communicable diseases being brought into the project area, the situation gets worst as these diseases spread to the local population and turn to an epidemic. As evident from other projects in Nepal, the risks of sexually transmitted diseases (STD) including HIV and AIDS increases in the project area.

With a number of outsider population introduced to the area, there is always likelihood of conflicts between the locals and the outsiders. The locals have their own way of living as guided by the traditional cultures and practices. The outsider populations have a different way of living life as they are from a different area with different societal settings and customary traditions. This difference between the locals and outsiders creates a cultural gap and with any kind of intrusion to the existing traditions in the local area by the outsiders there will be conflicts generated. Moreover, with increased migrant workforce in the area, there will be increased alcoholism, gambling, prostitution in the project area and thereby the law and order situation may get vandalized. *The impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.*

xi) Gender discrimination (issues of equal pay between women &men for work of equal value)

Male and female workers may be paid unequally for the same or similar works. Similarly, contractor may select male and female workers for selective works rather than the capacity of individual workers. Such gender discrimination on works and pay may create dispute at workplace and hindrance on progress of works. *The impact will be indirect in nature, moderate in magnitude, site specific in extent and short term in duration.*

xii) Stakeholder Engagement and information disclosure

Stakeholder engagement and information disclosure is very important for the successful implementation of the proposed project. Avoiding or evading the stakeholders on proposed project activities may hamper the progress and sustainability of the project. Likewise, if information regarding the project is not shared with concerned stakeholders and locals of PIA, it also creates problem in project implementation and sustainability. *The impact will be indirect in nature, moderate in magnitude, local in extent and long term in duration.*

xiii) Issues of Grievances Management and Gender Based Violence (GBV)

Locals of PIA, construction crews and other concerned stakeholders may have complaints regarding project activities and also about the behaviors of project staffs and workers. On the same way, there may be gender based violence and sexual exploitation & harassment in/among workers, project staffs and also with local people. If there is no mechanism to address these issues at project level initially, it will create a huge problem later. *The impact will be indirect in nature, high in magnitude, local in extent and short term in duration.*

xiv) Issues related to disturbance to community during construction

Construction activities, movement of construction crew and associated activities may disturb to local communities. Socio-cultural invasion, unsocial behaviour, increment of wastes, unnecessary noise and shouting might disturb the nearby community. *The impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.*

xv) Issues related with COVID-19 Pandemic

No place has remained untouched by COVID-19 pandemic since last two years. Construction crew and project staffs may transfer virus to community level or vice-verse. In this situation, both community people and workers may get infected and situation may become chaos. The *impact will be indirect in nature, moderate in magnitude, local in extent and short term in duration.*

xvi) Child labor

There is probability of using children as cheap construction labour. *The impact will be direct in nature, low in magnitude, local in extent and short term in duration.*

xvii) People's Behaviors due to change in economy

The area is along famous tourist trekking route and people are earning handsome money in every tourist season. Thus it has been supposed that there will not be significant economic change of local community. Therefore, it does not play important role to change behaviors of local people.

xviii) Impact on historical, religious, cultural and touristic important sites

The proposed project does not have any negative impacts on historical, religious, cultural and touristic sites.

xix) The pattern of uses of natural resources in festivals and religious rituals (if any)

The proposed project does not have any negative impacts on pattern of uses of natural resources in festivals and religious rituals.

7.1.2.3.2 Operation Phase

i) Occupational health and safety related issues of the power station workers

Occupational Health and Safety issues during operation phase are particularly associated with long term exposures to noise from turbine operation and accidents due to electrocution causing injuries and deaths.

Occupational health impacts are direct in nature, moderate in magnitude, site specific in extent and long-term duration.

ii) Public Safety Related Issues/Movement of people in dangerous places

Local people with ignorance may not know about new structures and dangerous places such as the switch yard. They may visit these areas and risk their well-being. Children are especially susceptible to such hazards, which can result in accidents.

The impact will be direct in nature, moderate in magnitude, site specific in extent and long term in duration.

iii) Issues relating to sudden release of water to downstream

Water is released suddenly to downstream area to flush out the sediment load from settling basin especially during the wet season. Local people may cross the river. People may be washing in the river if they are unaware of the situation. Thus, there is a high risk of accidents and even loss of life if people are unknown and are not informed about the sudden release of water.

The impact will be direct in nature, moderate in magnitude, site specific in extent and long term in duration.

iv) Withdrawal of economic opportunity

The first and foremost impact during the operation phase is the withdrawal of economic activities which flourished during the construction phase since majority of the construction workforce will leave the project areas. During operation phase when the energy is distributed to locals, the economic activities will be much less, only about 2~3 percent of total investment is necessary for annual expenditure. The labour requirement will decrease drastically, and so will be the income opportunities. Similarly, the employment opportunity will be drastically reduced during this phase. Lack of public awareness and participation in the development effort will generate negative impact in the local people. *The impact will be indirect in nature, low in magnitude, local in extent and short term in duration.*

v) Water right issues

Currently water is being used for running of Monjo Khola Micro Hydro from the downstream of Intake of MKMHP. When MKMHP will be operated, Monjo Khola Micro Hydro needs to be shut down. *Thus this impact is direct in nature, high in magnitude, site specific in extent and long term in duration.*

vi) Issues related to benefit sharing of project

Locals want some benefits as they have to provide local resources to private sector. They arise the issue of benefit sharing in terms of share on company and benefit accrued from power generation. This issue may affect on sustainability of the project. *Thus this impact is indirect in nature, moderate in magnitude, local in extent and long term in duration.*

vii) Issues related to tariff of electricity

Majority of locals are using energy from micro hydro and solar for lightening purpose only. Most of the micro hydros made from community initiation and ownerships are with them. They are paying the energy tariff with mutual understandings of community people. And locals always want energy at low price as possible from developer. The proposed project has supposed to be provide energy not only for lightening but also for house appliances and small industry as per need of the local people. Therefore, local peoples' willingness to pay the electricity tariff is very important in one hand while making profit from investment for developer is in another hand. *This impact is indirect in nature, moderate in magnitude, local in extent and short term in duration.*

viii) Stress on local resources & infrastructure

The proposed project does not make any stress on local resources and infrastructures during operation phase.

ix) Issues related to management of micro hydro project that exist in project affected area

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There are four existing micro hydro projects in PIA (**Table 28 in Section 5.3.5**). Out of four micro hydro, MKMHP needs to shut down as the proposed project utilizes water from the upstream of the intake of Monjo Khola micro hydro. There is no feasible to run Monjo Khola micro hydro. Other three remaining micro hydro wil also be impacted as they are producing insufficient amount of electricity, only for lightening. People may use the electricity from new project that provides energy as per their demand. Therefore, other three micro hydros may be affected and their revenues may be impacted. *This impact is direct in nature, high in magnitude, local in extent and long term in duration.*

7.1.2.4 Impacts to integrity of protected areas and Outstanding Universal Value

As the project area falls within BZ of SNP, world heritage site since 1979. The proposed activity is confined in a small site along the river banks and trails. Construction activity will be of manual and restored immediately. During construction, there will be very minor topographical changing works for penstock and transmission and distribution laying as both will be underground except river/stream crossing. It will impact on visual perception in some extent in the PIA, but not park area. Similarly, local community has already been exposed to diverse cultural and religious groups from various country since last 75 years. So influx of labour cannot easily influence the local customs, cultural and religious practices. In terms of biodiversity, the project activities do not involve clear felling of forest thus not affecting prime wildlife habitat but may hinder the movement during construction. On the same way, electroshocking may kill the birds in the river/stream crossing area where transmission lines are open. But this is impossible as the transmission lines will be armored cables. Thus the impact of proposed project on integrity of PA and OUV is *indirect in nature, low in magnitude, local in extent and long term in duration.*

7.2 EVALUATION OF IMPACTS

The significance of the impacts has been evaluated using the words significant, moderately significant and insignificant. Assumption has also been made to evaluate the significant impacts. Impacts having total score of over 75 are considered significant; impacts having 45 to 75 score are considered moderately significant; and impacts having total score of less than equal to 45 are considered insignificant for this project. However, some of the impacts whose total score exceeds 45 may not be significant in view of the nature of the predicted impacts. Some impacts having less than 45 score could also be considered significant. It has been done so as the impacts are related to the subjective judgment on magnitude, extent and duration of the impacts (**Table 36 and 37**). For example, impacts likely to occur outside the project's direct impact zone and of indirect nature may not be significant although the total score exceeds 45. This ranking has provided a basis to select and propose environmental protection measures, i.e., beneficial impacts augmentation measures, and adverse impacts mitigation measures.

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Table 36: Evaluation of Beneficial Impacts

SN	Likely Impacts	Nature	Magnitude	Extent	Duration	Total Score	Significance
1. Construction Stage							
1.1	Employment opportunities for local people and impact on local economy and skill development	D	H(60)	L(20)	ST(05)	85	Significant
1.2	Benefits from implementation of environmental mitigation programs and benefit augmentation measures	ID	M(20)	L(20)	LT(20)	60	Moderately Significant
1.3	Increase in economic activities in the project area and associated beneficial impacts in local economy through micro-enterprise development	ID	M(20)	L(20)	ST(05)	45	Insignificant
1.4	Benefits for Exposure of local population to new technologies and technology transfer	D	L(10)	L(20)	LT(20)	50	Moderately Significant
1.5	Utilization of local resources	ID	L(10)	L (20)	ST (05)	35	Insignificant
2. Operational Stage							
2.1	Employment generation and skill enhancement	D	M (20)	L(20)	LT(20)	60	Moderately Significant
2.2	Benefits to be incurred from addition of 942 kW of power	D	H(60)	L(20)	LT(20)	100	High Significant
2.3	Changes in local economic activities	ID	M(20)	L(20)	LT(20)	60	Moderately Significant
2.4	Changes in micro and macro economy	ID	L(10)	L(20)	LT(20)	50	Moderately significant
2.5	Sharing of electricity royalty to concerned authorities	D	M (20)	L(20)	LT(20)	60	Moderately Significant

Note: D = Direct, ID = Indirect, S= Site specific, L= Local, R= Regional, ST=Short Term, LT= Long Term, H = High, M=Moderate, L= Low
Values in the parenthesis are based on numeric value provided in National Environmental Impact Assessment Guideline, 1993. Priority rank; 1 (sum of numerical value 70 or above) = highly significant; 2 (sum of numerical value 45- 70) = moderately significant; 3 (sum of numeric value below *45) = low significant.*

Table 37: Evaluation of Adverse Impacts

SN	Likely Impacts	Nature	Magnitude	Extent	Duration	Total Score	Significance
1. Physical Environment							
1.1 Construction Stage							
1.1.1	Change in land use	D	M (20)	SS (10)	LT (20)	50	Moderately Significant
1.1.2	Change in Topography	D	L (10)	SS (10)	LT (20)	40	Insignificant
1.1.3	Possible Glacier Lake Outburst Flood (GLOF) and associated impacts	IN	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.4	Landslide and soil erosion	IN	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.5	Generation of spoils and spoil disposal related issues	D	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.6	Impact due to quarrying activity	D	M (20)	L (10)	ST (05)	35	Insignificant
1.1.7	Impacts on material quarrying sites	D	M (20)	SS (10)	LT (20)	50	Moderately Significant
1.1.8	Water pollution and increase in sediment loads	ID	M (20)	L (20)	ST (05)	45	Insignificant
1.1.9	Noise Pollution	D	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.10	Soil Pollution	D	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.11	Issues of haphazard stockpiling of construction material	D	L (10)	SS (10)	ST (05)	25	Insignificant
1.1.12	Solid Waste Generation	IN	M (20)	SS (10)	ST (05)	35	Insignificant
1.1.13	Air Pollution Related Issues	D	L (10)	L (20)	ST (05)	35	Insignificant
1.1.14	Hydrology and river morphology	D	M (20)	SS (10)	ST (05)	35	Insignificant
1.1.15	Loss of Top Soil	D	L (10)	SS (10)	ST (05)	25	Insignificant
1.2. Operational Phase							
1.2.1	GLOF and associated impacts	ID	M (20)	L (20)	ST (05)	45	Moderately Significant
1.2.2	Impacts on river morphology and possible microclimatic changes	D	M (20)	L (20)	LT (20)	60	Moderately Significant
1.2.3	Land submergence due to diversion weir and associated impacts	D	L (10)	L (20)	LT (20)	50	Moderately Significant
1.2.4	Management/final disposal of solid waste and wastewater (both black water and grey water)	ID	L (10)	SS (10)	LT (20)	40	Insignificant
1.2.5	Change in River Water Quality	D	M (20)	SS (10)	LT (20)	50	Moderately Significant
1.2.6	Noise and vibration	D	L (10)	SS (10)	LT (20)	40	Insignificant
1.2.7	Soil Erosion due to Tailrace Discharge	D	L (10)	SS (10)	LT (20)	40	Insignificant
1.2.8	Impact on Downstream due to Sediment Flushing	ID	M (20)	L (20)	LT (20)	60	Significant

SN	Likely Impacts	Nature	Magnitude	Extent	Duration	Total Score	Significance
2. Biological Environment							
Adverse Impacts							
2.1. Construction Stage							
2.1.1	Loss of forest area	D	M (20)	SS (10)	LT (20)	50	Moderately significant
2.1.2	Loss of forest vegetation and overall vegetation diversity	D	M (20)	SS (10)	LT (20)	50	Moderately significant
2.1.3	Pressure on Forest for Fuelwood	ID	L (10)	SS (10)	ST (05)	25	Insignificant
2.1.4	Impact on natural and critical habitat	D	M (20)	SS (10)	ST (05)	35	Insignificant
2.1.5	Impact on aquatic flora and fauna	D	M (20)	SS (10)	ST (05)	35	Insignificant
2.1.6	Impact on non-timber forest products/MAPs	D	L (10)	SS (10)	ST (05)	25	Insignificant
2.1.7	Possible Risk of forest fire	ID	L (10)	L (20)	ST (05)	35	Insignificant
2.1.8	Wildlife hunting and poaching	ID	M (20)	L (20)	ST (05)	45	Moderately significant
2.1.9	Human Wildlife Conflict	D	M (20)	SS (10)	ST (05)	35	Insignificant
2.2. Operational Stage							
2.2.1	Reduced river flow	D	M (20)	L (20)	LT (20)	60	Moderately significant
2.2.2	Disturbance to the wildlife due to resident workforce	ID	L (10)	SS (10)	LT (20)	40	Insignificant
2.2.3	Impact on rare , endangered, protected and threatened species of flora and fauna						No impact
2.2.4	Bird casualties due to electrocution and collision with transmission line	D	L (10)	L (20)	LT (20)	50	Moderately significant
2.2.5	Forest Fire	ID	M (20)	L (20)	LT (20)	60	Moderately significant
2.2.6	Pressure on forest for fuelwood	ID	L (10)	SS (10)	LT (20)	40	Insignificant
3. Socio economic and Cultural Environment							
Adverse Impacts							
3.1. **Construction Stage**							
3.1.1	Land acquisition and Land compensation related issues	D	M (20)	L (20)	LT (20)	60	Moderately significant
3.1.2	Loss of agricultural land and crop production	D	M (20)	SS (10)	LT (20)	50	Moderately significant
3.1.3	Affect on existing social infrastructures	D	H (60)	SS (10)	ST (05)	75	Significant
3.1.4	Affect on existing social infrastructures	D	H (60)	L (20)	ST (05)	85	Significant
3.1.5	Pressure on existing facilities, services and resources of the project area	ID	M (20)	SS (10)	ST (05)	35	Insignificant

SN	Likely Impacts	Nature	Magnitude	Extent	Duration	Total Score	Significance
3.1.6	Health and sanitation and public safety	ID	M (20)	SS (10)	ST (05)	35	Insignificant
3.1.7	Occupational health and safety related issues	D	H (60)	SS (10)	ST (05)	75	Significant
3.1.8	Socio-cultural conflict between local community and outside work force	D	L (10)	L (20)	ST (05)	35	Insignificant
3.1.9	Issues relating to unsocial activities like gambling, alcoholism, girl trafficking and prostitution	ID	M (20)	L (20)	ST (05)	45	Moderately significant
3.1.10	Gender Discrimination	ID	M (20)	SS (10)	ST (05)	35	Insignificant
3.1.11	Stakeholder Engagement and information disclosure	ID	M (20)	L (20)	LT (20)	60	Significant
3.1.12	Issues of Grievances Management and Gender Based Violence (GBV)	ID	H (60)	L (20)	ST (05)	85	Significant
3.1.13	Issues related to disturbance to community during construction	ID	M (20)	L (20)	ST (05)	45	Moderately significant
3.1.14	Child labour	D	L (10)	L (20)	ST (05)	35	Insignificant
3.2. Operation Phase							
3.2.1	Occupational health and safety related issues of the power station workers	D	M (20)	SS (10)	LT (20)	50	Moderately significant
3.2.2	Public Safety Related Issues/Movement of people in dangerous places	D	M (20)	SS (10)	LT (20)	50	Moderately significant
3.2.3	Issues relating to sudden release of water to downstream	D	M (20)	SS (10)	LT (20)	50	Moderately significant
3.2.4	Withdrawal of economic opportunity	ID	L (10)	L (20)	ST (05)	35	Insignificant
3.2.5	Water right issues	D	H (60)	SS (10)	LT (20)	90	Highly Significant
3.2.6	Issues related to benefit sharing of project	ID	M (20)	L (20)	LT (20)	60	Moderately significant
3.2.7	Issues related to tariff of electricity	ID	M (20)	L (20)	LT (20)	60	Moderately significant
3.2.8	Issues related to management of micro hydro project	D	H (60)	L (20)	LT (20)	100	Highly Significant
4	**Impacts to integrity of protected areas and OUV**	**ID**	**L (10)**	**L (20)**	**LT (20)**	**50**	**Moderately significant**

CHAPTER 8: ENVIRONMENTAL IMPACT MITIGATION MEASURES AND ENVIRONMENTAL MANAGEMENT PLAN

The BES study has proposed site-specific mitigation measures to minimize/mitigate/avoid or control of proposal's adverse impacts during construction and operation stages.

The mitigation measures have been selected based upon appropriateness and cost analysis Mitigation measures have been proposed for the impacts on physical, biological, socio-economic and cultural environment. Mitigation Measures are of two types, which are benefit augmentation measures and adverse impacts mitigation measures.

8.1 ENVIRONMENTAL ENHANCEMENT MEASURES

8.1.1 CONSTRUCTION PHASE

i. Employment opportunity and skill enhancement

The project will give first priority to the PAFs and local people who want to work in the project. The project will maintain the roster of the PAFs and at least a member of PAF will be employed during the project construction period. The project will provide necessary training to PAFs, if necessary, depending upon the nature of the work offered. The project will include a binding clause in the contractor's agreement to give first priority to PAFs while hiring both skilled and unskilled labor forces and to give daily wages or monthly wages not less than the RM approved rates. The next priority will be given to local people for employment. Local people will be recruited for administrative and technical works as per their qualifications and skills.

Table 38: Estimated Cost for the Skill Development Training

SN	Particular	Number of trainees	Per trainee cost	Training Duration/Period as per CTEVT	Total Cost (NRs.)
1	Electrical /Plumbing training	10	50,000.00	390 Hrs	500,000.00
2	Mason	10	18,000.00	15 Days	180,000.00
3	Other training as local interest	10	50,000.00	45 Days	500,000.00
4	Tourism hospitality & Cook	15	47,000.00	45 Days	705,000.00
	Total	**30**			**1,885,000.00**

ii. Benefits from implementation of EMP

Implementation of EMP during the construction period will benefit the local community. Support on community facilities such as education, health, drinking water and trekking trails will certainly benefit the local people.

iii. Benefits due to Exposure of local population to new technologies and technology transfer

The project will launch training programs in specialized area such as electro-mechanical works of hydroelectric, house wiring and maintenance, spoil handling etc. First priority will be given to the project affected families (PAFs) and local people to the extent they are interested to get involved in the construction activities.

8.1.2 OPERATION PHASE

i. Benefits to be incurred from addition of 942 kW of power to local people

As the project is aimed for selling the energy to local community, there will be additional availability of power/energy to locals. The locals can use the electricity as per their needs such as cooking, heating, lighting and so on. Tariff for electricity will be made in close coordination with community so that all can use the electricity at affordable cost.

ii. Public Shares

The project will provide 10% of the public shares to the locals in the project area.

iii. Implementation of ESMP

Implementation of ESMP will continue in operation phase also. Support on community facilities such as education, health, drinking water and trekking trails will certainly benefit the local people.

8.1.3 ENVIRONMENTAL MITIGATION MEASURES

8.1.3.1 Mitigation Measures for Impacts on Physical Environment

8.1.3.1.1 Construction Phase

i. Change in land use

- Due consideration will be given to avoid use of good forest, fertile land, settlement areas for the establishment of labour camp, quarry sites, construction material stockpiling area including other permanent project features;
- Appropriate compensation will be provided for families who will lose their land.
- Temporarily acquired land will be leased for construction period and it will be rehabilitated and brought to its original status, after the completion of construction work, to the extent possible.
- Losses of forest area will be compensated as per the prevailing law. As per the Work Procedure Regarding Use of National Forest Area for Projects of National Priority, 2074, the project will develop a plantation site.
- All the muck will be disposed in designated areas only.

ii. Change in topography

Change in topography is very minor in the implementation of the project. All the temporarily used areas such as quarry sites and disposal sites will be rehabilitated. All the areas dug for laying of penstock pipe, transmission and distribution lines will be rehabilitated immediately.

iii. Possible Glacier Lake Outburst Flood (GLOF) and associated impacts

GLOF impacts on the project area will be caused by natural events without relationship to project activities or facilities. But due to the establishment of the project, mitigation measures against natural GLOFs will be introduced and should in principle be classified as enhancement rather than mitigation measures. From an environmental perspective the most important actions are:

- Make aware to workers about GLOF warning system established in Dudh Koshi River and its significance while working at power house and tailrace site.

- Prepare emergency plans in respect of GLOF warnings and establishment of evacuation paths for escape to higher ground (up to 15 m above river level at the intake site) at critical sites.

iv. Landslides and soil erosion

Following mitigation measures for the soil erosion and landslides impacts has been prescribed;

- Land clearance will be minimized as far as possible
- Storage and dumping of excavated spoils in the hill slope will be avoided
- Surface excavations works in headwork, penstock pipe and powerhouse areas will be controlled as to the geotechnical requirements of land stability and erosion
- After excavation works, the excavated slopes in all areas will be stabilized by the application of civil and bioengineering works as required by the local geotechnical conditions.
- The spoil will be deposited to levels and heights taking into consideration of the geotechnical stability of deposited materials and reused for land filling as in case of pan stock laying.
- All excavated materials will be deposited in the safe spoil disposal sites as designated in the proposal
- Disposal of excavated loose materials along the water pathways will be prohibited
- Appropriate protection measures for major landslides shall be constructed

v. Generation of spoils and spoil disposal related issues

Following mitigating measures need to be adopted:

- Top soil (up to 15cm depth from the surface) from the affected area will be scrapped and stored for later reuse in land development at disposal sites and other degraded land in the project area.
- The excavation materials will be used for backfilling purposes wherever required
- All excavated materials will be deposited in the safe spoil disposal sites as provided by the project design.
- Deposition of the spoils on the hill slopes, drainage structures, private agricultural land, natural waterways etc. will be strictly prohibited.
- The excavated areas including the slopes will be revegetated with the local species of grass, herbs, shrubs or trees so that the erosion prone area could be protected.

vi. Impacts due to quarrying activity

- Quarry will be done in specified area
- Construction materials will be kept in designated area with covering
- Haphazard quarry activities will be prohibited
- Spoils will be kept separately and used for land reclamation
- Quarry sites will be reclaimed.

vii. Impact on material quarrying sites

- Materials will be extracted with careful manner so that slope stability will be maintained
- Haphazard materials extraction will be prohibited
- Spoils will not throw/kept haphazardly
- Natural drainage will not be blocked due to stock piling of construction materials and spoils
- The quarry site will be rehabilitated and vegetated.

viii. Water quality management and waste water disposal issues

- The storage areas for the chemicals, oils and other substances will be located far from the water sources to avoid the contamination by spillage.
- Workshop facilities will be located at least 100 m away from the water sources. Spilled oil and grease trapping systems will be built in the workshop to avoid contaminated runoff into the water courses.
- All kinds of waste will be kept away from water sources to avoid contamination through seepage or direct runoff.
- Toilets shall be provided at all construction sites and camp site with appropriate septic system. Toilets will be located away from water courses.
- Open urination and defecation shall be prohibited.
- Camp effluents shall not be discharged directly into the water sources. An adequate size effluent treatment system will be constructed to treat the camp effluent.
- Any discharge in inland surface water will be practiced as per the tolerance limit set by the MoFE.
- Water quality of the sources in and around the construction sites, camp sites and major settlements shall be monitored quarterly (dry season and wet season monitoring). The drinking water used in the camps and housings shall also be monitored.

ix. Clogging of natural drainages

Following are the mitigating measures to reduce the impact:

- During excavation natural drainage channels will be protected as far as possible
- Runoff drainages will be constructed in project construction sites and project facility sites (camps, storage facilities, muck disposal sites etc.) will be facilitated during the construction period and later remodified to suit to the local conditions in the operation period as permanent network. After the completion of the muck disposal, the muck disposal sites will be facilitated by permanent drainage networks to collect and discharge the runoff water safely to the water bodies
- In the agricultural fields, provisions will be made to drain the slope water to the down slope agricultural land.

x. Noise and vibration related impacts

- Installing noise reducing equipment in the ventilators, compressors and diesel generator set
- The noise generating machineries and equipment such as generators, crushers etc. will be placed far from the residential areas
- Noise intensity level will be monitored regularly in the major construction sites such as headworks, powerhouse, settlements etc.
- No construction works will be done during night time.

xi. Issues relating haphazard stockpiling of construction material

The impacts will be mitigated by the following mitigation measures:

- Proper disposal mechanisms will be established for the management of remaining of construction materials;
- Stockpiling and storage of the construction materials in designated sites only.
- The construction materials such as sand and gravel will be methodically stored at proper locations separately; and

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- The residual of construction materials will be re-utilized for other construction purposes like construction of resting places wherever possible.

xii. Issues relating to generation of solid waste and their management

- Dumping facilities will be provided at each construction site to avoid proliferation of the litters and construction trash materials.
- The construction wastes will be managed within the work areas. Tins and other metals are kept in a closed scrap yard within the construction premise.
- Solid waste from the camp and work areas will be collected regularly.
- Separate waste collection bins will be provided in the camps to segregate wastes of different nature.

xiii. Air pollution related issues

Excavation will be minimized as far as possible.

- The aggregate crushing plants will be located far from the settlements and camp areas.
- The spoils disposed in the spoil tip areas will be compacted in order to stabilize them and avoid dust blowing by the wind; after the completion of the construction plantation will be carried out in the spoil tip areas.
- Excavated areas will be revegetated to minimize the bare surface.
- The air quality monitoring will be done in major construction sites such as headworks. powerhouse, and settlements. Compliance with National Ambient Air Quality Standard of GoN will be checked.

xiv. Impact on river morphology

The extraction of river bed materials will be planned properly in such a way that river morphology does not change after the removal of the materials. Further, during the extraction of materials, due consideration will be given to minimize bank erosion. Similarly, the construction of the weir will be planned in a way so that concentrated flow or the diverted flow does not make bank erosion as such. As the mitigation measure is related to planning, no budget will be required for mitigating this impact.

xv. Loss of fertile top soil

While preparing the site for construction for laying of penstock pipe, powerhouse and headworks, the top soil will be managed separately and saved in a separate area for later rehabilitation works. The top soil (0-15 cm) from the productive land (penstock pipe and powerhouse) shall be preserved and reused for plantation and restoration purposes. A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).

8.1.3.1.2 Operation Phase

i. GLOF and associated impacts

Following are the mitigating measures to reduce the impact:

- Educate the local residents about the early warning system and characteristics of lake outbursts as there is already early warning system in Dudh Koshi River.

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ii. Impacts on river flow regime downstream of diversion weir (dewatered stretch of Monjo Khola) and possible microclimatic changes

Changes in microclimate will be expected during dry season in the downstream area. As a mitigation measure, the project will maintain a minimum flow of 10% of the mean monthly flow. The extraction of river bed materials will be planned properly in such a way that river morphology does not change after the removal of the materials. Further, during the extraction of materials, due consideration will be given to minimize bank erosion.

iii. Land submergence created by 2.75 m high diversion weir and associated impacts

The river bank erosion due to bed level rise will be minimized by the river bank protection measures in the critical areas.

iv. Management/final disposal of solid waste and wastewater (both black water and grey water)

Following are the mitigating measures to reduce the impact

- Solid waste and wastewater from project permanent camp and project office will be managed properly.
- Haphazard disposal of wastes will be strictly prohibited.

v. Noise and vibration

Since, the operation phase impacts on air quality, water quality, noise pollution and solid waste generation is too minimal, the mitigation actions required are also few. The powerhouse workers will be provided with the ear muffs to reduce the exposure to continuous noise of turbine operation.

vi. Air Quality

Since, the operation phase impacts on air quality is too minimal, there is no need of mitigation measure.

vii. Water Quality

- The effluent discharges from project office and project camp to nearby water sources will be prohibited.
- The spillage of chemicals such as oils and paints which can occur during repairing and maintenance of powerhouse equipment and machines will be controlled.
- Haphazard disposal of spent oils and lubricants from the powerhouse and the switchyard will be prohibited. All the spent oils, lubricants, from the powerhouse and switch yards and transformers will be collected and kept in a separate designated area.
- Drinking water quality of the camp and water quality of the water sources around powerhouse will be monitored periodically.

8.1.3.2 Mitigation measures for impacts on Biological Environment

8.1.3.2.1 Construction Phase

i. Impacts on forest area and forest vegetation and overall forest biodiversity

Following are the mitigating measures to reduce the impact

- Forest and vegetation will be cleared only to the required by pegging the area and numbering the trees;
- Compensatory afforestation for the felled local tree species as per department of Forest guideline will be carried out in consultation with the Sagarmatha National Park and

Buffer Zone Community Forest. The plantation will be carried out with the species those are required to cut down for the project construction in order to compensate for the lost species. Moreover, emphasis will be given to the species with high value for timber and fuelwood.

- As per rule of 1:25, a total of tree saplings will be planted. The cost of plantation has been estimated to be NRs. 408,852. The total cost including caretakers has been estimated to be NRs. 708,852. The saplings will be planted in 0.64 ha of land at the rate of 1600 plants per ha. The required land will be arranged during implementation phase in consultation with BZCFUG and SNP office. A separate plantation plan will be made before plantation of the saplings.

ii. Possible impacts on protected species of flora and fauna

Following are the mitigating measures to reduce the impact

- As far as possible, the felling of rare, endangered, endemic species will be avoided
- In case the felling is required by the project layout, such species will be planted in afforestation areas as a part of compensatory afforestation as per department of Forest guideline.

iii. Impact on wildlife and avian population

Following are the mitigating measures to reduce the impact

- Forest and vegetation will be felled only to the required by pegging the area and numbering the trees
- The project will organize programs to raise awareness on conservation of wildlife habitats and wildlife species for local people, school children and project workers
- Night time construction activities will be avoided.

iv. Impact on Non-Timber Forest Products/MAPs

Following are the mitigating measures to reduce the impact

- The project will develop programs to support NTFPs/MAPs promotion.
- While carrying out afforestation, the plantation of NTFPs/MAPs species will also be carried out.

v. Possible Risk of forest fire

Following are the mitigating measures to reduce the impact

- The project staff and workforce will be instructed not to visit the forested areas
- Awareness relating to importance of forest and biodiversity and consequences of forest fires will be provided to the local people and the project staffs.

vi. Loss of aquatic habitat and consequent impacts on aquatic lives

Following are the mitigating measures to reduce the impact

- Unless required by the project structural placement, the riverbed will not be disturbed
- Spoil disposal in the river flood plain will be prohibited

vii. Disturbance to Wildlife due to Construction Activities

Following are the mitigating measures to reduce the impact

- No poaching and hunting activities will be allowed.
- Minimum disturbance will be maintained
- Workers will be made aware about wildlife conservation

8.1.3.2.2 Operation Phase

i. Impacts on aquatic fauna and their habitat

Following are the mitigating measures to reduce the impact

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- Residual environmental flow (10% lps) will be released round the year from the weir as per Hydropower Policy to sustain the aquatic life of the dewatered section between weir and tailrace.

ii. Possible disturbance to the wildlife activities

Following are the mitigating measures to reduce the impact

- No poaching and hunting activities will be allowed.
- Minimum disturbance will be maintained
- The project staff and workforce will be instructed not to visit the forested areas
- Awareness relating to importance of forest and biodiversity to the local people and the project staff.

iii. Bird casualties due to electrocution and collision with transmission line

This impact is very low as transmission and distribution lines will be made underground except river crossing areas. In these cases, transmission lines will be covered with insulated materials.

iv. Pressure on forest for fuelwood

- Prohibition on use of fuelwood
- Provision of LPG for cooking to resident workers
- Provision of electricity for heating purposes

8.1.3.3 Socioeconomic and Cultural Environment

8.1.3.3.1 Construction Phase

i. Land acquisition and compensation related issues

Following are the mitigating measures to reduce the impact

- The private lands which is acquired by the project will be compensated in negotiation with land owners. The compensation is fixed based on current market value and in consultation with the project affected families. All the land owners are ready to provide land in negotiation (**Annex XX**).
- The standing crop at the time of acquisition will be allowed to harvest by the respective landowners. If construction works need to be done before the harvesting of standing crop, the standing crop will be compensated as per the production potential at market price.
- Employment priorities will be given to the population in the household whose land and property are lost due to project.
- Public land will be acquired as per GoN's law.

ii. Loss of agricultural land and crop production

The project will provide adequate compensation for the loss of agriculture land and crop production. Trainings on scientific agriculture technologies and an improved seed program will increase the agricultural production in the project area.

iii. Affect on existing social infrastructures

Out of four micro hydro, only MKMH will be affected during the construction. Construction activities will be done in such a way that it will function during construction period. Construction sites will be immediately rehabilitated to check the disruption on electricity production. The same will be applied in trails. The trenches dug for laying of transmission and

distribution lines will be rehabilitated immediately. Precaution will be made while digging trenches to protect water pipes, if there. And if water distribution pipe gets damage, it will be maintained immediately.

iv. Pressure on existing facilities, services and resources of the project area

Following are the mitigating measures to reduce the impact

- The project will support the existing educational institution in the project area
- The project will support existing health institution in the project area to upgrade its capacity
- The project will support to upgrade the existing trekking trails of project affected area

v. Occupational health and safety related issues

Following are the mitigating measures to reduce the impact

- The project will have the facility of first aid for its staff and construction worker. Such service will be provided free of cost service to the local area people.
- A contract will be done with helicopter company for emergency cases of injury and illness.
- Emergency firefighting systems will be provisioned in the camps and the construction areas.
- Personnel protective equipment such as helmets, gloves, boots, mask, ear plugs, safety belts etc. as to the requirement of the construction work nature to each of the construction workers and supervisors will be provided. Workers without required PPEs will not be allowed to enter in to the construction site.
- The project will make the Contractor to organize regular safety instruction prior to, during and after the working hours in a routinely manner.

vi. Issues relating to public health and sanitation and as well as public safety

Following are the mitigating measures to reduce the impact

- Provisions will be made for checking health status of the worker for contagious diseases
- The project will launch community awareness program on health and sanitation. communicable disease and ways to prevent such disease.
- Signboards with signs on different construction related activities will be placed in the construction sites.
- All the construction sites will be fenced and unauthorized persons will not be allowed in the construction sites.
- All visitors in the construction site will be instructed to wear protective gears

vii. Socio cultural issues such as community conflict with the outside work force

Following are the mitigating measures to reduce the impact

- Code of conduct for the project staff will be prepared and implemented and project staff will be provided the orientation on norms and values of project affected communities
- The project will organize regular ethical behavioral programs to outside workers before work session to respect local people, their culture and traditions
- Labour management plan will be prepared and implemented
- Gambling and alcohol drinking will be prohibited within the camp.

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viii. Issues related to stakeholder engagement and information disclosure

All the activities related to project will be made transparent. All the project activities will be made public through notices as well as meetings. Stakeholder engagement plan will be made separately.

ix. Issues of Grievances Management and Gender Based Violence (GBV)

GRC at project level will be established to address the issues related to compensation, labour and SEA/SH etc. Orientation to the project staff& GRC on sexual exploitation and harassment and gender based violence will be provided.

x. Issues related to disturbance to community

Followings are the mitigating measures to reduce the impact

- Separate camps will be made for construction crew.
- Separate toilets and place for breast feeding for women project staff
- Construction crew will be made aware about the social activities, customs, traditional, cultural and religious activities.
- Unnecessary and untimely movement of construction of crew will be checked.

xi. Issues related with COVID-19 Pandemic

Following are the mitigating measures to reduce the impact

- Minimum distance will be maintained.
- Using of PPEs especially mask will be made compulsory
- Sanitizers will be provided at work place and camp
- Workers will not be allowed to visit community
- Isolation wards will be made at camp
- Suspicious workers are immediately kept in isolation and provision will be made to check COVID-19

xii. Issues of Child Labour

- Uses of child labour will be completely prohibited
- Records of all the workers will be kept along with their identity showing age.

8.1.3.3.2 Operation Phase

i. Occupational health and safety related issues of the power station workers

Following are the mitigating measures to reduce the impact

- Occupational health and safety plan (OHSP) specific to operation and maintenance phase of the project will be developed incorporating plans to deal with safety in powerhouse as well as maintenance activities shall be developed and implemented. Compliance of the implementation of the measures recommended in the plan will be monitored periodically.
- Safety signs, warning symbol boards will be placed in powerhouse.
- Powerhouse workers will be equipped with all necessary safety equipment.
- Emergency firefighting system will be provisioned in the camps and the powerhouse
- Powerhouse workers will be made aware of the safety issues inside the powerhouse.

ii. Public Safety Related Issues/Movement of people in dangerous places

Following are the mitigating measures to reduce the impact

- All dangerous sites such as switch yard will be fenced as a precautionary measure to restrict people's movement in the area;
- Safety signs and posts will be erected at critical areas; and
- Local people will be made aware of dangerous project areas.

iii. Issues relating to sudden release of water to downstream

During the operation phase, the sudden release of water downstream of the headworks may cause accidents. Thus, as a mitigation measure, a siren system will be established to make the downstream people aware about the timings of the release of water. Similarly, local people will be made aware about the siren system.

iv. Issues of Withdrawal of economic opportunity

Upon the completion of the project, most of the labour will lose jobs. They will not be able to utilize their skills locally. Therefore, they have to either leave the area and go elsewhere in search of jobs that match their skills or remain in the local area and find jobs which are locally available. To overcome from this issue, following works will be done:

- The project will try to appoint maximum number of local people as far as possible during the operation period;
- Training sessions will be conducted at least 3 months prior to the project completion, so that the labour force will be able to start their own businesses immediately upon the termination of their jobs in the project;
- Training programs will be organized particularly targeting the skilled labour force willing to establish their own entrepreneurship, where they can utilize their skills and make a living.

v. Issues of water right at down stream

Monjo Khola Mini Hydro (MKMH) set needs to be shut down as there will not be sufficient water to operate. At present, MKMH at half of their full capacity due to poor maintenance and management. People are not getting enough energy as required. Users are happy if they get enough energy in spite of demolish of old micro hydro. Agreement between MKMH and MKMHSP has been made to demolish the old MKMH. Similarly, separate agreement has been done with other three micro hydro and there is no effect on the operation of them (**Annex XXI**).

vi. Issues related to benefit sharing of project

Locals will be provided at least 10% of the share. Beside the share, locals will be benefited from CSR and implementation of ESMP. Local government get the revenue and can be used for local development activities.

vii. Issues related to tariff of electricity

This issue will be managed in coordination with local people.

viii. Issues related to management of micro hydro project that exist in project affected area

Agreement with four existing micro hydro has been made separately. MKMH is ready to demolish the old structures as its running/operating cost has been more than its income while electricity generated from three others will be purchased at agreed rate (**Annex XXI**). Proponent will manage transmission and distribution system while operation and management of power generation system will be managed by respective micro hydro.

8.1.3.4 Impacts to integrity of protected areas and Outstanding Universal Value

Following are the mitigating measures to reduce the impact

- No poaching and hunting activities will be allowed.
- Restriction on visit in forest area
- Restriction on collection forest produces from forest
- Prohibition of use of fire in forest area
- Biodiversity conservation awareness raising activities to workers as well locals

The mitigation matrix is given in **Table 39**.

Table 39: Proposed Mitigation Matrix

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
A. Physical Environment						
Construction						
1	Change in land use	• Avoid of good forest, fertile land and settlement areas area for labor camp, quarry sites, construction material stock piling	No cost	Proponent/Contractor	Construction Period	
		• Rehabilitation of temporarily acquired land	Included in project cost	Proponent /Contractor	Construction Period	
		• Appropriate compensation to land owner		Proponent /Contractor	Preconstruction Period	
		• Development of Plantation Area/Compensatory Plantation	708,852.00	Proponent	Preconstruction Period	
2	Change in Topography	• Rehabilitation of quarry sites and excavated sites for laying of penstock pipe, transmission and distribution lines	Included in project cost	Proponent /Contractor	Construction Period	
3	Possible Glacier Lake Outburst Flood (GLOF) and associated impacts	• Awareness to workers about early warning system • Preparation of Emergency Plan	100,000.00	Proponent	Preconstruction/Construction Period	
4	Landslide and Erosion	• Minimal land clearance • Avoidance of dumping of excavated spoils in hill slope • Stabilization of excavated slopes with the application of bioengineering • Deposition of spoils in designated area • Reuse of excavated materials • Prohibition of disposal of spoils in waterways	Included in project cost	Proponent /Contractor	Construction Period	
5	Spoil generation and disposal issues	• Top soil will be stored separately and later use in land rehabilitation • Use in back filling • Deposit in specified place	Included in project cost	Proponent /Contractor	Construction Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
		• Revegetated the excavated areas				
6	Impacts due to quarrying activity	• Quarry will be done in specified area • Construction materials will be kept in designated area with covering • Haphazard quarry activities will be prohibited • Spoils will be kept separately and used for land reclamation • Quarry sites will be reclaimed	Included in project cost	Proponent /Contractor	Construction/operation Period	
7	Impacts on material quarrying sites	• Materials will be extracted with careful manner so that slope stability will be maintained • Haphazard materials extraction will be prohibited • Spoils will not throw/kept haphazardly • Natural drainage will not be blocked due to stock piling of construction materials and spoils • The quarry site will be rehabilitated and vegetated.	Included in project cost	Proponent /Contractor	Construction/operation Period	
8	Water quality and waste water disposal issues	• Storage of chemicals away from water sources • Establishment of workshop facilities at least 100 m away from water sources with oil and grease trapping system • Provision of toilets at construction and camp sites with appropriate septic system • Prohibition of open urination and defecation • No direct discharge of camp effluents in water sources.	Included in project cost	Proponent /Contractor	Construction Period	
9	Clogging of natural drainage	• No disturbance to natural drainage	Included in project cost	Proponent /Contractor	Construction Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
		• Construction of runoff drainage in construction sites • Prohibition of disposal of spoils in natural drainage				
10	Noise and vibration related issues	• Installation of noise reducing equipment in ventilators, compressors and diesel generators • Placing of generators and crushers away from settlements	Included in project cost	Proponent /Contractor	Construction Period	
11	Issues of haphazard stockpiling	• Storage at designated sites • Proper disposal of remaining construction materials	Included in project cost	Proponent /Contractor	Construction Period	
12	Solid waste generation	• Provision of dumping facilities in each construction sites • Collection and storage of scraps in scrap yard • Separate collection bins in camps for segregation of waste of different nature	Included in project cost	Proponent /Contractor	Construction Period	
13	Air Pollution	• Establishment of crushing plants away from settlements • Stabilization of spoils at tipping area • Revegetation of bare area	Included in project cost	Proponent /Contractor	Construction Period	
14	Impact on River Morphology	• Extraction of river bed materials without affecting the river morphology	No extra cost	Proponent /Contractor	Construction Period	
15	Loss of fertile top soil	• Preservation of top soil and reuse for plantation and restoration purposes		Proponent /Contractor	Construction Period	
Operation						
1	GLOF and associated impacts	• Installation, Educate locals and workers about early warning system • Preparation of Emergency Preparedness Plan	100,000.00	Proponent	Operation Period	
2	Impacts on flow regime downstream of diversion weir	• Maintain minimum flow of 10% of the mean monthly flow	No extra cost	Proponent	Operation Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
3	Land submergence created by 2.75 m high diversion weir	• Bank protection measures	Included in project cost	Proponent /Contractor	Construction Period	
4	Solid waste and waste water generation	• Solid waste and waste water management at camp • No disposal of waste and waste water haphazardly	50,000.00	Proponent	Operation Period	
5	Noise and Vibration	• Ear muffs will be provided	10,000.00	Proponent	Operation Period	
6	Water contamination	• No discharge of effluent and chemicals in water body • Monitoring of water quality periodically	50,000.00 (water quality test)	Proponent	Operation Period	
B. Biological Environment						
Construction						
1	Impacts on forest area and forest vegetation	• Vegetation will be cleared only to require by pegging and numbering the trees • Compensatory plantation will be done as per GoN and will be cared for next five years	Already included	Proponent /Contractor	Construction Period	
2	Possible impacts on protected flora and fauna	• Felling of rare, endangered and endemic species will be avoided • Priority will be given for protected and endemic plants in compensatory plantation	No extra cost	Proponent /Contractor	Construction Period	
3	Impact on wildlife and birds	• Prohibition on hunting and poaching • Awareness on wildlife and habitat conservation • No work on night time	100,000.00 (Awareness)	Proponent /Contractor	Construction Period	
4	Impacts on NTFPs/MAPs	• Support on NTFPs/MAPs promotion • Priority for NTFPs/MAPs in afforestation	No extra cost	Proponent	Construction/Operation Period	
5	Forest fire	• Restriction of visit on forest area	No extra cost;	Proponent /Contractor	Construction Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
		• Awareness on biodiversity and consequences of forest fires				
6	Loss of aquatic habitat and consequent impacts on aquatic lives	• Unnecessary river bed will not be disturbed • Prohibition of spoil disposal in river flood plain	No extra cost	Proponent /Contractor	Construction Period	
7	Disturbance to wildlife	• No poaching and hunting • Awareness on biodiversity conservation • No work in night	No extra cost; Cost for awareness has already included	Proponent /Contractor	Construction Period	
Operation						
1	Impacts on aquatic fauna and habitat	• Minimum water flow will be maintained	No extra cost	Proponent	Operation Period	
2	Disturbance to wildlife activities	• No visit in forest area • No poaching and hunting • Awareness on biodiversity conservation	100,000.00 (Awareness)	Proponent	Operation Period	
3	Bird Casualties	• Insulation of transmission and distribution lines in open areas (River crossing)	Included in project cost	Proponent	Operation Period	
4	Pressure on forest for fuelwood	• Prohibition on use of fuelwood • Provision of LPG for cooking to resident workers • Provision of electricity for heating purposes	Included in project cost	Proponent	Operation Period	
C. Socioeconomic and Cultural Environment						
Construction Phase						
1	Land acquisition and compensation	• Acquisition and compensation of private land will be done as per negotiation with individual households and public land as per GoN Rule • Compensation of standing crops as per market price • Employment priority for affected households and locals	Cost required for compensation of land will be borne separately by proponent.	Proponent /Contractor	Construction Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
2	Loss of agriculture land and standing crops	• Acquisition and compensation will be done as per negotiation with individual households • Compensation of standing crops as per market price • Trainings on agriculture technology and improved seeds	Cost required for compensation of land will be borne separately by proponent.	Proponent /Contractor	Construction Period	
3	Affect on existing social infrastructures	• Rehabilitation of construction sites especially trenches for laying penstock pipe, transmission and distribution lines	Included in project cost	Proponent /Contractor	Construction Period	
4	Pressure on existing facilities, services and resources of the project area	• Support on educational and health institution • The project will support to upgrade the existing trekking trails of project affected area	500,000.00 (for educational institution); 200,000.00 (Upgrading and maintenance of Trekking Trails if needed, Otherwise, project will rehabilitate trekking)	Proponent /Contractor	Construction Period	
5	Issues of Occupational Health and Safety	• Provision of PPEs and First Aid • Preparation of Emergency Preparedness Plan • Provision of Fire Fighting Systems • Regular instruction on safety to workers • Provision of accidental insurance	100,000.00 (PPEs); 25,000.00 (First Aid); 25,000.00 (Fire Fighting); Cost of Insurance in project cost	Proponent /Contractor	Construction Period	
6	Issues relating to public health and sanitation and as well as public safety	• Regular health checkup of Workers • Awareness program on health and sanitation • Provision of sign boards • Provision of fencing and restriction of unauthorized persons in construction sites	100,000.00 (Health checkup); 25,000.00 (Sign Board); No cost for awareness; Cost for fencing in project cost	Proponent /Contractor	Construction Period	

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
7	Socio-cultural issues	• Awareness program on ethical behavior, local tradition, culture and religious activities • Prohibition on gambling and alcohol drinking in work place and camp premises	No extra cost	Proponent /Contractor	Construction Period	
8	Stakeholder engagement and information disclosure	• Maintenance of transparency of project activities • Meeting with stakeholders • Preparation of Stakeholder Engagement Plan	50,000.00 for meeting; No extra cost for others.	Proponent /Contractor	Pre-construction/ Construction/ Operation Period	
9	Issues of GRM and GBV	• GRC at project level will be established • GBV will be punishable	No extra cost	Proponent /Contractor	Construction Period	
10	Issues related to disturbance to community	• Separate construction camps for man and woman will be made • Make aware about social activities, customs, traditional, cultural and religious activities to construction crew • Checking of unnecessary and untimely movement of construction crew • Code of Conduct (CoC) including SEA/SH for project staff will be prepared and implemented	No extra cost; cost for toilets included in project cost	Proponent /Contractor	Construction Period	
11	Issues related with COVID-19 Pandemic	• Minimum distance will be maintained • Uses of PPEs is compulsory • Isolation wards will be made • Uses of masks and sanitizers will be made compulsory	Already included	Proponent /Contractor	Construction Period	
12	Issues of Child Labour	• Prohibition of child labour in works • Record keeping of labour with identity card showing age	2,000.00 (Record Keeping)	Proponent /Contractor	Construction Period	
Operation Phase						

SN	Environment & Social Impact	Mitigation Measures	Mitigation Cost(NPR)	Responsibility	Timeline	Remarks
1	Occupational health and safety issues	• OHSP will be prepared • Safety signs, warning symbol boards will be placed in powerhouse • All necessary safety equipment will be provided to workers • Emergency firefighting system will be provisioned in the camps and the powerhouse • Powerhouse workers will be made aware of the safety issues inside the powerhouse.	25,000.00 (For safety sign); 25,000.00 (Safety equipment); 25,000.00 (Firefighting system)	Proponent	Operation Period	
2	Public Safety Related Issues/Movement of people in dangerous places	• Restriction people in dangerous area • Safety signs and posts will be erected at critical areas	No extra cost for restriction while cost of safety sign already included	Proponent	Operation Period	
3	Issues relating to sudden release of water	• A siren system will be installed • local people will be made aware about the siren system	25,000.00 (Siren System)	Proponent /Contractor	Operation Period	
4	Issues of Withdrawal of economic opportunity	• Priority for employment during operation will be given to local people	No extra cost	Proponent	Operation Period	
5	Issues of water right at down stream	• Agreement has been for closure of MKMH	No extra cost	Proponent	Operation Period	
6	Issues related to benefit sharing	• Provision of shares • Implementation of ESMP • Local development from generated revenue	No extra cost	Proponent /Local Government	Operation Period	
7	Issues related to tariff of electricity	• Tariff will be fixed in coordination with local people	No extra cost	Proponent	Operation Period	

8.2 ENVIRONMENTAL MANAGEMENT PLAN

Different institutions involved in BES and EMP implementation and roles of these institutions are given in **Table 40.**

Table 40: Institutions and Their Role

SN	*Institutions*	*Roles and Responsibilities*
1	Ministry of Energy, Water Resources and Irrigation	Being line Ministry, has mandates to formulate and environmental policy, plans and programs but no direct responsibility in the project.
2	Project Management Office at AEPC	Overall responsibility from selection to implementation of project.
3	The World Bank	Partner of the Project and has supportive roles to ensure effective implementation of E&S risk management measures for the project, review E&S instruments and provide clearance and support AEPC in E&S capacity enhancement.
4	Sagarmatha National Park	Authorized agency for BZ management activities and can play role in implementation and monitoring of the proposed project.
5	Khumbu Pasang Lhamu Rural Municipality	concerned authority to provide generation license and approval agency for Brief Environmental Study Report as per prevailing law of Nepal with monitoring responsibilities of project.
6	Parner Bank	Has roles in the E&S screening, assessment, and monitoring cycle in order to better understand their risks, and specifically responsible for providing matching loan to proponent as per project policy.
7	Proponent (Monjo Khola Mini Hydro Pvt. Ltd.)	responsible for the preparation of DFS/DED, and BES as required by GoN and WB of the project and its implementation, implementation of project and also preparation of monitoring and progress report and submission to AEPC.
8	GRC	responsible to resolve the grievances at third level came through field level to Project Safeguard Unit, E &S Team of AEPC
9	BZMC	can play an important role in effective implementation and monitoring of proposed project
10	BZUC	an important role in effective implementation and monitoring of proposed project
11	BZUGs	can coordinate for effective implementation and monitoring of proposed project
12	BZCFUGs	coordinate for effective implementation and monitoring of proposed project
13	GRU	the responsibilities to resolve the local grievances and also of workers at field level
14	Construction Contractors	responsible for implementation of mitigation measures specified in the part of contractor and compliance with the tender clauses
15	Construction Management/Supervision Consultant	coordination of the compliance monitoring and mitigation program
16	LCF	a platform for locals to keep their concerns, suggestions and grievances, and coordinates to addresses these issues

8.3 REPORTING AND DOCUMENTATION

The proponent will prepare monthly, Quadrimester and Annual Progress Reports and submits to AEPC.

8.4 IMPLEMENTATION OF MITIGATION MEASURES

The mitigation measures should be integrated into project design and tender documents. Using this approach, the mitigation measures will automatically become part of the project construction and operation phase.

8.5 COSTS FOR EXECUTING THE ENVIRONMENTAL MANAGEMENT PLAN

Most of the mitigation measures suggested will be a part of bridge design and construction without additional cost. The design and cost estimate for most of the suggested mitigation measures such as river training, spoil disposal, supply of face masks, helmets, ear mufflers, accidental insurance, bioengineering measures, plantation, shall be incorporated in the design and cost estimates. All proposed mitigation measures will be integrated in the project design.

The following **Table 41** presents summary cost for environmental management. The cost includes only the added cost not included in the project design.

Table 41: Cost for Mitigation and Augmentation Measures

S. N.	Measures/ Activities	Costs in NPR	Remarks
1	Augmentation cost (As per table 38)	1,885,000.00	
2	Mitigation cost (As per table 39)	2,345,852.00	
	Total	**4,230,852.00**	

CHAPTER 9: ENVIRONMENTAL MONITORING

9.1 ENVIRONMENTAL MONITORING

Monitoring of the implementation of environmental protection measures provided a basis for comparison for the predicted and actual impacts of a proposal. As per the national EIA guidelines (1993) and Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, monitoring plans and indicators, schedules and responsibility has been identified in the BES report. The national EIA Guidelines of proposes three stages for monitoring. They are baseline monitoring, compliance monitoring and impact monitoring.

9.1.1 BASELINE MONITORING

This monitoring sometimes also referred as pre-audit study, is to know the pre-project baseline condition of the environmental parameters. In general, it is done to know if there is a significant time lapse between the preparation of the BES report and the construction stage or the change in environmental quality is noticeable. This project will proceed for construction immediately after the approval of this BES report and hence, baseline monitoring is not required for the proposed project.

9.1.2 COMPLIANCE MONITORING

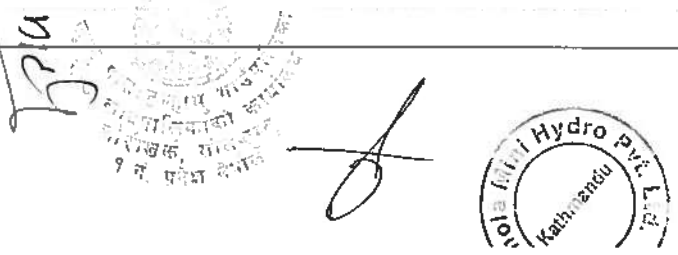
Compliance Monitoring employs a continuous recording of specific environmental quality indicators in order to ensure project compliance with recommended environmental protection standards. The main objective of the compliance monitoring is to ensure that all conditions set forth and commitments made in the approved BES report and other applicable regulatory requirements and standards, the project documents including project contracts and specifications etc. An early compliance assessment is also required to check if the environmental mitigation activities prescribed in the approved BES report are well integrated in subsequent project documents such as detailed engineering design and tender documents. **Table 41** gives the compliance monitoring plan, which includes compliance parameters, indicators for measuring compliance, methods to be followed and guiding document to be referred, responsible parties for compliance monitoring and the schedule for compliance check.

9.1.3 IMPACT MONITORING

Impact Monitoring measures the physical, Chemical, biological, socio-economic and cultural parameters within the project area during the construction and operation phases in order to dètect environmental changes that occur as a result of project implementation. It involves actual measurement of the impacts of construction activities on the environment, such as water quality samples being taken at regular intervals to assess pollution concentrations in the river from construction work camps, after mitigation steps are taken. The impact monitoring has been given in **Table 43.**

Table 42: Proposed Compliance Monitoring Plan Matrix

S.N.	Parameter	Indicators	Method/ Guiding Document	Location	Time	Cost (NPR)	Responsibility
1	BES mitigations	Incorporation of BES mitigation measures recommendations into contractual documents	Review of detailed design, project specification and tender documents/ Approved BES	Office	Following completion of tender documents	150,000.00	Consulting engineers/ Proponent /AEPC
2	Environmental Considerations	The presence of each of the environmental considerations from the tender documents in the work plan	Review of proposed work plans/ Approved BES	Office/Project Area	During contract negotiations		Consulting engineers/ Proponent /AEPC
3	Contractor's compliance in carrying out environmental mitigation activities prescribed in BES, project contract documents and project specification documents	Forest clearance, Excavation of lands for project construction, spoils management, work area, application of slope stability measures, air quality protection, water quality protection, noise minimization, solid waste management, over extraction of aggregates, felling of trees, intrusion in the surrounding forest, pre-employment screening of project workers, safety equipment for workers and safety assurance practices in area, public safety assurance practices, project camp management (drinking water, toilets, cooking fuel), control of social disorder (alcoholism, gambling, prostitution)	Site observation and discussion with project management, project staffs and local people using a checklist/ Approved BES, Project Contract and Specification document, Regulatory documents of GON	Project Area	Continuous during the construction period	150,000.00	Consulting engineers/ Proponent /AEPC/RM
4	Contractor's compliance to GON's and	Water quality, air quality, noise, forest clearance, employment, occupational health and safety	Review of the regulatory documents, enlisting of the relevant clauses, site	Project Area	Continuous during the		Consulting engineers/



S.N.	Parameter	Indicators	Method/ Guiding Document	Location	Time	Cost (NPR)	Responsibility
	WB's regulatory requirements (Acts, Regulations, Guidelines, Standards)		inspection and observation/All the documents mentioned in Chapter 3.		construction period		Proponent /AEPC/RM
5	Project Proponent's compliance in carrying out activities prescribed in environmental mitigation and environmental enhancement activities	Compensation, soil erosion and landslide control, compensatory plantation, staff employment, implementation of trainings, income generating programmes, awareness programs, support to social institutions and all others mentioned in Chapter 6 of this BES report	Review of project correspondence letters, evidence documents, observations, interviews with the concerned project authority, interviews with the project affected households/ Approved BES	Project Area	Continuous during the construction period	150,000.00	AEPC/RM
6	Project Proponent's compliance GON's regulatory requirements	Land acquisition and compensation, project staff employment, environmental protection	Review of the regulatory documents, enlisting of the relevant clauses, site inspection and observation/ All the regulatory documents mentioned in point 4 above (of this table) including Land Acquisition Act (1977)		Continuous during the construction period		AEPC/RM

Table 43: Proposed Impact Monitoring Plan Matrix

S. N.	Parameter	Indicators	Methods	Location	Schedule (Time)
A. Physical/Chemical Environment					
1	Land use	Change in area under different land use	Observation, GIS Mapping	Project Area	One time after completion of project construction
2	Soil Erosion and land stability	Development of rill and gullies, occurrence of landslides, drainage failures, river bank cutting	Observation	Construction area, spoil disposal areas, River bank	Continuous throughout project construction
3	Water Quality	Temperature, pH, Turbidity, TDS, TSS, Conductivity, alkalinity, hardness, iron, BOD, COD, SO_4, DO, Total Coliform	Water sampling and laboratory test	Monjo Khola downstream of weir and drinking water of project camp	Twice a year during construction phase in dry and wet season; two-time monitoring of project permanent camp drinking water and Headwork area
4	Noise	Noise intensity level	Measurement of noise using dB meter	Major construction areas, settlements	During peak construction period
5	Solid waste	Proliferation of waste	Observation	Project area	Continuous throughout project construction and one year of project operation
B. Biological Environment					
6	Forest	Change in forest area (area)	Observation, GIS mapping	Headworks, Penstock Pipe alignment, forests in the project area	One time monitoring after completion of project construction
7	Vegetation	No.of trees cleared	Records of clearance of species	Headworks, Penstock Pipe alignment	During clearance in each area
8	Protected species	No of protected species cleared	Records of clearance of species	Headworks, Penstock Pipe alignment	During clearance in each area
9	Compensatory Plantation	Status of plantation and survival rate	Records of plantation and counting of survived saplings	Plantation area	Every three months after plantation
10	Wildlife	Poaching events, crop depredation frequency	Interviews with local people	Project area	Continuous throughout project construction
C. Socioeconomic and Cultural Environment					

S. N.	Parameter	Indicators	Methods	Location	Schedule (Time)
11	Affected households	Livelihood conditions of the affected households by land and property acquisition	Household survey using structured questionnaires	Affected households	End of every year during construction period; at the end of the first year of operation
12	Affected community	Quality of community life in project area	Observation, Interviews, FGD	Affected Rural Municipality	End of every year during construction period; at the end of the first year of operation
13	Employment	No of local as well as migrant employees working for the Contractor and the Proponent	Records of employees	Project Work	Every month during construction phase; one time monitoring in the beginning of operation
14	Community services	Pressures in existing service institutions and facilities such as schools, health posts, drinking water etc.	Records of particular service institution such as health posts and school, interviews with schools, teachers, health personnel, water user groups	Service institutions in the project area	Every four months during construction, one-time monitoring at the end of first year of operation
15	Community health and safety	Incidence of communicable diseases, STDs, accidents	Interviews, structured questionnaire surveys, reports from health institutions	Project area	Every three months during construction, one time monitoring at the end of first year of operation
16	Occupational health and safety	Injuries, deaths, accidents of construction workforce	Project reports, interviews with construction workers	Construction areas	Every month during construction, one time monitoring at the end of first year of operation
17	Conflicts	Conflicts between locals and outside workforce	Interviews, record keeping	Project area	Every months during construction
18	Law and order	Events of burglary, fights	Interviews, record keeping	Project area	Every month during construction
19	Environmental Enhancement Programs	People perception of environmental enhancement programs	Discussions with the beneficiary of enhancement programs	Project area	Every six-month during project construction, one time at the end of first year of operation

9.2 COSTS FOR EXECUTING THE ENVIRONMENTAL MONITORING

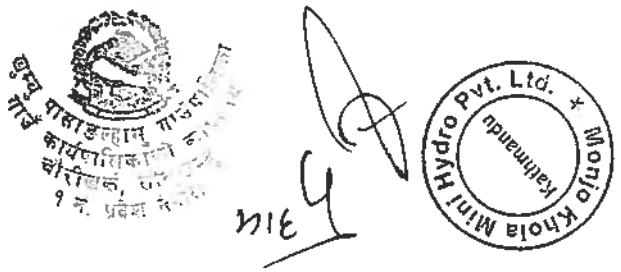
Rural Municipality will be supported by AEPC for environmental monitoring. According to Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, The Rural Municipality is responsible for monitoring and evaluation of the impact of the implementation of the project.

The RM with support from AEPC will make arrangements for project level monitoring. Thus, it is recommended that an external team hired by AEPC take responsibility for monitoring of the environmental performance, in addition to the regular supervision and guidance provided by the RM at the site. At least one monitoring in monthly basis is necessary.

The project level monitoring team will submit its report to RM/AEPC. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation) is estimated NRs. 750,000.00 as given in **Table 44.**

Table 44: Environmental Monitoring Cost

Description	Duration	Rate (NRs)	Amount (NRs)	Remarks
Regular Monitoring as per need		LS	300,000.00	(only for water/air/noise quality test)
Central level monitoring (AEPC)	3 times	LS	450,000.00	
Total			**750,000.00**	



CHAPTER 10: CONCLUSION AND RECOMMENDATION

The proposed MKMHP will generate 7,243,292.16 kWh of annual average energy. Apart from the generation of the hydroelectric power, the project will provide a number of benefits both during the construction and the operational stages. During the construction stage, some of the beneficial impacts include the employment generation, increase in local economy and enhancement of technical skills and know-how. It will have long-term impact for conservation of the local environment replacing biomass based energy with clean energy.

The project will also result in some adverse impacts of different magnitudes, in different locations and even for the long-term duration. The major adverse impacts include land acquisition. The project intends to acquire about 0.1686 ha of private land and about 5.48 ha of the government land. This project will also require 0.674 ha forest land. During the operation phase, water diversion will have impact on the river stretch (from headworks to confluence between Monjo Khola and Dudh Koshi River) due to reduced flow for an extended length about 1.3km. This BES report includes mitigation measures for each of the significant adverse impacts. The proposed project could be implemented by ensuring the implementation of the proposed Environmental Management Plan. The project will also commit to compensate/mitigate any other impact encountered during the construction and operation of the project. No further environmental study will be required for project clearance as the proposed proposal does not exceed any of the prescribed thresholds by Working Procedure for Brief Environmental Study and Initial Environmental Examination, Khumbu Pasang Lhamu Rural Municipality 2078, Province no. 1 EPA, 2020 and EPR, 2020, and EPR 2020 (GoN). Thus, an IEE or EIA study is not required for this proposed project, and BES is sufficient for the proposed proposal.

CHAPTER 11: REFERENCES

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Annexes

Annex I: Declaration

Declaration from Proponent

Name of Report: Brief Environmental Study of Monjo Khola Mini Hyro Project
Name and Address of Proponent:
Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga,
Bagmati Province, Nepal
Telephone No: 01-4464222, 01-4464333
Email: monjokholaminihydro@gmail.com

I declare the following:

- I have provided accurate and relevant information to the study team;
- I have allowed the study team to study professionally and independently;
- I have read and understood the contents of the report;
- I agree to implement all the impact mitigation and enhancement measures proposed in this report; and
- I understand that additional impact mitigation and augmentation measures can also be implemented by the Ministry of Road Infrastructure and Urban Development. If the impact mitigation and augmentation measures proposed in this report are not sufficient, I will be fully responsible for the implementation of those measures or any impact during the project implementation at my own expense.

Signature: Office Stamp: Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

Name: Samrat Raj Satyal (June-16-2022)
(Chief of the Office or Authorized Representative)
Date:

Self-Declaration from the Coordinator of the Study Team

Name of Report: Brief Environmental Study of Monjo Khola Mini Hyro Project
Name and Address of Proponent:
Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga,
Bagmati Province, Nepal
Telephone No: 01-4464222, 01-4464333
Email: monjokholaminihydro@gmail.com

I declare the following:

- I have read and examined the contents of this report;
- My study team members have conducted professional studies using acceptable methods;
- The findings of the study are correct to the best of my knowledge; and have not changed in any way;
- The proposed mitigation measures are sufficient to comply with my best knowledge, reliable, practical and relevant legal requirements; and
- I myself and my team will be responsible for any misleading information in any part of this report.

Signature:

Mini Hydro Pvt. Ltd. Monjo Khola Kathmandu

Name: Dhan B. Shrestha
Minimum Qualification: MSc, Environmental Science
Role in the competency / study team: Environment/ Team Leader
Date: June-15-2022

Mini Hydro Pvt. Ltd. Monjo Khola Kathmandu

Self-Declaration of Study Team Members

Name of Report: Brief Environmental Study of Monjo Khola Mini Hyro Project
Name and Address of Proponent:
Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu-8, Tilganga,
Bagmati Province, Nepal
Telephone No: 01-4464222, 01-4464333
Email: monjokholaminihydro@gmail.com

We declare the following:

- I have studied professionally using acceptable and universal methods;
- The findings of the study are true to the best of my knowledge and have not changed in any way;
- The proposed impact mitigation and enhancement measures, to the best of my knowledge, are sufficient to comply with reliable, practical and relevant legal requirements; and
- I will be responsible for any misleading information contained in this part of the report relating to my field of study.

Signature:  **Name**: Toya Nath Ghimire **Minimum Qualification**: MSc, Geology **Role in the competency / study team**: Geologist **Date**:	**Signature:**  **Name**: Lokesh Sapkota **Minimum Qualification**: ME, Environmental Engineering **Role in the competency / study team**: Physical Environment Expert **Date**:
Signature:  **Name**: Heramba Adhikari **Minimum Qualification**: MA, Economics/RD **Role in the competency / study team**: Expert, Socio-economic and Cultural **Date**:	**Signature:**  **Name**: Ramji Bogati **Minimum Qualification**: MSc Zoology **Role in the competency / study team**: Biologist **Date**:

Annex II: ToR of BES of Monjo Khola Mini Hydro Project

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
गाउँ कार्यपालिकाको कार्यालय, चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Churikharka, Solukhumbu, 1 No. Province, Nepal

प.सं. ०७८/७९
च.नं.२८१

मिति:- २०७८/०७/११

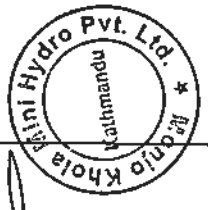
विषय: TOR स्वीकृत गरिएको सम्बन्धमा ।

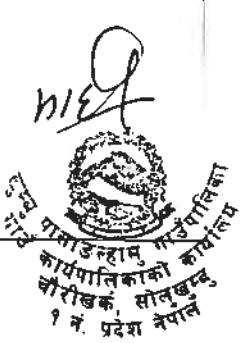
श्री मोञ्जोखोला मिनि हाईड्रो प्रा. लि.,

खुम्बु पासाङल्हामू गाउँपालिका वडा नं. ३, सोलुखुम्बु ।

त्यस मिनि हाईड्रो प्रा. लि. ले खुम्बु पासाङल्हामू गाउँपालिका वडा नं. ३ मा अवस्थित मोञ्जोखोलामा १ मे.वा. भन्दा कम क्षमताको मोञ्जोखोला मिनि जल विद्युत आयोजना प्रवर्द्धनका लागि संक्षिप्त वातावरणीय अध्ययनका लागि पेश भएको ToR मिति २०७८।०७।०८ को गाउँ कार्यापालिकाको निर्णयानुसार स्वीकृत भएको व्यहोरा अनुरोध छ ।

(सविन सिंह चौधरी)
प्रमुख प्रशासकीय अधिकृत





Annex III: Company Registration Certificates

नेपाल सरकार

उद्योग, वाणिज्य तथा आपुर्ति मन्त्रालय

कम्पनी रजिष्ट्रारको कार्यालय

कम्पनी दर्ताको प्रमाण-पत्र

दर्ता नं: २१४५७७/७५/०७६

श्री मोन्जो खोला मिनि हाईड्रो

नामको प्राइभेट लिमिटेड कम्पनी संम्वत् २०७६ साल बैशाख महिना २४ गते रोज ३ मा दर्ता भएको हुनाले कम्पनी ऐन, २०६३ को दफा ५ को उपदफा (१) बमोजिम यो प्रमाण-पत्र दिइएको छ ।

स. रजिष्ट्रार

मिति: २०७६-०१-२५

Government of Nepal

Ministry of Industry, Commerce & Supplies

सहायक रजिष्ट्रार

Office of the Company Registrar

Registration No: 214577/75/076

CERTIFICATE OF INCORPORATION OF COMPANY

This Certificate of Incorporation has been issued to M/s Monjo Khola Mini Hydro Private Limited having incorporated it on the 7 day of May, 2019 pursuant to sub-section (1) of section 5 of the Companies Act, 2006.

Asst. Registrar

Date: 2019-05-08

शर्त कम्पनी संस्थापनलाई मात्र कम्पनीको उद्देश्य कार्यान्वय गर्न इजाजत प्रदान गरिएको नमानिने हुनाले कानून अनुसार तिनुपर्ने अनुमति सम्बन्धित निकायबाट लिएर मात्र कम्पनीको उद्देश्य अनुसार कारोबार गर्नु पर्नेछ ।

Hiiri Hydro Pvt. Ltd. Kathmandu

नेपाल सरकार
अर्थ मन्त्रालय
आन्तरिक राजस्व विभाग

स्थायी लेखा नम्बर (PAN) दर्ता प्रमाण पत्र

स्थायी लेखा नम्बर	:	[illegible]
आन्तरिक राजस्व कार्यालय	:	[illegible]

दर्ता मिति: [illegible] (दिन / महिना / साल)

[illegible]	:	मोन्जो खोला मिनि हाईड्रो प्रा.लि.
[illegible]	:	प्राइभेट लिमिटेड
ठेगाना	:	वडा नं. ८, [illegible] महानगरपालिका काठमाडौं, काठमाडौं
[illegible]	:	विद्युत उत्पादन तथा वितरण.

करदाताको दस्तखत

कर अधिकृत

कर अधिकृत

[illegible]

Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu

Annex IV: Technical Clearance Certificate From DoED

नेपाल सरकार
ऊर्जा, जलस्रोत तथा सिंचाइ मन्त्रालय

विद्युत विकास विभाग

(..................अनुमतिपत्र महाशाखा.........)

फोन नं. ४८८०७२४, ४४७९९३७, ४८८७०६८, ४४७९५०१, ४८८६९७८, ४४७३७९८, ४४३९३६२
फ्याक्स ४४८३९०३
पोष्ट बक्स नं. २५०७
सानोगौचरण
काठमाडौं, नेपाल

पत्र संख्या :- २०७६/०७७
चलानी : ११६०

मिति: २०७६/११/१८.........

विषय:- Technical Clearance उपलब्ध गराइएको सम्बन्धमा ।

श्री खुम्बु पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय,
चौरिखर्क, सोलुखुम्बु ।

प्रस्तुत विषयमा तहाँको पत्र संख्या २०७६/०७७ , च.नं.३०७ को Technical Clearance (प्राविधिक सफाई/परामर्श) सम्बन्धी पत्र प्राप्त भई व्यहोरा अवगत भयो ।
प्रस्तावित मोन्जो खोला मिनी जलविद्युत आयोजना(off-grid) को लागि तहाँबाट माग भएको Technical Clearance सम्बन्धमा कारवाही हुँदा सो आयोजनाको क्षमता प्रोब्याबिलिटी अफ एक्सीडेन्स Q40 मा १(एक)मे.वा. भन्दा कम देखिएकोले क्षेत्र दोहोरो पर्ने दुधकोशी-२० जलविद्युत आयोजनालाई कुनै पनि प्रतिकूल असर नपार्ने शर्तसहित तपसिल बमोजिमको सर्वेक्षण क्षेत्रमा Technical Clearance उपलब्ध गराइएको व्यहोरा विभागको मिति २०७६/११/१२को निर्णयानुसार जानकारी गराइन्छ । साथै उक्त आयोजना विकास सम्बन्धी तहाँ बाट भए गरेका निर्णय कार्यान्वयनको जानकारी यस विभागलाई उपलब्ध गराइदिनु हुन अनुरोध छ ।

तपसिल:
अक्षांश: २७° ४६' ००" देखि २७° ४६' ३०" सम्म
देशान्तर: ८६° ४३' २०" देखि ८६° ४४' ३०" सम्म

(प्रदिप कुमार [illegible])
इन्जिनियर

बोधार्थ:
१.श्रीमान महानिर्देशकज्यू,विद्युत विकास विभाग
२.श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि., [illegible] ,काठमाडौं,९८०१०६५०७८

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

...ल्हामु गाउँपालिका, गाउँ कार्यपालिकाको कार्यालय, ...खर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल

Annex V: Generation License

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
गाउँ कार्यपालिकाको कार्यालय चौंरीखर्क सोलुखुम्बु १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Chunkharka, Solukhumbu, 1 No. Province, Nepal

च.नं. ६४८

मिति- २०७६/१२/०३

विषय :- एक मेगावाट मन्दा कम क्षमताको मिनी हाइड्रो पावरको इजाजत पत्र दिइएको सम्बन्धमा ।

श्री मोन्जोखोला मिनी हाइड्रो प्रा.लि.,
निनसंग, काठमाण्डौं ।

वैकल्पिक उर्जा प्रवर्द्धन केन्द्रको अनुदान सहयोगमा अक्षांश २७° ४६' ००" देखि २७° ४६' ३०" सम्म तथा देशान्तर ८६° ४३' २०" देखि ८६° ४४' ३० " अवस्थितमा रहेको श्री मोन्जोखोला मिनि हाइड्रोको विद्युत विकास विभाग काठमाण्डौंबाट Technical Clearance समेत प्राप्त भई इजाजत प्राप्तिका लागि यस कार्यालयमा पेश भएको हुँदा यस कार्यालयको मिति २०७६।१२।०३ को निर्णयानुसार प्रोब्याबिलिटी अफ एक्सीडेन्स Q80 मा १ मेगावाट मन्दा कम क्षमताको मिनी हाइड्रो सञ्चालन गर्न यो इजाजत पत्र प्रदान गरिएको व्यहोरा अनुरोध छ ।

(विनोद भट्टराई)
प्रमुख प्रशासकीय अधिकृत

बोधार्थ
श्री वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र,
खुमलटार, ललितपुर ।
श्री विद्युत विकास विभाग,
काठमाण्डौं ।

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

...ल्हामु गाउँपालिका
...पालिकाको कार्यालय
...खर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

Annex VI: Consent Letter from DNPWC

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग
व्यवस्थापन
.... शाखा।

पत्र संख्या :- व्यवस्थापन २०७८/०७९-३४
चलानी नं ९८६

पो.ब.नं. - ८६०
बबरमहल, काठमाडौं
Email info@dnpwc.gov.np
http:// www.dnpwc.gov.np
मिति २०७८/५/२

<u>विषय</u> :- संक्षिप्त वातावरणीय अध्ययन सहमति सम्बन्धमा।

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.,
पो.ब.नं. २००११, तिलगंगा, काठमाण्डौ।

प्रस्तुत विषयमा सगरमाथा राष्ट्रिय निकुञ्जको मध्यवर्ती क्षेत्रमा प्रस्तावित मोन्जो खोला साना जलविद्युत आयोजना (९४२ कि.वा.) को प्रारम्भिक वातावरणीय परीक्षण अध्ययन (IEE) सहमतिको लागि सही प्रा.लि.को पत्र संख्या/च.नं. MKMH ०७८०४/१८, मिति २०७८/४/१७ पत्रबाट विद्युत विकास विभाग, अनुमति-पत्र शाखाको च.नं. ११६०, मिति २०७६/११/१८ को Technical Clearance उपलब्ध गराइएको पत्र र खुम्बु पासाङल्हामु गाउँपालिका, गाउँ कार्यपालिकाको कार्यालयको च.नं. ६४८, मिति २०७८/४/३२ को इजाजत-पत्र सहित निवेदन प्राप्त हुन आएको।

सो उपर कारवाही हुँदा सगरमाथा राष्ट्रिय निकुञ्जको मध्यवर्ती क्षेत्र अन्तर्गत खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ३ मा प्रस्तावित मोन्जो खोला साना जलविद्युत आयोजनाको संक्षिप्त वातावरणीय अध्ययन सहमति सन्दर्भमा राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण ऐन २०२९, मध्यवर्ती क्षेत्र व्यवस्थापन नियमावली २०५२, वातावरण संरक्षण ऐन, २०७६ तथा नियमावली, २०७७ र संरक्षित क्षेत्रभित्र भौतिक पूर्वाधारहरु निर्माण तथा संचालन सम्बन्धी कार्यनीति २०६५ तथा तपसिलका शर्तहरुको पूर्ण पालना गर्नेगरी मोन्जो खोला साना जलविद्युत आयोजना (९४२ कि.वा.) को संक्षिप्त वातावरणीय अध्ययन सहमति प्रदान गरिएको व्यहोरा मिति २०७८/४/३२ को विभागीय निर्णयानुसार अनुरोध छ।

<u>तपसिल</u>

क. वातावरणीय अध्ययनको क्रममा सगरमाथा राष्ट्रिय निकुञ्ज कार्यालयका अधिकृतस्तरका प्राविधिक कर्मचारीलाई अनिवार्य संलग्न गराउने र कार्यालयसंग आयोजना सम्बन्धमा नियमित तवरमा राय परामर्श लिने तथा कार्यालयबाट प्राप्त हुने राय/सुझाव अन्तिम प्रतिवेदनको अङ्ग हुनेगरी समावेश गर्ने व्यवस्था मिलाउने,

ख. वातावरणीय अध्ययन गर्दाको सबै चरणहरुमा सगरमाथा राष्ट्रिय निकुञ्ज र मध्यवर्ती क्षेत्र व्यवस्थापन समितिको सहभागिता सुनिश्चित गर्ने,

ग. प्रस्तावित आयोजना निर्माण र सञ्चालन गर्दा त्यस क्षेत्रका रैथाने तथा बसाईसरी आउने दुर्लभ र लोपोन्मुख वन्यजन्तु तथा त्यस क्षेत्रका वन, वनस्पती, जैविक विविधता र पारिस्थितिकिय प्रणाली तथा Ecological hotspot कस्तो असर पर्ने हो?असर तथा त्यसको प्रभाव यकिन गरी विकल्पका उपायहरुको अध्ययन गर्नुपर्ने,

घ. वातावरणीय अध्ययन गर्दा विभिन्न विकल्पहरु अध्ययन गरी सो विकल्पहरुमध्ये तथ्य र तथ्यांकको आधारमा जैविक विविधता र समग्र वातावरणमा न्यून नकारात्मक प्रभाव पुर्‍याउने विकल्पको छनौट गरी प्रतिवेदन तयार गर्नुपर्ने,

ङ. आयोजना निर्माण स्थलमा अन्य कुनै जलविद्युत आयोजना निर्माणाधीन वा प्रस्तावित भए सोको विवरण उल्लेख गर्नुपर्ने,

च. उत्पादन भएको विद्युत Evacuate तथा वितरण गर्ने कार्य गर्दा त्यस क्षेत्रको जैविक विविधतामा पर्न सक्ने नकारात्मक असर न्यूनिकरणका योजना तयार गरी प्रतिवेदनमा समावेश गरिनुपर्ने,

छ. अध्ययन टोलीमा वन्यजन्तु र जैविक विविधता विज्ञ अनिवार्यरुपमा सहभागी गराउने र प्राप्त राय सुझावहरु अध्ययन प्रतिवेदनमा अनिवार्य समावेश गर्ने,

ज. अध्ययन क्षेत्रमा रहेका माछाको हाडफोहरुको तथ्य र तथ्याङ्कको आधारमा विद्यमान अवस्थाको विश्लेषण गरी सोको विवरण प्रतिवेदनमा समावेश गर्नुपर्ने,

झ. प्रस्तावित आयोजनाको लागि आवश्यक पर्ने वन क्षेत्रको यथार्थ विवरण अध्ययन प्रतिवेदनमा उल्लेख भएको हुनुपर्ने,

पाना १/२

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग
(.................व्यवस्थापन.................. शाखा)

फोन नं. : ४२२०८५०, ४२२०९१२, ४२२७९२६
फ्याक्स नं. ४२२७६७५

पो. ब. नं. - ८६०
बबरमहल, काठमाडौं
Email: info@dnpwc.gov.np
http//:www.dnpwc.gov.np

पत्र संख्या :- व्यवस्थापन २०७८/०७९-३४
चलानी नं :-

ञ. निर्माण गर्न प्रस्ताव गरिएका संरचनाहरुको GPS कोअर्डिनेट सहित निकुञ्जको सिमाना देखिने GIS प्रविधि समेत प्रयोग गरी तयार गरिएको टोपोनक्सा प्रतिवेदनमा संलग्न गराउने,

ट. अध्ययनको क्रममा स्थानीय जनता र सरोकारवाला निकायहरुबाट उठान भएका आर्थिक, सामाजिक, जैविक प्रभाव सम्बन्धी सवालहरु सम्बोधन गर्ने सम्बन्धमा अवलम्बन गर्नुपर्ने न्यूनीकरणका उपायहरु प्रतिवेदनको अभिन्न अङ्गको रुपमा समेटिनु पर्ने,

ठ. वातावरण संरक्षण नियमावली, २०७७ को नियम ९ बमोजिम वातावरणीय अध्ययन प्रतिवेदन स्वीकृत गर्ने सम्बन्धित निकायले प्राप्त वातावरणीय अध्ययन प्रतिवेदन सम्बन्धमा जाँचबुझ गर्दा सो विषयमा थप वातावरणीय अध्ययन गर्नुपर्ने देखिएमा संक्षिप्त वातावरणीय अध्ययनको हकमा प्रारम्भिक वातावरणीय परिक्षण र प्रारम्भिक वातावरणीय परिक्षणको हकमा वातावरणीय प्रभाव मुल्यांकन गर्न प्रस्तावकलाई आदेश दिनुपर्नेछ भन्ने व्यवस्था भए बमोजिम थप वातावरणीय अध्ययन गर्नुपर्ने भएमा सोही बमोजिम गर्नुपर्ने,

ड. अन्तिम प्रतिवेदन स्विकृती गर्नु पुर्व स्वीकृत गर्ने निकायले सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय र राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभागको लिखित सहमति लिनुपर्ने,

ढ. प्रस्तावित आयोजना निर्माण तथा संचालन गर्दा सगरमाथा राष्ट्रिय निकुञ्जको Outstanding Universal Value (OUV) मा पर्नसक्ने प्रभाव समेतको अध्ययन गरी यकिन विवरण प्रतिवेदनमा उल्लेख गर्नुपर्ने र नकारात्मक असर पर्ने पाईएमा युनेस्को (UNESCO) मा राय सुझावको लागि पठाउनु पर्ने, र

ण. यस वातावरणीय अध्ययन सहमति उपलब्ध गराइएको आधारमै यसपछिका अन्य कार्यका लागि सहमति प्रदान गर्न विभाग बाध्य हुने छैन।

२०७८/५/१२

(नुरेन्द्र अर्याल)
सहायक व्यवस्थापन अधिकृत

बोधार्थ :

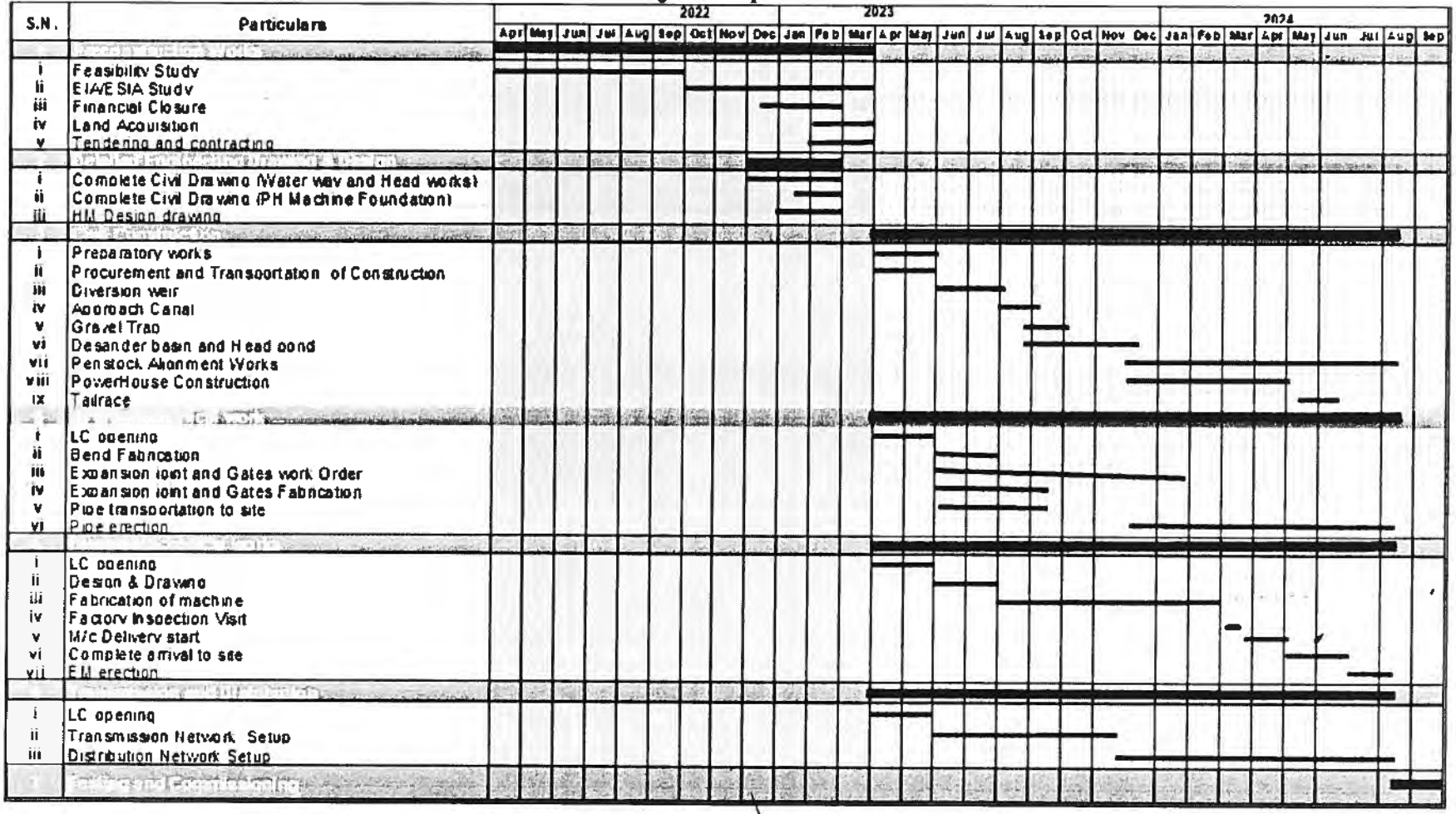
श्री वन तथा वातावरण मन्त्रालय,
सिंहदरबार, काठमाडौं।

श्री सगरमाथा राष्ट्रिय निकुञ्जको कार्यालय,
नाम्चेबजार सोलुखुम्बु

श्री खुम्बु पासाङल्हामु गाउँपालिका,
गाउँ कार्यपालिकाको कार्यालय, चौरीखर्क सोलुखुम्बु।

पाना २/२

Annex VII: Project Implementation Schedule



Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

गाउँपालिका कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु,
१ नं. प्रदेश नेपाल

Annex VIII: Data Sheet for Agrobiodiversity

Date:

Name of Respondent:…………………………… Sex:…… Age:………… Yrs:…………

Institution:…………………………Position:………………..Address:……………………

SN	Name of Plants/Crops	Uses			
		Food (Cereals/Pulses/Oil seed)	Fruits	Vegetables	Spices

Annex IX: Datasheet for Wildlife

Check List **Date:**

WILDLIFE AND BIRDS

Name of Respondent: .... **Sex:** .... **Age:** ....Yrs
Institution: .... **Position:** .... **Address:** ....

ID Number:

SN	Wildlife/Bird	Mammal/Reptile/Bird	Frequency		Remarks
			Regular	Rare	

Note:...
....
....

Annex X: Data Sheet for Socio-Economic Study

प्रभावित क्षेत्रको घरधुरी सर्वेक्षण:

१. घरमुलीको नाम: २. ठेगाना:

३. शिक्षा: ४. मुख्य पेशा:

५.. धर्म : .... ६. मातृभाषा : ..

७. बसाई सराई गरी आएको भए , क) कहाँबाट ख) कतिबर्ष पहिले

ग) बसाई सरी आउनुको कारण

८. घरको जनसंख्या तथा अन्य विवरण:

क.सं.	नाता	लिंग	उमेर	शिक्षा	पेशा	कैफियत

९. आम्दानीको श्रोतहरु:

क. सं.	श्रोत	बार्षिक आम्दानी (रू.)	कैफियत
१.	कृषि तथा पशुपालन		
२.	जागिर		
३.	बैदेशिक रोजगार		
४.	व्यापार ब्यवसाय		
५.	अन्य....		
६.	अन्य....		

१०. कृषि तथा पशुपंछी सम्वन्धि विवरण

१०.१ जग्गाको छेत्रफल:

१०.२ मुख्य बाली तथा उत्पादन:

क.सं.	बाली	लगाएको छेत्रफल	गत वर्षको उत्पादन (के.जी.)	खाध्यान्नको उपलब्धता (१=वर्षभरि पुग्ने;२= ९ महिना सम्म पुग्ने; ३= ६ महिनासम्म पुग्ने; ४= ३ महिनासम्म पुग्ने)	कैफियत (बेचबिखन गरि आम्दानी लिने गरेको छ छैन उल्लेख गर्ने)

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

महाकुलुङ गाउँपालिका गाउँ कार्यपालिकाको कार्यालय बोरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल

१०.३ पशुपंक्षी

क्र.सं.	पशुपंक्षी	संख्या	कैफियत (वेचविखन गरि आम्दानी लिने गरेको छ छैन उल्लेख गर्ने)

११. संघसंस्थासंगको संलग्नता

क्र.सं.	संस्थाको नाम	सदस्यता छ/छैन

१२. खानेपानी, सरसफाई तथा स्वास्थ्य

१२.१ खानेपानीको श्रोतः

१२.२ चर्पी भए/नभएको ....., भए, चर्पीको प्रकार .....

१३.३ गत २ बर्षमा परिवारमा विरामी भए/नभएको, यदि भएको भए,

क्र.सं.	विरामीको नाम	उमेर	रोगको नाम	रोगलागेको समय	उपचार गरेको स्थान

१०. इन्धन

१०.१ उज्यालोको लागिः १०.२ खाना पकाउनः

१०.३ दाउरा प्रयोग भए त्यसको श्रोत .....

११. धर्म तथा संस्कृतिः

११.१ धर्म .....

११.२ चाडपर्वहरु

.....

समाप्त

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

गाउँपालिका कार्यालय

Annex XI: Settlement Information Sheet

बस्तीको जानकारी:

१ ठेगानाः

२ बस्तीको नामः

३. घरधुरी संख्याः

४. जनसंख्याः

५. मुख्यजातजातिहरुः

क्र. सं.	जातजाति	प्रतिशत	कैफियत

६ . पेशा

क्र. सं.	मुख्य पेशा	प्रतिशत	सहायक पेशा	प्रतिशत
	कृषि तथा पशुपालन			
	ज्याला मजदुरी			
	व्यापार			
	घरेलु उद्योग			
	सरकारी तथा गैर-सरकारी सेवा			
	बैदेशिक रोजगार			
	अन्य (उल्लेख गर्ने)			

७. जमिन सम्बन्धि जानकारी

	जमिन को क्षेत्रफल							
	भूमिहीन	१ रोपनी भन्दा कम	१-५ रोपनी	५-१० रोपनी	१०-१५ रोपनी	१५-२० रोपनी	२०-५० रोपनी	>५० रोपनी
घर धुरी संख्या								

८. खाध्यान्नको अवस्था

	खाध्यान्नको उपलब्धता					
	३ महिना भन्दा कम	३ महिना सम्म	३-६ महिना	६-९ महिना	९-१२ महिना	१ वर्षभन्दा बढि
घरधुरी संख्या						

९. मुख्यबाली

अन्न	
नगदेबाली	

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

कार्यपालिकाको कार्यालय

१०. बस्तुभाउ (घरपालुवा जनावर)

बस्तुभाउ	संख्या	बस्तुभाउ	संख्या
गाइ		सुँगुर	
गोरु		खरायो	
भैसी		माछापालन (घरधुरी)	
घोंडा		मौरीपालन (घरधुरी)	
बाखा		कुखुरा	
भेंडा		अन्य भएमा उल्लेख गर्ने	

११. नजिकैको बजार:

१२. स्थानीय सरकारी, गैर-सरकारी, व्यक्तिगत तथा सेवा प्रदायक संघसस्था तथा पुर्वाधारहरु, धार्मिक, सांस्कृतिक तथा पुरातात्विक सम्पदाहरु र अन्य संस्थाहरु:

क्र.सं.	नाम	ठेगाना	संख्या	कैफियत
१.	स्वाध्य			
१.१	अस्पताल			
१.२	प्राथमिक स्वास्थ्य चौकी			
१.३	स्वास्थ्य चौकी			
१.४	उपस्वास्थ्यचौकी			
२.	शिक्षा			
२.१	क्याम्पस			
२.२	उच्च मा. वि.			
२.३	मा. वि.			
२.४	नि. मा. वि.			
२.५	प्रा. बि.			
३.	संचार			
३.१	मोबाइल			
३.२	ल्याण्डलाइन			
३.३	स्काई/CDMA			
३.४	हुलाक			
३.५	इन्टरनेट			
४.	उघोग तथा बाणिज्य			
४.१	होटल तथा लज			
४.२	रेस्टुरेन्ट तथा चिया पसल			
४.३	खाध्य पसल			
४.४	स्टेशनरी तथा पुस्तक पसल			
४.५	औषधि पसल			
४.६	अन्य भए उल्लेख गर्ने			

क्रमशः

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

क्र.सं.	नाम	ठेगाना	संख्या	कैफियत
५.	विधुत्			
५.१	मिनी/माइक्रो-हाइड्रो			
५.२	राष्ट्रिय प्रसारण			
५.३	सोलार			
५.४	अन्य भएमा उल्लेख गर्ने			
६.	खानेपानी			
६.१	धारा			
६.२	कुवा तथा मुहान (संख्या)			
७.	सिंचाईको अवस्था			
७.१	सिंचाई भएको जमिन (रोपनी/हे./कट्ठा)			
७.२	सिंचाई नपुगेको जमिन (रोपनी/हे./कट्ठा)			
८.	अन्य भौतिक पुर्वाधार			
८.१	माइक्रोहाइड्रो (संख्या तथा क्षमता)			
८.२	पानी मिल (संख्या)			
८.३	झोलुंगे पुल (संख्या)			
८.४	काठे पुल (संख्या)			
८.५	अन्य पुल भएमा उल्लेख गर्ने			
९.	उद्योग			
९.१	सिलाई बुनाई			
९.२	अन्न कुटानी पिसानी मिल			
९.३	अन्य उद्योग भएमा उल्लेख गर्ने			
१०.	आर्थिक कारोबार गर्ने संस्था			
१०.१	बैंक			
१०.२	सहकारी			
१०.३	फाइनान्स			
११.	सार्वजनिक सम्पति			
११.१	घाट			
११.२	खेलमैदान			
११.३	हाट बजार			
११.४	सामुदायीक केन्द्र			
११.५	मन्दिर			
११.६	गुम्बा/मस्जिद/चर्च			
११.६	पुरातत्तिक सम्पदा			
११.७	अन्य केहि भएमा उल्लेख गर्ने			

१३. मुख्य चाडपर्वहरु:

१४. योजनाले प्रत्यक्ष असर पार्ने क्षेत्रहरु

क्षेत्र	ठेगाना	दुरी
घर (संख्या):		
खेतीयोग्य जमिन (क्षे.):		
बन (नाम र क्षे.):		
मन्दिर/गुम्बा/मस्जिद/चर्च (नाम):		
पानीका श्रोत		
झोलुंगे पुल		
कुलो		
अन्य भौतिक पुर्वाधार भएमा उल्लेख गर्ने		

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

गौरीशंकर गाउँपालिका कार्यपालिकाको कार्यालय गौरीशंकर, सोलुखुम्बु १ नं. प्रदेश नेपाल

Annex XII: Water Quality Test Report

NEPAL ACADEMY OF SCIENCE & TECHNOLOGY
CENTRAL OFFICE
NAST

Environment and Climate Study Laboratory

Water Analysis Report

Date: 2078-08-16

Date Received: 2078-08-05
Received From: Khumbu Pasang Lamu
Source: Monjo Khola
Location: Solukhumbu
Lab Code: 078/08/16

S.N.	Parameters	Test Results	Standards #
	Physical Tests		
1.	Temperature (°C)	18.5	
2.	pH	8.07	6.5-8.5*
3.	Conductivity (µS/cm)	14	1500
4.	Turbidity (NTU)	0.36	5(10)
5.	Total Dissolved Solids (mg/L)	6.84	
6.	Total Suspended Solids (mg/L)	4	
	Chemical Tests		
7.	Total Hardness (as $CaCO_3$)	8	500 mg/L
8.	Chloride Content (mg/L)	2.84	250 mg/L
9.	Iron Content (mg/L)	ND	0.3(3) mg/L
10.	Arsenic Content (mg/L)	ND	0.05 mg/L
11.	Ammonia (mg/L)	ND	1.5 mg/L
12.	Nitrate (mg/L)	2	50 mg/L
13.	Dissolved Oxygen (mg/L)	7.6	
14.	Biological Oxygen Demand (mg/L)	2.8	
15.	Chemical Oxygen Demand (mg/L)	41	
	Microbiological Test		
16.	Total Coliform Count	50†	0/100 mL

Nepal Drinking Water Quality Standard, 2062
*These Values show lower and upper limit

ND- Non- Detected >-Greater than
( ) refers the acceptable values only when alternatives is not available.

Comments:
The water sample contains total coliform count beyond the standard at the time of analysis.

Approved by

Dr. Tista Prasai Joshi
Scientific Officer

Notes:

- The result refers only to the parameters tested for the sample received in the laboratory for analysis.
- The reproduction of this report wholly or partially cannot be used as evidence in the court of law and should not be used in any advertising media without the written approval of the laboratory

Address : Khumaltar, Lalitpur, Nepal, GPO Box 3323 Kathmandu, E-mail: Info@nast.gov.np
Telephone: 977-1-5547715, 5547720,5547721,5553132 Fax: +977-1-5547713

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

NEPAL ACADEMY OF SCIENCE & TECHNOLOGY

CENTRAL OFFICE

NAST

Environment and Climate Study Laboratory

Water Analysis Report

Date: 2078-08-16

Date Received: 2078-08-05
Received From: Monjo drinking water supply
Source:
Location: Monjo
Lab Code: 078/08/18

S.N.	Parameters	Test Results	Standards #
	Physical Tests		
1.	Temperature (°C)	18.5	
2.	pH	7.92	6.5-8.5*
3.	Conductivity (µS/cm)	18	1500
4.	Turbidity (NTU)	0.24	5(10)
5.	Total Dissolved Solids (mg/L)	8.95	
6.	Total Suspended Solids (mg/L)	2	
	Chemical Tests		
7.	Total Hardness (as $CaCO_3$)	12	500 mg/L
8.	Chloride Content (mg/L)	5.68	250 mg/L
9.	Iron Content (mg/L)	ND	0.3(3) mg/L
10.	Arsenic Content (mg/L)	ND	0.05 mg/L
11.	Ammonia (mg/L)	ND	1.5 mg/L
12.	Nitrate (mg/L)	2	50 mg/L
13.	Dissolved Oxygen (mg/L)	6.86	
14.	Biological Oxygen Demand (mg/L)	0.4	
15.	Chemical Oxygen Demand (mg/L)	ND	
	Microbiological Test		
16.	Total Coliform Count	>300†	0/100 mL

Nepal Drinking Water Quality Standard, 2062
*These Values show lower and upper limit

ND- Non- Detected >-Greater than
( ) refers the acceptable values only when alternatives is not available

Comments:
The water sample contains total coliform count beyond the standard at the time of analysis.

Approved by

Dr. Tista Prasai Joshi
Scientific Officer

Notes

- The result refers only to the parameters tested for the sample received in the laboratory for analysis
- The reproduction of this report wholly or partially cannot be used as evidence in the court of law and should not be used in any advertising media without the written approval of the laboratory

Address : Khumaltar, Lalitpur, Nepal, GPO Box 3323 Kathmandu, E-mail: Info@nast.gov.np
Telephone: 977-1-5547715, 5547720,5547721,5553132 Fax: +977-1-5547713

Monjo Khola Mini Hydro Kathmandu

Annex XIII: Public Notice for Public Hearing

MONJO KHOLA MINI HYDRO PVT. LTD.

मोन्जो खोला मिनी हाईड्रो प्रा. लि.
काठमाडौं-८, तिलगंगा
बागमती प्रदेश, नेपाल

मोन्जो खोला मिनी हाईड्रो परियोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारी गर्ने सम्बन्धि सार्वजनिक सुनुवाईको लागि सार्वजनिक सूचना
(प्रथम पटक प्रकाशित मिति:२०७८।०७।१८ गते)

नेपाल सरकार, वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र तथा विश्व बैंकको आर्थिक तथा प्राविधिक सहयोगमा मोन्जो खोला मिनी हाइड्रो प्रा. लि. बाट प्रदेश नं. १ सोलुखुम्बु जिल्लाको खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ३ मा रहेको मोन्जो खोलाको पानीबाट नदी प्रवाहमा आधारित (RoR) रहेर ९४२ कि.वा. क्षमताको विद्युत निकाल्ने योजना रहेकोछ। समुद्री सतहबाट २९६०५ मिटर (मि.) उचाँइमा बाँध बाधिर प्रति सेकेन्ड ०.५६० घन मिटर (घ.मि.) पानीलाई १४१० मि. लामो पेनस्टक पाईप मार्फत् समुद्री सतहबाट २७४५ मि. उचाईमा निर्माण गरिने विद्युतगृहमा जडान गरिने ४९६ किलो वाट (कि.वा.) साफ्ट क्षमताको २ वटा टर्बाइनमा खसाली वार्षिक उर्जा ७,१८५,४५१.८७ कि.वा. घण्टा उत्पादन गर्ने लक्ष्य रहेकोछ। यस परियोजनाको डिजाईन डिस्चार्ज प्रति सेकेन्ड ०.५६० घ.मि., ग्रसहेड २१५.५ मि. र नेट हेड २०४.९९ मि. रहेकोछ। प्रस्तावित परियोजनाका संरचनाहरु अन्तर्गत हेडवर्क, ग्रावेल ट्राप, डिस्यानडिंग बेसिन र पेनस्टक पाईपको केहि भाग मोन्जो खोलाको बाँया किनार तर्फ पर्छ भने बाकि पेनस्टक पाईप, विद्युतगृह र टेलरेस पाइप खोलाको दायाँ किनार तर्फ पर्छ। प्रस्तावित परियोजनाबाट उत्पादित विद्युत ४०.८० कि.मि. लामो प्रसारण लाईनबाट स्थानीयबासीहरु लाई वितरण गरिने छ। यस आयोजनाको अनुमानित कुल लागत रु.५१६३४२७१५.०० रहेको छ भने प्रति कि.वा. लागत रु.५,४८,१३४.५२ रहेको छ। खुम्बु पासाङ्ल्हामु गा.पा.को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ अनुसार वातावरणीय अध्ययन प्रतिवेदन तयार गर्दा सार्वजनिक सुनुवाई गर्नुपर्ने प्रावधान भएकाले निम्न मिति, समय, र स्थानमा सार्वजनिक सुनुवाई कार्यक्रम आयोजना गरिने भएको हुनाले उक्त कार्यक्रममा सहभागी भई आफ्नो अमुल्य राय सुझाव एवं प्रतिक्रिया प्रदान गरिदिनुहुन सम्बन्धित सरोकारवाला सबैको जानकारीको लागि यो सुचना प्रकाशित गरिएकोछ।

सार्वजनिक सुनुवाई कार्यक्रम	आयोजक:
स्थान:खुम्बु पासाङ्ल्हामु गा.पा.-३, मोन्जो, सोलुखुम्बु मिति :२०७८।०७।२५गते, विहिबार समय: बिहान ११ बजे	मोन्जो खोला मिनी हाईड्रो प्रा. लि. काठमाडौं-८, तिलगंगा बागमती प्रदेश, नेपाल ईमेल:monjokholaminihydro@gmail.com फोन नं.:०१-४४६४२२२, ०१-४४६४३३३

Tilganga - 8 , Kathmandu, Nepal
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P.O. Box No : 20011

MONJO KHOLA MINI HYDRO PVT. LTD.

चलानी नं:३३../२०७८/७९ मिति. २०७८/..../....

श्री .....
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विषय : मोन्जो मिनी हाइड्रो आयोजनाको मोन्जो खोला मिनी जल-विद्युत परियोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारी गर्ने सम्बन्धि सार्वजनिक सुनुवाईको लागि सार्वजनिक सुचना टाँस गरि सुचना टाँसको मुचुल्का तथा राय सुझाव भए पठाई दिने बारे ।

महोदय,

उपरोक्त सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचना जारि गरि सो प्रस्ताव सम्बन्धि सार्वजनिक सुनुवाई गर्नु पर्ने प्रावधान रहेकोले यसै पत्र साथ संलग्न सार्वजनिक सुनुवाइको सुचना त्यहाँको सुचना पाटीमा टाँस गरि त्यसको जानकारी पठाई दिनुहुन अनुरोध गरिन्छ ।

संलग्न : १ प्रति सार्वजनिक सुचना

भवदिय,

.....
हर्कमान लामा
प्रोजेक्ट इन्जिनीयर
मोन्जो खोला मिनी हाइड्रो प्रा.लि.

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MONJO KHOLA MINI HYDRO PVT. LTD.

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

चलानी नं: १-२ / २०७८/७९ | मितिः २०७८/..../....

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विषय: सार्वजनिक सुनुवाईमा उपस्थितिको लागि अनुरोध ।

उपरोक्त सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो पा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुनुवाई गर्नु पर्ने भएकोले तपसिलको स्थान, मिति र समयमा सार्वजनिक कार्यक्रम गरिने भएकोले यहाँको गरिमामय उपस्थितिको लागि अनुरोध गरिन्छ ।

तपसिल

स्थान	:	खुम्बु पासाङ्ल्हामु गा.पा.-३, मोन्जो, सोलुखुम्बु
मिति	:	२०७८।०७।२५गते, बिहिबार
समय	:	बिहान ११ बजे

Tilganga - 8, Kathmandu, Nepal
+977 - 1 - 4465 888
P.O. Box No : 20011

खुम्बु पासाङ्ल्हामु गाउँपालिका गाउँकार्यपालिकाको कार्यालय चौरिखर्क, सोलुखुम्बु १ नं. प्रदेश नेपाल

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

वर्ष १७ | अंक ५१ | काठमाडौं | बिहीबार, १८ कार्तिक २०७८ | Thursday 4 November 2021 | पृष्ठ ८ | मूल्य रु १०

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बजार ३

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मोन्जो खोला मिनी हाईड्रो प्रा. लि.

काठमाडौं-८, तिलगंगा

बागमती प्रदेश, नेपाल

मोन्जो खोला मिनी हाईड्रो परियोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारी गर्ने सम्बन्धि सार्वजनिक सुनुवाईको लागि सार्वजनिक सूचना

(प्रथम पटक प्रकाशित मिति:२०७८।०७।१८ गते)

नेपाल सरकार, वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र तथा विश्व बैंकको आर्थिक तथा प्राविधिक सहयोगमा मोन्जो खोला मिनी हाइड्रो प्रा. लि. बाट प्रदेश नं. १ सोलुखुम्बु जिल्लाको खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ३ मा रहेको मोन्जो खोलाको पानीबाट नदी प्रवाहमा आधारित (RoR) रहेर ९.४२ कि.वा. क्षमताको विद्युत निकाल्ने योजना रहेकोछ। समुद्री सतहबाट २९६०.५ मिटर (मि.) उचाईमा बाँध बाँधेर प्रति सेकेन्ड ०.५६० घन मिटर (घ.मि.) पानीलाई १४९० मि. लामो पेनस्टक पाईप मार्फत् समुद्री सतहबाट २७४५ मि. उचाईमा निर्माण गरिने विद्युतगृहमा जडान गरिने ४९६ किलो वाट (कि.वा.) साफ्ट क्षमताको २ वटा टर्बाइनमा खसाली वार्षिक ऊर्जा ७,१८५,४५१.८७ कि.वा. घण्टा उत्पादन गर्ने लक्ष्य रहेको छ । यस परियोजनाको डिजाईन डिस्चार्ज प्रति सैकेन्ड ०.५६० घ.मि., ग्रसहेड २१५.५ मि. र नेट हेड २०४.९९ मि. रहेकोछ। प्रस्तावित परियोजनाका संरचनाहरु अन्तर्गत हेडवर्क, ग्रावेल ट्राप, डिस्यानडिंग बेसिन र पेनस्टक पाईपको केही भाग मोन्जो खोलाको बाँया किनार तर्फ पर्छ भने बाँकि पेनस्टक पाईप, विद्युतगृह र टेलरेस पाइप खोलाको दायाँ किनार तर्फ पर्छ। प्रस्तावित परियोजनाबाट उत्पादित विद्युत ४०.८० कि.मि. लामो प्रसारण लाईनबाट स्थानीयवासीहरु लाई वितरण गरिने छ। यस आयोजनाको अनुमानित कुल लागत रु. ५१६३४२७५.०० रहेको छ भने प्रति कि.वा. लागत रु. ५,४८,१३४.५२ रहेको छ। खुम्बु पासाङ्ल्हामु गा.पा.को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण कार्यविधि २०७८ अनुसार वातावरणीय अध्ययन प्रतिवेदन तयार गर्दा सार्वजनिक सुनुवाई गर्नुपर्ने प्रावधान भएकाले निम्न मिति, समय, र स्थानमा सार्वजनिक सुनुवाई कार्यक्रम आयोजना गरिने भएको हुनाले उक्त कार्यक्रममा सहभागी भई आफ्नो अमुल्य राय सुझाव एवं प्रतिक्रिया प्रदान गरिदिनुहुन सम्बन्धित सरोकारवाला सबैको जानकारीको लागि यो सूचना प्रकाशित गरिएकोछ।

सार्वजनिक सुनुवाई कार्यक्रम	आयोजक:
स्थान: खुम्बु पासाङ्ल्हामु गा.पा.-३, मोन्जो, सोलुखुम्बु मिति :२०७८।०७।२५ गते, बिहिबार समय: बिहान ११ बजे	मोन्जो खोला मिनी हाईड्रो प्रा. लि. काठमाडौं-८, तिलगंगा बागमती प्रदेश, नेपाल ईमेल:monjokholaminihydro@gmail.com फोन नं.:०१-४४६४२२२, ०१-४४६४३३३

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

Annex XIV: Broadcasting Certificate of FM

हिमाल एफ.एम. ९०.२ मेगाहर्ज
Himal FM 90.2 Mhz

Solu Dudhkunda Municipality-5, Salleri, Solukhumbu
Tel: 038 520451, 520013, 520477
E mail: himalfm90.2@gmail.com
Web: www.hmalfm.com
www.himalsamachar.com

Date : 2078 07-18

Monjo khola Mini Hydro pvt ltd

Kathmandu 8 Tilganga

Broadcasting Schedule

We hereby that the following Radio. Jingle has broadcasted as per the following details provided by Monjo khola Mini Hydro pvt ltd

Client : Monjo khola Mini Hydro pvt ltd

Caption : Public hearing

Spot :per day 4

Time . morning, day, evening

Airing Date : 2078/07/18 to 078/07/24

Morning	Day	Evening
7-55 , 9-30	12-30	6-55

Annex XV: Deed of Enquiry of Public Hearing Notice Affixation

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
गाउँ कार्यपालिकाको कार्यालय, चौरीसर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Chunkharka, Solukhumbu, 1 No. Province, Nepal

प.सं.: ०७८/०७९
च.नं.: ३१८

मिति : २०७८/०७/२३ गते

विषय : सूचना टाँस गरिएको सम्बन्धमा ।

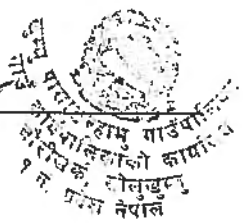
श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.,
तिलगङ्गा, काठमान्डौं ।

यस मोन्जो खोला मिनी हाइड्रो प्रा.लि. बाट मिति २०७८/०७/१८ च.नं. ३३ को पत्रसाथ प्राप्त मोन्जो खोला मिनी जलविद्युत परियोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारी गर्ने सम्बन्धि सार्वजनिक सुनुवाई कार्यक्रमको सूचना यस कार्यालयको सूचना पाटीमा टाँस गरीएको व्यहोरा जानकारीको लागि अनुरोध छ ।

सुजन कुमार बुढाथोकी/ठकुरा
प्रशासकीय अधिकृत

प्रशासकीय अधिकृत

E-mail: ito.khumbupasanglhamumun@gmail.com | www.khumbupasanglhamumun.gov.np



नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग

सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय

नाम्चे, सोलुखुम्बु

पत्र संख्या: २०७८/७९
चलानी नं.: ९३८

मिति: २०७८/०७/२५

विषय: सूचना टाँस गरिएको सम्बन्धमा।

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
काठमाडौँ-८, तिलगंगा
बागमती प्रदेश, नेपाल।

प्रस्तुत विषयमा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौँ प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सूचनाको प्रतिलिपि थान-१ यस सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय नाम्चेको सूचना पाटीमा मिति २०७८/०७/२५ गतेका दिन सुचना टाँस गरिएको व्यहोरा अनुरोध छ।

भूमिराज उपाध्याय
प्रमुख संरक्षण अधिकृत

नाम्चे बजार, सोलुखुम्बु, फोन नं.: ०३८-५४०११४, फ्याक्स नं.: ०३८-५४०१९५
वेब पेज: WWW.sagarmathanationalpark.gov.np, इमेल: info@sagarmathanationalpark.gov.np, snp.namche@gmail.com

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
३ नं. वडा कार्यालय, नाचिपाङ, सोलु-खुम्बु, १ नं. प्रदेश नेपाल
Ward No. 3 Office, Nachipang, Solukhumbu, 1 No. Province, Nepal

च.नं: ०६८/०६५
च.नं: १६६

मिति: २०७८/०७/२३

श्री मोन्जो खोला मिनी हाईड्रो प्रा.लि.
तिलगंगा-०८, काठमाडौं,बागमति प्रदेश,नेपाल ।

बिषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाईड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाईड्रो आयोजना ९४२ कि.वा.को विधुत उत्पादन तथा ११ के.भी. मिडगल मर्किट प्रभारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सूचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ०३ मा आज मिति २०७८/ ०७ /२५ गतेका दिनको ११ बजे हामीहरुको रोहबरमा सूचना टाँस गरि यो मुचुल्कामा सहि छाप गरिदियौं ।

<u>तपशिल</u>

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ०३ बस्ने वर्ष २५ को श्री पेम्बा छिरिङ शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ०३ बस्ने वर्ष ३६ को श्री ङ्वेम्बा शेर्पा

मिङ्मा छिरी शेर्पा
वडा अध्यक्ष
खुम्बु पासाङल्हामु गाउँपालिका-३

मिङ्मा छिरी शेर्पा
वडा अध्यक्ष
खुम्बु पासाङल्हामु गाउँपालिका
वडा नं. ३

ईति सम्वत २०७८ साल ०७ महिना २५ गते रोज ५ शुभम्...

E-mail: kplrmegovernancew3@gmail.com | www.khumbupasanglhamumun.gov.np

दर्ता नं.:

श्री हिमालय मध्ये वर्ति क्षेत्र सामुदायीक वन उपभोक्ता समूह

खुम्बु पासाङ ल्हामु गाउँपालिका ३, मन्जु, सोलुखुम्बु

प.सं.   मिति:-
च.नं.

श्री मन्जो खोला मिनी हाइड्रो प्रा०ली०
सिंगा - ८ काठमाडौं
बागमती प्रदेश नेपाल

विषय: सुचना टाँस गरिएको सम्बन्धमा

लिखित मन्जो खोला मिनी हाइड्रो प्राली काठमाडौं प्रस्तावक भएको मन्जो खोला मिनी हाइड्रो आयोजना ३४२ किलोवाट को विद्युत उत्पादन तथा ११ कि.वि. सिंगल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रतिवेदन तयार गर्नका लागी खु.पा०गा०पा०को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भीक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि २०७८ को सार्वजनिक सुनुवाई सम्बन्धी सार्वजनिक सुचनाको प्रतिलिपि यस सोलुखुम्बु जील्ला खु.पा०गा.पा वडा नं.३ मा रहेको श्री हिमालय म०व० सा०व०समुहमा आज मिति २०७८/६/२५ गते दिनको ४:२० बजे हामी रहेको रोहवरमा टाँसगरी यो मुचुल्का सहि छाप गरिदियौं।

रोहबर

सोलुखुम्बु जील्ला खु०पा०गा०पा -३ वडा नं ... बस्ने वर्ष ४१ को राम कान्छी मगर

सोलुखुम्बु जील्ला खु.पा.गा.पा वडा-३ छापार्चा बस्ने वर्ष-३८ को सोनाम शेर्पा

खुम्बियुला महिला समुह

खुम्बु पासाङल्हामु गा.पा. ३, सोलखुम्बु

पत्र संख्या

मिति: २०७८/६/२७

श्री मोन्जोखोला मिनी हाइड्रो प्रा.लि
तिलगंगा -८ काठमाडौं
बागमती प्रदेश, नेपाल

विषय: सुचना टाँस गरिएको सम्बन्धमा।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाट को विद्युत उत्पादन तथा ११ केभी डबल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रतिवेदन तयार गर्नको लागि ~~सोलुखुम्बु~~ खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त ~~वातावरणीय~~ अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धी सार्वजनिक सूचनाको प्रतिलिपि पाना १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ३ मा रहेको उपस्थितिमा खुम्बियुला महिला समूह मा मिति २०७८/६/२७ गते बिहानको ८:३० बजे हामीहरुको रोहबरमा टाँस गरि यो मुचुल्का तयार गरिदियौं।

रोहबर!

सोलुखुम्बु जिल्ला खुम्बु पा.गा. वडा नं ३ नाम्चे बस्ने वर्ष ५४ को डावा डोमा शेर्पा (हस्ताक्षर)

सोलुखुम्बु जिल्ला खु.पा.गा. वडा ३ नाम्चे बस्ने वर्ष ४२ को डोल्मा फुटी शेर्पा (हस्ताक्षर)

Monjo Khola Mini Hydro Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका गाउँकार्यपालिकाको कार्यालय खुम्जुङ, सोलुखुम्बु १ नं. प्रदेश नेपाल

सूचना टाँसको मुचुल्का

क) संस्थागत

मिति २०६८ ०७ २५

श्री मोन्जो खोला मिनी हाइड्रो प्रा. लि.
[illegible] कम्प्लेक्स, तिलगंगा-८, काठमाडौं
बागमती प्रदेश, नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

निवेदक मोन्जो खोला मिनी हाइड्रो प्रा. लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९५२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नका लागि खुम्बु पासाङल्हामु गाउँपालिकाका संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सूचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा., वडा नं. ३..मन्जु..मा आज मिति २०६८।०७।२५... गते दिनको ..११:००.. बजे हामीहरुको रोहबरमा टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ३...छुमवा बस्ने वर्ष ५५ को ..गोकर्ण...राई...

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ३...घाट बस्ने वर्ष २६ को ..दमी फेन्डु राई

इति सम्वत २०६८... साल ..कार्तिक महिना...२५.... गते रोज विहिबार....०५ शुभम

गोकर्ण राई
प्रधानाध्यापक

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
GAUTAM BUDDHA BUFFER ZONE USER GROUP
गौतम बुद्ध मध्यवर्ती क्षेत्र उपभोक्ता समूह
चौरीखर्क-३, फाक्डिङ, सोलुखुम्बु

पत्र संख्या
चलानी नं

मिति २०७८-८-२३

श्री मोन्जो खोला मिनि हाइड्रो प्रा. लि.
तिलगंगा - ८, काठमाडौं

विषय :- सूचना टाँस गरिएको सम्बन्धमा

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा. लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ५४० किलोवाटको विद्युत उत्पादन तथा ११ के.भी. सिङ्गल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सूचनाको प्रतिलिपि थान-१ थप संलग्न गरी खुम्बु पासाङल्हामु गा.पा. वडा-३ मा आज मिति २०७८-०८-२३ गतेका दिन ११:०० बजे हामीहरुको रोहबरमा टाँस गरि यो मुचुल्का समितिले गरिदियौं

(हस्ताक्षर)
अध्यक्ष
गौतम बुद्ध मध्यवर्ती क्षेत्र उ.स.

समूहको कार्यालय
चौरीखर्क-३, फाक्डिङ, सोलुखुम्बु
P.O. Box: .... Tel: .... Fax: .... Email: ....

श्री मन्जोखोला लघु जलविद्युत कार्यगत समूह

मन्जो, चौरीखर्क-१, सोलुखुम्बु, सगरमाथा अञ्चल

Shree Manjokhola Micro Hydro Functional Group

Manjo, Chaunrikharka-1, Solukhumbu, Sagarmatha Zone

पत्र सं. ०८८/६९
च नं ०३.

मिति २०८८/०६/२४.

श्री मन्जो खोला मिनि हाइड्रो प्रा०लि.
तिलगंगा ८ काठमाण्डौं,
बागमती प्रदेश, नेपाल.

विषय :- सूचना दाँस गरिएको सम्बन्धमा,।

लिखितम मन्जो खोला मिनि हाइड्रो प्रा०लि. काठमाण्डौं प्रस्तुत रहेको मन्जो खोला मिनि हाइड्रो आयोजना ४४२ कि. लोवट को विद्युत उत्पादन तथा ११ के भी सिंगल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रतिवेदन तयार गर्ने का लागी खुम्बु पासाङ् ल्हाकु गाउ पालिका को संक्षिप्त वातावरणीय अध्ययन तथा प्रारिभक वातावरणीय परिक्षण प्रतिवेदन कार्यविधी २०७८ बमोजिम सार्वजनिक सुनुवाइ सम्बन्धी सर्वजानिक सूचनाको प्रतिलिपी थाप्ने यस सोलुखुम्बु जिल्ला खुम्बु पासाङ् ल्हाकु गा०पा० वडा नं०३ मा रहेको मन्जो खोला लघु जल विद्युत समिति मा आज मिति २०८८।०६।२३ गते दिन १:३० बजे हाजी हरुको रोहवरमा दास गरि यो सुचना मा सही छाप गरि दिनौं।

तपसिल

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हाकु गा०पा० ३ मन्जु बस्ने वर्ष ५८ को छिम तोन्डेङ शेर्पा - १

सोलुखुम्बु जिल्ला खुम्बु पासाङ् ल्हाकु गा०पा० ३ बस्ने ल्हाक्पा जेङ्बे शेर्पा - १

इति सम्वत २०८८ साल ६ महिना २३ गते रोज ६ शुभम —

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

पासाङ्ल्हामु गाउँपालिका कार्यपालिकाको कार्यालय प्रतिलेख, सोलुखुम्बु १ नं प्रदेश नेपाल

Gov. Regd. No.: 851

ཨུ་ཆེ་ཆོས་གླིང་དགོན་པ།

उच्चे छोलिङ गोम्पा व्यवस्थापन समिति

Utche Chholing Monastery Management Committee

Khumbu Pasanglhamu Rural Municipality-3, Munjo, Solukhumbu

Ref. No.: ४२ Date: २०७८।६।२४

श्री मोन्जोखोला मिनी हाइड्रो प्रा.लि.
तिलगंगा - ८ काठमाडौं
बागमती प्रदेश, नेपाल

विषय : सुचना टाँस गरिएको सम्बन्धमा ।

लिखितम् मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ३४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हमु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हमु गा.पा. वडा नं. ३ मा रहेको उच्चेछोलिङ गोम्पा व्यवस्थापन समितिमा आज मिति २०७८/६/२४ गते दिनको २:३० बजे हामीहरुको रोहवरमा टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तपसिल :

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हमु गा.पा. वडा नं ३ मन्जु बस्ने वर्ष ४२ को नवाङ कसाङ शेर्पा [signature] ।

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हमु गा.पा. वडा नं ३ मन्जु बस्ने वर्ष ४२ को डवाङ गेले शेर्पा [signature]

इतिसम्बत २०७८ साल ६ महिना २४ गते रोज १ शुभम् ।

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका ... को कार्यालय ... सोलुखुम्बु ... नेपाल

मिति २०७८/७/२४

श्री मोन्जो खोला मिनि हाइड्रो प्रा.लि.

विषयः- सूचना टाँस गरेको सम्बन्धमा

निवेदक मोन्जो खोला मिनि हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो मिनि हाइड्रो आयोजना ५४२ किलोवाटको विद्युत उत्पादन तथा ११ के.भी. ट्रान्समिशन सहित प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय प्रतिवेदन तयार गर्नेका लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धी सार्वजनिक सूचनाको प्रतिलिपि थान १ सोलुखुम्बु जिल्ला, खुम्बु पासाङल्हामु गाउँपालिका वडा नं. २ [illegible] मिति २०७८/७/२४ गते दिनको १:०० बजे हामीहरुको रोहबरमा टाँस गरि यो मुचुल्का सहिछाप गरिदियौं।

तपसिल :-

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. २ बस्ने वर्ष २२ को ल्हाक्पा ग्याल्जेन शेर्पा।

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. २ वर्ष ५६ को छिरिङ नेन्जीङ शेर्पा

इति संवत २०७८ साल कार्तिक महिना २४ गते रोज ४ शुभम्।

सुचना टाँसको मुचुल्का

क) संस्थागत

मिति : २०७८/०८/२५

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
~~गाउँ तहको नाम~~ तिलगंगा-८, काठमाडौं
बाग्मती पदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्गल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा., वडा नं. ३.....मा आज मिति २०७८/०८/२५..... गते दिनको ..११:००... बजे हामीहरुको रहोबरमा टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापासिलः

सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा. वडा नं. ३..... बस्ने बर्ष ३५..को .सोनाम...तेन्जिङ०.शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा. वडा नं. ३..... बस्ने बर्ष ५०...को .फुरा.ग्याल्जेन.शेर्पा

इति सम्वत् ...२०७८. साल ...०८....महिना.....२५.... गते रोज .....बिहीवार..... शुभम्

Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङ्गल्हामु गाउँपालिका गाउँपालिकाको कार्यालय सोलुखुम्बु नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
कोङदे मध्यवर्ती क्षेत्र समुदायिक वन उपभोक्ता समूह
KONGDE BUFFER ZONE COMMUNITY FOREST USER GROUP
खुम्बु पासाङल्हामु ... सोलुखुम्बु

पत्र सं:
चलानी नं:

श्री मोन्जो खोला मिनि हाइड्रो प्रा. लि.
तिलगंगा - ८, काठमाडौं, नेपाल

विषय : सूचना टाँस गरिएको सम्बन्धमा ।

यस मञ्जु खोला मिनी हाइड्रो प्रा. लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ५४२ किलोवाटको विद्युत उत्पादन ११केभी सिङ्गल सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागी खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सुनुवाई सम्बन्धि सार्वजनिक सूचनाको प्रतिलिपि आज -१ थान सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गाउँपालिका वडा नं. ५ स्थित थाम कोङदे मध्यवर्ती क्षेत्र सामुदायिक वनको सूचना पाटीमा मिति २०७८/०८/२३ गते दिनको ११:०० बजे हामीहरुको रोहवरमा टाँस गरिएको थियो भनी सर्जमिन गरिदियौं ।

२०७८/०८/२३
फुनुरु शेर्पा
अध्यक्ष

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु,
१ नं. प्रदेश नेपाल

Annex XVI: Public Hearing Minute

Date ______
Page ______

नेपाल सरकार, वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र तथा विश्व बैंकको आर्थिक तथा प्राविधिक सहयोगमा मोन्जो खोला मिनि हाइड्रो प्रा.लि. बाट प्रदेश नं. १ सोलुखुम्बु जिल्लाको खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा रहेको मोन्जो खोलाको पानीबाट ५४२ कि.वा. क्षमताको विद्युत निकाल्ने योजना रहेको र उक्त परियोजनाको खुम्बु पासाङल्हामु गा.पा.को संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण कार्यविधि २०६८ अनुसार संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्दा सार्वजनिक सुनुवाई गर्नुपर्ने भएकोले मिति २०६८ साल कार्तिक २४ गते बिहिबारको दिन सोलुखुम्बु जिल्लाको खुम्बु पासाङल्हामु गा.पा. वडा नं. ३, मोन्जोमा खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ का अध्यक्ष श्री मिङ्मा शेर्पा ज्यूको अध्यक्षतामा तथा नुरु जाङ्बु शेर्पा ज्यूको प्रमुख आतिथ्यको उपस्थिति साथै प्रस्तावक तथा परामर्शदाताको प्रतिनिधिहरू र स्थानीय सरोकारवालाहरूको उपस्थितिमा सार्वजनिक सुनुवाई सम्पन्न भयो।

उपस्थिति :-

क्र.सं.	नाम / लिङ्ग	ठेगाना/संस्था/पद	हस्ताक्षर
१.	मिङ्मा छिरी शेर्पा पु.	खुम्बु पा.ल्हा. गा.पा. वडा ३ अध्यक्ष	
२.	नुरु जाङ्बु शेर्पा पु.	चौरीखर्क म.श. उ. समिति सचिव	
३.	डिमा तेन्जिङ शेर्पा पु.	मोन्जो खोला मा.ह. अध्यक्ष	
४.	पासाङ सोनाम शेर्पा पु.	[illegible] सामुदायिक वन सचिव	
५.	कामी तेम्बा शेर्पा	समुदायलाई मन्जो, गोम्बा	
६.	पासाङ दावा शेर्पा पु.		पासाङ
७.	रिन्जी ल्हाक्पा शेर्पा पु.		
८.	सोनाम तेन्जीङ शेर्पा पु.	खुम्बुला मध्यवर्ती सचिव	
९.	गाङ्जेन राई पु.	प्र.अ. मन्जो अ. वि.	
१०.	दावा नुरु शेर्पा पु.		
११.	ज्ञान बहादुर तमाङ पु.		
१२.	राम काजी मगर पु.	सामुदायिक वन अध्यक्ष	
१३.	कामी छिरी शेर्पा पु.	संस्कृति [illegible] अध्यक्ष	

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका गाउँपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु १ नं. प्रदेश नेपाल

१४ पेम्बा तेन्जी शेर्पा पु.
१५ फुरा ग्याल्जेन शेर्पा पु
१६ तेन्जीङ तामाङ पु
१७ पासाङ दिकी शेर्पा महिला
१८ डोल्मा दिकी शेर्पा म. मन्जो खोला मिनी हाइड्रो प्रतिनिधि
१९ फुरा दिकी शेर्पा म. फुरा दिकी शेर्पा
२० डोमा शेर्पा म. डोमा शेर्पा
२१ च्याङ्बा शेर्पा म.
२२ फुर्तेम्बा शेर्पा पु. वडा नं ३ वडा अध्यक्ष
२३ ङवाङ छिरिङ शेर्पा म
२४ फुर्वा ग्याल्जेन शेर्पा पु. मन्जो
२५ आङ फुटी शेर्पा पु.
२६ ङवाङ कर्साङ शेर्पा पु. सचिव मन्जो
२७ ल्हाक्पा तेम्बा शेर्पा पु. सचिव
२८ ङवाङ नोरा शेर्पा सगरमाथा कृषि समूह
२९ फुरा फुटी शेर्पा म.
३० जाङ्मु शेर्पा म. जाङ्मु
३१ पेम्बा नुरु शेर्पा पु.
३२ ङवाङ डोमा शेर्पा अध्यक्ष कृषि समूह
३३ फुर्वा याङ्जी शेर्पा म. फुर्वा याङ्जी
३४ दावा याङ्जी शेर्पा म.
३५ डोमा शेर्पा म. डोमा शेर्पा
३३. शिव प्र. तिमल्सिना पु., CED,
३४ रामजी बोगटी, पु.
३५ कमाण्डर राई पु. स. टो. नि. का
३६ कृपा स्मर राई पु. कृपाराई
३७ तारो राई पु.
३८ केशव प्रधानाङ्ग - वै.ऊ.प्र. केन्द्र
३९ सुनिता खतिवडा - वै.ऊ.प्र. केन्द्र
४० शिव हरि कुमाखले - वै.ऊ.प्र.के
४१ धन ब. श्रेष्ठ पु. वातावरणीय अध्ययन टोली प्रमुख
४२ उमेश प्र. अधिकारी वातावरणीय अध्ययन टोली
४३ ल्हाक्पा शेर्पा
४४ आङ दोर्जी शेर्पा

Date ______
Page ______

छलफलका विषयहरू :-

क) भौतिक वातावरणमा पर्न सक्ने प्रभाव तथा क्षेत्रहरू:-

ख) जैविक वातावरणमा पर्न सक्ने प्रभाव तथा क्षेत्रहरू:-

ग) सामाजिक वातावरणमा पर्न सक्ने प्रभाव तथा क्षेत्रहरू:-

घ) सांस्कृतिक वातावरणमा पर्न सक्ने प्रभाव तथा क्षेत्रहरू:-

ङ) आर्थिक वातावरणमा पर्न सक्ने प्रभाव तथा क्षेत्रहरू:-

च) अन्य (विविध)

छलफलमा उठेका सुझावहरू :-

१. प्रभावित क्षेत्रका बासिन्दाहरूलाई रोजगारीको लागि प्राथमिकतामा राख्नुपर्ने ।

२. चौंरी लगायत अन्य क्षेत्रका बासिन्दाहरूलाई समेत रोजगारीको लागि अवसर दिनुपर्ने ।

३. प्रभावित क्षेत्रका बासिन्दाहरूको लागि न्यूनतम शुल्क विद्युत महसुल उपलब्ध गराउने व्यवस्था हुनुपर्ने ।

४. गुम्बा, विद्यालय जस्ता सार्वजनिक संस्थाहरूलाई हालसम्म निःशुल्क विद्युत उपलब्ध गराइँदै आएको त्यही व्यवस्था पनि हुनुपर्ने ।

५. जोरसाल्ले तथा बेंकरलगायत अन्य बस्तीहरू सबै सम्म पुग्ने जस्तो दाबी गरेकोले उक्त बस्तीहरू लगायत बस्तीहरू समेत विद्युत प्रसारणको लागि सम्बोधन पर्ने ।

६. सम्पूर्ण घरधुरीको तथ्याङ्क आउनुपर्ने तथा उनीहरूको माग कति हो उल्लेख हुनुपर्ने ।

७. स्थानीयले विद्युत कम्पनीको सेयर के कसरी पाउने हो त्यसको जानकारी हुनुपर्ने ।

८. व्यक्तिगत जग्गाको बाटोमा कसकसको जग्गा पर्छ र ती जग्गाहरूको व्यवस्थापन कसरी गर्ने भन्ने कुरामा छलफल सम्झौता हुनुपर्ने ।

९. हाल सञ्चालनमा रहेको लघु जलविद्युत तथा पेल्टोन सेट आयोजना हरूमा सञ्चालनमा के कस्तो असर पर्ने तथा तिनीहरूको व्यवस्थापन कसरी गर्ने भन्ने कुरा टुंगो लगाउनुपर्ने ।

१०.

[signatures]

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Khola Mini Hydro ... Kathmandu

गाउँपालिका गाउँकार्यपालिकाको कार्यालय सोलुखुम्बु, १ नं. प्रदेश नेपाल

Date ______
Page ______

प्रस्तावकको तर्फबाट दिइएका प्रतिबद्धताहरु:-

१. प्रभावित तथा स्थानीय व्यक्तिहरूलाई रोजगारको लागि उच्च प्राथमिकता दिने प्रतिबद्धता व्यक्त गरियो।

२. स्थानीय सबैको लागि उचित समयमा लगानीको अवसर प्रदान गर्ने जानकारी गराइयो।

३. प्रभावित क्षेत्रको बासिन्दाहरूको लागि न्यूनतम शुल्कमा उपलब्ध गराउने सम्बन्धमा लगानीकर्ता बिचमा छलफल गरी शुल्क निर्धारण गर्ने तथा स्थानीयसँग छलफल गरेर गरी निर्धारण गर्ने जानकारी गराइयो।

४. गुम्बा तथा विद्यालय जस्ता सार्वजनिक संस्थाहरूलाई सहुलियत विद्युत प्रदान गर्ने सम्बन्धमा कम्पनीको बोर्डमा छलफल गरी निर्णय गर्ने जानकारी गराइयो।

५. जोरसल्ले देखि मुनि सम्मका सम्पूर्ण बस्तीहरूमा विद्युत प्रसारणको व्यवस्था गरिने प्रतिबद्धता जनाइयो।

६. व्यक्तिगत जग्गा कसैको पर्ने भए तिनको पहिचान गरी वहाँहरूसँग सम्झदारी गरेर मात्र अगाडि बढाउने प्रतिबद्धता जनाइयो।

७. हाल संचालनमा रहेको लघुजलविद्युत तथा [illegible] सँग सम्बन्धमा आपसी छलफल गरी उपयुक्त निष्कर्ष निकाल्ने जानकारी गराइयो।

Monjo Khola ... Kathmandu

...गाउँपालिका
...कार्यालय
...सोलुखुम्बु
...प्रदेश नेपाल

Annex XVII: Public Notice for Suggestions and Comments

मोन्जो खोला मिनी हाईड्रो परियोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारीसम्बन्धी सार्वजनिक सूचना

(प्रथम पटक प्रकाशित मिति : २०७८।११।०४ गते)

प्रदेश नं १ सोलुखुम्बु जिल्लाको खुम्बु पाग्याङ्लामु गा.पा. वडा नं ३ मा नेपाल सरकार, वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र तथा विश्व बैंकको आर्थिक तथा प्राविधिक सहयोगमा मोन्जो खोला मिनी हाइड्रो प्रा. लि. द्वारा देहाय बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ।

प्रस्तावकको नाम र ठेगाना	**मोन्जो खोला मिनी हाईड्रो प्रा. लि.** काठमाडौं-८, तिलगंगा बागमती प्रदेश, नेपाल ईमेल : monjokholaminihydro@gmail.com फोन नं : ०१-४४६४२२२, ०१-४४६४३३३
प्रस्तावको व्यहोरा	नेपाल सरकार, वैकल्पिक ऊर्जा प्रवर्द्धन केन्द्र तथा विश्व बैंकको आर्थिक तथा प्राविधिक सहयोगमा मोन्जो खोला मिनी हाइड्रो प्रा लि बाट प्रदेश नं १ सोलुखुम्बु जिल्लाको खुम्बु पाग्याङ्लामु गा.पा. वडा नं ३ मा रहेको मोन्जो खोलाको पानीबाट नदी प्रवाहमा आधारित (RoR) रहेर ९.४२ कि.वा. क्षमताको विद्युत निकाल्ने योजना रहेकोछ। समुद्री सतहबाट २९६० मिटर मि। उचाईमा बांध बाधेर प्रति सेकेन्ड ०.५६० घन मिटर (घ.मि। पानीलाई १४१० मि. लामो पेनस्टक पाईप मार्फत समुद्री सतहबाट २७४५ मि. उचाईमा निर्माण गरिने विद्युतगृहमा जडान गरिने ४९६ किलो वाट (कि.वा.) मापट क्षमताको २ वटा टर्बाइनमा खमाली आपेंक उर्जा ७,१८५,४५१.८७ कि.वा. घण्टा उत्पादन गर्ने लक्ष्य रहेकोछ। यस परियोजनाको डिजाईन डिस्चार्ज प्रति सेकेन्ड ०.५६० घ.मि., ग्रसहेड २१५.५ मि. र नेट हेड २०४.९९ मि रहेको छ। प्रस्तावित परियोजनाका संरचनाहरु अन्तर्गत हेडवर्क, गाबेल ट्राप, डिस्र्यान्डिंग बेसिन र पेनस्टक पाईपको केहि भाग मोन्जो खोलाको बायां किनार तर्फ पर्छ भने बाकि पेनस्टक पाईप, विद्युतगृह र टेलरेस पाइप खोलाको दायां किनार तर्फ पर्छ।प्रस्तावित परियोजनाबाट उत्पादित विद्युत ४० ८० कि.मि. लामो प्रसारण लाईनबाट स्थानीयवासीहरु लाई वितरण गरिने छ। यस आयोजनाको अनुमानित कुल लागत रु.५१६३४२७१५.०० रहेको छ भने प्रति कि.वा. लागत रु. ५४८,१३४५२ रहेको छ।

प्रभाव पर्न सक्ने क्षेत्र	सोलुखुम्बु जिल्ला, खुम्बु पाग्याङ्लामु गा.पा -३

माथि उल्लेखित प्रस्तावको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयारी गर्ने क्रममा सो क्षेत्रको जैविक तथा पारिस्थितिकीय प्रणाली, प्राकृतिक तथा भौतिक प्रणाली, सामाजिक तथा आर्थिक प्रणाली र सांस्कृतिक प्रणालीहरु बीच के कस्तो सकारात्मक तथा नकारात्मक प्रभाव परेछ भनि पहिचान गर्न यस खुम्बु पाग्याङ्लामु गाउँपालिका, वडा कार्यालय, विद्यालय, स्वास्थ्य संस्था तथा सरोकारवाला व्यक्ति वा संस्थाको राय सुझाव लिन आवश्यक भएकोले यो सार्वजनिक सूचना प्रकाशन भएको मितिले सात दिन भित्र देहायमा उल्लिखित ठेगानामा आइ पुग्ने गरि लिखित राय सुझाव उपलब्ध गराई दिन हुन अनुरोध गरिन्छ।

प्रस्तावकको नाम र ठेगाना	**मोन्जो खोला मिनी हाईड्रो प्रा. लि.** काठमाडौं-८, तिलगंगा, बागमती प्रदेश, नेपाल ईमेल: monjokholaminihydro@gmail.com; फोन नं :०१-४४६४२२२, ०१-४४६४३३३
परामर्शदाताको नाम र ठेगाना	**ईको फ्रेण्ड इन्टरनेशनल प्रा.लि.** ललितपुर-२, सानेपा इमेल: ecofriend.nepal@gmail.com; फोन नं ९८५११२७८८७

Annex XVIII: Deed of Enquiry for Affixation of Public Notice for Suggestion and Comments

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality

गाउँ कार्यपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Chaurikharka, Solukhumbu 1 No. Province, Nepal

प.सं. ०७८/०७९
च.नं. ६२८

मिति:-२०७८/११/०९.

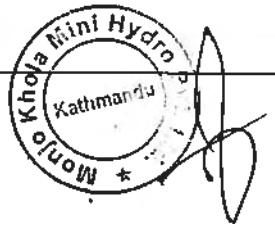
श्री मोन्जोखोला मिनी हाइड्रो प्रा.लि.,
तिलगंगा, काठमाण्डौं ।

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

प्रस्तुत विषयमा तहाँ कार्यालयको मिति २०७८/११/०५ च.नं. १ को पत्रमाथ प्राप्त मिति २०७८/११/०४ मा प्रकाशित सूचना यस कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा जानकारीको लागि अनुरोध छ ।

(ऋषिराज कुमार राम)
सब-इन्जीनियर

E-mail: ito.khumbupasanglhamumun@gmail.com | www.khumbupasanglhamumun.gov.np
Contact no. +97738590046



खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
३ नं. वडा कार्यालय, नाचिपाङ, सोलुखुम्बु १ नं. प्रदेश नेपाल
Ward No. 3 Office, Nachipang, Solukhumbu, 1 No. Province, Nepal

च.नं.: ४८/७९
च.नं.: १६८

मिति: २०७८/११/१५

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा -८,काठमाडौं
बाग्मती प्रदेश, नेपाल

विषय :- सुचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागी खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि,२०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा.,वडा नं. ३ मा आज मिति २०७८/११/०९ गते दिनको १०.०० बजे हामीहरुको रहोबरमा टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तपशिल :

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. नं. ३ बस्ने वर्ष ३८ को डातेम्बा शेर्पा
सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. नं. ३ बस्ने वर्ष ३५ को पासाङ नुरु शेर्पा

इति सम्वत् .....साल .....महिना .....गते रोज .....शुभम्

मिङमा छिरी शेर्पा
वडा अध्यक्ष

मिङमा छिरी शेर्पा
वडा अध्यक्ष
खुम्बु पासाङल्हामु गाउँपालिका-३

E-mail: kplrmegovernancew3@gmail.com | www.khumbupasangthamumun.gov.np

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका
वडा कार्यालय, सोलुखुम्बु
१ नं. प्रदेश नेपाल

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग
सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय
नाम्चे

पत्र संख्या: २०७८/७९
चलानी नं.: ४८२

मिति:२०७८/११/१०

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.,
तिलगंगा-८ , काठमाडौं
बाग्मती प्रदेश, नेपाल |

प्रस्तुत विषयमा त्यहाँ प्रा.लि.को च.नं. १ मिति २०७८/११/०५ गतेको पत्रानुसार मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजनाको ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिलिंग सर्किट प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस कार्यालयको सुचना पाटीमा टाँस गरिएको व्यहोरा अनुरोध छ |

२०७८।११।१०
विष्णु राकाया
निमित्त प्रमुख संरक्षण अधिकृत
निमित्त प्रमुख संरक्षण अधिकृत

नाम्चे बजार, सोलुखुम्बु, फोन नं. ०३८-५४०११४, फ्याक्स नं. ०३८ ५४०३१५
वेब पेज WWW.sagarmathanationalpark.gov.np इमेल info@sagarmathanationalpark.gov.np snp.namche@gmail.com

Monjo Khola Mini Hydro Project Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका कार्यपालिकाको कार्यालय
औरीखर्क, सोलुखुम्बु,
१ नं. प्रदेश नेपाल

सगरमाथा राष्ट्रिय निकुञ्ज
मध्यवर्ती क्षेत्र व्यवस्थापन समिति
मण्डल, नाम्चे
Sagarmatha National Park Buffer Zone Management Committee, Namche

पत्र संख्या : २०७८/०७९
चलानी नं : ०६

मिति : २०७८।११।११

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
चिनगाल -८, काठमाडौं
बागमती प्रदेश, नेपाल ।

विषय : सूचना टाँस गरिएको सम्बन्धमा ।

प्रस्तुत विषयमा मोन्जो खोला मिनि हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनि हाइड्रो आयोजना १.८० मेगावाटको विद्युत उत्पादन तथा ११ के.भि. विद्युत प्रसारण लाइन आयोजनाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सूचनाको प्रतिलिपि थान १ यस समितिको कार्यालयमा मिति २०७८।११।११ गतेका दिन सूचना टाँस गरिएको व्यहोरा अनुरोध छ ।

[illegible]
का.मु.

चलानी नं.: ...../२०७८/७९ मिति: २०७८/११/०५

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बागमती प्रदेश , नेपाल

विषयः सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि यान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस [illegible] कार्यालयमा आज मिति २०७८/११/०५ गते दिनको ११.० बजे हामीहरुको रहोवरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिलः

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ०३ बस्ने वर्ष ३१ को [illegible]

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ०३ बस्ने वर्ष ३१ को [illegible]

इति सम्वत् २०७८ साल ११ महिना ०५ गते रोज [illegible] शुभम्

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङ्ल्हामु गाउँपालिका गाउँपालिकाको कार्यालय प्रमुख, सोलुखुम्बु प्रदेश नेपाल

चलानी नं.: ....../२०७८/७९

मिति: २०७८/११/५

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
वाग्मती प्रदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा., वडा नं. ३ मा रहेको यस ...खुम्बु पासाङल्हामु गा.पा. ३ न.व.का... कार्यालयमा आज मिति २०७८/११/५ गते दिनको ...10:30 बजे हामीहरुको रोहवरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ..३.... बस्ने वर्ष ३२ को आङ्मा दिकी शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ..३.... बस्ने वर्ष २८ को ङवाङ छिरिङ शेर्पा

इति सम्वत् २०७८.. साल ...११...महिना....५..... गते रोज .....२........ शुभम्

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिकाको कार्यालय, सोलुखुम्बु, प्रदेश नेपाल

चलानी नं.: ...../२०७८/७९ मिति: २०७८/११/०९

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बागमती प्रदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्गल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा., वडा नं. ३ मा रहेको यस [illegible]
कार्यालयमा आज मिति २०८/११/०३ [illegible] ७९ [illegible]
सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा. वडा नं. ८..... वस्ने वर्ष.३५को दावा शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङ्गल्हामु गा.पा. वडा नं. २..... वस्ने वर्ष.३९को दावा नाङ्गु शेर्पा

इति सम्वत् २०८० साल ७९ महिना ०९ गते रोज ०२ शुभम्

खुम्बु पासाङ्गल्हामु गाउँपालिका
कार्यपालिकाको कार्यालय
सोरोखर्क, सोलुखुम्बु,
१ नं. प्रदेश नेपाल

Monjo Khola Mini Hydro
Kathmandu

चलानी नं.: ..१.../२०७८/७९

मिति: २०७८/११/६

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बाग्मती प्रदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस ....स्वास्थ्य चौकी..... कार्यालयमा आज मिति २०७८/११/६ गते दिनको ....१०.... बजे हामीहरुको रहोवरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ...३..... बस्ने वर्ष २८ को ...[illegible] शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ...३..... बस्ने वर्ष ४१ को ...[illegible] शेर्पा

इति सम्वत् २०७८ साल ...११..महिना.....६..... गते रोज .....२.......... शुभम्

Monjo Khola Mini Hydro P. Kathmandu

खुम्बु पासाङ्ल्हामु गाउँपालिका गाउँ कार्यपालिकाको कार्यालय ... सोलुखुम्बु १ नं. प्रदेश नेपाल

चलानी नं.: ...../२०७८/७९

मिति: २०७८/११/०१

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बागमती प्रदेश , नेपाल

विषयः सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस [illegible] कार्यालयमा आज मिति २०७८/११/१५ गते दिनको ...१९... बजे हामीहरुको रोहबरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिलः

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ३..... बस्ने वर्ष ४५ को [illegible]

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ३..... बस्ने वर्ष ४९ को [illegible]

इति सम्वत २०७८ साल ...११...महिना.....५..... गते रोज .....२..... शुभम्

चलानी नं.: ....../२०७८/७९

मिति: २०७८/११/.५.

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बाग्मती प्रदेश , नेपाल

विषयः सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस ....[illegible]................ कार्यालयमा आज मिति ..२०७८।११।५ गते दिनको ....५..... बजे हामीहरुको रहोबरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ..३. बस्ने वर्ष..को ..[illegible]
सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ..३..... बस्ने वर्ष..को ...[illegible]

इति सम्वत् २०७८.. साल ..११...महिना.....५..... गते रोज .....२.......... शुभम्

चलानी नं.: ....../२०७८/७९ मिति: २०७८/..../....

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
बाग्मती प्रदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस रेड पाण्डा मन्जो स्वा.व.उ.सं. कार्यालयमा आज मिति २०७८/११/५ गते दिनको १०:३० बजे हामीहरुको रहोवरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ...३... बस्ने वर्ष ४१ को ङ. तेन्जी शेर्पा

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. ...२.... बस्ने वर्ष ३५ को पासाङ न्ह. शेर्पा

इति सम्वत २०७८ साल ....११...महिना.....५..... गते रोज .....२......... शुभम्

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
KHUMBILA BUFFER ZONE USER GROUP
खुम्बिला मध्यवर्ती क्षेत्र उपभोक्ता समूह
चौरीखर्क-१, मोन्जु, सोलुखुम्बु

पत्र संख्या
चलानी नं

मिति २०७८।११।०८

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा – काठमाडौं
बागमती प्रदेश, नेपाल

विषय : सूचना टाँस गरिएको सम्बन्धमा

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ६४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी प्रसारण लाइन निर्माण आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नका लागि खुम्बु पासाङल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यविधि २०७८ बमोजिम सार्वजनिक सूचनाको प्रतिलिपि थाम १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा रहेको यस खुम्बिला मध्यवर्ती क्षेत्र उपभोक्ता समूहको कार्यालय पाटिमा आज मिति २०७८।११।०८ गतेका दिनको ४ बजे हामीहरूको रोहबरमा सूचना टाँस गरि यो मुचुल्का सहिछाप गराइदियौं।

तायदात :

१. सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ३ बस्ने वर्ष ४४ को दावा ग्यालजेन शेर्पा।

२. सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ३ बस्ने वर्ष ४४ को सन्त बहादुर सुनुवार।

इति सम्वत् २०७८ साल ११ महिना ३ गते रोज २ शुभम्।

समूहको कार्यालय
चौरीखर्क-१, मोन्जु, सोलुखुम्बु
PO Box .... Tel .... Fax .... Email ....

चलानी नं.: ३६./२०७८/७९ मिति: २०७८/११/०६

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८, काठमाडौं
वागमती प्रदेश , नेपाल

विषय: सूचना टाँस गरिएको सम्बन्धमा ।

लिखितम मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना ९४२ किलोवाटको विद्युत उत्पादन तथा ११ केभी सिङ्गल सर्किट प्रसारण लाईन आयोजनाको संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन तयार गर्नको लागि खुम्बु पासाङ्ल्हामु गाउँपालिकाको संक्षिप्त वातावरणीय अध्ययन तथा प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन कार्यविधि, २०७८ बमोजिम सार्वजनिक सुचनाको प्रतिलिपि थान १ यस सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा., वडा नं. ३ मा रहेको यस श्री .... कार्यालयमा आज मिति २०७८/११/०६ गते दिनको ....२..... बजे हामीहरुको रहोबरमा सुचना टाँस गरि यो मुचुल्का सहिछाप गरिदियौं ।

तापसिल:

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. .३...... बस्ने वर्ष ४५को ....

सोलुखुम्बु जिल्ला खुम्बु पासाङ्ल्हामु गा.पा. वडा नं. .३...... बस्ने वर्ष २८को ....

इति सम्वत् २०७८ साल ११ महिना ०६ गते रोज ....२..... शुभम्

Annex XIX: Recommendation Letters

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
गाउँ कार्यपालिकाको कार्यालय, चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल
Office of the Rural Municipal Executive, Chaurikharka, Solukhumbu, 1 No. Province, Nepal

पत्र सं : ०७८/०७९
च.न : ६४१

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा -८,काठमाडौं
बागमती प्रदेश, नेपाल

विषय :- मोन्जो खोला मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे ।

उपरोक्त सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा.वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस क्षेत्रको उर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले विद्यमान् वातावरणमा समेत कुनै उल्लेख्य नकारात्मक प्रभाव नपर्ने साथै वन माथिको स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको वासस्थान समेत सुरक्षित हुने पर्यटकहरुको लागि विद्युतको सुविधा प्राप्त भई पर्यटन प्रर्वधमा समेत टेवा पुग्ने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ ।

मोहन प्रसाद चापागाई
प्रमुख प्रशासकीय अधिकृत

खुम्बु पासाङल्हामु गाउँपालिका
Khumbu Pasanglhamu Rural Municipality
३ नं. वडा कार्यालय, नाचिपाङ, सोलुखुम्बु, १ नं. प्रदेश नेपाल
Ward No. 3 Office, Nachipang, Solukhumbu 1 No Province Nepal

प.सं.: ०७८/०७९
च.नं.: २६९

मिति: २०७८/११/१५

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा -८,काठमाडौं
वाग्मती प्रदेश, नेपाल

विषय :- <u>मोन्जो खोला मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे ।</u>

उपरोक्त सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा.वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस क्षेत्रको उर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले विद्यमान् वातावरणमा समेत कुनै उल्लेख्य नकारात्मक प्रभाव नपर्ने साथै वन माथिको स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको वासस्थान समेत सुरक्षित हुने पर्यटकहरुको लागि विद्युतको सुविधा प्राप्त भई पर्यटन प्रर्वधमा समेत टेवा पुग्ने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ ।

(मिङ्मा छिरी शेर्पा)
वडा अध्यक्ष

मिङ्मा छिरी शेर्पा
वडा अध्यक्ष
खुम्बु पासाङल्हामु गाउँपालिका-३

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग

सगरमाथा राष्ट्रिय निकुञ्ज कार्यालय

नाम्चे, सोलुखुम्बु

प.सं. :- ०७८/७९ मिति :- २०७८/१२/२५ गते
च.नं. :- १४३५

विषय :- सिफारिस गरिएको सम्बन्धमा।

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा, ८, काठमान्डौ।
बागमती प्रदेश, नेपाल।

प्रस्तुत विषयमा सोलुखुम्बु जिल्ला स्थित खुम्बु पासाङल्हामु गाउ पालिका वडा न.३ मा सो मिनी हाइड्रो प्रा.लि. प्रस्ताबक रहेको मोन्जो खोला मिनी जल विधुत परियोजना यस क्षेत्रको उर्जाको आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले स्वच्छ उर्जा उत्पादन गरि बन माथिको स्थानीयको निर्भरतालाई कम गरि वन, वन्यजन्तुको वासस्थानमा थप नभई स्थानीय वातावरण तथा आय आर्जनमा समेत समेत सकारात्मक प्रभाव पार्ने भएकोले निम्न बुंदाहरु अनिवार्यरुपमा पालना गर्ने शर्तमा प्रस्तावित परियोजना कार्वान्वयनका लागि सिफारिश गरिएको व्यहोरा अनुरोध छ।

शर्तहरु

१. प्रस्तावित आयोजनाका लागि आवश्यक पर्ने भौतिक संरचनाहरु निर्माण गर्दा तथा सो आयोजना संचालन गर्दा सो गर्नु पुर्व राष्ट्रिय निकुन्ज तथा वन्यजन्तु संरक्षण ऐन, २०२९ वातावरण संरक्षण ऐन, २०७६, वातावरण संरक्षण नियमावली, २०७७, हिमाली राष्ट्रिय निकुन्ज नियमावली, २०३६, संरक्षित क्षेत्र भित्र भौतिक पूर्वाधार निर्माण तथा संचालन मापदण्ड,२०६५ को समेत पूर्ण पालना गर्नु पर्नेछ।

२. यस कार्यालय अन्तर्गत रहेको मंजो स्थित जोरसल्ले प्रवेशद्वारमा हाल बिधुत आपूर्ति अप्रायाप्त रहेको कारण Visitor Tracking System / Visitor Information System संचालन समेत समस्या आएको भन्ने सन्दर्भमा सो System संचालन लगायत जाडो यामका टिकट काउन्टरमा खटिने निकुन्जका कर्मचारी तथा आर्मी सुरक्षाकर्मी समेतको लागि कोठा तताउन, पानी तताउन, खाना पकाउन समेत सुविधा पुग्ने गरि सो आयोजनाले जाडो मौसममा दैनिक कम्तिमा ५ (पांच) किलोवाट तथा गर्मि मौसममा दैनिक ३ (तिन) किलोवाट विधुत आपूर्ति सो प्रवेशद्वार तथा आर्मी सुरक्षा पोस्टको लागि निःशुल्क रुपमा उपलब्ध गराउने व्यबस्था गर्नु पर्नेछ।

बोधार्थ

श्री राष्ट्रिय निकुन्ज तथा वन्यजन्तु संरक्षण विभाग
बबरमहल, काठमाडौं।

भूमिराज उपाध्याय
प्रमुख संरक्षण अधिकृत

पासाङल्हामु गाउपालिका
कार्यपालिकाको कार्यालय
नौरिकर्म, सोलुखुम्बु
१ नं. प्रदेश नेपाल

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

सगरमाथा राष्ट्रिय निकुञ्ज
मध्यवर्ती क्षेत्र व्यवस्थापन समिति

नाम्चे

Sagarmatha National Park Buffer Zone Management Committee, Namche

पत्र संख्या : २०७८ /०७९
चलानी नं : ०३

मिति : २०७८ /१२/२०

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
सिनामंगल -८, काठमाडौं
बागमती प्रदेश, नेपाल ।

विषय : मोन्जो मिनि हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे ।

प्रस्तुत विषयमा १ नं प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गाउँपालिका वडा नं ३ मा मोन्जो खोला मिनि हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना [illegible] उर्जा आवश्यकता पूरा गर्न प्रस्तावित आयोजना रहेको र उक्त आयोजनाले विद्यमान वातावरणमा समेत उल्लेख्य नकारात्मक प्रभाव पार्नुका साथै स्वच्छ उर्जा उत्पादन गरी [illegible] स्थानीय [illegible] वन तथा वन्यजन्तुको संरक्षण समेत सुनिश्चित हुने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनका लागि सिफारिस गरिएको छ ।

छिरिङ [illegible] शेर्पा
अध्यक्ष

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुम्बु पासाङल्हामु गाउँपालिका
गाउँकार्यपालिकाको कार्यालय

मिति: [illegible]

प्रमुख कार्यकारी अधिकृत ज्यू,
श्री मोन्जो खोला मिनि हाइड्रो प्रा.लि.,
तीनगंगा ८, काठमाण्डौ ।

विषय: राय सुझाव सहित आयोजना कार्यान्वयन सिफारिस गरेको सम्बन्धमा ।

महोदय,

उपरोक्त सम्बन्धमा यहाँ कार्यालयको मिति [illegible] गते च.नं. [illegible] को पत्रानुसार १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. [illegible] मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. [illegible] प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना [illegible] ऊर्जा आवश्यकता पूरा गर्न अत्यन्त आवश्यक रहेको र उक्त आयोजना [illegible] स्वच्छ ऊर्जा उत्पादन र वन [illegible] सहित यस संस्थाको मिति [illegible] गतेको निर्णय संलग्न राखि सिफारिस गरिन्छ ।

शर्तहरु,

१. यस सामुदायिक वन उपभोक्ता समूहभित्र बसोबास गर्ने स्थायी उपभोक्ताहरुलाई वातावरण संरक्षणार्थ प्रत्येक घर ५ किलोवाटको विद्युत निशुल्क उपलब्ध गराउनु पर्नेछ ।
२. यस परियोजना कार्यान्वयन हुँदा र परियोजना सञ्चालनमा रहदा सामाजिक विकास स्वरुप यस वन उपभोक्ता समूहभित्र बसोबास गर्ने स्थायी [illegible] रोजगारीको लागि विशेष प्राथमिकता प्रदान गराउनु पर्ने छ ।

राम काजी मगर
अध्यक्ष

Monjo Khola Mini Hydro Pvt. Ltd.
Kathmandu

पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee

GAUTAM BUDDHA BUFFER ZONE USER GROUP

गौतम बुद्ध मध्यवर्ती क्षेत्र उपभोक्ता समूह

चौरीखर्क-५, फाक्दिङ, सोलुखुम्बु

पत्र संख्या: ०७८/७९
चलानी नं.: ११

मिति: २०७८/११/१४

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिनकुने - ८ काठमाडौं
बागमती प्रदेश, नेपाल

विषय: मोन्जो मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे।

प्रस्तुत विषयमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस क्षेत्रको ऊर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले विद्यमान वातावरणमा समेत उल्लेख्य नकारात्मक प्रभाव पार्दैन साथै स्वच्छ ऊर्जा उत्पादन गरि वन प्रतिको स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको बासस्थान समेत सुरक्षित हुने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ।

अध्यक्ष
पुर्बा आङनु शेर्पा

समूहको कार्यालय
चौरीखर्क-५, फाक्दिङ, सोलुखुम्बु
Fax: Email:

Monjo Khola Mini Hydro
Kathmandu

पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
CHHOMOLONGMA BUFFER ZONE USER GROUP
छोमोलोङ्मा मध्यवर्ती क्षेत्र उपभोक्ता समूह
चौरीखर्क-६, घाट, सोलुखुम्बु

पत्र संख्या ०७५।०७६।
चलानी नं

मिति २०७५।११।०५।

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
सिलौंजा -८ - काठमाडौं
बागमती प्रदेश - नेपाल

विषय :- मोन्जो मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे

प्रस्तुत विषयमा १ नं प्रदेश सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं ५ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस क्षेत्रको ऊर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले विभिन्न चरणहरुमा समेत उल्लेखनीय नकारात्मक प्रभाव पार्दैन साथै स्वच्छ ऊर्जा उत्पादन गरि वन मासिने स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको वासस्थान समेत सुरक्षित हुने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागी सिफारिस गरिन्छ।

अध्यक्ष
आङ. नुरु शेर्पा
(signature)

समूहको कार्यालय
चौरीखर्क-६, घाट, सोलुखुम्बु
P.O. Box .... Tel. .... Fax .... Email ....

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu (stamp)

(signature)

खुम्बु पासाङल्हामु गाउँपालिका गाउँपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु १ नं. प्रदेश नेपाल (stamp)

दुधकुण्ड मध्यवर्ती क्षेत्र सामुदायिक वन उपभोक्ता समूह
DUDHKUNDA BUFFER ZONE COMMUNITY FOREST USER GROUP
खुम्बु पासाङल्हामु गाउँपालिका-३, घाट, सोलुखुम्बु १ नं. प्रदेश, नेपाल

पत्र संख्या: ०७८/०७९
चलानी नं

मिति २०७८/११/१५.

श्री, मोन्जो खोला मिनि हाइड्रो प्रा.लि
तिलगंगा काठमाडौं
बागमति प्रदेश नेपाल

विषय - मोन्जो मिनि हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे।

प्रस्तुत विषयमा प्रदेश नं. १ सोलुखुम्बु जिल्ला खु.पा.गा.पा वडा ३ स्थित मोन्जो खोला मिनि हाइड्रो प्रा.लि काठमाडौंको प्रस्तावक रहेको उक्त हाइड्रो आयोजना यस क्षेत्रको ऊर्जा आवश्यकता पुरा गर्ने अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले यस क्षेत्रको वन संरक्षणमा नियमित रूपमा टेवा पुग्ने र यस क्षेत्रमा विभिन्न योजना सम्पन्न गर्नेमा पनि सहयोग पुग्ने देखिएको र यस आयोजनाले स्वच्छ र सुन्दर वातावरण हुनको साथै जङ्गली जनावर संरक्षणमा मुख्य रूपमा सहयोग पुग्ने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ।

अध्यक्ष
ङवाङ जाङबु शेर्पा

Monjo Khola Mini Hydro P. Ltd. Kathmandu

पासाङल्हामु गाउँपालिका गाउँपालिकाको कार्यालय, सोलुखुम्बु, १ नं. प्रदेश नेपाल

RED PANDA BUFFER ZONE COMMITTEE FOREST USER GROUP

रेड पाण्डा मध्यवर्ती क्षेत्र सामुदायिक वन उपभोक्ता समूह

चौरीखर्क-३, सिलुङ, सोलुखुम्बु

मिति २०७८/११/१२

चलानी नं. २०७८/७९

श्री मोन्जो खोला मिनी हाइड्रो प्रा. लि.

तिलगंगा ८, काठमाडौं

बागमती प्रदेश नेपाल,

विषय: मोन्जो मिनी हाइड्रो आयोजना सम्बन्धी सिफारिस

उपरोक्त सम्बन्धमा १ नं प्रदेश सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा लि काठमाडौं प्रस्तावक रहेको उक्त आयोजना यस क्षेत्रको उर्जा आवश्यकता पूरा गर्ने किसिमको आवश्यक रहेको र वातावरण तथा वन्यजन्तुलाई हुने नकारात्मक प्रभाव नपर्ने र स्वच्छ वातावरण र वनको हैसियत कायम राख्दै स्थानीयलाई आय उर्जा राहत हुने हुँदा प्रस्तावित आयोजना कार्यान्वयनको लागि सिफारिस गरिन्छ।

अध्यक्ष

पासाङ नुरु शेर्पा

समितिको कार्यालय

चौरीखर्क-३, सिलुङ, सोलुखुम्बु

PO Box .... Tel .... Fax .... Email ....

Monjo Khola Mini Hydro ... Kathmandu

पासाङल्हामु गाउँपालिका गाउँपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
कोडदे मध्यवर्ती क्षेत्र समुदायिक वन उपभोक्ता समूह
KONGDE BUFFER ZONE COMMUNITY FOREST USER GROUP
खुम्बु पासाङल्हामु गा.पा.-३, सोलुखुम्बु

मिति २०६८/११/१३

पत्र:
च.नं:

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
गिलगंगा-८, काठमाडौं
बागमती प्रदेश, नेपाल

विषय – मोन्जो मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे ।

उपरोक्त सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खु.पा.गा.पा. वडा नं. ३ मा रहेको मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावित रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस टोलको आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले वित्तिय वातावरणमा असर नपर्ने र यस विद्युत उत्पादन गैर बाधक वन तथा वातावरण संरक्षणमा टेवा पुर्ने भएकोले यस प्रस्तावित परियोजना कार्यान्वयनको लागी सिफारिस गरेकु ।

धन्यवाद

फुन्जु शेर्पा
SC03226332

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
KUSHUM KHANGKARU BUFFER ZONE USER GROUP
कुसुम खाङकरू मध्यवर्ती क्षेत्र उपभोक्ता समूह,
चौरीखर्क-३, सोलुखुम्बु

पत्र संख्या
चलानी नं

मिति २०७८/११/१२.

श्री मोन्जो खोला मिनि हाइड्रो प्रा.लि
त्रिपुरेश्वर-८ काठमाडौं
बागमती प्रदेश, नेपाल

विषय – मोन्जो मिनि हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे ।

उपरोक्त सम्बन्धमा १ नं. प्रदेश सोलुखुम्बु जिल्ला खु.पा.गा.पा. वडा नं. ३ स्थित मोन्जो खोला मिनि हाइड्रो प्रा.लि काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनि हाइड्रो आयोजना यस स्थानीय स्तरमा दिगो विकास कार्यको लागि अति आवश्यक र यहाँको वन वातावरण संरक्षण गर्नेकालागी यस हाइड्रोले मुख्य मेरुदण्डको भूमिका निर्वाह गर्ने भएकोले र उक्त हाइड्रो निर्माण गर्दा वन्यजन्तुको वासस्थान र वातावरण संरक्षण हुने भएकोले प्रस्तावित परियोजना कार्यान्वयनको लागी सिफारिस गरिन्छ ।

अध्यक्ष
ङाक्पा छिरी शेर्पा
९८४२८८८६६२

समूहको कार्यालय
चौरीखर्क-३, सोलुखुम्बु, नेपाल
PO Box .... Tel .... Fax .... Email ....

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

पासाङल्हामु गाउँपालिका गाउँ कार्यपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु १ नं. प्रदेश नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
KHUMBILA BUFFER ZONE USER GROUP
खुम्बिला मध्यवर्ती क्षेत्र उपभोक्ता समूह
चौरीखर्क-१, मोन्जु, सोलुखुम्बु

प.सं.
चलानी नं.

मिति २०७८/११/१२

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि.
तिलगंगा-८ काठमाडौं
बागमती प्रदेश, नेपाल

विषय: मोन्जो मिनी हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे।

उपरोक्त सम्बन्धमा सम्बन्धमा १ नं. प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. वडा नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. कम्पनीको प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना यस क्षेत्रको उर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यकता रहेको र उक्त आयोजनाले विद्यमान वातावरणमा समेत उल्लेख्य नकारात्मक प्रभाव नपार्ने सस्तो स्वच्छ उर्जा उत्पादन गरि वन माथिको स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको वासस्थान समेत सुरक्षित हुने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ।

दावा ग्याल्जेन शेर्पा
अध्यक्ष

समूहको कार्यालय
चौरीखर्क-१, मोन्जु, सोलुखुम्बु
PO Box: ____ Tel: ____ Fax: ____ Email: ____

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

पासाङल्हामु गाउँपालिका गाउँकार्यपालिकाको कार्यालय चौरीखर्क, सोलुखुम्बु, १ नं. प्रदेश नेपाल

Sagarmatha National Park
Buffer Zone Management Committee
Chaurikharka Buffer Zone User Committee
PHARI BUFFER ZONE USER GROUP
फरी मध्यवर्ती क्षेत्र उपभोक्ता समूह
चौरीखर्क-५, सोलुखुम्बु

पत्र संख्या
चलानी नं

मिति २०७८/११/१३

श्री मोन्जो खोला मिनी हाइड्रो प्रा.लि
तिलगंगा-८ काठमाडौं
बाग्मती प्रदेश, नेपाल

विषय: मोन्जो खोला हाइड्रो आयोजना कार्यान्वयन सम्बन्धि सिफारिस गरिएको बारे।

उपरोक्त सम्बन्धमा १ नं प्रदेश, सोलुखुम्बु जिल्ला खुम्बु पासाङल्हामु गा.पा. व.नं. ३ मा मोन्जो खोला मिनी हाइड्रो प्रा.लि. काठमाडौं प्रस्तावक रहेको मोन्जो खोला मिनी हाइड्रो आयोजना उक्त क्षेत्रको ऊर्जा आवश्यकता पुरा गर्न अत्यन्तै आवश्यक रहेको र उक्त आयोजनाले वातावरणमा समेत उल्लेखनीय प्रभाव पार्नुको साटो स्वच्छ ऊर्जा उत्पादन गरि वन माथिको स्थानीयको निर्भरतालाई कम गरि वन तथा वन्यजन्तुको वासस्थान समेत सुरक्षित हुने देखिएकोले प्रस्तावित परियोजना कार्यान्वयनको लागि सिफारिस गरिन्छ।

पासाङ नुरु शेर्पा
अध्यक्ष

समूहको कार्यालय
चौरीखर्क-५, सोलुखुम्बु
PO Box .... Tel .... Fax .... Email ....

Monjo Khola ... Kathmandu

पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

Annex XX: Agreement with Land Owners

मोन्जो खोला मिनी हाइड्रो प्रा. ली. तथा स्थानीय जग्गावाला बिचको सम्झौता

आज मिति २०७८ साल चैत १६ गतेको दिन यस मोन्जो खोला मिनी हाइड्रो प्रा. लि. र तल उल्लेखित वासिन्दाका स्थानीय जग्गावाला बिच प्रस्तावित मोन्जो खोला मिनी हाइड्रो उप-आयोजना (९.८२ कि.वा.) निर्माण तथा सञ्चालन गर्न आवश्यक जग्गा उपलब्ध गराउने सम्बन्धमा निम्न बुँदाहरुमा छलफल भई सहमति भयो ।

छलफल तथा सहमतिका बुँदाहरु:

१. प्रस्तावित मोन्जो खोला मिनी हाइड्रो उप-आयोजना (९.८२ कि.वा.) निर्माण तथा सञ्चालन गर्नलाई उल्लेखित संरचना [illegible] क्षेत्रफल पर्ने [illegible] प्रस्तावित उप-आयोजना निर्माण तथा सञ्चालन गर्नको लागि यहाँ प्रावधानहरू आपसी सहमतिमा निम्न लिखित ३ (ख) मध्ये कुनै एक वा त्यो भन्दा बढी प्रावधान भित्र रही उल्लेखित जग्गा भन्दा केहि तल माथि पर्ने पनि आवश्यकता अनुसार जग्गा उपलब्ध गराउन हामी जग्गावालाहरू राजीखुसी छौं ।

क, जग्गा तथा जग्गावालाहरुको विवरण:

क.सं.	नाम*	कित्ता नं.	सम्भावित आवश्यक पर्ने जमिन क्षेत्रफल (व.मि.)	कैफियत
१	पासाङ शेर्पा	३	२२.८१	टेलरेस पाइप
२	पासाङ शेर्पा	१३	२४३.९१	पावर हाउस
३	पासाङ शेर्पा	१५	१३.०८	पेनस्टक पाइप
४	[illegible] शेर्पा	१७	१३५.७३	पेनस्टक पाइप
५	नवाङ गेले	१७	१३.८५	पेनस्टक पाइप
६	डोमा शेर्पा	२०	३११.८१	पेनस्टक पाइप
७	इली शेर्पा	२३	१३.३३	पेनस्टक पाइप
८	काजी शेर्पा	२१	३३.९१	पेनस्टक पाइप
९	पासाङ [illegible] शेर्पा	२२	८७.५	पेनस्टक पाइप
१०	कामि दोर्जी शेर्पा	३३	६६.३२	पेनस्टक पाइप

नोट: क.सं. १, २ र ३ को [illegible]

ख, सम्भावित सम्झौताका प्रावधानहरु

(१) हामी [illegible] उपलब्ध गराउने
(२) [illegible]

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

(३) जग्गाको मन्य [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] प्राप्त गरि कम्पनीलाई बेच्ने।

२. बुँदा १ को (क) मा उल्लेखित [illegible] बुँदा १ को (ख) मा उल्लेखित प्रावधानमा [illegible] हामी जग्गावालाहरु तथा मोन्जो खोला मिनी हाइड्रो प्रा. लि. [illegible] भई सम्झौतामा सहि छाप गरेका छौं ।

जग्गावालाहरुको तर्फ बाट

क्र.सं.	नाम	सहि	कित्ता नं.
१	पासाङ शेर्पा		[illegible]
२	फुरा [illegible] शेर्पा		[illegible]
३	नवाङ शेर्पा		[illegible]
४	डोमा शेर्पा		[illegible]
५	[illegible] शेर्पा		[illegible]
६	काजी शेर्पा		[illegible]
७	पासाङ [illegible] शेर्पा		[illegible]
८	[illegible] शेर्पा		[illegible]

साक्षीहरु

क्र.सं.	नाम	सहि
१	Jigme lamamo sherpa	
२	Nima Tenzing	
३	Mingma Chhiri Sherpa	
४		

मोन्जो खोला मिनी हाइड्रो प्रा. लि.को तर्फ बाट

नाम: ल्हाक्पा सोनाम शेर्पा

पद: अध्यक्ष

हस्ताक्षर:

कम्पनीको छाप

Monjo Khola Mini Hydro Kathmandu

साक्षी:

नाम: सम्राट राज लल्याल

पद: जीनरल म्यानेजर

हस्ताक्षर:

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

Annex XXII: Agreement with Existing Micro Hydro

सम्झौता पत्र

आज मिति २०७८/०८/२६ का दिन यस काठमाडौं जिल्ला बाग्मती प्रदेश काठमाडौं महानगरपालिका वडा नम्बर ८, तिलगंगा स्थित मोन्जो खोला मिनि हाईड्रो प्रा.लि. प्रस्तावित आयोजना का प्रतिनिधी र हाल सचालनमा रहेको सोलुखुम्बु जिल्ला, बाग्मती प्रदेश, पासाङ ल्हमु गाउपालिका वडा नम्बर ..... स्थित मोन्जो खोला माइक्रो जलविद्युत (५० कि.वा) आयोजनाका उपभोक्ता समिती तथा उपभोक्ताहरुका प्रतिनिधीबीच मोन्जो खोला मिनि हाईड्रो प्रा.लि.ले पबर्द्धन गर्ने लागेको मोन्जो खोला मिनि हाईड्रो (९.४२ कि.वा) को प्रबर्द्धन तथा व्यवस्थापन सम्बन्धमा दुवै पक्ष बीच निम्न लिखित बुदाहरुमा छलफल भई सहमति भयो ।

छलफल तथा निर्णयका बुंदाहरु :

१) यस प्रस्तावित मोन्जो खोला मिनि हाईड्रो आयोजना (९.४२ कि.वा) विकासको निमित्त हाल कायम रहेको मोन्जो खोला माइक्रो हाइड्रो (५० कि.वा) को विद्यमान संरचना हटाउनु पर्ने भएको हुनाले उक्त संरचना हटाउनका लागि मोन्जो खोला माइक्रो हाइड्रो जलविद्युत् आयोजना (५० कि.वा) ले मन्जुर गर्दछ । उक्त संरचनाहरु प्रस्तावित आयोजनाले आफ्नो श्रोत साधन प्रयोग गरी हटाउने मोन्जो खोला मिनि जलविद्युत प्रा.लि. लाई सम्पूर्ण जिम्मेवारी प्रदान गरिएको छ । यस व्यवस्थामा मोन्जो खोला माइक्रो जलविद्युत (५० कि.वा) आयोजनाको उपभोक्ता समिती तथा उपभोक्ताहरुको पूर्ण सहमती रहेको छ ।

२) बुदा नं. १ बमोजिम साविकका संरचनाहरु हटाई आयोजना बन्द भएको कारणले मोन्जो खोला मिनि हाईड्रो प्रा.लि. संग कुनैपनि पक्षको कुनै प्रकारको प्रतिफल वा क्षतिपूर्ती दावि रहने छैन । साथै उक्त साविकको आयोजनाले बेहोर्नु पर्ने कुनै पनि दायित्व नरहेको र भविष्यमा कुनै दायित्व बापत दावि आएमा त्यसको जिम्मा प्रस्तावित आयोजनाले लिने छैन । उक्त दायित्व का फरफारकको जिम्मा स्वयम् मोन्जो माइक्रो हाइड्रो (५० कि.वा) ले लिनु पर्ने छ ।

३) साविक आयोजना बन्द गरे बापत प्रस्तावित मोन्जो खोला आयोजनाले विस्तारित क्षमताको भरपर्दो विद्युत साविकका उपभक्ताहरु समेतलाई उपलब्ध गराउनु पर्नेछ ।

४) साविक आयोजनाको विस्थापनको लागि उक्त आयोजनाहरुले सहयोगकर्ता (donor) को सहमति आवश्यक भए साविक आयोजना स्वयमले लिनुपर्ने र प्रस्तावित आयोजनाले भविष्यमा सहयोगकर्ता (donor) बाट आउने सम्भावित कुनै पनि किसिमका माग दावि तथा क्षतिपूर्ति बेहोर्ने छैन ।

Monjo Khola Mini Hydro Project Kathmandu

७) प्रस्तावित आयोजनाको निर्माण, पवदन तथा दिगो व्यवस्थापन गर्ने सम्पूर्ण जिम्मेवारी प्रस्तावित आयोजना प्रवर्द्धकको हुनेछ । यस बापत वितरीत विद्युतको शुल्क बाहेक अन्य कुनै रकमशुल्क वार्षिक उपभोक्ता तथा उपभोक्ता समूहसग लिन पाइने छैन ।

६) प्रस्तावित आयोजनाको निर्माणको क्रममा आवश्यक पर्ने विद्युत वार्षिक आयोजनाले निर्धारण गरेका दरमा उपलब्ध गर्ने तथा निर्माण, पवर्द्धन र सचालनको लागी यस सम्झौताका सम्पूर्ण पक्षहरुबाट आवश्यक सहयोग गर्ने प्रतिबद्धता व्यक्त गरिछन ।

७) प्रस्तावित आयोजनाको निर्माण शुरु भए पश्चयात हाल सचालनमा रहेको मोन्जो खोला माइक्रो हाइड्रोबाट उत्पादन भइरहेको विद्युत आपूर्ति सेवा बन्द हुने र प्रस्तावित आयोजनाबाट लगभग १ वर्ष पश्चात विद्युत उत्पादन प्रारम्भ हुने क्रममा सबै पक्षको मन्जुरी छ । कुनै विशेष परिस्थितीले प्रस्तावित आयोजनाको निर्माण तथा सचालनमा ढिलाई हुन गए वप १ वर्षमा आयोजना सम्पन्न गर्ने जिम्मा प्रस्तावित आयोजनाको हुनेछ । नियन्त्रण भन्दा बाहिरको परिस्थिति बाहेक सो भन्दा बढि ढिलाई गरि वार्षिक उपभोक्तालाई विद्युत उपभोग गर्ने हकबाट वन्चित गरिने छैन ।

८) प्रस्तावित आयोजनाले विद्युत उत्पादन तथा वितरण प्रारम्भ गरे पश्चयात प्रस्तावित आयोजनाको विद्यमान नियम तथा प्रचलित नियम अनुसार निर्धारण गरेको दरमा वार्षिक आयोजना उपभोक्ताले विद्युत खरीद गरी उपभोग गर्ने सहर्मति भयो ।

९) वार्षिक आयोजनाको वार्षिक घरधुरी सरचना निवासले छाएका सडकसम्म विद्युत आपूर्ति गर्ने जिम्मा प्रस्तावित आयोजनाको हुनेछ भने उक्त स्थानबाट आफनो घर सरचना निवास सम्म विद्युत आपूर्ति गर्ने जिम्मेवारी वार्षिक उपभोक्ताको हुनेछ । यस बापत आवश्यक सम्पूर्ण सामग्री उपकरणको व्यवस्थापन वार्षिक उपभोक्ताले गर्नुपर्नेछ ।

१०) यो सम्झौता कार्यान्वयनमा भविष्यमा कुनैपनि विवाद उत्पन्न भएमा दुई पक्ष विचमेर आपसी सहर्मतिमा विवाद समाधान गरिनेछ, दुवै पक्ष बीच आपसी सहर्मति हुन नसक नेपालको प्रचलित कानून अनुसार विवादको समाधान गरिनेछ ।

११) यो सम्झौता, सम्झौता भएको मितीबाट लागु हुनेछ र प्रस्तावित आयोजना सचालनमा रहुन्जेल सम्म प्रभावकारी बहाल रहनेछ ।

मोन्जो खोला मिनि हाईड्रो प्रा.लि. को तर्फ बाट:

नाम: लक्ष्मण गोपाल श्रेष्ठ
पद: अध्यक्ष
हस्ताक्षर:
कम्पनीको छाप:

साक्षी :

नाम: उमेश पनेरु
पद: कोर्पोरेट निर्देशक
हस्ताक्षर:

मोन्जो खोला माइक्रो जलविद्युत (५० कि.वा) आयोजनाको तर्फ बाट:

नाम: डिल्ल तेन्जिङ शेर्पा.
पद: अध्यक्ष
हस्ताक्षर:
छाप:

साक्षी :

नाम: फुर्बा गेल्जेन शेर्पा.
पद: सदस्य.
हस्ताक्षर:

सम्झौता पत्र

आज मिति 2068/07/26 का दिन यस काठमाडौं जिल्ला, बागमती प्रदेश, काठमाडौं महानगरपालिका वडा नम्बर ८, तिलगंगा स्थित मोन्जो खोला मिनि हाईड्रो प्रा.लि. (प्रस्तावित आयोजना का प्रतिनिधी र हाल सचालनमा रहेको सोलुखुम्बु जिल्ला, बागमती प्रदेश पासाङ ल्हमु गाउपालिका वडा नम्बर ___ स्थित घट्टे खोला माइक्रो जलविद्युत (३० कि.वा) आयोजनाको उपभोक्ता समिती तथा उपभोक्ताहरु का प्रतिनिधी बीच मोन्जो खोला मिनि हाईड्रो प्रा.लि.ले प्रवर्द्धन गर्न लागेको मोन्जो खोला मिनि हाईड्रो (९.४० कि.वा) को प्रवर्द्धन तथा व्यवस्थापन सम्बन्धमा दुवै पक्ष बीच निम्न लिखित बुदाहरुमा छलफल सहमति भयो ।

बुँदाहरु :

१) यस प्रस्तावित मोन्जो खोला मिनि हाईड्रो (क्षमता ९.४० कि.वा.) आयोजनाले निर्माण पछि हाल सचालनमा रहेको घट्टे खोला माइक्रो जलविद्युत (क्षमता ३० कि.वा.) को वितरण लाई प्रभावित गर्ने हुनाले उक्त प्रस्तावित मोन्जो खोला मिनि हाईड्रो (९.४० कि.वा) सचालनमा आए पछि हाल सचालनमा रहेको घट्टे खोला माइक्रो जलविद्युत (क्षमता ३० कि.वा.) द्वारा उत्पादित विद्युत मोन्जो खोला मिनि हाईड्रो (क्षमता ९.४० कि.वा.) लाई बिक्रि गर्ने घट्टे खोला माइक्रो जलविद्युत (क्षमता ३० कि.वा.) आयोजना मन्जुर गर्दछ । उक्त विद्युतको बद्युत बिक्रि दर नेपाल विद्युत प्राधिकरणद्वारा ROR आयोजनाहरुलाई उपभोगको आधारमा हिउद र वर्षा याममा निर्धारण गरिए अनुसार हुनेछ जुन व्यवस्था सबै दिन बमोजिमको छ ।

Season	Rate
Wet (Jestha 16 – Mangsir 15)	Rs. 4.80/Kwh
Dry (Mangsir 16 – Jestha 15)	Rs. 8.40 /Kwh

यस सम्झौताको माध्यमबाट उक्त आयोजना बाट उत्पादित विद्युत को वितरणको जिम्मा मोन्जो खोला मिनि हाईड्राको हुनेछ । यो कुरामा घट्टे खोला माइक्रो जलविद्युत (क्षमता ३० कि.वा.) आयोजनाको उपभोक्ता समिती तथा उपभोक्ताहरुको पूर्ण सहमती छ ।

२) धारा नं १ बमोजिम घट्टे खोला माइक्रो जलविद्युतको सम्पूर्ण संरचना सहित आयोजनाको व्यवस्थापकिय जिम्मा घट्टे खोला माइक्रो जलविद्युत व्यवसायको हुनेछ ।

३) प्रस्तावित आयोजनाको निर्माणका क्रममा आवश्यक पर्ने विद्युत सम्बन्धी आयोजनाले माथि धारा नं १ मा उल्लेखित हरुमा उपलब्ध गर्ने तथा निर्माण, प्रवर्द्धन र सञ्चालनको लागी गरेम सम्झौताका सम्पूर्ण पक्षहरुबाट आवश्यक सहयोग गर्ने प्रतिबद्धता व्यक्त गरेछन् ।

४) यस आयोजनाले विद्युत वितरण गर्ने बोर्डपछि आयोजनाले निर्धारण गरेको दरमा बिजुली खरीद बिक्री गर्ने सहमति भयो ।

५) घट्टे खोला माइक्रो जलविद्युत (क्षमता ७० कि वा) आयोजनाले यहाँन पर्ने कुनै पनि दायित्व नरहेको र भविष्यमा कुनै दायित्व बापत दावि आएमा त्यसको जिम्मा प्रस्तावित मोन्जो खोला मिनि हाईड्रो आयोजनाले लिने छैन । उक्त दायित्वको फरफारकको जिम्मा स्वयम् घट्टे खोला माइक्रो जलविद्युत (७० कि वा) आयोजनाको उपभोक्ता समितीले लिन पर्ने छ ।

६) यो सम्झौता अनुसार भविष्यमा कुनैपनि विवाद उत्पन्न भएमा दुइ पक्ष मिलेर सहमति गरिनेछ . दुवै पक्ष बीच सहमति नभएमा नेपालको विद्यमान कानुन अनुसार सहमति गरिनेछ ।

७) यो सम्झौता आजको मितीबाट लागु हुनेछ र आयोजना सञ्चालन रहुन्जेल सम्म प्रभावकारी रहनेछ ।

मोन्जो खोला मिनि हाईड्रो प्रा.लि (पहिलो पक्ष) तर्फ बाट :

नाम: लक्ष्मण मोनाम शेर्पा
पद: अध्यक्ष
हस्ताक्षर:
कम्पनीको छाप :

साक्षी :

नाम: उमेश पनेरु
पद: कार्यकारी निर्देशक
हस्ताक्षर:

३ प्रस्तावित आयोजनाको निर्माणको क्रममा आवश्यक पर्ने विद्युत मासिक आयोजनाले उपयुक्त दरमा उपलब्ध गर्ने तथा निर्माण, प्रवर्द्धन र सञ्चालनको लागी यस सम्झौताका समस्त पक्षहरुबाट आवश्यक सहयोग गर्ने प्रतिबद्धता व्यक्त गर्दछन् ।

४ यस आयोजनाले विद्युत वितरण गर्न थालेपछि आयोजनाले निर्धारण गरेको दरमा विद्युत खरीद बिक्रि गर्ने सहमति भयो ।

५ ठाडोकोशी माइक्रो जलविद्युत (क्षमता १०० कि वा) आयोजनाले बेहोर्नु पर्ने कुनै पनि दायित्व नरहेको र भविष्यमा कुनै दायित्व आएमा दावि आएमा त्यसको जिम्मा प्रस्तावित मोन्जो खोला मिनि हाइड्रो आयोजनाले लिने छैन । उक्त दायित्वको फरफारकको जिम्मा स्वयम ठाडोकोशी माइक्रो जलविद्युत १०० कि वा। आयोजनाको उपभोक्ता समितीले लिनुपर्ने छ ।

६ यो सम्झौता अनुसार भविष्यमा कुनैपनि विवाद उत्पन्न भएमा दुइ पक्ष मिलेर सहमति गरिनेछ , दुवै पक्ष बीच सहमति नभएमा नेपालको विद्यमान कानून अनुसार सहमति गरिनेछ ।

७ यो सम्झौता आजको मितीबाट लागु हुनेछ र आयोजना सञ्चालन रहन्जेल सम्म प्रभावकारी रहनेछ ।

मोन्जो खोला मिनि हाईड्रो प्रा.लि (पहिलो पक्ष) तर्फ बाट :

नाम: ल्हाक्पा सोनाम शेर्पा
पद: अध्यक्ष
हस्ताक्षर:
कम्पनीको छाप :

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

साक्षी :

नाम: उमेश पनेरु
पद: कर्पोरेट निर्देशक
हस्ताक्षर:
कम्पनीको छाप :

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

पासाङल्हामु गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय
चौरीखर्क, सोलुखुम्बु
१ नं. प्रदेश नेपाल

घट्टे खोला माइको जलविद्युत (७० कि.वा) आयोजनाको उपभोक्ता समिती (दोस्रो पक्ष) तर्फ बाट :

नाम: टंक राम विश्वकर्मा
पद: अध्यक्ष
हस्ताक्षर:
कम्पनीको छाप

साक्षी :

नाम:
पद: प्रबन्धक
हस्ताक्षर:

मिति :

सम्झौता पत्र

आज मिति २०७८/०८/२८ का दिन यस काठमाडौं जिल्ला, बाग्मती प्रदेश, काठमाडौं महानगरपालिका वडा नम्बर ८, तिनकुने स्थित मोन्जो खोला मिनि हाइड्रो प्रा.लि. (प्रस्तावित आयोजना) का प्रतिनिधि र हाल सञ्चालनमा रहेको सोलुखुम्बु जिल्ला, बाग्मती प्रदेश पासाङ ल्हमु गाउँपालिका वडा नम्बर   स्थित छुमेमा माइक्रो जलविद्युत (३५ कि.वा) आयोजना को उपभोक्ता समिति तथा उपभोक्ताहरुका प्रतिनिधि बीच मोन्जो खोला मिनि हाइड्रो प्रा.लि.ले प्रवर्द्धन गर्न लागेको मोन्जो खोला मिनि हाइड्रो (९.४२ कि.वा) को प्रवर्द्धन तथा व्यवस्थापन सम्बन्धमा दुवै पक्ष बीच निम्न लिखित बुँदाहरुमा छलफल भई सहमति भयो ।

बुँदाहरु :

१. यस प्रस्तावित मोन्जो खोला मिनि हाइड्रो (क्षमता ९.४२ कि.वा) आयोजनाको निर्माण पछि हाल सञ्चालनमा रहेको छुमेमा माइक्रो जलविद्युत (क्षमता ३५ कि.वा) को वितरण क्षेत्र लाई प्रभावित गर्ने हुनाले उक्त प्रस्तावित मोन्जो खोला मिनि हाइड्रो (९.४२ कि.वा) सञ्चालनमा आए पछि हाल सञ्चालनमा रहेको छुमेमा माइक्रो जलविद्युत (क्षमता ३५ कि.वा) द्वारा उत्पादित विद्युत मोन्जो खोला मिनि हाइड्रो (क्षमता ९.४२ कि.वा) लाई बिक्रि गर्न छुमेमा माइक्रो जलविद्युत (क्षमता ३५ कि.वा) आयोजना मन्जुर गर्दछ । उक्त विद्युतको बढेन बिक्रि दर नेपाल विद्युत प्राधिकरणद्वारा ROR आयोजनाहरुलाई उपभोगका आधारमा हिउँद र वर्षा याममा निर्धारण गरिए अनुसार हुनेछ जुन व्यवस्था तल दिए बमोजिमको छ ।

Season	Rate
Wet (Jestha 16 – Mangsir 15)	Rs. 4.80/Kwh
Dry (Mangsir 16 – Jestha 15)	Rs. 8.40 /Kwh

यसै सम्झौताको माध्यमबाट उक्त आयोजना बाट उत्पादित विद्युत को वितरणको जिम्मा मोन्जो खोला मिनि हाइड्रोको हुनेछ । सो कुरामा छुमेमा माइक्रो जलविद्युत (क्षमता ३५ कि.वा) आयोजनाको उपभोक्ता समिति तथा उपभोक्ताहरुको पूर्ण सहमति छ ।

२. शर्त नं. १ बमोजिम छुमेमा माइक्रो जलविद्युतको सम्पूर्ण संरचना सहित आयोजनाको व्यवस्थापकिय जिम्मा छुमेमा माइक्रो जलविद्युत स्वयंको हुनेछ ।

३) प्रस्तावित आयोजनाको निर्माणको क्रममा आवश्यक पर्ने विद्युत सम्बन्धी आयोजनाले माथि बुदा नं १ मा उल्लेखित दरमा उपलब्ध गर्ने तथा निर्माण, प्रवर्द्धन र सञ्चालनको लागी यस सम्झौताको सम्पूर्ण पक्षहरुबाट आवश्यक सहयोग गर्ने प्रतिबद्धता व्यक्त गर्दछन् ।

४) यस आयोजनाले विद्युत वितरण गर्न थालेपछि आयोजनाले निर्धारण गरेको दरमा विद्युत खरीद बिक्रि गर्ने सहमति भयो ।

५) छुम्बेमा माइक्रो जलविद्युत (क्षमता ३५ कि.वा.) आयोजनाले बहोर्नु पर्ने कुनै पनि दायित्व नरहेको र भविष्यमा कुनै दायित्व बापत दावि आएमा त्यसको जिम्मा प्रस्तावित मोन्जो खोला मिनि हाईड्रो आयोजनाले लिने छैन । उक्त दायित्वको फरफारकको जिम्मा स्वयम् छुम्बेमा माइक्रो जलविद्युत (३५ कि.वा.) आयोजनाको उपभोक्ता समितीले लिन पर्ने छ ।

६) यो सम्झौता अनुसार भविष्यमा कुनैपनि विवाद उत्पन्न भएमा दुइ पक्ष मिलेर सहमति गरिनेछ . दुवै पक्ष बीच सहमति नभएमा नेपालको विद्यमान कानुन अनुसार सहमति गरिनेछ ।

७) यो सम्झौता आजको मितीबाट लागु हुनेछ र आयोजना सञ्चालन रहन्जेल सम्म प्रभावकारी रहनेछ ।

मोन्जो खोला मिनि हाईड्रो प्रा.लि. (पहिलो पक्ष) तर्फ बाट

नाम : लक्ष्मण मोनाम शेर्पा
पद : अध्यक्ष
हस्ताक्षर :
कम्पनीको छाप :

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साक्षी :

नाम : उमेश पनेरु
पद : कार्यकारी निर्देशक
हस्ताक्षर :

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

खुसेमा माइको जलविद्युत (३५ कि.वा) आयोजनाको उपभोक्ता समिती (दोस्रो पक्ष) तर्फबाट

नाम: दावा जाङ्बु शेर्पा
पद: अध्यक्ष
हस्ताक्षर:
कम्पनीको छाप:

साक्षी :

नाम: लक्ष्मण [illegible]
पद: सचिव
हस्ताक्षर:

मिति

सम्झौता पत्र

आज मिति २०८८/८८/८८ का दिन यस काठमाडौं जिल्ला, बागमती प्रदेश, काठमाडौं महानगरपालिका वडा नम्बर ८, तिनगाउ स्थित मोन्जो खोला मिनि हाइड्रो पावर प्रस्तावित आयोजना का प्रतिनिधी र हाल सञ्चालनमा रहेका सानुखुम्ब जिल्ला बागमती, प्रदेश नम्बर ३ गाउपालिका वडा नम्बर ३ स्थित ठाडोकोशी माइक्रो जलविद्युत १०० कि.वा. आयोजना को उपभोक्ता समिती तथा उपभोक्ताहरुका प्रतिनिधी बीच मोन्जो खोला मिनि हाइड्रो पावर प्रवद्धन गर्न लागेको मोन्जो खोला मिनि हाइड्रो ९.४० कि.वा. को प्रवर्दन तथा व्यवस्थापन सम्बन्धमा दुवै पक्ष बीच निम्न लिखित बुदाहरुमा छलफल भई सहमति भयो ।

बुँदाहरु :

१ यस प्रस्तावित मोन्जो खोला मिनि हाइड्रो (क्षमता ९.४० कि.वा.) आयोजनाले निर्माण पश्चि हाल सञ्चालनमा रहेको ठाडोकोशी माइक्रो जलविद्युत (१०० कि.वा.) को वितरण क्षेत्र लाइ प्रभावित गर्ने हुनाले उक्त प्रस्तावित मोन्जो खोला मिनि हाइड्रो ९.४० कि.वा. सञ्चालनमा आए पछि हाल सञ्चालनमा रहेको ठाडोकोशी माइक्रो जलविद्युत (क्षमता १०० कि.वा.) द्वारा उत्पादित विद्युत मोन्जो खोला मिनि हाइड्रो क्षमता ९.४० कि.वा. लाई थिति गर्ने ठाडोकोशी माइक्रो जलविद्युत (क्षमता १०० कि.वा.) आयोजना मन्जुर गरेछ । उक्त विद्युतको थोक विक्रि दर नेपाल विद्युत प्राधिकरणद्वारा ROR आयोजनाहरुलाई उपलब्ध गराईने विद्युत र वर्षा यामका निर्धारण गरिए अनुसार हुनेछ जुन व्यवस्था तल दिए बमोजिमको छ ।

Season	Rate
Wet (Jestha 16 – Mangsir 15)	Rs. 4.80/Kwh
Dry (Mangsir 16 – Jestha 15)	Rs. 8.40 /Kwh

यस सम्झौताको माध्यमबाट उक्त आयोजना बाट उत्पादित विद्युतको वितरणको जिम्मा मोन्जो खोला मिनि हाइड्रोको हुनेछ । सो कुरामा ठाडोकोशी माइक्रो जलविद्युत (क्षमता १०० कि.वा.) आयोजनाको उपभोक्ता समिती तथा उपभोक्ताहरुको पण सहमती छ ।

२ शर्त नं १ बमोजिम ठाडोकोशी माइक्रो जलविद्युतको सम्पुर्ण सरचना सहित आयोजनाको व्यवस्थापकिय जिम्मा ठाडोकोशी माइक्रो जलविद्युत सबैको हुनेछ ।

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ठाडोकोशी माइको जलविद्युत (१०० कि.वा) आयोजनाको उपभोक्ता समिती (दोस्रो पक्ष) तर्फ बाट

नाम
पद
हस्ताक्षर
कम्पनीको छाप

साक्षी :

नाम
पद
हस्ताक्षर
कम्पनीको छाप

मिति :

Annex XXIIII: Photographs

Figure 1: Monjo River

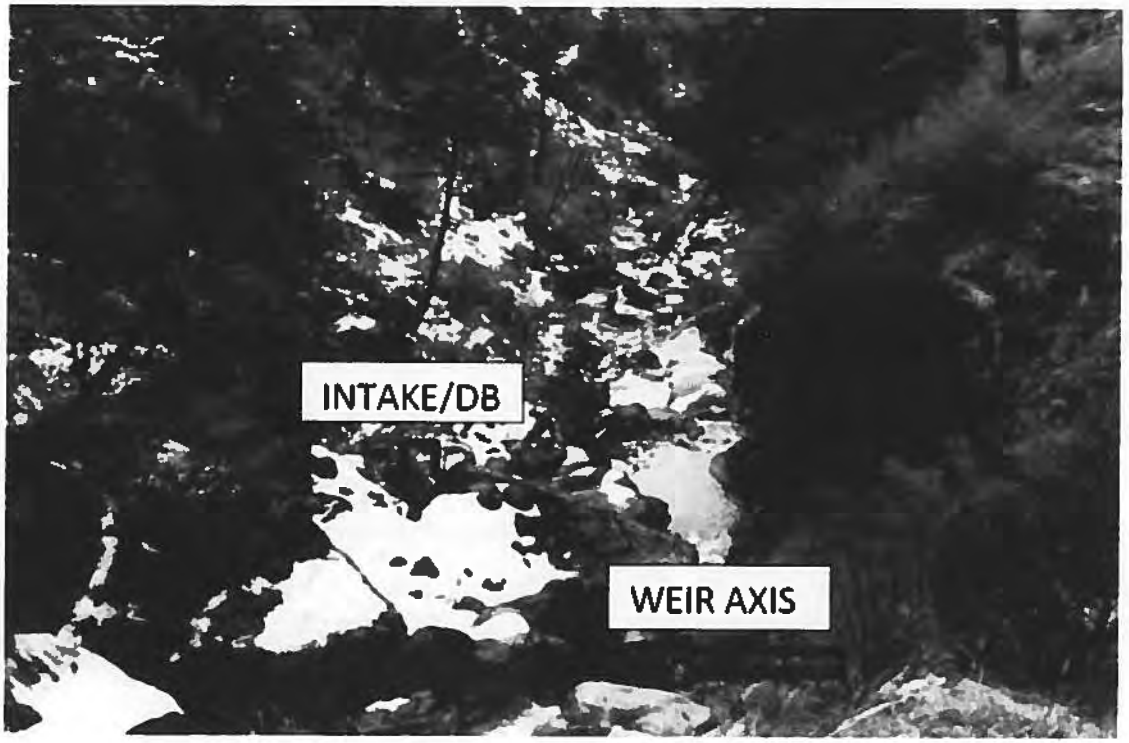

Figure 2: Weir, Intake and Desilting Basin(DB) Location

Figure 3: Penstock Route

Figure 4 : River Crossing

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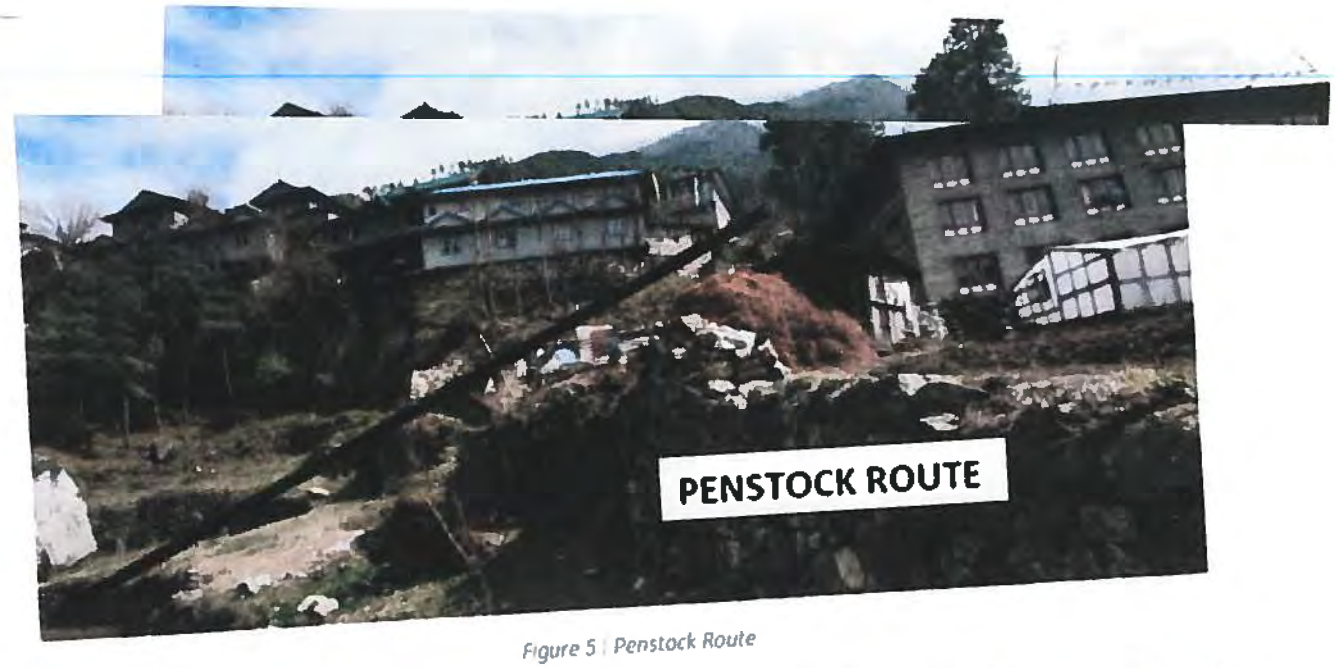

Figure 5 | Penstock Route

Figure 6: Penstock Route and Powerhouse (PH)

(Photo Source: DFS Report)

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu

Chair Person of Monjo Khola Micro Hydro, at Public Hearing

Public Hearing Program at Monjo

Monjo Khola Mini Hydro Pvt. Ltd. Kathmandu