EIA of Devdaha Medical College and Research Institute

Submitted to

Ministry of Environment, Science and Technology
Singh Durbar, Kathmandu

Through

Ministry of Education and Sports
Kesharmahal, Kathmandu

Submitted By

Devdaha Medical College and Research Institute
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ACRONYMS

DMCRI	Devdaha Medical College and Research Institute
EIA	Environment Impact Assessment
GON	Government of Nepal
IEE	Initial Environmental Examination
MOEST	Ministry of Environment, Science and Technology
MOES	Ministry of Education and Sports
NCS	National Conservation Strategy
NEHI	Nepal Environmental Health Initiative
NHP	National Health Policy
NGO	Non Government Organization
OPD	Outdoor Patients Department
OT	Operation Theater
RCC	Reinforced Cement Concrete
RBC	Reinforced Brick Concrete
SLTH	Second Long Term Health Plan
SWMRMA	Solid Waste Management and Resource Mobilization Act
VDC	Village Development Committee

कार्यकारी सारांश

१. परिचय

१.१ आयोजनाको पृष्ठभूमी

जनताको स्वास्थ्य स्थितिमा सुधार गर्ने उद्देश्यले वि.सं. २०४८ सालमा नेपालमा राष्ट्रिय स्वास्थ्य नीति तयार गरियो, जसले स्वास्थ्य क्षेत्रको सेवा प्रदान र प्रशासनिक आकारलाई समेटेको छ । यसै नीतिसंग आधारित रहेर आठौं, नवौं योजनाहरु र दोश्रो दीर्घकालिन स्वास्थ्य योजना तयार पारिए । जिल्ला र गा.वि.स. तहसम्म एकीकृत र आवश्यक स्वास्थ्य सेवा सुविधाहरुको विकास गर्नु, सकृय सामुदायिक सहभागिताको आधारमा स्वास्थ्य सेवाको विकास गर्नु र साधारण तथा विशेष स्वास्थ्य सेवाको विकासमा निजी क्षेत्रलाई समावेश गर्नु स्वास्थ्य नीतिका प्रमुख विशेषता हुन् । विशेष स्वास्थ्य सेवाको रुपमा सरकारी नीति अनुरुप नेपालमा स्तरीय स्वास्थ्य सेवा प्रदान गर्ने उद्देश्यले रुपन्देहीको देवदहमा प्रस्तावित श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट स्थापना गर्न लागिएको हो । यस संस्थाले देवदह गा.वि.स. भलुही - ८ अन्तर्गत करीब २० बिगाहा क्षेत्रमा ७०० बेडको सुविधा सम्पन्न अस्पताल निर्माण गर्नेछ । साथै, यस संस्थाबाट वार्षिक १०० जना एम.बि.बि.एस. तहका मेडिकल विद्यार्थीहरुलाई भर्ना लिई पठनपाठन गराइनेछ ।

यस संस्थाले उच्च स्तरको स्वास्थ्य सेवा प्रदान गर्नुको अलावा मेडिकल क्षेत्रमा गुणस्तरीय जनशक्ति उत्पादन गर्नेछ । यस संस्थामा गुणस्तरीय र उच्च प्रविधिका उपकरणहरुद्वारा रोगहरुको परीक्षण गरिनेछ । ओ.पि.डि., आइ.सि.यू., फार्मेसी, प्याथोलोजी, आकस्मीक सेवा र वार्डहरु आदि मापदण्ड अनुसार निर्माण गरी गुणस्तरीय सेवा प्रदान गर्ने संस्थाको प्रमुख उद्देश्य हो ।

१.२. अध्ययनको उद्देश्य

देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट आयोजनाको वातावरणीय प्रभाव मूल्याङ्कन अध्ययनको प्रमुख उद्देश्य प्रस्तावित कलेज एण्ड रिसर्च इन्स्टिच्यूटको वातावरणीय पक्षहरुको अध्ययन गर्नु, संभाव्य सकारात्मक एवं नकारात्मक प्रभावहरुको निर्धारण एवं मूल्याङ्कन गर्नु, आयोजनाको भौतिक, जैविक एवं सामाजिक, आर्थिक, सांस्कृतिक अवयवहरुमा पर्न सक्ने प्रभावहरु अनुमान गर्नु, प्रभावहरुको न्यूनिकरण र सुधारका उपायहरु प्रस्ताव गर्नु एवम् वातावरणीय अनुगमन योजना र सम्परीक्षण योजना तयार गर्नु हो ।

२. अध्ययन विधी

वातावरणीय प्रभाव मूल्याङ्कन (EIA) अध्ययनको क्षेत्र निर्धारण र कार्यसूची तयार गर्ने क्रममा सन्दर्भ सामाग्रीहरुको संकलन र अध्ययन, आयोजना स्थलको क्षेत्र भ्रमण, स्थानीय स्तरमा अन्तरक्रिया र छलफल, हावा, पानी, माटोको प्रयोगशाला परीक्षण, सरोकारवालाहरुबाट राय सुझाव संकलन गर्न १५ दिने सार्वजनिक सूचना प्रकाशन आदि कार्यहरु गरियो । वातावरण प्रभाव मूल्याङ्कन प्रतिवेदन तैयार गर्नु अघि स्थलगत भ्रमण, स्थानीय व्यक्ति, संघसंस्थाहरुसंग छलफल र बृहत सार्वजनिक सुनुवाई मार्फत विचार, राय प्रतिक्रिया र सूचना संकलन गर्ने काम सम्पन्न भयो ।

संकलित तथ्याङ्कलाई प्रशोधन गरी प्रभावको पहिचान तथा आङ्कलन तदर्थ विधि, चेकलिष्ट, म्याट्रिक्स, नक्सा खप्टाउने, विशेषज्ञ प्रणाली विधिको प्रयोग गरिएको छ । प्रभावको उल्लेखनियता

विशेषज्ञ, सरोकारवालाहरुको परामर्श, न्यूमेरीकल भ्यालुज, स्वास्थ्य ऐन, र नेपाल सरकारबाट प्राप्त भएका निर्णयहरुको उपयोग गरिएको छ । प्रभावलाई उपयुक्तता अनुसार तालिका र म्याट्रिक्समा प्रस्तुत गरिएको छ ।

२.१ दस्तावेजहरुको अध्ययन

हालसम्म यस विषय संग सम्बन्धित प्रकाशित पुस्तक, जरनल, नियम कानून, अध्ययन र अन्य सन्दर्भ सामाग्रीहरुको अध्ययन र विश्लेषण गरियो ।

२.२ स्थलगत अध्ययन

भौतिक, जैविक, आर्थिक, सामाजिक, सांस्कृतिक पक्षहरुको बारेमा तथ्याङ्क संकलन गर्न तथा अध्ययन गर्न उपयुक्त प्रविधी प्रयोग गरी विवरण संकलन गर्न दक्ष व्यक्तिहरु समावेश भएको टोलीले मार्च अप्रिल २००६ मा आयोजना स्थलको भ्रमण गऱ्यो ।

२.२.१ भौतिक वातावरण : यस अन्तर्गतका विवरण संकलन गर्न आयोजना क्षेत्रको भू-बनोट, हावापानी, भू-गर्भ, पानीको गुणस्तर, हावा र माटोको गुणस्तर, ध्वनीको मात्रा बारे अध्ययन र मूल्याङ्कन गरियो ।

२.२.२ जैविक वातावरण : स्थलगत अध्ययन र अवलोकनको क्रममा मुख्य रुपमा यस आयोजना क्षेत्रको वनस्पती, वनजंगल, वन्यजन्तु आदिमा आयोजना निर्माण र सञ्चालनमा पर्न सक्ने असरमा जोड दिइयो ।

२.२.३ सामाजिक, आर्थिक र सांस्कृतिक वातावरण : उपयुक्त विधी प्रयोग गरी आयोजना क्षेत्रको विभिन्न सामाजिक, आर्थिक, सांस्कृतिक क्षेत्रसंग सम्बन्धित विवरण संकलन गरियो ।

३. आयोजना विवरण

३.१ आयोजनाको स्थल

देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट रुपन्देही जिल्लाको देवदह गा.वि.स. वडा नं. ८ भलुही अन्तर्गत पर्दछ । यस संस्थाले करीब २० बिगाहा जग्गा ओगटेको छ । आयोजना स्थल बुटवलबाट करीब ९ कि.मी. पूर्व तर्फ पर्दछ । यस आयोजना अन्तर्गत अस्पताल र मेडिकल कलेजलाई आवश्यक पर्ने सम्पूर्ण पूर्वाधारहरु तयार गरिने छ ।

३.२ प्रस्तावित आयोजना अन्तर्गत निर्माण हुने यूनिटहरु

अस्पताल, कलेज, आवास, फूलबारी, पार्क, पार्किङ आदि क्षेत्रहरु रहने छन् । यस संस्थामा ओ.पि.डि. कक्ष, रेडियोलेजी कक्ष, प्याथोलोजी, फार्मेसी, वार्डहरु, ओ.टी., आई.सि.यु, पुस्तकालय, सभाकक्ष, फोहरमैला थुपार्ने ठाउँ, फोहरमैलाको व्यवस्थित व्यवस्थापन गर्ने ठाउँ, कक्षा कोठाहरु, फिजियोलोजी विभाग, बायो केमिष्ट्री विभाग, प्याथोलोजी विभाग, माइक्रोबायोलोजी विभाग, एनाटोमी विभाग, मेडिसिन विभाग, महिला तथा प्रसुति विभाग, फार्मोकोलोजी र कम्युनिटी मेडिसिन, माइक्रोबायोलोजी, अर्थोपेडिक, सर्जरी विभाग, अप्थाल्मोलोजी, डरमाटोलोजी, पेडियाट्रिक्स, एनेस्थीया, डेन्टिष्ट्री, फिजियोथेरापी, साईकियाट्रिक आदि रहनेछन् ।

यस प्रतिवेदनमा समावेश गरिएका चित्रहरुले भवनको अवस्थिती, सुविधाहरु र अन्य ठाउँ सहित हरेक इकाइको विस्तृत नक्सा समावेश गरिएको छ ।

३.३ प्रस्तावित आयोजनाको मुख्य विवरण

प्रस्तावित देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूटको कुल जग्गा = २० विगाहा

देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूटको यूनिटहरु र क्षेत्रफल यस प्रकार छन् ।

क्र. सं.	यूनिट	तल्ला	निर्माण गरिने वर्षहरु			कैं
			प्रथम	दोश्रो	तेश्रो	
१.	ओ.पि.डि.	भुइँ पहिलो	१२,४६४ व.फि.	१२,४६४ ब.फि.		
२.	इनडोर	भुइँ पहिला	२७,००० व.फि. ७,४४८ ब.फि.	७,४४८ ब.फि. २,००० ब.फि.	७,००० ब.फि.	
३.	कलेज ब्लक					
३.१	एनाटोमी	भुइँ	६,७६० व.फि.			
३.२	फिजीयोलोजी	भुइँ	४,१६० व.फि.			
३.३	बायो केमिष्ट्री	भुइँ	४,१६० व.फि.			
३.४	कम्युनिटी मेडिसिन फार्मेकोलोजी	पहिलो	४,१६० व.फि.			
३.५	प्याथोलोजी	पहिलो	६,७६० ब.फि.			
३.६	माइक्रोबायोलोजी	पहिलो	४,१६० व.फि.			
४.	कर्मचारी गृह		२५,००० ब.फि.	२५,००० ब.फि.	२५,००० ब.फि.	
५.	छात्रावास	भुइँ पहिलो	१०,००० व.फि.	१०,००० ब.फि.	१०,००० ब.फि.	
६.	ओ.टी. ब्लक	भुइँ	५,००० ब.फि.	५,००० ब.फि.	५,००० ब.फि.	
७.	व्यवस्थपन ब्लक		५,००० व.फि.	५,००० ब.फि.		

३.४ निर्माण योजना

यो प्रतिवेदनमा निर्माण विधि, आवश्यक कामदारहरुको स्तर र संख्या, प्रयोग गरिने निर्माण सामाग्रीहरु, आदि विस्तृत रुपमा प्रस्तुत गरिएको छ ।

४. वातावरणीय नीति, कानून, नियमावली तथा निर्देशिकाहरुको पुनरावलोकन:

विद्यमान नीति, नियम, नियमावलीहरुको वातावरणिय प्रभाव मुल्यांकन गर्ने सिलसिलामा समिक्षा गरिएको छ । मुलत: वातावरण संरक्षण ऐन, वातावरण संरक्षण नियमावली, २०५४, अस्पतालजन्य फोहरहरुको लागि नेपाल स्वास्थ्य अनुसन्धान परिषदले तयार गरेको निर्देशिकाहरुको वातावरणीय प्रभाव मूल्यांकन प्रतिवेदन तयार गर्ने सन्दर्भमा पुनरावलोकन गरिएको छ । यस वाहेक प्रतिवेदन तयार पार्ने सन्दर्भमा स्वास्थ्य क्षेत्र संग सम्वन्धीत नीति, नियमहरु, फोहरमैला तथा स्रोत परिचालन सम्बन्धी ऐन, पुनरावलोकन गरिएको छ ।

५. विद्यमान वातावरणीय अवस्था

५.१ भौतिक अवस्था

आयोजना स्थल रुपन्देही जिल्लाको देवदह गा.वि.स. वडा नं. ८ मा पर्दछ । यो स्थान २७° ४७' १०" ल्याटिच्युड र ८३° १२' १६" लंगिच्युडमा पर्दछ । यो तराई भावर क्षेत्र अन्तर्गत पर्दछ । यसको दक्षिण तिर समथर भू-भाग छ । चुरे पर्वत उत्तर तर्फ पर्दछ । यो आयोजना क्षेत्र कृषियोग्य जमिनमा बन्दैछ जसको एकतर्फ सामुदायिक वन र दुई तर्फ मानव वस्ती छ र अन्य एक तर्फ महेन्द्र राजमार्ग छ ।

आयोजनाको केही भाग नदीको बाढी सतह भन्दा मुनी पर्दछ । यो क्षेत्रमा बाटो र फुलबारी क्षेत्र प्रस्ताव गरिएको छ । यो क्षेत्र रोहणी र भलुही खोला क्षेत्रको मुखमा पर्दछ । यो भावर क्षेत्रबाट शुरु हुन्छ भने यस क्षेत्रमा तल ग्राबेल, पेब्बल, र ठूल्ठूलो ढुङ्गा (बोल्डर) पाईन्छ । यस क्षेत्रमा पहेलो माटो पाईन्छ । रोहणी खोला दोश्रो श्रेणीको र भलुही तेश्रो श्रेणीको खोला हो । भलुही खोला पूर्वबाट र रोहिणी खोला १५० मीटर तलबाट बग्दछन् । यो क्षेत्रमा मनसुन वर्षा प्रमुख हो । विगत ५ वर्षका अधिकतम् तापमानहरु ३५.५, ३७.२, ३४.७, ३६, ३५.९ र ३८.६ डिग्री सेल्सीयस छन् । न्यूनतम तापमान क्रमशः ११.९, १०.५, १२.६, ११.२ र १०.५ डिग्री सेल्सीयस छन् ।

हावा र ध्वनीको आयोजना क्षेत्रमा पूर्व मापन गरेको पाइदैन । आधारभूत तथ्याङ्क संकलन गर्ने समयमा गरिएको मापन अनुसार ध्वनी ४० डेसिबेल र हावा पनि मापदण्ड भित्र पाइयो ।

५.२ जैविक वातावरण

आयोजना स्थल भित्र कुनै पनि वन क्षेत्र पर्दैन । आयोजना स्थल बाहिर २ वटा सामुदायिक वन क्षेत्र पर्दछ । जुन सामुदायिक वन क्षेत्र मिलन सामुदायिक वन र जनप्रिय सामुदायिक वन हुन । आयोजना निर्माण स्थलमा एउटा पिपल, एउटा बकैनो, ११ सिसौं, तीन खनीया, एक इपिल इपिल र एक जमुनाका रुखहरु पर्दछन् । आयोजना स्थलको वरपर कुनै वन्यजन्तु भेटिएनन् ।

५.३ सामाजिक, आर्थिक, एवं सांस्कृतिक वातावरण

यस क्षेत्रमा मुख्य बसोवास गर्ने जातहरुमा ब्राम्हण, क्षेत्री, चौधरी, मगर, तामाङ, गुरुङ, गैरे, लिम्बु, मुस्लीम समुदाय पर्दछन् । यस क्षेत्रको साक्षरता करीब ७५% रहेको छ ।

मुख्य आयस्रोतमा कृषि पर्दछन् । यसको अलावा वैदेशिक रोजगारी पनि दोश्रो प्रमुख श्रोतमा पर्दछन् । अन्यमा साना व्यापारी र औद्योगिक कल कारखानामा काम गर्ने मजदुर पर्दछन् ।

प्रस्तावित आयोजना महेन्द्र राजमार्गसंगै पर्दछ जुन सार्वजनिक यातायातबाट सजिलै पुग्न सकिन्छ । स्थानिय स्तरमा बस, माइक्रो, जीप आदि सञ्चालन हुन्छन् जसले बर्घघाट, बुटवल आदिबाट मान्छेहरु ओसार पसार गर्दछन् ।

खानेपानी र सरसफाईको सवालमा यस गा.वि.स. भूमिगत पानीको श्रोतहरुमा हालसम्म निर्भर रहदै आएको छ । भूमिगत पानी ट्युबवेलद्वारा तानिने गर्दछ । पानी करीब २० मीटर देखि १०० मीटरको सतहबाट निकालेको पाइन्छ ।

यो क्षेत्रमा हिन्दु, बौद्ध, इसाई र मुस्लिम धर्मावलम्बीहरु पाईन्छन् । वडा नं. ८ मा ७ वटा मन्दिरहरु छन् । जसमध्ये गणेश, रोहिणी, भलुही, बालकुमारी, पण्डित टोल मुख्य पर्दछन् । यो क्षेत्रमा स्वास्थ्य चौकी, प्राइभेट क्लिनिक आदि सञ्चालित छन् । यसको अलावा मुख्य उपचारको लागि लुम्बिनी अञ्चल अस्पताल बुटवल छ । यहाँका वासिन्दाहरु औषधी उपचारको सिलसिलामा काठमाण्डौं र गोरखपुर पनि जान्छन् ।

शैक्षिक क्षेत्रको हकमा एउटा मा.वि. (जनप्रिय मा.वि.), दुईवटा बोर्डिङ्ग स्कुल नजिकै पर्दछन् । यस क्षेत्रमा भिजन हाईजिन उद्योग, डिष्टिलरी, आदि पर्दछन् ।

६. विकल्प विश्लेषण

वैकल्पिक विश्लेषणलाई वातावरणीय मूल्याङ्कनको अभिन्न अंश मानिन्छ । वर्तमान स्थितीमा आयोजना स्थलको कुनै विकल्प देखिदैन ।

७. संभाव्य वातावरणीय प्रभावहरु

७.१ अनुकुल प्रभाव तथा प्रभाव अधिकतम् गर्ने उपायहरु

आयोजना निर्माण चरणमा आयोजना निर्माण गर्नु पूर्व नै आयोजनाबारे स्थानीय जनतालाई उपलब्ध कामको बारेमा जानकारी दिने छ । आयोजना निर्माण अवधिका दक्ष, अर्धदक्ष र अदक्ष कामदारहरु स्थानिय तवरबाट परिपूर्ति गर्नुपर्ने हुन्छ । यसले स्थानिय स्तरमा रोजगारीको अवस्थ सृजना गरी आर्थिक अवस्थामा सुधार ल्याउदछ ।

कर्मचारी र कामदारको माग आपूर्तिको लागि स्थानिय स्तरमा तरकारी, चामल, दाल, फुल, दुध, घिउ, कुखुरा जस्ता वस्तुहरुले बजार पाउने छन् । विभिन्न प्रकारका कुटीर उद्योग र पसलहरुले थप आर्थिक स्थितीमा सुधार ल्याउन आयोजनाले उत्प्रेरण गर्ने छ ।

आयोजनाको निर्माण चरणमा कामदारहरुले व्यवसायीक सीप सिक्ने मौका प्राप्त गर्ने छन् । उच्च र वैज्ञानिक हिसावको निर्माण प्रकृयासंग सम्बन्धित कार्यहरु स्यानिटरी, विद्युत, उपकरण जडान, एअर कन्डिसन, टायल, रंगरोगन, वेल्डिङ, आदि सम्बन्धी ज्ञानहरु हासिल गर्नाले भविष्यमा देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट या अन्य सम्बन्धित क्षेत्रहरुमा स्वरोजगारीको अवस्था रहनेछ ।

सञ्चालन चरणमा देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट बाट उच्च स्तरको स्वास्थ्य सम्बन्धी सेवाहरु सस्तो, सुलभ रुपमा स्थानिय व्यक्ति समुदायहरुको अलावा राष्ट्रिय रुपमा समेत पुऱ्याउँदछ । सञ्चालनको क्रममा यस संस्थाले दीर्घकालिन रुपमा स्थानिय व्यक्तिहरुलाई रोजगारी प्रदान गर्ने देखिन्छ ।

यस संस्थाद्वारा २० प्रतिशत विद्यार्थीहरुलाई नेपाल सरकारको सिफारिसमा निःशुल्क अध्ययन गराउनु पर्नेछ । साथै २० प्रीतशत शैया असहाय र अशक्त विरामीको लागि छुट्याउनु पर्नेछ । यस मध्ये १० प्रतिशतलाई निःशुल्क उपचार गर्नुपर्नेछ । र १० प्रतिशतलाई वेडको शुल्क नलिने व्यवस्था गर्नु पर्नेछ ।

स्थानिय गा.वि.स. र समुदायका विभिन्न मागहरु प्रति संस्था सकारात्मक रहनेछ । प्राथमिकता र पारस्परिक सहयोग हुने सवालहरुमा संस्थाले बाटो, खानेपानी, तालिम आदि जस्ता सामुदायिक विकासका कार्यहरुमा संस्थाले सहयोग पुऱ्याउने छ ।

७.२ प्रतिकुल प्रभावहरु

आयोजना निर्माण र सञ्चालनको क्रममा विभिन्न प्रकारका प्रतिकूल प्रभावहरु समेत पर्ने देखिन्छ। उक्त प्रभावहरु निम्न प्रकारका हुने आंकलन गरिएको छ।

७.२.१ भौतिक वातावरण

निर्माण चरण

भू-उपयोग : देवदह कलेज २० विगाहा जग्गामा रहेको व्यक्तिगत कृषि योग्य जमिनमा निर्माण हुनेछ। भू-उपयोगमा परिवर्तन हुने भएकोले विशेष ध्यान दिइएको छ। निर्माण चरणमा भू-उपयोग कम गर्न सिमित क्षेत्र भित्र रहेर निर्माण कार्य गरिनेछ।

भू-क्षय र नदी कटान : भलुही खोलाबाट भैरहेको नदी कटान बढ्दै जादा आयोजना स्थलमा असर पर्न जाने देखिन्छ। भू-क्षय र नदी कटानको प्रभाव विशेष रुपमा रहेकोले यसको नियन्त्रणमा आयोजनाले तटबन्ध निर्माण र भल तर्काउने संरचना निर्माण गर्नेछ।

पानीको गुणस्तर : फोहर पानी, फोहर वस्तु, ढल आदि सतही पानीका श्रोतहरुमा मिलाउदा पानीको स्रोत प्रदुषित हुन्छ। आयोजना नजिक रहेका भलुही खोलामा सिधै अस्पतालबाट निस्कने तरल पदार्थहरु मिसाइएमा असर पर्ने देखिन्छ। तसर्थ तरल र अर्ध तरल पदार्थ विसर्जन गर्ने संरचना निर्माण गरिनेछ।

हावाको गुणस्तर : निर्माण चरणमा सवारी साधनहरुको चाप बढ्ने हुदा हावाको गुणस्तरमा ह्रास आउदछ। कालोपत्रे नभएको सडक हुनाले धुलो उड्ने संभावना प्रबल छ। सवारी साधनहरु कम गतिमा चलाउने, बाटोमा पानी छर्कने कार्यहरु प्रथम चरणमा गरिने छ। दिर्घकालिन रुपमा सडकलाई कालोपत्रे गरिने छ।

ध्वनीको गुणस्तर : निर्माण चरणमा सवारी साधनहरुको ओहर-दोहर, निर्माण सामाग्रीहरु, मेशिनरीहरु लोड गर्ने झार्ने आदिले गर्दा ध्वनीको मात्रामा वृद्धि भै ध्वनी प्रदुषणको समस्या हुन सक्दछ। तसर्थ यी पक्षहरुलाई मध्यनजर गर्दै रात्रीको समयमा निर्माण सम्बन्धी कार्यहरु गर्न बन्देज गरिएको छ। सवारी साधनहरुले अनावश्यक रुपमा हर्न बजाउने, आवाज दिने, नचाहिदो समयमा इञ्जिन चालु राख्ने आदि कृयाकलाप गरिने छैन। साथै जेनेरेटर, अस्पताल र समुदायमा ध्वनीले असर नपर्ने गरी छुट्टै राखिने छ। जेनेरेटर र अन्य ध्वनी आउने क्षेत्रमा काम गर्ने व्यक्तिहरुलाई कानमा ध्वनी रोक्ने यन्त्र (Ear Plug. Ear Muff) उपलब्ध गराइने छ।

निर्माण सामाग्रीहरुको भण्डारण र माटोहरुको विसर्जन : निर्माण सामाग्रीहरु जस्तै गिट्टी, सिमेन्ट, बालुवा, छड, काठ/फलामका सामानहरु उचित ठाउमा सवारी अवरुद्ध नहुने गरी भण्डारण गरिने व्यवस्था मिलाइएको छ।

सञ्चालन चरण

वन जंगलमा आश्रितको संख्यामा वृद्धि : दाउरा, घाँस, पात पतकर आदि वनजंगलबाट ल्याई आश्रित हुनेको जनसंख्या बढ्ने देखिन्छ। तसर्थ यसलाई समयमै निरुत्साहित गर्न देवदह कलेजका कर्मचारीहरु लगायत उनीहरुका परिवारलाई समयमै यस बारेमा सचेत गराउने, बैकल्पिक उर्जा प्रयोग गर्न प्रोत्साहित गर्ने खालका कार्यक्रमहरु कलेज सञ्चालन चरणमा राखिएका छन्।

भू-क्षय र नदी कटान : भलुही नदीको कारण संभाव्य भू-क्षय र नदी कटानको समस्यालाई समाधान गर्न निर्माण चरणमा गरेको जस्तै तटबन्धन, भल तर्काउने जस्ता कार्यहरुको अनुगमन गरिने छ र आवश्यकता भएमा सञ्चालन चरणमा समेत यो कार्यलाई निरन्तरता दिइने छ ।

पानीको गुणस्तर : कलेज, अस्पतालमा वितरण गरिने पानी विश्व स्वास्थ्य संगठनद्वारा तोकिएको मापदण्ड अनुरुपको हुनेछ । अस्पतालबाट निस्कने फोहर पानी सिधै कुनैपनि सतही पानीको श्रोतमा मिसाइने छैन । आवश्यक उपचार गरेपछि पानीलाई विसर्जन गरिने छ । अस्पताल र कलेजलाई आवश्यक मात्राको पानी सुरुमा भूमिगत श्रोतबाट र दीर्घकालिन रुपमा भलुही खानेपानी आयोजनाबाट परिपूर्ति गरिनेछ ।

हावाको गुणस्तर : सवारी साधनहरु, इन्भिनिरेटर, धुलो आदिले सञ्चालन चरणमा हावा प्रदुषण गर्ने सम्भावना छ । धुलो कम गर्न बाटोमा पानी छर्की, धुलो ठाउँमा काम गर्नेहरुले मास्क लगाउन लगाउने, सडकको छेउछाउ, अस्पताल परिसरहरुमा रुख रोप्ने आदि जस्ता कार्यहरुबाट हावाको गुणस्तर कायम गर्न सकिन्छ ।

अस्पतालजन्य फोहरहरु : देवदह मेडिकल कलेज एण्ड रिसर्च इन्टिच्यूट सञ्चालन गर्ने क्रममा साधारण, संक्रमक, धारिला आदि प्रकारका फोहरहरु निस्कन्छन् जसको उचित व्यवस्थापन र विसर्जन गर्न जरुरी छ । यसको विसर्जन National Healthcare Waste Management Guidelines, 2002 मा भने वमोजिम गरिने छ । अस्पतालमा Needle destroyer, Autoclave र Incinerator जस्ता उपकरणहरुको व्यवस्था गरिने छ र माथि उल्लेखित Guideline भित्र रहेर सम्पूर्ण फोहरको उचित व्यवस्थापन गरिने छ ।

ध्वनीको गुणस्तर : देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट संचालनको क्रममा विभिन्न प्रकारका ध्वनी निस्कने मेशिन, जेनेरेटर, मोटरगाडी आदिको सामना गर्नुपर्ने हुन्छ । तसर्थ ध्वनीको गुणस्तर अस्पताललाई तोकिएको मापदण्ड भित्र पर्ने गरी कम ध्वनी उत्पन्न हुने औजारहरु किन्ने, जेनेरेटर अस्पताल र आवास क्षेत्र, छेउछाउका घरहरुबाट टाढा राख्ने, रात्रीको समयमा औजारको प्रयोग नगर्ने/कम गर्ने, अस्पताललाई हर्न निषेधित क्षेत्र घोषणा गर्ने, ध्वनी बढि आउने ठाउँमा काम गर्ने कर्मचारीहरुलाई Ear Plugg/Ear Muffs आदि दिने जस्ता कार्यहरु गरिने छ ।

७.२.२ जैविक वातावरण

<u>निर्माण चरण</u>

रुख, बुट्यान र घाँसहरुको फँडानी : देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट निर्माण गर्ने क्रममा केही रुखहरु, बुट्यान र घाँस फँडानी गर्नुपर्ने हुन्छ । जुन ज्यादै कम छन् । यो जोगाएर निर्माण गर्न नसकिने अवस्थ छ । तसर्थ यस प्रति आयोजना संवेदनशिल हुदै रुख विरुवाहरुको बृहत वृक्षारोपण कार्यक्रम अस्पताल क्षेत्र र गा.वि.स.मा समेत सञ्चालन गरिने छ ।

निर्माणले गर्दा उत्पन्न हुने विघ्न/बाधा/अड्चनहरु (Disturbances) : निर्माण चरणमा हुने disturbances हरुलाई सम्पूर्ण रुपमा निर्मुल गर्न सकिन्न तर विभिन्न निराकरणका उपायहरु अवलम्बन गर्न सकिन्छ । जस्तै : कम ध्वनी निस्कने उपकरणहरु प्रयोग गर्ने, कर्मचारी र कामदारहरुलाई वन फडानी गर्न रोक्ने, सचेतना कार्यक्रमहरु सञ्चालन गर्ने आदि । यसको लागि शुरुमा अनुगमन गरिने छ ।

गैरकानुनी वन फँडानी, वन पैदावारहरुको प्रयोग : गैरकानुनी वन फँडानी र वन प्रदावारहरुको प्रयोगलाई निरुत्साहित गरिने छ । विभिन्न प्रकारका चेतनामूलक कार्यक्रमहरु सञ्चालन गरिने छ ।

सञ्चालन चरण

वन र वन पैदावारको प्रयोगमा वृद्धि : देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूटको सञ्चालनको समयमा विभिन्न व्यवसायहरु बढ्ने, जनसंख्या बढ्ने क्रमले वन र वन पैदावारको प्रयोगमा वृद्धि हुनेछ । अस्पतालका छेउछाउमा पर्ने ४ वटा सामुदायिक वनहरु कालिका, मिलन, जनप्रिय, सुसंवा सामुदायिक वनमा असर पर्ने हुनाले यस प्रति विभिन्न निराकरणका उपायहरु अवलम्वन गरिएको छ । अस्पतालका कर्मचारीहरुको अलावा भलुही - ८ क्षेत्रमा वैकल्पिक उर्जाका कार्यक्रमहरु लागू गर्न प्रोत्साहन गर्ने, चेतनामूलक कार्यक्रमहरु सञ्चालन गर्नेछ ।

चरन क्षेत्र र घाँसहरुमा पर्ने असर : २० विगाहा क्षेत्रमा चरनको प्रयोगको लागि सामान्य प्रयोग भएपनि असर पर्ने देखिएकोले अन्य वैकल्पिक चरन क्षेत्र प्रयोग गरिने र समुदायमा उन्नत जातका घाँस र डालेघाँस लगाउन प्रेरित गरिने छ ।

७.२.३ सामाजिक - आर्थिक तथा सांस्कृतिक वातावरण

निर्माण चरण

कृषि योग्य जमिनको ह्रास : कृषि योग्य जग्गा ह्रास हुनेछ । जग्गा धनीहरुलाई प्राथमिकता, अनुभव र योग्यताको आधारमा जागिर र अन्य कार्यहरुमा अवसर प्रदान गरिने छ ।

इट्टाभट्टाको विस्थापन : देवदह मेडिकल कलेज एण्ड रिसर्च इन्टिच्यूट निर्माण गरिने क्षेत्रमा एउटा इट्टाभट्टा विस्थापित हुने छ । इट्टाभट्टाको जग्गाको उचित मुआब्जा दिइने छ । इट्टाभट्टा व्यवसायीले अस्पताल जस्तो संस्था बन्न लागेकोमा सहर्ष रुपमा अन्यत्र जान तैयार भएकोले यसबाट कुनै समस्या देखिदैन ।

स्वास्थ्य र सरसफाई : अस्पतालको निर्माण चरणमा जनसंख्या बढ्ने हुँदा स्थानिय तहमा स्वास्थ्य र सरसफाईको अवस्था विग्रन सक्छ । नसर्ने यसलाई समयमै सम्बोधन गर्न प्रचार प्रसार, सचेतनाको कार्यक्रम, टोल सुधार, सरसफाई कार्यक्रममा देवदह मेडिकल कलेजले सघाउने छ ।

लैङ्गिक पक्ष र बालश्रम : आयोजनामा रोजगारी दिदा लैङ्गिक पक्षलाई ध्यान दिइने छ । महिलालाई समेत रोजगारी दिइने छ तर यसबाट महिलालाई कामको बोझ बढ्न सक्छ । यो प्रभावको परिणाम, सीमा र अवधी क्रमशः कम, स्थानिय, र अल्पकालिन हुने आङ्कलन गरिएको छ । यसलाई न्यून गर्न घरेलु कार्यलाई असर नपर्ने गरी साप्ताहिक रुपमा गर्नुपर्ने कामको समय निर्धारण गरिने छ । आयोजनामा बालश्रमलाई रोकिने छ । नियमित अनुगमनद्वारा यी पक्षहरुलाई सम्बोधन गरिने छ ।

एक्कासी आर्थिक वृद्धि : एक्कासी रुपमा मुआब्जा आदि बापत प्राप्त रकमको सही उपयोग नगर्नाले पनि समस्या उब्जाउन सक्दछ । यसको लागि जग्गा बेच्ने परिवारलाई आवश्यक सरसल्लाह र यथासम्भव व्यवसाय र स्वरोजगारीको मौका दिइने छ ।

७.२.४ आर्थिक र सामाजिक विकासको माग र चाहना

स्थानिय गा.वि.स., समुदाय र व्यक्तिहरुले आयोजनासंग आर्थिक र सामाजिक विकासको लागि विभिन्न प्रकारका मागहरु राख्नु स्वभाविकै हो । त्यस प्रकारका मागहरुलाई प्रकृति हेरेर प्राथमिकताको रुपमा देवदह मेडिकल कलेज एण्ड रिसर्च सेन्टरले सघाउने छ ।

सञ्चालन चरण

- कृषिजन्य वस्तुहरुको उत्पादनमा कमी आउने र त्यसबाट आर्थिक अवस्थामा प्रभाव पर्नेछ । २० विगाहा क्षेत्रमा उत्पादन नहुने हुन्छ । वैज्ञानिक पाराको खेती प्रणाली र नगदेबाली रोप्न समुदायमा प्रोत्साहन गरिनेछ । परम्परागत खेती प्रणाली भन्दा वैज्ञानिक प्रणालीमा बढि आर्थिक फाईदाहरु छन् ।

- देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट सञ्चालनको क्रममा एक्कासी रुपमा धेरै रकमहरु पाउँदा स्थानिय व्यक्तिहरुले आर्थिक व्यवस्थापन पक्ष बिगार्न सक्छन् तसर्थ पूँजिको व्यवस्थापन गर्न आवश्यक पर्ने राय, सल्लाह उपलब्ध गराइनेछ ।

- आयोजना सञ्चालनको बेला रकमको कारोवार बढ्ने भएकोले रक्सी, जुवा र अन्य सामाजिक विकृति बढ्न सक्छ । यसैगरी कानूनी विवाद पनि उठ्न सक्नेछ । यस्ता क्रियाकलाप रोक्न स्थानिय प्रशासनको सहयोग लिइनेछ । कुनै विवाद उठेमा त्यसलाई आयोजनाले समाधान गर्नेछ ।

- आयोजना सञ्चालन गर्ने क्रममा स्थानिय स्तरमा विभिन्न किसिमका सामाजिक मागहरु लिएर गा.वि.स., समुदाय, व्यक्तिहरु आउने कुरालाई नकार्न सकिदैन तसर्थ आयोजनाले स्थानीय स्तरमा गठन हुने समन्वय समितिसंग मिलेर यथासम्भव पुरा गर्न सकिने मागहरुप्रति प्राथमिकताको हिसाबले दीर्घकालिन रुपमा पुरा गर्दै लग्ने तर्फ पहल गर्नेछ ।

- आयोजना कार्यान्वयन गर्दा साधारणतया पुरातात्विक तथा धार्मिक महत्वका स्थानमा कुनै असर पर्ने छैन ।

८. सार्वजनिक सुनुवाई

बैशाख ७, २०६४ का दिन यस आयोजनाको सार्वजनिक सुनुवाई देवदह गा.वि.स., भलुही स्थित जनप्रिय माध्यमिक विद्यालयमा भएको थियो उक्त कार्यक्रमको विवरण अनुसूचि ५ मा संलग्न गरिएको छ । सार्वजनिक सुनुवाईमा उठेका अधिकांश माग तथा सुझावहरु यस प्रतिवेदनमा समावेश गरिएका छन् ।

९. वातावरण व्यवस्थापन योजना

९.१ वातावरण संरक्षणका उपायहरुको कार्यानवयन सुनिश्चित गर्दा योजना, संस्थागत संरचना, कर्मचारी निर्देशन, समन्वय, रिपोर्टिङ्ग र बजेटको व्यवस्था गर्नको लागि "पोष्टकर्व एप्रोच" अवलम्बन गरी वातावरण व्यवस्थापन योजना तर्जुमा गरिएको छ । यसै गरी वातावरणीय लाभलाई अधिकतम् गर्न, प्रतिकुल प्रभावलाई न्यूनतम् गर्न वातावरणीय अनुगमन तथा परीक्षण सम्बन्धी कार्यहरुको लागि ५ "क" (के, कसरी, कहाँ, कहिले र कसले गर्ने) लाई वातावरण व्यवस्थापन योजनामा समावेश गर्ने प्रयास गरिएको छ ।

९.२ योजना

९.२.१ आयोजनाको पूर्व निर्माण, निर्माण तथा सञ्चालन एवम् मर्मत सम्भारको अवस्थामा वातावरण संरक्षणका उपायहरु कार्यान्वयन गरिनेछन् । आयोजनाको पूर्व निर्माण अवस्थामा साईट क्लियरेन्स सम्बन्धी सबै कार्यहरु सम्पन्न गरिनेछन् र संरक्षणका उपायहरु आयोजनाको सञ्चालन अवस्थासम्म निरन्तर रुपमा कार्यान्वयन गरिनेछ ।

९.२.२ वातावरणीय अनुगमन सम्बन्धमा पालना र प्रभाव अनुगमन गर्न प्रस्ताव गरिएकोछ । आयोजना निर्माणको अवस्थामा वायु र पानीको गुणस्तर, ध्वनीको मापन जस्ता भौतिक सूचकहरुको नियमित अनुगमन गरिनेछ । यस अन्तर्गत फोहरहरुको व्यवस्थापन, धुलोको मात्रा घटाउन छर्किइने पानी, नदी नियन्त्रणका पक्षहरु, कामदारलाई दिइने मास्क, सुरक्षा तथा हर्न नबजाउने जस्ता सामाग्रीयुक्त साइनबोर्ड बसोवास क्षेत्र, अस्पताल क्षेत्रका सडकमा राख्ने जस्ता कार्यहरु गरिने र यसको नियमित अनुगमन गरिनेछ ।

९.२.२.१ वातावरणीय अनुगमन कार्यको सूची र तालिका अनुसार भौतिक, जैविक, आर्थिक तथा सामाजिक पक्षहरुको अनुगमन गरिनेछ । अनुगमन गरिने तरिका, ठाउं र समयको बारेमा यस दस्तावेजमा प्रष्ट रुपमा लेखिएको छ ।

९.२.२.२ अनुकुल वातावरणीय प्रभाव अधिकतम् गर्न तथा प्रतिकुल वातावरणीय प्रभाव न्यूनिकरण गर्न लाग्ने रकम आयोजनाको बजेटमा समावेश गरिएको छ । वातावरण संरक्षणका उपायहरु कार्यान्वयन गर्नको लागि शुरुका ३ वर्षमा रु. १२,१०,०००/– अनुमान गरिएको छ । वातावरण अनुगमन कार्यको लागि रु. ५,७०,०००/– र आयोजना कार्यान्वयन भएको ३ वर्ष भित्र प्रभाव परीक्षण गर्न सुझाव गरिएको छ । वातावरणीय परीक्षण कार्यको लागि रु. १,४५,०००/– अनुमान गरिएको छ ।

वातावरण संरक्षणका उपायहरु कार्यान्वयन गर्न तथा वातावरणीय अनुगमनको लागि प्रस्तावकले आयोजनाको एक अभिन्न अङ्गको रुपमा बेग्लै वातावरण व्यवस्थापन युनिटको स्थापन गर्नेछ । उक्त युनिटमा विज्ञ कर्मचारीहरुको पनि व्यवस्था गरिनेछ । यसले निर्माण र सञ्चालन क्रममा आयोजनाको अनुगमनको नतिजा समावेश गर्नेछ ।

१०. निष्कर्ष तथा सुझावहरु

वातावरणिय प्रभाव मूल्याङ्कन अध्ययनले प्रस्तावित आयोजनाको भौतिक, जैविक र आर्थिक सामाजिक तथा सांस्कृतिक वातावरणमा न्यून प्रभाव पार्ने देखिन्छ । अध्ययन अनुसार सुझाव गरिएका वातावरणीय प्रभावहरुको न्यूनिकरण, निराकरण र अनुगमन कार्य गर्न सकेमा देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट आयोजना वातावरणीय दृष्टिकोणले उपयुक्त देखिन्छ ।

EXECUTIVE SUMMARY

CHAPTER - I

GENERAL

National Health Policy (NHP) in Nepal was formed in 1991 with the objective of enhancing the health status of the population. 86% of the population of the country that is rural is also targeted. The NHP is a comprehensive policy that addresses the service delivery as well as the administrative structure of the health system. The 8th plan (1992-1997), 9th plan (1997-2002) and second long term health plan (SLTHP) (1997-2017) were developed in keeping with the NHP. The main features of the health plan were the development of integrated and essential health care services at the district level and below, active community participation and mobilization of the private sector to develop general as well as specialized health services. Other includes, inter and intra-sectoral coordination, decentralization of health administration developing the traditional system of medicine and promoting the participation of national and international NGOs, private enterprises and foreign investors.

Shree Devdaha Medical College and Research Institute is a project for the enhancement of health standard of the Nepali people and production of quality medical practitioners in Nepal. The Devdaha Medical College and Research Institute is expected to produce 100 competent medical graduates per year and would follow the annual intake procedure as per the Pre-requisite of Nepal Government i.e. 10% as nominated by Government under full scholarship, scholarship to 10% securing highest marks in the entrance exams, and would take other fee paying students from Nepal and India. 40-40 students each from two countries. The Institute will provide high quality services on Gynecology, Obstetrics, General Surgery, General Medicine, Radiology, Ultra sonogram, Gastro intestine, Cardiology, Orthopedic, Ophthalmology, Dermatology & venerology, Pediatrics, ENT and many more facilities.

CHAPTER - II

METHODOLOGY

Necessary information was generated through review and field works. Secondary information was collected through published reports and interpretation of maps and photographs. Primary level of information was generated through questionnaire, checklist, measurement, and consultation. Furthermore, local people were contacted and interviewed to solicit information. A number of focus group discussions were held in the project areas. The district level offices, village development committee (VDC), and community groups were also contacted to verify information and to solicit their concerns.

The EIA study of DMCRI comprised of:

- Literature review and map interpretation;
- Preparation of questionnaire and checklists;
- Field study to collect primary information and verify the secondary information through cross check of data, interview and participatory discussion with local people. Data processing
- Preparation of draft report

- A mega public hearing was also conducted at the proposed construction site to disseminate the project related information to the concerned stakeholders and public at large and obtained their input and feedback.
- Preparation and submission of the final report.

Necessary information was collected and analyzed by employing the methods elaborated in this report.

CHAPTER - III

PROJECT DESCRIPTION

Location: Shree Devdaha Medical College and Research Institute is situated at Devdaha V.D.C. 8, Bhaluhi in Rupendehi District. Formerly the area was under Kerabani V.D.C. The area is surrounded by Buddhanagar, ward no 7 on its East, Butwal on West, ward no 9 on its north and Makrahar V.D.C. on its South. The project site lies at a latitude of 27°47'10" and longitude of 83°12'16". It covers an area of 20 bighas.

Accessibility: The location is situated about 8.5 KM East of Butwal and is easily accessible. The site touches the EastWest Mahendra highway and hence is readily accessible by bus or other light vehicles. The nearest airport lies at Bhairahawa. From the highway the main project site where all the facilities are to be built takes a 700 meter long route which is now accessible from existing road.

PROJECT COMPONENTS

The prominent features of the proposed hospital includes; Out Patient Department, In Patient Department, Operation Theater, Library, Auditorium, Training hall, Administration section, Workshop, Staff quarter, , Incinerators

According to the structural design for proposed Devdaha Medical College and Research Institute., several units are proposed. It includes teaching block, hospital block, staff quarter, hostel, parking, open spaces and other spaces designated for storage of ancillary equipment; spaces allocated water treatment and sewage disposal, solid waste treatment etc. The building is made up of RCC frame structure having the walls of brick jointed with cement mortar. The positioning and details of the building is shown in the **Annex-4 (different units of proposed DMCRI project)**. The details of the facilities and space are clearly specified in the drawings.

CHAPTER - IV

REVIEW OF PLANS/POLICIES, ACTS, RULES/REGULATIONS AND GUIDELINES

This chapter summarizes existing policies, laws, guidelines and institutions in order to inform the decision makers on their implications on the project functioning.

Policies

- The Tenth Plan (2002-2007), environment and health sector related policies

Acts including their Rules

- Environmental protection Act, 1996
- Solid Waste Management and Resource Mobilization Act, 1987
- Labor Act, 1991
- Land Acquisition Act, 1977
- Local Self-Governance Act, 1999

Standards

- Water and air quality standards and guidelines
- Standards for hospitals

Guidelines

- National EIA Guidelines, 1993

Conventions

- Basel Convention

CHAPTER - V

EXISTING ENVIRONMENTAL CONDITIONS

PHYSICAL ENVIRONMENT

The detail information on topography of site, geology and soil characteristics, river morphology, air and noise level, rainfall, temperature is collected and presented in the report.

BIOLOGICAL ENVIRONMENT

The data on community forests of the area, floral Diversity, faunal diversity in detail are collected and included in the EIA report.

SOCIO-ECONOMIC ENVIRONMENT

The details on population, ethnicity, literacy rate, source of income, transportation facilities, water supply and sanitation of the project and its vicinity, religion, religious sites and cultural activities, health and sanitation, education institutions, industries around the project sites, water quality

CHAPTER - VI

ALTERNATIVE ANALYSIS

In general the alternative analysis of a project is carried out to assess the technical feasibility, to check the economical viability and environmentally acceptable of the proposed DMCRI.

The purpose of alternative analysis in EIA study is to assess the environmental impact by the different alternatives that have been considered during the feasibility study. This alternative analysis will look in the following headings.

- Project alternative at different locations;
- Do nothing scenario

Alternative analysis should be an integral part of EIA report. DMCRI project will be evaluated by comparing the "No Action Option" with the option of implementation of the project. Furthermore, the proponent (including EIA team) should analyze the likely environmental impacts of the project activities for different alternatives, such as location, construction material transportation and their stockpiling etc. The EIA study shall also document possible alternative analysis should also consider the environmental management system, acceptability of risks likely to emerge during the implementation of the proposal and other issues of topical interest. The likely impacts of each alternative shall be assessed and compared in terms of environmental soundness. and the environmentally acceptable alternative should be identified and documented.

Based on the above analysis, the DMCRI should be developed on location as conceived. The following chapters identify, predict and evaluate the potential impacts of the Project on the environment and also propose environmental protection measures to minimize adverse impacts along with the provisions for environmental monitoring and auditing.

CHAPTER – VII

ENVIRONMENTAL IMPACT

BENEFICIAL IMPACT

The construction and operation of DMCRI is for the benefit of the people and the country. Apart from direct benefit of getting better access to state of the art health services, the project will have number of other benefits during the construction stage as well as operation stages. This section of the report has tried to enumerate the beneficial impact from the project and suggest the possible augmentation measures to enhance the benefit.

Construction Stage: The likely beneficial impacts during the construction stage are:
Employment opportunity to local people, boost in the local economy, enhancement in technical skills and know how:.

Operational Stage: The likely beneficial impacts during the operational stages are better, easy access to health facility, increase in health facility, employment opportunity to local people, government declared free health services to poor, helpless patients, allocation of scholarship quota for studying MBBS at DMCRI. Increase in local development activities

ADVERSE IMPACTS

The EIA for this project has identified impacts on physical, biological and socio cultural environment. In order to keep the study as per the TOR of the study, impact on each issue has been discussed, evaluated and the mitigation measures have been proposed in the following chapters.

The impact which lasts for over 20 years is categorized as long term. Similarly impacts lasting for more than 5 years and less than 20 year is categorized as medium and if lasts for only 5 years is categorized as short term impacts.

For assessing the significance following criteria will be followed:
If the quantified magnitude is more than 50% (in an average), it is categorized as significant impact.

If the impact is irreversible, then the impact is termed as significant.

For classifying the extent the following criteria is followed.
If the extent is limited to project area then it is termed as site specific. If the extent is limited to affected VDC then it is local and any impact extending beyond the project site of DMCRI would be termed as regional impact.

The physical environmental impacts have been assessed as per the National Environmental Impact Assessment Guidelines 1993 for magnitude, extent, Duration and significance of the impacts are categorized below.

Physical Environment

Construction Stage
The construction stage adverse impacts includes:land use, potential land slide, soil erosion, gully cutting, water quality, air quality, noise pollution, stockpiling of construction materials and disposal of spoils.

Operation Phase
The operational phase adverse impacts on physical environment includes: potential land slide, soil erosion, gully cutting, water quality, air quality, health care waste, noise pollution.

Biological Environment

Construction Stages
Loss of trees, disturbance from construction activities, illegal collection of forest products.

Operation Phase
Possible increase in the use of forest product, loss of grazing land and fodder grasses, trees.

Socio Economic and Cultural Environment

Construction Stage
Loss of farm land as part of site clearance, relocation of brick factory, health and sanitation, gender and child labor issues, increase in land value of the vicinity, sudden cash flow in the community, economic and social development issues, cultural and aesthetic sites.

Operation Stage

Impact on local economy due to loss of agricultural production, sudden cash flow, economic and social development issues, law and order will be assessed.

Evaluation of Impacts

The above impacts are of two types i.e identified and predicted. These impacts have been evaluated to know their environmental significance taking into consideration the location of the project, direct or indirect nature, reversibility and irreversibility of the impacts, and more importantly the national policy, law and guidelines. Furthermore, they have been grouped into identified and predicted impacts for easy understandings. In general direct impacts are identified, and indirect impacts predicted. The significance of the impacts has been evaluated using the words most significant (+ +), significant (+), and insignificant (-).

Impacts having total score of over 70 are considered very significant; impacts having 40- 70 score are considered significant, and impacts having total score less than 40 are considered insignificant for DMCRI project.

CHAPTER - VIII

MITIGATION MEASURES

BENEFICIAL AUGMENTATION

The benefit from the project could be enhanced or make effective use if they are planned properly. This section of report provides possible augmentation measures to enhance the benefit.

MITIGATION MEASURES

This report has tried to identify the impacts to the extent possible and proposed mitigation measures to each of the identified impacts. In addition to these mitigation measures if there are additional impact or damage to the environment due to the project activities that will be mitigated and/or compensated according to the rules and regulations of the country.

Physical Environment

Construction Stage

1. **Land use:** Permanent land acquisition will be minimized and limited within the requirements stipulated by the ministry of education and sports. During the road construction the cut and fill portion of materials. The site will be vegetated with local species of trees.

2. **Potential land slide, soil erosion, gully cutting:** There is not visual landslide exists in the area. However, due to the existing flow of Bhaluhi River, the earth cutting of areas along the flow regime takes place. So DMCRI would take the river protection/training works very seriously and plan for it in coordination with VDC and local community.

3. **Water quality:**

   - The solid, semi solid and liquid wastes are not disposed directly intp water bodies. The landfill site will be identified and developed near the DMCRI facility. All effluent will be treated before discharging into water bodies.
   - Water supplies to DMCRI for human use will be disinfected through filtration and chlorination. Water thus supplied would meet WHO guidelines for drinking water.

4. **Air Quality:** The following mitigation measures will be implemented to minimize the impacts on air quality.

   - Water spraying will be carried out in earthen roads.
   - Use of breathing masks and ear plugs by the construction workers in the dust prone areas
   - Several trees will be planted along the boundary as dust screens or arrester.

5. **Noise Level:**

- Night time construction work is not planned during the construction of DMCRI.
- All vehicles plying in the construction area will have regular maintenance as per the manufacture's recommendations.
- Generators will be kept at a distance from DMCRI and near by houses to avoid noises
- Ear plugs/muffs will be provided to workers working in noisy areas.

6. **Stockpiling of construction materials and disposal of spoils:**

- The priority will be given for re using the spoil for other construction related activities.
- The spoil disposal will not be thrown in the River, rather it will be safely deposited in the stream gullies, ravines.

Operation Phase

1. **Potential land slide, soil erosion, gully cutting:** There is not visual landslide exists in the area. However, due to the existing flow of Bhaluhi River, the earth cutting of areas along the flow regime takes place. A suitable River training works will be done prior the construction of DMCRI

2. **Water quality:** The solid, semi solid and liquid wastes are not disposed directly into water bodies. The landfill site will be identified and developed near the DMCRI facility. All effluent will be treated before discharging into water bodies.

   Water supplies to DMCRI for human use will be disinfected through filtration and chlorination. Water thus supplied would meet WHO guidelines for drinking water.

3. **Air Quality:** The following mitigation measures will be implemented to minimize the impacts on air quality.

   - Water spraying will be carried out in earthen roads.
   - Use of breathing masks and ear plugs by the construction workers in the dust prone areas
   - Several trees will be planted along the boundary as dust screens or arrester.
   - A modern incinerator will be selected to avoid air pollution problem. The incinerator will be kept in a ideal location in DMCRI (lee ward side of wind direction)

4. **Water Quantity:**
   The DMCRI would coordinate with Bhaluhi Drinking Water Project for getting the required supplied water for the facility. In the meantime, groundwater will be used in a rational fashion.

5. **Health care waste:** DMCRI would follow health care waste management guidelines, 2002 in order to minimize and manage the health care wastes produced from the facility. A proper health care waste management plan will be in place during the operation phase. Segregation of waste will be done at the source itself as suggested in the health care waste management manual. Needle destroyer and autoclave will be used to tackle the infectious types of health care wastes. Besides, a modern scientific incinerator will be installed to burn the combustible waste at high temperatures.

6. **Noise Level:** Night time loading and unloading of material is restricted. Noise absorbent and reducers will be used in sensitive areas like OT. While purchasing the equipment, less noisy equipment is selected. Plantation of trees around the boundary wall will also help to reduce the noise.

Biological Environment

Construction Stages

1. **Loss of trees:** The loss of trees in the land acquired by DMCRI is inevitable as it is a part of site clearance. This impact could not be prevented or corrected but could be compensated. Hence, the proponent will implement compensatory measures for this loss. The proponent will plant several types of saplings at appropriate place in and around the project area and manage in its own cost.

2. **Disturbance from construction activities:** The impact could not be avoided but will be minimized by using low noise producing equipment, instruction of drivers not to use pressure horn in and around the areas. The impact on forest due to the activities of the construction labors will be avoided or mitigated by regulating the activities of labor force and/or their dependents. The close monitoring will be done by the proponent. The necessary orientation will be provided to staff and workers involved in DMCRI.

3. **Illegal collection of forest products:** In order to minimize this threat/impact, the proponent will strictly inform the staff and labors involved during the construction phase not to use any forest products. The kerosene and gas is available to the local market and rational uses of those fuels are recommended.

Operation Phase

1. **Possible increase in the use of forest product:** The proponent will develop a policy to discourage the use of forest product. The management of DMCRI would work in close coordination with community forestry near to it. They are; Kalika community forestry, Milan community forestry, Janapriya community forestry, and Susarura community forestry.
   The DMCRI would find alternative energy and close vigilance and control in above activity.

2. **Loss of grazing land and fodder grasses, trees:** This could not be avoided. Local farmers will be encouraged for plantation of improved fodder crops which gives high yield in small areas.

Socio Economic and Cultural Environment

Construction Stage

1. **Loss of farm land as part of site clearance:** Land will be purchased based on the local prevailing rate. The land owners will be given priority in job and other opportunities at DMCRI based on their qualifications and skills.

2. **Relocation of brick factory:** The owner of the brick factory is voluntarily willing to relocate for the good reason that DMCRI would benefit the community at large. The owner of the factory realizes that it will bring adverse impact to DMCRI, so the factory is

willing to relocate in a voluntary basis. The land belonging to the factory was sold to DMCRI.

3. **Health and Sanitation:** The workers will be made aware of the health problems caused by bad sanitation and contamination of drinking water. They will also be made aware of causes of communicable diseases such as AIDS and other venereal diseases. Control measures of above health problems and communicable diseases will be taught to them.

4. **Gender and child labor issues:** Weekly working hours will be fixed to the construction workers so that they will have enough time for household works. The regular monitoring by the proponent will be done to check if child labor is used in the project. The child labor is strictly prohibited in the project.

5. **Sudden cash flow:** DMCRI will run an awareness program before the execution of construction works to tell the local people that the cash flow will be reduced once the construction works will complete, so they should be very careful in spending. They will also be made aware of the investments opportunities likely to generate due to the project and encourage them to exploit the opportunities for long term income source.

6. **Economic and social development issues:** The project will stick to the mitigation measures of the project related impacts only to the extent possible. However, project may consider those cases if the demanded activities are beneficial both to the project and the local people. The activities can be implemented in partnership with the local people.

Operation Stage

1. **Impact on local economy due to loss of agricultural production:** Intensified agriculture, modern and scientific agricultural system is the demand of the present development. These aspects will be highlighted by the management of DMCRI to agencies responsible for agricultural promotion. In addition, during the operation of the DMCRI, the occupation of the local people will be diversified. Majority of the people will be involved in business; job and even self employment will be generated. There will be opportunity for market of agricultural and livestock products, so the focus of people could shift from traditional system of agriculture to cash crop and other agricultural products having immediate market values with good return.

2. **Sudden cash flow:** Hugh cash flow will take place during the operation stages of DMCRI. Local people will also be made aware of the investments opportunities likely to generate due to the project and encourage them to exploit the opportunities for long term income source. There will be awareness and orientation program for securing their investments and assets in a proper fashion.

3. **Economic and social development issues:** DMCRI will coordinate with consultative groups formed locally and support rational economic and social development activities which could be beneficial to DMCRI and local community. These issues are dealt within the jurisdiction and scope of the project.

4. **Law and order:** Regular flow of project related information to the community and government line agencies will be maintained. Besides, a cordial relation with government line agencies and local community will be established to avoid any unpleasant circumstances.

A public hearing was organized on Baisakh 7, 2064 at Janapriya Madyamik Vidyalaya at Bhaluhi Devdaha -9, Rupandehi. The proponent presented the details of EIA findings and gave the proposed mitigation measures. The proceedings of the public hearing is presented in annex

Based on the public hearing suggestions, mitigation measures were updated.

CHAPTER – IX

ENVIRONMENTAL MANAGEMENT PLAN

The EMP is pre-requisite for any EIA study, which has been emphasized in EPR as well. But the content of EMP is subject to discretion of the proponent. Lohani et al. (1997) has emphasized to set out the environmental protection measures (EPM) in EMP and to outline EPM and other measures that should be undertaken to ensure compliance with environmental laws and to reduce or eliminate adverse impacts. The EMP should define technical work programmed, including details of the required tasks and reports and necessary staff skills, supplies and equipment; a detailed accounting of the estimated costs to implement the plan; and planned implementation of the plan, including proposed staffing, schedules of participation and inputs of different agencies. Furthermore, the mitigation measures and monitoring requirements are normally set out in an EMP (Lohani et al., 1997). It is also recommended to establish an Environmental Management Unit (EMU) for the implementation of the plan.

The issued terms of reference of the study suggests that EMP should comprises of implementation of the mitigation measures, environmental monitoring plan, framework for the environmental auditing and the institutional arrangement for the implementation of EMP.

Stages for the Implementation of Environmental Protection measures, protocols for environmental monitoring, monitoring plan and schedule is proposed in this report.

Budget for EMP Implementation: The benefit augmentation, mitigation and compensatory measures are the part of the project development. Hence, their cost will be included in the project cost. Most of the cost will be included in the project cost. Most of the benefit augmentation and mitigation measures are included in the engineering design, necessary contract provision and the specifications will be included in the tender document and their cost will be included in the engineers estimate. Some of the specific costs for the program implementation that may not include in the engineers are presented in the table in this report. The total cost is Rs.1210000.00

Monitoring Cost: The Monitoring cost is recommended for both construction phase and operation phase monitoring. Operation phase monitoring cost for 2 years is also estimated. The project being small in size, total estimated cost for monitoring activities comes to be only NRs 5,70000 (In words Five Lakh Seventy Thousand Only).

MANPOWER

Following manpower will be required to accomplish the above-mentioned monitoring activities.

- Team Leader/Environmental Engineer -1
- Environmental Officer-1
- Field Assistant-1

INSTITUTIONAL SETUP

The project proponent will have the prime responsibility for the implementation of mitigation measures and monitoring plan. However, the proponent can depute the required manpower for monitoring. Such person/s for the monitoring program need not stay in the field regularly, but they should visit the area frequently as prescribed in the monitoring schedule.

The sole responsibility of the monitoring of the project goes to DMCRI. The Ministry of Environment, Science, and Technology (MOEST) shall accomplish the environmental audit two years after the commencement of services.

CHAPTER - X

ENVIRONMENTAL AUDITING

Environmental Auditing is required after two years of project operation. Auditing refers to a general class of environmental investigations that are used to verify past and current environmental performance. Environmental Auditing will be performed only once for each project. Compared to the environmental management of a project, environmental impact auditing assesses the actual environmental impact, accuracy of prediction, effectiveness of environmental impact mitigation and enhancement measures, and functioning of monitoring mechanisms.

Environmental Auditing Cost

Environmental Audit will be carried out after two years of project completion. The total cost for the environmental auditing is estimated to be NRs. 145,000

CHAPTER - XI

CONCLUSIONS AND RECOMMENDATIONS

The assessment report concluded that there would be no significant environment impact due to the proposed construction facility for DMCRI. The project has many beneficial impacts as compared to few localized adverse impacts, which could be minimized or mitigated with very minimal cost. The following measures are recommended to avoid, correct or compensate for the adverse impacts on the physical, biological and socio-economic resources of the area due to the construction and operation of the proposed project. This study may not have included all the proposed mitigation measures. Numbers of environmental concerns have to be reflected in the contract clauses. Hence, the provisions of this EIA report must be included in the detailed design and the tender document so that they are implemented. Any activity is not effective without proper monitoring. The proponent has generously committed the monitoring cost within the project cost. The several recommendations are proposed in the EIA report which should be taken in consideration during the construction and operation phases of DMCRI.

CHAPTER – I

1.0 GENERAL

1.1 BACKGROUND

National Health Policy (NHP) in Nepal was formed in 1991 with the objective of enhancing the health status of the population. 86% of the population of the country that is rural is also targeted. The NHP is a comprehensive policy that addresses the service delivery as well as the administrative structure of the health system. The 8th plan (1992-1997), 9th plan (1997-2002) and second long term health plan (SLTHP) (1997-2017) were developed in keeping with the NHP. The main features of the plan were the development of integrated and essential health care services at the district level and below, active community participation and mobilization of the private sector to develop general as well as specialized health services. Other includes, inter and intra-sectoral coordination, decentralization of health administration developing the traditional system of medicine and promoting the participation of national and international NGOs, private enterprises and foreign investors.

With the current data as published by UNFPA- 2001/02, the number of population per physician in Nepal is 18439. With such a high population to physician ratio and an increasing number of patients each year, there is an acute need for the production of adequate human resources to provide quality health services in the country. Therefore, Nepal Government has adopted a policy to promote private medical colleges/ hospitals, nursing homes and hospitals run by INGO's/ NGO's and private practitioners as complementary government facilities. Accordingly, as of 2003/04 (2060/61), in patient services were provide by government hospitals, nursing homes and private practitioners

In order to reduce crude death rate and infant mortality rate and to raise longevity, it becomes necessary to provide effective health services in a major part of the country. Moreover, in view of the national and international commitment to provide basic health services to everybody in near future, there has to be all round integrated approach towards the development of the health sector in the country. Among the various policies formulated to achieve the targets as stipulated in the plan documents, one of the policies is to encourage private sector to invest in the development of health service on specified policies and conditions without financial and other liability to Nepal Government. The strategy has been formulated after setting the goal for health sector.

Shree Devdaha Medical College and Research Institute is a project for the enhancement of health standard of the Nepali people and production of quality medical practitioners in Nepal. The Devdaha Medical College and Research Institute is expected to produce 100 competent medical graduates per year and would follow the annual intake procedure as per the Pre-requisite of Nepal Government i.e. 10% as nominated by Government under full scholarship, scholarship to 10% securing highest marks in the entrance exams, and would take other fee paying students from Nepal and India, 40-40 students each from two countries. The Institute will provide high quality services on Gynecology, Obstetrics, General Surgery, General Medicine, Radiology, Ultra sonogram, Gastro intestine, Cardiology, Orthopedic, Ophthalmology, Dermatology & venerology, Pediatrics, ENT and many more facilities.

1.2 The Proponent

Shree Devdaha Medical College and Research Institute Pvt Ltd
Devdaha Bulahi VDC
Rupandehi District, Nepal
Tel: 071-621800/801

1.3 Objectives of EIA Study

The main objectives of the EIA study are to:

- Document the existing environmental condition of the project area,
- Identify, predict and evaluate the impacts of the project on physical, chemical, biological, socio-economic and cultural aspects of the environment,
- Examine the significance of the environmental impacts
- Recommend preventive and curative measures, including benefits augmentation measures, and environmental management plan along with monitoring and auditing requirements,
- Provide information for decision-makers and concerned parties about the environmental implications of the proposed project implementation and associated cost for the implementation of environmental protection measures.

To meet the above objectives and essential of the study, procedural collection and analysis of the environmental information within the physical coverage to the possible extent would be done.

CHAPTER - II

METHODOLOGY

2.0 METHODOLOGY

Necessary information was generated through review and field works. Secondary information was collected through published reports and interpretation of maps and photographs. Primary level of information was generated through questionnaire, checklist, measurement, and consultation. Furthermore, local people were contacted and interviewed to solicit information. A number of focus group discussions were held in the project areas. The district level offices, village development committee (VDC), and community groups were also contacted to verify information and to solicit their concerns.

The EIA study of DMCRI comprised of:

- Literature review and map interpretation;
- Preparation of questionnaire and checklists;
- Field study to collect primary information and verify the secondary information through cross check of data, interview and participatory discussion with local people. Data processing
- Preparation of draft report
- A mega public hearing was also conducted at the proposed construction site to disseminate the project related information to the concerned stakeholders and public at large and obtained their input and feedback.
- Preparation and submission of the final report.

Necessary information was collected and analyzed by employing the following methods.

2.1 Literature Review

A review of EIA reports and other literatures related to the construction of hospitals and its operation are studied and briefly cited in this document. The map of the proposed project site was studied to determine the baseline condition and to locate the existing surrounding features. The literatures related to EIA of hospitals, EIA manuals; Environmental Protection Act/Regulations 1993, National Health Care Waste Management Guidelines was studied in detail.

2.2 Map Interpretation

The maps of the project area were interpreted to extract necessary information particularly on physical aspects.

2.3 Questionnaire and Checklists

As part of desk study, a checklist was developed to gather the information on physical parameters. Similarly, a simple checklist was developed to collect information on biological resources, particularly terrestrial flora and fauna. Attention was paid to accommodate issues as contained, *inter alia* in the National EIA Guidelines, 1993, and National Health Care Waste Management Guidelines, and TOR approved by the Ministry of Environment, Science and Technology. A

checklist was developed and used to collect information of the composition of plants and animals and their status in the core project area.

A structured household survey questionnaire was prepared to solicit information of socio economic and cultural environment. Furthermore a checklist was also prepared for the Focus Group Discussion which was used to cross check and verify the information. A checklist and household survey questionnaire is presented in annex 2.

2.4 Project Area Delineation

The entire project's infrastructures are located in ward no 8 (formerly ward no 6) of Devdaha VDC, Bhaluhi of Rupandehi District.

2.5 Field Study

A team of the professionals led by the team leader. an environmental engineer, civil engineer, socio- economist, and a doctor visited the site. The objective of this visit was to collect the overall basic information regarding the project site area and to collect the site-specific information. The members of the team visited the project affected site Devdaha VDC-8, Bhaluhi and its surroundings in Rupandehi district to collect the information on physical, biological, hydro-geological, socio- economic and cultural conditions using the appropriate techniques and methods.

2.5.1 Physical Environment: Field observation and walk through survey was adopted to verify information on geological condition, drainage system, slope stability, hydrological study of area, study on flood prone area, work camp and labor camp, water sources (types, quality and quantity), spoil disposal areas, generation and disposal of health care wastes, construction material storage areas etc. Water samples of Rohini River, Bhaluhi River were taken and analyzed in laboratory. Water samples of ground water extracted at the proposed construction sites were also taken for analysis. The results are included in this report. Similarly the baseline data on air and noise quality were also recorded.

2.5.2 Biological Environment: The field study was carried out to verify the baseline information reviewed and to collect additional site specific data on plants and animals. Interaction was conducted with the local people to collect the information on animals, plants, and crops.

2.5.3 Socio-economic and Cultural Environment: The property owners whose lands were bought by the DMCRI were consulted. The details of land purchased by the project, details of *Lagat Katta, details of Land Ownership transfer* are included in annex of this report. Household question was administered with local people who were available in the project area. FGD were held in VDC-8, Bhaluhi. VDC officials were also contacted to verify the socio-economic information. The details of land acquired by DMCRI are given in next chapter.

2.5.4 Consultation Meeting: During the field study, the study team 4 numbers of consultative meeting with the local people and local leaders. The local people were contacted to offer their concerns and opinions on biological and socio-economic aspects and they have been well documented in this report, at appropriate places.

2.6 Impact Identification, Predication, and Analysis

After the survey, the data was compiled and the matrix method was used to identify and categorize the potential impacts. The matrix method was used to identify the possible positive and negative impacts due to implementation of the proposed DMCRI project.

The different aspects of environmental impacts (negative or positive) were identified and prioritization of the seriousness of environmental impacts was evaluated.

The physical, biological, social, economic, cultural and historical aspects of the environment relating the construction of DMCRI project were also discussed with stakeholders and significant impacts were included in this report. The methods like checklist, questionnaire survey, experts' opinion etc are also used.

The magnitude, extent, and duration of the impacts are categorized according to the National Environmental Impact Assessment Guidelines, 1993. The impacts are further categorized as high, medium and low in terms of magnitude, short term, medium term and long terms in duration and local, site specific and regional in terms of extents.

2.7 Draft Report Preparation

Based on the processed information, impacts were identified and evaluated. Mitigation measures for the adverse impacts Environmental Management Plan (EMP) is prepared which focused on mitigation measures, environmental monitoring and auditing requirement including implementation responsibilities, staffing, reporting, budget and coordination aspects. A draft EIA report was prepared incorporating all the above aspects.

2.8 Public Participation

Public participation was sought at the different stages of EIA study. First of all a 15 days public notice was published in Nepal Samacharpatra, a national daily of October 21, 2006. A copy of above notice is enclosed in this report. A notice was also pasted in nearby schools, sub health post, VDC. The suggestions from sub health post, school, VDC were incorporated in TOR document. During the EIA study phase, interaction with the local people was made through FGD and household survey. Finally, a public hearing was held in the project area on April 20, 2007 to solicit the comments and suggestions of the local people on the EIA recommendations. The proceeding of the public hearing is presented in annex 5.

2.9 Preparation of Report

2.9.1 Study Team: The EIA study team comprises of the following professionals from multi disciplinary field.

1. Team Leader (Environmental Specialist)
2. Architect
3. Civil Engineer
4. Sociologist
5. Ecologist
6. Medical Doctor
7. Economist
8. Biologist

Apart from above key professionals, number of local enumerators, and staff consultant as well as seconded staff has provided their input in this study.

2.9.2 Cost: The total cost required for mitigation, auditing and other associated items are included in this report.

2.9.3 Schedule for EIA Report Preparation of DMCRI

S. No	Period▶ / Activities▼	Month 1				Month 2				Month 3				Month 4				Remarks
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1	Team Mobilization on Approval of Scoping & TOR to DMCRI site																	For EIA study
2	Literature Review & Field Study, Impact Analysis																	Field work
3	Data Compilation, Draft Report Preparation																	EIA Report preparation
4	Public Hearing																	At the project site
5	EIA Report Submission																	MOES, MOEST
6	Approval of EIA Report																	MOEST

2.10 The Final Report

The final EIA report was prepared incorporating all suggestions and comments received during the public hearing and intra-agency consultation meetings. The final report has been formatted in such a way that it minimizes duplication in write ups, makes the report a concise and easily understandable form and does not omit issues and concerns mentioned in Schedule 6 of EPR, 1997 and the approved TOR. The final report contains information on baseline environmental conditions, review of environment related policies, legislation, and guidelines and existing environmental condition. As a part of EIA report, alternatives were evaluated and environmental impacts of best option were identified, predicted and evaluated. In order to augment the beneficial environmental impacts and minimize the adverse impacts, this EIA report also contains elaborated benefits augmentation measures and adverse impacts mitigation measures, monitoring parameters, methods and schedules and also a framework for environmental auditing as a part of the Environmental Management Plan.

CHAPTER – III

PROJECT DESCRIPTION

3.1 PROJECT LOCATION

3.1.1 Location: Shree Devdaha Medical College and Research Institute is situated at Devdaha V.D.C. 8, Bhaluhi in Rupendehi District. Formerly the area was under Kerabani V.D.C. The area is surrounded by Buddhanagar, ward no 7 on its East, Butwal on West, ward no 9 on its North and Makrahar V.D.C. on its South. The project site lies at a latitude of 27°47'10" and longitude of 83°12'16". It covers an area of 20 bighas. The location map showing the VDC boundary is shown in **Annex-3.**

3.1.2 Land Acquisition: The details of land acquired by DMCRI are as follows.

Land Purchased by Sri Sankara Institute of Health Science and Research Pvt. Ltd. for the construction of Devdaha Medical College & Research Institute

S.No.	Landlord's Name	Kitta No.	Areas		
		Kervani 6 Kha	Bigha	Kattha	Dhur
1	Harilal Aryal	85, 204	0	10	0
2	Suntali Devi Khadka	111, 116, 120	0	8	2
3	Khigishra Gharti	190, 193	0	10	19
4	Ram Prashad Pun	112, 303	0	3	0
5	Shami Kumari Thapa	163	0	3	0
6	Devi Maya Grud	161, 224	0	6	0
7	Shavitri Pun	146	0	4	0
8	Chandra Kala Adhikari	309	0	2	4
9	Tetri Chaudhari	230	0	2	1
10	Nathuram Chaudhari	231	0	2	1
11	Bhim Sharma Paudal	311	0	1	1
12	Ran Bahadur Tharu	305, 307	0	7	0
13	Navin Kumar Shrestha	325	0	12	15
14	Raj Kumar Shrestha	104, 199, 45	5	17	11
15	Champa Devi Shrestha	102	2	8	10
16	Pradeep Kumar Shrestha	41, 48	1	2	0
17	Om Mati Paija	125, 167	0	8	0
18	Renu Khadka	321	0	3	15
19	Dhan Bahadur Shrestha	332	0	3	12
20	Khuma Nath Gautam	143, 167	0	5	0
21	Durga Dutta Lamichhane	88, 82	0	8	7
22	Prithivi Raj	23, 25, 317, 318	0	9	5

23	Ghure Chaudhari	323	0	1	10
24	Khim Lal Bhattarai	152	0	3	0
25	Vishnu Kumari	313	0	4	10
26	Jit Bahadur Lama	220	0	2	0
27	Deshav Kumar Regmi	294, 295, 337, 140, 335, 297	3	17	17
	6 Ka				
	1313, 1317, 1315, 1319, 401, 1321, 1383, 1387, 1389, 1385, 1307				
	Total		**19**	**7**	**0**

Source: DMCRI, 2007

3.1.3 Accessibility: The location is situated about 8.5 KM East of Butwal and is easily accessible. The site touches the EastWest Mahendra highway and hence is readily accessible by bus or other light vehicles. The nearest airport lies at Bhairahawa. From the highway the main project site where all the facilities are to be built takes a 700 meter long route which is now accessible from existing road.

3.2 Project Components

The prominent features of the proposed hospital includes; Out Patient Department, In Patient Department, Operation Theater, Library, Auditorium, Training hall, Administration section, Workshop, Staff quarter, , Incinerators

According to the structural design for proposed Devdaha Medical College and Research Institute., several units are proposed. It includes teaching block, hospital block, staff quarter, hostel, parking, open spaces and other spaces designated for storage of ancillary equipment, spaces allocated water treatment and sewage disposal, solid waste treatment etc.. The building is made up of RCC frame structure having the walls of brick jointed with cement mortar. The positioning and details of the building is shown in the **Annex-4 (different units of proposed DMCRI project)**. The details of the facilities and space are clearly specified in the drawings.

3.2.1 Building and Civil Works: The proposed DMCRI will spread over 20 Bigha of land (approximately 13 hectors). The area is considered adequate to meet the requirements stipulated by the Nepal Medical Council.

The envisaged civil works will be constructed in 4 stages. The stages of construction and its details are shown in area analysis. The hospital will be a multi storied frame structured buildings with fairly good finishing. The teaching faculty too will be multi-storied frame structured buildings with fairly good finishing. Seismic and other likely load will also be duly considered while designing the building. The building will also have elevator facility mainly to transport the patient and the provisions.

In addition, there will some more utility/ancillary buildings for the purpose of laundry, drug stores, cafeteria, oxygen generator, guard house and so on. Moreover, an incinerator will also be there. In order to meet the daily requirement of water, a deep bore well be constructed within the premises. Commensurate with the need, all other physical amenities such as internal roads, drainage, compound walls etc will be constructed.

3.2.2 Utilities and Other Inputs:

a. **Water:** Significant quantity of water is required for the cleaning operation and for human consumption purpose. The required water will be obtained partly from public water supply and partly from ground water. Normally, physical and chemical treatment of natural water is required to make the quality of water acceptable for the drinking and cleaning purpose. Adequate provision for tube wells, water reservoirs, piping, distribution systems including valves and manholes and water treatment facilities consisting of pumps have been incorporated in the project cost.

b. **Power:** The power required for the proposed DMCRI will be about 100 KVA, which will be obtained through national grid of Nepal Electricity Authority. In addition, provision has been made for a captive diesel generator set to cope with the problem of load shedding and power failures.

c. **Fuel:** The fuel will be required for running diesel generator set, laundry machines, incinerator and vehicles. Fuel is easily available in the local market through Nepal Oil Corporation. Lubricating oil, grease etc also is used in the construction and operation phases of the project.

d. **Fire Fighting Equipment:** Adequate provision for the fire fighting will have to be made to cope with any kind of eventualities.

3.2.3 Design Data:

Total number of hospital beds = 700 (300 at the initial stage)
Total number of medical students intake per year = 100

The DMCRI would have the following facilities.

• Anatomy	Ophthalmology
• Pharmacology	Dermatology
• Biochemistry	Pediatrics
• Pathology	Orthopedic
• Microbiology	Otolaryngology
• Forensic medicine	Anesthesiology
• Community medicine	Radiology
• Medicine	Dentistry
• Surgery	Physiotherapy
• Gynecology and obstetrics'	Psychiatry

The arrangement of rooms has been made according to the patient flow pattern. All rooms have been checked for adequacy of size. The special feature of the design is the sharing of specialty services. This is necessary for economizing on expensive equipment and scarce specialist doctors. Time of the specialist doctors will be fully utilized. The details of different units proposed for Devdaha Medical College and Research Institute are as follows.

Table 1: Different Units of DMCRI

S.N	Services of hospital	Floor type	1st year	2nd year	3rd year	4th year
1	OPD Block	Ground	12464 sq ft			
		First floor		12464 sq ft		
2	Indoor Blocks	Ground floor	27000 sq ft	7448 sq ft		
		First floor	7448 sq ft	2000 sq ft	7000 sq ft	
3	College Block					
	Anatomy	Ground floor	6760 sq ft			
	Physiology	" "	4160 sq ft			
	Bio chemistry		4160 sq ft			
	Community medicine + Pharmacology	1st floor	4160 sq ft			
	Pathology	1st floor	6760 sq ft			
	Microbiology	1st floor	4160 sq ft			
4	Staff quarter		25000 sq ft	25000 sq ft	25000 sq ft	
5	Hostel	Ground floor First floor Second floor	10000 sq ft	10000 sq ft	10000 sq ft	
6	OT block	Ground	5000 sq ft	5000 sq ft	5000 sq ft	
7	Administration		5000 sq ft	5000 sq ft		

As elaborated above, the civil work will be constructed in four stages. As the student's intake will increase, the physical infrastructure will be gradually increased. The hospital would be a multi storied frame structured building with fairly good finishing. The teaching faculty too will be multi storied buildings with fairly good finishing. Seismic and other likely load will also be duly considered while designing the building. In addition to the above, there will be some more utility/ancillary buildings for the purpose of laundry, drug stores, cafeteria, oxygen cylinder room etc. In order to meet the daily requirement of water, a deep borehole well be constructed within the premises. Commensurate with need, all other physical amenities such as internal roads, drainage, compound wall etc will also be constructed.

3. 3 Construction Planning

3.3.1 Construction Schedule: Based on the construction activities and their planning, a detailed work schedule has been prepared (The schedule considers time frame and relevant social aspects). The monthly work progress will be prepared incorporating managerial, executive, and supervisory aspects. Based on the construction activities and their planning; a detailed work schedule has been prepared. This schedule considers the time frame for the corresponding nature of the work. The total construction duration is proposed in 4 stages. The construction work mainly consists of the

construction of hospital buildings, academic buildings, ancillary buildings and infrastructures and other support facilities.

3.3.2 Construction Methods: Detail design and drawing of DMCRI was already completed.

During the construction phase, the main civil works consists of excavation, concrete works, flooring, plastering, electrical, and sanitary works in and around the complex. For the completion of the work in time, the suitable method with the proper use of labor and the material would be applied. The construction procedure would include the following:

- **Mobilization**
  All essential machinery, manpower and other resources, which are required, would be mobilized in the site within 60 days after the contract award.

- **Construction survey**
  The joint construction cross-section survey has expected to be completed within 30 days by the joint effort of the consultant and the contractor.

- **Temporary construction work**
  The temporary construction work, which would include the works like collection of materials, the site clearance would likely to take 45 days as described in the work schedule.

3.3.3 Requirements of Workers during the Construction Phase of DMCRI

S. No.	Type of Manpower Required	Total Number Required Per Day	Remarks
1	Staff during construction of DMCRI	40	
	Staff during the operation phase	Over 500	When operated with full capacity
2	Skilled, Semi-Skilled Construction Staff	80	
3	Labor	150-175	

3.4. Construction Materials Required

The different types of material required for the construction includes the cement, sand, aggregate, brick, aluminum, steel etc.

3.5 Construction Power Supply

The area though lie in the village, still has got adequate electrical system. The power supply ensures the uninterrupted construction works. In addition, provision has been made for a captive diesel generator set to cope with the problem of load shedding and power failures.

3.6 Workers Camp and Material Storage Area

There would 150-175 numbers of labors and 80 skilled and unskilled manpower are expected to be involved during the construction phase of the project. No labor or staff (except guards) will live inside the construction premises of DMCRI. The materials, which are required for the construction, would be, stored in one or two closed rooms specially the cement and other important materials.

Table 2: Construction Equipment Required (Minimum)

S. No.	Description	Unit	Quantity	Remarks
1.	Excavator	No.	Optioned	For foot excavation
2.	Bulldozer	No.	Optioned	For excavation of existing ground
3.	Crane	No.	Optioned	For slab concreting
4.	Loader	No.	Optioned	For backfilling on the plinth level
5	Mixer machine	No.	4	For concreting
6.	Truck Mixer	No.	-	During slab concreting only
7	Vibrator	No.	10	For concreting
8.	Mini Damper	No.	4	Miscellaneous jobs
9.	Monkey Jumper	No.	2	For foundation compacting
10.	Plate Compactor	No.	2	Compaction/concreting (if required)
11.	Water Pump (pump Set)	No.	Optioned	For dewatering from foundation
12.	Wheel Barrow	No.	10	Miscellaneous jobs
13.	Bar Bending machine	No.	1	For reinforcement jobs
14.	Bar Cutter machine	No.	1	For reinforcement jobs
15.	Shaw Cutter machine (manual)	No.	-	For formwork
16.	Tipper Truck	No.	2	Miscellaneous jobs
17.	Ashiba	Sets	Optioned	Miscellaneous jobs
18.	Jack Pipe (2 m height)	No.	3000	Concreting (beam, slat, columns etc.)
19.	Black Pipe	No.	-	For connecting jack pipes
20	Stone crushing machine	No	1	
21	Hoisting Machine	No	1	
22	10 Ton Roller	No	1	

3.7 Technical Details of Facilities Proposed at DMCRI

Water Supply, Storm Water, Waste Water, and Sewer Drainage (Design principle of the services are elaborated in master plan report of DMCRI)

3.7.1 Water Demand: Hand pumps will be installed for toilets at the subsidized wards and the guardhouse, cleaning areas. Piped water will be used only for drinking water. The table 3 shows maximum demand forecast when the DMCRI runs at its full capacity. The general demand at initial phases will be 8000-10000 liters per day.

Table 3: The water demand is based on the full capacity-peak demand when all the units of hospitals are fully functional and run with its full capacity

Particulars	Water Demand in Liters/Day
100 paying bed , individual ward@ 100 liters per bed	10000
200 general bed @20 liters per bed	4000
OT 150 persons @ 50 liters/head	7500
Staff 500 @ 4 liters/head	2000
Guard 10 @ 5 liters/head	50
OPD 250 @ 10 liters/head	2500
Administration, Canteen etc	3000
Staff quarters: 200 @ 100 liters/head	20000
Gardening and others	7000
Total	**56050**

Note: Internal adjustment to the demand calculation will have to be made.

3.7.2 Storm Water Drains: A combination of open earth and brick will be used. All storm water is to be diverted to the drains provided along the boundary wall at four sides.

3.7.3 Sewer and Waste Water Drains: The design principle is the same as indicated in the Master Plan Report. It is a two-pipe system, one pipe carrying to septic tank and other carrying to sewer. A waste water management plan of DMCRI will cover the sewerage and waste water drains.

3.7.4 Internal Electrification: The internal electrification will be followed as per the drawing and specifications.

3.7.5 Pavements and Parking: Majority of the built up area of the proposed DMCRI complexes would be asphalt topped. Besides the transportation management is planned in such a way that it will unhinder the patient and the hospital activity. The parking area at DMCRI is big enough to accommodate the expected traffic flow in the medical college and hospital.

3.7.6 Waste Management including the Health Care Waste: The different kinds of wastes are generated from DMCRI. The waste generated in DMCRI are categorized in to three types namely; general, hazardous and sharps. A general waste includes paper, cardboard, floor sweeping, kitchen waste etc. DMCRI needs no special treatment and storage facilities however it still need to be collected separately from infectious waste. Such wastes at DMCRI will be collected separately. These wastes will be placed in a suitable container lined with black plastic bag. Adequate numbers of general waste containers shall be placed in all areas of health care institutions and notices affixed to encourage visitors to use it. The hazardous waste that could be generated from DMCRI includes; cotton, gauze, soiled bandages, cotton used for dressing, blood bags, human and animal

tissue, chemicals, drugs etc. The containers for hazardous wastes shall be colored yellow and marked "Danger Hazardous Waste" (It will be written in Nepali as well) . Other category of waste to be generated from DMCRI includes sharps. Sharps includes whether infected or not, needles, syringes, scalpels, blades, glass, infusion sets, saws, etc. DMCRI is fully aware that used needle should never be recapped, bend or mutilated by hand. For collection of sharp metals, high density plastic containers resistance to penetration and leakage will be used. The indoor waste will be stored properly on each ward, operation theater, and segregated properly there as per norms developed in National Health Care Waste Management Guidelines, 2002). The waste will be then properly hauled to the storage room. Wastes will be segregated there and sent for the proper treatment. Needle destroyer, autoclaving of wastes will be performed based on the nature of health care wastes. Besides for the proper disposal of hazardous wastes, DMCRI would provide the incineration facility, i.e. the wastes would be incinerated in a high temperature under the closed hearth. For the proper management of the wastes treatment plant area would also be managed. Since there is no settlement nearby the proposed area and location of incinerator and selection will be given due consideration, besides proper segregation of waste prior to incineration, regular inspection of incinerator, its effectiveness, training to personnel involved etc will be done during the operation phase. The impact on human health due to incinerator gases will be minimal.

3.8 Design Parameters of DMCRI and Its Integration With Environment Management Plan

The design of DMCRI including the land use and facilities are planned in such a way that the project will be environmentally friendly. The design of DMCRI units, water supply systems, health care waste management facility, separate and isolated building for generator, parking and plantation areas, open spaces, safety measures adopted in design could be well integrated with the proposed EMP of DMCRI. The checklist and monitoring protocols are designed considering the design of DMCRI. The environmental aspects overlooked in the design of DMCRI are included in the EMPs.

CHAPTER – IV

REVIEW OF PLANS/POLICIES, ACTS, RULES/REGULATIONS AND GUIDELINES

This chapter summarizes existing policies, laws, guidelines and institutions in order to inform the decision makers on their implications in the project during the operation of the project.

4.1 Relevant Policies

4.1.1 Health Policy: Nepal has developed 20 year Second Long Term Health Plan (SLTHP)(1997-2017) to guide health sector development for the improvement of the health of the population. In the Tenth Plan (2002-2007) Nepal Government emphasizes the involvement and mobilization of government, non government and private organizations related to health through the improvement of the economic and human resource management. Integration of EIA has given priority for implementation of the mitigation of adverse effects and enhancement of beneficial effects produced. Under this policy government is promoting private medical colleges/hospitals, nursing homes and hospitals.

4.1.2 Environmental Policy: The government, for the first time in the planning history of Nepal, introduced the concept of integrating the environmental aspects in the development projects and programs by carrying out EIA studies from the Sixth Plan (1980- '85) onwards. This commitment was re-enforced in the Seventh Plan (1985-'90), the National Conservation Strategy, 1988. The Eighth Plan (1992-1997) elaborated the need for institutionalizing EIA system to attain the goals of sustainable development by integrating environmental aspects into development activities. The Nepal Environmental Policy and Action Plan (NEPAP), 1993 also recognized EIA as an essential planning and management tool to internalize environmental management aspects into development projects, including the construction of hospital with over 25 beds. NEPAP II, 1988 has been finalized with recommendations for implementing environmental programs and action plans in the development projects.

The Ninth Plan (1997-2002) emphasized participatory EIA to involve the stakeholders in natural resource management and also to internalize environmental management in sectoral development projects and programs with a view to attaining sustainable development objectives. The environment and natural resource management policy as included in the Ninth Plan has re emphasized the need for internalizing the institutionalizing the EIA system right from the local level through coordinated effort.

The Tenth Plan (2002-2007) has also identified EIA as a priority area, and it emphasizes on environmental monitoring of the project that have undergone EIA process. The Plan focuses on the need for setting up national environmental standards with strategy of internalizing environmental management into the development programs. The Plan has also realized to carryout Strategic Environmental Assessment (SEA) with the long term policy of promoting environmental governance. The plan emphasizes on the local participation in environment conservation, as envisaged in the Local Self Governance Act 2055, through the local bodies, make them responsible and capable to manage local natural resources.

4.2 Environmental Legislation

As an emerging subject, there are number of benefit of adopting Environmental Assessments as a planning and management tool in development, planning and administration. Government of

Nepal made a provision for carrying out either IEE or EIA for the prescribed projects, and programs since the beginning of sixth year plan (2037-2045) and onwards.

Prior to the enactment of the Environment Protection Act 1997(EPA, 1997) and the Environment Protection Rules 1997 (EPR 1997). Government of Nepal (GON) has made a provision for integration of EIA in development project as a compulsory requirement through administrative decisions and the implementation of EIA guidelines. Realizing the importance of EIA, Government of Nepal has made EIA as mandatory requirement by enforcing EPA 1997, the EPR 1997. The EPR1997 contains comprehensive list of the proposals, which require IEE or EIA (EPR1997).

The EPA 1997 obliges the proponent to carry out EIA study for the proposed project. Article (6) of the EPA 1997 empowers the concerned agencies and the Ministry of Environment, Science and Technology (MOEST) to review and approve EIA report. The proposals requiring EIA are prescribed in schedule (2) of the EPR 1997. According to Schedule (2), under heading J (Health), for the construction of DMCRI requires an EIA. The report would be submitted to MOEST through the ministry of education and sports for approval prior to the initiation of the project.

4.3 Other Legislations

4.3.1 Solid Waste Management and Resource Mobilization Act, 2044 (1986): SWMRMA empowered the solid waste management center to take necessary measures to stop air, water, and soil pollution caused by solid waste that effects or is likely to affect human beings, animals, birds, plants and other objects, or commodities at any public place, human settlement areas or any other place.

4.3.2 The Labor Act, 1991: the Labor Act 1991 deals with the occupational health and safety. Section 27 of chapter 5 requires the management to make certain arrangements such as the removals of the waste accumulated during the production process and prevention of accumulation of dust, fume, vapor and other impure materials, which would adversely affect health of workers. Section 28 and 29 requires management to provide protective clothing and devices to workers handling chemical substances and other hazardous and explosive substances. In order to prevent accidents, section 30 of the Act requires the proponent to make arrangements for fire safety equipment and emergency equipment while section 31 requires the placement of study fences around hazardous machines operated by energy.

4.3.3 The Local Self- Governance Act (LSGA), 1999: the LSGA, 1999 empowers the local bodies for the conservation of soil, forest and other natural resources and implement environmental conservation activities. Section 28 and 189 of the Act provide that the village development committee (VDC) and district development committee (DDC) are liable to formulate and implement the programs related to the protection of the environment and biodiversity. Furthermore, sections 43 and 201 require the VDC and the DDE to give adequate priority to the protection of the environment through the formulation and implementation of the local level plan(s).

4.3.4 Land acquisition Act, 2034 B.S (1977): The land acquisition act 2034 provides basis for the items for acquisition and compensation.

4.4 EIA Guidelines

The National EIA guideline 1993 uses lists of projects, thresholds and sensitive areas as criteria to assist EIA. Integration of EIA in development projects was started in Nepal after the endorsement of the National EIA guidelines 1993. This guideline contains objectives, methods for screening the projects requiring an application of environmental assessment, scoping, impact identification and prediction, report review, monitoring and evaluation and impact auditing. The guideline also contains the methods for ensuring the public participation during the preparation of the EIA report, including the need for the clear documentation of the impact mitigation measures. The guidelines has also set the provisions for identifying socio-economic, biological and physico-chemical and cultural impacts and prescriptions of mitigation measures to avoid, eliminate and/or minimize the adverse effects and to augment the beneficial impacts resulting from the project implementation (GON 2050 B.S). The guideline also emphasizes the adoption of monitoring, evaluation and environmental auditing frameworks.

As listed in the EPR 1997, a proponent shall be required to carry out the Initial Environmental Examination (IEE) of the proposals mentioned in schedule1 and the Environmental Impact Assessment (EIA) of the proposals mentioned in Schedule 2. EPA 1997 empowers the concerned agency to approve the IEE report, and the MOEST approves the Scoping, TOR and EIA report of proposed project.

4.5 Guidelines, Norms of Ministry of Health and Population

All the guidelines, norms set by the ministry of health and population will be fully incorporated during the construction and operation of DMCRI. The stipulated requirements by the ministry of health and population, Nepal medical council will be fully abide during the construction and operation of DMCRI.

4.5.1 National Health Care Waste Management Guidelines, 2002: The national health care waste management guideline, 2002 provides a framework of waste management strategies to assist in the long term management of health care waste by implementing procedure and norms given in the guideline. The aim is to protect public health and safety to provide safer working environment, and to minimize waste generation and environmental impacts of waste treatment and disposal.

4.6 Environment-Related Conventions

Nepal has some international obligations for environmental protection as being a party to some of the Environment related conventions. Some conventions to which Nepal is a party may be relevant. They are **Basel Convention** on the Control of Trans boundary Movements of Hazardous Wastes and their disposal, and **Persistent Organic Pollutants (POPs)**, Stockholm conference.

Those conventions are the most effective way to protect human health and environment posed by hazardous and other wastes are to minimize their production in quantity and/or hazard potential. Nepal should take measures to ensure that management and movement of wastes is consistent with the production of both human health and environment, regardless of the disposal place. In the present context, these instruments are assessed in the process of EIA study. Mitigation measures are committed in this report to minimize the impacts (negative) of the project, particularly on biological species from the project construction and operation.

CHAPTER - V

EXISTING ENVIRONMENTAL CONDITIONS

5.0 EXISTING ENVIRONMENTAL CONDITIONS

5.1 PHYSICAL ENVIRONNENT

Topography:-The proposed project site lies in Terai which is in the Bhabar zone. The land is smooth on its south. The Chure hills on the north lie around 6 km from the project site. The site lies over a cultivated area with a community forest on one side, settlements on two sides, and Mahendra highway on the other.

Some part of the project site lies over river bank which has lower elevation. This part has been proposed for road construction and gardening.

Geology and soil:-The project site lies on the mouth of major rivers like Rohini and Bhaluhi arising from the Chure hills. The project is a typical Bhabar zone with debris derived from the Chure hills. It has a bed of gravels, pebbles, and boulders. it is composed of thick succession (upto 500m to 1000m). The region consists of yellow-colored soil.

River morphology:-There are 2 main rivers in the area, the Rohini and the Bhaluhi. Rohini is a second class river and Bhaluhi a third class river. The Bhaluhi runs along the eastern part of the site and the Rohini is about 150 m from the site on its right.

Air and noise level:-The air quality data of the project site was not available. The preliminary survey done at the project site for background noise level showed a background noise level of 40 db. The quality of ambient air is within the standards.

Rainfall: The rainfall pattern of the area is a typical monsoon type.

Temperature: According to the data collected from Dept. of Hydrology and Meteorology, Babar Mahal, the maximum temperature of Butwal near Devdaha for the years 2000, 2001, 2002, 2003, 2004, 2005 are 35.5, 37.2, 34.7, 36.0, 35.9 and 38.6 degree Celsius respectively. The minimum temperatures for those years are 11.9, 10.5, 12.6, 11.2, 10.5 and 12.0 degree Celsius respectively.

5.2 BIOLOGICAL ENVIRONMENT

Community Forests:
There are altogether four community forests within the V.D.C., Mahamaya and Srijana in ward no 5, Buddhamawali in ward no 6, and Buddhanagar in ward 7. The areas of these community forests in hectares are 4.48, 11.31, 40.5 and 83.25 respectively. Two other forests have been proposed to be handed over to the community, Milan community forest and Janapriya community forest. Both lie near the project site.

Floral Diversity:
According to the data generated from the local community forest user group and the yearly publication (District Forestry Office Rupendehi's Brief Description and Project Report 2062/2063) the major tress found in the area are *sal ,saaj ,pyari ,roini, bhalayo, lap-lape, kumbi, gum, tatro, mauwa, jamun, amala, neem, chaap, kadam, baansh, bedh, khayar, satisal, bijayasal, sadan, bayar, bar, papal, aap, leechi, anar, simal, pat-pate ,tilco, karam, sisso, epil-epil, belauti, tote, kutmiro, khanyau, dumri, kyamuno, mewa, dhupisallo, ashok, tik, safeda,*

bakaino, kimbu, laharepipal, kathar, nibu, bhal and babari.

The shrubs and herbs of medicinal value found in the area are thakal, kurelo, sarpaganda, pipala, bajradandi,setomusali, kalomusali, pati, lemon grass, aank, kachur, besar, kalohaleto, tulsi, toprejhar, golkankri, and bankerela.

Within the 20 bigahas of project site, there is presence of one pipal, one bakaino, 11 sisso, three khaniyo, one epil-epil, one jamun, and a few meters outside the site lies two simals (an endangered and protected species of Nepal).

5.3 Faunal Diversity

In case of faunal diversity, the project site has no forested area, so there are no vertebrates within the area. According to the data collected from (District Forestry Office Rupandehi's Brief Description and Project Report 2062/2063) the animals found near the project site are *deer, porcupine, fox, monkey, wild boar, lokharke, and nilgai*. Some people even claimed to have seen *leopard and tiger*. The birds found in the district are *bankukhura, parrot, maina, saras, sparrow, vulture, falcon, panihaans, kalij, and dhukur.*

5.4 Socio-economic Environment

Population: The total population of Devdaha VDC in 2058 was 21122 and is now expected to be 36000 out of which 18750 are female and 17250 are male. The total no of households in the V.D.C. is 4000. The data were collected from the interview with the V.D.C. secretary, the V.D.C. office was locked at the time of survey because of insurgency.

Ethnicity: The ethnic groups in the V.D.C. are Bahun, Chhetri, Chowdary, Magar, Tamang, Gurung, Gaire,Rrai, Limbu, Muslims. Among these Bahun, Chetri, and Magar comprised the largest share.

Literacy: The total literacy rate of the village is about 75%.

Source of Income: Majority of the villagers are dependent of agriculture for their livelihood. The dependency on employment overseas is the second important source of income. Some people are operating small scale businesses within the V.D.C. and in Butwal. few others are industrial workers.

Transportation Facilities: The area lies on the Mahendra highway so it is readily accessible via bus and microbus from Kathmandu, Pokhara, Narayangadh. It is at a distance of 300 km from Kathmandu, 102 km from Narayangadh, and 12 km from Butwal. Beside the bus and microbus running in the highway, there are also local buses and jeeps carrying people from Barghat to Butwal (48 km). These local buses travel at an interval of 5 minutes.

Water supply and Sanitation: Within the V.D.C. the major source of water is ground water. The depths from which the underground water can be pumped-up varies from ward to ward. At Buhali ward no 8, the water pump can operate at 20 m depth and 100 m depth. It is said that the water pumped from 20m depth contains trace amount of arsenic but the water pumped from 90 m depth does not contain any arsenic (test was done by FINNIDA supported agency). The people of Buddhanagar are using the stream water collected from the Chure water sheds.

Religion, Religious sites, and Cultural Activities: The main religion in the area is Hinduism. Besides, there are also some Buddhists and Christians living in the area. Muslims are rare.

Within ward no 8, there are 7 temples (Ganeshji temple, Rohini khola temple, Bhalwi chowk temple, two Baghkumar temples, Pundit tole temple). There is one church within the ward.
In ward no 7 and 6, there is the famous Buddhamawali which is a site of religious significant for Hindu and Buddhists.

Health and Sanitation: There is one main health post and one temporary health post as government health facilities in this area. Besides, privately owned clinic also run in the area (one in ward 8, two in ward 5 out of which one is acupuncture clinic, and 4 in ward 2). Other wards in the V.D.C. do not have clinics. People responded during the interview that they rarely go to the local health post. They rather prefer Lumbini Zonal Hospital or would go to Butwal for treatment. In case of major illnesses, people reach as far as Kathmandu or Gorakhpur.

Education Institutions: Within the ward, there is one government school (Janapriya Madhyamik School), two private boarding schools, and no colleges. But the V.D.C. consist one higher secondary school. Many people go as far as Butwal for their studies.

Industries: There is one minor industry in ward no 8, Vision Hygiene Industry, a distillery around 200 m from the project site. A brick industry was running in the project site which has now been displaced.

Cremation site: Currently there are no cremation sites in Ward no 8. The cremation sites at ward no. 9 are used from cremation services for Hindus at the moment.

Water Quality

The DMCRI has currently a daily demand of 20000 liters of water and all the water is being fulfilled through the ground water. It is expected that in future when the hospital would run with the full capacity, its daily water demand would be 56500 liters/day. To meet this future requirement, the hospital management has planned to get water from both underground as well as the municipal supply. The hospital has planned to construct a reservoir tank. The DMCRI has planned to set water purification system in its premises as well. The water initially would pass through the aeration and sand filter unit and then it would pass through the sand and carbon filter units. DMCRI is very much attentive in not to over use ground water. The natural or spring sources are not available in the vicinity.

Other Health related Agencies/ Institutions in the District:

Medical Colleges	:	1
Nursing Homes	:	2
Hospitals	:	5
Health Posts	:	7
Primary Health care centre	:	4
Temporary health post	:	58
Clinics	:	244
Female health workers (volunteers)	:	1290
Khop clinic	:	205

*Note: **According to the facilities and services available in the area, the VDC has been proposed to be nominated into a "kha" class VDC. The VDC has also been classified as a location turning into an urban area.***

CHAPTER – VI

6.0 ALTERNATIVE ANALYSIS

In general the alternative analysis of a project is carried out to assess the technical feasibility, to check the economical viability and environmentally acceptable of the proposed DMCRI.

The purpose of alternative analysis in EIA study is to assess the environmental impact by the different alternatives that have been considered during the feasibility study. This alternative analysis will look in the following headings.

- Project alternative at different locations;
- Do nothing scenario

Alternative analysis should be an integral part of EIA report. DMCRI project will be evaluated by comparing the "No Action Option" with the option of implementation of the project. Furthermore, the proponent (including EIA team) should analyze the likely environmental impacts of the project activities for different alternatives, such as location, construction material transportation and their stockpiling etc. The EIA study has documented possible alternative analysis and considered the environmental management system, acceptability of risks likely to emerge during the implementation of the proposal and other issues of topical interest. The likely impacts of each alternative were assessed and compared in terms of environmental soundness, and the environmentally acceptable alternative were identified and documented.

The construction materials required for the project construction will be mainly locally supplied. The EIA report will investigate and details about the sources of construction aggregates and required for construction.

6.1 TECHNOLOGIES, IMPLEMENTATION PROCEDURE & TIME SCHEDULE

Likely environmental impacts will be avoided/ minimized or mitigated using easily and locally available. The construction technologies, procedure to be adopted in DMCRI is of state of the art technology and procedures followed in construction are based on the latest technology. The proposed time schedule is realistically planned.

6.2 PROJECT ALTERNATIVES AT DIFFERENT LOCATIONS

As per the requirements stipulated by the MOES, the DMCRI should be developed in a 20 Bighas of land. DMCRI did substantial search in finding the suitable areas with above requirements. In addition, economic, environmental, social, technical aspects were some of the key indicators for selecting the ideal location for DMCRI. Among the various sites selected, the present site is found to be the most suitable site from all the perspectives, so executing the DMCRI project at other locations are not considered.

6.3 With and Without Project Scenario of DMCRI

Comparative Assessment of Impacts

S. No.	Impacts	With Project	Without Project
1.	Likely increment in traffic jam	♦	
2.	Loss of plants and shrubs	♦	
3.	Occupational health and safety	♦	
4.	Air and noise pollution	♦	
5.	Land use change	♦	
6.	Employment opportunity	♦	
7.	Health care waste	♦	
8.	Likely Impact on Physical Infrastructure	♦	
9.	Enhancement of local economy		♦
10.	Carter state of art health service		♦
11.	Increase in local skill		♦
12.	Assist to reduce poverty level		♦
13.	Improve the health service		♦

6.4 Do Nothing Scenario

Based on the above analysis, the DMCRI should be developed on location as conceived. The following chapters identify, predict and evaluate the potential impacts of the Project on the environment and also propose environmental protection measures to minimize adverse impacts along with the provisions for environmental monitoring and auditing.

CHAPTER – VII

ENVIRONMENTAL IMPACT

7 ENVIRONMENTAL IMPACT

7.1 BENEFICIAL IMPACT

The construction and operation of DMCRI is for the benefit of the people and the country. Apart from direct benefit of getting better access to state of the art health services, the project will have number of other benefits during the construction stage as well as operation stages. This section of the report has tried to enumerate the beneficial impact from the project and suggest the possible augmentation measures to enhance the benefit.

7.1.1 Construction Stage: The likely beneficial impacts during the construction stage are:

1. ***Employment opportunity to local people:*** During the construction of the project large number of skilled, semi skilled and unskilled manpower will be required. The part of the required labor force could be supplied locally. The employment will increase the income level of the people.

2. ***Boost in the local economy:*** The socioeconomic survey revealed that the major occupations of the area are foreign employment, agriculture, job and business. The employment of the people in the project, business opportunities during the construction and operation phases of the DMCRI and other off spin development due to the project will boot the local economy. The project will expand market/bazaar areas which will increase the local economy.

3. ***Enhancement in technical skills and know how:*** State of the art construction techniques will be followed in DMCRI. Several types of experts including electricians, painters, sanitary fixers, welders, heavy machine and equipment operators, carpenters, will be involved during the construction. The local people involved during the construction phases will be trained on the job. Those skills will be transferred directly or indirectly at local level.

7.1.2 Operational Stage

1. ***Better, easy access to health facility, increase in health facility:*** DMCRI will provide the state of the art facility to locals and in the region. The hospital will carter affordable health services to wider population of the country.

2. ***Employment opportunity to local people:*** During the operation phases of the project large number of skilled, semi skilled and unskilled manpower will be required for day to day operation of DMCRI. The part of the required labor force could be supplied locally. The employment will increase the income level of the people.

3. ***Government declared free health services to poor, helpless patients:*** As per the requirements stipulated by the MOES, for the poor and helpless patient 20% bed will be allocated by the DMCRI. Out of that 20%, 10% will be treated for free and for remaining 10% bed/cabin charge will be free.

4. ***Allocation of scholarship quota for studying MBBS at DMCRI:*** As per the condition stipulated by the Nepal Government, 20% students will get full scholarship at DMCRI for studying MBBS.

5. ***Increase in local development activities:*** Local development activities like construction road, better transportation facilities, better market for vegetable, crop, milk and milk products, water supply system, electricity and other similar local development including health sector will be improved and increased directly or indirectly during the operational stages of DMCRI.

7.2 Adverse Impacts

The approved scoping document and terms of reference for this project has identified possible impacts on physical, biological and socio cultural environment. In order to keep the study as per the TOR of the study, impact on each issue has been discussed, evaluated and the mitigation measures have been proposed in the following chapters.

The impact which lasts for over 20 years is categorized as long term. Similarly impacts lasting for more than 5 years and less than 20 year is categorized as medium and if lasts for only 5 years is categorized as short term impacts.

For assessing the significance following criteria will be followed:
If the quantified magnitude is more than 50% (in an average), it is categorized as significant impact.

If the impact is irreversible, then the impact is termed as significant.

For classifying the extent the following criteria is followed.
If the extent is limited to project area then it is termed as site specific. If the extent is limited to affected VDC then it is local and any impact extending beyond the project site of DMCRI would be termed as regional impact.

The physical environmental impacts have been assessed as per the National Environmental Impact Assessment Guidelines 1993 for magnitude, extent, Duration and significance of the impacts are categorized below.

7.2.1 Physical Environment

7.2.1.1 Construction Stage

1. ***Land use:*** The physical location of the project infrastructures will occupy certain areas of 20 bighas of land that belong to DMCRI. The DMCRI will be constructed in a private agricultural land. Nepal is an agricultural country and above 75% of people's occupation is agriculture. Good agricultural land is limited so the land use change has been taken very serious and must be minimized to the extent possible.

   The land occupied by the DMCRI is permanent in nature. So this impact is significant because land take is irreversible, long term because the land take is for the entire project duration and extent is local. It is worth to note that actual project infrastructures will occupy about 20% of land.

   Considering the above analysis, the magnitude of impact is high, duration is long term and extent is site specific.

2. ***Bank cutting, gully cutting:*** There is not visual landslide exists in the area. However, due to the existing flow of Bhaluhi River, the earth cutting of areas along the flow regime takes place.

   The magnitude of impact is long term, duration is long term and extent is local. This is an significant impact.

3. ***Water quality:*** Disposal of solid waste, sewage into Bhaluhi River would increase turbidity, chemical and bacteriological contamination in River.

   Magnitude is high, duration is long term and impact is local.

4. ***Air Quality:*** During the construction period a large number of vehicles would ply on the 600m earthen road. Vehicles carrying construction materials to construction sites, movement of owners and consultants vehicle is likely to add some dust, carbon dioxide and other gases into the atmosphere.

   The impact is low, extent is local and duration is short term.

5. ***Noise Level:*** The operation of vehicles, construction equipment, and activities associated with the construction like hammering, drilling, bending, forging, welding would increase the noise level. Besides loading, unloading of construction materials, operation of generators would also increase the ambient noise level.

6. ***Stockpiling of construction materials and disposal of spoils:*** The construction material will be stored in designated areas. The proper fencing and storage will be arranged. The spoil materials from excavation of foundations, construction wastes will be used in other areas of the construction of DMCRI.

   The impact is small; duration is short term and site specific.

7.2.1.2 Operation Phase

1. ***Potential bank cutting, gully cutting:*** There is not visual landslide exists in the area. However, due to the existing flow of Bhaluhi River, the earth cutting (bank cutting)of areas along the flow regime takes place.

   The magnitude of impact is high, duration is long term and extent is local. This is a significant impact.

2. ***Water quality:*** Disposal of solid waste including health care waste, liquid wastes including sewage into Bhaluhi River would increase turbidity, chemical and bacteriological contamination in River.
   Magnitude is high, duration is long term and impact is local.

3. ***Air Quality:*** During the operation of DMCRI a large number of vehicles would ply on the 600m earthen road. The vehicle is likely to add some dust, carbon dioxide and other gases into the atmosphere.

4. ***Water Quantity:*** Huge quantity of water is required during the operation of DMCRI. The over withdrawn of ground water could decrease the recharge capacity of underground water, depletes rate of ground water discharge and due to which sinking of ground could takes place.

The impact is high, long term and local in nature.

5. ***Health care waste:*** DMCRI would generate substantial amount of health care waste. The impact of waste is significant in nature. The magnitude of impact is high, duration is long term, and extent is local.

6. ***Noise Level:*** The operation of vehicles, construction equipment, and activities associated with the construction like hammering, drilling, bending, forging, welding would increase the noise level. Besides loading, unloading of construction materials, operation of generators would also increase the ambient noise level.

7.2.3 Biological Environment

7.2.3.1 Construction Stages

1. ***Loss of trees:*** During the construction of DMCRI, few trees within the project areas including *bakaino, sissoo, khaniyo, and papal* needs be felled down as a part of site clearance. Similarly few simal trees should be cleared as well.

   The impact is high in magnitude, extent is site specific and duration is long term.

2. ***Disturbance from construction activities:*** During the construction stage, the noise, air may be high due to several activities. The magnitude of impact is low; extent is local and duration and short term.

3. ***Illegal collection of forest products:*** A large number of construction workers will be engaged during the construction period. It is predicted that the local people and labors and/or their dependents may be involved in collecting using and selling the forest products particularly timber and firewood to meet their demand. The number of shops, tea stall, restaurants, and lodges will also be increased to cater the services to the construction workers and project staff. These may require additional quantity of fuel wood and timber.

   The magnitude, extent and duration of the impact are predicted as low, local and short term (construction related).

7.2.3.2 Operation Phase

1. ***Possible increase in the use of forest product:*** It is also predicted that there will be continuation of the firewood consumption for cooking and heating purposes. The tea stalls, restaurants and lodges will likely consume more firewood because of increase number of patients, visitors, doctors, students.

   The impact is insignificant as the DMCRI would find alternative energy and close vigilance and control in above activity.

2. ***Loss of grasses, trees:***

   The magnitude of impact is low, duration of impact is long term and extent is site specific.

7.2.3 Socio Economic and Cultural Environment

7.2.3.1 Construction Stage

1. ***Loss of farm land as part of site clearance:*** Land acquisition and site clearance of 20 bigha of land for DMCRI will directly affect the families dependent on it. The level of impacts on them may vary with the proportion of loss of land and its effects on the overall household income. The land areas would include 20 bigha of land is khet land. Paddy, wheat and maize are major cereal crops grown in the land acquired for DMCRI.

   Loss of land and production is direct loss of income to the landowners. The magnitude is medium, duration is long term and extent is site specific.

2. ***Relocation of brick factory:*** The brick factory lying in the land acquired by the DMCRI will be relocated. The magnitude is small, duration is long term and extent is site specific.

3. ***Health and Sanitation:*** Concentration of large number of people in the project sites will increase demands for social services and facilities and may give increased pressure to the existing services and facilities such as health posts, schools, water supply. The concentration may also raise serious problems for solid water and sewerage disposal. There may be also being problems in managing sanitation due to open defecation by the work force.

   Though the health and sanitation will be one of the major concerns during the construction activities, the magnitude of impact has been assessed to be low, the extent is site specific and duration will be short term.

4. ***Gender and child labor issues:*** During the construction of DMCRI, most of the men of the project area are likely to involve in the construction activities creating shortage of labor required for agricultural and other household activities. The shortage may have to fulfill by women and children. This shortage may have to fulfill by women and children. This will give them heavy burden of workload. Moreover, overburdened women with household works may also have to take additional responsibilities of men who would be away on the construction job.

5. ***Increase in land value of the vicinity:*** Due to the land acquisition for DMCRI , the land value, rent and services for basic services in the area of Devdaha VDC-8, Bhaluhi and surrounding will increase. Hence the magnitude of this impact is high, extent is local and duration would be long term.

6. ***Sudden cash flow:*** The sudden cash flow in the area in the hands of local people with limited experience in cash transactions and investments may feel themselves cash rich. The risk of poor investment and overspending habit will create the problem. This will lead to development of extravagant habit among them and start purchasing commodities unnecessarily paying more prices. This may lead to increase in prices of commodities in the area.

   The experience from other hospital projects show that people do not make effective use of cash compensation amount and fall in economic crisis after the cash is spent. Hence the magnitude of this impact is considered to be high, extent is local and duration would be long term.

7. ***Economic and social development issues:*** There are demands for assistances from local authorities and VDC people to improve/develop local services and infrastructures not directly related to the project. The local coordination committee has already been formed in the VDC by local people to deal with DMCRI in this matter.

8. ***Cultural and aesthetic sites:*** The execution of DMCRI activities will not disturb archeological and/or religious sites of the area.

7.2.3.2 Operation Stage

1. ***Impact on local economy due to loss of agricultural production:*** The loss of agricultural land of 20 bigha will have direct impact (loss of) production of food grains. These food grains will be brought from outside to the project area. Hence the cost of food grains may increase.

2. ***Sudden cash flow:*** The sudden cash flow in the area in the hands of local people with limited experience in cash transactions and investments may feel themselves cash rich. The risk of poor investment and overspending habit will create the problem. This may also lead to development of extravagant habit among them and start purchasing commodities unnecessarily paying more prices. This may lead to increase in prices of commodities in the area.

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4. ***Law and order:*** The concentration of large number of students, patients and people with varied social and cultural backgrounds and inflow of cash at the same time may lead to anti social activities such as alcoholism, gambling, prostitution. The influx of people from outside may also disturb existing socio-cultural practices of the area. This may bring uneasiness to the local people resulting in conflicts. The conflicts may deteriorate the law and order situation in the area.

7.3 Evaluation of the Impacts

The above impacts are of two types i.e. identified and predicted. These impacts have been evaluated to know their environmental significance taking into consideration the location of the project, direct or indirect nature, reversibility and irreversibility of the impacts, and more importantly the national policy, law and guidelines. Furthermore, they have been grouped into identified and predicted impacts for easy understandings. In general direct impacts are identified, and indirect impacts predicted. The significance of the impacts has been evaluated using the words most significant (+ +), significant (+), and insignificant (-).

Impacts having total score of over 70 are considered very significant; impacts having 40- 70 score are considered significant, and impacts having total score less than 40 are considered insignificant for DMCRI project.

7.3.1 Evaluation of Beneficial Impacts

Evaluation of Beneficial Impacts

Sn.	Likely Impacts	Environmental Impact						Total Score	Significance of Impacts	Remarks
		Nature	Identified	Predicted	Magnitude	Extent	Duration			
1. Construction Stage										
1.1	Employment opportunity to local people	D	√		H (60)	L (20)	ST (05)	85	Very Significant	
1.2	Boost in local economy	ID		√	H (60)	L (20)	ST (05)	85	Very Significant	
1.3	Income generating training opportunities	D	√		M (20)	L (20)	ST (05)	45	Significant	
2. Operational Stage										
2.1	Better, easy access to health facility	D	√		H (60)	R (60)	LT (20)	140	Very Significant	
2.2	20% free health services to poor, helpless patients	D	√		M (20)	L (20)	LT (20)	60	Significant	
2.3	Increase in local development activities	ID		√	L (10)	L (20)	LT (20)	50	Significant	

7.3.2 Evaluation of Adverse Impacts

Sn.	Likely Impacts	Environmental Impact						Total Score	Significance of Impacts	Remarks
		Nature	Identified	Predicted	Magnitude	Extent	Duration			
1. Physical Environment										
1.1	**Construction Stage**									
1.1.1	Land Use	D	√		H (60)	SS (10)	ST (05)	75	Very Significant	
1.1.2	Soil erosion, gully cutting	D	√		M (20)	SS (10)	ST (05)	35	Insignificant	
1.1.3	Change in water quality	IN		√	H (60)	L (20)	ST (05)	85	Very Significant	
1.1.4	Change in air quality	IN		√	M (20)	L (20)	ST (05)	45	Significant	
1.1.5	Increase in noise level	D		√	M (20)	SS (10)	ST (05)	35	Insignificant	
1.1.6										
1.2	**Operational Stage**									
1.2.1	Soil erosion, gully cutting	D	√		M (20)	SS (10)	ST (05)	35	Insignificant	
1.2.2	Change in water quality	IN		√	H (60)	L (20)	ST (05)	85	Very Significant	
1.2.3	Change in air quality	IN		√	M (20)	L (20)	ST (05)	45	Significant	
1.2.4	Water quantity	D		√	H (60)	L (20)	LT (20)	100	Very Significant	

Sn.	Likely Impacts	Environmental Impact						Total Score	Significance of Impacts	Remarks
		Nature	Identified	Predicted	Magnitude	Extent	Duration			
1.2.5	Management of Healthcare	D	√		H (60)	SS (10)	LT (20)	90	Very Significant	
1.2.6	Noise level	D		√	M (20)	SS (10)	ST (05)	35	Insignificant	
2. Biological Environment										
2.1	**Construction Stage**									
2.1.1	Loss of trees	D, IR	√		H (60)	SS (10)	LT (20)	90	Very Significant	Direct & Indirect Impact
2.1.2	Disturbance from construction activities	IR		√	L (10)	L (20)	ST (05)	40	Insignificant	Direct & Indirect Impact
2.1.3	Illegal collection of forest products	IR		√	L (10)	L (10)	SS (05)	25	Insignificant	Direct & Indirect Impact
2.2	**Operation Stage**									
2.2.1	Possible increase in Use of forest product	D, IR		√	L (10)	SS (10)	LT (20)	40	Insignificant	
2.2.2	Loss of grazing land	D,		√	L (10)	SS (10)	LT (20)	40	Insignificant	
3. Socio-economic and Cultural Environment										
3.1	**Construction Stage**									
3.1.1	Loss of farm land	D	√		H (60)	SS (10)	LT (20)	90	Very Significant	Direct & Indirect Impact
3.1.2	Relocation of brick factory	IN	√		L (10)	SS (10)	SS (10)	30	Insignificant	
3.1.3	Health and Sanitation	IR		√	L (10)	SS (10)	ST (05)	25	Insignificant	
3.1.4	Gender & child labor	IR		√	L (10)	L (20)	ST (05)	35	Insignificant	
3.1.5	Increased in land value of vicinity	D		√	H (60)	L (20)	ST (05)	85	Very Significant	
3.1.6	Sudden cash flow	D		√	H (60)	L (20)	ST (05)	85	Very Significant	
3.1.7										
3.2	**Operation Stage**									
3.2.1	Loss of Agriculture production	D		√	L (10)	L (20)	ST (05)	35	Insignificant	
3.2.2	Sudden cash flow	D		√	H (60)	L (20)	ST (05)	85	Very Significant	
3.2.3	Economic & social dev. issue	IN		√	M (20)	SS (10)	LT (20)	50	Significant	
3.2.4	Law & order	D		√	M (20)	L (20)	ST (05)	45	Significant	

Note:

Nature of Impact: D = Direct, IN = Indirect, R = Reversible, IR = Irreversible at site specific level

Magnitude: H = High (60), M = Medium (20), & L = Low (10)

Extent: R = Regional (60), L = Local (20), SS = Site Specific (10)

Duration: LT = Long Term (20), MT = Medium Term (10), & ST = Short Term (05)

Scores are taken from the National EIA Guidelines 1993.

CHAPTER - VIII

8 MITIGATION MEASURES

8.1 BENEFICIAL AUGMENTATION

The benefit from the project could be enhanced or make effective use if they are planned properly. This section of report provides possible augmentation measures to enhance the benefit.

8.1.1 Construction Stage: The likely beneficial impacts during the construction stage are:

1. ***Employment opportunity to local people:*** During the construction of the project large number of skilled, semi skilled and unskilled manpower will be required. The priority will be given to require labor force could be supplied locally. Based on the qualifications and experiences, the people whose lands were acquired by DMCRI will be given the priority.

2. ***Boost in the local economy:*** DMCRI will disseminate information regarding the project activities and invite local people to work in construction activities. DMCRI will designate certain places within the project for the operation of tea stalls, vegetable and shops for rice, pulses, sugar, meat products. The project would encourage staff to purchase the product from the local market to uplift the economic condition of locals.

3. ***Enhancement in technical skills and know how:*** DMCRI will hire and provide on the job trainings to make them capable for future related jobs within or outside the scope of DMCRI.

8.1.2 Operational Stage

1. ***Better, easy access to health facility, increase in health facility:*** DMCRI will provide the state of the art facility to locals and in the region. Transportation facilities, flexible timings and trained professionals will carter affordable health services to wider population in the area and in the region. A complain lodging system and prompt addressing mechanism will be established within the management system of DMCRI.

2. ***Employment opportunity to local people:*** During the operation phases of the project large number of skilled, semi skilled and unskilled manpower will be required for day to day operation of DMCRI. The part of the required labor will be recruited in a priority basis. DMCRI will workout the criteria for it.

3. ***Government declared free health services to poor, helpless patients:*** The requirements stipulated by the Government for DMCRI will be fully followed during the operation phases.

4. ***Allocation of scholarship quota for studying MBBS at DMCRI:*** As per the condition stipulated by the Nepal Government, 20% students will get full scholarship at DMCRI for studying MBBS. This will be fully complied and reported to the concerned agencies.

5. ***Increase in local development activities:*** Local development activities like construction road, better transportation facilities, better market for vegetable, crop, milk and milk products, water supply system, electricity and other similar local development including health sector will be improved and increased directly or indirectly during the operational stages of DMCRI.

Reasonable and rational support will be provided by DMCRI for the above activities. Prior and close consultation with the VDC and communities will be made to make this aspect more transparent, clear and to avoid any misunderstandings.

8.2 Mitigation Measures

This report has tried to identify the impacts to the extent possible and proposed mitigation measures to each of the identified impacts. In addition to these mitigation measures if there are additional impact or damage to the environment due to the project activities that will be mitigated and/or compensated according to the rules and regulations of the country.

8.2.1 Physical Environment

8.2.1.1 Construction Stage

1. **Land use:** DMCRI will ensure that Permanent land acquisition will be minimized and limited within the requirements stipulated by the ministry of education and sports. During the road construction the cut and fill portion of materials. The site will be vegetated with local species of trees.

2. ***Potential land slide, soil erosion, gully cutting:*** There is not visual landslide exists in the area. However, due to the existing flow of Bhaluhi River, the earth cutting of areas along the flow regime takes place. So DMCRI would take the river protection/training works very seriously and plan for it in coordination with VDC and local community. The site will be developed in a stable area and DMCRI will ensure that there will be no encroachment in near by areas.

3. ***Water quality:***
   - The solid, semi solid and liquid wastes are not disposed directly into water bodies. The DMCRI will identify the suitable site near its facility for the treatment plant. All effluent will be treated before discharging into water bodies.
   - Water supplies to DMCRI for human use will be disinfected through filtration and chlorination. Water thus supplied at DMCRI would meet WHO guidelines for drinking water.

4. ***Air Quality:***
   The following mitigation measures will be implemented by DMCRI to minimize the impacts on air quality.

   - Water spraying will be carried out in earthen roads.
   - Use of breathing masks and ear plugs by the construction workers in the dust prone areas
   - Several trees will be planted along the boundary as dust screens or arrester.
   - During the construction period, pollution due to dust will be controlled.

5. ***Noise Level:*** DMCRI will ensure the following;

   - Night time construction work is not planned during the construction of DMCRI.
   - All vehicles plying in the construction area will have regular maintenance as per the manufacture's recommendations.
   - Generators will be kept at a distance from DMCRI and near by houses to avoid noises
   - Ear plugs/muffs will be provided to workers working in noisy areas.

- During the construction period, the noise level will be kept below 90 dB.

6. ***Stockpiling of construction materials and disposal of spoils:***

- DMCRI will re use the spoil for other construction related activities.
- The spoil disposal will not be thrown in the River, rather it will be safely deposited in the stream gullies. ravines.

8.2.1.2 Operation Phase

1. ***Potential River bank cutting, gully cutting:*** Due to the existing flow of Bhaluhi River. the earth cutting of areas along the flow regime takes place. DMCRI will construct suitable River training works prior to the construction of DMCRI facility.

2. ***Water quality:*** The solid, semi solid and liquid wastes are not disposed directly into water bodies. The landfill site will be identified and developed near the DMCRI facility. All effluent will be treated before discharging into water bodies. The treated effluent will meet the international standards before discharging into any water bodies

   Water supplies to DMCRI for human use will be disinfected through filtration and chlorination. Water thus supplied would meet WHO guidelines for drinking water.

3. ***Air Quality:*** The following mitigation measures will be implemented by DMCRI to minimize the impacts on air quality.

- Water spraying will be carried out in earthen roads.
- Use of breathing masks and ear plugs by the construction workers in the dust prone areas
- Several trees will be planted along the boundary as dust screens or arrester.
- A modern incinerator will be selected to avoid air pollution problem. The incinerator will be kept in an ideal location in DMCRI (lee ward side of wind direction).
- Dust, TSP will be completely controlled. Other obnoxious gases will be kept to minimum internationally prescribed standard.

4. ***Water Quantity:*** The DMCRI is committed in coordinating with Bhaluhi Drinking Water Project for getting the required supplied water for the facility. Regular discharge monitoring of ground water will be done by DMCRI. To ensure the optimal use of ground water a better water management practices will be incorporated.

5. ***Health care waste:*** DMCRI is committed to follow health care waste management guidelines, 2002 in order to minimize and manage the health care wastes produced from the facility. A proper health care waste management plan will be in place during the operation phase. Segregation of waste will be done at the source itself as suggested in the health care waste management manual. Needle destroyer and autoclave will be used to tackle the infectious types of health care wastes. Besides, a modern scientific incinerator will be installed to burn the combustible waste at high temperatures. DMCRI will develop a health care waste management plan based on the health care waste management guidelines 2002 and use it in practice.

6. ***Noise Level:*** It is the commitment of DMCRI that night time loading and unloading of material is restricted. Noise absorbent and reducers will be used in sensitive areas like OT. While purchasing the equipment, less noisy equipment is selected. Plantation of trees around the

boundary wall will also help to reduce the noise. The noise will be kept within the standards mentioned below.

Day Time Noise Level (L_d) dB (A)	Night time Noise Level (L_n) dB (A)	Avg. Day and Night (L_{dn}) dB (A)
55-60	45-55	50-55

8.2.2 Biological Environment

8.2.2.1 Construction Stages

1. ***Loss of trees:*** The loss of trees in the land acquired by DMCRI is inevitable as it is a part of site clearance. This impact could not be prevented or corrected but could be compensated. Hence, the proponent will implement compensatory measures for this loss. The proponent will plant several types of saplings at appropriate place in and around the project area and manage in its own cost. It is the commitment of DMCRI that a ration of 1 slash: 10 plantations will be followed for plantation.

2. ***Disturbance from construction activities:*** The impact could not be avoided but will be minimized by using low noise producing equipment, instruction of drivers not to use pressure horn in and around the areas. DMCRI felt that the impact on forest due to the activities of the construction labors will be avoided or mitigated by regulating the activities of labor force and/or their dependents. DMCRI will perform the close monitoring. The necessary orientation will be provided to staff and workers involved in DMCRI.

3. ***Illegal collection of forest products:*** In order to minimize this threat/impact, the DMCRI will strictly inform the staff and labors involved during the construction phase not to use any forest products. The kerosene and gas is available to the local market and rational uses of those fuels will be encouraged to all staff and workers involved at DMCRI.

8.2.2.2 Operation Phase

1. ***Possible increase in the use of forest product:*** The proponent will develop a policy to discourage the use of forest product. The management of DMCRI would work in close coordination with community forestry near to it. They are; Kalika community forestry, Milan community forestry, Janapriya community forestry, and Susarura community forestry.
   The DMCRI would find alternative energy and close vigilance and control in above activity. Regular orientation regarding the use of renewable energy is one of the main aspects that will be followed by DMCRI.

2. ***Loss of grasses, trees:*** This could not be avoided. An alternative grazing area will be searched by the people. Local farmers will be encouraged for plantation of improved fodder crops which gives high yield in small areas.

8.2.3 Socio Economic and Cultural Environment

8.2.3.1 Construction Stage

1. ***Loss of farm land as part of site clearance:*** Land will be purchased based on the local prevailing rate. DMCRI commits that the land owners will be given priority in job and other opportunities at DMCRI based on their qualifications and skills. The job, business and other

off spin developments and possible employment and business opportunities to locals in and around DMCRI will overcome this impact.

2. ***Relocation of brick factory:*** The owner of the brick factory is voluntarily willing to relocate for the good reason that DMCRI would benefit the community at large. The owner of the factory realizes that it will bring adverse impact to DMCRI, so the factory is willing to relocate in a voluntary basis. The land belonging to the factory was sold to DMCRI.

3. ***Health and Sanitation:*** DMCRI commits that the workers will be made aware of the health problems caused by bad sanitation and contamination of drinking water. They will also be made aware of causes of communicable diseases such as AIDS and other venereal diseases. Control measures of above health problems and communicable diseases will be taught to them. A basic first aid facility will be made available to the workers involved in the construction of DMCRI. Besides, a referral case will be made to Lumbini Zonal Hospital, Butwal.

4. ***Gender and child labor issues:*** DMCRI will fix the weekly working hours for the construction workers so that they will have enough time for household works. The DMCRI will conduct regular monitoring to check if child labor is used in the project. As per DMCRI policy, the child labor is strictly prohibited in the project.

5. ***Sudden cash flow:*** DMCRI will run an awareness program before the execution of construction works to tell the local people that the cash flow will be reduced once the construction works will complete. so they should be very careful in spending. They will also be made aware of the investments opportunities likely to generate due to the project and encourage them to explore the opportunities for long term income source. DMCRI will encourage them for developing the private entrepreneurship and other potential sources for income generation.

7. ***Economic and social development issues:*** The DMCRI will stick to the mitigation measures of the project related impacts only to the extent possible. However, project may consider those cases if the demanded activities are beneficial both to the project and the local people. The activities can be implemented in partnership with the local people.

8.2.3.2 Operation Stage

1. ***Impact on local economy due to loss of agricultural production:*** Intensified agriculture, modern and scientific agricultural system is the demand of the present development. These aspects will be highlighted by the management of DMCRI to agencies responsible for agricultural promotion. In addition, during the operation of the DMCRI, the occupation of the local people will be diversified. Majority of the people will be involved in business; job and even self employment will be generated. There will be opportunity for market of agricultural and livestock products, so the focus of people could shift from traditional system of agriculture to cash crop and other agricultural products having immediate market values with good return.

2. ***Economic and social development issues:*** DMCRI commits that it will coordinate with consultative groups formed locally and support rational economic and social development activities which could be beneficial to DMCRI and local community. These issues are dealt within the jurisdiction and scope of the project.

3. ***Law and order:*** DMCRI commits that the regular flow of project related information to the community and government line agencies will be maintained. Besides, a cordial relation with

government line agencies and local community will be established to avoid any unpleasant circumstances.

8.3 Cost Estimate for Implementing the Proposed Mitigation Measures

S.N	Particulars	Mitigation Proposed	Cost (Rs)
1	Landslide protection, soil erosion, protection for gully formation	Construction of protective measures (civil engineering and bio engineering measures)	600,000.00
2	Maintain water quality of DMCRI	Construction and installation of primary and secondary water treatment facility	450,000.00
3	Waste water treatment	Construction of waste water treatment facility	1,000,000.00
4	Control of Air pollution	Water sprinkling to roads, supply of masks to person working in dusty areas etc	400,000.00
5	Control of noise pollution	Construction of generator house away from residential area. Supply of ear plug/ear muffs to workers working in noisy areas	75,000.00
6	Stockpiling of construction material	Fencing of designated areas, construction of yards etc	80,000.00
7	Plantation	Plantation as per design in DMCRI compound and in other areas	60,000.00
8	Awareness raising program	Raise awareness to staff, workers on HIV/AIDS, Water quality, health and sanitation	150,000.00
9	Health care waste management	Incorporation of health care waste management facilities (purchase and installation of needle destroyer, auto clave, incinerator etc), trainings	800,000.00

8.4 Public Hearing

A public hearing was organized on Baisakh 7, 2064 at Janapriya Madyamik Vidyalaya at Bhaluhi Devdaha -9, Rupandehi. The proponent presented the details of EIA findings and gave the proposed mitigation measures. The proceedings of the public hearing are presented in annex 5. Based on the public hearing suggestions, mitigation measures were updated.

CHAPTER - IX

ENVIRONMENTAL MANAGEMENT PLAN

9. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

9.1 INTRODUCTION

The EMP is pre-requisite for EIA study of DMCRI. which has been emphasized in EPR as well. But the content of EMP is subject to discretion of the proponent. Lohani et al. (1997) has emphasized to set out the environmental protection measures (EPM) in EMP and to outline EPM and other measures that should be undertaken to ensure compliance with environmental laws and to reduce or eliminate adverse impacts. The EMP should define technical work programmed, including details of the required tasks and reports and necessary staff skills, supplies and equipment; a detailed accounting of the estimated costs to implement the plan; and planned implementation of the plan, including proposed staffing, schedules of participation and inputs of different agencies. Furthermore, the mitigation measures and monitoring requirements are normally set out in an EMP (Lohani et al.. 1997). It is also recommended to establish an Environmental Management Unit (EMU) for the implementation of the plan.

The issued terms of reference of the study suggests that EMP should comprises of implementation of the mitigation measures, environmental monitoring plan, framework for the environmental auditing and the institutional arrangement for the implementation of EMP.

9.2 PLANNING

9.2.1 Stages for the Implementation of Environmental Protection measures: The Environmental Protection Measures (EPMs) of DMCRI will be implemented during the pre-construction, construction and operational and maintenance stages of the project. The implementation of the mitigation measures will be the responsibility of the proponent. All preparatory activities related to site clearance will be completed during the pre construction stages. The proponent will continue its conservation activities during the post construction stages as well depending upon the type and nature of EPMs. With due consideration on the similarity of EPMs, they have been merged at appropriate places. Necessary manpower, and budget for their implementation is given in other sections of this chapter.

9.2.2 Environmental Monitoring: Environmental monitoring is an integral part of the EIA report. The sub section focuses on compliance and impact monitoring. Furthermore, the compliance monitoring is not related to effectiveness of the measures implemented. It will only focus whether the implementation of EPMs is complied with or not.

9.2.2.1 Monitoring Plan and Schedule: The impact of the proposed project on physical. biological, and socioeconomic and cultural environment will be minimal. Based on the size, location and magnitude of the project. the monitoring schedule depending upon the parameters is recommended for construction phase. Table below summarizes the monitoring plan and schedule for all three types of monitoring. The DMCRI commits that the prime responsibility for conducting the proposed monitoring program. It is also recommended that third party monitoring will be adopted in order to make the unbiased judgment on monitoring.

Environmental Monitoring Plan and Schedule for DMCRI

Parameter	Indicators	Method	Location	Schedule
Baseline Monitoring				
Physical Environment				
Air quality & noise level	Suspended particulate matter and noise intensity	Observation/inspection and measurement	In and around project area	Pre-construction Phase
Water quality	Temperature, pH, DO,	Water sampling and testing	Bhaluhi River, and water sources within 50 m from the project site	Pre-construction Phase
Biological Environment				
Shrub and vegetation	Enumerators of trees and vegetation	Observation	In and around project area	Once a year
Socio-Economic and Cultural Environments				
Settlement & Population structure	Settlements in project area & number of people	Census data of municipalities, discussion with local people	In and around project area	Pre-construction phase
Health & Sanitation	Types and incidences of diseases	Discussion with local people and health workers, Observation	In and around project area	Pre-construction phase
Local economy	Economic activities	Discussion with local people and Observation	In and around project area	Pre-construction phase
Compliance Monitoring				
Construction Phase				
Implementation of EIA recommendations	Incorporating of EIA recommendations into project documents	Review of detailed design, project specification and tender documents	- -	After the project design and completion of tender documents
Incorporation of environmental considerations mentioned in the tender documents	Review of proposed work plan submitted by contractor	Site observation and consultation with project management	- -	During contract negotiations
Construction logistics	Contractor's arrangement construction activities	Site observation	- -	Beginning of the construction period
Clean-up an reinstatement of the project area	Completion of different aspects of project clean-up	Site observation	- -	At the end of construction period, before operation
Operation Phase				
Medical waste volume	Waste separation system and Collection bins	Observation	- -	Once a week

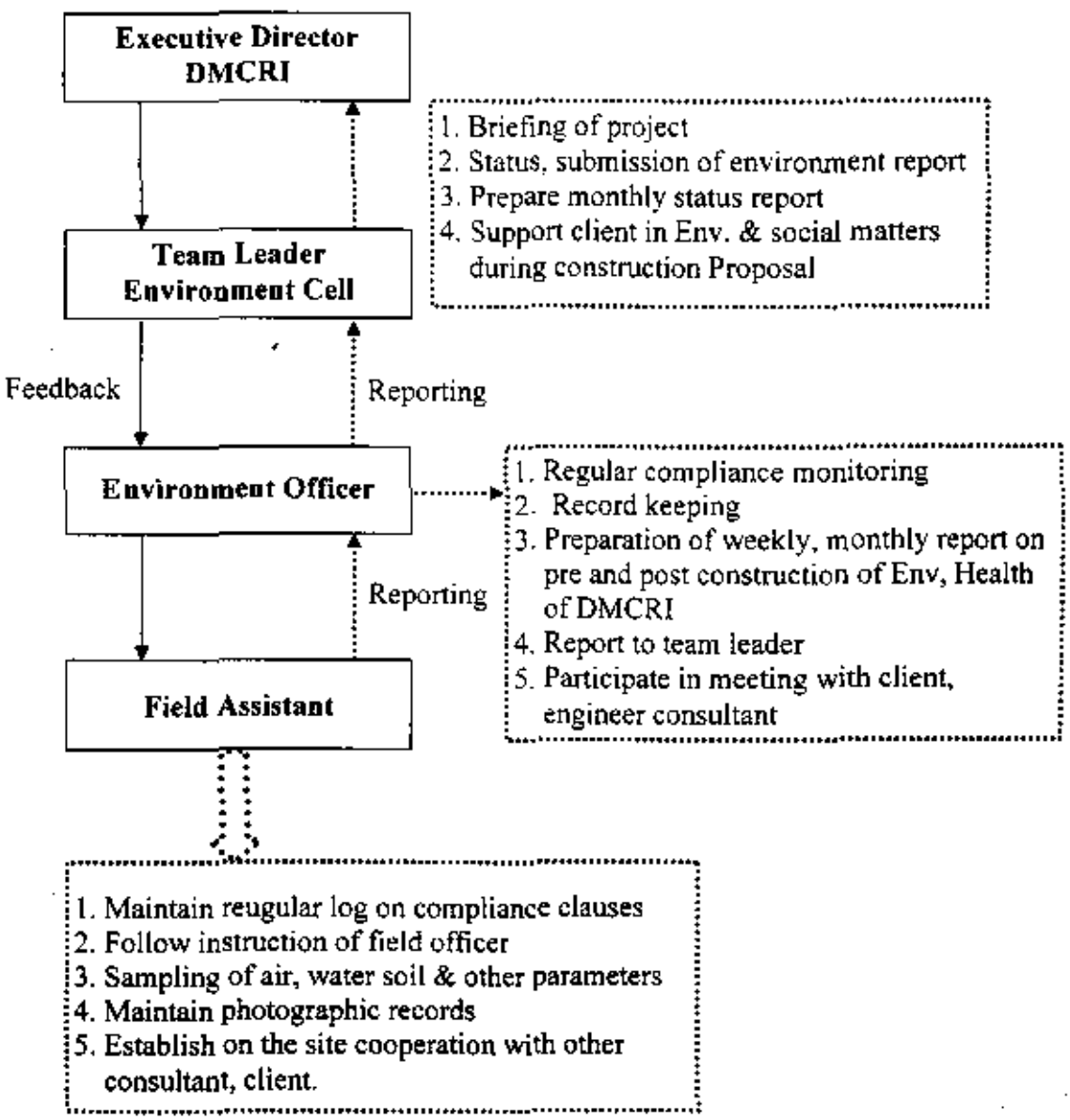
Impact Monitoring				
Physical Environment				
Construction Phase				
Air quality	Suspended particulate matter; Dust accumulation from construction activities	Inspection, measurement and comparison with ambient standards	In and around project site	Throughout the construction phase
Noise level	Intensity of noise and loudness	Measurement	In and around project site	Throughout the construction phase
Water Quality	Temperature, pH, DO, oil & grease	Water sampling and testing	Bhaluhi river, and water sources within 50 m from the project site	Throughout the construction phase
Operation Phase				
Land use	Changes in land use pattern	Observation	In and around project site	Operation phase
Hospital waste volume	Waste separation system and Collection bins	Observation	DMCRI premises	Once a week
Biological Environment				
Construction Phase				
Forest and vegetation	Species survival rate and plantation sites	Plantation site	Once a year	Measurement
	Utilization of forest products by workers and project	Project site	After sale	Measurement and observation
	Number of tea stalls, restaurant, firewood trade	Project site	Twice a year	
Operation Phase				
Forest and vegetation	Species survival rate and plantation sites	Plantation site	Once a year	
	Utilization of forest products by workers and project	Project site	After sale	
Socio-Economic and Cultural Environment				
Construction Phase				
Impact on social practice	New behaviors, disturbances	Observation	In and around project area	Continuous during construction phase
Safety	Number of casualties	Record of accidents	In and around project area	Continuous during construction phase
Health and sanitation	Types and incidence of diseases	Discussion with local people and health professionals	In and around project area	Continuous during construction phase
Employment	Number of local people employed	Records kept by project management and contractor	Project area	Construction phase

Local economy	Economic activities	Discussion with local people and Observation	In and around project area	Construction phase
Operation Phase				
Settlement & Population structure	Settlements in project area & number of people	Census data of municipalities, discussion with local people	In and around project area	Operation phase
Local economy	Economic activities	Discussion with local people and Observation	In and around project area	Operation phase

Implementing Mechanism of Environmental Protection Measures

The DMCRI is committed in implementing EMPs through the contractor(s) and will make responsible the supervising consultant to ensure its implementation. The DMCRI commits to establish a separate Environmental Management Cell (EMC) as an integral part of the project to ensure the implementation of EMPs and monitoring as an in built mechanism within DMCRI. The EMC will focus on compliance monitoring, record keeping, and providing technical inputs to the contractors(s).

Staff and Flow Diagram of Reporting Mechanism



9.2.2.2 Budget for EMP Implementation

I. ***Benefit Augmentation, Mitigation and Compensation:*** The benefit augmentation, mitigation and compensatory measures are the part of the project development. Hence, their cost will be included in the project cost. Most of the cost will be included in the project cost. Most of the benefit augmentation and mitigation measures are included in the engineering design, necessary contract provision and the specifications will be included in the tender document and their cost will be included in the engineers estimate. Some of the specific costs for the program implementation that may not include in the engineers are presented in the table below.

S.N	Benefit augmentation measures mitigation measures	Methods	Estimated Budget
1	Dissemination of project information	Prepare project information pamphlets and distribute in the project area	100000.00
2	Impart income generating training programs (In house)	Different trainings will be provided	200000.00
3	Run health camps in Devdaha VDC	2 Health camps per year will be arranged in project areas (Yearly)	200000.00
Mitigation Measures			
4	Collaborative support to community in river training works	River training work of Bhaluhi Khola	250000.00
5	Plant about 600 Saplings and its maintenance	Plantation of saplings in and around DMCRI	60000.00
6	Collaborative support to community demands on priority	Support to approach road, club, etc	400000.00
TOTAL			**1210000.00**

II. Monitoring Cost: The Monitoring cost of DMCRI for both construction phase and operation phase monitoring are discussed below. Operation phase monitoring cost for 2 years is also estimated. The project being small in size, total estimated cost for monitoring activities comes to be only NRs 5,70000 (In words Five Lakh Seventy Thousand Only).

Table Environmental Monitoring Cost

Items	Amount (Rs.)
CONSTRUCTION PHASE MONITORING COST	
Baseline Monitoring	
• Laboratory analysis (water and air)	20,000
• Manpower (Environmental engineer, Field technician/Enumerator)	50,000
• Logistics	30,000
Subtotal	**1,00,000**
Compliance Monitoring	**100,000**
Impact Monitoring	
• Laboratory analysis	30,000
• Manpower (Environmental engineer, Field technician)	130,000
• Logistics	50,000
Subtotal	**210000**

OPERATION PHASE MONITORING COST (FOR 2 YEARS)	
Compliance Monitoring	**60,000**
Impact Monitoring	
• Laboratory analysis	30,000
• Manpower	40,000
• Logistics	30,000
Subtotal	**1,00,000**
TOTAL	**570,000**

9.2.2.3 Manpower: Following manpower will be required to accomplish the above-mentioned monitoring activities.

- Team Leader/Environmental Engineer - 1
- Environmental Officer - 1
- Field Assistant - 1

9.2.2.4 Institutional Setup: The project proponent will have the prime responsibility for the implementation of mitigation measures and monitoring plan. However, the proponent can depute the required manpower for monitoring. Such person/s for the monitoring program need not stay in the field regularly, but they should visit the area frequently as prescribed in the monitoring schedule.

The sole responsibility of the monitoring of the project goes to DMCRI. The Ministry of Environment, Science. and Technology (MOEST) shall accomplish the environmental audit two years after the commencement of services.

CHAPTER - X

ENVIRONMENTAL AUDITING

10. ENVIRONMENTAL AUDITING

Environmental Auditing is required after two years of project operation. Auditing refers to a general class of environmental investigations that are used to verify past and current environmental performance. Environmental Auditing will be performed only once for each project. Compared to the environmental management of a project, environmental impact auditing assesses the actual environmental impact, accuracy of prediction, effectiveness of environmental impact mitigation and enhancement measures, and functioning of monitoring mechanisms.

10.1 Types of Auditing

As stated in the National EIA Guidelines the followings are different types of Environmental Impact Auditing must be done for different aspects of the EIA process:

- **Decision point Auditing**:- examines the effectiveness of EIA as a decision-making tool
- **Implementation Auditing**:- ensures that the conditions of consent have been met
- **Performance Auditing**:- studies the work of agencies associated with project management
- **Project Impact Auditing**:- examines environmental changes arising from project implementation
- **Predictive Technique Auditing**:- examines the accuracy and utility of predictive techniques by comparing actual against predicted environmental impact
- **EIA Procedure Auditing**:- examines critically the methods and approach adopted during the EIA study

Environmental Impact auditing is not required in all cases. The Project Impact Auditing and Performance Auditing will be mainly used for the DMCRI Project. Table below shows the Environmental Auditing Plan proposed by DMCRI.

Table Parameters, Indicators, Location and Methods for Environmental Auditing

Parameters	Location	Methods	Indicators
Physical Environment			
Water Quality	River water, tap water and other water sources in project area	Analysis of water samples	DO, BOD, pH, conductivity, coliform
Air quality and Noise level	In and around project area	Inspection and measurement	SPM, dB
Biological Environment			
Forest and Vegetation	Project areas and surroundings	Measurement and observation	Change in baseline condition
Socio-Economic and Cultural Environment			
Community development work	Around the Project site	Records	Number of development works, number of shops
Economic status of the people	Around the project	Survey and	Status of local

in project	site	Interview	people, beneficial use
Medical Waste	DMCRI premises	Inspection	Type and Quantity of wastes
Occupational health and safety	DMCRI	Records	Number and type of accidents/diseases

10.2 Environmental Auditing Cost

Environmental Audit will be carried out after two years of project completion. The total cost for the environmental auditing is estimated to be NRs. 145,000

Table: Environmental Auditing Cost

Items	Amount (Rs.)
Human Resources • Team Leader • Environmental Engineer • Socio-economist • Environmental supervisor	 25000 30000 20000 20000
Transportation	30000
Stationary	20000
Total	**145,000**

10.2.1 Timing for Auditing and Responsibility: In principle, environmental auditing should be carried out just after the completion of the construction stage of the project. However, it could be carried out after two years of the commencement of the service from the project in accordance with Rule 14 of EPR, 1997 (amended 1999), preferably within three years to assess changes on natural resources in between pre and post construction stages.

Based on EPR 1997, MOEST is responsible to carry out environmental auditing after two years of service provided by the Project.

CHAPTER - XI

CONCLUSIONS AND RECOMMENDATIONS

11.0 CONCLUSIONS AND RECOMMENDATIONS

The assessment report concluded that there would be no significant environment impact due to the proposed construction facility for DMCRI. The project has many beneficial impacts as compared to few localized adverse impacts, which could be minimized or mitigated with very minimal cost. The following measures are recommended to avoid, correct or compensate for the adverse impacts on the physical, biological and socio-economic resources of the area due to the construction and operation of the proposed project. This study may not have included all the proposed mitigation measures. Numbers of environmental concerns have to be reflected in the contract clauses. Hence, the provisions of this EIA report must be included in the detailed design and the tender document so that they are implemented. Any activity is not effective without proper monitoring. The proponent has generously committed the monitoring cost within the project cost. Some of the commitments are listed below.

1 Sprinkling of water on the road leading to the construction site and also in construction site will be done to reduce the dust and air pollution.

2 As far as possible environment-friendly methods, viz. use of brake mechanical part to absorb vibrations, during construction will be practiced.

3 Construction activities will be planned properly and construction wastes generated will be disposed properly and reused as far as applicable.

4 Awareness programs will be carried out for the contractor and the workers to minimize noise, vibration and dust within the acceptable limit. Similarly adequate provisions should be made for safe water supply to the construction workers and solid waste disposal.

5 Employment opportunities will be provided to the local families as far as possible.

6 Environmental mitigation cost will be incorporated as an integral part of the project cost.

7 Regular monitoring of machinery will be performed for safe exhaust emission levels.

8 Safe health care waste handling practices will be incorporated as suggested by National Health Care Waste Management Guidelines.

9 The proponent will give emphasis for controlling ill social behavior during the construction and operation phases of DMCRI.

10 The effective coordination will be established with local community, VDC and coordination committee.

11 Number of medical college and hospitals being developed in the region. DMCRI commits to coordinate among them to have the common facilities and share of knowledge and information.

12 The management of DMCRI will coordinate and establish good rapport with VDC, local organization, local people. In this regard, DMCRI will establish link, coordination with local coordination committee which was recently formed by the community of Devdaha VDC.

Approved Scoping & ToR Document

This Terms of Reference (TOR) has been prepared to conduct Environmental Impact Assessment of the Devdaha Medical College and Research Institute (DMCRI), in accordance with Rule 5 (3) of the Environmental Protection Rules, 1997.

1. Proponent and Address

Shree Devdaha Medical College and Research Institute Pvt Ltd
Devdaha Bulahi VDC
Rupandehi District, Nepal
Tel: 071-621800/801

2. General Introduction Of The Proposal

The main objective of the proposed teaching hospital will be to foster and promote the cause of higher education in the field of medical science and technology. Every endeavor of the proposed venture by Devdaha Medical College and Research Institute will be to contribute significantly in improving the health as well as socio-economic standards of large section of people of Nepal by increasing opportunities to obtain high quality education and provide job opportunities as well as significantly enhance the health and economic standards of Nepalese people.

Since the establishment of National Health Policy (NHP) in 1991, the country has developed a 20 year Second term long term Health plan (SLTHP) (1997-2017) to guide health sector development for the improvement of the health of the population. With the current data as published by UNFPA- 2001/02 , the number of population per physician in Nepal is 18439. With such a high population to physician ratio and an increasing number of patients each year, there is an acute need for the production of adequate human resources to provide quality health services in the country. Therefore, Nepal Government has adopted a policy to promote private medical colleges/ hospitals, nursing homes and hospitals run by INGO's/ NGO's and private practitioners as complementary government facilities. Accordingly, as of 2003/04 (2060/61), in patient services were provide by government hospitals, nursing homes and private practitioners.

Shree Devdaha Medical College and Research Institute is a project for the enhancement of health standard of the Nepali people and production of quality medical practitioners in Nepal. The Medical College and Research Centre is expected to produce 100 competent medical graduates per year and would follow the annual intake procedure as per the Pre-requisite of Nepal Government i.e. 10% as nominated by Government under full scholarship, scholarship to 10% securing highest marks in the entrance exams, and would take other fee paying students from Nepal and India, 40-40 students each from two countries. The Institute will provide high quality services on Gynecology, Obstetrics, General Surgery, General Medicine, Radiology, Ultra sonogram, Gastro Intestinology, Cardiology, Orthopedic, Ophthalmology, Dermatology & Venerology, Pediatrics, ENT and many more facilities.

The operation of the hospitals or nursing homes with more than 25 beds or medical profession (study and teaching also) requires going through Environmental Impact Assessment (EIA) process. The proposed DMCRI project has to undergo and EIA study, to ensure that the proposed program is environmentally sound, sustainable and to suggest accordance with the provisions of the Environmental Protection Act (EPA), 1997 and Environmental Protection Rules (EPR) 1997. The proposed Devdaha Medical College and Research Institute project with a 300 bed capacity falls under the category requiring an EIA document.

2.1 Project Description

The proposed Devdaha Medical College and Research Institute (DMCRI) will be located in Devdaha Bulahi VDC, Rupandehi district, Nepal. The location is situated about 12 KM East of Butwal and is easily accessible. The site touches the East West Mahendra highway and hence is readily accessible by bus or other light vehicles. The nearest airport lies at Bhairahawa. From the highway the main project site where all the facilities are to be built takes a 1 km long route which is now accessible from a small track road. The total area of DMCRI is approximately 20 bigha. Out of 20 bigha of land, 20% will be occupied by the buildings and rest to be used as play ground, parking space, gardening etc. The location is fully supported by physical infrastructures, power supply, water supply and drainage facility. The DMCRI would have the following facilities.

- Anatomy
- Pharmacology
- Biochemistry
- Pathology
- Otolaryngology
- Forensic medicine
- Ophthalmology
- Dermatology
- Pediatrics
- Microbiology
- Orthopedic
- Anesthesiology

- Community medicine
- Medicine
- Surgery
- Gynecology and obstetrics

Radiology
Dentistry
Physiotherapy
Psychiatry

The arrangement of rooms has been made according to the patient flow pattern. All rooms have been checked for adequacy of size. The special feature of the design is the sharing of specialty services. This is necessary for economizing on expensive equipment and scarce specialist doctors. Time of the specialist doctors will be fully utilized. The details of different units proposed for Devdaha Medical College and Research Institute are as follows.

S.N	Services of hospital	Floor type	1st year	2nd year	3rd year	4th year
1	OPD Block	Ground First floor	12464 sq ft	12464		
2	Indoor Blocks	Ground Floor First floor	27000 7448.00	7448 2000	7000	
3	College Block					
	Anatomy	Ground floor	6760			
	Physiology	" "	4160			
	Bio chemistry	1st floor	4160			
	Community medicine – Pharmacology		4160			
	Pathology Microbiology	1st floor	6760 4160			
4	Staff quarter		25000 sq ft	25000 sq ft	25000	
5	Hostel	Ground floor First floor	20000 sq ft	20000 sq ft	20000	
6	OT block	Ground	5000 sq ft	5000 sq ft	5000 sq ft	
7	Administration		5000 sq ft	5000 sq ft		

As elaborated above, the civil work will be constructed in four stages. As the student's intake will increase, the physical infrastructure will be gradually increased. The hospital would be a multi storied frame structured building with fairly good finishing. The teaching faculty too will be multi storied buildings with fairly good finishing. Seismic and other likely load will also be duly considered while designing the building. In addition to the above, there will be some more utility/ancillary buildings for the purpose of laundry, drug stores, cafeteria, oxygen cylinder room etc. In order to meet the daily requirement of water, a deep borehole well be constructed within the premises. Commensurate with need, all other physical amenities such as internal roads, drainage, compound wall etc will also be constructed.

2.2 Objectives of EIA

The main objectives of EIA study are to:

- Document the existing environmental condition of the project area,
- Identify, predict and evaluate the impacts of the project on physical, chemical, biological, socio-economic and cultural aspects of the environment,
- Examine the significance of the environmental impacts
- Recommend preventive and curative measures, including benefits augmentation measures, and environmental management plan along with monitoring and auditing requirements,
- Provide information for decision-makers and concerned parties about the environmental implications of the proposed project implementation and associated cost for the implementation of environmental protection measures.

3. Data Requirement and Collection Methods

In order to meet the above objectives, the proponent shall collect and analyze both primary and secondary data and information on physical, chemical, biological and socio-economic parameters including community resources,

health and sanitation, agriculture production and practices, migration pattern, archaeological, historical and religious sites, cultural, religious and social practices within the defined project area.

3.1 Data Requirement

3.1.1 Physical Requirement: The proponent shall collect necessary data and information in the following areas and incorporate in the EIA report.

- Type and nature of waste including solid, liquid, infected hospital waste product
- Physiography, topography and landscape
- Climate and hydrology
- Geology and soil
- Air, water quality (including Arsenic), water demand
- Potential for rain water harvesting, groundwater and recharge potentials
- Noise level and vibrations

3.1.2 Biological Environment: The following data and information shall be included in the EIA report

- Plants, mammals, birds, insects, and fishes
- Forest biodiversity
- Agricultural diversity

3.1.3 Socio-economic and Cultural Environment

- Population, ethnicity, settlement, and occupation of the immediate influence area
- Social services and other facilities
- Major economic activities
- Aspects related to land acquisition, compensation, rehabilitation

3.2 Data Collection Methods

3.2.1 Literature Review: Data and information from secondary sources such as the Project Document of Devdaha Medical College and Research Institute and various published and unpublished reports, articles etc available from different governmental as well as non-governmental offices and libraries will be collected and reviewed. Similarly other pertaining information such as Policies, Acts, Rules, directives, and guidelines shall be collected and reviewed.

3.2.2 Field Investigation: Consultation with local bodies and community groups shall be made to collect field level information. Focus Group Discussion, Participatory Rural Appraisal (PRA) shall also be employed as applicable. The proponent shall make a field visit to the project site to verify the secondary data and fill the data gaps through field surveys, consultation with local people and relevant experts. The local people shall also be informed about the project activities through informal consultations.

Information on plants, animals in the study area will be collected through discussion with local people, and observation methods.

3.2.3 Data Collection: The data on air, water, noise and soil shall be gathered from primary as well as secondary information. Data of the core project shall be collected through inventory.

3.2.4 Data Analysis: The baseline data shall be analyzed and interpreted using standard methods.

3.2.5 Impacts Identification, Prediction, and Evaluation: The proponent shall identify and predict the likely impacts of the project activities on the environment. Impact identification prediction techniques like Ad hoc method, checklist, and matrices will be used. For the impact prediction purposes techniques like expert judgment, cause-effect method, laboratory experiments, and socio economic methods will be used. These methods will focus on prediction of significant environmental modifications, forecasting of quantity and/or spatial dimension of change in the environment, and estimation of probability of that impact will occur over the time period of DMCRI. Each identified and predicted impacts shall be evaluated taking into consideration the national policies, laws, environmental and health related standards and local customs. The species protection list shall also be used during the impact evaluation to the extent applicable. Environmental impacts in terms of magnitude, duration and the extent associated with the proposed project will be assessed. The proponent shall also examine the significance of

impacts, and criteria for denoting significant impacts shall be included in the EIA report. It shall include measures to minimize the adverse effects and enhance beneficial impacts by employing standard methods.

Information shall be interpreted in narrative fashion as appropriate and shall be included at appropriate places in EIA report.

3.2.6 Public Hearing: After preparation of draft EIA report, the public hearing shall be conducted in the project area. For this a public notice will be published in a national daily newspaper about the date, place and time of public hearing. Such notice will be pasted in notice board of the affected wards in Devdaha Bulahi VDC, schools, health posts, etc. Comments and suggestions received from the stakeholders during this process shall be incorporated into the EIA report.

4. POLICIES, LAWS, GUIDELINES AND MANUALS

The proponent shall review the relevant articles, sections of the rules of the Constitution of Kingdom of Nepal 1990, Acts and Rules related with this report. The proponent shall review, *inter alia*, the following:

Policies

- The Tenth Plan (2002-2007), environment and health sector related policies

Acts including their Rules

- Environmental Protection Act, 1996
- Solid Waste Management and Resource Mobilization Act, 1987
- Labor Act, 1991
- Land Acquisition Act, 1977
- Local Self-Governance Act, 1999

Standards

- Water and air quality standards and guidelines
- Standards for medical colleges stipulated by ministry of health and population, Nepal medical council and other related institutions

Guidelines

- National EIA Guidelines, 1993

Conventions

- Basel Convention
- Persistent Organic Pollutants (POPs)

The proponent shall also review the responsibilities of the institutions related to this proposal.

5. PREPARATION OF THE REPORT

5.1 TIME

The proponent shall incorporate EIA recommendations into the detailed design of the project in order to make the project environmentally sound and sustainable. The proponent shall prepare the EIA report in about 3 months. The following has proposed the following timetable.

Schedule for EIA Report preparation

S. No	Period▶ / Activities▼	Month 1				Month 2				Month 3				Remarks
		1	2	3	4	1	2	3	4	1	2	3	4	
1	Team Mobilization on Approval of Scoping & TOR													For EIA study
2	Literature Review & Field Study													Field work
3	Data Compilation & Draft Report Preparation													EIA Report preparation

4	Public Hearing				At the project site
5	EIA Report Submission				MOES, MOEST
6	Approval of EIA Report				MOEST

The proponent shall address the following issues during the EIA report preparation for both construction and operational stages of the proposal.

5.2 Budget

The proponent has allocated Rs. 300000.00. excluding VAT and TAX to complete the EIA study of DMCRI.

5.3 Proposed Experts

The following experts shall be mobilized to complete the EIA study.

- Environmental specialist (Team Leader)
- Architect
- Environment engineer
- Sociologist
- Medical doctor
- Economist
- Biologist

Beside, the proponent shall also take the inputs from public health specialist and mobilize the field assistants to collect field level data, verify secondary information, and process the data and information for inclusion in final EIA report.

6. Scope Determined for the Preparation of the Report

The proponent shall address the following issues during the EIA report preparation for both construction and operational stages of the proposal.

Details of the likely issues related to physical, biological and socio-economic environments are described in the following subchapters.

Existing Environmental Issues: (Due to the hospital construction)

6.1 Physical Environment:

The construction activities like excavation and running of construction equipment, machinery might create the problem of air pollution by emitting dust particles, aerosols and obnoxious gases and also noise pollution. The proponent will focus on, but not limited to, the following issues;

Construction Stage:

a. Air quality
b. Water quality, surface and ground water, water table including groundwater recharge potentials
c. Noise and vibrations
d. Change in land use
e. Stockpiling of construction materials
f. Disposal of general wastes and construction spoils including their management
g. Nuisance to adjacent areas
h. Access road and traffic management
i. Work camp area
j. Disruption of private property
k. Disruption of natural drainage
l. Infrastructure, electricity etc

Operation Stage:

a. Water quality related to wastewater/sewer discharge including potentials for rainwater harvesting
b. General and special wastes collection, disposal and their management
c. Vehicular emission and noise level and traffic management
d. Water supply and sanitation
e. Health care waste management (mid term and long term management)
f. Waste treatment and management (incineration, etc)

6.2 Biological Environment

a. Vegetation and agro-biodiversity
b. Loss/alteration of habitat

6.3 Socio Economic and Cultural Environments

Construction Stage

a. Expectation management
b. Accident, occupational health and safety
c. Land acquisition, compensation and employment
d. Impact on local economy
e. Social undesirable activities and use of child labor
f. Impact on social service facilities
g. Disruption and/or pressure on community

Operation Stage:

a. Expectation management
b. Local health and sanitation including impacts of special wstes
c. Impact on local economy
d. Socially undesirable activities
e. In migration
f. Change in land and property value
g. Spread of communicable and non communicable diseases

Environmental Impacts Due to Access Road Construction

For providing the better transportation facilities to the proposed hospital, a 700 meter access road diverting from the feeder road has been proposed by DMCRI. There will be 30-35 labors engaged for the construction of the above road. It has been planned that all the labors will be hired locally, so the issue of labor camp during the construction of road and other related aspects are not applicable for discussion. However, the road construction will have the following environmental and socioeconomic issues.

Environmental Issues

Physical

- Change in land use pattern
- Air pollution due to dust and vehicular movement
- Issue of spoil management
- Health and safety management

Biological

- Encroachment of forest

Socio economic

- Grievances/Demands by people, community
- Land price of the vicinity will increase
- Demand for employment
- Ill social behavior will flourish
- Pressure on local resources

7. Environmental Impacts

The proponent shall elaborately identify, predict and evaluate each impact of the proposal's activities of the environment quantitatively, to the extent possible, for construction and operational stages. Impacts shall be classified for direct impact areas and indirect impact areas. Each impact identified and predicted on physical, chemical, biological, socio-economic and cultural aspects of the environment for both construction and operational stages, and for direct and indirect impact areas shall be evaluated to know their significance by using standard methods and shall be documented in the EIA report. The proponent shall mention nature of impacts (direct or indirect, beneficial or adverse, reversible or irreversible), magnitude, extent, and duration using appropriate symbols and definitions with due consideration on the National EIA Guidelines, 1993. The criteria used for assessing the impacts significant shall be included in the EIA report. The proponent shall also consider the cumulative impacts

that might arise during the implementation of the project. Environmental impacts should be presented in the matrix form.

8. ALTERNATIVE ANALYSIS

Alternative analysis should be an integral part of EIA report. DMCRI project will be evaluated by comparing the "No Action Option" with the option of implementation of the project. Furthermore, the proponent shall analyze the likely environmental impacts of the project activities for different alternatives, such as design, location, construction material transportation and their stockpiling and technology. The alternative analysis should also consider the environmental management system, acceptability of risks likely to emerge during the implementation of the proposal, and other issues of topical interest. The likely impacts of each alternative shall be assessed compared in terms of environmental soundness, and the environmentally acceptable alternative should be identified and documented.

9. MITIGATION MEASURES

The proponent shall recommend mitigation measures to prevent or reduce significant adverse impacts to acceptable levels. Enhancement measures to enhance beneficial impact due to implementation of the project shall be presented. The proponent shall follow the avoidance-minimization-compensation approach to address environmental impacts. In EIA report, three types of mitigation measures namely preventive, corrective or rehabilitative, compensatory measures shall be proposed on physical, chemical, biological, and socio-economic and cultural aspects of the environment to the extent applicable for both construction and operational stages.

The proponent shall provide clear information on responsible agency, cost involved, schedule and manpower to carryout proposed benefit augmentation measures and adverse impacts mitigation measures. The proponent shall have overall responsibility to implement benefit augmentation and adverse impacts mitigation measures as included in the EIA report. An organization set up to carry out the mitigation measures shall be proposed. The mitigation approach for DMCRI shall be to maximize the positive impacts and to completely nullify or minimize the negative impacts. In each category of mitigation, the cost involved institution/person responsible, type and time of monitoring required during mitigation phase shall be clearly spelled out in EIA report.

The EIA report shall include Environmental Management Plan in the matrix form. The implementation plan for environmental protection measures (benefit enhancement measures and adverse impacts mitigation measures) shall be presented for construction and operational phases on physical, chemical, biological, socio-economic, and cultural aspects of the environment. The environmental management plan (EMP) shall be an integral part of the EIA report and it shall include monitoring and auditing requirements along with schedule of implementation. The management aspect should also touch upon the reinstatement of public services likely to be damaged by the project during its construction.

10. COST AND RETURNS OF THE PROPOSAL

The proponent shall carry out cost-benefit analysis of the proposal incorporating the mitigation costs and monitoring cost of the proposal or environmental management costs. The cost benefit analysis will also consider the risks and benefits involved.

11. ENVIRONMENTAL MONITORING

The proponent shall include monitoring parameters and indicators, schedules, monitoring locations, methods and responsibility for monitoring in the matrix form with estimated budget in the EIA report for construction and operational stages of the project. The proponent shall also include these requirements for compliance and impact monitoring to assess the actual physical, biological, socio-economic and cultural effects of the project. The frequency of sampling and the analytical procedures or methods and agencies to be consulted while carrying the monitoring activities shall be included in the EIA report. The format for the presentation and recording of the data shall also be given.

The construction phase monitoring shall, *inter alia*, include:

- Monitoring of the accuracy of the predicated impacts during EIA
- Monitoring on the likely impacts of the project, particularly on biological resources
- Monitoring on occupational health and safety measures

The proponent shall also include operation phase monitoring as follows:

- Environment, health and safety awareness program in relation to fire hazard
- Counseling about safe handling of health care waste and other possible direct and indirect impacts and their mitigation

- Training to the operation and maintenance staff

12. Environmental Auditing

The proponent shall propose type-based auditing requirements to assess the actual effects of the proposal on the physical, biological, socio-economic and cultural aspects of the environment. The proponent shall include auditing program including the parameters, indicators, methods, schedule, and location. Estimated cost of auditing works and human resources required for carrying out auditing works shall also be included in the EIA report. The format for the presentation and recording of the data shall also be included in the EIA report.

13. Conclusion and Recommendations

The proponent shall include chapter on conclusions and recommendations in the EIA report.

14. Other Matters

The proponent must comply with all requirements as mentioned in the Environment Protection Rules (EPR), 1997 before submitting the EIA report for approval. The EIA report shall adequately cover aspects as included in this Terms of Reference, and as mentioned in the schedule 6 of the EPR, 1997. The EIA report will include proofs of the public hearing and recommendation letter (s) of the concerned VDC - s). The EIA report should include relevant information, details on impact identification, prediction and evaluation methods, references, annexes, map, photo, tables, charts, graphs and questionnaires, as applicable. Furthermore, the reference should be given in the frame as mentioned in # 13 of the schedule 6 of the EPR 1997. A clear linkage on baseline information, impacts, environmental protection measures, monitoring and auditing requirements shall be maintained in the EIA report. The proponent ensures that the scoping and terms of reference will be included as annex in final EIA report.

15. Deliverables

The proponent shall submit copies of final EIA report of this DMCRI project to the Ministry of Environment, Science, and Technology (MOEST) through concerned body in accordance with Rules 11 (1) of the Environment Protection Rules, 2054 (1997).

Annex - 1

A 15 days notice published in Nepal Samacharpattra of October 21, 2006

श्री शंकर इन्स्टिच्युट अफ हेल्थ साइन्सेस प्रा.लि. द्वारा श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्युट निर्माण आयोजनाको वातावरणीय प्रभाव मूल्याङ्कनको लागि क्षेत्र निर्धारण सम्बन्धी सार्वजनिक सूचना

(समाचारपत्र दैनिकमा सूचना प्रकाशित मिति २०६३/८/०४)

रुपन्देही जिल्ला देवदह बुलही वडा नं ६ मा श्री शंकर इन्स्टिच्युट अफ हेल्थ साइन्सेस प्रा.लि. द्वारा करीब बीस बिघा क्षेत्रमा श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्युट निर्माण गर्ने योजना प्रस्तुत गरी सो आयोजना कार्यान्वयनको लागि वातावरणीय प्रभाव मूल्याङ्कन (Environmental Impact Assessment) प्रतिवेदन तयार गर्न वातावरण संरक्षण नियमावली २०५४ नियम ३ (१), र (२) अनुसार क्षेत्र निर्धारण गर्नुपर्ने भएकोले यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्युट प्रा.लि.
प्रभाव पर्न सक्ने क्षेत्र: देवदह गा.वि.स. वडा नं ६

यो प्रस्ताव कार्यान्वयन गर्नु अघि वातावरण संरक्षण नियमावली २०५४ बमोजिम वातावरणीय प्रभाव मूल्याङ्कन गरी स्वीकृत गराउनु पर्ने भएकोले उक्त वातावरणीय प्रभाव मूल्याङ्कन गर्दा उक्त नियमावली बमोजिम निम्न क्षेत्रमा के कस्तो प्रभाव पर्दछ सो उल्लेख गरी क्षेत्र निर्धारण गर्नु पर्ने छ।

१. भौतिक प्रणाली   २. सांस्कृतिक प्रणाली
३. सामाजिक प्रणाली   ४. आर्थिक तथा मानवीय क्रियाकलापहरु
५. [illegible] अन्तरक्रिया तथा [illegible]।

यसै सिलसिलामा उपरोक्त क्षेत्रमा उक्त प्रस्ताव कार्यान्वयन गर्दा के कस्तो प्रभाव पर्न सक्दछ सो सम्बन्धमा वडा, गाउँ क्षेत्रका विद्यालय, अस्पताल, स्वास्थ्य चौकी तथा सरोकारवाला व्यक्ति वा संस्थाहरुलाई यो सूचना नेपाल समाचारपत्रमा प्रकाशित भएको मितिले १५ (पन्ध्र) दिन भित्र निम्न ठेगानामा आइपुग्ने गरी लिखित राय सुझाव उपलब्ध गराई दिनु हुन अनुरोध गरिन्छ। यस बमोजिम राय सुझावको प्रतिलिपि सम्बन्धित कार्यालयलाई समेत दिन सकिनेछ।

राय सुझाव पठाउने ठेगाना

श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्युट प्रा. लि.
देवदह बुलही वडा नं ६, रुपन्देही जिल्ला
फोन नं : ०७१-४००२१४, ९८०३२४६६२३
Email : drrjlodal@gmail.com

Annex - 2

Questionnaire used during field survey

Questionnaire (to local villagers)
Name

VDC: Ward no

A hospital is going to be set up in your area (ward no. 6 - Bulahi). How do you feel?

What kind of effect do you think the construction of this hospital will have on your village? on social, economic, environmental aspects of your village?

History of any Epidemics in the village?

Where do you go for treatment in serious cases? (Ayurvedic, *Dhami, allopathvi*)

Flood in the recent time? No of HH and property destroyed, no of casualties, livestock lost.

Religious activities in the village? Mention name and month and ethnic group.

Dependence of people on river for daily activities/ livestock raring/ fishing for survival?

Cultural Sites

Religious sites: temple/ church/ mosque/ stupa in the area. Category and no.s

Historical sites in the area:

Archaeological sites:

Cremation sites in the area: (any near project site)

Data to be collected from the VDC:

Total Population of the VDC:
Total male: Total Female:
No. of Households:
Avg Household Size: (to be calculated):

Ethnicity:
Religions:

No of Doctors in the VDC:
No of Health Workers in the VDC:
No of organization providing health facility in the VDC:

Main Economic Activity in the VDC:

No of Schools (Primary to secondary):
No of High Sec. School: No of Campuses:
Literacy rate in the VDC: (aprox)
No and Name of Community forests in the VDC with ward no:

Govt forest in the area near ward no 6: (area)
Police post:
NGO / INGO/ CBO/ CFUG'S/ Govt Offices:

VDC Map, Get info general about surrounding VDC

Data to be collected from Health post/ or health personnel:
Main diseases in the area:

Status of health situation in the village?

REFERENCES

1. Asian Regional Environmental Assessment Programme, IUCN Nepal,1996, EIA Training Mannual for Professionals and Managers
2. District Forestry Office Rupendehi's Brief Description and Project Report 2062/2063.
3. Feasibility Study Report for the Establishment of Devdaha Medical College and Research Institute.
4. Nepal Government. 1993, Environment Impact Assessment Guidelines, NG press #5, GON
5. Government of Nepal, Ministry of Law, Justice and Parliament Affairs, Environment Protection Act, 1997 and Environment Protection Rules, 1997
6. NPC, 1997, Nepal Environmental Health Initiative (Draft)
7. NPC, 1997, the Ninth Five year plan (1997-2002), National planning commission, Kathmandu
8. NPC, Tenth Five Year Plan (2002-2007), National Planning Commission, Kathmandu

Questions (Secretary)
Name of the Secretary:

1. What are the water supply sources in the village?

2. Are there any irrigations project nearby the current proposed site for the hospital? If yes, please specify.

3. Are there any waste disposal sites nearby the village?

4. current waste disposal practices in the village?

5. Which is the nearest Hospital from the VDC ?

6. Communication Facility in the VDC

7. Transportation Service in and out of the VDC

8. Electricity facility in the VDC?

9. (If the hospital is near the river), how many *majhi* live in the area?

Project Effected persons : (only to people who have lost their land / house)

No of families who have lost their land:
No of people displaced:

Do you have home/ land in any other area?

What is your opinion about the establishment of a hospital in your area in the near future?

You have sold land and/or house . What plans do you have for the future?

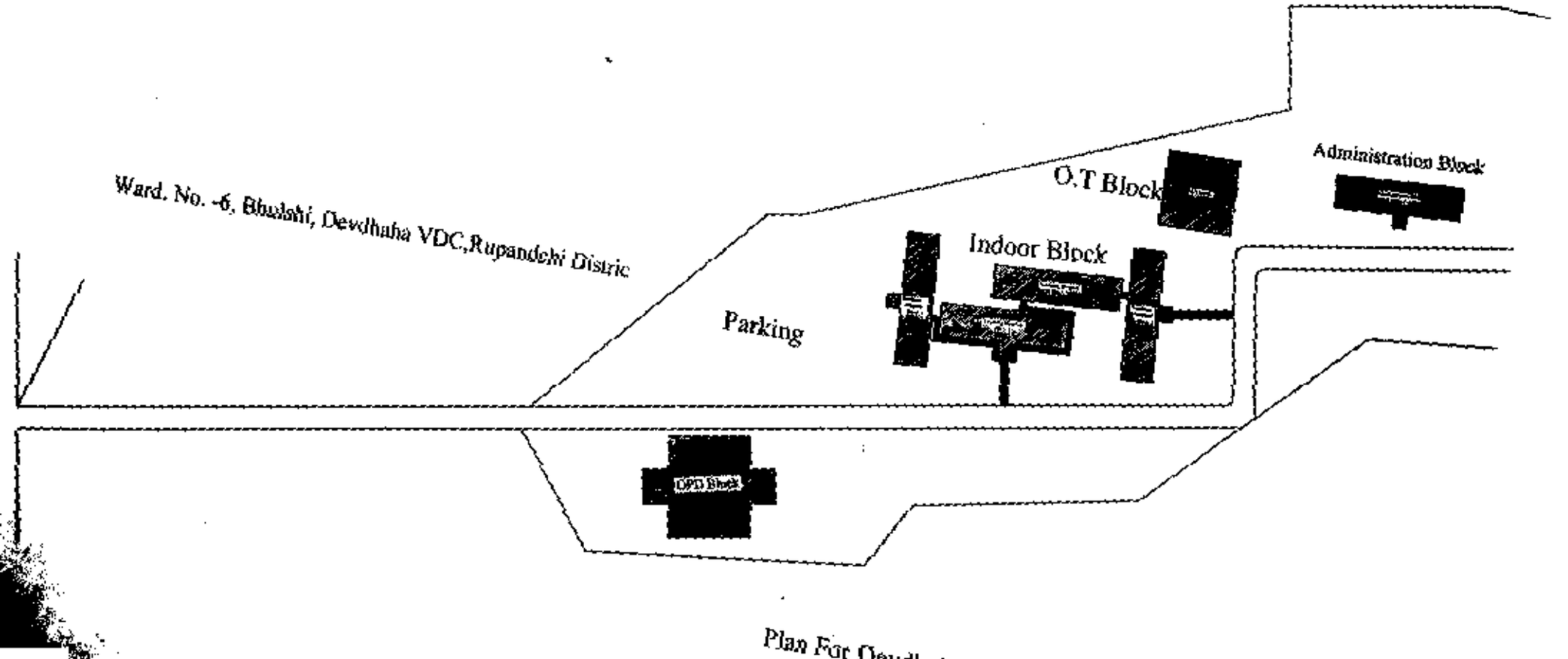
Any other things on the establishment of hospital.

Get data from VDC chairman: Population, HH, Religion.
No. of schools, Health post etc.

Land rates after acquisition by hospital.

Annex - 3

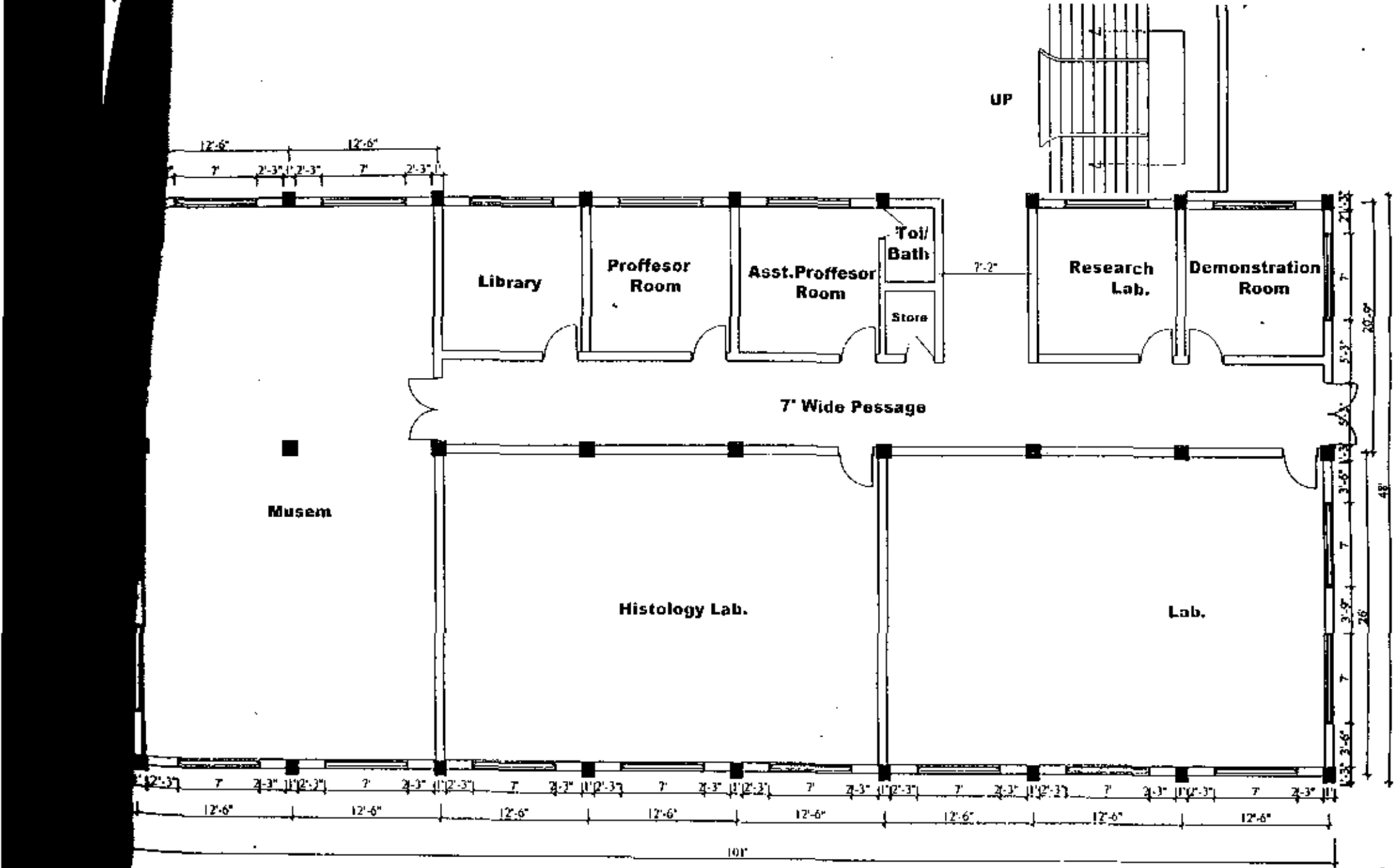
Location map of DMCRI project area



Plan For Devdhaha Medical College & Research Institute

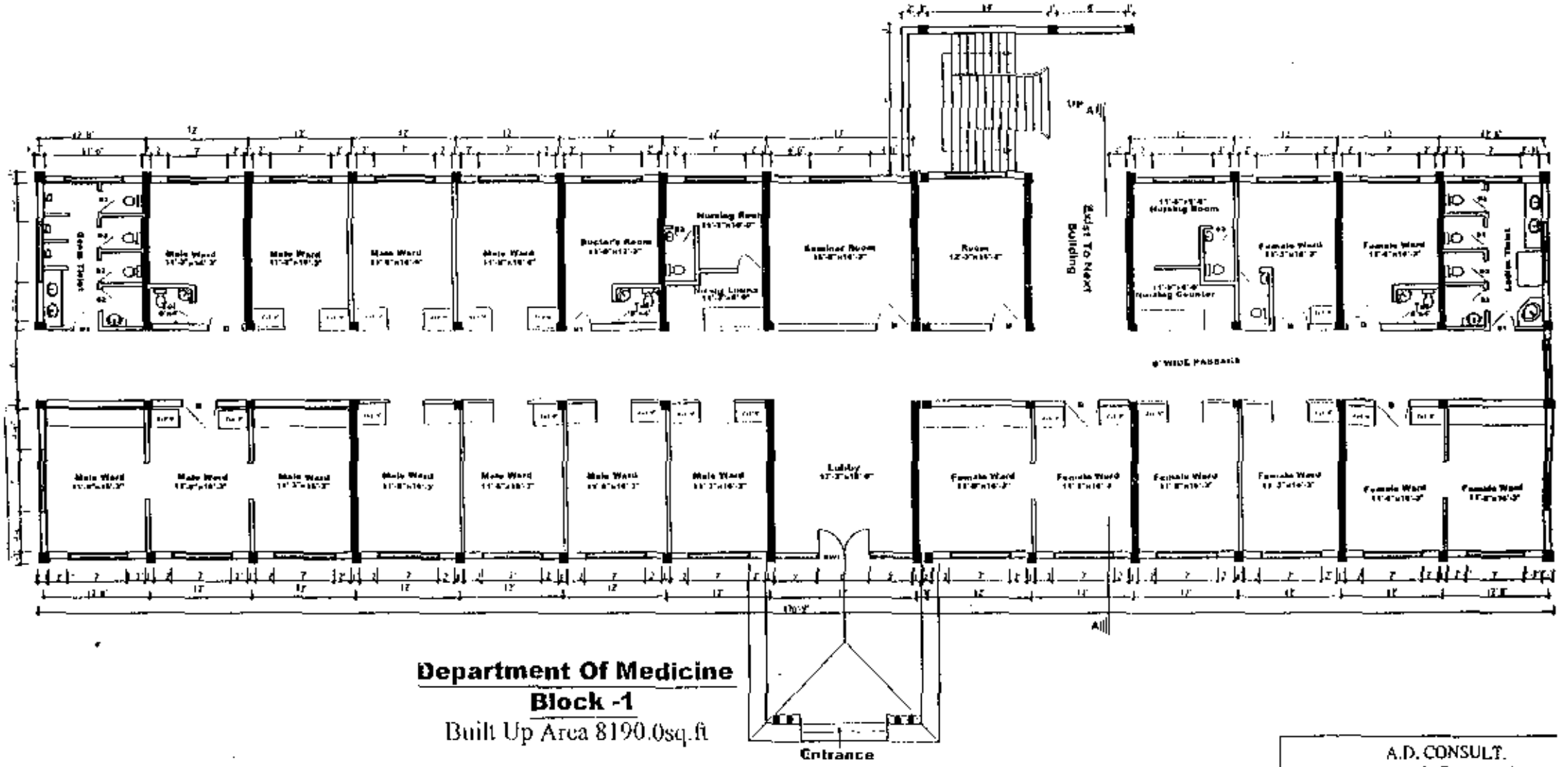
Annex - 4

Different units of proposed DMCRI Project



Department Of Pathology

Ground Floor Plan(Area = 4848.0sq.ft)

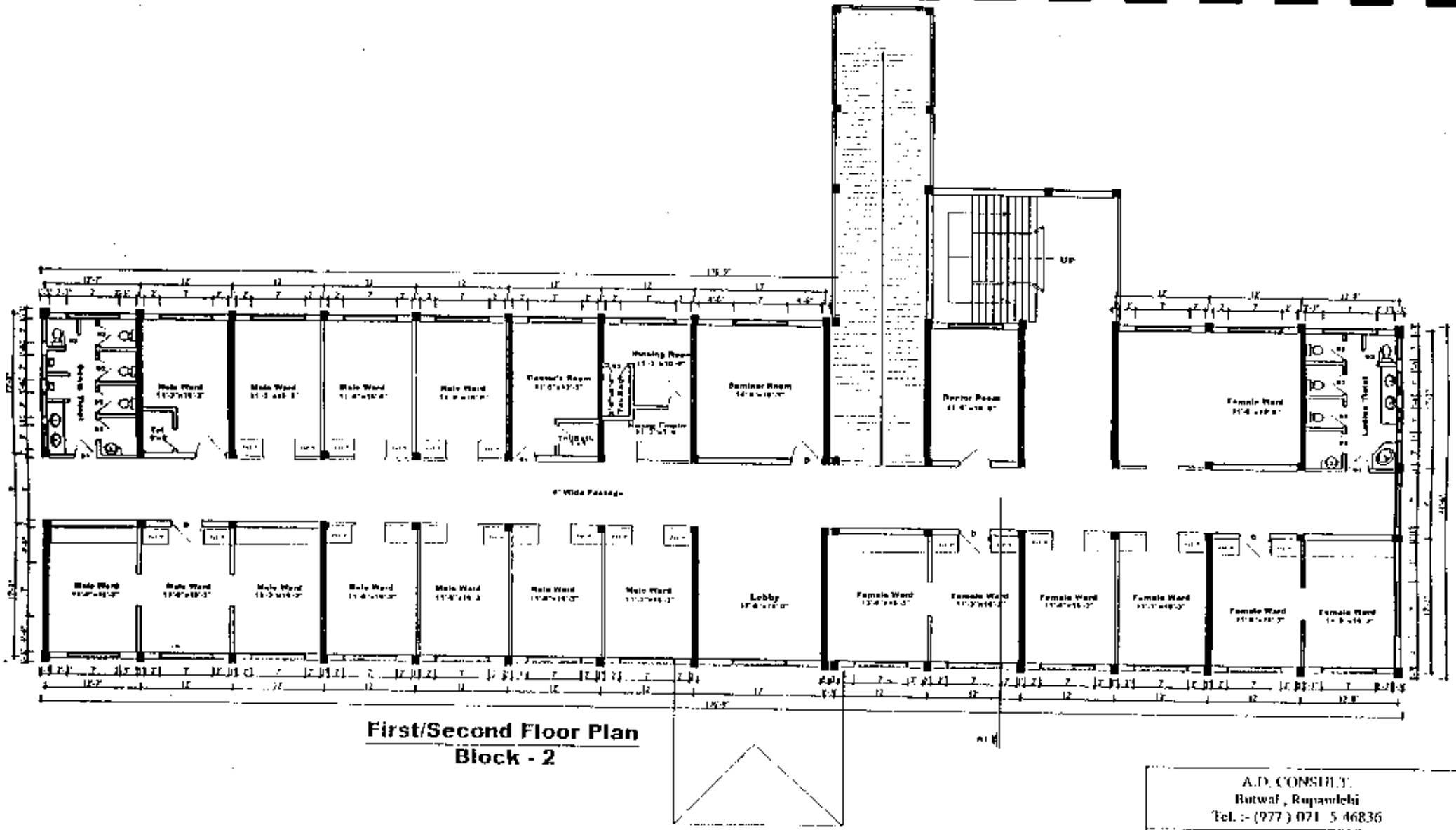


Department Of Medicine

Block -1

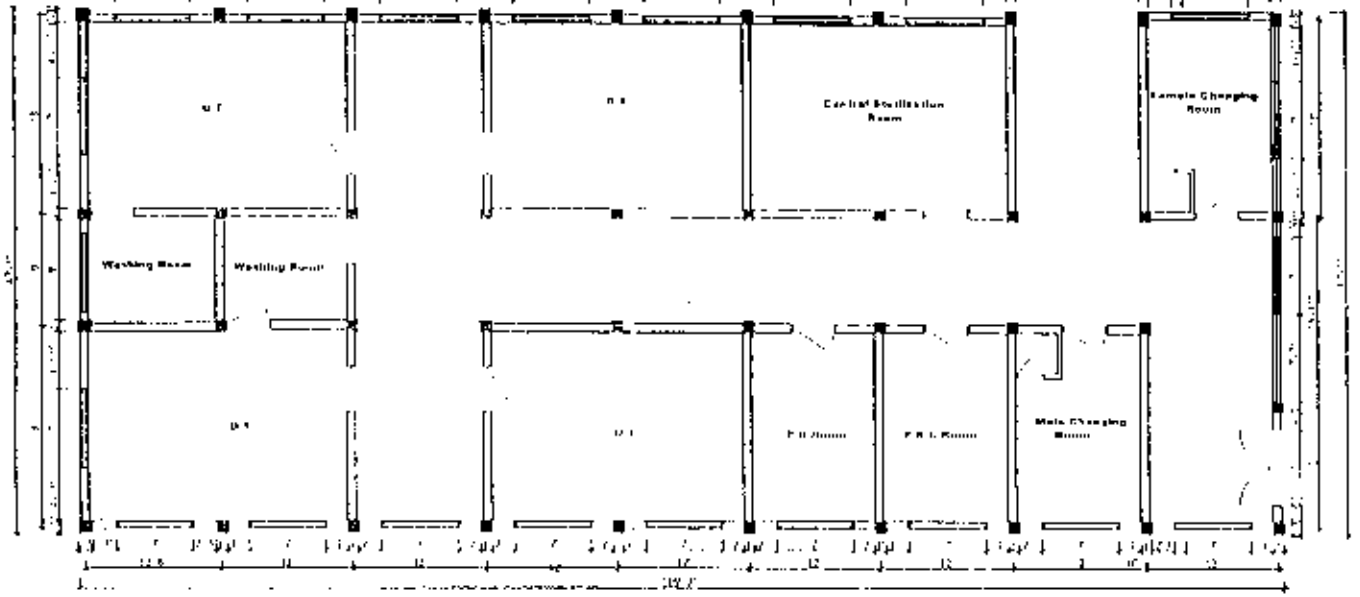
Built Up Area 8190.0sq.ft

A.D. CONSULT. Butwal , Rupandehi Tel. :- (977)-071 -5-46836	
Project:- Devdaha Medical Colle And Research Institute At Bhulahi	
Teaching Hospital Hospital Block-1 Ground Floor Plans	
Design By : Dinesh Bhajracharya	Drawn B Kusum Shr



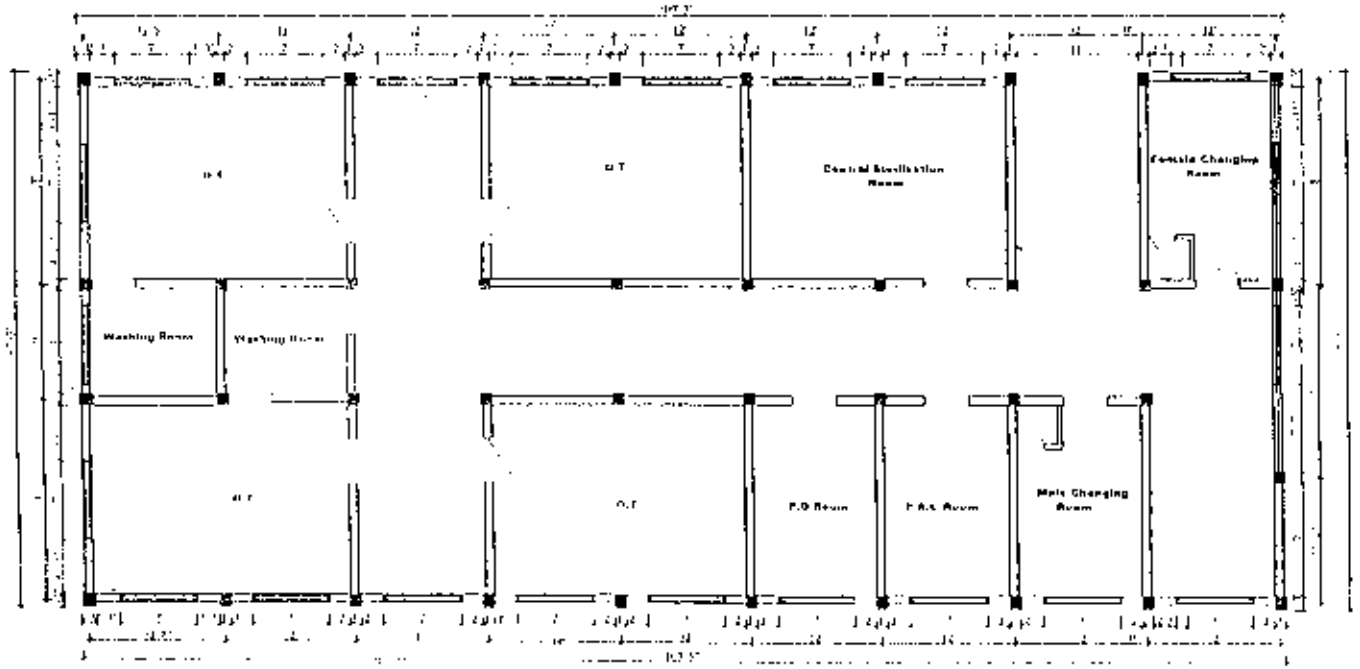
First/Second Floor Plan
Block - 2

A.D. CONSULT Butwal, Rupandehi Tel. :- (977) 071 5 46836	
Project:- Devdaha Medical College And Research Institute At Bhulahi	
Teaching Hospital Hospital Block-2 First/ Second Floor Plan	
Design By : Dinesh Bhajracharya	Drawn By : Kusum Shrestha
Date: 063/08/14	Scale: 1"=8'



Department Of Operation Theatra

Block-3 Built Up Araa5186.0



First Floor Plan

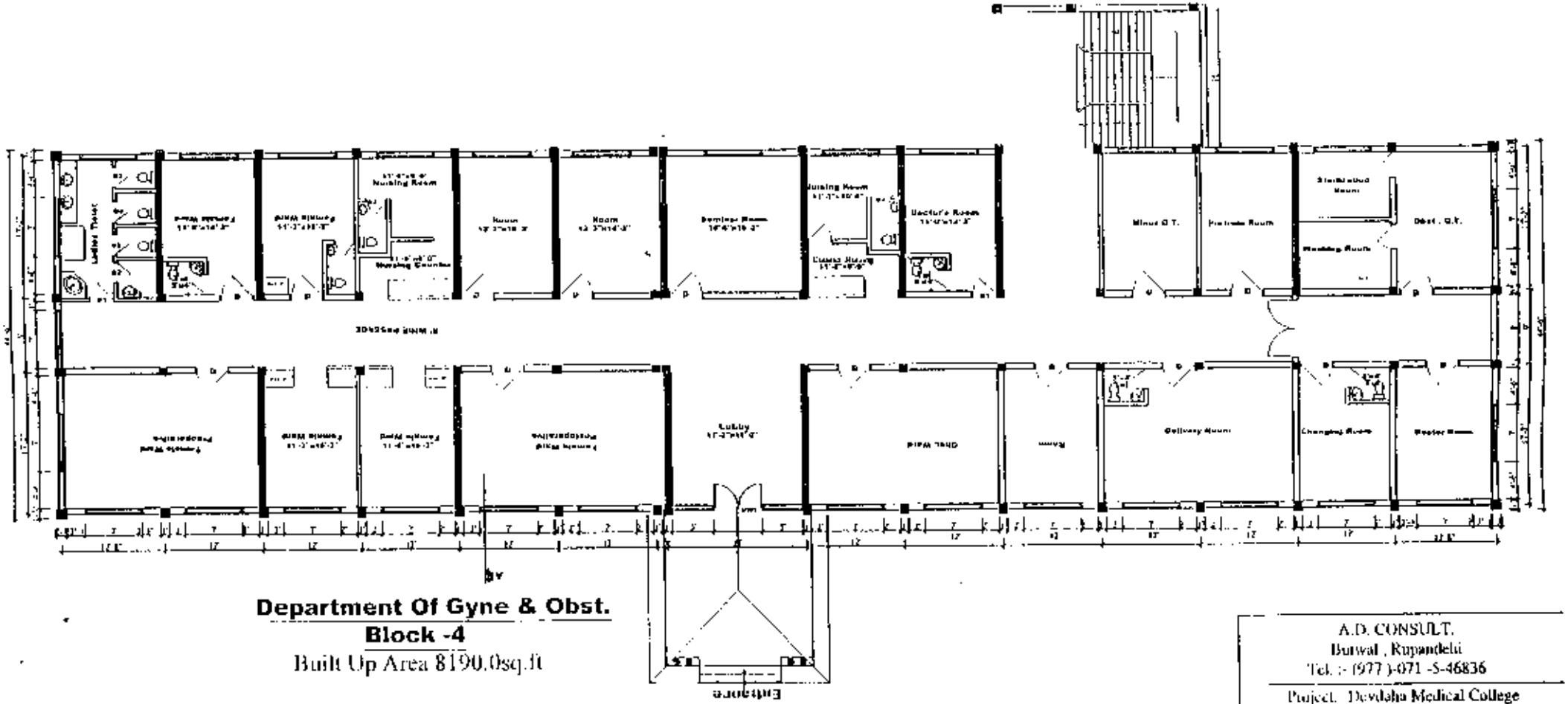
Block-3

A.D CONSULT
Butwal , Rupandehi
Tel. : (977) 071 5 46836

Project:- Devdaha Medical College And Research Institute At Bhulahi

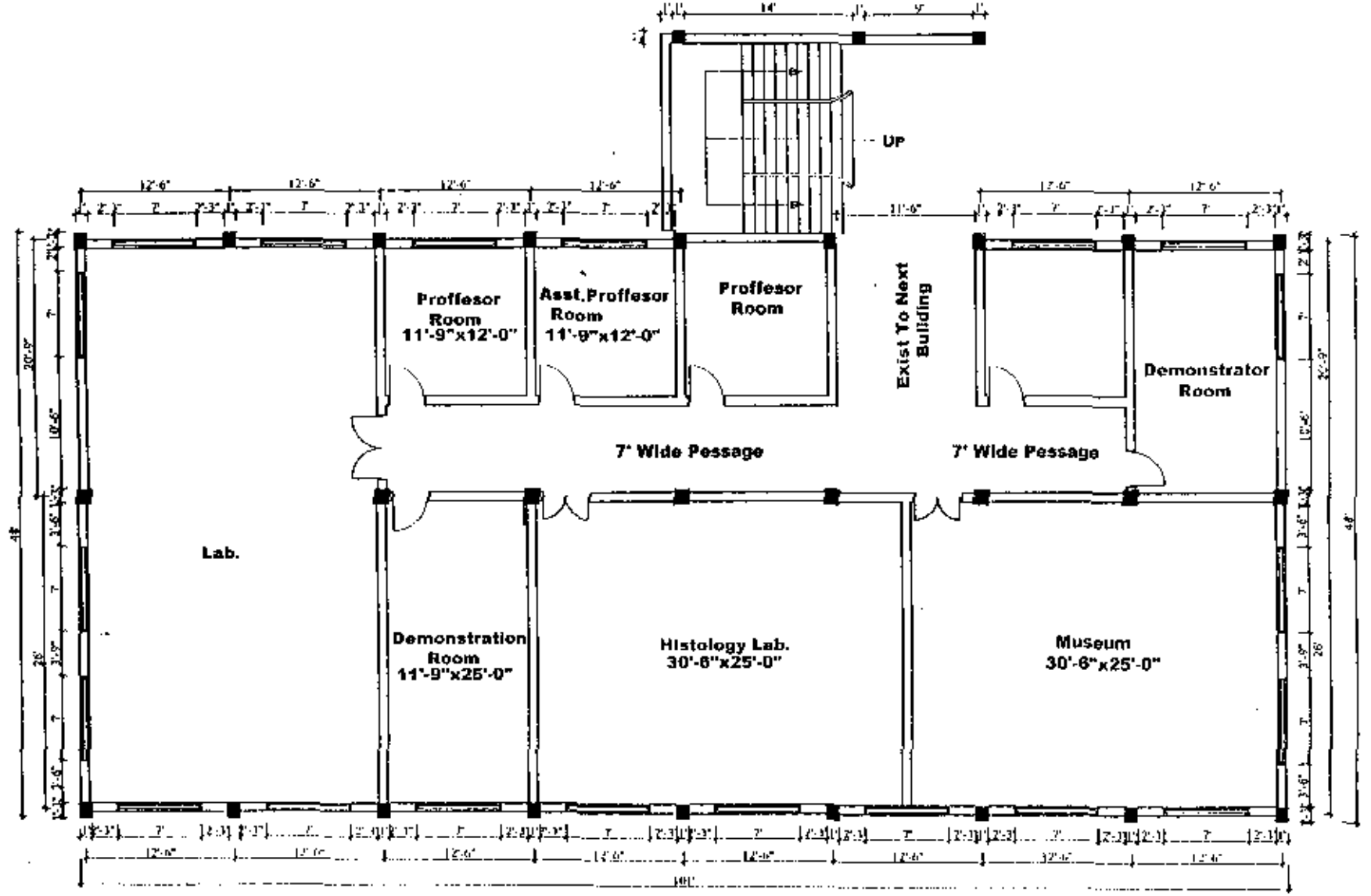
Teaching Hospital
Hospital Block 3
Ground & First Floor Plans

Design By : Dinesh Bhattacharya	Drawn By : Kusum Shrestha
Date: 063/087/08	Scale: 1" = 8'



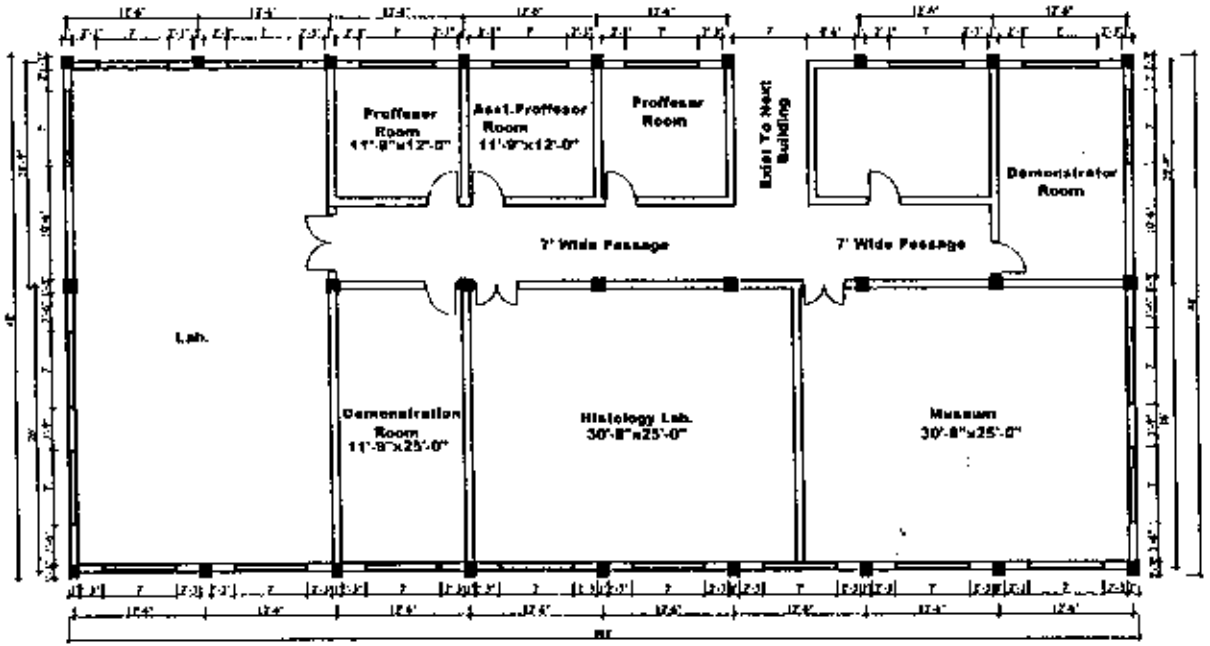
Department Of Gyne & Obst.
Block -4
Built Up Area 8190.0sq.ft

A.D. CONSULT. Butwal , Rupandehi Tel. :- (977)-071 -5-46836	
Project. Devdaha Medical College And Research Institute At Bhalahi	
Teaching Hospital Hospital Block-4 Ground Floor Plans	
Design By : Dinesh Bhajracharya	Drawn By : Kusum Shrestha
Date. 063/ 08/ 28	Scale: 1"=8"



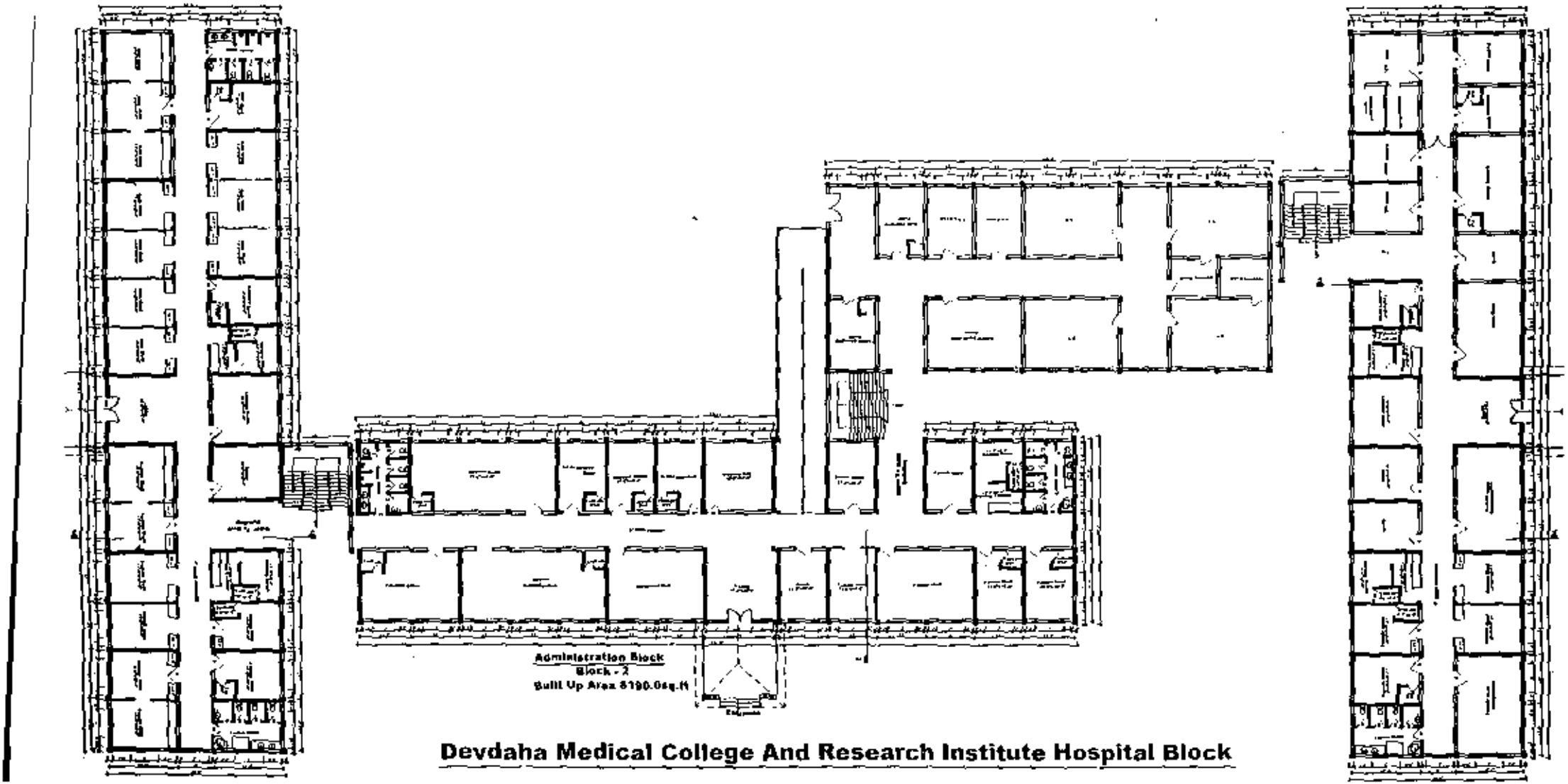
1.Department Of Pharmaclogy & Community Medicine

First Floor Plan(Area = 4848.0Sq.ft



Department Of Micro-Biology
First Floor Plan(Area = 4348.0sq.ft)

A.D. CONSULT. Butwal , Rupandehi Tel. :- (977)-071 -5-46836	
Project:- Devdaha Medical College And Research Institute At Bhulahi	
Teaching Hospital College Block-4 First Floor Plans	
Design By : Dinesh Bhajracharya	Drawn By ; Kusum Shrestha
Date: 06/ 08/ 14	Scale: 1"=8'



Devdaha Medical College And Research Institute Hospital Block

Annex - 5

The list of participants of public hearing conducted at DMCRI construction site & their views

देवदह मेडिकल कलेज एण्ड रिसर्च सेन्टर निर्माण आयोजना

सार्वजनिक सुनुवाइ कार्यक्रम

सहभागीहरुको नामावली

मितिः २०६४/१/७, देवदह

सि.नं.	नाम	ठेगाना	दस्तखत
१	[illegible]	[illegible]	[illegible]
२	[illegible]	[illegible]	[illegible]
३	[illegible]	[illegible]	[illegible]
४	[illegible]	[illegible]	[illegible]
५	[illegible]	[illegible]	[illegible]
६	[illegible]	[illegible]	[illegible]
७	[illegible]	[illegible]	[illegible]
८	[illegible]	[illegible]	[illegible]
९	[illegible]	[illegible]	[illegible]
१०	[illegible]	[illegible]	[illegible]
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१२	[illegible]	[illegible]	[illegible]
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१५	[illegible]	[illegible]	[illegible]
१६	[illegible]	[illegible]	[illegible]
१७	[illegible]	[illegible]	[illegible]
१८	[illegible]	[illegible]	[illegible]
१९	[illegible]	[illegible]	[illegible]
२०	[illegible]	[illegible]	[illegible]
२१	[illegible]	[illegible]	[illegible]
२२	[illegible]	[illegible]	[illegible]
२३	[illegible]	[illegible]	[illegible]
२४	[illegible]	[illegible]	[illegible]
२५	[illegible]	[illegible]	[illegible]
२६	[illegible]	[illegible]	[illegible]
२७	[illegible]	[illegible]	[illegible]
२८	[illegible]	[illegible]	[illegible]
२९	[illegible]	[illegible]	[illegible]
३०	[illegible]	[illegible]	[illegible]

क्र.सं.	नाम	पेशा	दस्तखत	कैफियत
२१	रमेश शर्मा	देवदह ६ मलुही		विधायक
२२	रोहित चौ.	" ८ "		
२३	[illegible]	" " "		
२४	डिल्ली राज	" " "		
२५	तिकाराम [illegible]	" ९ "		
२६	[illegible]			
२८	[illegible]	" " "		
२९	मधु के सी	" ८ "		
४०	[illegible]	" ८ "		
४१	शशिकांत खवास	" ८ "		
४२	लक्ष्मी रक्सार	" ८ "		
४३	कलम [illegible]	" ८ "		
४४	[illegible]	" ८ "		
४५	नारा [illegible]	[illegible]		
४६	[illegible]	[illegible]		
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४९	[illegible]	"		
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५१	[illegible]	"		
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६३				

Mr. JaiKishan Adhikari, Chief, Devdaha Sub Health Post, Rupandehi

1. Raised the concern regarding the benefits to people of Devdaha VDC people from the establishment of DMCRI.
2. The negative impacts due to construction and operation stages of DMCRI on environment, social, Biological. disposal of health care waste should be properly addressed.
3. DMCRI should run different collaborative programs with local health centers and DMCRI should be developed and used as a referral center of this region.
4. DMCRI should promote health awareness, health camps in the Devdaha and surrounding VDCs. They should work on both preventive. and curative health sector.

Mrs. Maya Balami, Chairman, Janapriya Community Forest Users Group

1. DMCRI should give priority to people whose land was acquired by the project.

Mr. Babu Lal Neupane, Devdaha-9

1. DMCRI should provide an opportunity for job to locals
2. Keen to know about the agreements made between the local coordination committee and DMCRI regarding the future cooperation, collaboration.

Mr. Chitra Bdr Nepali, Mr. Gori Bdr. Nepali

1. Some of their land lies in the middle portion of the area already been acquired by the DMCRI. Since their land might be required by the project, they are willing to exchange the land and for which they have already request to the project.

Mr. Shyam Thapa, Teacher

1. There is an agreement made between DMCRI and the local regarding the development and use of play ground. The land is currently being used by the Bhaluhi Sports Development Committee. The committee is willing to provide the land for the use of DMCRI, provided they will develop it as a playground to be used for local sports development.

Mr. Bindu Prasad Chaudhary, Local resident

1. The DMCRI management has shown the commitment for the support to upgrade the access road from the main highway to the project site. He want to know the actual amount of contribution that DMCRI is willing to contribute for the upgrading of road.

Mrs. Rukma Chaudhary, Social worker

1. Her land was acquired by the project. She and her family should give priority in hiring at DMCRI.

Mr. Govinda Bdr. Kunwar, Devdaha-9

1. Expecting DMCRI for the upgrading of road and for providing medical facility to local residents.

Ram Prasad Sapkota, Chairman, VDC-DMCRI cooperation committee

1. A written agreement has been made between the DMCRI and cooperation committee (formed locally) regarding the support that could be provided by DMCRI to VDC/local community.
2. A mutual trust, respect and ethos of cooperation will be established between DMCRI and VDC for smooth and unhindered operation of DMCRI.

Annex - 6

Approvals received by DMCRI from different agencies

नेपाल सरकार
वातावरण, विज्ञान तथा प्रविधि मन्त्रालय

४२४७३९९, ४२२५५९६
४२२५४८६, ४२६२३७१
४२४४६९८, ४२४४६०८
४२४८२०७, ४२४४६०९
४२४०३५५
फ्याक्स नं. ४२२५४७४
email: info@most.gov.np
website:www.most.gov.np
सिंहदरबार, काठमाडौं
नेपाल ।

वातावरण महाशाखा
वातावरण मूल्याङ्कन शाखा

पत्र संख्या :- ०३१५८
च.नं. :- २०४६

मिति: २०६४।९।

विषय:- क्षेत्र निर्धारण प्रतिवेदन र कार्यसूचिको स्वीकृति सम्बन्धमा ।

श्री देवदह मेडिकल कलेज एण्ड रिसर्च इन्स्टिच्यूट
बुलाही गाँउ विकास समिति
बुटवल, रुपन्देही ।

प्रस्तुत विषयमा तहाँको मिति १५ अप्रिल २००७ को पत्रसाथ प्राप्त त्यस इन्स्टिच्यूटको परिमार्जित क्षेत्र निर्धारण प्रतिवेदन र कार्यसूचिमा कारवाही हुँदा नेपाल सरकार (सचिवस्तर) को मिति २०६४।१।९ को निर्णयानुसार सरोकारवालाहरुले अध्ययनको क्रममा उठाएका सवालहरु लगायत निम्न पक्षहरु यस प्रस्तावको कार्यसूचीको अङ्ग हुने गरी वातावरण संरक्षण नियमावली, २०५४ को नियम ४ र ५ बमोजिम तहाँबाट पेश भएको परिमार्जित क्षेत्र निर्धारण प्रतिवेदन र कार्यसूची (मार्च २००७) स्वीकृत भएको व्यहोरा जानकारीको लागि हार्दिक अनुरोध छ ।

1. The Proponent shall use the National Health Care and Waste Management Guidelines, 2002; publications on arsenic comtanimation in the study area; and Guides on Environment Management Plan, Monitoring and Auditing published by MoEST while preparing the EIA report.
2. The proponent shall group and present the data and information in the EIA report for: (i) direct impact area, i.e., related to site clearance; and (ii) influence area. All data must be quantified in the EIA report, at least, for direct impact areas.
3. The EMP shall include budget for each mitigation and enhancement measure, necessary manpower, and reporting requirements. The proponent shall clearly mention the percentage of the total project cost for EMP implementation.

(बटु कृष्ण उप्रेती)
वातावरण अधिकृत

बोधार्थ
श्री शिक्षा तथा खेलकुद मन्त्रालय
केशरमहल, काठमाण्डौ ।

श्री स्वास्थ्य तथा जनसङ्ख्या मन्त्रालय
रामशाहपथ ।

९८

४२३०९५७

१०२