अर्धवार्षिक पत्रिका

विद्युत VIDYUT

• वर्ष ३२ • अंक १ • २०७८ भाद्र

नेपाल विद्युत प्राधिकरण
दरबारमार्ग, काठमाडौं

33_11kV 6_8 MVA Bhalche Substation Nuwakot

220kV-123 New Khimti Substation

अर्धवार्षिक पत्रिका
विद्युत
VIDYUT
▶ वर्ष ३२ ▶ अंक १ ▶ २०७८ भाद्र

प्रकाशन/व्यवस्थापन

तारादेवी अधिकारी
मिनु थापा
कुसुमकुमारी शर्मा
मिना देवकोटा

प्रकाशक:
नेपाल विद्युत प्राधिकरण जनसम्पर्क तथा गुनासो व्यवस्थापन शाखा
दरबारमार्ग, काठमाडौं
फोन : ०१-४१५३०२१
आन्तरिक : २००२, २००३
फ्याक्स : ०१-४१५३०२२
ईमेल : pro@nea.org.np

मुद्रण/डिजाइन:
जय लालीगुराँस ईन्भेष्टमेन्ट एण्ड ट्रेडिङ्ग कम्पनी प्रा. लि.
ललितपुर-३, हरिहरभवन
फोन नं.: ०१-५०१०६१०, ५०१०७११

संरक्षक


कुलमान घिसिङ
कार्यकारी निर्देशक

सल्लाहकार


हरराज न्यौपाने
उपकार्यकारी निर्देशक
वितरण तथा ग्राहक सेवा निर्देशनलय


लोकहरि लुइटेल
उपकार्यकारी निर्देशक
प्रशासन निर्देशनालय


रामजी भण्डारी
उपकार्यकारी निर्देशक
आयोजना व्यवस्थापन निर्देशनालय

सम्पादन समिति

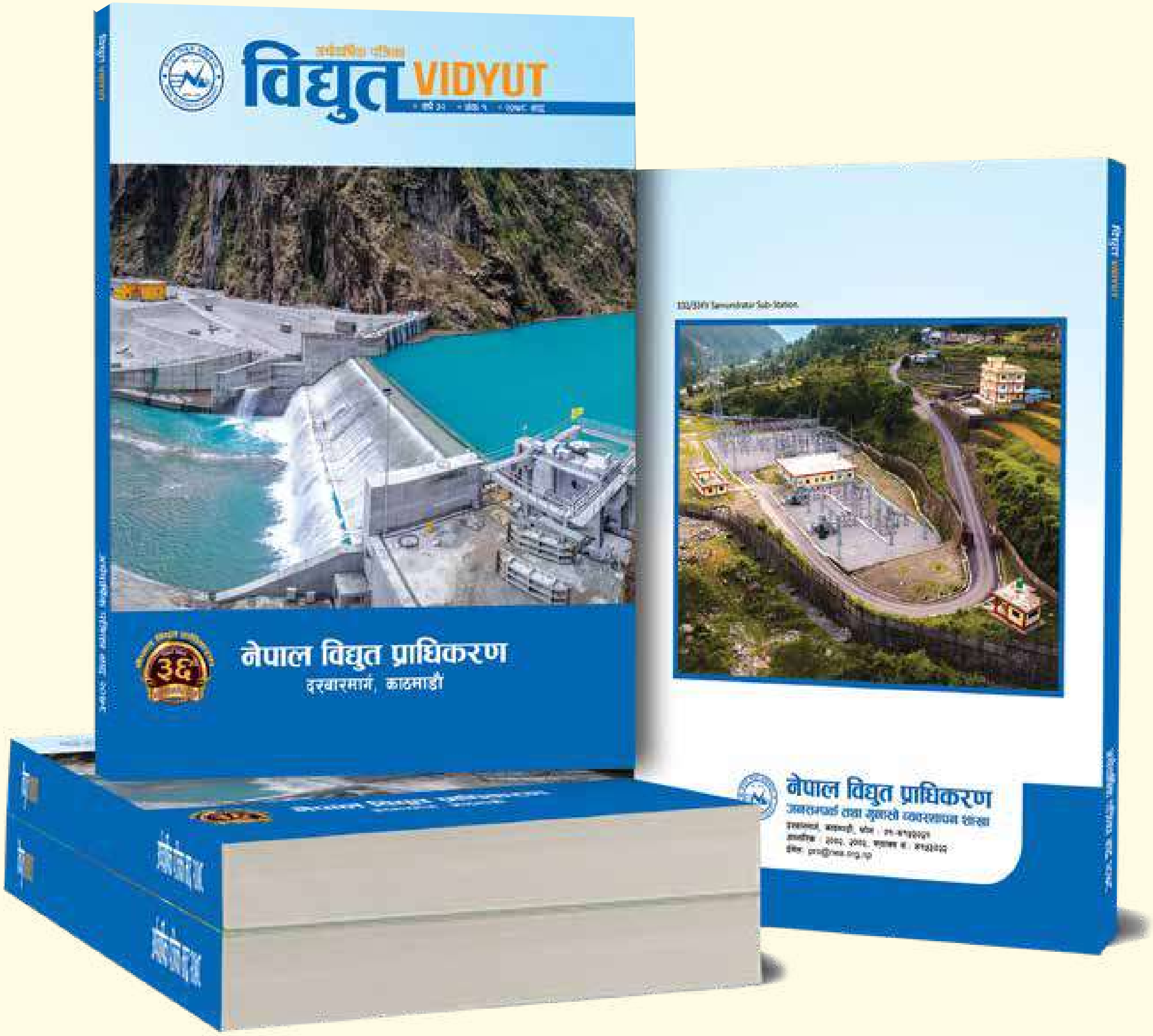

प्रवल अधिकारी
निर्देशक
विद्युत व्यापार विभाग


शिव कुमार अधिकारी
निर्देशक
पदपूर्ति विभाग


विश्वनाथ शर्मा
प्रमुख
जनसाधन विभाग


वेल प्रसाद शर्मा
निर्देशक
सामान्य सेवा विभाग
कार्यकारी सम्पादक


अनिता सुवेदी
प्रमुख
जनसम्पर्क तथा गुनासो व्यवस्थापन शाखा



आवरण तस्बिर

४५६ मेगावाट क्षमताको माथिल्लो तामाकोशी जलविद्युत आयोजनाको हेडवर्क्स
र
१३२/३३ के. भि.को समुन्द्रटार सवस्टेशन

zesfdgf

नेपाल विद्युत प्राधिकरणको नियमित प्रकाशन “विद्युत” वर्ष ३२ अङ्क १ यहाँहरु समक्ष प्रस्तुत गर्न पाउँदा खुशी लागेको छ ।

नेपाल विद्युत प्राधिकरणले बिगतमा प्राप्त गरेका मुख्य उपलब्धिहरु बिशेष गरी मुलुकभर नियमित विद्युतको आपूर्ति, संस्थागत मुनाफामा वृद्धि, विद्युत चुहावट नियन्त्रण, विभिन्न जलविद्युत तथा प्रसारण लाइन आयोजनाहरुको शिघ्र निर्माण आदिलाई निरन्तरता दिदै आगामी दिनमा स्वदेशबाटै उपलब्ध हुने पर्याप्त उर्जाको परिमाणलाई मध्यनजर गरी आन्तरिकरुपमा विद्युतको अधिकतम खपत गर्ने र स्वदेशमा खपत हुन नसकेको अतिरिक्त विद्युत निर्यात गर्ने गरी आवश्यक सम्पूर्ण पूर्वाधारहरु निर्माण गर्ने तर्फ प्राधिकरणले महत्वपूर्ण भूमिका खेल्ने छ ।

आन्तरिकरुपमा विद्युतको अधिकतम खपत गर्ने अनुकुल वातावरण तयार गर्नका लागि मुलुकभरका प्रसारण तथा वितरण संरचनाहरुको विकास, विस्तार र स्तरोन्नती गर्ने, विशेष गरी न्यून आय भएका तथा बिपन्न वर्गका जनतासँग निश्चित युनिटसम्मको महसुल नलिने, कृषि, सिंचाई र औद्योगिक वर्गका ग्राहकलाई सहुलियत दरको महसुल निर्धारण गर्ने, औद्योगिक क्षेत्रमा नियमित र गुणस्तरीय विद्युत आपूर्ति हुने गरी अलगै औद्योगिक फिडरहरु निर्माण गर्ने, ग्राहकलाई वर्षा र हिउँद याम तथा दिन र रातको अलगै महसुल दर लागू गर्ने, पेट्रोल, डिजल र ग्याँसको परनिर्भरतालाई विद्युतीय सवारी साधन र चुलोले क्रमशः विस्थापित गर्दै जाने गरी आवश्यक नीतिगत व्यवस्था सहित कार्यान्वयन गरिनेछ । साथै स्वदेशमा खपत हुन नसकेको अतिरिक्त विद्युत नियमितरुपमा निर्यात गर्न सकिने गरी विभिन्न अन्तरदेशीय प्रसारण लाइन तथा अन्य आवश्यक संरचनाहरुको निर्माण गर्ने कार्यलाई पनि प्राथमिकताका साथ अघि बढाइनेछ ।

मुलुकभर नियमित, भरपर्दो र गुणस्तरीय विद्युत आपूर्ति गर्ने, विद्यमान जीर्ण तथा अव्यवस्थित संरचनाहरुको आमूल सुधार गर्दै स्तरोन्नति गर्ने, बाँकी बक्यौता महसुल असुल गर्ने, आर्थिक अनुशासन, मितव्ययीता र संस्थागत सुशासन कायम गर्ने, अटोमेसनको माध्यमबाट सेवा प्रवाह तथा कार्य सम्पादन गर्ने, विभिन्न निर्माणाधिन आयोजनाहरुलाई यथाशिघ्र सम्पन्न गर्ने र प्राधिकरणले थप जलविद्युत आयोजनाहरु प्राप्त गरी निर्माण गर्ने लगायतका चुनौतिहरु हाम्रा सामु छन् ।

विगतमा झैं सम्वद्ध सबै पक्षबाट निरन्तर सहयोग र समर्थन पाएमा उक्त चुनौतिहरुलाई एउटा अवसरको रुपमा बदली प्राधिकरणलाई एउटा सक्षम संस्थाको रुपमा स्थापित गर्न सकिनेछ भन्नेमा म विश्वस्त छु । प्राधिकरणलाई सक्षम व्यवसायिक संस्थाको रुपमा विकास गर्न र यसका समग्र काम कारवाहीलाई प्रभावकारी बनाउन नेपाल सरकार, दातृ निकाय, उपभोक्ता, ट्रेड युनियन, सम्पूर्ण कर्मचारी लगायत सबैबाट निरन्तर सहयोग र समर्थन प्राप्त भइरहने विश्वास लिएको छु ।

कोभिड-१९ को महामारीका कारण ज्यान गुमाउनु भएका कर्मचारी, उपभोक्ता, शुभेच्छुक लगायत सम्वन्धित सबैमा हार्दिक श्रद्धान्जली अर्पण गर्दै संक्रमितहरुको शिघ्र स्वास्थ्य लाभको कामना गर्दछु । कोभिड संक्रमणको जोखिमका बावजूद आफ्नो कर्तव्यलाई सर्वोपरी ठानी नियमित विद्युत सेवा उपलब्ध गराउन विभिन्न क्षेत्रमा अहोरात्र खटिने सबै कर्मचारी मित्रहरुमा उच्च सम्मान व्यक्त गर्दछु । आगामी दिनमा उत्कृष्ट सामग्रीहरु सहित विद्युत पत्रिका प्रकाशन हुन सकोस् भन्ने शुभेच्छाका साथ प्रकाशनमा संलग्न सबैमा हार्दिक धन्यवाद व्यक्त गर्दछु ।

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कुलमान घिसिङ

कार्यकारी निर्देशक

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नेपाल विद्युत प्राधिकरणको ३६ औं बार्षिकोत्सबको अबसरमा प्राधिकरणको नियमित प्रकाशन “बिद्युत” को नयाँ अंकका साथ यहांहरु समक्ष उपस्थित भएका छौं ।

उर्जा बिकासको अनन्त सम्भावना र स्रोतहरु बोकेको नेपाल विद्युतको बिकास गरेको करिब ११० बर्षपछि विद्युतमा आत्मनिर्भर हुने अवस्थामा आइपुगेको छ । मुलुककै सबैभन्दा ठुलो अर्थात ४५६ मेगावाट क्षमताको तामाकोशी जलविद्युत आयोजनाको निर्माण सम्पन्न भएपछि नेपालले आवश्कताअनुसारको विद्युत खपत गर्न र स्वदेशमा खपत हुन नसक्ने विद्युत निर्यात गर्न सक्ने सम्भावनालाई पनि संगसंगै अगाडि सारेको छ । यद्यपी यसका लागि प्राधिकरणले शिघ्रातिशिघ्र विद्युत खपत बढाउन र निर्यात गर्न सकिने गरी मुलुकका बिभिन्न क्षेत्रहरुमा प्रसारण तथा वितरण संरचनाहरुको पूर्बाधारहरु निर्माण गर्ने, विद्यमान पुराना तथा जीर्ण संरचनाहरुको स्तरोन्नती गर्दै नियमित, भरपर्दो र गुणस्तरीय विद्युत आपूर्ति हुने व्यवस्था मिलाउन जरुरी छ ।

समय सापेक्ष नेपाल विद्युत प्राधिकरणलाई एउटा सक्षम र व्यावसायिक सार्वजनिक संस्थानको रुपमा स्थापित गर्न विद्युत चुहावट नियन्त्रण, बक्यौता विद्युत महशुलको असुली, सडक बत्ति बापतको रकम प्राप्ति, आर्थिक अनुशासन र मितब्ययीता, सुशासन र पारदर्शिता, अटोमेशनको भरपुर उपयोग र बिस्तार, प्रविधिमैत्री सेवा सञ्चालन, प्रभावकारी सेवा प्रबाह व्यवस्थापन, चुस्त दुरुस्त सांगठनिक र दरवन्दी संरचना, जवाफदेहिता र उत्तरदायित्वसहितको कार्य बिभाजन, जनशक्तिको उत्पादकत्व बढाउने गरी उत्प्रेरणा, तालिम, दण्ड र पुरस्कारको व्यवस्था तथा बहुआयामिक क्षेत्रमा कर्मचारीको उपयोग र परिचालन आदि समेतलाई मध्यनजर गरी ब्यापक सुधार गर्नुपर्ने देखिन्छ ।

कुनै समय उल्लेख्य जलविद्युत आयोजनाहरुको प्रारम्भिक अध्ययन, विस्तृत इन्जिनियरिङ्ग अध्ययन तथा डिजाइन एवम् निर्माण गरेको नेपाल बिद्युत प्राधिकरण यतिखेर आयोजना बिहिन अवस्थामा रहेको छ । नेपालको जलबिद्युत बिकासमा प्राधिकरणले पुर्याएको योगदान, अनुभब र दक्षतासमेतलाई दृष्टिगत गरी उर्जा क्षेत्रको समग्र बिकासका लागि नेपाल सरकारले बिशेष गरी दीर्घकालिन महत्वका बिभिन्न पिकिङ रन अफ रिभर तथा जलाशययुक्त आयोजनाहरुको अध्ययन तथा निर्माण गर्ने गरी प्राधिकरणलाई प्रमाणपत्र जारी गर्न अति आवश्यक छ । विद्युत महशुल पुनरावलोकनको लागि सम्वद्ध सबै पक्ष नअलमलिने गरी बैज्ञानिक र ब्याबहारिक सूत्रका आधारमा कम्तिमा प्रत्येक २ बर्षमा स्वत: महसुल समायोजन हुने ब्यबस्था अबलम्बन गर्न पनि उत्तिकै जरुरी छ ।

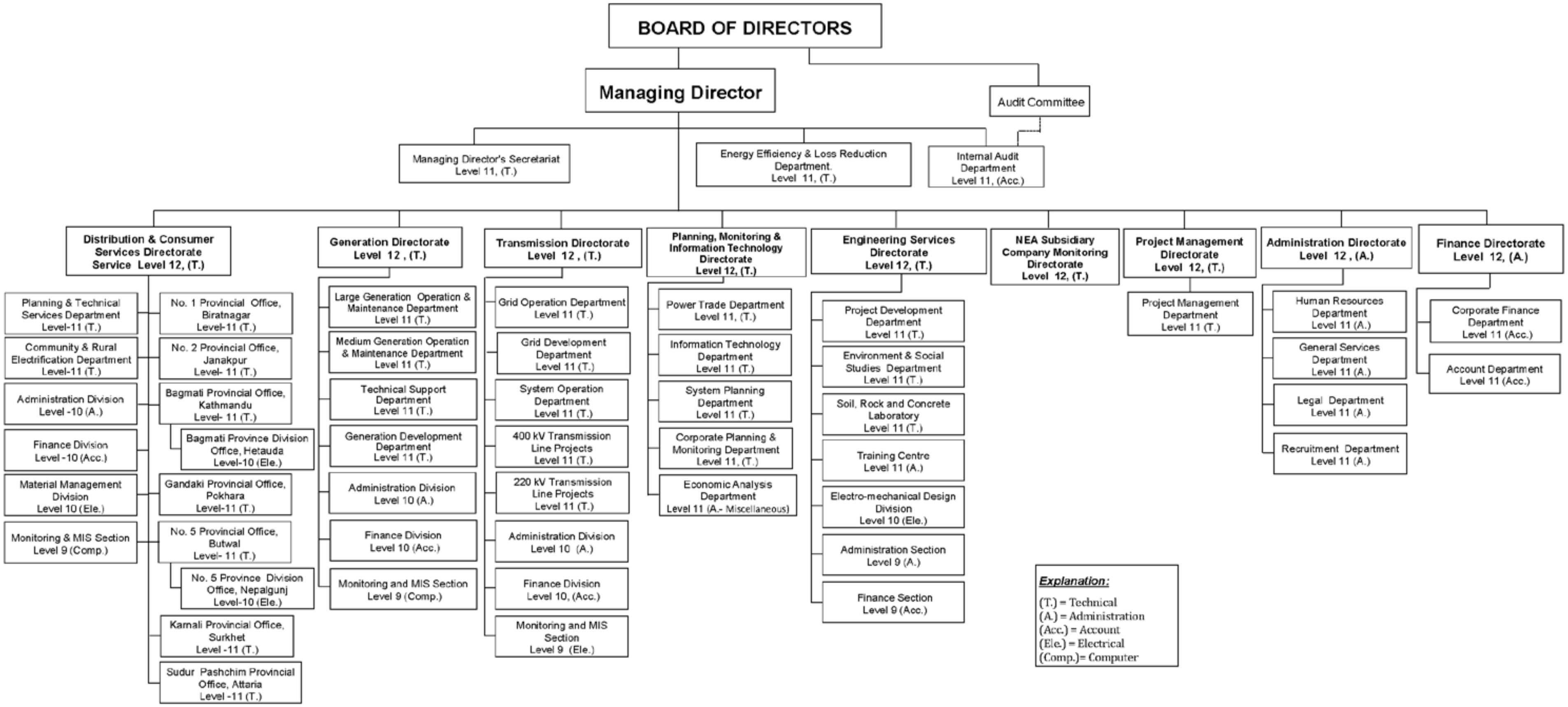
नेपाल बिद्युत प्राधिकरण र उर्जा क्षेत्रसंग सम्बन्धित बिभिन्न महत्वपूर्ण बिषयबस्तुहरु समाबेश गरिएको यस प्रकाशनले नेपालको उर्जा क्षेत्रको बिकासका लागि गरिनुपर्ने बिभिन्न कार्यहरुका साथै देखिएका चुनौति र अबसरहरुको समेत बिश्लेषण गर्न सहयोग पुगोस् भन्ने अपेक्षा गरिएको छ । बिद्युतका अंकहरु अझ स्तरिय बनाउने सन्दर्भमा यहांहरुबाट सदैव रचनात्मक सुझाबको अपेक्षा गर्दै आफ्ना बिभिन्न लेख रचनाहरु उपलब्ध गराई सहयोग गर्नुहुने सम्वद्ध सर्जकहरु लगायत प्रकाशनमा संलग्न सबैलाई हार्दिक धन्यबाद दिन चाहन्छौं ।

- सम्पादक मण्डल

/ rgfqmd

Nepal Electricity Authority

Organisation Structure



Explanation:

(T.) = Technical
(A.) = Administration
(Acc.) = Account
(Ele.) = Electrical
(Comp.)= Computer

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तोयानाथ अधिकारी
सचिव, नेपाल सरकार

१. पृष्ठभूमि:

संयुक्त राष्ट्र संघ दिगो विकासको लक्ष्य (लक्ष्य नम्बर ७) अनुसार सन् २०३० सम्ममा सस्तो, विश्वसनीय दिगो र आधुनिक ऊर्जामा सबैको सहज पहुँच स्थापित गरिने उल्लेख भएको छ र त्यसमा सबै सदस्य राष्ट्रले प्रतिवद्धता जनाएका छन् । यो लक्ष्य सबै सदस्य राष्ट्रहरुको साझा कार्यसूची (एजेण्डा) भएको र ऊर्जाको वढ्दो माग सम्वोधनका निम्ति ऊर्जाको उत्पादनमा वृद्धि गर्नु पहिलो आवश्यकता भएको छ भने ऊर्जा उत्पादनमा वृद्धि गर्दा वातावरणीय संरक्षण र हरित गृह प्रभावलाई न्यूनीकरण गर्न पनि ध्यान दिनुपर्नेछ । पृथ्वीको वातावरण संरक्षण र सन्तुलनको लागि सन् २०५० सम्ममा समग्र ऊर्जाको उत्पादन र खपतमा नवीकरणीय ऊर्जाको हिस्सा ८५ प्रतिशत पुऱ्याउन अनिवार्य हुनेछ भनी जलवायु परिवर्तन सम्बन्धी अन्तरसरकारी समूहले चेतावनी दिएको छ । त्यसैले ऊर्जाको उत्पादनमा नवीकरणीय ऊर्जाको हिस्सालाई उल्लेखनीय मात्रामा वढाउनु पर्ने चुनौती पनि छ ।

विश्व जनसंख्याको ठूलो हिस्सा बसोबास गर्ने दक्षिण एशियाका सबै जनतामा आधुनिक ऊर्जाको पहुँच पुगेको छैन । आर्थिक वृद्धि, प्रतिव्यक्ति आयमा भएको वृद्धि र ऊर्जा खपत जस्ता कारणहरुले दक्षिण एशिया क्षेत्रका देशहरुमा ऊर्जाको मागमा वृद्धि भएको छ । संयुक्त राष्ट्र संघ दिगो विकासको लक्ष्यले निर्धारण गरेका उपलव्धिहरु हासिल गर्न ऊर्जाको उत्पादन वढाउन आवश्यक भएको छ ।

विद्युत उत्पादन खासगरी नवीकरणीय ऊर्जा उत्पादनका निम्ति नेपालमा ठूलो सम्भावना रहेको छ।नेपालको भौगोलिक अवस्था र नदीहरुको वहावको प्रकृति (खासगरी उच्च भौगोलिक क्षेत्रमा उत्पत्ति भइ पहाडका खोँच हुदै समथर भूभाग तर्फ प्रवाहित भएकोले नदी प्रवाहित अवस्था (रन अफ रिभर) र जलाशय वा बाँधको निर्माण मार्फत ठूलठूला विद्युत आयोजनाहरु विकास गर्न सकिने अध्ययनले देखाएको छ ।

नेपालमा उत्पादन हुने विद्युत शक्ति प्रयोगका निम्ति क्षेत्रीय बजारको रुपमा रहेका छिमेकी देशहरु भारत, बंगलादेश र चीनले चासो र रुचि देखाएका छन् । ऊर्जाको वढ्दो मागसँगै नवीकरणीय ऊर्जाको हिस्सा बढाउने चुनौती राज्यहरुका सामु रहेको छ । उदाहरणको लागि बङ्गलादेशलाई लिन सकिन्छ । बङ्गलादेशमा नवीकरणीय ऊर्जा उत्पादनका स्रोतको अभाव रहेकोले नवीकरणीय ऊर्जाका निम्ति नेपाल तर्फ आँखा लगाउनु स्वभाविक नै हो । त्यसैले अन्तरदेशीय विद्युत व्यापारका निम्ति कानूनी आधार तयार गर्न भारत, बङ्गलादेश एवं चीन र नेपालबीच विद्युत आयोजनाको विकास र विद्युत व्यापारका लागि दुई पक्षीय सम्झौताहरु सम्पन्न भएका छन् । यी सम्झौताहरुको मुख्य उद्देश्य नेपालको जलविद्युत विकासमा सहकार्य गर्ने र विद्युतको अन्तरदेशीय व्यापारका लागि आवश्यक आधार तयार गर्ने रहेका छन् । यसका अतिरिक्त नेपालको विद्युत विकास र बजार विस्तारका लागि अन्य देशहरु जस्तै: अमेरिका, अष्ट्रिया, जपान, अष्ट्रेलिया लगायतका देश र बहुपक्षीय दातृ निकायहरु: विश्व बैङ्क, एसियाली विकास बैङ्क, जाइकाले पनि आपसी सहकार्य र सहयोग उपलव्ध गराएका छन् ।

२. नेपाल कानूनमा अन्तर्राष्ट्रिय सन्धि सम्झौता सम्बन्धी व्यवस्था:

राज्य राज्य बिचको सम्बन्ध अर्थात अन्तर्राष्ट्रिय सम्बन्ध र व्यवहारलाई निर्देशित र परिभाषित गर्ने काम सन्धिले गरेको हुन्छ। त्यसैले सन्धिको पालना गर्नु पक्ष राष्ट्रको दायित्व र कर्तव्य हुनेछ भनी सन्धिको कानून सम्बन्धी भियाना महासन्धिको धारा २६ मा उल्लेख छ । अन्तर्राष्ट्रिय अदालतको विधानको धारा ३८ ले अन्तर्राष्ट्रिय सन्धि सम्झौतालाई अन्तर्राष्ट्रिय कानूनको प्रमुख स्रोतको रुपमा स्वीकार गरेको छ । अन्तर्राष्ट्रिय सन्धि सम्झौताहरुले राज्यहरु बिचको सम्बन्धलाई नियमित गर्ने र अन्तर्राष्ट्रिय कानूनको प्रमुख स्रोत समेत भएकोले यसलाई स्पष्टरुपमा परिभाषित गर्न आवश्यक भएकोले भियाना महासन्धिको धारा २ को उपधारा (१) मा यसको परिभाषा गरिएको छ : जुनसुकै खास नाम दिइएको भए पनि राज्यहरु बिच लिखित रुपमा सम्पन्न भइ एक वा एक भन्दा बढी दस्तावेजमा समावेश भएको र अन्तर्राष्ट्रिय कानूनद्वारा निर्देशित अन्तर्राष्ट्रिय सम्झौतलाई सन्धि भनिएको छ ।

नेपालको सन्दर्भमा सन्धि सम्झौताको परिभाषा, सन्धि सम्झौतामा हस्ताक्षर, अनुमोदन, सम्मिलन वा स्वीकृत गर्ने, सन्धि सम्पन्न गर्ने विधि, प्रक्रिया र कार्यान्वयन गर्ने सम्बन्धी विषय नेपाल सन्धि ऐन, २०४७ ("सन्धि ऐन") मा व्यवस्थित गरिएको छ । सन्धि ऐनले दुई वा दुई भन्दा बढी राज्यहरु वा कुनै राज्य र अन्तर सरकारी सङ्गठन बिच लिखित रुपमा सम्पन्न भएको सम्झौतालाई सन्धिको रुपमा परिभाषा गरेको छ।नेपालको संविधानको धारा ५१ (ख) मा नेपाल पक्ष भएका अन्तर्राष्ट्रिय सन्धि सम्झौताको कार्यान्वयन गरिने उल्लेख छ र संविधानको धारा २७८ (१) ले सन्धि सम्झौता सम्पन्न गर्ने अधिकार संघमा निहित रहने व्यवस्था गरेको छ ।

नेपालको संविधानको धारा २७९ को उपधारा (२) ले निम्न चार प्रकारका सन्धि वा सम्झौता संघीय संसदको दुई तिहाई बहुमतबाट स्वीकृत हुनुपर्ने व्यवस्था गरेको छ, (क) शान्ति र मैत्री, (ख) सुरक्षा एवं सामरिक सम्बन्ध, (ग) नेपाल राज्यको सीमान, र (घ) प्राकृतिक स्रोतको उपयोग र त्यसको बाँडफाँट सम्बन्धी विषय ।

सन्धि ऐनको दफा ४ वा नेपालको संविधानको धारा २७९ को उपधारा (२) मा उल्लेख भएका सन्धिहरु बाहेक अन्य जुनसुकै विषयका सन्धिमा नेपाल सरकारले हस्ताक्षर गरी लागू गर्न सक्ने कानूनी व्यवस्था सन्धि ऐनको दफा ६ मा रहेको छ ।

संघीय संसदबाट स्वीकृत भएको (अनुमोदन, सम्मिलन, स्वीकृति वा समर्थन) भएको कुनै सन्धिको कुरा प्रचलित कानूनसँग बाँझिएमा सो सन्धिको प्रयोजनको लागि बाँझिएको हदसम्म प्रचलित कानून अमान्य हुनेछ र तत्सम्बन्धमा सन्धिको व्यवस्था नेपाल कानून सरह लागू हुनेछ। यदि संघीय संसदबाट अनुमोदन, स्वीकृति वा समर्थन नभएको वा सम्मिलनको स्वीकृति नपाएको तर नेपाल वा नेपाल सरकार पक्ष भएको कुनै सन्धिबाट नेपाल वा नेपाल सरकार उपर कुनै थप दायित्व वा भार पर्न जाने र त्यसको कार्यान्वयनका लागि कानूनी व्यवस्था गर्नु पर्ने रहेछ भने त्यस्तो सन्धि कार्यान्वयनका लागि नेपाल सरकारले यथासम्भव चाँडो कानून बनाउन कारवाही चलाउनु पर्ने विषय पनि सन्धि ऐनको दफा ९ मा रहेको छ। सन्धि वा सम्झौताको कार्यान्वयनका लागि आवश्यक परेमा नयाँ कानून बनाउने वा प्रचलित कानूनमा आवश्यकता अनुसार संशोधन गरिने कुरालाई सन्धि ऐनले स्पष्ट गरेकोले सन्धि सम्झौतालाई पूर्ण सद्भाव र इमान्दारी पूर्वक कार्यान्वयन गरिने नेपालको प्रतिवद्धता रहेको छ ।

३. विद्युत क्षेत्रको विकासका निम्ति भएका दुई पक्षीय सम्झौताहरु र परिलक्षित क्षेत्र:

विद्युत क्षेत्रको विकास र विद्युत व्यापारलाई प्रवर्द्धन गर्ने उद्देश्यले नेपालले छिमेकी देशहरु भारत, चीन र बङ्गलादेशसँग दुई पक्षीय सम्झौता गरेको छ भने यस क्षेत्रको विकास र लगानी प्रवर्द्धनका लागि अमेरिका, अष्ट्रियासँग पनि दुई पक्षीय सम्झौताहरु भएका छन। ति सम्झौताहरुको उद्देश्य र क्षेत्रलाई संक्षिप्त रुपमा प्रस्तुत गरिएको छ।

नेपाल-भारत:

नेपाल भारत विद्युत व्यापार सम्झौता[1]**:** नेपाल-भारत बिच अन्तरदेशीय विद्युतको व्यापार सञ्चालन गर्न, अन्तरदेशीय विद्युत प्रसारण लाईनको निर्माण गर्न, दुई देशका ग्रिड प्रणालीलाई एक अर्कोसँग आबद्ध गर्न र विद्युत आयोजनाको विकासमा संयुक्त लगानी प्रवर्द्धन गर्ने उद्देश्यले सन् २०१४ मा नेपाल र भारत विच विद्युत व्यापार सम्झौता सम्पन्न भएको थियो। सम्झौताका प्रमुख व्यवस्थाहरुमा: सरकारी, सार्वजनिक तथा निजी क्षेत्र मार्फत विद्युत क्षेत्रको विकास खासगरी प्रसारण लाईन एवं प्रसारण प्रणाली, ग्रिड आवद्धता, विद्युत आदान-प्रदान र विद्युत व्यापारको लागि आवश्यक सहयोग गर्ने, आपसमा आवद्ध अन्तरदेशीय विद्युत ग्रिड सञ्चालनको लागि दुवै देशले सुरक्षित र विश्वसनीय कार्यविधि र प्रक्रियाकहरु तयार गरी लागू गर्ने, स्वीकृति वा अनुमतिपत्र प्राप्त संस्थाहरुलाई विना भेदभाव अन्तरदेशीय विद्युत प्रसारण प्रणालीमा पहुँच दिने,

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[1] Agreement between the Government of Nepal and the Government of India on Electric Power Trade, Cross-border Transmission Interconnection and Grid Connectivity 2014.

विद्युत व्यापार अभिवृद्धिका निम्ति विद्युत आयोजनमा दुवै देशको तर्फबाट संयुक्त लगानी गर्ने, दुई देश बिचको ग्रिडलाई एक आपसमा आबद्ध गर्न अन्तरदेशीय प्रसारण लाईन सम्बन्धी योजना तयार र सोको निर्माणको लागि दुवै देशको सरकारी, सार्वजनिक र निजी क्षेत्रलाई प्रोत्साहित र सहयोग गर्ने र विद्युत व्यापारको प्रभावकारी कार्यान्वयनका लागि विभिन्न नीतिगत व्यवस्थाहरुमा एकरुपता कायम गर्न सहयोग गर्ने रहेका छन् ।

यो सम्झौताले नेपाल र भारत बिच विद्युत आयात निर्यात र विद्युत व्यापारलाई अगाडि बढाउन कानूनी र नीतिगत आधार तयार गरेको छ। यो सम्झौताले तय गरेका सिद्धान्तका आधारमा नेपालले भारतबाट विद्युत खरिद गरेको छ । साथै नेपाल विद्युत प्राधिकरणलाई भारतको विद्युत बजारमा विद्युत बिक्री गर्ने अनुमति पनि प्राप्त भएको छ ।

महाकाली सन्धि[2]: पञ्चेश्वर बहुउद्देश्यीय आयोजनाको विकास गर्ने उद्देश्यले नेपाल र भारत बिच सन् १९९६ मा महाकाली सन्धि सम्पन्न भएको हो । उक्त सन्धिमा महाकाली नदीलाई दुई देश बिचको सीमा नदी स्वीकार गर्दै संयुक्त लगानीमा पञ्चेश्वर जलविद्युत आयोजनाको विकास गर्ने र त्यसबाट सिंचाइ र वाढी नियन्त्रणको लाभ हासिल गर्ने प्रमुख उद्देश्यहरु रहेका छन् । यसको कार्यान्वयनका लागि पञ्चेश्वर विकास प्राधिकरणको गठन पनि भएको छ । तर सन्धिको उद्देश्य अनुरुप कार्यान्वयन प्रक्रिया भने अगाडि बढ्न सकेको छैन । खासगरी पञ्चेश्वर बहुउद्देश्यीय आयोजनाको विकासका निम्ति तयार भएको मस्योदा विस्तृत आयोजना प्रतिवेदनमा दुई देश बिच सहमति हुन सकेको छैन । आयोजनाबाट प्राप्त हुने सबै प्रकारका लाभहरु आधा आधा हुने सन्धिको सिद्धान्त अनुसार पानीको बाँडफाँटका विषयमा सहमति हुन नसक्दा आयोजना विकासको कार्यले गति लिन सकेको छैन । तर सन्धि धारा १(वि) को व्यवस्था भने कार्यान्वयन भएको छ । उक्त व्यवस्थाका आधारमा भारतको टनकपुर विद्युत गृहदेखि नेपालको सिमानासम्म १३२ केभी विद्युत प्रसारण लाईनको निर्माण गरी टनकपुर विद्युत गृहबाट उत्पादित विद्युत मध्येबाट वार्षिक ७० लाख किलोवाट घण्टा (युनिट) विद्युत नेपालले निःशुल्क प्राप्त गरिरहेको छ ।

गण्डक सम्झौता (सिंचाइ तथा विद्युत आयोजना सम्बन्धी)[3]: गण्डक नदीबाट सिंचाइ तथा विद्युत उत्पादन गर्ने उद्देश्यका साथ नेपाल र भारत बिच गण्डक (सिंचाइ तथा विद्युत आयोजना) सम्बन्धी सम्झौता सम्पन्न भएको थियो। सम्झौतामा १५,००० किलोबाट विद्युत उत्पादन गर्ने र त्यस मध्ये १०,००० किलोबाट विद्युत शक्ति नेपालले प्राप्त गर्ने उल्लेख छ । यसका अतिरिक्त नेपालमा विद्युत आपूर्तिका निम्ति विद्युत प्रसारण तथा वितरण लाईन निर्माण गर्ने विषय पनि सम्झौतामा रहेको छ । यो सम्झौता समान हैसियतमा सम्पन्न नभएकोले नेपालप्रति अन्याय भएको भन्ने धारणा रहेको छ । तथापी यो सम्झौताले नेपालमा विद्युत आपूर्तिका लागि वितरण एवं प्रसारण प्रणाली निर्माण गर्न र विद्युत विकासको लागि दुई पक्षीय सहयोगका निम्ति आधार तयार गरेको छ ।

कोशी सम्झौता[4]: सिंचाइ, वाढी नियन्त्रण र विद्युत उत्पादन गर्ने प्रयोजनका लागि नेपाल सरकार र भारत सरकार बिच कोशी सम्झौता सम्पन्न भएको थियो । सम्झौताको धारा ४ को व्यवस्था अनुसार कोशी बाँधको दश किलोमिटरको क्षेत्रभित्र उत्पादन हुने विद्युतको पचास प्रतिशत हिस्सामा नेपालको अधिकार रहने र त्यस्तो विद्युत प्रसारणका निम्ति आवश्यक पर्ने प्रसारण लाईनको निर्माण गरिने विषय पनि सुनिश्चित गरिएको छ ।

विद्युत खरिद सम्झौता: नेपालको आन्तरिक खपतको लागि विद्युतको अभाव भएकोले भारतमा उत्पादित विद्युत खरिद गर्न नेपाल विद्युत प्राधिकरण र एनविविएन (भारत) बिच विद्युत खरिद सम्झौता भएको छ। उक्त सम्झौताका आधारमा आन्तरिक प्रयोजनको लागि नेपालले भारतबाट विद्युत खरिद गरिरहेको छ। सन् २०१४ सम्पन्न विद्युत व्यापार सम्झौताले तय गरेको आधारभूत सिद्धान्तका आधारमा दुई देशका संस्था बिच विद्युत व्यापार सम्झौता सम्पन्न भएको हो ।

यसका अतिरिक्त अरुण तेस्रो जलविद्युत आयोजन (९०० मेगावाट) र माथिल्लो कर्णाली जलविद्युत आयोजना (९०० मेगावाट) प्रत्येकबाट उत्पादित विद्युत मध्ये २१ प्रतिशत विद्युत शक्ति नेपाललाई निःशुल्क उपलब्ध गराउने र बाँकी विद्युत भारत निर्यात गर्ने शर्तमा उक्त दुवै आयोजनाको लागि विद्युत उत्पादनको अनुमतिपत्र प्रदान गरिएको छ। यस मध्ये अरुण तेस्रो जलविद्युत आयोजनाको अनुमतिपत्र प्राप्त कम्पनी- एसजेभिएनले आयोजनाको निर्माण कार्यलाई प्रभावकारी रुपमा अगाडि वढाएको छ। यो आयोजनाको निर्माण पश्चात नेपाल-भारत बिचको विद्युत व्यापार नयाँ चरणमा प्रवेश गर्नेछ ।

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[2] Treaty Between Government of Nepal and The Government of India concerning the Integrated Development of the Mahakali Barrage Including Sarada Barrage, Tanakpur Barrage and Pancheshwar Project.

[3] Agreement between Government of Nepal and the Government of India on the Gandak Irrigation and Power Project (1959 Revised).

[4] Revised Agreement between Government of Nepal and the Government of India on the Koshi Project.

नेपाल–बङ्गलादेश:

विद्युत क्षेत्रको विकास सम्बन्धी समझदारीपत्र[5]: नेपाल र बंगलादेश बिचको विद्युत व्यापारलाई प्रवर्द्धन गर्ने उद्देश्यले सन् २०१८ मा एक समझदारीपत्र सम्पन्न भएको छ । समझदारीपत्रको दफा २ अनुसार देहायका कार्यहरुलाई दुई देशले संयुक्त रुपमा अगाडि बढाउने उल्लेख गरिएको छ:

- जलविद्युत उत्पादन र प्रसारण लाईनको विकास निर्माण गर्ने (ऊर्जा दक्षता तथा नवीकरणीय ऊर्जाको उत्पादनमा सहकार्य गर्ने),
- विद्युतको उत्पादन र ऊर्जा दक्षताको क्षेत्रमा अध्ययन, अनुसन्धान, तालिम, गोष्ठि तथा सेमानिर आयोजना गर्ने,
- विद्युत उत्पादन आयोजना, विद्युत प्रसारण लाईनको निर्माण, विद्युत वितरण र ऊर्जा दक्षताको क्षेत्रमा लगानी गर्न दुवै देशका निजी क्षेत्रलाई सहयोग र प्रोत्साहन गर्ने,
- नेपालको जलविद्युत आयोजनाको निर्माणमा संयुक्त लगानी गर्ने,

यो समझदारीपत्रले दुई देश बिच विद्युत व्यापार गर्नका लागि आवश्यक ढाँचा एवं आधार तयार गर्ने विश्वास लिइएको छ। साथै दक्षिण एशिया क्षेत्रमा विद्युत व्यापारलाई प्रवर्द्धन गर्न क्षेत्रीय तथा उपक्षेत्रीय तहमा स्थापित मञ्चहरु जस्तैः सार्क, बिमस्टेक, बिवआइएनमा सहभागी हुने र तिनको प्रवर्द्धनका निम्ति सहकार्य गर्ने विषय पनि समावेश गरिएको छ । उक्त समझदारिपत्रले दुई देश बिचको विद्युत व्यापारलाई प्रवर्द्धन गर्न, आपसी सहयोगलाई अगाडि बढाउन र नीतिगत विषयहरुलाई कुटनीतिक माध्यमबाट समाधान गर्न दुवै देशका सहसचिव र सचिवले सहअध्यक्षता गर्ने दुई पक्षीय संयन्त्रको समेत व्यवस्था गरेको छ ।

नेपाल–चीन:

विद्युत क्षेत्रको विकास सम्बन्धी सहयोग सम्झौता[6]: नेपालको ऊर्जा क्षेत्रको विकासका लागि सीमापार विद्युत प्रसारण लाईन तथा ग्रिडको विकास, नवीकरणीय ऊर्जा लगायत जलविद्युत आयोजनाको विकास, ऊर्जा सम्बन्धी आयोजनाको विकासमा लागि आपसी सहयोग प्रवर्द्धन र यसका लागि प्राविधिक सहयोग समेत उपलब्ध गराउने उद्देश्य हासिल गर्न सन् २०१८ मा नेपाल र चीन बिच विद्युत क्षेत्रको विकास सम्बन्धी सहयोग सम्झौता सम्पन्न भएको छ ।

विद्युत प्रसारण लाईन (ग्रिड) को सम्भाव्यता अध्ययन सम्बन्धी सहयोग सम्झौता[7]: नेपाल र तिब्बत बिच अन्तरदेशीय विद्युत प्रसारण लाईनको विकास गर्न नेपाल विद्युत प्राधिकरण र स्टेट ग्रिड कर्पोरेशन, चीन बिच पनि एक सम्झौता सम्पन्न भएको छ । उक्त सम्झौता अनुसार तिब्बतको केरुङ्ग देखि नेपालको गल्छिसम्म ४०० केभी (डबल सर्किट) अन्तरदेशीय विद्युत प्रसारण लाईनको निर्माणका लागि सम्भाव्यता अध्ययन गरिनेछ । यो सम्झौताले नेपाल चीन बिच सीमापार (अन्तरदेशीय) विद्युत प्रसारण लाईन निर्माणको लागि आधार तयार गरेको छ।यो प्रसारण लाईनको निर्माणले नेपालको विद्युत व्यापारको लागि उत्तर तर्फको बजार खुला गर्नेछ ।

नेपाल–अष्ट्रिया:

विद्युत विकास सम्बन्धी समझदारीपत्र[8]: जलविद्युत आयोजनाको विकासका निम्ति आर्थिक एवं प्राविधक सहयोग गर्न, विद्युत क्षेत्रसँग सम्बन्धित जनशक्तिको विकास र क्षमता अभिवृद्धि गर्न एवम् नेपाल र अष्ट्रिया बिच आपसी सहकार्य र सहयोग आदान प्रदान गर्न दुई देश बिच विद्युत विकास सम्बन्धी सम्झौता सम्पन्न भएको छ। यसका आधारमा नेपाली पक्षले विद्युत उत्पादनको लागि आवश्यक पर्ने उपकरणहरु अष्ट्रियाबाट प्राप्त गर्न सक्नेछन् ।नेपाल अष्ट्रिय बिच सम्पन्न भएको यो सम्झौताले नेपालको जलविद्युतको विकासमा अष्ट्रियन प्रविधि, पुँजी र जनशक्तिको प्रयोगका लागि आधार तयार गरेको छ ।

नेपाल–अमेरिका:

एमसिए सम्झौता[9]: विद्युत प्रसारण लाईन निर्माण र सडक सुधारका लागि नेपाल सरकारलाई आर्थिक सहयोग गर्ने उद्देश्यका साथ सन् २०१७ मा नेपाल सरकार र संयुक्त राज्य अमेरिकी सरकार बिच एमसिए सम्झौता सम्पन्न भएको थियो ।उक्त सम्झौतामा विद्युत र सडक दुबै पक्ष समावेश भए पनि अनुदानको ठूलो हिस्सा विद्युत प्रसारण लाईनको निर्माणमा खर्च हुनेछ । एमसिए सम्झौता अन्तर्गत एमसिसिबाट नेपालले ५०० मिलियन युएस डलर सहयोग प्राप्त हुनेछ भने नेपाल सरकारले १३० मिलियन युएस डलर लगानी गर्नुपर्ने शर्त रहेको छ। एमसिए सम्झौता अन्तर्गत नेपाल भित्र निम्न खण्डहरुलाई जोड्ने प्रसारण लाईन निर्माण हुनेछ: (क) लप्सीफेदी, काठमाडौं (रातमाटे, नुवाकोट, (ख) रातमाटे-हेटौडा, (ग) रातमाटे-दमौली

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[5] Memorandum of Understanding between The Government of Nepal and the Government of the People's Republic of Bangladesh on Power Sector Development 2018.

[6] Nepal-China Framework Agreement on Bilateral Cooperation on Power Sector Development 2018

[7] Cooperation Agreement between State Grid Corporation of China (SGCC), China and Nepal Electricity Authority, Nepal on the Feasibility Study of China-Nepal Power Grid Interconnection 2018.

[8] Memorandum of Understanding between Nepal and Austria on Power Sector Development 2019.

[9] Millennium Challenge Compact between the United States of America Acting Through the Millennium Challenge Corporation and the Federal Democratic Republic of Nepal Acting Through the Ministry of Finance 2017.

र (घ) दमौली-बुटबल । यो प्रसारण लाईन ३०० किलोमिटर लामो र ४०० केभी क्षमताको (डबल सर्किट) हुनेछ । त्यसैगरी नेपाल भारतको संयुक्त पहलमा बुटबलदेखि गोरखपुरसम्मको अन्तरदेशीय विद्युत प्रसारण लाईन निर्माण गर्नुपर्ने शर्त पनि यो सम्झौतामा रहेको छ ।

यो प्रसारण लाईन निर्माणको प्रमुख उद्देश्यहरु क्रमशः (क) विद्युतको उपलब्धता र ग्रिडको विश्वसनीयतामा सुधार गरी विद्युतको खपतमा वृद्धि गर्ने एवम् विद्युत व्यापारलाई सहज बनाउने, र (ख) बाह्य विद्युत व्यापारका निम्ति दोस्रो अन्तरदेशीय विद्युत प्रसारण लाईन तयार गर्ने रहेका छन् ।

बुटबल-गोरखपुर खण्डको अन्तरदेशीय विद्युत प्रसारण लाईनको निर्माण पश्चात व्यापारका निम्ति भरपर्दो प्रसारण लाईन तयार हुनेछ ।यो लाईनको माध्यमबाट नेपाल-भारत बिच विद्युत आयात निर्यात तथा विद्युत व्यापारलाई अगाडि बढाउन सहज हुने विश्वास लिइएको छ । वर्षायाममा नेपालमा बचत हुने विद्युत भारत निर्यात गर्न र सुख्खायाममा भारतबाट विद्युत आयात गर्नका लागि पनि यो अन्तरदेशीय विद्युत प्रसारण लाईन उपयोगी हुनेछ ।

नेपाल अमेरिका बिच सम्पन्न भएको एमसिए सम्झौता संघीय संसदबाट अनुमोदन हुनुपर्ने शर्त रहेको र हाल सम्म उक्त सम्झौता अनुमोदन हुन बाँकी नै रहेकोले सम्झौता कार्यान्वयनमा आएको छैन

४. क्षेत्रीय तथा उपक्षेत्रीय सम्झौता तथा संयन्त्रहरु:

सार्क ऊर्जा सहयोग (विद्युत) सम्बन्धी सम्झौता[10]: विद्युत उत्पादनमा वृद्धि र ग्रिड सुरक्षामा अभिवृद्धि गर्दै सार्क सदस्य राष्ट्रहरु बिच अन्तरदेशीय विद्युत व्यापार र विद्युत आदान प्रदानका लागि आपसी सहयोग र सहकार्य अभिवृद्धि गर्न सन् २०१० मा सार्क ऊर्जा सहयोग (विद्युत) सम्बन्धी सम्झौता सम्पन्न भएको थियो । उक्त सम्झौताको प्रमुख उद्देश्यहरु देहाय बमोजिम छन :

- स्वेच्छिक रुपमा सदस्य राष्ट्रहरुले आ-आफ्नो देशको कानून बमोजिम दुई पक्षीय, त्रिपक्षीय वा आपसी सम्झौताका आधारमा अन्तरदेशीय विद्युत व्यापारलाई अगाडि वढाउने,
- विद्युत व्यापार तथा विद्युत आदान प्रदानको क्षेत्रमा प्रतिस्पर्धालाई प्रवर्द्धन गर्ने,
- सदस्य राष्ट्रहरुले दुई पक्षीय, त्रिपक्षीय वा आपसी सम्झौताका आधारमा अन्तरदेशीय ग्रिड तथा प्रसारण लाईन निर्माण सम्बन्धी योजना तयार गर्न र सोको आधारमा सम्बन्धित देशको सिमानासम्म प्रसारण लाईन निर्माणको कार्यलाई अगाडि बढाउने,
- अन्तरदेशीय विद्युत प्रसारण लाईन निर्माण गर्न निजी क्षेत्रलाई प्रोत्साहन गर्ने र त्यसको लागि निर्माण, स्वामित्व ग्रहण र सञ्चालन अवधारणा अवलम्बन गर्ने
- विद्युत खरिद तथा बिक्रीका लागि अनुमतिपत्र प्राप्त संस्थाहरु बिच विद्युत प्रसारण सेवा सम्झौता सम्पन्न गर्न सहयोग गर्ने,
- विद्युत प्रसारण प्रणाली सञ्चालन, विद्युत प्रवाह, सोको अभिलेख र सीमापार (अन्तरदेशीय) विद्युत व्यापारको भुक्तानी सम्बन्धी कार्यविधिहरु तय गर्ने र त्यसमा एकरुपता कायम गर्ने,
- अन्तरदेशीय विद्युत व्यापार सञ्चालनका लागि सम्बन्धित अनुमतिपत्र प्राप्त निकायलाई विना भेदभाव प्रसारण प्रणाली तथा ग्रिडमा पहुँच दिने,
- आआफ्नो देशको कानून बमोजिम अन्तरदेशीय विद्युत व्यापारको लागि विद्युत खरिद बिक्रीमा संलग्न निकायहरुलाई सहयोग र प्रोत्साहन गर्ने,
- विद्युत व्यापार तथा विद्युत आदानप्रदान सम्बन्धी कार्यलाई नियमन गर्न नियामक निकाय र संयन्त्रको स्थापना गर्ने।

विमस्टेक ग्रिड अन्तर संयोजन (आबद्ध) सम्बन्धी समझदारीपत्र[11]: ऊर्जाका विभिन्न स्रोतहरुको अधिकतम उपयोग गर्न, ग्रिड संयोजन (आबद्ध) लगायत ऊर्जासँग सम्बन्धित पूर्वाधार विकास गर्न, अन्तरदेशीय ऊर्जा व्यापारलाई सहयोग तथा प्रवर्द्धनका निम्ति सन् २०१८ मा विमस्टेक ग्रिड अन्तर आबद्ध गर्ने सम्बन्धी समझदारीपत्र सम्पन्न भएको थियो ।

सदस्य राष्ट्रहरु बिच सहयोगको भावना र आपसी लाभको आधारमा क्षेत्रीय कनेक्टिभिटिलाई व्यवस्थित गर्ने, सदस्य राष्ट्रहरुको राष्ट्रिय कानूनको आधारमा यस क्षेत्रमा विद्युत आदान प्रदान र विद्युत व्यापार गर्ने, ग्रिडको विश्वसनियता र सुरक्षालाई उच्च प्राथमिकता दिदै लागतलाई ध्यानमा राखी कनेक्टिभिटिका लागि योजनाको निर्माण, विकास र सञ्चालन गर्ने एवं आयोजना विकास गर्दा लाभ लागतलाई ध्यान दिने, विश्वसनिय, सुरक्षित र मितव्ययी विद्युत आपूर्तिमा जोड दिने र विद्युत व्यापारका लागि नयाँ अवधारणाहरु (सिद्धान्त र उद्देश्य) लागू गर्ने विषय यो समझदारीपत्रमा समावेश गरिएको छ । साथै ग्रिड सञ्चालन सम्बन्धमा समान प्राविधिक तथा अन्य मापनहरु लागू गर्ने र सदस्यराष्ट्रहरु बिच भेदभाव नगर्ने,

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[10] SAARC Framework Agreement for Energy Cooperation (Electricity) 2010.

[11] Memorandum of Understanding for establishment of the BIMSTEC Grid Interconnection 2018.

ग्रिडको निर्माण, सञ्चालन र व्यवस्थापनका लागि आयात निर्यात कर, महसुल तथा शुल्कमा छुट दिने र सदस्य राष्ट्रहरुको सम्बद्ध कानूनमा एकरुपता कायम गर्न ध्यान दिने पक्षलाई पनि समभ्रदारीपत्रमा उल्लेख गरिएको छ ।

विद्युत एकीकरण सम्बन्धी दक्षिण एशियाली क्षेत्रीय पहल[12]**:** अन्तरदेशीय विद्युत व्यापार, विद्युतको बजार निर्माण र क्षेत्रीयस्तरमा सफा ऊर्जाको विकासका निम्ति दक्षिण एशियाका राष्ट्रहरुलाई सहयोग गर्ने हेतुले संयुक्त राज्य अमेरिकी सहयोग नियोगको अगुवाइमा विद्युत एकीकरण सम्बन्धी दक्षिण एशियाली क्षेत्रीय पहलको शुरुवात भएको हो । यस क्षेत्रको विद्युत बजारलाई एक आपसमा आबद्ध गरी यस क्षेत्रमा ३५० गिगावाट जलविद्युतको विकास गर्न उत्प्रेरित गर्नु यसको प्रमुख उद्देश्य रहेको छ ।

यो कार्यक्रम मूलभूत रुपमा देहायका तीनबटा क्षेत्रमा केन्द्रीत रहेको छः

(क) **नीतिगत, कानूनी र नियामक ढाँचामा समन्वयन गर्नेः** दक्षिण एशियाका राष्ट्रहरु बिच अन्तरदेशीय विद्युत व्यापारसँग सम्बन्धित कानूनी तथा नीतिगत व्यवस्था, अनुमतिपत्र सम्बन्धी व्यवस्था, खुला पहुँच, महसुलर शुल्क, व्यापार सम्बन्धी वार्ता र विवाद समाधान सम्बन्धी संयन्त्र र व्यवस्थाहरुमा एकरुपता कायम गर्दै विद्युत व्यापारलाई प्रवर्द्धन र प्रोत्साहनका लागि समन्वयन गर्ने,

(ख) **विद्युत प्रसारण प्रणालीहरुलाई एकआपसमा आबद्ध गर्नेः** आगामी २० देखि ३० वर्षको लागि विद्युत आयात निर्यात गर्न प्राविधिक र आर्थिक रुपले सम्भाव्य विन्दुहरुको पहिचान गरी विद्युत प्रसारण प्रणालीहरुलाई एक आपसमा संयोजन (आबद्ध) गर्न पहलकदमी लिने र सोको लागि आवश्यक अध्ययन अनुसन्धानमा सहयोग गर्ने,

(ग) **दक्षिण एसियाली क्षेत्रीय विद्युत बजार निर्माणमा सहयोग गर्नेः** क्षेत्रीय बजार निर्माणका लागि अन्तरदेशीय विद्युत प्रसारण लाईन निर्माणमा प्रोत्साहन गर्ने, प्रसारण लाईन तथा संरचनाहरु प्रयोग गर्ने सुविधा दिने, प्रस्तिस्पर्धा वृद्धिका निम्ति क्षेत्रीय विद्युत उत्पादकहरुको संगठन स्थापनाका लागि पहल गर्ने, विद्युत व्यापार, विद्युत आदान प्रदान र बजार निर्माणका लागि प्रोत्साहन गर्ने र यि विषयहरुमा साभ्रा नीति तथा कानून बनाउन सदस्य राष्ट्रहरुलाई सहयोग गर्ने ।

दक्षिण एशियाली आर्थिक सहयोग कार्यक्रम[13]**:** भुटान, भारत, माल्दिभ्स, म्यान्मार, नेपाल र श्रीलंका गरी ६ वटा देशहरुलाई लक्षित गरी यो कार्यक्रम आरम्भ गरिएको छ । यो कार्यक्रमको मुख्य उद्देश्य यस क्षेत्रका देशहरु बिच व्यापार वृद्धि र सहयोग विस्तार गर्ने रहेको छ। साथै यो क्षेत्रलाई म्यान्मार हुदैं चीन र विश्वसँग जोड्ने र व्यापार विस्तारमा पनि यो कार्यक्रमले जोड दिनेछ । यो कार्यक्रमले यातायात, व्यापार, ऊर्जा र आर्थिक विकासका क्षेत्रमा कार्य गर्नेछ ।

ऊर्जाको उत्पादन र ऊर्जा व्यापारलाई प्रवर्द्धन गर्ने लक्ष्य यो कार्यक्रमले लिएको छ । यस अन्तर्गतको ऊर्जा कार्यक्रमले सीमापार विद्युत प्रसारण प्रणालीको विकास र सुदृढीकरण, ऊर्जा व्यापारमा वृद्धि, ऊर्जा दक्षता तथा सफा ऊर्जाको विकासमा सहयोग, ऊर्जा क्षेत्रमा कार्यरत जनशक्ति एवं संस्थाहरुको क्षमता अभिवृद्धि, ऊर्जा सुरक्षा र क्षेत्रीयस्तरमा विद्युत आदानप्रदान सम्बन्धी संरचना तयार गर्न सहयोग गर्नेछ। सीमापार तथा अन्तरदेशीय विद्युत व्यापार र विद्युत आदान प्रदानलाई सहज र प्रभावकारी बनाउन क्षेत्रीय संयन्त्र तयार गर्न एवम् ऊर्जा क्षेत्रसँग सम्बन्धित कानूनी तथा नीतिगत विषयहरुमा एकरुपता र सामाञ्जस्यता कायम गर्न पनि यो कार्यक्रमले सदस्य राष्ट्रहरुलाई प्रेरित र सहयोग गर्नेछ ।

बङ्गलादेश, भुटान, भारत र नेपाल उपक्षेत्रीय मञ्च[14]**:** जलस्रोतको व्यवस्थापन, विद्युत प्रसारण सञ्जाल, यातायात र पूर्वाधार क्षेत्रमा सहकार्य र आपसी सहयोग अभिवृद्धिका निम्ति बंगलादेश, भुटान, भारत, नेपाल सम्मिलित एक उपक्षेत्रीय मञ्चको स्थापना गरिएको छ । यस उपक्षेत्रका राष्ट्रहरु बिच विद्युत व्यापारलाई प्रवर्द्धन गर्न विद्युत प्रसारण लाईन, विद्युत ग्रिड सञ्चाललाई एक अर्को देशको प्रणालीसँग आबद्ध गर्ने पनि यसको उद्देश्य रहेको छ । यो उपक्षेत्रका सबै देशहरुसँग भारतको विद्युत प्रसारण प्रणाली आबद्ध भएकाले बङ्गलादेश भुटान तथा नेपाल तीनबटै देश र भारत बिच विद्युत आदान प्रदान तथा विद्युत व्यापार सञ्चालनमा रहेको छ ।

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[12] South Asian Regional Initiative for Power Integration: The USAID supported program that supports policy, legal, and regulatory issues related to energy in the region; promotes transmissions interconnections; and works towards establishing a regional market exchange for electricity. It also works on promoting integration of energy systems and enhancing Cross-Border Energy Trade (CBET) among the participating South Asian countries.

[13] South Asian Economic Cooperation (SASEC) program brings together Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, and Sri Lanka in a project-based partnership that aims to promote regional prosperity, improve economic opportunities, and build a better quality of life for the people of the sub region. SASEC countries share a common vision of boosting intraregional trade and cooperation in South Asia, while also developing connectivity and trade with Southeast Asia through Myanmar, to the People's Republic of China, and the global market.

[14] The Bangladesh, Bhutan, India, Nepal (BBIN) Initiative is a sub-regional architecture of countries of South Asia. It meets through official representation of member states to formulate, implement and review quadrilateral agreements across areas such as water resources management, connectivity of power, transport, and infrastructure.

[15] Energy cooperation is a driver for the SAARC process leading to durable peace in the region. SAARC Energy Centre has been created through Dhaka Declaration in 2005, as the Special Purpose Vehicle to realize the vision of SAARC leaders to establish an Energy Ring in South Asia.

सार्क ऊर्जा केन्द्र[15]**:** सार्क क्षेत्रको विकास र समृद्धिका लागि ऊर्जा क्षेत्रको विकास सार्क प्रक्रियाको एउटा महत्वपूर्ण पक्ष हो । विद्युतको क्षेत्रमा अध्ययन, अनुसन्धान गर्न एवं ऊर्जासँग सम्बन्धित कानूनी तथा नीतिगत व्यवस्थाहरुमा सुधार र सामाञ्जस्यता कामय गर्ने उद्देश्यले ढाका घोषणा २००५ बमोजिम सार्क ऊर्जा केन्द्रको स्थापना भएको हो । सरकारी अधिकारी, विज्ञ, प्राज्ञ, वातावरण विद् र गैर सरकारी क्षेत्रका प्रतिनिधहरु सबैलाई सहभागी गराइ ऊर्जा क्षेत्रको विकास खासगरी जलविद्युत, नवीकरणीय ऊर्जा, प्रविधिको हस्तान्तरण, ऊर्जा व्यापार, ऊर्जा संरक्षण र ऊर्जा दक्षताका विषयमा छलफल तथा विचारको मन्थन गर्ने साझा मञ्चको रुपमा यो केन्द्र रहेको छ । यो केन्द्रको प्रभावकारिता सार्क संगठनको समग्र पक्षसँग जोडिएको छ । विगत केही वर्ष देखि भारत र पाकिस्तान बिचको सम्बन्धको कारण सार्क प्रक्रिया नै रोकिएको कारण यो केन्द्रको काम कारबाही पनि स्वभाविक रुपमा प्रभावित भएको छ।साथै कोभिड १९ को कारण केन्द्रका काम कारबाहीहरु प्रभावित भएका छन् ।

५. कार्यान्वयनको अवस्था र चुनौती:

कार्यान्वयनको अवस्था: नेपालको विद्युत विकास र विद्युत व्यापारलाई प्रभावकारीरुपले अगाडि बढाउन भारत, चीन र बङ्गलादेशसँग ऊर्जा विकास तथा सहयोग सम्बन्धी दुई पक्षीय सम्झौताहरु सम्पन्न भएका छन भने विद्युत प्रसारण प्रणाली तथा ग्रिड संयोजन र विस्तार गर्ने एवम् एक अर्को देशसँग आबद्ध गर्ने लगायताका विषयहरु समावेश गरी सार्क ऊर्जा सम्झौता र बिमस्टेक ग्रिड अन्तर संयोजन (आबद्ध) गर्ने सम्बन्धी समझदारीपत्र सम्पन्न भएका छन् ।।

विद्युत र ऊर्जा क्षेत्रको विकासका लागि नेपाल र भारत बिच सरकारीस्तरमा सम्पन्न भएका सन्धि सम्झौताको कार्यान्वयनको अवस्था मिश्रित रहेको छ । विद्युत व्यापार र ग्रिड संयोजन सम्बन्धमा सन् २०१४ मा सम्पन्न विद्युत व्यापार सम्झौताको कार्यान्वयनको अवस्था केही हदसम्म सन्तोषजनक रहेको पाउन सकिन्छ। उक्त सम्झौता अनुसार दुवै देशका उच्च अधिकारीहरु रहेको संयुक्त कार्यमूलक समिति (सहसचिव स्तर) र संयुक्त निर्देशन समिति (सचिव स्तर) गठन भएको र ती समितिहरुको प्रत्येक ६-६ महिनको अन्तरालमा दुई पक्षीय बैठकहरु आयोजना हुने व्यवस्थाका कारण पनि यसको कार्यान्वयनले गति लिएको र अपेक्षाकृत प्रगति गरेको मान्न सकिन्छ। हालसम्म दुवै पक्ष बिच आठौ संयुक्त बैठकहरु सम्पन्न भइ आपसी सहमतिका आधारमा विभिन्न विषयमा निर्णयहरु भएका छन्। यी बैठकमा भएका निर्णणहरुले नेपाल भारत बिच सम्पन्न विद्युत व्यापार सम्झौतलाई कार्यान्वयन गर्न सकारात्मक सहयोग पुगेको छ । उक्त सम्झौताको पूर्ण कार्यान्वयनमा लैजान अझै पनि दुवै देशको तर्फबाट थप गृहकार्य र मेहनत गर्न आवश्यक छ। कोशी र गण्डक सम्झौतामा समावेश भएका विद्युतसँग सम्बन्धित प्रावधानहरुको कार्यान्वयन भएको पाउन सकिन्छ[16]।

नेपाल र भारत बिच सम्पन्न महाकाली सन्धिको कार्यान्वयनले गति लिन सकेको छैन।महाकाली सन्धिको मुख्य उद्देश्य पञ्चेश्वर बहुउद्देश्यीय आयोजनाको विकास गर्ने रहेको छ । आयोजनको विकास गर्नका लागि तयार गरिएको विस्तृत आयोजना प्रतिवेदनका सम्बन्धमा दुवै देश बिच सहमति हुन सकेको छैन । फलतः आयोजना विकासको कार्य प्रभावित भएको छ । भारतको टनकपुर विद्युत गृहबाट उत्पादित विद्युत मध्ये वार्षिक ७० लाख किलोवाट घण्टा (युनिट) विद्युत निःशुल्क रुपमा नेपालले प्राप्त गर्ने र उक्त विद्युत आपूर्तिको लागि टनकपुर विद्युत गृहदेखि नेपालको सिमानासम्म १३२ केभी क्षमताको विद्युत प्रसारण लाईन निर्माण गर्ने सम्बन्धी सन्धिको धारा १ (बि) को व्यवस्था भने कार्यान्वयन भएको छ ।

यस बाहेक नेपाल विद्युत प्राधिकरण र एनविविए लगायताका निकायसँग भएका सम्झौतहरु (विद्युत व्यापार र विद्युत आयात निर्यात सम्बन्धी) व्यापरिक मुल्य-मान्यता र सिद्धान्तको आधारमा सम्पन्न भएको हुँदा कार्यान्वयन प्रक्रिया स्वभाविक रुपमा अगाडि बढेको छ ।

नेपाल र बङ्गलादेश बिच सम्पन्न विद्युत विकास सम्बन्धी सम्झौताको मुख्य उद्देश्य नेपालमा उत्पादित जलविद्युत खरिद गर्ने अर्थात विद्युत व्यापार नै प्रमुख विषय रहेको छ । यसको लागि बङ्गलादेशको समेत लगानीमा केही जलविद्युत आयोजनाको विकास गरी नेपालबाट विद्युत लैजाने उद्देश्य रहेको छ। यो सम्झौता सन् २०१८ मा सम्पन्न भएकोले कार्यान्वयनको प्रारम्भिक चरणमा नै रहेको छ र नेपालबाट बङ्गलादेश विद्युत निर्यात गर्न भारतको भूमि र भारतको प्रसारण प्रणालीको प्रयोग गर्नुपर्ने हुन्छ। यसको लागि नेपाल, भारत र बङ्गलादेशका बिचमा कुनै न कुनै रुपमा त्रिपक्षीय सहमति आवश्यक पर्न सक्छ । यसका लागि भारतको भूमिका र नीति प्रधान हुनेछ । नेपाल र बङ्गलादेश बिच सम्पन्न समझदारीपत्रमा पनि उच्च स्तरीय दुई पक्षीय संयन्त्र संयुक्त कार्यमूलक समिति र संयुक्त निर्देशन समितिको व्यवस्था रहेको र संयन्त्रको प्रत्येक ६-६ महिनाम नियमित तरवले दुई पक्षीय बैठक बस्ने व्यवस्थाको कारण सम्झौताको कार्यान्वयन सहज हुने विश्वास गर्न सकिन्छ ।

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[16] कोशी र गण्डक सम्झौता भिन्न परिवेश र समयमा सम्पन्न भएको हुँदा तिनीहरुको कार्यान्वयन र प्रभावकारिता अलग विश्लेषणको विषय हुनसक्ने भएकाले सम्झौतामा उल्लिखित विद्युतको उपयोग र प्राप्तिको विषयलाई मात्र यो लेखको सन्दर्भमा हेरिएको छ ।

नेपाल र चीन बिच विद्युत क्षेत्रको सम्बन्धमा दुईटा सम्झौता सम्पन्न भएका छन: विद्युत क्षेत्रको विकास सम्बन्धी सहयोग सम्झौता र विद्युत प्रसारण लाईन (ग्रिड) को सम्भाव्यता अध्ययन सम्बन्धी सहयोग सम्झौता। यी सम्झौताको माध्यमबाट नेपाल र चीन बिच विद्युत ग्रिडलाई आबद्ध गर्न र विद्युत आयोजनाको विकासमा चिनीया लगानी वढाउन सहयोग पुग्ने अपेक्षा गर्न सकिन्छ । तर सम्झौता सम्पन्न भएको केही समय पछि नै कोभिड १९ को प्रभाव परेकोले दुई पक्षीय बैठक तथा समीक्षा समेत हुन सकेको छैन। त्यसैले सम्झौताको प्रभावका विषयमा समीक्षा गर्न अझै केही वर्ष पर्खनु पर्ने हुन्छ।

नेपाल सरकार र अष्ट्रियन सरकार बिच सम्पन्न सम्झौताको कार्यान्यनका लागि पनि दुई पक्षीय संयुक्त संयन्त्रको व्यवस्था गरिएको र त्यस्तो संयन्त्रको पहिलो बैठक सन् २०१९ मा काठमाडौं सम्पन्न भएको थियो । उक्त बैठकले सम्झौता बमोजिम नेपालको जलविद्युत आयोनामा अष्ट्रियन सरकार वा निजी क्षेत्रबाट लगानी हुनसक्ने सम्भाव्य आयोजनाको पहिचान र लगानीको मोडालिटि तय गर्ने प्रारम्भिक छलफल भएको थियो। तर कोभिड १९ को कारण यो संयन्त्रको दोस्रो बैठक प्रभावित भएकाले अगाडिको कार्यान्वयन प्रक्रिया रोकिएको छ।

नेपाल र संयुक्त राज्य अमेरिका बिच सन् २०१७ मा सम्पन्न भएको एमसिए सम्झौता कार्यान्वयन गर्नु अघि नेपालको संसदबाट स्वीकृत (अनुमोदन) हुनु पर्ने बिचार अमेरिकी सरकारको रहेकोले उक्त सम्झौता नेपालको संसदबाट स्वीकृत हुन बाँकी नै रहेकोले सम्झौताको कार्यान्वयन प्रक्रिया अगाडि बढन सकेको छैन ।

चुनौतीहरु:

दुई पक्षीय वा क्षेत्रीय सन्धि सम्झौताको प्रभावकारी कार्यान्वयनको लागि पक्ष राष्ट्रहरुको समान धारणा र बुझाइ आवश्यक हुनेछ। एक पक्षको पहल मात्र सम्झौता कार्यान्वयन गर्न पर्याप्त हुदैन । त्यसैले दुवै पक्षले पूर्ण सद्भाव र इमान्दारीताका साथ सम्झौताको कार्यान्वयन गर्न जरुरी हुन्छ।

पहिलो, राष्ट्रिय कानून र नीतिमा सामाञ्जस्यता र एकरुपताको अभाव: विद्युतको विकास र अन्तरदेशीय विद्युत व्यापारका लागि सम्पन्न भएका सन्धि सम्झौताको भावना र व्यवस्था अनुसार सदस्य देशहरुको कानूनमा सामाञ्जस्यता र एकरुपता कायम हुन सकेको छैन। राष्ट्रिय कानूनका व्यवस्थाहरु त्यस्तो सन्धि सम्झौताका व्यवस्थासँग सामाञ्जस्य नभएसम्म कार्यान्वयन प्रक्रिया प्रभावकारी हुन सक्दैन । दुई पक्षीय वा क्षेत्रीय सम्झौताको साथसाथै सदस्य देशहरुको राष्ट्रिय कानून र नीति पनि समयानुकूल संशोधन र परिमार्जनमा भएको ढिलाइले पनि सम्झौताहरुको कार्यान्वयन पक्ष चुनौतीपूर्ण भएको छ।

दोस्रो, त्रिपक्षीय सहमति र समझदारीको अभाव: नेपालबाट दक्षिण एशियाका देशहरुमा विद्युत निर्यात वा विद्युत व्यापार गर्न भारतको भूमिका अत्यन्त महत्वपूर्ण रहन्छ। अन्तरदेशीय विद्युत व्यापारका लागि भएका दुई पक्षीय वा क्षेत्रीय सम्झौताहरुको कार्यान्वयन पनि भारतको आन्तरिक कानून र नीतिमा भर पर्नेछ।जस्तै: नेपाल र बङ्गलादेश बिच सम्पन्न सम्झौता बमोजिम नेपालबाट बङ्गलादेशसम्म विद्युत निर्यात वा विद्युत व्यापार गर्न भारतको भूमि, भारतीय विद्युत प्रसारण प्रणाली र भारतीय निकायको अनुमति आवश्यक हुनेछ । त्रिपक्षीय समझदारी बिना यो कार्य सम्भव हुदैन । उदाहरणको लागि भारतले जारी गरेका दुई वटा कानून: विद्युत आयात निर्यात (अन्तरदेशीय) सम्बन्धी निर्देशिका २०१८[17] र विद्युत आयात निर्यात (अन्तरदेशीय) को स्वीकृत तथा सहजीकरण सम्बन्धी कार्यविधिलाई[18] लिन सकिन्छ । सन् २०१८ मा जारी भएको निर्देशिकामा छिमेकी देशसँग हुने विद्युत आयात निर्यात तथा विद्युत व्यापारलाई सजह बनाउने व्यवस्थाहरु रहेका छन भने सन् २०२१ मा जारी गरिएको कार्यविधिले केही निश्चित शर्तहरु थप गरेको छ । खासगरी विदेशी लगानीमा विकास निर्माण हुने जलविद्युत आयोजनाबाट उत्पादित विद्युतको निर्यात र व्यापारलाई नियन्त्रित गर्ने मनसाय रहेको जस्तो देखिन्छ[19]। दक्षिण एशिया क्षेत्रमा भारत जुन भौगोलिक अवस्था छ त्यसको कारण पनि भारतको सकारात्मक नीति बिना यस क्षेत्रका देशहरु बिच कनेक्टिभिटि कायम हुन सक्दैन ।

तेस्रो, पूर्वाधारको अभाव: विद्युतको आयात निर्यातको लागि उच्च क्षमतायुक्त, विश्वसनीय र भरपर्दो विद्युत प्रसारण लाईनको निर्माण प्रमुख चुनौतीको रुपमा रहेको छ । यस्ता पूर्वाधारको अभाव रहेसम्म अन्तरदेशीय विद्युत व्यापारको उद्देश्यले सम्पन्न भएका सन्धि सम्झौताको कार्यान्वयन अगाडि वढ्न सक्दैन ।

चोथौ, संस्थागत संयन्त्रको अभाव: यस क्षेत्रमा विद्युत व्यापारलाई सहज बनाउने, प्राविधिक तथा कानूनी पक्षमा नियमन र विवाद उत्पन्न भएमा समाधान गर्ने संयन्त्रको अभाव देखिन्छ। अन्य देशहरुले विद्युतको व्यापारलाई नियमन र सहज बनाउने प्रयोजनको लागि संस्थागत संयन्त्रको व्यवस्था गरेका छन्।

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[17] The Guidelines on Import/Export (Cross Border Trade) of Electricity 2018.

[18] The Procedure for approval and facilitating Import/Export (Cross Border) of Electricity by the Designated Authority 2021.

[19] Indian entities may import electricity from the generation projects located in neighbouring country(ies) directly or through Government or a Government Company or a licensed trader of that country after taking approval of the Designated Authority, provided that the generating company is not owned, directly or indirectly by any natural/ legal personality(ies) whose effective control or source of funds or residence of beneficial owner, is situated in/ citizen of a third country with whom India shares land border and that third country does not have a bilateral agreement on power sector cooperation with India. For any relaxation in this provision, the Designated Authority will consult Ministry of Power and Ministry of External Affairs (section 6.3 of the Procedure).

तर दक्षिण एशिया क्षेत्रमा यस किसिमको संयन्त्र तयार हुन सकेको छैन ।

६. निष्कर्ष तथ सुझाब:

माथि विश्लेषण गरिए अनुसार नेपाल पक्ष भएका दुई पक्षीय तथा क्षेत्रीय सन्धि सम्झौताको कार्यान्वयनको अवस्था मिश्रित रहेको देखिन्छ । दुई पक्षीय सम्झौताहरुको कार्यान्वयनको अवस्था सन्तोषजनक रहेको छ भने कतियप सम्झौताहरुको कार्यान्वयन स्थिति कमजोर रहेको छ । क्षेत्रीयस्तरमा सम्पन्न भएका अधिकतर सन्धि सम्झौताहरु नीतिगत र सैद्धान्तिक पक्षमा केन्द्रीत रहेकोले पनि कार्यान्वयन पक्ष प्रभावकारी हुन सकेको छैन । यसका लागि पक्ष राष्ट्रहरु बिचको नियमति छलफल र परामर्शबाट आआफ्नो देशका राष्ट्रिय कानून र नीतिमा समावेश गर्ने प्रयास र प्रयत्न आवश्यक हुनेछ । माथि गरिएको विश्लेषण, यस क्षेत्रमा रहेका समस्याहरुको सम्बोधन गर्दै दुई पक्षीय तथा क्षेत्रीय सन्धि सम्झौताको प्रभावकारी कार्यान्वयनका लागि देहायका सुझाबहरु प्रस्तुत गरिएको छः

(क) सन्धि सम्झौताको कार्यान्वयनका लागि आवश्यक परेमा नयाँ कानून बनाउने वा प्रचलित कानूनमा आवश्यकता अनुसार संशोधन गरिने कुरालाई सन्धि ऐनले स्पष्ट गरेको छानेपाल पक्ष भएका सन्धि सम्झौतालाई पूर्ण सद्भाव र इमान्दारीताका साथ कार्यान्वयन गरिने नेपालको प्रतिवद्धता रहेकोले क्षेत्रीय सन्धि सम्झौता जस्तै सार्क ऊर्जा सम्झौता र बिस्मेट ग्रिड आबद्ध गर्ने सम्बन्धी समझदारीपत्रलाई कार्यान्वयन गर्न आवश्यकता अनुसार राष्ट्रिय कानूनमा संशोधन वा परिमार्जन आवश्यक हुनसक्छ । त्यसैले ऊर्जासँग सम्बन्धित दुई पक्षीय तथा क्षेत्रीय सन्धि सम्झौताका आधारमा राष्ट्रिय कानून संशोधन परिमार्जन आवश्यक हुनेछ ।

(ख) सन्धि सम्झौताका पक्ष राष्ट्रहरु सबैले आ-आफ्नो देशको ऊर्जासँग सम्बन्धी कानूनमा आवश्यक संशोधन गरी एकरुपता र समाञ्जस्यता कायम गर्नु पर्नेछ । सार्क तथा बिमस्टेक लगायत क्षेत्रीय र उपक्षेत्रीयस्तरमा भएका विद्युतसँग सम्बन्धित सन्धि सम्झौतामा राष्ट्रिय कानूनलाई एक अर्को देशको कानूनसँग सामाञ्जस्यता र एकरुपता कायम गर्न पहल गर्ने भन्ने व्यवस्था समेत रहेको पक्षलाई दृष्टिगत सो बमोजिम राष्ट्रिय कानूनमा संशोधन गर्नुपर्छ ।

(ग) दुई पक्षीय वा क्षेत्रीय सन्धि सम्झौताको प्रभावकारी कार्यान्वयनको लागि सबै पक्ष राष्ट्रहरुको समान धारणा र बुझाइ आवश्यक हुन्छ । एक पक्षको पहल र प्रयास मात्र सम्झौता कार्यान्वयनका निम्ति पर्याप्त हुदैन । त्यसैले सन्धिको कानून सम्बन्धी भियाना महासन्धि १९६९ को धारा २६ मा उल्लेखित सिद्धान्त "pacta sunt servanda" अनुसार पक्ष राष्ट्र सबैको पूर्ण सद्भाव र इमान्दार प्रयास आवश्यक हुनेछ ।

(घ) ऊर्जा क्षेत्रसँग सम्बन्धित माथि विश्लेषण गरिएका अधिकांश दुई पक्षीय वा क्षेत्रीय सन्धि सम्झौताको कार्यान्वयनको लागि भारतको ऊर्जा सम्बन्धी कानून तथा नीति व्यवस्थाको महत्वपूर्ण भूमिका रहन्छ । नेपालमा उत्पादन भइ बचत हुने विद्युतको सहज र पहिलो बजार भारत हो । नेपालको भौगोलिक अवस्थाको कारण भारतीय निकायको अनुमति वा संलग्नता बिना नेपालले बङ्गलादेश लगायतका दक्षिण एशियाली देशहरुमा विद्युत निर्यात गर्न सम्भव हुदैन । त्यसैले यस क्षेत्रको विद्युत व्यापारलाई अगाडि वढाउन नीतिगत र प्राविधक पक्षमा समेत भारतले नेतृत्वदायी भूमिका निर्वाह गर्न आवश्यक हुन्छ ।

(ङ) दुई पक्षीय सन्धि सम्झौताको कार्यान्वयनको लागि दुवै पक्षको समान प्रतिवद्धता आवश्यक हुन्छ । सन्धि सम्झौताको प्रकृति अनुसार कतिपय सन्धि सम्झौताहरु स्वतः कार्यान्वयन हुनेछन भने कतिपयको लागि राष्ट्रिय कानून निर्माण गर्न वा आवश्यकता अनुसार मौजुदा कानूनमा आवश्यक संशोधन वा परिमार्जन गरिनु पर्नेछ ।

(च) क्षेत्रीय वा उपक्षेत्रीयस्तरमा विद्युत आयात निर्यात र व्यापरको लागि सम्बन्धित राष्ट्रहरुलाई आबद्ध गर्ने विद्युत प्रसारण प्रणाली र अन्य पूर्वाधार आवश्यक हुने भएकोले सदस्य राष्ट्रहरु विद्युत प्रसारण लाईन तथा पूर्वाधारको विकासमा लगानी र सहकार्य गर्न आवश्यक हुनेछ । साथै विद्युत आयात निर्यात गर्न लाग्ने शुल्क, विद्युत प्रसारण महसुल लगायत अन्य कर छुट दिने वा न्यायोचित र समसामयिक बनाउन पनि ध्यान दिनुपर्नेछ ।

(छ) ऊर्जासँग सम्बन्धित दुई पक्षीय तथा क्षेत्रीय सन्धि सम्झौताको प्रमुख उद्देश्य विद्युतको आयात निर्यात र अन्तरदेशीय विद्युत व्यापारलाई सहज बनाउने, वैदेशिक लगानी आकर्षित गर्ने, प्रसारण प्रणालीमा खुला पहुँच र ऊर्जा आयात निर्यातको लागि पारवहनको सुविधा दिने विषयहरु रहेका छन् । यि विषयहरु ऊर्जा चार्टर सन्धि[20] मा विस्तृत रुपमा उल्लेख भएका छन् । उक्त सन्धिमा अन्तर्राष्ट्रिय नियमहरु समावेश भएको र सो प्रक्रियामा ऊर्जाको अन्तरदेशीय व्यापारमा संलग्न देशहरु पक्ष

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[20] The Energy Charter Treaty is an international agreement made for the cooperation on cross-border trade of energy. The treaty mainly covers the areas of trade, transit, investments and energy efficiency. The treaty contains dispute resolution procedures both for States Parties to the Treaty (vis-a-vis other States).

राष्ट्र बनेकोले यस क्षेत्रका राष्ट्रहरुले पनि उक्त सन्धिको प्रक्रियामा (पर्यवेक्षक[21] वा सदस्य कुनै रुपमा) सहभागिता जनाउँने तर्फ सोच राख्नु उचित हुनेछ । यो प्रक्रियामा सहभागी हुनसकेमा अन्तर्राष्ट्रिय अभ्यास र अनुभवका आधारमा यस क्षेत्रका राष्ट्रहरु बिच सम्पन्न भएका विद्युत व्यापार सम्बन्धी सन्धि सम्झौताहरुलाई प्रभावकारी रुपमा कार्यान्वयन गर्न सहयोग पुग्नेछ ।

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[21] यस क्षेत्रबाट बङ्गलादेश, चीन र पाकिस्तान पर्यवेक्षक रुपमा सहभागी भएका छन् भने सार्कबाट अफगानिस्तान सदस्य राष्ट्र भएको छ ।

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गोपी नाथ मैनाली
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विषय प्रवेश

लोकतान्त्रिक समाजमा नीति राज्य सञ्चालनको आधार हो। नीति प्रक्रियाका आधारमा सर्वसाधारण र सरकार एकअर्कामा आवद्ध भै प्रणाली निर्माण एवम् संस्थागत गर्दछन्। नीति राज्य ईच्छाको त्यस्तो घोषणा हो, जसलाई कार्यान्वयन गरेर सर्वसाधारणको हित विस्तार गर्न सकिन्छ । सरकारले गर्ने सबै काम नीति होइनन्। नीति हुनका लागि त्यसले परिस्थितिको सही विश्लेषण गरेको हुनुपर्दछ, समस्या समाधान वा हित विस्तारका लागि सम्भावित विकल्पहरुको विश्लेषण त्यसको पृष्ठमूमिमा हुनुपर्दछ, विकल्पहरुको मूल्याङ्कन गरिएको हुनुपर्दछ र विवेकपूर्ण निष्कर्ष निकालिएको हुनुपर्दछ। यो कार्यान्वयन योग्य त हुनैपर्छ, यसलाई कार्यान्वयन गर्दा सर्वसाधारणको भावना परिचालन हुनसक्ने विश्वासिलो पनि हुनुपर्दछ। त्यसैले नीतिलाई लहड वा सामान्य रुपमा लिन नै हुदैन। कतिपय निर्णय र कार्यका लागि नीति कार्य मार्गदर्शन पनि हो।

नीति लहडमा त्यत्तिकै निर्माण गर्ने विषय होइन। नीतिको माग र पूर्ति (आवश्यकता र निर्माण) बीच पनि तालमेल चाहिन्छ। नीति धेरै हुनुको पनि अर्थ रहदैन भने समस्या समाधानको संयन्त्र (वा नीति) भएन भने पनि सरकारको बैधता रहदैन। त्यसैल नीति निर्माता र जनप्रतिनिधिले नीति के हो र यसले व्यवस्थालाई कसरी सघाउछ भन्ने जान्नु पर्दछ। तर राजनीतिज्ञ जसरी नीति विज्ञ र व्यवस्थापकहरु बोल्दैनन्। उनीहरुले बोल्ने भाषा बेग्लै हुन्छ । राजनीतिज्ञहरु मतदाताको सङ्केत टिप्न खप्पिस हुन्छन्, जसले लोकप्रियता बढाउछ । तर प्रणालीको क्षमता एवम् नीति बास्तविकताप्रति उनीहरुको विज्ञता रहदैन। नीतिलाई जति वास्तविक बनाउन सकियो, त्यसको सार्थकता त्यति नै बढ्छ। नीतिलाई वास्तविक बनाउन यसका चरणवद्ध प्रक्रियालाई सावधानीपूर्वक ध्यान दिनु जरुरी छ,नीति प्रारुपण, रणनीतिक सोच र सहजिम्मेवारीको जरुरी हुन्छ। नीति बिज्ञहरु यसलाई नीति प्रक्रियाका चित्राङ्कन (mapping the policy making process) भन्न रुचाउछन् । नीति विषयबस्तुको उठान वा कार्यसूची तय, नीति विकल्पको पहिचान, नीति तर्जुमा, नीति कार्यान्वयन र नीति अनुगमन एवम् मूल्याङ्कन लगायत नीति व्यवस्थापनका सबै पक्ष यस अन्तर्गत पर्दछन्। यी सबै कामहरुमा अनुशासित विज्ञताको माग हुन्छ । अझ सबै चरणमा चाहिने नीति विश्लेषणको पक्ष अझै जटिल र प्राविधिक हुने गर्दछ।

नीति निर्माणको प्रवेशविन्दु कार्यसूची तय हो । यस चरणमा खास विषयहरु नीति प्रक्रियामा लैजान हुन्छ वा हुदैन भन्ने निर्क्यौल गरिन्छ। कार्यसूची निर्धारणपछि मात्र खास विषयको गम्भिरतामा सरकारको ध्यान आकृष्ठ हुन्छ। त्यसैले यसै चरणलाई तथ्यमूलक वनाइ अन्य चरणमा देखाएको सावधानीले कुनै अर्थ राख्दैन। कार्यसूची तयलाई पनि औपचारिक कार्यसूची सवाल र अनौपचारिक पक्षले प्रभाव पार्ने बास्तविकता छ । विकल्प पहिचानका चरणमा पनि उपलव्ध जानकारीको आधार, समय, नीति निर्माताको बैयक्तिक आग्रह, चाख समूह र साझेदारहरुले प्रभाव पर्न गै नीति वास्तविकतालाई समस्यामा पार्ने संभावना रहन्छ। त्यस्तै कार्यान्वयन पक्ष संस्थागत क्षमता, प्रशासनिक मनोविज्ञान, स्रोत साधन एवम् सामाजिक मूल्यबाट प्रभावित हुन्छ । अनुगमन र मूल्याङ्कनमा पनि बास्तविकता छुप्न गै नीति सुधारका लागि शिक्षा प्राप्त नहुन सक्छ । त्यसैले नीति

व्यवस्थापन आफैमा जटिल र गतिशील प्रक्रिया हो । यसलाई व्यवस्थित बनाउन नीति विश्लेषण एवम् अनुसन्धान पक्ष सबल हुनुपर्दछ । नीतिलाई सान्दर्भिक र तथ्यमूलक बनाउन नेटवर्किङ, नोलेज ब्रोकरिङ, पैरवी, बहुपक्षीय अध्ययन जस्ता क्यगितष्यल क्तयचकष्लनका संयन्त्रलाई उपयोगमा ल्याउने चलन पनि छ ।

असल नीति कस्तो हुनुपर्छ ?

सबै सरकारहरु संधै नीति निर्णयका विषयमा जटिलता भोगिरहेका हुन्छन् । किनकी शासन व्यवस्था भनेकै नीतिहरुको प्रभावकारी व्यवस्थापन कसरी गर्ने भन्ने पक्षसंग जोडिएको हुन्छ । सरकारका दृष्टिकोण, प्रतिवद्धता र कार्यक्रम नीति प्रक्रियामार्फत नै सर्वसाधारणका दैनन्दिनीलाई संवोधन गर्न पुग्छन् । त्यसैले नीतिलाई कसरी आदर्श र वास्तविक बनाउने भन्ने समस्या रहनु स्वाभाविक हो । कतिपय लोकतान्त्रिक मुलुकमा नीतिलाई सान्दर्भिक, वास्तविक, कार्यान्वयनयोग्य र नतिजामुखी बनाउन नीति विज्ञहरुको संरचना नै निर्माण गरिएको पाइन्छ । विज्ञ संयन्त्रबाट अध्ययन तथा अनुसन्धान हुदा आन्तरिक संरचनामा रहने आग्रहबाट नीति निर्माताहरुलाई अलग राख्न सकिन्छ । तर पनि नीति व्यवस्थापनका औपचारिक प्रक्रियामा आन्तरिक संरचना नै निर्णायक हुन्छ ।

एउटा असल नीति कस्तो हुनुपर्दछ ? यसको सटिक एवम् मान्य उत्तर दिन सकिदैन तर नीतिका खास गुणका आधारमा नीति यस्तो हुनुपर्छ भन्ने आग्रह राख्न भने सकिन्छ । यस अर्थमा कि यो राज्य इच्छाको घोषणा हो, राज्य इच्छा भन्ने वित्तिकै जनताको सुख र समृद्धिलाई केन्द्रविन्दुमा राखिन्छ ।

राजनैतिक बृत्तमा नीतिलाई हलुका र सतही रुपमा लिइन्छ भने प्रशासनले बौद्धिक एवम् औपचारिक रुपमा लिदै आएको छ । यी दुवै सन्दर्भ नीति विज्ञानका दृष्टिमा उपयुक्त होइनन् । जनताका अपेक्षाहरु राजनीतिका माध्यमबाट राज्य प्रक्रियामा मुखरित हुनेहुन् । प्रशासनले प्राविधिक खाका नदिएसम्म त्यसले राज्यइच्छाको वास्तविक रुप पाउदैन । त्यसैले सार्वजनिक नीतिलाई विस्तृत र व्यावहारिक रुपमा लिने संस्कृतिले नीतिलाई असल बनाउने आधार दिन्छ । यो विवेकपूर्ण छनौट र कार्यान्वयन योग्य हुनै पर्दछ । नीति व्यावहारिक रुपमा राम्रो हुन यसभित्र यी कुराहरु हुनुपर्दछ :

- सरकारको सोच, कार्यक्रम र सरकारले गरेका अन्य प्रतिवद्धतासंग मेलखाने हुनुपर्दछ । (In line with government programme) ।
- समस्याको समाधान खोज्न नीति आवश्यक भएको हुनुपर्दछ । (Acutally needed in order to address real problem) ।
- खास समस्याको समाधान खोज्न सक्षम हुनुपर्दछ । (Actually addresses the identified problem)
- समस्या संवोधन गर्न प्रभावकारी र लागत प्रभावी हुनुपर्दछ । (Effective and cost-efficient)
- नीतिले नया समस्या (ठूलो समस्या) सिर्जना गर्नु हुदैन । (Doesnot create new/serios problem)
- नीति अन्य नीति/कानूनसंग विरोधाभाषपूर्ण हुनुहुदैन, ता कि त्यसलाई कार्यान्वयन गर्न सकियोस । (Not contradict other laws/policy)।
- कार्यान्वयन गर्ने संयन्त्र र क्षमता भएको हुनुपर्दछ । (Means of implementation are available)
- नीति कार्यान्वयनले सांकेतिक नीति मूल्य सिर्जना (Symbolic value creation and direction) गर्न सक्नुपर्छ ।

नीति संयन्त्र र कार्यसम्पादन

नीति संयन्त्र र कार्यसम्पादन उपलब्धि बीच प्रत्यक्ष सम्बन्ध रहन्छ । सार्वजनिक तथा अन्य पात्रहरुको क्रियाकलापलाई नतिजा केन्द्रीत बनाउनु नीति संयन्त्रको उद्देश्य हो । त्यसैले नीति संयन्त्र प्रभावकारी बनाई सर्वसाधारणको हित विस्तार गर्नु आधुनिक शासन प्रणालीमा जोड दिइन्छ । जोहन हप्किन्स नीति अध्ययन संस्थानको निष्कर्ष अनुसार आधुनिक शासकीय प्रणालीमा यी पक्षमा ध्यान दिनु पर्दछ :

- नीति संयन्त्रमाथि जोड, नकि कार्यक्रम वा संगठन संरचनामा ।
- सांगठनिक उद्देश्य पूरा गर्न कार्यसञ्चालनको पहिचान, न कि पदसोपानमा ।
- सार्वजनिक, निजी सामुदायिक क्षेत्रबीच सहकार्य, न कि प्रतिस्पर्धा ।
- व्यवस्थापन शैली वार्ता र नियमन, न कि निगरानी र नियन्त्रण ।
- अन्तरनिहित क्षमता विकास र प्रोत्साहन शैली, न कि परम्परागत ।

तर आधुनिक बहुलवादी शासन प्रणालीमा यी तीन अन्तरनिहित चुनौती छन् :

- **व्यवस्थापन चुनौती :** बहुस्तरीय शासकीय व्यवस्था र बहुपात्रको नीति कार्यक्रममा संलग्नताले व्यवस्थापन सरल होइन, जटिल बनाएको छ ।
- **जवाफदेहिता नियन्त्रण चुनौती :** सरकारका संयन्त्र प्रत्यक्ष नियन्त्रण भूमिकामा नरहने भएकाले नीति

कार्यक्रमको उपलब्धि जवाफदेहितामा जटिलता देखिएको छ ।

- **बैधता शिद्ध गर्ने चुनौती** : सार्वजनिक कोषबाट सञ्चालित कार्यक्रम अन्य निकायबाट प्रशासित हुदा नागरिक सेवा र उसले तिरेको तिरोको बैधता सिद्ध गर्ने चुनौती पनि छ ।

यी चुनौतीलाई संवोधन गर्न नीति व्यवस्थापनका विभिन्न चरणमा समन्वय आवश्यक हुन्छ । नीति संयन्त्र, संरचना र कार्यक्रम जस्ता उपायबाट सामान्य गर्न नसकेमा एकातिर नीतिको आयतन विस्तार (Policyinflation) हुन्छ भने अर्कोतर्फ नीतिले समाजमा दिनपर्ने उपलब्धि (Policy performamc) प्राप्त हुन सक्दैन । त्यसैले नीति समन्वयको आवश्यकता एवम् महत्व बढ्दै आएको छ ।

नीतिका प्रकार

- सामाजिक नीति (सामाजिक व्यवहारलाई व्यवस्थित गर्ने)
- आर्थिक नीति (लगानी, रोजगारी, उत्पादन, आपूर्ती, उपभोग, स्रोत परिचालन जस्ता पक्षलाई व्यवस्थित गर्ने)
- विकास नीति (विकास निर्माण, क्षमता विकास जस्ता पक्ष व्यवस्थित गर्ने)
- सेवा प्रवाह नीति (नागरिक आवश्यकता व्यवस्थित गर्ने)
- कानूनी नीति (कानून कार्यन्वयन, व्यवस्था कायम गर्ने)
- अन्तर सम्बन्धित नीति (विभिन्न विषय क्षेत्रको आवद्धता व्यवस्थित गर्ने)
- विषयगत नीति (खास विषय क्षेत्रलाई व्यवस्थित गर्ने)

नीति समन्वय

प्रभावकारी, जवाफदेही र समावेशी संस्था निर्माण नभै राज्य प्रणालीले बैधता र विश्वास पाउदैन । जवसम्म नीति संयन्त्रहरु संस्था निर्माण (Institutional building) मा लाग्न सक्दैनन्, प्रणाली तदर्थ रुपमा नै चल्ने गर्दछ । संस्थाहरु पनि औपचारिक र अनौपचारिक दुई प्रकारका हुने गर्दछन् । औपचारिक संस्था कानून, करार र सार्वजनिक व्यवस्थापन प्रक्रियाबाट सवल बन्दछन् भने अनौपचारिक संस्था सहसम्बन्ध र नेटवर्किङ्बाट संवलीकृत हुन्छन् । अनौपचारिक संस्थाले औपचारिक संस्थालाई प्रभाव पारिरहेका हुन्छन् । यी दुई प्रणालीबीच सकारात्मक सहसम्बन्ध विकासले नै प्रणालीको गतिशीलता बढ्ने गर्दछ । नीति समन्वयले त्यस कार्यलाई सघाउने गर्दछ ।

कार्य फैलावट, पात्रहरु र कार्यप्रकृति बढ्ने क्रमसंगै समन्वयको आवश्यकता बढ्दै जान्छ । क्रियाकलापहरुलाई संगठनको उद्देश्यअनुरुप ल्याउन, कार्यजिम्मेवारीलाई एकअर्कासंग प्रतिस्पर्धी बन्नबाट रोक्न, स्रोत साधन र शक्ति प्रयोगमा प्रभावकारिता ल्याइ उपलब्धि विस्तार गर्न समन्वय संयन्त्रलाई उपयोगमा ल्याइन्छ । नागरिक सेवा वितरणमा अस्पष्टता हटाउन एवम् समय र लागत घटाउन समन्वय चाहिन्छ । समन्वयले सहकार्य प्रोत्साहित गर्छ, कार्यदिशावोध गर्छ, समय र साधनको आदर्श अभ्यास गर्न सघाउछ, संगठनहरुबीच राम्रो सम्बन्ध बनाउछ र स्थापित उद्देश्य पूरा गर्न सघाउछ । यसर्थ समन्वय प्रभावकारी बनाउनु भनेको शासकीय व्यवस्थालाई सुशासित बनाउनु हो ।

समन्वय धेरै प्रकारले गर्न सकिन्छ । जस्तो कि आन्तरिक बैठक, कार्यअवस्थाको अनुगमन, भेला, गोष्ठि छलफल, विशेष बैठक, प्रतिवेदन प्रणाली, व्यवस्थित सूचना प्रणाली, डाटा सञ्चार प्रणाली, कार्यविधि आदि । तर कार्यक्षेत्र र उद्देश्यको फैलावटसंग समन्वय कार्य जटिल बन्दै जान्छ । जनचाहना कम भएको, चेतनास्तर कम भएको, एकात्मक र अनुदार राज्य प्रणालीका तुलनामा जनआकांक्षा र चेतनास्तर बढ्दै गएको, उदारीकृत अर्थव्यवस्था अवलम्वन गरिएको बुहलवादी लोकतन्त्रमा नीति समन्वयको आवश्यकता बढी हुन्छ, किनकी जनचाहना पूरा गर्न धेरै पात्र र प्रक्रिया परिचालन गरिएको हुन्छ ।

नेपालको सन्दर्भमा भन्दा नेपाल सरकार कार्यविभाजन नियमावली अनुसार विषयगत मन्त्रालयहरु आआफना कार्य जिम्मेवारीमा नीति तर्जुमा गर्न स्वतन्त्र छन् । त्यस्तै विभिन्न तहका सरकार र सरकारी संरचना पनि निर्धारित कार्यसीमाभित्र नीति/कार्यनीति बनाउन स्वतन्त्र छन् । नीति सूची तय देखि नीति घोषणासम्मका कार्य गर्न यी संरचनाहरु स्वाधीन छन् । संविधान र कानूनले दिएको मार्गदर्शनको पालना मात्र तिनले गरेपुग्छ । साथै उदारीकृत राज्य प्रणाली अवलम्वन गरिएकाले विभिन्न सरोकारवाला र नीति विज्ञसंग पनि सहकार्य आवश्यक छ । यस अवस्थामा नीति समन्वय गर्न आवश्यक हुन्छ, ता कि सवै राष्ट्रिय नीतिहरु राष्ट्रिय उद्देश्य पूरा गर्न सक्षम होउन ।

सारमा भन्दा तर्जुमा हुदा नै कार्यान्वयन नहुने नीति बन्नबाट रोक्न (dead on arrival), नीति स्वामित्व बढाउन र नीति अनुशासन अवलम्बन गर्न नीति समन्वयको प्रभावकारी संयन्त्र आवश्यक हुन्छ भन्ने गरिन्छ, राम्रा नीति बनाउन त सजिलै सकिन्छ, तर यसलाई आशय अनुरुप कार्यान्वयनमा लैजान

असजिलो पर्दछ । नेपालका सन्दर्भमा यो भनाइ बारम्वार दोहोरिदो छ । प्रभावकारी नीति समन्वय संयन्त्र नहुदा नीति कार्यान्वयनका संयन्त्रहरुको साथ नीतिले पाउदैन र यस्तो स्थिति आउने गरेको छ। (क) कानून र नियमक वातावरण, (ख) संस्थात्मक क्षमता विकास, (ग) सहउत्पादन र साझेदरी एवम् (घ) सार्वजनिक वित्त नै यस्ता संयन्त्र हुन्, जसले नीतिलाई कार्यान्वयन तहमा अनुवाद गर्दछन् ।

यी कारणले नीति समन्वयको औचित्य रहन्छ

- नीतिलाई प्रमुख नीति प्राथमिकताबाट विषयान्तर हुन नदिन ।
- आवश्यक क्षेत्रमा 'PolicyVacuum' हुन नदिन ।नीति माग र नीति तर्जुमाबीच सन्तुलन ल्याउन ।
- नीति निर्माताामा बिश्वासको अभाव हुन नदिन।
- बिषय मन्त्रालय/तहहरुमा भूमिकाको अस्पष्टता हुन नदिन ।
- लाग्ने खर्च/साधन बारे दह्रिलो प्रतिबद्धताका लागि ।
- अनुत्तरदायी समूह वा अदृश्य हातहरुको औपचारिक सरकारसरहको उपस्थिति रोक्न ।

समन्वय समस्या

नीति तर्जुमाका सन्दर्भमा विषयगत मन्त्रालय, मन्त्रालयस्तरका निकाय र शासकीय तहहरु आ-आफ्नै सीमा एवम् कार्यक्षेत्रमा संलग्न रहन्छन्। विभिन्न कारणले राष्ट्रिय आवश्यकता अनुसार नीति तर्जुमा नहुन सक्ने हुदा नीति समन्वय गर्न जरुरी पर्दछ। साथै नीतिमा हुनुपर्ने आधारभूत चरित्रलाई संवोधन गर्न पनि समन्वयको जरुरी छ। तर नीति समन्वयमा आफ्नै किसिमका समस्याहरु हुन्छन् । जस्तो कि यी विषयसंग नीति समन्वय सापेक्ष रहन्छ :

- कार्य अयातन (scale of action)
- जटिलता (Complexity)
- नेटवर्क समस्या (Network)
- क्षमताका खाडल (Capacitygap)
- संरचनागत कुण्ठा (Structuralfrustration)
- अस्थिरताको नियति (Instabilityparadox)
- अधिकारको समस्या (Contingent authority problem)
- प्रतिस्पर्धात्ककता (Competitiondilemma)

नीति समन्वयका सवाल

एकात्मक वा संघात्मक जस्तोसुकै शासन व्यवस्था भए पनि नीति समन्वयमा यी सवालहरु पनि रहदै आएका छन् ।

- विभिन्न नीति तर्जुमा तहबीच ठाडो र समतलीय अधिकार (Vertical and horizontal authority)
- विभिन्न नीति क्षेत्रमा समानान्तर प्रणाली व्यवस्थापन (Parallel system management)
- विभिन्न सरोकारवाला र पात्रबीच समन्वय (Coordination between sakeholders from governmental and non state actors)
- जवाफदेहिताको प्रश्न (Political, Legla+voter)
- व्यवस्थापन आधारशिला (Management infrastructure)

संघीय शासन व्यवस्था र नीति व्यवस्थापन

संविधान नीतिको स्रोत हो। जनताका प्रतिनिधि आफैले लेखेको नेपालको संविधानमा जनताका भावना र समाजको विम्व मुखरित छन् । युगौयुगसम्म नेपालीको भविष्यलाई सुनिश्चित गर्न आर्थिक समृद्धि, सामाजिक रुपान्तरण, सहशासन र समावेशिता संविधानका मर्म हुन् । संविधानले नागरिक र राज्यका बीचको सम्बन्ध स्थापित गरेको छ । नागरिक र राज्यको सीमा र संभावना उल्लेख गरेको छ। संविधानको धारा ४९ ले धारा ५० अन्तर्गत राज्यका उद्देश्य पूरा गर्न सरकारलाई निर्देश गरेको छ । यसमा मूलत राज्यका तीन बृहद उद्देश्य घोषणा गरिएका छन् :

- लोकतान्त्रिक गणतन्त्रात्मक शासन व्यवस्थाको सुदृढीकरण,
- राष्ट्रिय एकताको सदृढीकरण, र
- समाजवाद उन्मुख स्वतन्त्र र समृद्ध अर्थतन्त्रको विकास ।

यी उद्देश्य प्राप्त गर्न अवलम्वन गर्नुपर्ने क्षेत्रगत राष्ट्रिय नीतिहरुको उल्लेख संविधानको धारा ५१ मा गरिएको छ । जसमा (क) राष्ट्रिय एकता र राष्ट्रिय सुरक्षा सम्बन्धी नीति, (ख) राजनीतिक तथा शासन व्यवस्था सम्बन्धी नीति, (ग) सामाजिक र सांस्कृतिक रुपान्तरण सम्बन्धी नीति, (घ) अर्थ उद्योग र बाणिज्य सम्बन्धी नीति, (ङ) कृषि र भूमिसुधार समबन्धी नीति, (च) विकास सम्बन्धी नीति, (छ) प्राकृतिक स्रोत संरक्षण, सम्वर्द्धन र उपयोग सम्बन्धी नीति, (ज) नागरिकका आधारभूत आवश्यकता सम्बन्धी नीति, (झ) श्रम र रोजगार सम्बन्धी नीति, (ञ) सामाजिक न्याय र समावेशीकरण सम्बन्धी

नीति,(ट) न्याय र दण्ड व्यवस्था सम्बन्धी नीति, (ठ) पर्यटन सम्बन्धी नीति र (ड) अन्तर्राष्ट्रिय सम्बन्ध सम्बन्धी नीति छन् । यी नीतिहरुको दायरामा रहेर नै राज्यका उद्देश्यहरु पूरा हुने हुन् र उद्देश्य कार्यान्वयन गर्ने संयन्त्रका रुपमा बन्ने नीतिहरु पनि संवैधानिक आशय भन्दा पर रहेर बन्न सक्दैनन् ।

राज्यका तहहरुको अधिकारको वितरण, नीति निर्माण एवम् निर्णय प्रक्रिया अधिकार र कर्तव्य उल्लेख गरेको छ । त्यस्तै समुदाय, सहकारी र निजी क्षेत्रलाई परिचालन गरी राष्ट्रिय उद्देश्य पूरा गर्ने आशय संविधानले स्थापना गरेको छ । बहुलवादी राजनैतिक समाजमा राजनैतिक पात्रहरु सामाजिक चाहनालाई नीति प्रक्रियामा समाविष्ट गरी आधिकारिक मूल्य दिने गर्दछन् । यसर्थ नीति निर्माणका दृष्टिमा यी सवालहरुको संवोधन आवश्यक छ :

- सवै तह र संरचनामा सदाचार प्रवर्द्धन,
- सवै तह र संरचनामा जवाफदेहिता, पारदर्शिता र प्रभावकारिता प्रवर्द्धन,
- समावेशी र सहभागितात्मक निर्णय प्रक्रिया,
- सेवा प्रवाहको प्रभावकारिता, र
- दिगो र चक्रीय आर्थिक क्रियाकलापको संस्थानीकरण ।

संघीय शासन प्रणाली अवलम्वन गरिएकोले सरकारका तीनै तह आआफ्ना कार्य क्षेत्रमा नीति, कानून, योजना र कार्यक्रम बनाउन सक्षम छन् । संविधानको धारा ५७ मा राज्यशक्तिको बाँडफाँड गरिएको छ । जस अनुसार तीनै शासकीय तहका एकल र साझा अधिकारहरु उल्लेख गरिएका छन् । संविधानको भाग २० मा संघ, प्रदेश र स्थानीय तह बीच अन्तर सम्बन्ध उल्लेख छ । धारा २३१ मा संघ र प्रदेश बीच व्यवस्थापकीय अन्तरसम्बन्ध एवं धारा २३२ मा संघ, प्रदेश र स्थानीय तह बीच अन्तर सम्बन्ध उल्लेख गरिएको छ । यस धाराले तीन तह बीचको अन्तरसम्बन्ध (१) सहकारिता, पारपारिकता र समन्वयमा आधारित हुने, (२) नेपाल सरकारले राष्ट्रिय महत्व र प्रदेशहरुबीच समन्वय गर्न प्रदेश सरकारलाई निर्देशन दिनसक्ने र (३) प्रदेश मन्त्रिपरिषद र प्रदेश सभा निलम्वन वा विघटन गर्नसक्ने प्रावधान राखेको छ । साथै धारा २३३ मा प्रदेश-प्रदेशबीच एकअर्कामा सहयोग गर्ने विषयमा उल्लेख गरिएको छ । जस अनुसार (१) एक प्रदेशले अर्को प्रदेशको कानून, आदेश वा निर्णय कार्यान्वयनमा सहयोग गर्नुपर्ने, (२) एक प्रदेशले अर्को प्रदेशसंग साझा चासो, सरोकार वा हितको विषयमा सूचना आदान प्रदान, परामर्श, समन्वय र सहयोग गर्नसक्ने र (३) एक प्रदेशले अर्को प्रदेशको बासिन्दालाई प्रदेशको कानुन बमोजिम समान सुरक्षा, व्यवहार र सुविधा उपलव्ध गराउनु पर्ने उल्लेख छ । यी व्यवस्थाहरुले शासकीय तहहरु एक आपसमा स्वायत्त नीति निर्माता नभै साझा उद्देश्यका लागि समन्वय र सहकार्यमा रहनुपर्ने संवैधानिक निर्देश रहेको स्पष्ट हुन्छ ।

धारा २३५ मा संघ, प्रदेश तथा स्थानीय तह बीचको समन्वयका लागि संघीय संसदले आवश्यक कानून बनाउने वाध्यात्मक व्यवस्था गरेको छ । यस व्यवस्थाले नीति समन्वय संयन्त्रलाई समेत मार्ग प्रशस्त गरेको छ ता कि विभिन्न तह बीच बन्ने नीति, कानुन, योजना र कार्यक्रम बीच सन्तुलन र समन्वय गर्न सकियोस । यसका अलावा धारा २३४ मा प्रधानमन्त्रीको अध्यक्षतामा अन्तर प्रदेश परिषद गठन गरी प्रदेश प्रदेशबीच उत्पन्न हुनसक्ने राजनैतिक विवाद समाधान गर्ने व्यवस्था छ । यसले नीति समन्वय भन्दा पनि विवाद निरुपण संयन्त्रका रुपमा काम गर्ने देखिन्छ । त्यस्तै अन्तर सरकारी वित्त व्यवस्थापन सम्बन्धमा व्यवस्थागर्न बनेको ऐन, २०७४ को दफा ३३ ले नेपाल सरकार, प्रदेश सरकार र स्थानीय तहबीच अन्तर सरकारी वित्त व्यवस्थापनका विषयमा आवश्यक परामर्श तथा समन्वय गर्न नेपाल सरकारको अर्थमन्त्रीको संयोजकत्वमा विभिन्न पदाधिकारी र विज्ञहरु रहेको अन्तर सरकारी वित्त परिषद् रहने व्यवस्था छ ।

व्यापार, बस्तु तथा सेवाहरुको प्रवाहलाई भने संविधानले नै उच्च महत्व दिई विभेद र अवरोध गर्न नपाइने व्यवस्था धारा २३६ मा गरिएको छ ।

प्राकृतिक स्रोतको उपयोग, संरक्षण, राजस्व हस्तान्तरण र वित्त साधनको विभाजनका विषयमा आधार तथा ढाँचा निर्धारण, प्राकृतिक स्रोतको परिचालन लगायतका विषयमा सिफारिस गर्न राष्ट्रिय प्राकृतिक स्रोत तथा वित्त आयोग रहने व्यवस्था संविधानको भाग २६ मा गरिएको छ ।

यसर्थ अन्तर प्रदेश परिषद्, राष्ट्रिय प्राकृतिक स्रोत तथा वित्त आयोग, अन्तर सरकारी वित्त परिषद्, वित्तीय आर्थिक र राजनैतिक विषयलाई समन्वय/विवाद निरुपण गर्न व्यवस्था भएका संवैधानिक र कानूनी संयन्त्र हुन् । यी संयन्त्रहरु राष्ट्रिय नीति समन्वय गर्न क्रियाशील हुनेभन्दा पनि विवाद निरुपण र स्रोत साधनसंग क्रियाशील हुने देखिन्छ । सरकारका विभिन्न तहमा बन्ने नीति, योजना र कार्यक्रम समन्वयका विषयमा प्राविधिक कार्य गर्ने कार्यादेश यी संयन्त्रमा देखिदैन ।

एकात्मक शासन प्रणालीमा आवधिक राष्ट्रिय योजना, दीर्घकालीन रणनीति एवम् योजना, विषयगत कार्यक्रम एवम् नीति समन्वयको भूमिका साविकको राष्ट्रिय योजना आयोगले गर्दै आएको थियो । यसले उल्लिखित विषयमा समन्वयकारी, परामर्शकारी र कार्यकारी गरी तीन प्रकारका भूमिका खेलेको

थियो । २०४७ सालको श्री ५ को सरकार कार्य विभाजन नियमावली, २०५० को श्री ५ को सरकारको निर्णय, २०५५ को आर्थिक कार्यविधि ऐन, २०५५ को श्री ५ को सरकारको निर्णय, राष्ट्रिय योजना आयोग गठन आदेश २०६७ अनुसार आयोगले यी कार्य गर्दै आएको थियो :

- आर्थिक तथा नीति, रणनीति र योजनाका विषयमा सरकारको प्रमुख सल्लाहकार,
- आर्थिक विकास र आर्थिक व्यवस्थापनको प्रमुख समन्वयकर्ता,
- आर्थिक विकास तथा नीति कार्यान्वयनको सहजकर्ता,
- आर्थिक नीति सुधारको प्रमुख नेतृत्वकर्ता,
- केन्द्रीयस्तरका आयोजनाको अनुगमन तथा मूल्याङ्कनकर्ता,
- विकास,नीति तथा आर्थिक सुधारको अन्तरक्रिया थलो,
- नीति सम्वाद समितिका हैसियतमा नीति विश्लेषण र नीति समन्वयकर्ता,
- राष्ट्रिय समस्या समाधानको पहलकर्ता,
- निजी तथा सामुदायिक क्षेत्र विकासको सहजकर्ता,
- बार्षिक विकास कार्यक्रम निर्माणकर्ता, र
- नीति, योजना र कार्यक्रम अनुसन्धान र अध्ययनकर्ता ।

आयोगले निर्वाह गर्नुपर्ने भूमिका लागि आर्थिक विकास, सामाजिक विकास, पूर्वाधार विकास, स्थानीय विकास र अनुगमन एवम् मूल्याङ्कन महाशाखा गरी पाँच थेमेटिक समूह कार्यरत थिए । आयोगले सम्पादन गरेका कार्य कानुनी र बैधानिक रुपमा भन्दा पनि सरकारको नीति तथा योजना विज्ञ निकायका रुपमा हो । मुलुकको कार्यकारी प्रमुख नै आयोगको अध्यक्ष हुने व्यवस्थाले समन्वय र सहजकर्ताको भूमिका खेल्न आयोगलाई खासै समस्या भएन । कतिपय समयमा आयोग थिङ्क ट्याङ्कको परामर्श भूमिकामा मात्र रहने कि कार्यकारी भूमिकामा पनि प्रवेश गरेर नीति, योजना, बजेट र कार्यक्रममा कार्यकारी काम पनि गर्ने भन्न विषय वहस हुने गरेको थियो । तर एकात्मक शासन प्रणाली र स्वयम् कार्यकारी प्रमुख नै आयोगको अध्यक्ष हुने व्यवस्थाले गर्दा ती बहसले धेरै महत्व पाएनन्, स्रोत समितिमार्फत बजेट सीमा र मागदर्शन वितरण एवम् बार्षिक विकास कार्यक्रमलाई प्राविधिक रुपमा अन्तिम रुप दिने कार्य पनि आयोगले गर्दै आयो, जुन धेरैजसो लोकतान्त्रिक मुलुकमा अर्थ मन्त्रालयको काम थियो । बरु कतिपय अवस्थामा अयोगको नेतृत्व क्षमताले आयोगको कार्यप्रणालीलाई प्रभाव पारेको थियो भन्न सकिन्छ ।

नया संविधान जारी भै विभिन्न तहमा निर्वाचित सरकारहरु गठन पश्चात मुलुक संघीय शासन प्रणालीमा क्रियाशील भएकाले नीति तथा योजना तर्जुमाको भूमिका पनि विभिन्न तहका सरकारमा छरिएका छन् । राष्ट्रिय योजना आयोगले पनि साविकको भूमिका निर्वाह गर्नसक्ने स्थिति संवैधानिक र व्यावहारिक रुपमा छैन । राष्ट्रिय योजना आयोग (गठन तथा कार्य सञ्चालन) आदेश, २०७४ ले आयोगलाई यी चार कार्यक्षेत्रमा सीमित गरेको छ :

- दीर्घकालीन सोच, तथ्यपरक नीति तथा योजना तर्जुमा,
- अनुगमन तथा मूल्याङ्कन,
- तहगत समन्वय, र
- अध्ययन, अनुसन्धान तथा अन्वेषण ।

संविधानतः सवै शासकीय तह निर्धारित कार्यक्षेत्रमा नीति, रणनीति, योजना र कार्यक्रम तर्जुमा एवम् कार्यान्वयन गर्न सक्षम छन् भने यी विषयमा आपसमा सहकार्य पनि गर्न सक्दछन् । संघीय तहमा निर्माण हुने नीति, योजना र रणनीतिमा आयोगको भूमिका रहे पनि प्रदेश तथा स्थानीय तहमा आयोगको भूमिका विस्तार हुन सक्तैन । सहकार्य, सहकारिता र सहशासन संविधानको आशय हो । तर यसका लागि नीति प्रणाली विकास भैसकेको छैन । नीति नियामक, समन्वय र सहजकर्ताका रुपमा संघीय तहलाई कार्यजिम्मेवारी दिइएको छ । तर के कस्ता क्षेत्रमा कसरी नीति बनाउने, कति नीति बनाउने, साझा नीति तर्जुमा विधि के हुने, र के कति क्षेत्रमा साझा नीति चाहिन्छ भन्ने आंकलन र अध्ययन समेत भैसकेको छैन । धारा २३५ अनुसार संघ, प्रदेश तथा स्थानीय तहबीच समन्वय गर्न चाहिने कानून पनि संघीय संसदले निर्माण गरिसकेको छैन । संविधान जारी भएको दुई बर्षभित्र यस्ता कानुनहरु निर्माण भैसक्नुपर्ने भएपनि कानुनी रिक्तता कायम नै छ । तर प्रदेश तथा स्थानीय सरकारले क्षेत्रगत कानून तथा योजना तर्जुमा प्रक्रिया शुरु गरिसकेका छन् । संघीय तहबाट जारी गरिएका नमूना कानूनबाट प्रदेश तथा स्थानीय तहमा कानून निर्माण गर्न केही सजिलो त भएको छ तर योजना र नीतिका सम्बन्धमा त्यसो गरिएको छैन, न प्रदेश तथा स्थानीय तहमा प्रणाली निर्माण नै भैसकेको छ । साथै दीर्घकालीन रुपमा नै नीतिको राष्ट्रिय मूल्य र आधारभूत राष्ट्रिय नीतिमा एकरुपता आवश्यक पर्ने भएकोले यी कार्य गर्न आवश्यक देखिएको छ :

- धारा २३५ अनुसारको कानून र सोही कानून मार्फत नीति एवम् योजना समन्वय संयन्त्र घोषणा,

- विषयगत मन्त्रालय तथा प्रदेश तथा स्थानीय तहमा नीति शिक्षा एवम् नीति क्षमता विकास,
- आधारभूत राष्ट्रिय नीति मूल्य, मानक र मार्गदर्शन घोषणा,
- नीति र योजनाको समन्वय,
- नीति पृष्ठापोषण र अभिलेखीकरण,
- नीति, रणनीति समीक्षाको साझा स्थल कयम, र
- नीति अनुगमन र अध्ययन ।

विगतको संरचनागत आधार, कार्यप्रणाली र आर्जित अनुभवका आधारमा यी कार्य गर्ने विज्ञ निकाय (थिङ्क ट्याङ्क भन्न सकिएला) राष्ट्रिय योजना आयोगलाई बनाउन उपयुक्त हुन्छ । विगतमा आयोगले क्षेत्रीय सन्तुलन र स्रोत विनियोजनमा खेलेको भूमिकाका आधारमा पनि आयोग राष्ट्रिय नीति समन्वयको संरचना बन्नसक्ने आधार छ । आयोगको अव कार्यक्रमिक भूमिका छैन, नीति र सहजकारी भूमिका मात्र बांकी छ । साथै आयोग प्रधानमन्त्री कार्यालय मातहतको निकाय भएकाले आयोगको संरचनालाई कानुनी सवलीकरणका साथ नीति समन्वय भूमिका दिन सकिन्छ । तर भुल्न नहुने कुरा केहो भने आयोगलाई सामाजिक-आर्थिक सङ्केत टिप्न सक्ने त्भअजलय-उयष्तिष्अबिं दयमथका रुपमा विकास गरिनु पर्दछ, न कि सामान्यविदहरुको व्यूरोको रुपमा ।

उपसंहार

सरकारले के गर्छ भन्ने कुराहरु सीमा बाहिर छ । जनताका समस्या समाधान गर्नका लागि राज्य बुहउद्देश्यीय स्थायी संस्था हो । जनताको विश्वास छ, सरकारले गरिबी समाप्त गर्ने छ, सामाजिक न्याय र समावेशिता सिर्जना गर्नेछ, समग्र मानव सुरक्षा र विकासको प्रत्याभूति गर्नेछ, शहरलाई अवसरको केन्द्रका रुपमा पुन:स्थापित गर्नेछ, गाउको पवित्रता र शहरी सौन्दर्य कायम गर्न कार्य गर्नेछ, वातावरणीय सन्तुलन र चक्रीय अर्थव्यवस्था कायम गर्नेछ, गरिबी निवारण र रोजगारी सिर्जना लगायत थुप्रै कार्य गर्नेछ । यी सवैका लागि राम्रा नीति संयन्त्र अवलम्बन गर्नुपर्छ । तर यति धेरै अपेक्षाले सरकारको क्षमतालाई बाहिर पारेको छ । केही सामाजिक शक्तिलाई सरकार एक्लैले दोहन गर्न सक्तैन । जस्तै तत्काल सामाजिक समीकरण घर परिवार स्तरमा गराउन कठिन हुनसक्छ । त्यसैले धेरै नीतिहरु बनाउनु पनि आवश्यक छ तर ती नीतिहरु उपयोगिताविहीन हुदै गएमा राज्यस्रोतले कसरी धान्ने भन्ने सावधानी अहिले नै नलिई पनि सुख छैन । एउटै नीति खास समस्याको समाधान संयन्त्र नवन्न पनि सक्छ, अन्य नीति एवम् नीति पात्रसंगको समन्वय र सहकार्य पनि आवश्यक हुनसक्छ । समस्याभन्दा उपचारविधि महंगो पनि हुनदिनु हुदैन । सरकारका तहहरु र सरकारबाहिरका पात्रहरुको सहकार्यविना अपेक्षालाई क्षमताले धान्न सक्दैन । राजनीतिक प्रणाली बिबेकशील निर्णय प्रक्रियासंग संरचित हुदैन तर सामाजिक समस्याले विवेकशील ढाँचामा समाधान माग्छ । त्यसैले सवै तहबाट निर्माण हुने नीतिलाई वास्तविक, तथ्यमूलक, राष्ट्रिय मूल्य सापेक्ष र सहकार्यमूलक बनाउन सवल नीति समन्वय संयन्त्र आवश्यक छ ।

सन्दर्भ

१ नेपालको संविधान, कानुन किताव व्यवस्थापन समिति, २०७२

२ गोपीनाथ मैनाली, राज्य सञ्चालनका आधारहरु, २०६७ (परिमार्जित पाँचौ संस्करण २०७५)

३ अन्तर सरकारी वित्त व्यवस्थापन सम्बन्धमा व्यवस्था गर्न बनेको ऐन, २०७४

४ राष्ट्रिय योजना आयोग (गठन तथा कार्य सञ्चालन) आदेश, २०७४

५ गोपीनाथ मैनाली, विकास, व्यवस्थापन र व्यावसायिकता, २०७४

६ गोपीनाथ मैनाली, संघीयता र नीति समन्वय, संविधान दिवस २०७५ स्मारिका, संविधान दिवस मूल समारोह समिति ।

ब्रज भुषण चौधरी
पूर्व उपकार्यकारी निर्देशक, ने.वि.प्रा.

प्रशारण लाइन निर्माणमा ढिलाई हुने कारण र न्यूनीकरणका उपायहरु?

पृष्ठभूमि :-

प्रशारण लाइन भनेको विद्युत उत्पादन केन्द्रबाट उत्पादित विद्युतलाई माग भएको स्थान सम्म पूर्याउने विद्युत संरचना हो । सवैले वुझ्ने भाषामा भन्ने हो भने प्रशारण लाइनलाई विद्युत प्रवाह हुने High way पनि भन्न सकिन्छ । विद्युत उत्पादन केन्द्रबाट उत्पादित विद्युत माग भएको ठाउँसम्म वा Grid Substation सम्म पुऱ्याउन प्रशारण लाइनले जोडिन्छ । यस प्रकार जुन गतिले विद्युत उत्पादनको विकास हुन्छ त्यसै क्रममा प्रशारण लाइनको निर्माण हुन अपरिहार्य हुन्छ। वर्तमान अवस्थामा नेपाल विद्युत प्राधिकरणको विद्युत प्रणालीमा (INPS) ४०० के.भि.,२०० के.भि.,१३२ के.भि.,६६ के.भि.र ३३ के.भि. गरि कूल ५ (पाँच) भोल्टेज स्तरमा विद्युत प्रशारण भईरहेका छन् । हालसम्म विद्युत विकास विभागले प्रशारण लाइन निर्माण सम्पन्न गरेका, निर्माणाधिन तथा निर्माण सुरु गर्ने ४०० के.भि. क्षमताका चार, २२० के.भि. क्षमताका अठार, ६६ के.भि. क्षमताका पाँच र ३३ के.भि. क्षमताका पचास गरि कूल १५२ प्रशारण लाइन आयोजनाहरुलाई अनुमति-पत्र प्रदान गरेको छ ।

आ.ब.२०७६/०७७ सम्म विभिन्न भोल्टेज स्तरमा निर्माण भएका प्रशारण लाइनहरुको लाइन लम्वाई निम्न बमोजिम रहेका छन् ।

क.सं.	भोल्टेज स्तर (के.भि.)	लाईन लम्वाई (सर्किट कि.मी.)
१.	६६ के.भि.	५१४ कि.मी.
२.	१३२ के.भि.	३२४० कि.मी.
३.	२२० के.भि.	४३७ कि.मी.
४.	४०० के.भि.	७८ कि.मी.

हाल नेपाल विद्युत प्राधिरणको विद्युत प्रणालीमा Peak Load 1385 M.W.(2078/03/26) पुगेको देखिन्छ । नेपाल विद्युत प्राधिकरणको आफ्नो जलविद्युत उत्पादन केन्द्रहरुबाट ४०८ मेगावाट, IPP हरुबाट ५२० मेगावाट तथा भारतबाट ४५७ मेगावाट आयात गरि विद्युत आपूर्ति व्यवस्था मिलाईएको छ । भारतबाट मुख्यरुपमा ढल्केवर-मुजफ्फरपुर ४०० के.भि.प्रशारण लाइनबाट हाल सम्म बढीमा ३७५ मेगावाट सम्म विद्युत आयात गरिएको छ। साथै १३२ के.भि. र ३३ के.भि.मा विभिन्न Interconnection Points बाट पनि समेत विद्युत आपूर्तिको व्यवस्था मिलाईएको छ ।

ढल्केवर-मुजफ्फरपुर ४०० के.भि.प्रशारण लाइन विगतमा २२० के.भि.भोल्टेज स्तरमा संचालन गरि विद्युत आपूर्ति भैरहेकोमा मिति २०७७/०७/२६ का दिन पहिलो पटक ४०० के.भि.मा चार्ज गरि 3*315 M.V.A. 400/220 K.V. Substation संचालनमा ल्याईयो। साथै ढल्केवर-न्यूखिम्ती २२० के.भि.दोस्रो सर्किट मिति २०७८/०३/१४मा तथा न्यूखिम्ती-तामाकोशी २२० के.भि.प्रशारण लाइन २०७८/०३/२१ का दिन चार्ज गरि तामाकोशी ४५६ मेगावाट जलविद्युत केन्द्रको एउटा यूनिट ७६ मेगावाट संग Synchronize गरि संचालनमा आएको छ। यसै गरि तामाकोशीको अन्य युनिट पनि संचालनमा आईसकेको र आउने क्रममा रहेका छन् ।

प्रशारण लाइन निर्माणमा ढिलाई हुनुका मुख्य कारणहरु :

नेपाल विद्युत प्राधिकरणमा प्रशारण लाइन निर्माणको ठेक्का सम्झौता हुंदा प्राय ठेक्का सम्झौता अवधि १८ महिना देखि बढीमा २४ महिना सम्म कायम गरि निर्माणकर्ता संग

सम्झौता गर्ने प्रचलन छ । प्रशारण लाइन निर्माण गरिने ठाउँको भौगोलिक अवस्था,दैवी प्राकृतिक प्रकोप,निर्माण कार्यमा स्थानिय जनसमुदायको वाधा-अवरोध,जग्गा प्राप्तीमा कठिनाई र अनावश्यक आर्थिक मागको कारणले लक्ष्य अनुसारको निर्माण कार्य तोकिएको समयमा सम्पन्न हुन सकिरहेको छैन ।

(क) IEE/EIA स्वीकृत हुन समय लाग्ने :

सर्वेक्षण कार्य पछि प्रशारण लाइन संग सम्बन्धित सवस्टेसनको जग्गा खरिद तथा IEE/EIA स्वीकृत भए पश्चात मात्र निर्माण कार्यको लागि बोलपत्र आव्हान गर्नुपर्ने भएको र IEE/EIA स्वीकृत हुन एक देखि डेढ बर्ष सम्म समय लाग्ने हुँदा प्रशारण लाइन निर्माणमा ढिलाई हुन जाने ।

(ख) पुरक IEE/EIA गर्नुपर्ने :

- Right of Way मा पर्ने रुखहरु कटानको स्वीकृति लिनुपूर्व रुखहरुको संख्या गणना गर्दा IEE/EIA को प्रतिवेदनमा उल्लेखित संख्याहरुको १०% भन्दा बढी भएमा पूरक IEE/EIA गर्नुपर्ने ।

(ग) बन फडानीको समस्या :

- सरकारी वन भएको अवस्थामा Tower Pad & Right of Way मा पर्ने रुखहरु कटान गर्न जिल्ला वन कार्यालय,वन विभाग र वन मन्त्रालयले गठन गरको समितिको सिफारीसको आधारमा मात्र नेपाल सरकार मन्त्रीपरिषदबाट स्वीकृत हुनेहुँदा वनक्षेत्रको भोगाधिकारमा लामो समय लाग्ने भएको ।
- सामुदायिक वन भएको अवस्थामा रुखहरु कटान गर्न स्वीकृतिका लागि सामुदायबाट सहमति लिनुपर्ने भएकोले अनावश्यक माग राखि समयमा सहमति नदिने ।

(घ) जग्गा प्राप्तीमा समस्या :

- Tower Pad & Route Alignment को लागि जग्गा प्राप्ती (अधिग्रहण) गर्दा जग्गाधनीले सरकारी दररेटमा दिन नमान्ने,अत्यधिक र अस्वाभाविक क्षतिपूर्ति माग राखि निर्माण कार्य रोक्ने ।
- ऐलानी (Untitled Land) जग्गाको हकमा भोगचलन गर्ने जग्गाधनीले प्रचलित दरभाउ अनुसार शतप्रतिशत मुआब्जा माग गर्ने ।
- IEE/EIA हुनेवेलामा स्थानिय वासिन्दा,सामुदायिक वन, सम्बन्धित संघ संस्थाहरुले सहमति जनाएपनि निर्माण कार्य प्रारम्भ हुँदा अनावश्यक परिस्थितिको श्रृजना गरि च्यगत बष्निलक्भलत परिवर्तन गर्न माग राखि निर्माण कार्य रोक्ने ।
- त्यधभच एबम ७ च्यगत बष्निलक्भलत को लागि जग्गा प्राप्ती गर्दा अन्य सरोकारवाला सरकारी निकायहरु संग समन्वय गर्नुपर्ने ।

(ङ) विकट भौगोलिक अवस्थाः

जस्तै पहाड, नदीको भिडालो,वन-जंगलमा Tower Pad निर्माण र तार तान्दा Approach Road बनाइ निर्माण सामाग्री ढुवानीगर्दा समय लाग्ने,ढुवानीका लागि Rope Way वनाउनुपर्ने ।

(च) प्राकृतिक प्रकोप र महामारी :

- भुकम्प, आँधिवेरी, भारीबर्षा, बाढी, हिमपातको कारणले गर्दा बाटो बगाउनु, आवतजावत बन्द हुनु, कामदारहरुले साईट छोडेर भाग्नु ।
- वर्तमान अवस्थामा कोभिड-१९ जस्तो महामारीको कारणले गर्दा स्थानिय वासिन्दाहरु तथा प्रशासन समेतले वाहिरको कामदारलाई कार्यक्षेत्र प्रवेशमा निषेध गर्नु र निर्माण कार्य समेत स्थगन गर्न लगाउनु ।

(छ) Route Alignment निर्धारण भएको जानकारी प्राप्त भए पछि पनि स्थानिय वासिन्दाहरुले Right of Way मा भवन निर्माण गरेर प्रशारण लाइन निर्माण कार्यमा व्यवधान खडागरि भवन हटाउनुपरेमा अत्याधिक मुआब्जा रकमको माग गर्नु । उदाहरणका लागि चमेलिया-स्याउले-अत्तरिया १३२ के.भि. प्रशारण लाइनको टावर नं.२१२ स्थित Right of Way मा घर वनाएको र दोस्रो सर्किट निर्माण गर्ने सन्दर्भमा घर हटाउनको लागि अत्यधिक क्षतिपूर्ति माग गरेको ।

(ज) ठेकेदारको कमजोर व्यवस्थापन तथा कार्य सम्पादन :

- निर्माणकर्ताले Design/Drawing स्वीकृतिका लागि ढीलो गरि पेश गर्नु,तदारुखताका साथ निर्माण सामाग्रीको आपूर्ति व्यवस्था नमिलाउनु तथा दक्ष कामदारहरुको व्यवस्थापन नगर्नु । पछि विभिन्न किसिमका समस्या देखाई निर्माण कार्य समयमा सम्पन्न नगरि म्याद थपका लागि परिस्थिति श्रृजना गर्नु ।

निर्माण कार्य समयमा सम्पन्न हुन नसकेका केही मुख्य आयोजनाहरु :

- **थानकोट-चापागाउँ-भक्तपुर १३२ के.भि.प्रशारण लाइन आयोजना :** यस आयोजनाको जिल्ला ललितपुर खोकना निवासीहरुले Route Alignment परिवर्तन

गर्न माग राखि बाँकी रहेका १८ कि.मी. प्रशारण लाइन निर्माण गर्न दिएको छैन । हाल खोकनामा Existing १३२ के.भि.टावरको Base Angle काटेर एउटा टावर ढालिदिएको छ ।

खोकनामा १३२ के.भि.टावर ढालेको दृष्य

- **सोलुकोरिडोर १३२ के.भि.प्रशारण लाइन आयोजना :** प्रशारण लाइनको कूल ३०२ टावर मध्ये २९२ वटा टावरको निर्माण कार्य र कूल ९० कि.मी.मध्ये ७५ कि.मी. डवल सर्किट तार तान्ने कार्य सम्पन्न भईसकेको छ । तर जिल्ला उदयपुको कटारी नगरपालिका वडा नं.४,मरुवाको स्थानियहरुले ३ बर्ष देखि Route Alignment परिवर्तनको माग राखि सरकारी बनमा पाँच,ऐलानी जग्गामा दुई,र निजी जग्गामा तीन गरि कूल १०(दश) वटा टावर निर्माण गर्न दिएका थिएनन् । तर नेपाल विद्युत प्राधिकरण,आयोजना र जिल्ला प्रशासन कार्यालयको सँयुक्त प्रयासमा ३०० भन्दा बढी सुरक्षाकर्मी परिचालन गरेर २०७८ असाढ २४ देखि निर्माण कार्य पुनःद्रुत गतिमा शुरु गरिएको छ ।

कटारी न.पा.वडा नं.४ मरुवामा प्रहरी परिचालन गरि टावर फाउन्डेसन कार्य भईरहेको दृष्य

- **भरतपुर-वर्दघाट २२० के.भि. प्रशारण लाइन आयोजना :** प्रशारण लाइनको सम्पूर्ण निर्माण कार्य सम्पन्न हुने अवस्थामा भएपनि जिल्ला पूर्वी-नवलपर ासी, नवलपुर (दुम्कीवास)मा निजी जग्गामा परेका दुई वटा टावरका लागि Right of Way परिवर्तन गर्न माग राखि निर्माण कार्य गर्न दिएको छैन ।
- **हेटौंडा-ढल्केवर-इनरुवा ४०० के.भि.प्रशारण लाइन आयोजना :** यस प्रशारण लाइनमा पनि स्थानियहरुले हेटौंडा नगरपालिका थाना भञ्ज्याङ्ग स्थित ऐलानी जग्गामा दुई वटा टावर निर्माण गर्न नदिएको, हटियामा अठारवटा टावरको Right of Way परिवर्तन गर्न माग राखि टावर निर्माण गर्न नदिएको, जिल्ला सर्लाहि लालवन्दी (जियाजोर)मा पाँच वटा टावर निर्माण गर्न नदिई Right of Way परिवर्तन गर्न माग राखेको र लहान नगरपालिका पड्डियामा आठ वटा टावर निर्माण गर्न नदिई Right of Way परिवर्तन गर्न माग राखि निर्माण कार्यमा वाधाअवरोध गरेका छन् ।

समस्या समाधान कार्यदलको गठन :

प्रशारण लाइन निर्माणमा आइपर्ने समस्याहरु समाधान गरि निर्माण कार्य अगाडी बढाउन आ.ब.२०७७/०७८ देखि नेपाल सरकारबाट संघ र स्थानिय तहमा कार्यदल गठन गर्ने निर्णय भएको छ । संघ तहमा उर्जा,जलस्रोत तथा सिंचाई मन्त्रालयको सचिवको संयोजकत्वमा गृह मन्त्रालय,वन तथा वातावरण मन्त्रालय एवं भूमि व्यवस्था सहकारी तथा गरिवी निवारण मन्त्रालय र नेपाल विद्युत प्राधिकरणका प्रतिनिधिहरु रहनेगरि कार्यदल गठन हुन्छ । स्थानिय स्तरमा प्रमुख जिल्ला अधिकारीको संयोजकत्वमा सरोकारवाला निकाय तथा स्थानिय तह समेतको सहभागितामा स्थानिय तहको कार्यदल गठन हुन्छ । यसरी सरकारबाट स्थानिय समस्याहरु समाधान गरि प्रशारण लाइन निर्माण कार्य द्रुत गतिमा अगाडी वढाई समयमै आयोजना सम्पन्न गर्न कार्यदलको गठन हुन निर्णय हुनु एउटा सकारात्मक पक्ष हो । भविष्यमा यस कार्यदलले प्रशारण लाइन निर्माणमा देखापरेका वाधा-अवरोधलाई समाधान गरि निर्माण कार्य अगाडी वढाउने अपेक्षा गर्न सकिन्छ ।

सुझावहरु :

१. जग्गा प्राप्ती सम्बन्धी समस्या समाधानका केही सुझावहरु:

(क) निजी जग्गाको हकमा :

- Tower Pad को लागि जग्गा अधिग्रहण गर्दा प्रचलित चलन-चल्तीको दरभाउलाई आधार मानी “मुआब्जा निर्धारण समिति”ले मुआब्जा निर्धारण गर्नुपर्ने ।

- Right of Way मा पर्ने जग्गाको क्षतिपूर्ति निर्धारण गर्दा पूरा कित्ता परेको खण्डमा समितिले निर्धारण गरेको मुआब्जा वापतको रकमको ८०% र कित्ताको आंशिक भाग परेको खण्डमा निर्धारित मुआब्जा रकमको ५०% रकम क्षतिपूर्ति उपलब्ध गराउने ।

(ख) ऐलानी जग्गाको हकमा :

- Tower Pad निर्माणका लागि जग्गा अधिग्रहण गर्दा समितिले निर्धारण गरेको मुआब्जा वापतको रकमको ८०% दिने ।
- Right of Way मा पर्ने जग्गाको क्षतिपूर्ति निर्धारण गर्दा समितिले निर्धारण गरेको मुआब्जा रकमको ४०% रकम क्षतिपूर्ति उपलब्ध गराउने ।

२. वर्तमान अवस्थामा Route Alignment मा पर्ने जग्गा बैंकले धितो राखि ऋण दिन नमानेकोले राष्ट्रिय नीति तर्जुमा गरि जग्गाधनीले बैंकमा उक्त जग्गा धितो राख्न चाहेमा बैंकले धितो राखि ऋण दिने नीति वनाउनुपर्ने ।

३. जंगल फडानीको कारणले वन्यजन्तु, चराचुरुङ्गी, Ecosystem मा परेका प्रभावहरुको आयोजनाले भरनपोषण गर्ने कार्ययोजनाहरु तथा समाजिक उत्तरदायित्व पूरा गर्ने कार्ययोजनाहरु बारे सरोकारवाला पक्षहरुलाई जानकारी गराउने ।

४. भौगोलिक दृष्टिकोणले विकट ठाँउहरुमा आयोजनाको निर्माण कार्य छिटोछरितो गर्न निर्माण सामाग्री ढुवानी गर्न र Conductor Stringing गर्न Helicopter Stringing Technology प्रयोग गर्ने व्यवस्था मिलाउने ।

सारांश:

प्रशारण लाइन निर्माणमा आइपर्ने समस्याहरु समाधान गरि निर्माण कार्य समयमै सम्पन्न गर्न संघिय र स्थानिय स्तरमा नेपाल सरकारबाट कार्यदल गठन हुन निर्णय भएको अवस्थामा सम्वन्धित पक्षहरु, आयोजना र ठेकेदार पनि उत्तिकै क्रियाशिल हुनु पर्दछ । ठेकेदारले स्वीकृत कार्ययोजना अनुसार Design & Drawing समयमै पेश गर्ने, निर्माण सामाग्रीको समुचित व्यवस्था गरि ढुवानी गर्ने तथा दक्ष कामदारहरुको समयमै व्यवस्थापन गर्ने कार्य प्रति प्रतिवद्ध हुनु पर्दछ । आयोजनाले पनि निरन्तर रुपमा सहयोग र समन्वय गर्दा निर्माण कार्य समयमै सम्पन्न हुन सक्ने अपेक्षा गर्न सकिन्छ ।

दुर्घटनामा परि घाईते तथा अंग भंग भएमा पेश गर्नुपर्ने कागजातहरु :

१. चालकको नाम, ठेगाना, सवारी ईजाजत पत्र नविकरण सहितको प्रतिलिपि
२. सम्वन्धित कार्यालयका प्रमुखबाट दिईएको कार्यादेश पत्र ।
३. दुर्घटना प्रतिवेदन (कार्यालयको तर्फबाट)
४. दुर्घटनाको प्रहरी प्रतिवेदन । (स्थलगत मुचुल्का सहित)
५. दुर्घटना भएको साधनको नम्बर र किसिम । (भाडा, सहकारी, संस्थान आदि)
६. सवारी साधन वीमा गर्दाको चालु वीमालेखको प्रतिलिपी ।
७. दुर्घटनाको किसिम (दुर्घटना आफ्नो कारणले वा तेस्रो पक्ष)
८. उपचार खर्चका सक्कल विल तथा Prescription र शिर्षक वाईज खर्चको विवरणहरु

संगठित संस्थाको पदपूर्तिमा लोक सेवा आयोगको भूमिका

शिव कुमार अधिकारी
निर्देशक, ने.वि.प्रा.

पृष्ठभूमि:

नेपालको संविधानको धारा २४३ ले लोक सेवा आयोगको काम, कर्तब्य र अधिकारको व्यवस्था गरेको छ। सोही धाराको उपधारा (२) र (४) मा संगठित संस्थाको सेवा, शर्त तथा पदपूर्ति लगायतका सम्वन्धमा देहाय बमोजिमको व्यवस्था उल्लेख छः

(२) निजामती सेवाको पद बाहेक नेपाली सेना, नेपाल प्रहरी, सशस्त्र प्रहरी बल, नेपाल, अन्य संघीय सरकारी सेवा र संगठित संस्थाको पदमा पदपूर्तिका लागि लिईने लिखित परीक्षा लोकसेवा आयोगले सञ्चालन गर्नेछ।

स्पष्टीकरण : यस धाराको प्रयोजनका लागि “संगठित संस्था” भन्नाले विश्वविद्यालय र शिक्षक सेवा आयोग बाहेकका पचास प्रतिशत वा सो भन्दा बढी शेयर वा जायजेथामा नेपाल सरकारको स्वामित्व वा नियन्त्रण भएको संस्थान, कम्पनी, बैंक, समिति वा संघीय कानून बमोजिम स्थापित वा नेपाल सरकारद्वारा गठित आयोग, संस्थान, प्राधिकरण, निगम, प्रतिष्ठान, बोर्ड, केन्द्र, परिषद र यस्तै प्रकृतिका अन्य संगठित संस्था सम्झनु पर्छ।

(४) कुनै संगठित संस्थाको सेवाका कर्मचारीको सेवाका शर्त सम्बन्धी कानून र त्यस्तो सेवाका पदमा बढुवा र विभागीय कारबाही गर्दा अपनाउनु पर्ने सामान्य सिद्धान्तको विषयमा लोक सेवा आयोगको परामर्श लिनु पर्नेछ।

उल्लेखित व्यवस्थाका आधारमा लोक सेवा आयोग (यसपछि आयोग भनिनेछ) को गरिमा, आयोगले अवलम्वन गरी आएको सिद्धान्त, योग्यतामा आधारित छनौट प्रणाली, निष्पक्षता, समानता, सबै संस्थाका कर्मचारी सेवा शर्त सम्वन्धी आधारभुत व्यवस्थाहरुमा एकरुपता कायम गर्ने लगायतका मान्यताका आधारमा लोक सेवा आयोगको क्षेत्राधिकार भित्र पर्ने सबै संगठित संस्थाका कर्मचारीको सेवाका शर्त सम्बन्धी कानूनमा परिमार्जन गर्नपर्ने अवस्था सृजना भयो।

बिभिन्न संगठित संस्थाका कर्मचारी सेवा, शर्त सम्वन्धी कानुनलाई पुनरावलोकन गर्ने हेतुले आयोगले संगठित संस्थाका कर्मचारीको सेवाका शर्त सम्बन्धी कानून, बढुवा र विभागीय कारबाही सम्बन्धी सामान्य सिद्धान्त (यसपछि सामान्य सिद्धान्त भनिनेछ) मिति २०७४।०२।२५ स्वीकृत गरी जारी गर्यो। कर्मचारीका सेवा शर्त सम्वन्धमा अवलम्वित आधारभूत मान्यता र सिद्धान्त बिपरित प्रत्येक संगठित संस्थामा रहेका कर्मचारीका सेवा शर्त सम्वन्धी कानुनमा भएको फरक फरक व्यवस्थालाई हटाई एकरुपता कायम हुने गरी संस्थाका कर्मचारीका सेवा शर्त सम्वन्धी कानुन परिमार्जन गर्न जारी भएको सामान्य सिद्धान्त आफैंमा उपयुक्त र अनुकरणीय पनि छ।

सामान्य सिद्धान्त र कार्यान्वयन:

आयोगबाट सामान्य सिद्धान्त जारी भए (अधिकांश संस्थाको हकमा आयोगको ताकेता) पछि बिभिन्न संगठित संस्थाहरुले आफ्नो अनुकुलतालाई प्राथमिकतामा राखी कर्मचारी सेवा, शर्त विनियमावलीमा परिमार्जन गरी परामर्शका लागि आयोगसमक्ष पेश गरे। आयोगबाट धेरै कुराहरु सोचबिचार गरेर तयार गरेको सामान्य सिद्धान्तलाई संगठित संस्थाका सेवाका शर्तसम्वन्धी आधारभूत मापदण्ड (Basic terms and conditions of employee) को रुपमा अवलम्बन गरेर सोही

बमोजिम कर्मचारी सेवा शर्तसम्वन्धी कानुनमा परिमार्जन वा संशोधनका लागि परामर्श माग भई आए नआएकोबारे आयोगले बिशेष हेक्का राखी परामर्श प्रदान गर्नुपर्नेमा आयोगले सम्पूर्ण सेवा शर्तसम्वन्धी कानुन पुनरालोकन गर्न तिर लाग्यो । यति मात्र नभई उक्त सामान्य सिद्धान्त अनुकुल सबै संगठित संस्थाका कर्मचारी सेवा शर्त सम्वन्धी कानुनमा एकरुपता हुने गरी कार्यान्वयन गर्नुको सट्टा संगठित संस्था पिच्छे फरक फरक प्रावधान र शर्त राखी परामर्श प्रदान गरीयो । उदाहरणका लागि केहि संगठित संस्थाका सेवा शर्तमा कर्मचारीले साविकको योग्यता र सेवा शर्त बमोजिम बढुवा तथा बिशेष बढुवा हुन सक्ने सुविधा पाइरहनु, खुला प्रतियोगितामा सहभागि हुन उमेरको हद नलाग्नु र अन्य संस्थामा ती सेवा सुविधा नपाउनु आदि । यसबाट संगठित संस्था पिच्छे एकै प्रकृतिको बिषयमा फरक फरक प्रावधान कायम रहनु र कुनै संस्थामा कर्मचारीले लामो समयदेखि प्राप्त गरिरहेको सेवा सुविधाबाट बञ्चित हुनु परेकाले बिबादको बिजारोपण भयो र केहि संस्थामा त्यस्तो कानूनहरु स्वीकृत हुन समेत अधिक समय लाग्यो ।

लोक सेवा आयोग आफैले बनाएको सामान्य सिद्धान्तको मर्म र भावना बिपरित कर्मचारीको बृत्ति बिकास तथा सेवा सुविधामा असर पर्ने गम्भीर प्रकृतिका बिषयमा समेत संगठित संस्था पिच्छे फरक प्रावधान र शर्त राख्न दिने वा त्यस्ता फरक फरक प्रावधानहरु नसच्याई वा एकरुपता कायम नगरी ती संस्थाको पदपूर्तिमा आयोग निरन्तर संलग्न भइरहनुले आयोगले कसैलाई काखा र कसैलाई पाखा गरेको उसैको ब्यबहारबाट देखिन गयो ।

आयोगको संबैधानिक भूमिका, गरिमा, प्रतिष्ठा र सबै संगठित संस्थालाई गर्नुपर्ने समान ब्यबहार (Equal treat to all) का बिरुद्ध संगठित संस्था पिच्छे फरक ब्यबहार अवलम्वन भएकै कारण आयोगले बिभिन्न संगठित संस्थालाई दिएको परामर्श आम कर्मचारीका लागि सर्ब स्वीकार्य हुन नसकि संस्थाका पदपूर्ति प्रक्रिया समेत अवरुद्ध हुन पुग्यो । नेपाल विद्युत प्राधिकरण, कर्मचारी सञ्चय कोष, कृषि विकास बैंक, नेपाल वायु सेवा निगम आदि संस्थामा कार्यरत कर्मचारीलाई उमेरको हद तोक्ने, शैक्षिक योग्यता थप गर्ने लगायतका विषयहरुमा फरक किसिमको परामर्श प्रदान गरिएको र सो अनुसार गरिएको पदपूर्ति सम्बन्धी विज्ञापनका बिरुद्ध प्रभावित पक्षले सम्मानित सर्वोच्च अदालतमा रिट निबेदन दायर गरे । जसबाट आयोगको परामर्श नै बिबादित भई न्यायिक परीक्षणको विषय बन्न पुग्यो ।

कर्मचारीले प्राप्त गरिरहेका सेवा, शर्त र सुविधामा तात्विक असर पर्ने गरी कानून बनाई तत्कालै लागु गर्ने जमर्को आयोगले नगरि दिएको भए कर्मचारीका गुनासा र विवादहरु चुलिंदै अदालत सामु पुग्ने थिएनन् होला । सेवा प्रवेशका लागि सेवा बाहिर रहेका उमेद्वारहरुको योग्यता सरहको समान व्यवस्था सेवा भित्रका कर्मचारीहरुको पनि हुनुपर्ने मान्यता आयोगले अंगिकार गरिरहंदा त्यही शर्त बन्देज निश्चित अवधि पछि लागु हुने गरी वा यस्तो शर्तमा सेवा प्रवेश गर्नेको हकमा लागु हुने गरी व्यवस्था गरि दिएको भए पनि बिबाद जटिल भई पदपूर्ति प्रक्रिया प्रभावित हुने थिएन । तर यी सबै कुरा अव बिगत भई सकेको छ । बिभिन्न संगठित संस्थाका आधिकारिक ट्रेड युनियन तथा कर्मचारीहरुद्धारा आयोगको परामर्श समेतका उपर दायर गरेको रिट निबेदनमा आयोगले लिएको मान्यता र अडानलाई सर्वोच्च अदालतले न्यायिक परीक्षण गरी निवेदकको पक्षमा रिट जारी हुने गरी मिति २०७७।११।१० गते फैसला गरिसकेको हुंदा यस उपर थप विवेचना आवश्यक रहेन ।

अधिकांश संगठित संस्थाको पदपूर्ति गर्न आयोगको सहमतिमा एकै मितिमा प्रकाशित बिज्ञापन मध्ये ज्येष्ठता तथा कार्यक्षमता मूल्यांकन बढुवातर्फ निर्धारित पदसंख्यामा यस अघि नै कर्मचारी बढुवा भई सो अनुसारको सेवा सुविधा लिई आ आफ्नो जिम्मेवारीमा कार्यरत छन् र कतिपय कर्मचारीले अवकास समेत पाइसकेका छन् भने एकै मितिमा प्रकाशित बिज्ञापनबाट लिइएको खुला तथा आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको नतिजा प्रकाशन नभएको र कतिपयको लिखित परीक्षासमेत लामो समयसम्म सञ्चालन हुन नसकेकोले एकातिर हजारौं उमेदवारहरुमा अन्यौल र नैराश्यता छाएको थियो भने संस्थाको पदपूर्ति प्रक्रिया नै अवरुद्ध हुन पुगेको थियो ।

तर सम्मानित सर्वोच्च अदालतबाट उक्त मितिमा भएको फैसलाको पूर्ण पाठ प्राप्त भएपछि लोक सेवा आयोग र आयोगका हालसालै बहालवाला पदाधिकारीहरु समेतले बिशेष अग्रसरता लिई बिभिन्न संगठित संस्थाको बिभिन्न चरणमा बांकी रहेका पदपूर्ति सम्वन्धी कार्यहरु र आगामी दिनमा सम्पादन गरिने कार्यहरु नियमित रुपमा अघि बढाउने गरी आ.ब. २०७८/७९ को बार्षिक कार्यतालिका प्रकाशित गरी तद्अनुरुपको कार्य प्रक्रिया अघि बढाइसकेको हुंदा त्यसले सम्पूर्ण उमेदवारहरुमा नयां आशा जगाएको छ भने संगठित संस्थाले पनि यथाशिघ्र रिक्त पदहरुको पूर्ति हुने अपेक्षा गरेको अनुमान गर्न सकिन्छ ।

आयोगको भूमिका र अपेक्षा :

निष्पक्ष र स्वतन्त्ररुपमा सक्षम जनशक्तिको भर्ना गरी निजामती सेवालाई भरपर्दो र मर्यादित बनाउन लोक सेवा आयोगको भूमिका अद्धितिय छ । बिगत देखि बर्तमानसम्म आयोगले यो कार्य सफलतापूर्वक सम्पादन गरी आएको छ । केहि अपवाद बाहेक आयोगले सदैब मेरिटोक्रेसीलाई उच्च प्राथमिकतामा राखी समयसापेक्ष आधुनिक मूल्यांकन र परीक्षण विधीलाई

आत्मसात गरी योग्य र क्षमतावान उमेद्वारको छनौट गर्ने प्रयत्न गरिरहेकै छ । यो सबै नेपालीको लागि गौरवको विषय पनि हो ।

आयोगको यो ऐतिहासिक सफलता, छवि र कार्यकुशलतालाई उच्च मूल्यांकन गर्दै नेपालको संविधानले नेपाल सरकारको पचास प्रतिशत वा सो भन्दा बढी स्वामित्व भएको संगठित संस्थाहरुमा समेत लोक सेवा आयोगद्वारा परिक्षा लिने र पदपूर्ति तथा विभागीय कारबाही सम्बन्धी सिद्धान्तका विषयमा आयोगको परामर्श लिनुपर्ने व्यवस्था गरेको हो । यसको उद्धेश्य ती संस्थाहरुमा पनि स्वतन्त्र र निश्पक्षरुपमा योग्य र क्षमतावान जनशक्ति आपूर्ति हुन सकोस् र सेवा शर्तसम्वन्धी कानुनमा समेत एकरुपता होस् भन्ने नै हो ।

संगठित संस्थाले पदपूर्ति गर्दा आयोगको संलग्नता रहनु र लिखित परिक्षा सञ्चालन आयोगबाटै हुंदा त्यसको निष्पक्षता र विश्वासनियतामा बृद्धि भइरहेको छ । विशेष गरी लिखित परिक्षा सञ्चालनदेखि उमेद्वार छनौट गर्ने अन्तिम चरणसम्ममा अनावश्यक व्यक्तिले दवाव दिने, प्रभावमा पार्न खोज्ने वा भ्रममा पारी अनुचित लाभ लिने लगायतका गलत प्रवृत्ति निरुत्साहित हुँदै गएको छ । यद्यपी संगठित संस्थाको पदपुर्ति गर्ने प्रक्रियासंग सम्वन्धित प्रश्नपत्र निर्माण, परिक्षा सञ्चालन, उत्तरपुस्तिका परीक्षण, विज्ञहरुको छनौट तथा पदपूर्ति गर्न लाग्ने अवधि र लागत मूल्यमा कटौती गर्नँपर्ने लगायतका पक्षहरुमा आयोगले धेरै सुधार गर्न बांकी नै छ । परिक्षा प्रणाली आफैंमा नियमित, मितव्ययी, व्यवस्थित र गोप्य हुनुपर्ने अवस्थालाई मध्यनजर गरी आयोगले सम्बद्ध पक्ष र विज्ञहरुको रायसुझाव लिई आगामी दिनमा क्रमशः सुधार गर्ने नै छ ।

आयोगको क्षेत्राधिकार भित्र परेका संगठित संस्थाहरुको पदपूर्ति प्रक्रिया बिगतमा आयोगले तोकेको कार्यतालिका बमोजिम अघि बढ्न सकेन । आयोगको सहमति लिई पदपूर्ति गर्न विज्ञापन प्रकाशन गरेका विभिन्न संगठित संस्थाहरुको पदपूर्ति प्रक्रियासमेत अवरुद्ध भएको छ । कुनैको लिखित परिक्षाको नतिजा प्रकाशन हुन बांकी छ, कुनैको लिखित परीक्षा सञ्चालन हुन सकेको छैन भने कतिपय संस्थाको रिक्त दरवन्दीमा बिज्ञापन प्रकाशन गर्न आयोगको सहमति प्राप्त हुन समेत बांकी छ ।

नेपाल विद्युत प्राधिकरणको तथ्यांकलाई मात्रै हेर्ने हो भने पनि गत आ.ब.२०७७/७८ सम्ममा मिति २०७६।०३।१३ गते प्रकाशित विज्ञापनको लिखित परिक्षाको नतिजा र मिति २०७६।११।०२ गते प्रकाशित विज्ञापनको लिखित परिक्षा सञ्चालन हुन सकेन । आ.व. २०७७।७८ सम्मको कुल रिक्त १००४ पदसंख्यामा पनि विज्ञापन गर्ने सहमति प्राप्त भएको छैन । उल्लेखित तथ्यांकले प्राधिकरणको मात्रै पनि बिज्ञापन भएका कुल १०९३ पदसंख्या र बिज्ञापन प्रकाशनको सहमति प्राप्त हुन बांकी कुल रिक्त १००४ गरी जम्मा २०९७ पदसंख्या पदपूर्ति प्रक्रियामै रहेको देखिन्छ । पदपूर्ति गर्नुपर्ने पदसंख्या धेरै थोरै हुन सक्ला तर लामो समयसम्म पदपूर्ति हुन नसकेको कारणले विविध समस्या खेप्ने संस्थाहरु अरु पनि थुप्रै छन् ।

संगठित संस्थाको नियमानुसार अनिबार्य अवकाश, स्वेच्छिक अवकाश र राजिनामा वा विभागिय कारबाही प्रक्रियाबाट कर्मचारी अवकाश हुने तर विगत २/३ वर्ष देखि जनशक्ति आपूर्ति नहुँदा त्यस्ता संस्थाहरुले सञ्चालन गर्ने सेवामा के कस्तो असर पर्छ भन्ने तथ्यलाई पनि आयोगले नजर अन्दाज गर्न मिल्दैन । स्थायी पदपूर्ति गर्ने क्रममा बिवाद, व्यवधान वा समस्या जे आइपरे तापनि त्यसलाई यथास्थितिमा थाती राखेर होइन की परिस्थिति अनुसार आवश्यक निर्णय गरी जनशक्ति अभावको समस्या समाधान गरिदिने भूमिका आयोगले निर्बाह गर्नुपर्छ । आयोगको परामर्शसमेतका उपर अदालतमा मुद्धा परे तापनि अदालतले पदपूर्ति प्रक्रिया यथास्थितिमा राख्नु भनी आदेश नगरिरहेको अवस्थामा आयोगले मुद्धा किनारा लागेपछि मात्र पदपूर्ति गर्ने प्रक्रिया अघि बढाउने नीति अख्तियार गरेकै कारण लामो समयसम्म बिभिन्न संस्थामा कर्मचारी आपुर्ति हुन सकेन । परिणामस्वरुप बिभिन्न संगठित संस्थामा उल्लेख्य सँख्यामा जनशक्तिको अभाव मात्र भइरहेन की पदपूर्ति गर्दा लाग्ने समयावधि पनि लम्बिई रह्यो र त्यसले अझै लामो समयसम्म आयोगको प्रभावकारीतालाई प्रभावित गरिरहने छ ।

संगठित संस्थाको रिक्त दरवन्दीमा लामो समयसम्म कर्मचारी सिफारिश गर्न नसकिने अवस्थामा स्थायी पदपूर्ति नहुँदासम्मका लागि आयोगले करार/म्यादी/ज्यालादारी/सेवा करार लगायत अन्य उपयुक्त प्रतिस्पर्धात्मक बिधि र प्रक्रियाद्धारा जनशक्ति आपूर्ति गर्ने बिकल्प दिन सक्छ । जसबाट आयोगको भूमिका उत्प्रेरक, रचनात्मक र समन्वयात्मक हुन संस्थामा जनशक्तिको अभावसमेत हुन दिने छैन भने यस्तो प्रक्रियामा समेत निश्पक्षता र बिश्वसनियताको माग स्वाभाबिक भएकोले आयोग संलग्न भई जनशक्ति छनोट हुनु उपयुक्त समेत देखिन्छ । अन्यथा संस्थाले बाध्यताबस अन्य प्रक्रियाद्धारा जनशक्ति लिई सेवा सञ्चालन गर्नुपर्ने अवस्था आउन सक्छ । त्यस्तो अवस्था आउन नदिन सम्बद्ध सबै पक्ष सचेत भई बेलैमा उचित विकल्प अवलम्बन गरी जनशक्ति व्यवस्थापन गर्न अति जरुरी देखिन्छ ।

संगठित संस्थाको पदपूर्ति गर्ने क्रममा लोक सेवा आयोगले आफ्नो भूमिका निर्बाह गर्दै गर्दा विविध समस्याहरु देखिएका छन् । केहि प्रतिनिधि समस्याहरुलाई यसअघि औंल्याइ सकिएको छ । त्यसबाहेक केहि नीतिगत र अवलम्बित अभ्यास समेतलाई

स्पष्टताका साथ परिमार्जन गरी कार्यान्वयनमा ल्याउन सकेमा आयोगले आफ्ना काम कार्बाहीहरु आगामी दिनमा स्पष्ट, सरल र शिघ्ररुपमा सम्पादन गर्न सक्ने देखिन्छ। जसमध्ये मुख्य गरी दुइवटा बिषयलाई देहायबमोजिम बिबेचना गरिएको छः

पहिलो बिषय-संगठित संस्थामा कर्मचारी सेवा शर्त सम्बन्धी कानूनमा परामर्श प्रदान गरिदिन आयोगमा पठाइसकेपछि आयोगले समामान्यतः निम्नानुसार परामर्श प्रदान गर्ने गरेको देखिन्छः

- कर्मचारीको पदपूर्ति र विभागीय कारबाही सम्बन्धी शर्तहरुका हकमा आयोगको निर्णयानुसार र
- संस्थाको संगठन संरचनाहरुको सम्बन्धमा सम्बन्धित मन्त्रालयको स्वीकृतिमा र वित्तीय भार पर्ने विषयहरुका सन्दर्भमा अर्थ मन्त्रालयको स्वीकृति लिई ।

माथी उल्लेख भएबमोजिम आयोगको परामर्श प्राप्त गरेको कुनै संगठित संस्थाले समयसापेक्ष कर्मचारीका सेवा शर्तसंग सम्वन्धित प्रावधानहरु (जुन पदपूर्ति र बिभागिय कारबाहीसंग असम्बन्धित छन् तर थप वित्तिय भार पर्ने वा नपर्ने पनि हुन सक्छन् जस्तैः अनिबार्य अबकासको उमेर हद, कर्मचारीको क्षेत्रगत नियुक्ति, सरुवा, बिदा, सेवा अवधि गणना आदि) मा संशोधन गर्दा आयोगको परामर्श लिएर मात्र संशोधन गर्ने हो ? वा नलिई संशोधन गर्न सकिने हो ? वा सम्बन्धित मन्त्रालयको स्वीकृति लिई कार्यान्वयन गर्न सकिने हो भन्नेमा द्विविधा छ। यस सम्वन्धमा आयोगकै पदाधिकारी र कर्मचारीहरु बीच मतैक्य नरहेको हुंदा आयोगबाट स्पष्ट निर्णय गरी सामान्य सिद्धान्तमा समाबेश हुन अति जरुरी देखिन्छ।

दोस्रो विषय-आयोगको केन्द्रिय कार्यालयबाहेक अन्य क्षेत्रमा रहेका बिभिन्न कार्यालयहरुले निजामती सेवाका नायब सुब्बासम्मको पदको परीक्षा लिई सिफारिस गर्ने गर्दछन् । आयोगको केन्द्रिय कार्यालयको तुलनामा ती कार्यालयहरुको कार्यबोझ स्वाभाविक रुपमा कम छ। यस्तो अवस्थामा बिभिन्न संगठित संस्थाका सहायक स्तरका पदहरुको लिखित परीक्षा सञ्चालन तथा नतिजा प्रकाशनसम्मको काममा पनि आयोगका ती कार्यालयहरुलाई समेत भरपुररुपमा उपयोग गर्न सकिए पदपूर्ति गर्दा लाग्ने समयावधिलाई कटौती गर्न सकिने देखिन्छ।

यसर्थ आयोगले आगामी दिनमा निजामती सेवाका आधारभूत मान्यताहरुलाई आत्मसाथ गर्दै तद्अनुरुप सबै संगठित संस्थाहरुको कर्मचारी सेवा शर्त विनियमावलीमा एकरुपता कायम हुने गरी संशोधन गर्न अग्रसरता लिने, परिक्षा भई सकेका पदहरुको नतिजा प्रकाशन गर्ने, परिक्षा लिन बाँकी रहेका पदहरुमा परिक्षा सञ्चालन गर्ने, रिक्त पदहरुमा विज्ञापन प्रकाशन गर्न तत्काल सहमति प्रदान गर्न ढिलाई गर्नु हुँदैन। आयोग र आयोगको भाबी पदाधिकारीहरुको कांधमा बिगतका नियमित तथा असल कार्यहरुलाई निरन्तरता दिंदै उल्लेखित नीतिगत र अवलम्बित अभ्यासहरुमा समयसापेक्ष पुनरावलोकन गर्दै अघि बढ्नु पर्ने चुनौती छ। त्यो चुनौतिलाई चिर्दै आयोग अघि बढ्न सके संगठित संस्थाहरुको पदपूर्तिमा समेत आयोगको भूमिका प्रशंसनीय भई संबैधानिक दायित्वसमेत सफलरुपमा निर्बाह गर्न सकेको प्रमाणित हुन्छ। अन्यथा सबैको आशा र भरोसाको केन्द्रको रुपमा रहेको लोक सेवा आयोगको प्रभावकारीता निजामती सेवामा मात्र सीमित नहोला भन्न सकिन्न।

कर्मचारी दुर्घटनामा परी औषधि उपचार गराएको अवस्थामा वीमा दावीका लागि आवश्यक पर्ने कागजातहरु :

- आवश्यक विवरण भरिएको वीमा दावी फाराम
- औषधि उपचारका सम्पूर्ण सक्कल कागजात तथा बिलहरु
- कार्यालयले तयार पारेको दुर्घटना प्रतिवेदन (कार्यालयको कामको शिलशिलामा दुर्घटनामा परेको अवस्थामा मात्र)
- दुर्घटनाको प्रहरी प्रतिवेदन (कार्यालयको कामको शिलशिलामा दुर्घटनामा परेको अवस्थामा मात्र)

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शरद प्रसाद कोइराला

अधिवक्ता

१. विषय प्रवेशः

कुनै वस्तु वा सेवा वा दुवैको संयोजनको मूल्य भुक्तानी गरी प्राप्त गर्ने क्रियाकलापलाई खरिद भनिन्छ । खरिद विक्रीको क्रियाकलाप हुन सामान्यतः कम्तिमा दुई जना व्यक्तिहरु हुनुपर्दछ । यी व्यक्तिहरु मध्ये कुनै एक जनाले वस्तु वा सेवा उपलब्ध गराउदछ भने अर्को पक्षले सोको वजार मूल्य वा सहमती भएको मूल्य उपलब्ध गराउँदछ । खरिद विक्रीमा रहेको यस विशेषताको आधारमा वस्तु वा सेवा र सोको मूल्यको विनिमय (Exchange) लाई खरिदजनिक कार्य भन्न सकिन्छ । खरिद विधिद्वारा वस्तु वा सेवा आवश्यक हुनाले वस्तु वा सेवा प्राप्त गरी आफ्नो आवश्यकता पूर्ति गर्दछ वस्तु वा सेवा आपूर्ति गर्ने व्यक्तिले सोको मूल्य प्राप्त गरेको हुन्छ । वस्तु वा सेवा विक्री गरी रकम प्राप्त गर्न चाहने पक्षले रकम प्राप्त गर्दछ भने अर्को पक्षको वस्तु वा सेवाको आवश्यकता परिपूर्ति गर्दछ । यसलाई आवश्यकताको पूर्तिको रुपमा समेत लिइन्छ ।

खरिद सामान्य जीवनमा प्रत्येक व्यक्तिले दिनहुँ गरी रहने क्रियाकलाप हो । व्यक्तिको दैनिक जीवनमा आवश्यक पर्ने वस्तुको साथै राष्ट्रिय एवं अन्तराष्ट्रिय रुपमा ठुला स्तरका आवश्यकताहरु खरिद प्रकृयाद्वारा नै पूर्ति हुन्छन । यस रोहबाट नियाल्दा व्यक्तिको वास्तविक आवश्यकता खरिदद्वारा संवोधन भएको हुन्छ । व्यक्तिले आर्जन गर्ने कार्य आफ्नो आवश्यकता परिपूर्तिको निम्ती आवश्यक पर्ने चिज (Matter) खरिद गर्नको निम्ती स्रोत व्यवस्था गर्ने गरेको मानिन्छ । रोजगारी, व्यवसाय वा लगानी स्वयंमा आवश्यकताको आपूर्ति नभई आवश्यकताको आपूर्ति निम्ती स्रोत आर्जन (Resources Generation) गर्ने क्रियाकलाप हुन् । विश्वमा सबै भन्दा बढी हुने क्रियाकलाप नै खरिद विक्री हो ।

व्यक्तिले निजी प्रयोजनको निम्ती तथा निजी निकायहरुले आफ्नो इच्छा अनुसार खरिद गर्न सक्दछन । निजी निकायहरुले समेत आफ्नो खरिद कार्यलाई प्रणालीवद्ध (Systematic) गर्न आवश्यक कानूनहरु वनाई नियमित र ब्यवस्थित गन सक्दछन । यस विधिबाट गरिने खरिद सार्वजनिक सरोकार भन्दा स्वनियमन (Self regulation) को आशय वढी रहेको हुन्छ । यसप्रकारको खरिदमा तेश्रो पक्ष वा आम सर्वसाधारण जनता वा सार्वजनिक निकायको सरोकारको विषय हुदैन । यस प्रकारको खरिद विक्रीको मूल्य वा प्रकृया सार्वजनिक निकायको चासोको विषय नभएतापनि सार्वजनिक कानूनले यस प्रकारको खरिद विक्रीमा विशेष व्यवस्था गरेको भए उक्त हदसम्म सार्वजनिक निकायको निग्रानी र नियमनको विषय हुन सक्दछ । खरिद विक्रीको कार्यमा तोकिएको भन्दा वढी मुनाफा लिन नपाइने गरी कानूनमा व्यवस्था रहेको छ ।

वस्तु वा सेवाको खरिद व्यक्ति विशेष एवं विक्री क्षेत्रमा मात्र सिमित नरही सरकारी एवं सार्वजनिक निकायहरुले समेत गर्नुपर्ने हुन्छ । सरकारी कार्यालय तथा सार्वजनिक निकायहरुले दैनिक प्रशासन सञ्चालन गर्न आवश्यक पर्ने सामाग्री देखि कार्यालय सञ्चालन गर्न नियमितरुपमा आपूर्ति हुने विद्युत, दुरसञ्चार एवं खानेपानी आदि खरिद गर्नुपर्ने हुन्छ । सोको अलावा सार्वजनिक रुपमा आवश्यक पर्ने शिक्षा, स्वास्थ्य, सुरक्षा तथा अन्य विकास निर्माण कार्यको लागि आवश्यक पर्ने पुर्वाधार एवं

संरचनाहरु सरकारी निकायबाट निर्माण गर्नुपर्ने हुन्छ । यसै गरी सरकारी निकायबाट उपलब्ध भएको र सरकारी तथा सार्वजनिक निकायलाई आवश्यक पर्ने सेवाहरु समेत खरिद गर्नुपर्ने हुन्छ। सरकारी निकायले घरभाडामा लिनुपर्ने खाद्यान्न सामाग्रीहरु खरिद गर्नुपर्ने आवश्यकताहरु हुन्छन । निचोडमा सरकारी एवं सार्वजनिक निकायले समेत व्यापारीक क्रियाकलापमा खरिद विक्री हुने वस्तु वा सेवाहरु खरिद गर्दछ ।

निजी निकायले गर्ने खरिद र सार्वजनिक (सरकारी) निकायले गर्ने खरिदमा केहि आधारभुत भिन्नताहरु रहेका छन । निजी निकायले गर्ने खरिदमा सार्वजनिक कोष (Public purse) को रकम लगानी हुदैन। निजी निकायले आफुलाई चित्त बुझेको मूल्यमा खरिद गर्नसक्दछ । सार्वजनिक निकायले गर्ने खरिदमा सार्वजनिक कोषको रकम समावेश हुन्छ । सार्वजनिक कोषको रकमबाट राष्ट्रसेवकले खरिद गर्ने गर्दछन । सार्वजनिक कोष सम्बन्धित राष्ट्रको आम नागरिकको साझा धन हो । उक्त धनबाट कुनै पनि व्यक्ति (राष्ट्रसेवक) ले खरिद गर्दा यसको दुरुपयोग हुने संभावना हुन्छ। यो ब्यापारिक क्रियाकलाप भएको र प्रत्यक्ष रुपमा सार्वजनिक कोषको रकमबाट खरिद गरिने भएकोले यसमा अनियमिता हुने गुन्जाइस रहन सक्दछ । यस प्रकारको खरिद कार्यमा राष्ट्रिय ढुकुटीको जिम्मा लिने राष्ट्रसेवक र वस्तु वा सेवा विक्री गर्ने व्यक्ति वा समुदाय वीच समेत मिलेमतो भई राष्ट्रिय धनलाई क्षतिपुऱ्याउने र व्यक्तिगत लाभ प्राप्त गर्ने प्रवन्ध हुन सक्दछन ।

सार्वजनिक कोषको रकम सर्वसाधारण जनताबाट असुल गरिएको हुन्छ । सर्वसाधारण जनता एवं निजहरुद्धारा स्थापित निकायहरुले सम्पत्ति धारण, आय आर्जन एवं ब्यापारिक क्रियाकलाप सञ्चालन, कुनै वस्तु वा सेवा उपयोग गरे वापत कर स्वरुपमा रकम भुक्तानी गर्दछन। यसप्रकार जनताको पसिनाको आर्जनमा सार्वजनिक हित (Public Welfare) को निम्ती उपयोग गर्ने प्रतिवद्धता जनाउदै सरकारले कर, महशुल एवं शुल्कहरु लगाएको हुन्छ। यसरी सकंलन भएको कर दुरुपयोग नहुने र जुन प्रयोजनको निम्ती सकंलन गरिएको हो सोहि बमोजिम सदुपयोग हुने विश्वास सरकारले दिनुपर्दछ ।[1] सार्वजनिक कोषको मितव्यायीता पूर्ण र पारदर्शीरुपमा उपयोग हुनुपर्ने विश्वव्यापीरुपमा स्वीकार गरिएको सिद्धान्त हो । तसर्थ सार्वजनिक कोषको रकम खर्च गर्ने सम्बन्धमा विधायिका एवं सरकारी निकायहरुले विभिन्न कानून वनाई प्रकृयागतरुपमा नियमन गरेका हुन्छन । कानूनमा तोकिएको प्रकृया अवलम्वन गरी भएको कार्यले नै उचित निष्कर्षमापुऱ्याउने मानिन्छ। प्रकृया ठिक गनतव्यमा पुग्ने प्रणाली मानिन्छ ।

सार्वजनिक कोषबाट खरिद गर्दा खरिद गर्ने ब्यक्तिले आफ्नै रकमबाट आफ्नो लागि (As his own) खरिद सरह मितव्ययीता, गुणस्त्रीयता एवं मूल्यमा प्रतिस्पर्धा गर्न सक्ने अवस्था हुदैन । सार्वजनिक खरिदमा भुक्तानी मात्रै नभई खरिद गरिएको वस्तु वा सेवाको गुणस्तरमा सम्झौता गरी सार्वजनिक कोषको रकम दुरुपयोग गर्ने अवस्था हुन सक्दछ। सार्वजनिक खरिदमा हुन सक्ने यस्ता नकारात्मक पक्षहरुलाई रोक्न र मितव्ययी एवं प्रतिस्पर्धी लागतमा उच्च गुणस्तरको वस्तु वा सेवा खरिद गर्ने व्यवस्था गर्ने सार्वजनिक खरिद सम्बन्धी कानूनी व्यवस्था गरिएको हुन्छ । यस कानूनमा खरिदको आवश्यकता पहिचान गर्ने, खरिदको लागत एकिन, खरिद सम्बन्धी कागजात तयार गर्ने, प्रतिस्पर्धाको विधिबाट खरिद गर्ने, प्रतिस्पर्धा मध्ये सारभुतरुपमा प्रभावग्राही (सक्षम) र न्यूनतम कवोल गर्ने चयन गर्ने, खरिद पश्चात आपूर्तिको गुणस्तर जाँच गरी तोकिएको वान्छनियता (Specification) बमोजिमको वस्तु वा सेवा ग्रहण गर्ने र त्यस्तो आपूर्तिको भुक्तानी दिने जस्ता कार्यहरु नियमित गरिएका छन । यी प्रावधानहरुले राष्ट्रसेवकलाई खरिद कार्य कसरी गर्नु पर्दछ भन्ने प्रकृयागत व्यवस्थाहरुको जानकारी दिनुका साथै खरिद कारवाईमा कुन कार्य कानून सम्मत र कुन कार्य कानून प्रतिकुल हुन्छ भन्ने निर्णय गर्ने सारवान आधार समेत दिएको हुन्छ ।

सार्वजनिक खरिद सम्बन्धी कानूनको मुलभुत उद्देश्य खरिद पक्रियालाई ब्यवस्थित गर्नु, खरिद कार्यमा प्रतिस्पर्धाको विधिद्धारा खर्चमा मितब्यायिता र खरिदमा गुणस्तर कायम गर्नु रहेको छ। सार्वजनिक कोषको रकमबाट खरिद गरिने भएकोले यस प्रकृयामा आम र इच्छुक ब्यक्तिले भाग लिन पाउने र योग्य ब्यक्तिबाट कम लागतमा गुणस्तरीय खरिद गर्ने कानूनको मूल आशय रहेकोछ । सार्वजनिक खरिद कानूनको उद्धेश्य निम्नानुसार रहेको कानूनको प्रस्तावनामा प्रष्ट गरिएको छ ।[2]

(१) **कानूनी व्यवस्था** : सार्वजनिक खरिद सम्बन्धी मान्य सिद्धान्तहरुलाई वास्तविक अभ्यास (व्यवहार) मा लागु गरी सार्वजनिक खरिद सम्बन्धमा प्रष्ट व्यवस्था गर्न समेत यस सम्बन्धी कानूनी व्यवस्था गरिएको हो ।

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१ ने.का.प. २०७६ नि.नं. १०२२८ पृ. ६३५

२ सार्वजनिक खरिद ऐन, २०६३ को प्रस्तावना

(२) **कार्यविधिगत व्यवस्था** : खरिद सम्बन्धमा अपनाउनुपर्ने कार्यविधि र प्रक्रियालाई व्यवस्थित गर्न सार्वजनिक खरिद सम्बन्धी कानूनको उद्देश्य रहेको हुन्छ । सार्वजनिक खरिदको आवश्यकता पहिचान देखि खरिद सम्झौता अन्त गरी सोको दायित्व फरफारक सम्बन्धमा कानून व्यवस्था गरिएको हुन्छ । यसले गर्दा सार्वजनिक निकाय (राष्ट्रसेवक) एवं आम सर्वसाधारणलाई खरिद कार्य कसरी गर्नु पर्दछ भन्ने प्रकृयागत प्रष्टता हुन्छ। खरिद कारवाईमा अपनाइने प्रक्रियाले खरिद कारवाई चरणवद्ध एवं व्यवस्थित (इचनबलक्ष्कभम) रुपमा अगाडी वढ्दै परिणाममुखी हुन्छ। प्रक्रियाले नै उचित निर्णयमापुऱ्याउदछ भन्ने न्यायीक मान्यता रहेको छ । तसर्थ कानूनमा प्रक्रियाको व्यवस्था गरिएको हुन्छ। सार्वजनिक खरिद सम्बन्धी कानूनका धेरै प्रावधान प्रक्रियासंग सम्बन्धित रहेका छन्। प्रकृयाले नै लक्षित गन्तव्यमा पुग्न डोऱ्याउने मानिन्छ।

३. **उचित निर्णय गर्न** : सार्वजनिक खरिद सम्बन्धमा कानूनमा विस्तृत प्रक्रियागत व्यवस्था भएपनि उक्त प्रक्रिया अवलम्वन गर्दा प्राप्त नतिजा (Result) देखा परेको तथ्य, प्राप्त विवरण एवं कागजात कुन कानूनसम्मत हो भनी सार्वजनिक निकायको अधिकारीले निर्णय गर्नुपर्ने हुन्छ । यस प्रकारको निर्णय खरिदको प्रगतीको चरण तथा खरिद सम्झौताको पालनाको अवस्थामा समेत गर्नु पर्ने हुन्छ । सार्वजनिक अधिकारीबाट यस प्रकारका निर्णयहरुलाई खुला, पारदर्शी, वस्तुनिष्ठ, विश्वसनीय वनाउन समेत कानून वनाई लागू गरिएको छ । सार्वजनिक अधिकारीले भएको तथ्य (Given Facts) मा कानूनको आधारमा निर्णय गर्ने भएकोले यस्तो निर्णय खुला एवं वस्तुनिष्ठ हुन्छ ।

४. **खुला प्रतिस्पर्धा:** सार्वजनिक खरिदको स्रोत सार्वजनिक कोषको रकम भएकोले यस प्रकारको खरिदमा प्रतिस्पर्धा गराइनु पर्दछ भन्ने मान्यता रहेको छ । केहि अपवादात्मक अवस्थामा वाहेक[३] सार्वजनिक खरिद प्रतिस्पर्धाको विधिद्धारा गराइन्छ। सार्वजनिक रुपमा प्रतिस्पर्धा भएमा इच्छुक विक्रेता (आपूर्तिकर्ता) ले आफुले इच्छाएको मूल्यमा विक्री गर्ने प्रस्ताव पेश गर्न सक्दछन। यस अवस्था कानूनतः गोग्य एवं आर्थिक रुपमा न्यूनतम मूल्याङ्कित खरिद प्रयोजनको निम्ती छनौट गरिन्छ। यसरी खरिद गर्दा सार्वजनिक कोषबाट मितब्ययी खरिद हुन्छ। न्यून लागतमा[४] उच्च गुणस्तरको खरिदले मितब्यायीता, प्रतिस्पर्धा र स्वच्छता कायम गर्दछ। खरिद पक्रिया प्रतिस्पर्धा, स्वच्छता, इमान्दारीता, जवाफदेहिता र विश्वासनियता प्रर्वद्धन गरी मितब्ययी र विवेकपूर्ण ढंगबाट अधिकतम प्रतिफल प्राप्त गर्ने सार्वजनिक खरिद कानूनको उदेश्य रहेको छ।

५. **खरिदको व्यवस्थापन क्षमता अभिवृद्धि गर्ने :** खरिद कारवाईको सम्बन्धमा प्रकृयागत व्यवस्था कानूनमा गर्नुका साथै खरिद कारवाईको लागत एवं खरिदको बिशेषता (Specification) हरु खरिद कारवाईको कागजात तयारी चरणमा तयार गरिएको हुन्छ । आपूर्ति गर्ने व्यक्तिको योग्यता, आपूर्तिको गुणस्तर खरिद कारवाईले यकिन गर्ने र सो को जाच वा तुलना वस्तुनिष्ठरुपमा हुने भएकोले खरिद कार्यको व्यवस्थापन गर्ने क्षमता समेत अभिवृद्धि हुन्छ । यस खरिद प्रक्रियामा द्धिविधा न्यून हुने वोलपत्र एवं आपूर्तिको गुणस्तर जाँच वस्तुनिष्ठ रुपमा हुने अवस्थाले खरिद कार्यमा निर्णय लिन सहज भई खरिद व्यवस्थापन क्षमतम अभिवृद्धि हुन्छ।

६. **सहभागिताको समान अवसर** : सार्वजनिक प्रतिस्पर्धामा योग्य र इच्छुक सबै व्यक्तिको सहभागिता हुन सक्दछ । कुनै कार्य वा व्यवसाय गर्नको निम्ती राज्यले योग्यता वा शर्त तोक्न सक्दछ ।[५] तोकिएको योग्यता भएको र इच्छुक व्यक्तिलाई खरिद प्रक्रियामा समान रुपमा सहभागि हुन पाउने अवस्था सुनिश्चित गरिएको छ । यसलाई सार्वजनिक खरिद ऐनको प्रस्तावनामा मात्रै सिमित नगरी कानूनका विभिन्न प्रावधानमा समेत सहभागिताको अवसरलाई सिमित गर्ने प्रवन्ध गर्न नमिल्ने व्यवस्था गरिएको छ। सार्वजनिक खरिदमा खास प्रकारका निर्माण व्यवसायी, आपूर्तिकर्ता, परामर्शदाता वा सेवा प्रदायकले भाग लिन पाउने वा कुनै खास वर्गका निर्माण व्यवसायी, आपूर्तिकर्ता, परामर्शदाता वा सेवा प्रदायकले भाग लिन नपाउने व्यवस्था गर्न मिल्दैन ।[६] यो व्यवस्था राष्ट्रियस्तरको कवोल प्रतिस्पर्धा (National Bidding Competition) मा समेत लागू हुन्छ । अन्तराष्ट्रिय कवोल प्रतिस्पर्धामा समेत कानूनमा प्रष्ट रुपमा विभेद गर्न सक्ने प्रावधान भएको

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[३] सार्वजनिक खरिद ऐन, २०६३

[४] ऐ.ऐ. दफा २७(१)

[५] नेपालको संविधानको धारा १७(२) प्रतिवन्धात्मक वाक्याश (६)

[६] सार्वजनिक खरिद ऐन, २०६३ दफा १०(३)

अवस्थामा वाहेक वोलपत्रदातालाई भेदभाव गर्ने शर्त तोक्न सकिदैन । निम्नलिखित अवस्थामा वाहेक सार्वजनिक खरिद कारवाईमा राष्ट्रियताको आधारमा भेदभाव गर्ने कार्य गर्न मिल्दैन ।[७]

(क) स्वदेशी मालसामान र स्थानिय निर्माण व्यवसायीलाई प्राथमिकता दिने ।[८]

(ख) नेपाली उद्यमी तथा व्यवसायीलाई तोकिए बमोजिमका दरले प्राथमिकता (Domestic Preference) दिने ।[९]

७. **खरिद कारवाईमा सुशासनको प्रत्याभुती :** खरिद कारवाईको प्रक्रिया कानूनमा प्रष्ट गरिएको छ । के कस्तो तथ्यगत अवस्थामा के गर्नुपर्ने हुन्छ भन्ने ब्यहोरा समेत कानूनी प्रावधानको आधारमा बुझ्न सकिन्छ । त्यसैगरी सार्वजनिक खरिद सम्बन्धमा निषेधित क्रियाकलाप समेत कानूनमा उल्लेख गरिएको छ । कुनै कार्यको सम्बन्धमा प्रक्रियागत व्यवस्था र निश्चित तथ्यगत अवस्थामा निश्चित कार्य गर्नुपर्ने र गर्न नहुने कार्य प्रष्ट गरिएको अवस्थामा उक्त कानून प्रशासन गर्ने निकायले सोहि कानूनी प्रावधान अनुसार कार्य गर्ने भएकोले सुशासन कायम हुने मानिन्छ । सार्वजनिक खरिद सम्बन्धमा खरिद गर्ने अधिकार कानून बमोजिम भए नभएको जाँच गर्ने र कानून बमोजिमको कार्यबाट कायम हुन आएको नतिजा घोषणा (Pronouncement) गर्ने अधिकारीको रुपमा रहन्छ । वस्तुनिष्ठ आधारमा कार्य गर्नुपर्ने र मनोगत (Subective) रुपमा कार्य गर्ने अवस्था नभएकोले सुशासनको प्रत्याभुती गर्ने आशय ऐनको प्रस्तावनामा ब्यक्ति गरेको छ ।

२. सार्वजनिक खरिदको प्रकृति :

सार्वजनिक खरिद पनि सामान्यरुपमा खरिद कार्य नै हो । सामान्य खरिदमा हुने विशेषताहरु यस खरिदमा अन्तरनिहित हुन्छन । सार्वजनिक रकमबाट, सार्वजनिक निकायले गर्ने भएकोले यसलाई सार्वजनिक खरिद नामाकरण गरिएको हो । सार्वजनिक खरिद कार्यलाई नियमित एवं ब्यवस्थित गर्न विधायिकाले विशेष कानून वनाई लागू गरेको छ । यस खरिदमा प्रतिस्पर्धा, पारदर्शीता, सहभागिताको समान अवसर, खरिद निर्णय सार्वजनिक गर्नुपर्ने केहि विशिष्ट चरित्रहरु रहेको हुन्छन । यी चरित्रहरु निजी खरिदमा आवश्यक हुदैनन । यिनै माथि उल्लेखित कारणहरुले सार्वजनिक खरिद निजी खरिद भन्दा प्रकृयागत आधारमा पृथक रहेको देखिन्छ ।

सार्वजनिक खरिद कानूनमा तोकिएको प्रकृया पूरा गरी कानूनले तोकेको अवस्था भएमा मात्र खरिद गर्न पाउने अवस्था हुन्छ । कानुनतः निषेधित अवस्थामा खरिद कार्य हुन सक्दैन । सार्वजनिक कानूनले रोक लगाएको अवस्थामा बाहेक निजी क्षेत्रसंग सम्झौता गरी खरिद गर्न सक्दछ ।[१०] सार्वजनिक खरिद कानूनले नै खरिद गर्न नपाउने अवस्था तोकिएको वा अन्य कुनै कानूनले कुनै खरिद कार्य गर्न नपाउने गरी निषेध गरेको अवस्थामा बाहेक सरकार वा सार्वजनिक निकायले निजी क्षेत्रसंग सम्झौता गरी खरिद गर्नु पर्दछ । यसरी खरिद गर्दा कानूनमा तोकिएको प्रकृया भएको र कानूनले खरिद गर्न पाउने आधार स्थापित सरकारी वा सार्वजनिक निकायले निजी क्षेत्रसंग सम्झौता गरी खरिद गर्ने भएकोले यो खरिद देवानी दायित्वसंग सम्बन्धित विषय हो । करार (सम्झौता) बाट दायित्व सृजना हुने, मुलुकी देवानी संहिता, २०७४ मा प्रावधान छ ।[११] सम्झौता गरेपछि सो बमोजिम कार्य गर्ने सम्झौताको पक्ष वाध्य हुन्छ ।[१२] कानून बमोजिम वैध सम्झौतापत्रबाट सृजना भएको दायित्व त्यस्तो दायित्व पुरा गर्नुपर्ने ब्यक्तिले असल नियतले पुरा गर्नुपर्ने हुन्छ ।[१३] सरकारी वा सार्वजनिक निकायले निजी क्षेत्रसंग सम्झौता गर्दा राज्यको सार्वभौमसत्ता अन्तर्गत विशेषाधिकार प्रयोग गरी सम्झौता गर्ने नभई एक ब्यक्ति सरह वरावरीको हैसियतमा समान आधारमा (Equal Footing) मा समझौता गर्दछ । सम्झौताको विषय सार्वजनिक कानून नभई निजी कानून मानिन्छ ।[१४] सर्वोच्च अदालतबाट सरकारी निकायले गर्ने सम्झौतामा भएको यस ब्याख्याबाट सम्झौतापत्र एवं सोबाट सृजित दायित्वको विषय देवानी दायित्व हुन्छ । यस प्रकारको दायित्व सृजना गर्ने कार्य सार्वजनिक कानून बमोजिम (In accordance with public law) र सार्वजनिक कानूनको परिधि भित्र रही (Within the ambit of public law) गरिन्छ । सार्वजनिक कानून बाहिर गई सम्झौता हुन सक्दैन । उक्त परिधी बाहिर गई सम्झौता गरेमा उक्त करार बदर हुन्छ ।[१५] त्यसैगरी कानूनमा तोकिएको प्रकृया वा औपचारिकता पुरा नगरी भएको सम्झौता समेत

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[७] सार्वजनिक खरिद नियमावली, २०६४ नियम ३८
[८] सार्वजनिक खरिद ऐन, २०६३ दफा १३(२)(ज)
[९] सार्वजनिक खरिद ऐन, २०६३ को दफा १४(८)
[१०] ने.का.प. २०६७ नि.नं. ८३३४ पृ. २४५१
[११] मुलुकी देवानी संहिता, २०७४ दफा ४९४
[१२] ने.का.प. २०६९ नि.नं. ८७७६ पृ. ३४५
[१३] मुलुकी देवानी संहिता, २०७४ दफा ४९९
[१४] ने.का.प. २०६७ नि.नं. ८३७ पृ. ३६७
[१५] मुलुकी देवानी संहिता, २०७४ दफा ५१७(१)

कार्यान्वयन योग्य हुन सक्दैन ।[१६] करारको आधार अर्थात करार गर्न पाउने शक्ति (Empowerment) कानूनले दिएको हुनुपर्दछ । कानूनले अधिकार दिएको अवस्थामा करारले वैधता प्राप्त गर्दछ । सार्वजनिक कानून अन्तर्गत सम्झौता भएको कारणले करार सार्वजनिक कानून सरह हुने अवस्था हुदैन ।

सार्वजनिक खरिद सम्बन्धमा वोलपत्र आव्हान गर्ने र सम्झौता गर्ने कार्य देवानी विषयवस्तु मानिन्छ । के कस्ता कार्य वा कारोवारलाई देवानी विषयवस्तु (Civil matter) मानिन्छ भन्ने सम्बन्धमा कानूनमा प्रष्ट व्यवस्था गरिएको छ । कानूनमा फौजदारी कसुरको रुपमा परिभाषित गरिए बाहेकका कानूनी हक दायित्व एवं सम्पत्ति सम्वन्धी विषयलाई देवानी विषय मानिन्छ । कुनै करार, अधिकार वा अनुचित सम्वृद्धि अन्तर्गतको कुनै हकदावीको विषय देवानी विवाद मानिन्छ ।[१७] करार एवं अर्धकरार अन्तर्गतको विषयवस्तु फौजदारी विवाद हुदैन ।[१८] सामान्य कानूनले नै देवानी विषय मानिने खरिद कार्यमा देवानी तत्व अन्तर निहित हुन्छ ।

सार्वजनिक खरिद सम्बन्धी कार्यको मूल आधार सम्झौता हो । यस कार्यका सामान्य व्यवस्थाहरु करार कानून बमोजिम नै नियमित हुन्छन । साविकमा करार ऐन, २०५६ का प्रावधानहरु सार्वजनिक खरिद सम्बन्धमा सामान्य प्रावधानका रुपमा लागु हुन्थ्यो । उक्त कानूनलाई प्रर्तिस्थापन गर्दै मुलुकी देवानी संहिता, २०७४ लागू भएकोले यस ऐनको करार तथा अन्य दायित्व सम्बन्धी व्यवस्थाले सम्झौता सम्बन्धी सामान्य व्यवस्थालाई नियमित गर्दछ । सार्वजनिक खरिद सम्बन्धमा सार्वजनिक खरिद ऐन, २०६३ र सार्वजनिक खरिद नियमावली, २०६४ मा रहेका व्यवस्थाहरुको हदसम्म सोहि प्रावधान लागु हुन्छन् । यो सार्वजनिक खरिद सम्बन्धी विशेष व्यवस्था हो । मुलुकी देवानी संहिता ऐन, २०७४ ले नियमित गरेको विषयमा प्रचलित कानूनमा छुट्टै व्यवस्था भएमा यस ऐनको व्यवस्थाले कुनै असर पार्ने छैन ।[१९]

सार्वजनिक खरिदमा उत्पन्न कुनै द्विविधा वा विवादको निरोपण सार्वजनिक खरिद सम्बन्धी विशेष कानूनद्वारा संवोधन हुन नसक्ने अवस्थामा करार अन्य दायित्व सम्बन्धी प्रावधानको आधारमा नियमित गरिन्छ । सार्वजनिक खरिद कानूनमा समेत कतिपय प्रावधानमा सामान्य कानून लागु हुने व्यवस्था गरिएको छ । मालसामान तथा अन्य सेवा खरिद सम्बन्धमा सार्वजनिक खरिद नियमावलीमा व्यवस्था नभएको कुरामा वस्तु विक्री करार सम्बन्धी प्रचलित कानून बमोजिम हुने प्रावधान छ ।[२०] यस प्रावधानबाट वस्तु वा अन्य सेवा खरिद सम्बन्धमा सार्वजनिक खरिद सम्बन्धी कानूनमा व्यवस्था नभएकोमा मुलुकी देवानी संहिता, २०७४ को दफा ५४५ देखि ५६२ सम्मको प्रावधानद्वारा नियमित हुन्छ ।

वोलपत्र आव्हान गरी खरिद गर्ने कार्य स्वयंमा वस्तु वा सेवा वा दुवैको संयोजनको खरिद हो । वजारमा ब्यापारिक चिज (Commercial commodities) मानिने चिजहरु खरिद विक्री हुन्छन । यसरी ब्यापारिक चिज खरिद गर्ने कार्य स्वत: ब्यापारिक क्रियाकलाप मानिन्छ । सार्वजनिक कोषबाट खरिद गरिने भएकोले यसको प्रक्रिया एवं अन्य व्यवस्था कानूनमा गरिएकोले यसको मुल विशेषता (Fundamental characteristic) अन्यथा हुने वा विलुप्त हुने अवस्था हुदैन । यो सार्वजनिक निकायले गर्ने ब्यापारिक क्रियाकलाप (Commercial activities) मानिन्छ । सार्वजनिक निकायले न्यूनतम लागतमा वस्तु वा सेवा खरिद गर्न प्रतिस्पर्धा गराउनु वोलपत्रको विधिद्वारा मूल्यमा मोलमोलाई (Bargaining) गरेको विशेषता अन्तरनिहित हुन्छ । तसर्थ यस प्रकारको कारवाईलाई देवानी कारवाई मानिन्छ । वोलपत्रको विधिद्वारा खरिद गर्ने कार्य प्रथम दृष्टिमा नै देवानी कार्य मानिन्छ । वोलपत्र स्वीकृत गर्ने कार्य करारिय प्रकृतिको देवानी प्रकृया हो । करार सम्वन्धी कानून र प्रचलित कानून बमोजिम हुने कारवाईलाई स्वभाविक रुपमा पुरा हुन दिनु पर्ने हुन्छ । कानून बमोजिमको प्रकृया पुरा नहुदै सार्वजनिक खरिद सम्बन्धी कार्यको पक्ष अर्थात Employer ले कानून बमोजिम लिने निर्णयको विवेकमा हस्तक्षेप गर्न खोज्नु हुदैन । जसको जे अधिकार हो उसलाई आफ्नो अधिकार स्वतन्त्र रुपमा प्रयोग गर्न दिनुपर्दछ । अनुचित हस्तक्षेप हुन्छ भने त्यस्तो कार्य स्वयं पनि अनुचित हुन जान्छ । जुन निकायबाट वोलपत्रको कारवाई भैरहेको छ, यसले गर्ने निर्णय अरुले पनि गर्न गराउन हुदैन ।[२१]

सार्वजनिक खरिद सम्बन्धमा व्यवस्था भएका विधायिकी कानून एवं सर्वोच्च अदालतबाट प्रतिपादित नजिरवाट सार्वजनिक खरिद देवानी कार्य हो भन्ने प्रष्ट हुन्छ । यस प्रकारको सम्बन्ध देवानी पृष्ठभुमी (जग) बाट कायम भएको

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[१६] ऐ.ऐ. दफा ५०५(३),५१९(२)(ख)
[१७] मुलुकी देवानी कार्यविधि संहिता, २०७४ दफा २(३)
[१८] मुलुकी फौजदारी कार्यविधि संहिता, २०७४ दफा २(ठ)
[१९] मुलुकी देवानी संहिता, २०७४ दफा ३
[२०] सार्वजनिक खरिद नियमावली, २०६४ नियम २१(३)
[२१] ने.का.प. २०७४ नि.नं. ९७४२ पृ.४८

हुन्छ । जुन सम्बन्धको उत्पत्ती वा जन्म देवानी पृष्ठभुमी वा आधारमा भएको हो, तत् सम्बन्धमा उत्पन्न कुनै पनि विवाद वा असमभ्कदारीको निरोपण र तत् सम्बन्धी उपचार देवानी कानूनले प्रावधान अनुसार हुनुपर्ने हुन्छ । देवानी विषयलाई बलजफ्ती फौजदारीमा रुपान्तरण गर्ने कार्य स्वयंमा गैर कानूनी र गलत कार्य हो । करारको शर्त पालना गरे वा नगरेको सम्बन्धमा र त्यसबाट हुन गएको नोक्सानी वा क्षति सम्बन्धमा करार ऐनले तोकेको देवानी दायित्व सृजना हुन्छ ।[२२] सम्झौता बमोजिम टिकट विक्रीको रकम बाँकी राखि नतिरेको भन्ने प्रश्न अन्तरनिहित रहेको विवादलाई फौजदारी प्रकृतिको विवाद मान्न सकिदैन ।[२३] यसप्रकार सार्वजनिक निकायको सेवा उपलब्ध गराउन विक्री गरिएको हवाई टिकटको रकम भुक्तानी नभएको कार्यलाई भ्रष्टाचारजनित फौजदारी कसुर नभई देवानी विषय मानिने सर्वोच्च अदालतबाट व्याख्या भएको छ । सम्झौताबाट सृजित हकाधिकार एवं दायित्वको विषयमा प्रहरी प्रशासनले व्यक्तिलाई फौजदारी कसुरमा नियन्त्रणमा लिई अनुसन्धानको कार्य गरिएकोमा प्रथम दृष्टिमा उक्त कार्य देवानी प्रकृतिको देखिएकोले थुनाबाट छाडी दिनु भनी बन्दी प्रत्यक्षीकरणको आदेश जारी भएको छ ।[२४]

३. सार्वजनिक खरिद सम्बन्धमा उत्पन्न विवाद निरोपण :

सार्वजनिक खरिद व्यापारिक गतिविधि तथा विशुद्ध देवानी मानिएको विषय यस सम्बन्धमा गरिएको उपचारको व्यवस्थाबाट प्रष्ट हुन्छ । सम्झौतापत्र यसका पक्षहरुले आ-आफ्नो निम्ती वनाएको निजी कानून (Private law) मानिन्छ । निजी कानून यसका पक्षहरुलाई मात्र लागु हुन्छ । करारद्वारा उत्पन्न दायित्व करारका पक्षहरुले पालना गर्नुपर्ने हुन्छ ।[२५] करारको विषयवस्तु करारको पक्षको व्यक्तिगत दक्षता एवं योग्यतासंग सम्बन्धित भएमा उक्त करारद्वारा सृजित दायित्व सम्झौताकै पक्षले पालना गर्नुपर्दछ । सम्पत्तिसंग सम्बन्धित सम्झौताको दायित्व सम्झौताको पक्षको मृत्यु भएमा वा कुनै कारणले असक्षम भएमा निजका उत्तराधिकारीले कारारिय दायित्व पुरा गर्नुपर्दछ ।[२६] यस प्रावधानबाट सम्झौतापत्रद्धारा उत्पन्न दायित्व सम्झौताको पक्षले पालना गर्नुपर्ने र सम्पत्तिसंग सम्बन्धित भएका दायित्व निजका उत्तराधिकारीले पालना गर्नुपर्ने हुन्छ । यस प्रावधानले दायित्व परिपालनाको सिमाकंन प्रष्ट गरेको छ ।

यस प्रकारको निजी कानून सम्झौताको परिपालना नभएमा क्षतिपूर्ति एवं उपचारको व्यवस्था गर्न करारका पक्षहरु स्वायत्त हुन्छन् । यस अवस्थामा उपचारको प्रकृति समेत करारका पक्षहरुले नै निर्धारण गर्न सक्दछन् ।[२७] सम्झौता सम्बन्धी विवाद मध्यस्थताद्धारा समाधान गर्ने प्रावधान भएकोमा सोहि बमोजिम अन्यथा मध्यस्थता ऐन, २०५५ मा तोकिएको कार्यविधि अपनाई विवाद निरोपण गराउनु पर्ने हुन्छ ।[२८] सम्झौतापत्रमा विवाद निरोपण गर्ने व्यवस्था भएकोमा सो सम्झौता सम्वद्ध विवाद सुनवाई एवं निरोपण गर्ने अदालतको क्षेत्राधिकार हुदैन ।[२९] सम्झौतापत्रमा मध्यस्थताको प्रावधान भएकोले अदालतमा उजुरी लाग्न सक्दैन ।[३०] मध्यस्थतालाई विवाद समाधान गराउने वैकल्पिक उपचारको रुपमा मान्यता दिइएको छ । तसर्थ मध्यस्थताको प्रावधान भएको सम्झौता सम्वद्ध विवादमा रिट निवेदन दायर गरिएको वैकल्पिक उपचारको आधारमा खारेज भएको छ ।[३१] सम्झौतासंग सम्वन्धित विवाद एवं व्यापारिक प्रकतिका देवानी विवादहरु मध्यस्थताद्धारा निरोपण गराउन सकिन्छ ।[३२] प्रचलित कानून बमोजिम सार्वजनिक कानूनसंग सम्वन्धित विवादहरु मध्यस्थताद्धारा निरोपण गराउन सकिदैन । फौजदारी प्रकृतिका राज्यको सरोकार रहने तथा सर्वसाधरणको सरोकार रहने फौजदारी विवाद मध्यस्थता जस्तो निजी अदालतबाट निरोपण गराउन सकिदैन । सार्वजनिक कानून अन्तर्गत पर्ने फौजदारी प्रकृतिको विषयलाई गैर मध्यस्थता योग्य (Nonarbitral) विवाद मानिन्छ । सार्वजनिक खरिद सम्बन्धी सम्झौतापत्र सम्बन्धमा उत्पन्न विवाद मध्यस्थाद्धारा निरोपण गराउनु पर्ने वाध्यात्मक व्यवस्था गरिएको छ । मध्यस्थबाट विवाद निरोपण गराउनु अगावै आपसी सहमतीमा विवाद समाधान गर्नुपर्ने हुन्छ । यस विधिद्धारा विवाद समाधान नभएमा मध्यस्थद्धारा समाधान गराउने सम्झौतापत्रमा उल्लेख गर्नुपर्ने हुन्छ ।[३३] आपसी सहमतीबाट विवाद समाधान नभएमा मध्यस्थद्धारा विवाद समाधान गराउने प्रकृया शुरु गर्नुपर्ने हुन्छ ।[३४]

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[२२] ने.का.प. २०६६ नि.नं. ८८०९ पृ. ६१४

[२३] ने.का.प. २०४६ नि.नं. ३८४९ प. ६१४

[२४] केशवसिंह ठकुरीको हकमा शेभासिंह ठकुरी वि. महानगरिय प्रहरी अपराध महाशाखा समेत (२०७१–WH–००११)

[२५] मुलकी देवानी संहिता, २०७४ दफा ४९५(१)

[२६] मुलकी देवानी संहिता, २०७४ दफा ४९५(२)

[२७] ऐ.ऐ. दफा ५०७

[२८] मध्यस्थता ऐन, २०५५ दफा ३(१)

[२९] ऐ. ऐ. को दफा ३९

[३०] ने.का.प.२०४८ नि.नं. ४३४९ पृ. ४४३

[३१] ने.का.प. २०२० नि.नं. २०२० पृ.

[३२] मध्यस्थता ऐन, २०५५ दफा ३(२)

[३३] सार्वजनिक खरिद ऐन, २०६३ दफा ५८

[३४] सार्वजनिक खरिद नियमावली, २०६४ नियम १३५

देवानी प्रकृतिका व्यापारिक विवाद एवं सम्झौतासंग सम्वद्ध विवाद मध्यस्थद्धारा समाधान हुनसक्ने मध्यस्थता योग्य (Arbitral dispute) मानिएको छ । सम्झौताद्धारा राज्यको प्रचलित कानूनको अधिनमा रही देवानी हकाधिकार एवं दायित्व (Civil obligation) को सम्बन्ध सृजना गर्दछ । यस प्रकारको विषयमा आधारित विवाद मध्यस्थताद्धारा समाधान हुन सक्दछ । सार्वजनिक खरिद कानूनमा खरिद सम्बन्धमा उत्पन्न विवाद मध्यस्थताद्धारा समाधान गराउन सकिने व्यवस्था भएकोले सार्वजनिक खरिदको सम्बन्ध विशुद्ध देवानी विषय हुने विधायिकी कानूनको प्रावधानले नै प्रष्ट गर्दछ । तसर्थ यस सम्बन्धमा उत्पन्न विवाद देवानी विधिद्धारा तथा सम्झौतापत्रमा सुझाइएको माध्यम मध्यस्थता प्रणालीद्धारा समाधान गराउनु पर्ने हुन्छ । देवानी कानूनको विवाद निरोपण सम्बन्धी सामान्य सिद्धान्त र विधायिकी कानूनले व्यवस्था गरेको सामान्य प्रावधान मानिन्छ ।

४. सार्वजनिक खरिद सम्बन्धमा भ्रष्टाचारको आरोप :

सार्वजनिक खरिद सम्बन्धी सम्झौता वा सहमती वा कार्यको आधार देवानी कानून हो । सार्वजनिक खरिदको कराररिय सम्बन्ध (Contractual relationship) को जग देवानी कानून हो । सार्वजनिक खरिदको उत्पत्ति (Genesis) नै देवानी कानूनको आधारमा भएको हुन्छ । वोलपत्र आव्हान गर्ने कार्य नै देवानी कार्य हो ।[३५] वोलपत्र आव्हानलाई सम्झौता गर्ने प्रयोजनको निम्ती प्रस्ताव आव्हान (Invitation of offer) मानिन्छ । यसरी पेश हुन आएका प्रस्ताव मध्येबाट सार्वजनिक निकायले स्वीकृत गरेपछि प्रस्तावमा सहमती (Acceptance) गरेको मानिन्छ । यस पछि कराररिय सम्बन्ध हुन्छ तर सार्वजनिक खरिदमा कार्यसम्पादन जमानत पेश गरी लिखित सम्झौता हुनुपर्ने वाध्यात्मक व्यवस्था भएकोले लिखित सम्झौतापत्रमा हस्ताक्षर भएपछि मात्रै करार भएको मानिन्छ ।[३६] सार्वजनिक खरिदको उत्पत्तिको आधारमा, यसको विशेषता, मान्य सिद्धान्त र विधायिकी कानून समेतको आधारमा यो विशुद्ध देवानी विषय हुदा हुदैं पनि सार्वजनिक खरिद सम्बन्धमा राष्ट्रसेवक एवं ठेकेदार (निर्माण व्यवसायी, आपूर्तिकर्ता परामर्शदाता) समेत उपर भ्रष्टाचारको आरोप लगाई अभियोगपत्र दायर भएको पाइन्छ । सार्वजनिक खरिद सम्बन्धमा भ्रष्टाचार निवारण ऐन, २०५९ को दफा ८ र १७ को आधारमा अभियोग लगाउने गरेको पाइन्छ । यसरी अभियोग लगाउदा राष्ट्रसेवक एवं ठेकेदारको मिलेमतो भएको भन्ने प्रमाणको आधारमा वा अमूर्त व्याकरणको आधारमा आक्रमक शब्दावली प्रयोग गरी अभियोग लगाउने गरेको पाइन्छ । राष्ट्रसेवकको हकमा सम्झौतापत्रको मुल कार्य गर्ने वा विशेषज्ञ कर्मचारी वाहेक उपरोक्त प्रकृयामा आफ्नो सामान्य कर्तव्य पालनाको क्रममा सहभागी भएका राष्ट्रसेवकलाई समेत प्रतिवादी कायम गरिएको पाइन्छ । सार्वजनिक खरिद कार्यको प्रकृतिको आधारमा केही कर्मचारी विशेष ज्ञान भएका र मुख्य वा निर्णायक जिम्मेवारीमा रहेका हुन सक्दछन भने केही सामान्य प्रशासनिक कार्य गर्ने वा सहायक प्रकृतिको कार्य गर्ने हुन सक्दछन । उक्त कार्यमा कुनै रुपमा संलग्न भए पनि सो कर्मचारी उपर अभियोग लगाउने गरिएको पाइन्छ ।

गोश्वारा अभियोजन पद्धति अविवेकी र निर्मम प्रकृतिको रहेको छ । अनुसन्धानको क्रममा राष्ट्रसेवकको ज्ञान, मुख्य कर्तव्य (Core duty) वा विशेषज्ञता भएको व्यक्तिले ठिक छ भने पछि त्यसलाई मानी कार्य गर्ने कर्मचारी समान हुदैनन् । भ्रष्टाचारमा अभियोग लगाउने प्रणाली "खसी वकरी एउटै धकरी" भन्ने उखान चरितार्थ हुन्छ । अभियोजन पक्ष पहिलो न्यायधिश हो । अनुसन्धानबाट विवादको मुल विषयमा ज्ञान, विशेषज्ञता नभएको र निर्णायक कार्य नगरेकोलाई छुट्याउनु पर्ने कर्तव्य निर्वाह र विवेक प्रयोग गर्न अभियोजन पक्षले इच्छाएको देखिदैन । जति धैरै संख्यामा प्रतिवादी कायम गर्न सक्यो त्यती उपलब्धी मानि अभियोजन लगाउने पद्धति स्वयंमा निर्ममताको घोतक हो ।

भ्रष्टाचार फौजदारी कसुर हो ।[३७] फौजदारी कसुर गरेको ठहर भएमा कैद एवं जरिवाना लगायतका कानूनमा तोकिए बमोजिम सजाय हुने कार्यलाई सम्झनुपर्दछ ।[३८] प्रचलित कानूनले देवानी विषय मानिने वा देवानी दायित्वको विषयमा कैद एवं जरिवाना हुन सक्दैन ।[३९] सम्झौता सम्बन्धी दायित्व पालना नभएको अवस्थामा क्षतिपूर्ति गराउदा समेत सचेत हुनुपर्दछ । कराररिय विषयमा अत्याधिक क्षतिपूर्ति भराउने कार्य भएमा त्यसले जरिवानाको स्वरुप धारण गर्दछ । तसर्थ करारमा क्षतिपूर्ति गराउदा वास्तविक क्षति भएको वरावर (At cost) भराउनु पर्दछ भन्ने न्यायीक मान्यता रहेकोछ ।[४०] सम्झौताको परिपालना नभएको अवस्थामा हुन गएको वास्तविक क्षति (Actual loss) बरावरको क्षतिपूर्ति भराई पाउने साविकको करार ऐन, २०५६ को दफा ८३(३) मा प्रावधान थियो ।

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[३५] ने.का.प. २०७४ नि.नं. ७९४२ पृ. ४८
[३६] मुलुकी देवानी संहिता, २०७४ दफा ५०५(३), ५१९(२)(ख)

[३७] मुलुकी फौजदारी कार्यबिधी संहिता, २०७४ दफा २(ङ)
[३८] कानून ब्याख्या सम्बन्धि ऐन, २०१० दफा २(थ)
[३९] ने.का.प. २०६७ नि.नं. ८३२७ पृ. ३६१
[४०] ने.का.प. २०६८ नि.नं. ८६३५ पृ. १०२८

उक्त व्यवस्थालाई हाल रहेको करार तथा देवानी दायित्व सम्बन्धी कानूनले निरन्तरता दिएको छ।[४१] कानूनले तथा सर्वोच्च अदालतबाट करारको निष्पालनाको विषयमा क्षतिपूर्ति भराउदा समेत जरिवानाको रुप धारणा गर्न नहुने अवधारणा लिएको छ। यसरी करारको उल्लंघनमा जरिवाना सरहको अवस्था क्षतिपूर्तिको उपचार हुन हुदैन, भन्ने विधायिका एवं अदालतको स्पष्ट धारणा देखिन्छ। यस अवस्थामा करार पालना नभएको वा उल्लघन भएको अवस्थामा दण्ड जरिवाना हुने गरी फौजदारी अभियोग लाग्ने अवस्था हुन सक्दैन । नेपालले स्वीकार गरेको नागरिक तथा राजनितिक अधिकार सम्बन्धी अन्तर्राष्ट्रिय सन्धीमा समेत देवानी दायित्वमा कैद जनित कारवाई हुने कानूनी व्यवस्था गर्न नसकिने प्रावधान छ। करारको उल्लंघनमा फौजदारी कसुरमा आरोप लगाउने र दण्डित गर्ने कार्य नेपालले अन्तर्राष्ट्रिय जगतमा गरेको प्रतिवद्धता प्रतिकुल हुन्छ।

भ्रष्टाचारको विषयमा अनुसन्धान, अभियोजन गर्न संवैधानिक आयोगको व्यवस्था गरिएको छ। सरकारबाट अनुसन्धान गर्दा पक्षपात एवं प्रवृत्त धारणा हुन सक्ने भएकोले भ्रष्टाचारको विषयमा अनुसन्धान र अभियोजन गर्न स्वतन्त्र संस्थागत व्यवस्था गरिएको हो। संविधानमा नै विशेषाधिकार सहित आयोगको व्यवस्था गर्नुको आशय निष्पक्षता, स्वच्छता र न्यायीक मूल्य मान्यताको अपेक्षा हो। भ्रष्टाचारजन्य कसुरको सम्बन्धमा अनुसन्धान, छानविन गर्ने कार्य आधारभुत रुपमा कार्यापालिकाको जिम्मेवारीको विषय हो। कार्यापालिकाको उक्त कार्यमा विश्वासनियता, निष्पक्षता र सक्षमता कायम गर्न आवश्यक ठानेर स्वतन्त्रतापूर्वक कार्य सम्पादन गर्ने प्रावधान सहित आयोग गठनको व्यवस्था संविधानमा गरिएको र अख्तियारी सुम्पिने कार्य भएको हो। बृहत्त अर्थमा हेर्दा राज्यका तिन अङ्ग कार्यापालिका, ब्यावस्थापिका र न्यायपालिका मध्ये आयोगले सम्पादन गर्ने कार्यको प्रकृति कार्यपालिकीय क्षेत्र भित्रको विषय देखिन्छ। कार्यसम्पादनमा स्वतन्त्रता र निष्पक्षता कायम राख्ने हेतुले संवैधानिक निकायको रुपमा आयोगको स्थापना गरिएको कुरा स्वयंले नै निष्पक्षता, सक्षमता, स्वतन्त्रता आदिको ब्यवहारीक प्रत्याभुती भएको सम्झनु वस्तुवादी दृष्टिकोण बन्दैन । यो पक्ष निश्चित नै विचारणीय देखिन्छ । संवैधानिक इजलासको यस फैसलाबाट भ्रष्टाचारको अनुसन्धान अभियोजन वस्तुनिष्ठ हुनुपर्ने प्रष्ट निर्देश गर्दछ।[४२] आयोगले राज्यको सामान्य कानूनी प्रावधान जानेको हुनुपर्दछ । सर्वोच्च अदालत संविधान एवं कानूनी ब्याख्या गर्ने अन्तिम निकाय भएको र उक्त अदालतबाट भएको कानूनको ब्याख्या कानून सरह लागू हुने संवैधानिक प्रावधान छ।[४३] राज्यको कानूनले कस्तो प्रणाली अपनाएको छ भन्ने ब्यहोरामा आयोग अनभिज्ञ हुन पाउदैन । सामान्य कानूनका सिद्धान्तहरुले कानून सरहनै मान्यता प्राप्त गर्दछन्। प्रचलित कानूनले प्रष्टत: देवानी विषयवस्तु मानिएको क्रियाकलापलाई फौजदारी कसुरमा रुपान्तरण गर्ने कार्य स्वयंमा अक्षम्य कार्य हो। यो स्वयंमा अधिकारको दुरुपयोग (Abuse of jurisdiction) हो। कानूनको अज्ञानता क्षम्य नहुने देवानी कानूनको सामान्य सिद्धान्त रहेको छ।[४४] यो मान्यताको साथै आयोगबाट सम्पादन हुने कार्य कानून अनुरुप हुने वैध अपेक्षा (Legitimate Expection) ठानिन्छ।[४५]

सार्वजनिक खरिदको कार्यमा भ्रष्टाचार नहुने वा हुनै नसक्ने होइन । सार्वजनिक खरिद सम्बन्धी प्रावधानको पालना नगरेको कुन अवस्थामा फौजदारी कसुर/भ्रष्टाचार भन्ने विवेक मन्थनिय (Brain Storming) प्रश्न मानिन्छ । सार्वजनिक खरिद सम्बन्धमा राष्ट्रसेवकले वदनियत गरी सार्वजनिक निकाय, नेपाल सरकार वा सार्वजनिक कोषमा हानीनोक्सानीपुऱ्याउने र आफु वा अन्यलाई गैरकानूनी लाभपुऱ्याउने गरी कुनै कार्य गरेमा त्यस्तो कार्य भ्रष्टाचार हुनसक्दछ। सम्मानित सर्वोच्च अदालतबाट भ्रष्टाचारको सम्बन्धमा भएका ब्यवहारबाट भ्रष्टाचारको सम्बन्धमा निम्नानुसारको तत्व हुनुपर्दछ :

(अ) बदनियत (आ) सार्वजनिक सम्पत्तिलाई नोक्सानी पुऱ्याउने कार्य र (इ) आफू वा अन्य कसैलाई गैरकानूनी लाभ पुऱ्याउने कार्य।

सार्वजनिक कोषको सम्बन्धमा भ्रष्टाचारको अभियोग लगाउनुको निमित्त माथि उल्लेखित सबै तत्वहरु हुनुपर्दछ । सार्वजनिक खरिद सम्बन्धमा कुनै कार्य गुणस्तरिय नभएको वा अन्य कुनै अवस्था उत्पन्न भएको अवस्थामा भ्रष्टाचारको अभियोग राष्ट्रसेवक, ठेकेदार एवं परामर्शदाता समेतलाई लगाउने गरिएको पाइन्छ । यस सम्बन्धमा कम गुणस्तरको वा सम्झौतानुसार कुनै कार्य नभएको आधार लिई सो अवस्थामा राष्ट्रसेवक र ब्यवसायी मिलेमतो गरेको भन्ने आधार लिई अभियोगपत्र दायर गर्ने प्रचलन रहेको छ । मिलेमतो गरेको भन्ने मनोगत आधार लिई अभियोगपत्र दायर गरेकोले एकातर्फ

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[४१] मुलकी देवानी संहिता, २०७४ दफा ५३७(३)
[४२] अधिवक्ता विष्णुप्रसाद घिमीरे वि. संघीय संसद समेत (०७४-wo-००२०)
[४३] नेपालको संबिधान धारा
[४४] मुलकी देवानी संहिता, २०७४ दफा
[४५] नें.का.प. २०६५ नि.नं. ७९४३ पृ. ३२०, ने.का.प. २०७४ नि.नं. ९७५३ पृ. १७९

अभियोग दावी नपुग्ने हुन्छ । मनोगत आधारमा दायर भएकोले सार्वजनिक कोषमा हानी नोक्सानीपुऱ्याउने कार्य भएमा त्यो सोधभर्ना हुने अवस्था हुदैन । अर्कोतर्फ राष्ट्रसेवक एवं ब्यावसायीले फौजदारी कसुरको आरोपमा भोग्ने मानसिक, सामाजिक, आर्थिक क्षति एवं राष्ट्रश्वेवक निलम्वित भई उक्त अवधिमा राज्यले प्राप्त गर्ने सेवा समेतबाट राज्य वन्चित हुन्छ। आरोप लगाउने उद्धेश्यले मात्र दायर गरेको कानूनी कारवाईको परिणती दुवै पक्षलाई थप नोक्सानी हुनु हो । फौजदारी कसुरको अभियोग वस्तुनिष्ठ हुनुपर्दछ । सार्वजनिक खरिदमा भ्रष्टाचारको आरोपमा निम्नानुसारको तत्व विचारणिय छन् ।

(क) मिलेमतो वस्तुनिष्ठ रुपमा प्रमाणित हुनुपर्ने : सार्वजनिक खरिदको प्रकृति एवं सम्झौता अनुसार आपूर्तिकर्ता ब्यावसायी र आपूर्ति बुझिलिने (प्रमाणित गर्ने) तथा भुक्तानी दिने राष्ट्रसेवक हुन्छन । सम्झौताका सम्बन्धमा कम्तिमा दुई पक्ष हुनुपर्दछ ।[४६] एउटा पक्ष बिक्री गर्ने र अर्को पक्ष खरिद गर्ने निकायको प्रतिनिधि भई कार्य भएको आधारमा मिलेमतो भएको भन्न मिल्दैन। मिलेमतो गर्नको निम्ती भ्रष्टाचारमा हुनुपर्ने तत्वहरु विद्यमान हुनुपर्दछ। कुनै राष्ट्रसेवकले सार्वजनिक सम्पत्तिलाई हानी नोक्सानी पुऱ्याउने वदनियत लिई कार्य गरेको र त्यसबाट सार्वजनिक सम्पत्ति वा कोषलाई क्षति भएको अवस्था हुनुपर्दछ।

कुनै कार्य सम्झौता अनुसार नभएको आधारमा हानीनोक्सानीपुऱ्याउने वदनियत भएको भन्न मिल्दैन । राष्ट्रसेवकले वदनिय लिई कार्य गर्नको लागि उत्प्रेरणा दिने तत्व (Motivation factor) हुनुपर्दछ । वदनियत हुनुको निम्ती लिनुखानु गरेको हुनुपर्दछ। लिनुखानु नभएमा वदनियत रहेको आरोप मनोगत र तथ्यहिन मानिन्छ ।[४७] भ्रष्टाचारको कसुर हुन बदनियत हुनुको साथै रकम कलममा लिनुखानु गरेको पनि हुनुपर्छ । साथै गैरकानूनी लाभ र गैरकानूनी हानीको मात्रा प्रमाणित हुनुपर्दछ । अभियोग लगाउदैमा कसुर कायम हुनसक्दैन ।[४८] सवारी सरुवा नामसारी दर्ता गराउदा पुनरावेदक प्रतिवादीहरुले गैरकानूनी लाभ प्राप्त गरेको अथवा कुनै सुविधा लिनुखानु गरी कायम गरेको देखिदैन। गैरकानूनीरुपमा रकम लिनुखानु गरेको अथवा कुनै लाभ प्राप्त गरेको नदेखिएसम्म निजले गरेको काम वदनियतपूर्वक हो भन्ने अनुमान मात्र हुनजान्छ।[४९] लिनुखानु गरेको छैन भने वदनियतपूर्वक कार्य गर्नुपर्ने कारण हुनसक्दैन । सो बाहेक अन्यलाई लाभपुऱ्याउने नियतपूर्वक कार्य गरेको समेत हुन सक्दछ । यस अवस्थामा लाभ पाउने पक्ष कुनै सम्बन्ध वा आर्थिक स्वार्थ भएको हुनुपर्दछ । आपूर्तिकर्ता ठेकेदार आफन्ती भएको वा आपूर्तिकर्ता निकाय भएमा उक्त निकायमा वित्तिय स्वार्थ भएमा उक्त ठेकेदारलाई लाभपुऱ्याउमा आफुले लाभ प्राप्त गर्ने अवस्था हुन्छ । यसप्रकार प्रत्यक्ष वा प्रत्यक्ष लाभ लिने प्रवन्ध भएमा सार्वजनिक सम्पत्तिमा हानीनोक्सानीपुऱ्याउने नियतले कार्य गरेको हुनसक्दछ ।

(ख) असल नियतले कार्य गरेको : कुनै कार्य सम्पादन गर्ने क्रममा कानूनी व्यवस्था द्बिविधाजनक वा प्रष्ट नभएको अवस्था उत्पन्न हुन सक्दछ । कामको सिलसिलामा प्रकट भएको तथ्यगत वुदांलाई कसरी संवोधन गर्ने भन्ने सम्बन्धमा कानूनी प्रावधानद्धारा निरोपण हुन सक्ने अवस्थामा राष्ट्रसेवकले आफ्नो विवेकको आधारमा उत्तम विकल्पद्धारा कार्य गराउने निकासा दिन सक्दछ । उक्त निर्णय बमोजिमको कार्य गर्दा अपेक्षित परिणाम नआउने अवस्था हुन सक्दछ । त्यसको आधारमा कार्य गर्दा उल्टो परिणाम समेत आउन सक्दछ । यस अवस्थामा राष्ट्रसेवकले तत्काल उपलब्ध तथ्य (Given facts) मा एक राष्ट्रसेवकले गर्नुपर्ने होसियारी अपनाई राम्रो परिणाम प्राप्त गर्नको निम्ती कार्य गरेको हो वा होइन सुक्ष्मरुपमा मनन गर्नुपर्ने हुन्छ । यस्ता विषयमा अनुसन्धान एवं निर्णय गर्दा तत्पदमा, तत्समयमा म भएको भए के गर्थे भनि गंभिर हुनु पर्दछ । राष्ट्रसेबकले गर्नुपर्ने कार्य गरेको अवस्था भए नभएको कर्तव्य वोध गरी निर्णय गर्नुपर्ने हुन्छ। धेरै कानूनमा असल नियतले गरेको कार्यमा उत्तरदायी हुनुपर्ने प्रावधान छ ।[५०]

असल नियतले गरेको कार्यमा राम्रो परिणाम आउने मानिन्छ। असल नियतले गरेको अवस्थामा सदैव राम्रो, हितमुलक, लाभ दिने परिणाम आउने अवस्था नहुन सक्दछ । काम वा निर्णय

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[४६] मुलुकी देवानी संहिता, २०७४ दफा ५०४ र ५४५

[४७] स.अ. बुलेटिन, २०६६ पू. ४११ पृ. २७ (नेपाल सरकार वि. अच्युतराज गौतम)

[४८] स.अ. बुलेटिन, २०६६ पू. ४१० पृ. ७१ (नेपाल सरकार वि. बिमलकुमार थापा)

[४९] ध्रुवराज रेग्मी वि. नेपाल सरकार, २०६४ सालको फौ.पू.नं. ०२१०

[५०] मूल्य अभिबृद्धि कर ऐन, २०५२ दफा ३९

गर्ने क्रममा व्यक्तिगत लाभ लिने वा कसैलाई गैर कानूनी लाभपुऱ्याउने वा सार्वजनिक सम्पत्तिमा क्षतिपुऱ्याउने नियत नभई गरेको कार्यलाई नै असल नियतले गरेको मानिन्छ । निर्णयानुसार काम गर्दा उत्पन्न परिणाम नराम्रो भएको आधारमा खराव नियत रहेको आरोप लगाउन र त्यस्तो आरोपलाई न्यायीक रोहमा मान्यता दिन सकिदैन ।

कुनै व्यक्तिलाई कुनै कसुरको भागिदार वनाउन उक्त कार्य दुषित नियतले गरेको हुनुपर्ने आधुनिक फौजदारी कानूनको मान्य सिद्धान्त रहेको छ । वदनियत, दुषित नियत, अयान्य उदेश्य (Ulterior motive) नभई राम्रो गर्ने सदनियतकासाथ गरिएको कार्यलाई असल नियतले गरेको मानिन्छ । कार्य गर्ने क्रममा उत्पन्न समस्या विशेष प्रकारको भएको र त्यसलाई कानून वा नीतिले प्रष्ट स्वरुपमा संवोधन नगरेको अवस्थामा आफ्नो ज्ञानको आधारमा राम्रो नतिजा आउने अपेक्षा गरिएको कार्यलाई असल नियतले गरेको मानिन्छ । मानिससंग असल नियत (Good Conscience) भन्दा उत्कृष्ट कार्यको अपेक्षा गर्न सकिदैन । असल नियत नै मानिसलाई राम्रो कार्य गराउने भित्री विवेक मानिन्छ ।

(ग) लापरवाहीसाथ कार्य गरेको : कुनै कार्य गर्नको निम्ती कामको प्रकृति अनुसार अपनाउनु पर्ने सावधानी नअपनाउनु, विवेक प्रयोग नगर्नुलाई लापरवाहीसाथ कार्य गरेको मानिन्छ । कामको आवश्यकतानुसार सचेतना नअपनाई वा परिश्रम नगरी भए गरेको कार्यलाई लापरवाही गरेको मानिन्छ । यसरी लापरवाहीबाट गरेको कार्यलाई भ्रष्टाचारको कसुर मानिदैन । कुनै कार्य लापरवाहीसाथ गरेको वा नगरेको भएतापनि असल नियतले गरेको कार्यलाई इमान्दारीतासाथ गरेको मानिन्छ ।[५१] लापरवाहीसाथ गरेको कार्य राष्ट्रसेवकको हकमा विभागिय कारवाईको विषय हुन सक्दछ । निजी क्षेत्रको हकमा क्षतिपूर्तिको विषय हुन सक्दछ । लापरवाही गरेकोले भ्रष्टाचार गरेको मानिदैन । कर्मचारीले इमान्दारीसाथ ऐनले दिएको अधिकार प्रयोग गर्दछ भने यसलाई असल नियतले गरेको मान्नु पर्दछ ।[५२] कर्मचारीले आफ्नो पदीय कर्तव्य तथा जिम्मेवारी पुरा नगरेको कारणले नेपाल सरकारलाई हानी नोक्सानी हुने गरी सरकारी वन जंगलको रुख काटिएको वा मासिएको भन्ने विषय भ्रष्टाचारजन्य कसुर भन्दा पनि कर्मचारी उपर विभागीय कारवाई हुन सक्ने देखिन्छ ।[५३] कर्मचारीले रकम लिनु खानु गरेको प्रमाण नभएको सामान्य मानविय त्रुटी वा सुझबुझको प्रयोगको प्रश्नलाई वदनियत गरेको भन्न मिल्दैन । नियतबस लाभहानीको अवस्था र त्रुटीपूर्ण अवस्था हुनु फरक मानिन्छ । [५४]

(घ) देवानी ब्यापारिक क्रियाकलाप : कतिपय सरकारी एवं सार्वजनिक निकायको कार्यको प्रकृति नै ब्यापारिक प्रकृतिका रहेका छन् । विशेष ब्यापारिक चिज वस्तु आपूर्ति गर्ने निकायका कार्य ब्यापारिक प्रकृतिका रहेका हुन्छन । यस अवस्थामा ब्यापार तथा वाणिज्य क्षेत्रमा प्रचलित पद्धति अनुसार कार्य गर्नुपर्ने हुन्छ । सोको अलावा सार्वजनिक खरिद स्वयंमा ब्यापारिक क्रियाकलाप हो । यस अवस्थामा यसको व्यवस्थापन एवं नियमन ब्यापारिक मान्यता अनुसार हुन्छन् । यस्ता देवानी ब्यापारिक कृयाहरु वाणिज्य क्षेत्रका सिद्धान्त अनुसार गर्नुपर्ने हुन्छ । यस अवस्थामा हानी नोक्सानी वा वढी लागत भएको भन्ने आधारमा मात्रै भ्रष्टाचारको अभियोग दायर हुन नसक्ने सम्मानित सर्वोच्च अदालतको निम्नलिखित सिद्धान्तहरुले प्रष्ट गर्दछन :

१. स्वायत्त संस्थाले कानून बमोजिम करार गर्दछ भने त्यस्तो करारको शर्त निर्धारण गर्नु सो परिपालना गर्नु र अर्को पक्षले करारको परिपालना नगरेमा सो उपर आवश्यक उपाय अबलम्वन गर्नु त्यस्तो कानून बमोजिम संस्थापित संस्थाको स्वाभाविक कानूनी अधिकार हुन्छ । त्यस्तो संस्थाले अन्य कुनै ब्यापारिक प्रतिष्ठानसंग ब्यापारिक कारोवार गर्दछ भने वा कुनै कराररिय अनुसन्धानमा सामेल हुन्छ भने त्यो उसको अधिकारको विषय हुन्छ ।[५५]

२. ठेक्का कसलाई दिने, कसको योग्यता पुगेको, रित पुगेको वा नपुगेको भन्ने कुरा खास गरेर वोलपत्र आव्हानकर्ता (Employer) ले निर्णय गर्ने कुरा हो । सो प्रक्रियामा त्रुटि भए सच्याउन उजुरी दिने वा उपचारको हक प्रचलित कानूनले व्यवस्था गरिरहेको अवस्थामा खास प्रयोजनको लागि स्थापित निकायहरुले निर्णय गर्ने करारिय विषयमा अख्तियार दुरुपयोग अनुसन्धान आयोगले

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[५१] कानून व्याख्या सम्बन्धी ऐन, २०१० दफा २(ज)
[५२] ने.का.प. २०२२ नि.नं. २६५ पृ. १७६
[५३] ने.का.प. २०६० नि.नं. ७२७१ पृ. ७५६
[५४] ने.का.प. २०७५ नि.नं. ९९२४ पृ. १०
[५५] ने.का.प. २०६९ नि.नं. ८८५९ पृ. ११९

हस्तक्षेप गर्नुपर्ने औचित्य र वैधता पुष्टि हुन सकेको देखिदैन ।[५६]

३. सम्झौताको शर्त अनुसार कार्य पुरा नहुने अवस्था देखिएपछि स्वयं प्रतिवादीहरुको सक्रियतामा नोक्सानी हुन गएको फिर्ताको कारवाई अगाडी वढाएको र अदालतबाट रकम भरी पाउने फैसला भएकोले हानीनोक्सानी भएको भन्न मिल्दैन ।[५७]

४. राष्ट्र बैंकले विश्व बैंकबाट प्राप्त गर्ने सहयोग रकम आफुखुशी आफै खर्च गरेको नभई भुक्तानी दिएको रकम विश्व बैंकबाट स्वीकृत भई सोधभर्ना आएको अवस्था हुंदा संस्थाको रकम दुरुपयोग गरी भ्रष्टाचार गरेको तथ्य प्रमाणित हुदैन ।[५८]

(ङ) औचित्यपूर्ण आधार : कुनै अवस्था उत्पन्न भएमा त्यसलाई नियमन गर्ने प्रष्ट कानूनी व्यवस्थाको अभाव वा उक्त अवस्थालाई निषेध गरेकोमा वाहेक उक्त अवस्थालाई कानून नीति, असल अभ्यासको आधारमा औचित्य पूर्णरुपमा निकासा दिनुपर्ने हुन्छ । राष्ट्रसेवकलाई उत्पन्न भएको तथ्यगत अवस्थालाई उपयुक्त रुपमा संवोधन गर्न सक्ने अधिकार रहेको हुन्छ। राष्ट्रसेवक कर्मचारीले कानूनद्धारा प्रष्ट नगरिएको वा कानूनमा खाली खाल्सा (Gaping) भएको अवस्थामा उत्पन्न समस्यालाई औचित्यपूर्ण उचित आधार एवं कारण दिई निर्णय गर्न सक्दछ । उक्त कारण विवेकपूर्ण वा ठिक भएमा उक्त समयमा, उक्त परिस्थितीमा काम गर्ने जुनसुकै ब्यक्ति भएपनि सोहि बमोजिम कार्य गर्ने अवस्था हुन सक्ने देखिएमा औचित्यपूर्ण कार्य भएको मान्नु पर्दछ। यस अवस्थामा ब्यक्तिले निकालेको निष्कर्षणलाई उचित मान्नु पर्दछ । यस्तो तथ्य स्थापित भएमा कानून प्रतिकुल कार्य गरेको आरोप लगाउन मिल्दैन । अन्य व्यक्तिले विवेकपूर्ण, तर्कयुक्त आधारमा गरेको राम्रो निर्णय (Best Judgement) लाई अनादर गरी कसुर गरेको अभियोग लगाउनु स्वयंमा विवेकहिनताको परिचायक मानिन्छ ।

सार्वजनिक खरिद सम्बन्धमा धेरै तत्वहरु मिश्रण भएका हुन्छन। यो ब्यापारिक क्रियाकलाप भएकोले कानूनी प्रावधानको दायरा भित्र मात्रै यसको निकास खोजिएमा ब्यापारिक क्रियाकलाप संभाब्य हुन सक्दैन । सम्मानित सर्वोच्च अदालतको ने.का.प. २०६९ नि.नं.८८५९ पृ. १०६७ मा प्रतिपादित सिद्धान्तले यसलाई मनन गरेको छ । सार्वजनिक खरिदको सम्बन्धमा वार्ता समेत गर्नुपर्ने हुनसक्दछ। यस अवस्थामा अर्को पक्षसंग कुनै विन्दुमा सहमती गर्नुपर्ने हुन्छ। काममा विलम्व हुदां भैसकेको कार्य उपयोगमा आउन सक्ने, भविष्यमा लागत वढ्ने अवस्था समेतलाई विचार गरी कुनै कार्य गराउनुपर्ने हुनसदक्छ। वास्तवमा सार्वजनिक खरिद सम्बन्धमा राष्ट्रसेवकले नयां नयां चुनौती, समस्याहरुसंग जुध्न पर्ने हुन्छ । यस अवस्थामा असल नियतले गरेको कार्यले राम्रो परिणाम नदिन सक्दछ । यस परिणामलाई मात्रै हेरी भ्रष्टाचार जन्य कसुर गरेको आरोप लगाउनु हुदैन । यसको विविध अवस्थालाई मनन गरी अनुसन्धानकर्ता स्वयंले न्यायीक विवेक प्रयोग गरि उचित निष्कर्षमा पुग्नु पर्ने हुन्छ ।

(च) वेरुजु : कुनै कार्य सम्बन्धमा प्रकृयागत व्यवस्थामा भएको त्रुटीलाई भ्रष्टाचार मानिदैन। प्रकृयाको पालना नहुनु फौजदारी अभियोगमा अभियोग लगाउने र सजाय गर्ने आधार हुनसक्दैन । कार्यविधिकोमा कसुर र सजायको व्यवस्था हुदैन। कसुर सजायको व्यवस्था सारवन (अधिकार एवं दण्डको व्यस्था गर्ने) कानूनमा मात्रै हुन सक्दछ। कुनै कार्य वा भुक्तानी सम्बन्धमा कार्यविधिगत व्यवस्था पुरा नभएकोले भ्रष्टाचार हुदैन। भुक्तानी गरिएको रकम विधिवत फर्छौट हुने आधार पेश नभएको आधारमा मात्रै भ्रष्टाचारको अभियोग हुनसक्दैन । वेरुजु भन्नाले रुजु हुन नसकेको अवस्थासम्म हो । भुक्तानीको खर्च प्रमाणित गर्ने कागजात वा पेश भएको कागजातबाट संपुष्टि हुन नसकेको अवस्थालाई वेरुजु मनिन्छ । वेरुजु भन्नाले नियमित गराउन सक्ने विषय हो । रुजु नभएको अवस्थालाई निराकरण गर्न कागजात वा आधार प्रस्तुत गरी रुजु गराउन सकिन्छ । भ्रष्टाचार हुनु र वेरुजु हुनु पृथक पृथक कुरा हुन। भ्रष्टाचारमा ब्यक्तिगत फाइदा लिने वदनियत तत्वको विद्यमानता हुन्छ भने वेरुजुमा खर्च भएको रकम विल भरपाईद्धारा पुष्टि भएको हुदैन । भ्रष्टाचारको कसुर स्थापित हुन सरकारी सम्पत्ति दुषित मनसायबाट खर्च गरी हानीनोक्सानीपुर्‍याउने नियत र त्यसबाट आफुले लिनुखानु गरेको भन्ने प्रष्ट रुपमा देखिनुपर्ने हुन्छ। वेरुजु रकम श्रोतमा संलग्न हुन छुट भएका विल भरपाई पछि पेश गरी रुजु पनि हुन सक्छ। बील

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[५६] ने.का.प. २०७४ नि.नं. ९७४२ पृ. ४८

[५७] स.अ. बुलेटिन २०६६ पू. ४११ पृ. २७ (नेपाल सरकार वि. अच्युतराज गौतम)

[५८] ने.का.प. २०६६ नि.नं. ८१९४ पृ. ११५९

भरपाईद्धारा रुजु गराउन नसके वेरुजु भएको रकम खर्च गर्ने अख्तियारवालाले दाखिला गर्नु गराउनु पर्नेसम्मको दायित्व हुन्छ ।[59] खर्च गर्न अख्तियारी दिई मापदण्ड अनुसार खर्च नभएको भए वेरुजु देखिएको रकम तालुकदार कार्यालयले असुल उपर गर्न सक्दछ ।[60] भ्रष्टाचारको कसुर हुनको लागि नेपाल सरकार वा सार्वजनिक सस्थाको सम्पत्ति लापरवाही वा बदनियतपूर्वक वा हानीनोक्सानी वा दुरुपयोग गरेको पुष्टि हुनुपर्नेमा बुझि लिएको रकम वराबरको निर्माण सामाग्री बुझाएको र समान नलगेको रकम विद्यालयको खातामा फिर्ता गरेकोले भ्रष्टाचार गरेको मान्न मिल्दैन ।[61] राजस्व असुली भएपछि असुली गर्ने विगो वाँकी हुदैन । विगो नै नभएपछि भ्रष्टाचारको कसुर हुन सक्दैन ।[62]

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[59] ने.का.प. २०७४ नि.नं. ९८२७ पृ. १०६०

[60] स.अ. बुलेटिन, २०७४ पू. ६११ पृ. ५९ (नेपाल सरकार वि. भोगेन्द्र कुमार समेत)

[61] स.अ. बुलेटिन, २०७४ पू. ६१२ पृ. २ (नेपाल सरकार वि. नविन कूमार सिंह)

[62] स.अ. बुलेटिन, २०७४ पू. ६०८ पृ. १

कर्मचारी तथा आश्रित पारिवारिक औषधी उपचार वीमा दावीका लागि

आवश्यक कागजातहरु

- **भर्ना हुनु पूर्व गरिएका उपचारका कागजात ।**
- **भर्ना भईसकेपछि डाक्टरले लेखिएको** Prescription ।
- **औषधी खरिद गर्दाको सक्कल बिलहरु** Hospital **का** Invoice Bill ।
- **विभिन्न परिक्षणका** All Requisition **तथा** All Report **हरु ।**
- **डिस्चार्ज परिक्षणका डिस्चार्ज समरी शिट तर आकस्मिक उपचार सेवाको कागजात ।**
- **वीमा दावी फारम ।**
- **आश्रित परिवारको हकमा नाता खुल्ने आधिकारिक कुनै कागजात ।**

थर्क बहादुर थापा
प्रवन्धक, ने.वि.प्रा.

नेपालमा विद्युत प्रशारणको मूल्य निर्धारणको अवस्था र आवश्यकता

पृष्ठभूमि :

विगत दुई दशक देखि विद्युतीय बजारमा आमुल परिवर्तन आएको देख्न सकिन्छ । त्यस अघि विद्युत उत्पादन, प्रशारण र वितरण व्यवसाय कुनै एक कम्पनीको मातहतमा रही प्राकृतिक एकाधिकारमुखी भएर संचालनमा रहिरह्यो । सबै प्रकारका सेवा दिने प्रकृतिका यस्ता कम्पनीहरु धेरै जसो पूर्ण वा आंशिक सरकारी स्वामित्वमा संचालनमा रहेको पाईन्छ । विश्व अर्थतन्त्रमा आएको परिवर्तन र प्रविधिको विकाससंगसंगै बिस्तारै विद्युत बजारमा पनि एकाधिकारमुखी संरचनाहरु पुनरगठित भएर प्रतिस्पर्धी बजार तर्फ उन्मुख हुँदै गए । ठूलो परिमाणमा विद्युत खपत गर्ने उपभोक्ताहरु वा वितरकहरुलाई विद्युत उपलब्ध गराउंन विद्युत उत्पादक कम्पनीहरुले एक आपसमा प्रतिस्पर्धा गरी भरपर्दो प्रशारण संजालको प्रयोग गर्न थाले । प्रतिस्पर्धी बजारमा विद्युत खपतको मुल्य अन्तत्वगत्वा विद्युत प्रशारण सेवा प्रदायक कम्पनीले निर्धारण गरेको प्रशारण सेवा वापतको मुल्यमा (प्रशारण शुल्कमा) समेत निर्भर हुने भयो । जसलाई सरल भाषामा ह्विलिङ्ग चार्ज भनिन्छ । तसर्थ प्रशारण सेवा प्रदायक संस्था र प्रशारण सेवा प्राप्त गर्ने उपभोक्ता दुबैका लागि आर्थिक रुपमा फाइदाजनक प्रशारण मुल्य निर्धारण गर्न अत्यन्त महत्वपूर्ण देखियो । प्रशारण मुल्य निर्धारणलाई श्रोतको बांडफांड, प्रणालीको बिस्तार र सुदृढिकरणका लागि आर्थिक परिसुचकका रुपमा लिन सकिन्छ । प्रतिस्पर्धी बजारमा अनन्त छरिएर रहेका ग्राहकहरुले माग गरे अनुसार प्रशारण तथा वितरण संजालको पहुचको आवश्यकता बढ्दै जाने क्रममा प्रभावकारी प्रशारण मुल्य निर्धारण गर्नु पर्ने अर्को चुनौती थपियो । विशेषत: देहायका कारणहरुले प्रभावकारी प्रशारण मुल्य निर्धारण गर्नु पर्ने आवश्यकता देखापर्‍यो ।

(क) ठाडो रुपको एकिकृत संस्थालाई विभाजन गर्नु पर्ने
(ख) उत्पादनलाई प्रशारण संरचनाबाट अलग गर्नु पर्ने
(ग) प्रशारण संस्थालाई बेग्लै निकायका रुपमा बिस्तार गर्नु पर्ने
(घ) प्रशारकले लागत परिपुर्ति गर्न र संरचना बिस्तारका लागि आवश्यक शुल्क उठाउंनु पर्ने
(ङ) खुला पहुचवाला उपभोक्ताले प्रशारण संजाल प्रयोग गरे वापत शुल्क तिर्नु पर्ने
(च) माग र आपूर्तिलाई तोकिएकै समयमा सन्तुलन गर्नु पर्ने
(छ) विद्युतलाई चाहे अनुसार निश्चित बाटोमा हिंडाउन कठिन हुंने अर्थात उत्पादन भएको विन्दु देखि खपत हुने विन्दुसम्म पुग्ने क्रममा प्रशारण संजालको कुनै पनि बाटो भएर बग्न सक्ने

प्रशारण सेवा वापतको उपयुक्त मुल्य निर्धारणले लक्ष्य अनुसारको आम्दानी पूर्ति गर्ने, विद्युत बजारको प्रभावकारी संचालन गर्ने, विद्युत उत्पादन केन्द्रहरुको निर्माण तथा प्रशारण संरचनाहरुको विस्तारका हकमा उपयुक्त भौगोलिक स्थानको छनौट अनुसार लगानी गर्न प्रोत्साहित गर्ने, संचालन तथा संभार खर्च लगायत लगानीकर्ताको लगानी उठ्ने सुनिश्चितता प्रदान गर्दछ । अझै महत्वपूर्णरुपमा प्रशारण शुल्क निर्धारणको रणनीति प्रशारण संरचनाका उपभोक्ताहरु बीचमा निष्पक्षता सुनिश्चत हुने गरी कार्यान्वयन गर्नु हो ।

विश्व बजारको अवस्था:

पहिलो पटक इंल्याण्ड र वेल्समा विद्युतीय बजार सन् १९९० मा अविनियमित (Deregulated) भए पश्चात विस्तारै सो

लहर नर्वे (१९९१), फिनल्याण्ड (१९९५) र स्वेडेन (१९९६) तर्फ फैलँदै गयो । अमेरिकामा सन् १९९२ तिर विद्युत क्षेत्रमा अविनियमको शुरुआत भएको पाइन्छ। त्यस संगै विश्व बजारमा प्रशारण संरचनाहरुको व्यापारिकरण व्यापक रुपमा फस्टाउदै जाने क्रममा विद्युत प्रशारण सेवाको मुल्य निर्धारणको महत्व बढ्दै गयो । हाल विद्यमान प्रशारण मूल्य निर्धारणलाई विधि र पद्धतीका आधारमा मुख्यतया तीन हिस्सामा राख्न सकिन्छ ।

क) Incremental Transmission Pricing Method

ख) Embedded Transmission Pricing Method

ग) Composite Embedded/ Incremental Transmission Pricing Method

Incremental Transmission Pricing Method अन्तर्गत मुख्यतया SRIC (Short-run Incremental Cost Pricing), LRIC (Long-run Incremental Cost Pricing), SRMC (Short- run Marginal Cost Pricing) र LRMC (Long-run Marginal Cost Pricing) पर्दछन् । त्यसैगरी Embedded Transmission Pricing Method अन्तर्गत Network Based Methods / Flow Based Methods रहेका छन् । त्यस मध्ये Network Based Methods अन्तर्गत Postage Stamp Method, Contract Path Method, Distance Based MW-km Method, MVA-km Method र Distribution Factor Method छन् भने Flow Based Methods अन्तर्गत Bialek Tracing Method र Kirschen Tracing Method रहेका छन् । मौजुदा विधि र पद्धती मध्ये कुन उपयुक्त हुन्छ भनेर छान्नु पर्दा त्यस देशको उदारिकणको अवस्थामा निर्भर भएको पाईन्छ । तथापी निम्न सैद्धान्तिक आधारलाई छनौटको विषय मान्न उपयुक्त हुन्छ ।

क) Promoting efficiency

ख) Recovering costs

ग) Ensuring transparency, fairness and predictability

घ) Promoting non-discriminatory behavior

घ) Stability

घ) Ease of Application

यसका अलावा कारोबारको किसिम तथा विद्युत प्रशारण सेवाको सुविधाको अवधि (छोटो, मध्यम र दीर्घ) लाई समेत प्रशारण मुल्य (शुल्क) निर्धारणको मापदण्ड मान्न सकिन्छ । माथि उल्लेखित विभिन्न मापदण्डमा आधारित भएर विश्वका विभिन्न देशहरुले मूल्य निर्धारणका विभिन्न विधि र पद्धती अपनाएका छन् । युरोपको नर्ड पूल (NORD POOL, हाल १६ राज्यमा फैलिएको) ले Point (Stamp) Tariff अपनाइरहेको छ, जस अनुसार उत्पादक र उपभोक्ताले प्रणालीबाट लिएको वा दिएको मेगावाट आवर ऊर्जाका आधारमा प्रशारण शुल्क तिर्नु पर्ने हुन्छ । यस विधिमा प्रशारण लाईनको लम्बाई वा कुनकुन प्रशारण लाईन प्रयोग गरियो भन्ने गणना गरिँदैन । प्रत्येक प्रशारण प्रणाली संचालकले उक्त मुल्य निर्धारण गर्दछ र सम्वन्धित प्रशारण प्रणाली संचालक जसमा विद्युत जोडिएको हो उसलाई भुक्तानी दिनुपर्दछ ।

अमेरिको PJM (हाल १२ राज्य संलग्न रहेको) ले Locational Marginal Pricing (LMP) अनुसार निश्चित स्थान र समयमा कारोबार भएको ऊर्जाको आधारमा प्रशारण शुल्क लिने गर्छ । यो Day Ahead Market मा उत्पादकले माग गरेका आधारमा, विद्युत खरिदबिक्री बोलपत्र कबोल गरेको आधारमा र कुनै दुई पक्षको खरिदबिक्री सहमतीका आधारमा एक दिन पछिका लागि प्रत्येक घण्टाको LMPs गणना गर्ने गरिन्छ । Real Time Market मा ग्रिड संचालनको अवस्था अनुसार उक्त LMPs प्रत्येक ५ मीनेटको अन्तरालमा लिने गरिन्छ ।

त्यसै गरी आयरल्याण्डमा Locational Tariff (30%) र Postage Stamp Tariff (70%) विधि अपनाइएको छ भने Southern African Power Pool (SAPP) मा पहिले Postage Stamp विधि लागु गरिएकोमा हाल MW-km विधि अपनाई प्रशारण मुल्य निर्धारण गरिएको छ । विभिन्न कारणहरुले गर्दा Southern African Power Pool मा Nodel Transmission Pricing Model लागु गर्न सम्भव भएन । ब्राजिलको National Electric System Operator (ONS) ले संचालन गरेको प्रणालीमा विद्युत प्रवाह गरे वापतको मूल्य ५० प्रतिशत उत्पादक र बांकी ५० प्रतिशत उपभोक्ताले ब्यहोर्नु पर्ने हुन्छ । २० प्रतिशत प्रशारण लागत Flow Based Method बाट र ८० प्रतिशत लागत अधिकतम उपयोग वा उत्पादनको पूर्ण क्षमताका आधारमा गणना गरिन्छ ।

छिमेकी मुलुक भारतमा संघीय व्यवस्था अनुसार विद्युतमा राज्य सरकार र केन्द्र सरकारको क्षेत्राधिकार तोकिएको छ। अन्तरराज्य प्रशारण संरचनाहरु केन्द्र सरकार मातहतका संस्थानहरु र केन्द्र सरकारबाट इजाजतपत्र प्राप्त कम्पनीहरुले विकास गर्ने र राज्यभित्रका प्रशारण संरचनाहरु राज्य सरकार स्वयम्का मातहतका संस्थानहरु र राज्य सरकारबाट इजाजतपत्र प्राप्त कम्पनीहरुले विकास गर्ने व्यवस्था गरिएको छ । अन्तरराज्य प्रशारण प्रणालीको मुल्य (शुल्क) केन्द्रीय विद्युत विनियामक आयोग (Central Electricity Regulatory Commission) ले निर्धारण गर्ने गर्छ र सो मुल्य उपभोक्ताहरुले सामुहिक रुपमा ब्यहोर्नु पर्ने हुन्छ । सन् २०१० मा केन्द्रीय विद्युत विनियामक

आयोगले अन्तरराज्य प्रशारण शुल्क तथा प्रशारण चुहावटको हिस्सा ब्यहोर्नु पर्ने नियम बनाएको देखिन्छ । कारोबारका प्रकृति अनुसार ठाउं हेरी "postage stamp", "contract path" तथा "point-of-connection" विधि धेरै अवधिसम्म सहअस्तित्वमा रहिरहेको पाइन्छ । भारत सरकारले विद्युत प्रवाहको दुरी, प्रवाहको दिशा र ऊर्जाको परिमाणलाई अनिवार्य मध्ये नजर गरी Marginal Participation Method अनुसार मुल्य निर्धारण गर्नु पर्ने प्रावधान National Electricity Policy (NEP) मा समावेश गरे पश्चात "point-of-connection" लागु गर्नु पर्ने बाध्यात्मक परिस्थिति बनेको देखिन्छ । केही राज्यहरु यस नीतिका विरुद्धमा मुद्धाको विषय बनाएर अदालत समेत पुग्नु परेको घटनाक्रमले देखाउंछ । यही परिस्थितिलाई मध्ये नजर गरी माग अनुसार कमिटी (CERC TASK FORCE) गठन गरी केही प्रावधानहरु सुधार तथा परिवर्तन गर्न सुझाव पेश गरेको देखिन्छ ।

नेपालको अवस्थाः

विश्वका प्रायजसो विकसित मुलुकहरुले आफुसंग रहेका ऊर्जाका श्रोतहरुलाई सम्भव भए जति उपभोग गरिसकेका छन् र लगानी भएका धेरै जसो खर्चहरु उठाइसकेका छन् । ती मुलुकहरुका लागि लगानी कसरी उठाउंने भन्ने चुनौती अब रहेन ।

नेपाल जस्तो अल्पविकसित मुलुक जहां ऊर्जाका श्रोतहरुको नगन्य रुपमा उपभोग गरिएको छ, त्यहां ऊर्जा क्षेत्रको विकासका लागि आवश्यक संरचनाहरु निर्माण गर्न ठूलो मात्रामा लगानीको आवश्यकता पर्दछ, जसले गर्दा लगानी भएको रकम फिर्ता ल्याउनु ठूलो चुनौंती रहेको छ । अर्को तर्फ विश्वका ४६ अल्पविकसित मुलुकहरु मध्ये नेपाल एक रहेकोमा राष्ट्रिय योजना आयोगले तयार पारेको २०७६/७७ को आधार पत्र अनुसार सन् २०२२ सम्ममा नेपाललाई अल्पविकसित मुलुकबाट विकासशिल मुलुकमा रुपान्तरण गर्न संयुक्त राष्ट्रसंघले निर्धारित गरेको तीन मध्ये दुई मापदण्डहरु पुरा गर्नु पर्ने थियो; पहिलो औषत राष्ट्रिय प्रतिब्यक्ति आय र अर्को मानव साधन सुचकांक । United Nations Committee for Development Policy (CDP) ले फेब्रुअरी २६, २०२१ मा प्रकाशित गरेको प्रेस रिपोर्ट अनुसार नेपालले हालसालै मात्रै सम्पूर्ण सुचकांक पूरा गरेको र सन् २०२६ मा प्रभावकारी हुने गरी रुपान्तरणका लागि सिफारिस भएको छ । तिनै सुचकांकलाई आधार मान्दा आर्थिक वृद्धिदर ९.२ प्रतिशत कायम गर्नु पर्ने देखिन्छ । जल तथा ऊर्जा आयोगको सचिवालय (WECS) ले सन् २०१७ मा तयार पारेको नेपालमा खपत हुंने ऊर्जाको विविधिकरणलाई हेर्दा विद्युत क्षेत्रमा ३ प्रतिशत तथा नवीकरणीय ऊर्जाको हिस्सा ३ प्रतिशत मात्र रहेको छ जुन अन्य मुलुकको तुलनामा धेरै न्यून हो । यदि ९.२ प्रतिशत आर्थिक वृद्धिदरको बृहत्तर लक्ष्य लिएर विद्युत उपयोगमा नीतिगत हस्तक्षेप गर्ने हो भने सन् २०४० सम्म ५१,३३० मेगावाट जडित क्षमताको आवश्यकता पर्ने देखिन्छ । त्यसैलाई आधार मानेर राष्ट्रिय प्रशारण ग्रिड कम्पनी लिमिटेडले तयार गरी अनुमोदित नेपालको प्रशारण प्रणाली विकास योजना अनुसार आन्तरिक र बाह्य खपत सहित सन् २०४० सम्ममा पिक समयमा झण्डै ४० हजार मेगावाट बराबर जडित क्षमता आवश्यक पर्ने देखिन्छ । यति ठूलो मात्राको ऊर्जा ब्यापारलाई प्रभावकारी बनाउंन प्रशारण संरचना निर्माणमा निकै ठूलो लगानी अमेरिकी डलर ६०३७ मिलियन (करिब ने.रु. ७ खरब) को आवश्यकता पर्ने देखिन्छ । यसैकारण नेपाल जस्तो देशमा मुख्य दुई चुनौती रहेका छन् : पहिलो, पूजिगत लगानीको वातावरण कसरी बनाउंने र दोश्रो, संरचना निर्माणमा लगानी भैसकेका र भविष्यमा लगानी हुने पूजीको पुनः प्राप्ति कसरी गर्न सकिन्छ ।

विगत केही वर्षदेखि ऊर्जा क्षेत्रको संरचनागत तहमा केही परिवर्तन भएको देख्न सकिन्छ; विद्युत नियमन आयोगको गठन, उत्पादनमा निजी क्षेत्रको सहभागिता, प्रशारण प्रणालीमा एकाध कम्पनीहरुको आगमन, विद्युत ब्यापार कम्पनीको स्थापना र वितरण क्षेत्रको निजीकरणका चर्चाहरु । नेपाल विद्युत प्राधिकरणको संस्थागत विकास योजनाले सन् २०२३ सम्ममा ब्यापारिक संरचनामा केही रुपान्तर हुने कुराको संकेत पनि गर्दछ ।

हाल नेपाल विद्युत प्राधिकरणले बनाएका प्रशारण लाईनहरु तथा सवस्टेशनहरुको ह्विलिङ्ग चार्ज वा प्रशारण प्रणालीमा हुने चुहावटलाई एकमुष्ठ उत्पादकसंग गरिएको ऊर्जा खरिदबिक्री सम्झौतामा समावेश गरिएको छ । संस्थाको आन्तरिक ऊर्जा सन्तुलनको हिसाबमा समेत त्यस्को लेखा राखिएको छैन । कम्तीमा आन्तरिक (उत्पादन, प्रशारण र वितरण निकायहरुको) विखण्डिकरणको अभ्यास गरी सोको लेखा राख्नु पर्ने देखिन्छ । बहुसंख्यक निजी लगानीकर्ताले उत्पादन भएको विद्युतलाई सवस्टेन विन्दुसम्म प्रशारण लाईन बनाएर जोडेका छन् तर भोलीका दिनमा अन्य उत्पादकले तिनै लाईनहरुमा जोड्न खोजे के मापदण्ड अपनाउंने जो दुबैको हितमा होस्, हाल अनभिग्यता रहेको छ । ब्यवसायिक हिसाबले कुनै लगानीकर्ताले प्रशारण संरचना बनाउंन चाहेमा प्रतिफलको सुनिश्चितता नभई कसरी बनाउंने । त्यसो भए हाल नीतिगत ब्यवस्था के छ त भनेर हेर्नु पर्दा विद्युत नियमन आयोग ऐन, २०७४ को 13 (E) मा विद्युत नियमन आयोगले प्रशारण मुल्य (शुल्क) निर्धारण गरी लागू गर्न सक्ने प्रावधान रहेको छ । विद्युत नियमन आयोग नियमावली, २०१८ को नियम १३ (१) मा

आयोगले खरिद बिक्री मूल्य लागु गर्दा तल उल्लेखित सबै वा कुनै प्रावधानहरुलाई आधार लिन सक्ने उल्लेख छ ।

(a) Consumption capacity of the users or amount and distance,

(b) Point of Connection

(c) Zonal Transmission Charges,

(d) Investment to be made for the construction or extension of transmission line

नियम १३ (२) अनुसार राष्ट्रिय प्रशारण ग्रिड र अन्य प्रशारण लाईन खण्डलाई बेग्लै मुल्य तोक्न सकिने प्रावधान उल्लेख छ । त्यस्तै अन्य मापदण्ड तोक्ने कार्य आयोगको विशेषाधिकार भित्र रहेको छ ।

राष्ट्रिय प्रशारण ग्रिड कम्पनी लिमिटेड सन् २०१५ मा स्थापना भई विद्युत प्रशारणको पूर्वाधार निर्माण तर्फ अघि बढिरहेको भएता पनि त्यस कम्पनीले निर्माण गर्ने प्रशारणको मुल्य (शुल्क) कति हुने भन्ने निर्क्यौल नभइन्जेल दातृ निकायबाट ऋण वा अनुदान सहयोग सुनिश्चित गर्न कठिन छ । Power Transmission Company Limited ले भारतको मुज्जफरपुर देखि ढल्केबार सम्मको ४०० किलो भोल्टको प्रसारण लाईन मध्ये नेपाल तर्फको ढल्केबार देखि नेपाल-भारतको सीमावर्ती क्षेत्रमा अवस्थित बठ्नाह सम्मको ४२.१० कि.मी. लामो अन्तरदेशीय प्रशारण लाईनको पनि खास स्थापित मान्यता अनुसार प्रशारण मुल्य तोकिएको पाईंदैन । स्वपूंजी र ऋणको अंश ३०:७० कायम गरिएको यस कम्पनीका लागि Exim Bank of India ले नेपाल सरकारलाई १५ वर्ष अवधिका लागि Soft Loan उपलब्ध गराएको छ जुन नेपाल सरकारले ६.५ प्रतिशत ब्याजदरमा कम्पनीलाई ऋण उपलब्ध गराएको छ । त्यसैगरी एभरेष्ट बैंक लिमिटेडले संचालन खर्च वापत ११ करोड कर्जा उपलब्ध गराएको छ । पुजिगत लगानी, संचालन खर्च र अन्य खर्चको वार्षिक औषत हिसाब अनुसारको खर्चलाई गणना गरी कम्तिमा १८ प्रतिशत Guaranteed Return का आधारमा प्रशारण मुल्य (शुल्क) निर्धारण गरिएको छ । N-1 Contingency का आधारमा १००० मेगावाट बराबरको विद्युत प्रवाह गर्न सक्ने यस प्रशारण लाईनमा सम्झौता अनुसार न्यूनतम देखि लाईनको पूरा क्षमतासम्म विद्युत प्रवाह गर्दाको प्रशारण मुल्य (शुल्क) झण्डै उही नै हुने गरेको छ । लाईनै पिच्छे फरक फरक प्रशारण शुल्कको निर्धारण गर्नु भन्दा सैद्धान्तिक आधार र निश्चित विधि अनुसार पक्षापत नहुने गरी प्रशारण मुल्य (शुल्क) निर्धारण गरी लागु गर्नु पर्ने देखिन्छ।

उपयुक्त विधि र प्रशारण मुल्यः

विश्व बजारमा प्रशारण मुल्य तोक्ने उपयुक्त विधिका सम्वन्धमा ठूलो बहस र चर्चा हुने गर्छ तर कुनै पनि विधि सबै क्षेत्र वा सबै देशका लागि परिपुर्ण भने छैन । व्यवस्थापनको सिद्धान्त छ योजना बनाऊ, गर र हेर । अब पनि चुप लागेर बस्ने समय छैन । नेपालमा नियमन आयोगको गठन संगसंगै खुल्ला बजारमा निजी क्षेत्रले प्रशारण व्यवसायलाई पनि रोज्नेछन् । तथापी मौजुदा कम्पनीहरु वा भविष्यमा थपिन सक्ने कम्पनीहरुको चुनौती भन्नुनै लामो समय बजारमा टिकिरहन सक्छन् वा सक्दैनन् भन्ने हो, त्यसका लागि पुजिगत लगानी कति समयमा उठाउंन सक्छन् भन्नेमा निर्भर हुन्छ । नेपाल जस्तो देश जहां सरकारले समेत जोखिमको जिम्मा लिन गाह्रो छ, त्यहां समयमै लगानी उठ्ने कुराको सुनिश्चितता हुनु अत्यन्तै आवश्यक छ । जुन Nodal Pricing, SRIC (Short Run Incremental Cost), LRIC (Long Run Incremental Cost) अथवा अन्य Marginal Costing विधिबाट निर्धारण गरिएको प्रशारण मुल्य (शुल्क) ले सुनिश्चित गर्न सक्दैन । सरल वा प्रभावकारीका बीचमा पनि एउटा कुनै छनौंट गर्नु पर्ने अवस्था छ । लागु गर्न सजिलो होस्, लगानी उठ्ने सुनिश्चितता होस्, पारदर्शी होस् अनि स्थिरता पनि एकिन गर्न सकियोस्, यसर्थमा विभिन्न विधिहरु मध्ये Postage Stamp विधि उपयोगि हुनसक्छ । तर Postage Stamp विधिबाट मात्र मुल्य निर्धारण गर्दा पूर्ण भेदभाव रहित बनाउंन कठिन हुनेहुंदा Radial लाईन जस्ता खास किसिमका संरचनाका लागि Distance Based MW-km विधिलाई पनि एकसाथ प्रयोगमा ल्याउनु पर्ने हुन्छ । के हो त Postage Stamp Method तथा Distance Based MW-km Method ? विधिको विस्तृतिमा प्रवेश गर्नु अघि आवश्यक वार्षिक आम्दानी/राजस्व (Annual Revenue Requirement) को सम्वन्धमा बुझ्नु पर्ने हुन्छ । उदाहरणका लागि अध्ययनले देखाए बमोजिम नेपालको अनुमोदित प्रशारण प्रणाली विकास योजना (NPTN MAP, जुलाई २०१८) अनुसार ४०० के.भी.का पूर्व देखि पश्चिमसम्म फैलिएका दुई समानान्तर प्रशारण लाईनहरु छन् र तिनलाई बीचबीचमा जोड्ने ४०० के.भी.कै सहायक लाईनहरु छन् । २२० के.भी. तथा ४०० के.भी.को यो मुख्य प्रशारण संरचनालाई अध्ययनमा Ring Network मानिएको छ जसका लागि सम्भावित लागतको वर्गिकरण तल चित्र १ मा देखाइएको छ । पुजिगत लागतका अलावा संचालन संभार, ह्रासकट्टी, ब्याज खर्च, पुनर लगानी व्यवस्था आदि जस्ता प्रावधानका आधारमा Annual Revenue Requirement को गणना गरिन्छ ।

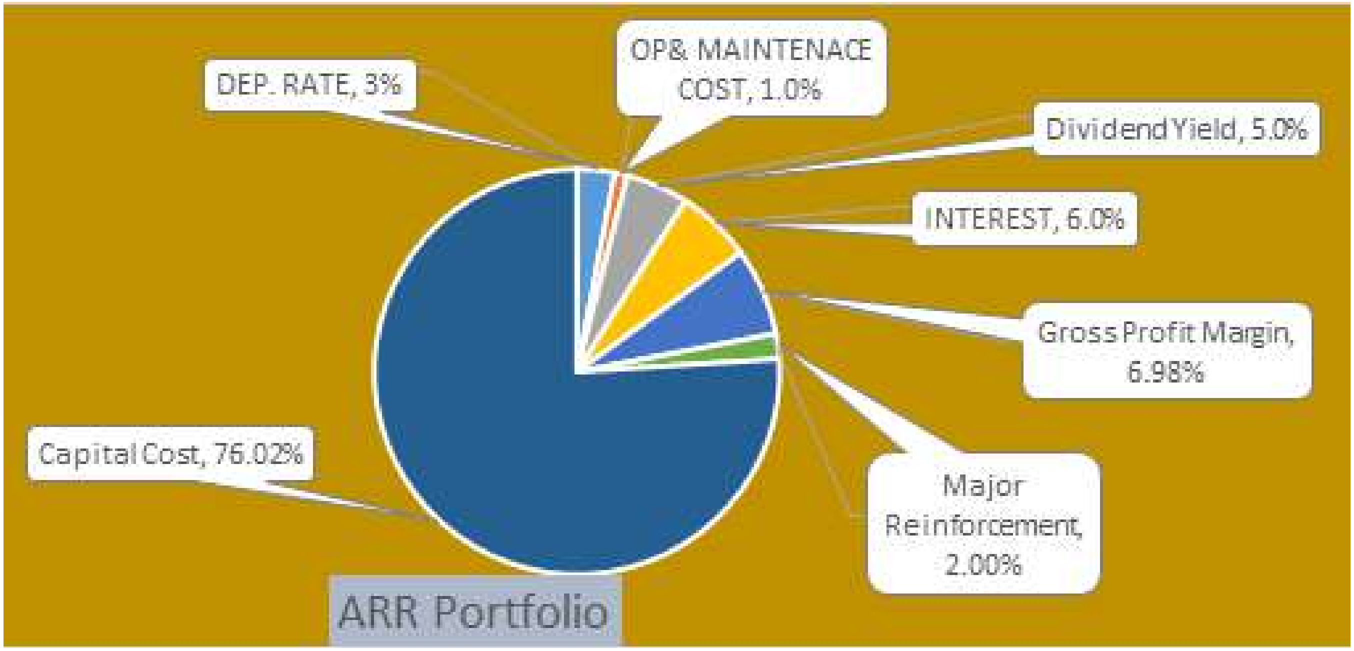


Figure 1: (ARR Portfolio for Ring Network)

सन् २०५५ सम्मका लागि आवश्यक वार्षिक आम्दानी/राजस्व (ARR) चित्र २ मा देखाइएको छ ।

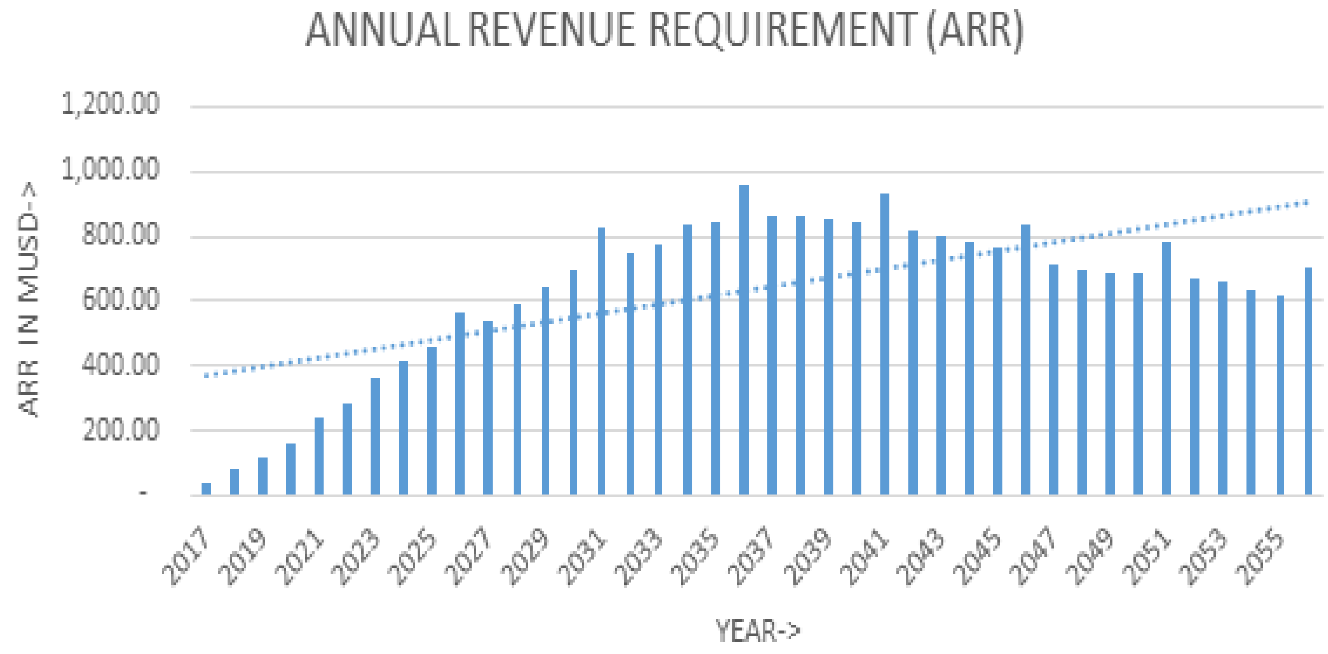


Figure 2: Annual Revenue Requirement for Ring Network for NPTN

देशभित्र खपत हुंने र अन्तरराष्ट्रिय बजारमा निर्यात गर्नु पर्ने ऊर्जाको परिमाणका आधारमा योजनाबद्ध हिसाबले हरेक वर्ष प्रशारण संरचना निर्माणको लागि आवश्यक लागतको गणना गर्नु पर्ने हुन्छ । मुख्य प्रशारण संरचना (Ring Network) मा जोडिन आउंने कुनै पनि उत्पादक र उपभोक्ता (प्रयोगकर्ता) ले Postage Stamp विधि अनुसार (तल समिकरणमा देखाइएको) शुल्क तिर्नु पर्ने हुन्छ ।

$$R_t = TC * \frac{P_t}{P_{peak}}$$

(Postage Stamp Method)

R_t the transmission price for transaction t

TC the total transmission charges, ARR

P_t is the transaction t load at the time of system peak, and

P_{peak} is the system peak load

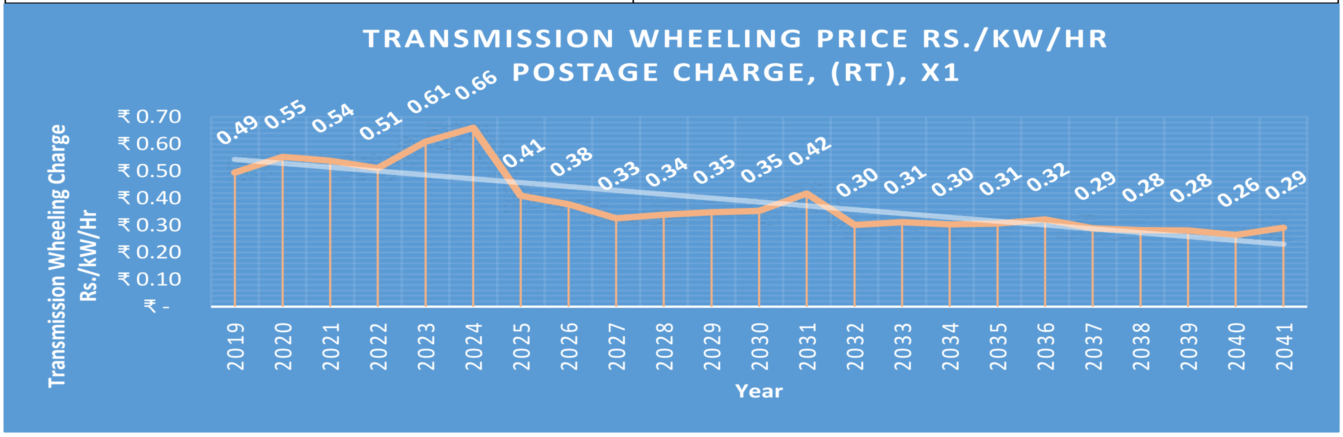


Figure 3: Transmission Wheeling Charge X1 (Rt) in NPTN (Rs./kW/Hr)-Ring Network

अध्ययनमा सन् २०१९ देखि सन् २०४१ सम्मको प्रशारण शुल्कको हिसाब गरिएको छ (चित्र ३ मा) जस अनुसार आजको मुल्यमा (सन् २०१९ लाई आधार वर्ष मान्दा) घटिमा २६ पैसा प्रति किलोवाट प्रतिघण्टा (सन् २०४०) र बढीमा ६६ पैसा प्रति किलोवाट प्रतिघण्टा (सन् २०२४) प्रशारण शुल्क लाग्ने देखिन्छ । तर आयोजनाहरु निर्माणको अवधि, लागतमा फेरबदल, माग र आपुर्तिको अवस्था आदिमा भरपर्नु पर्ने भएकोले यी शुल्कहरु चलायमान हुन्छन् ।

माथि उल्लेखित Ring Network बाहेक अन्यलाई Radial Network मा गणना गर्न सकिन्छ । Radial Network मा जोडिने प्रयोगकर्ताले प्रशारण शुल्कका अलावा MW-km विधिबाट निक्यौंल गरिएको तल समिकरणमा देखाए जस्तो शुल्क पनि (X1+X2) तिर्नु पर्ने हुन्छ ।

$$WC_t = TC * \frac{\sum_{k=1}^{K} C_k * L_k * MW_{t,k}}{\sum_{t=1}^{T}\sum_{k=1}^{K} C_k * L_k * MW_{t,k}}$$

(MW-km Method)

TC is the total cost of all lines, ARR

L_k is the length of line k in KM,

C_k is the cost per MW per unit length of line k,

$MW_{t,k}$ is the flow in line k due to transaction t,

T is the set of transactions and K is the set of lines.

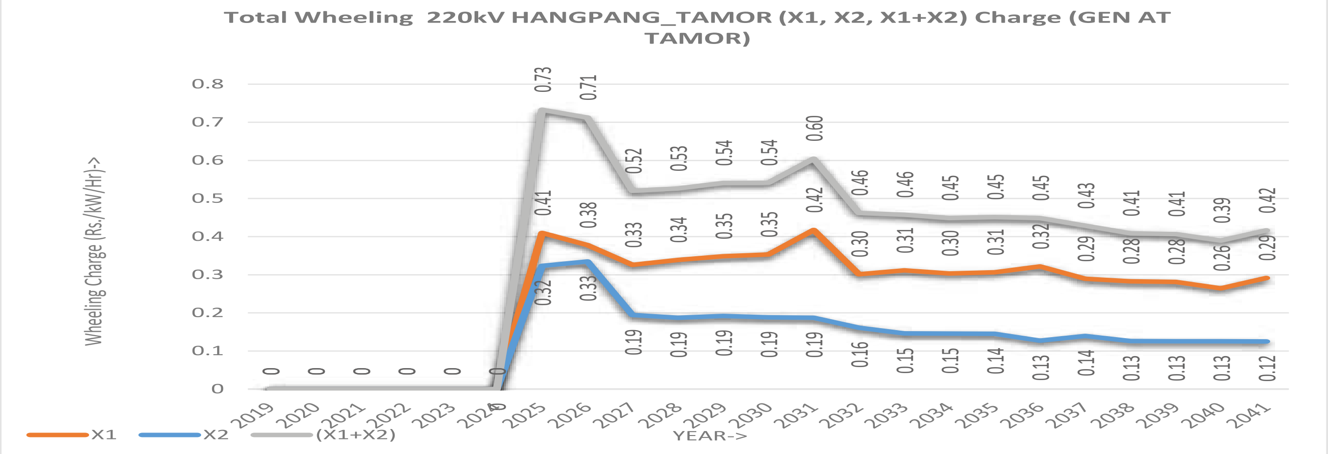
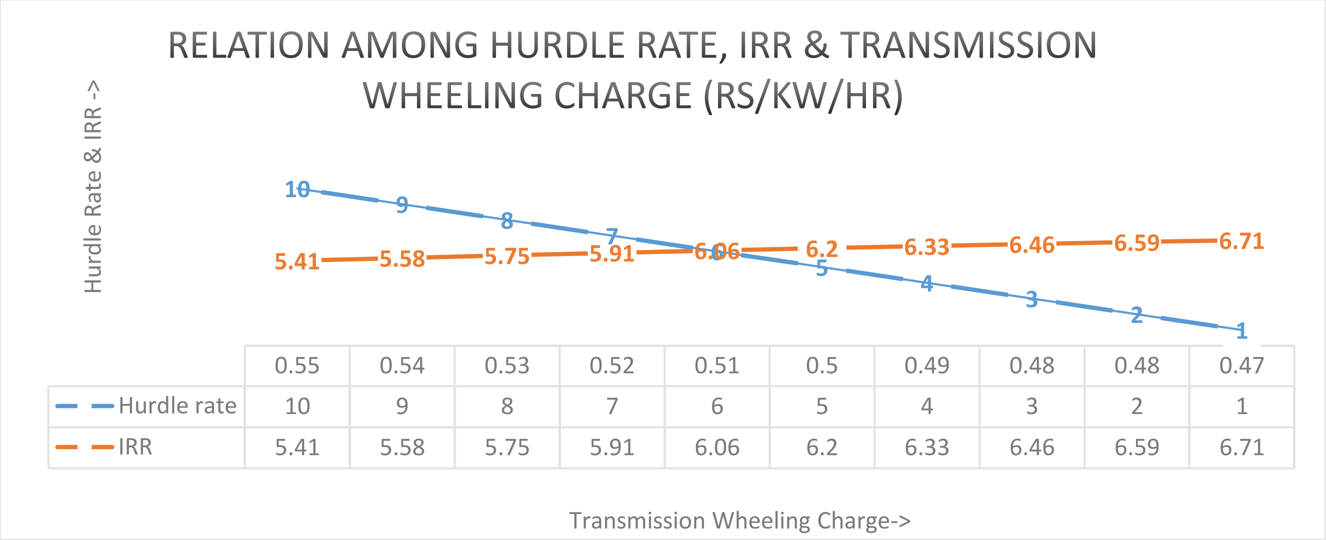


Fig. 4: Wheeling charge X1, X2, X1+X2: HANGPANG-TAMOR (Radial Network)

यदि कुनै प्रयोगकर्ताले Ring Network को प्रयोगनै गर्नु नपर्ने अवस्था आएमा च्वमष्बा ल्भतधयचप बाट विद्युत प्रवाह गरे वापतको शुल्क (माथि चित्र ४ मा, X2) मात्र तिरे पुग्छ । कुनै प्रयोगकर्ताले प्रणालीमा आफ्नो विद्युत जोड्ने क्रममा प्रणालीको चुहावटमा सकारात्मक वा नकारात्मक प्रभाव पार्ने गर्छ यसका लागि Penalty/Reward Factor को समेत गणना

गर्न सकिन्छ । प्रशारण शुल्क पूर्णत: Market Hurdle Rate र IRR (Internal Rate of Return) मा निर्भर रहने हुंदा तल चित्र ५ मा देखाए जस्तै आन्तरिक सम्वन्धको गणना गरी नीतिगत निर्णय गर्न सकिन्छ । उदाहरणका लागि Market Hurdle Rate, ७ प्रतिशत र IRR, ६.०६ प्रतिशत कायम गर्दा प्रशारण शुल्क ५१ पैसा पर्न आउंछ जुन स्वीकार योग्य हुनसक्छ ।



	0.55	0.54	0.53	0.52	0.51	0.5	0.49	0.48	0.48	0.47
Hurdle rate	10	9	8	7	6	5	4	3	2	1
IRR	5.41	5.58	5.75	5.91	6.06	6.2	6.33	6.46	6.59	6.71

Fig. 5: Relation among Hurdle rate, IRR & Transmission Wheeling charge (Ring, 2022)

निष्कर्ष:

लागुनै नगर्नु वा लागु गर्न विलम्व गर्नु भन्दा लागु गरेर त्यसबाट पाठ सिक्दै अगाडी बढ्नु बुद्धिमतापूर्ण निर्णय हुने गर्दछ । समयको माग र आवश्यता अनुसार यो वा त्यो विधि नभनी विश्वसनीय कुनै पनि विधि अपनाएर प्रशारण मुल्य निर्धारण र लागु गरिनु पर्दछ । तर यसो भनिरहंदा त्यो विधिले सुरुआती दिनमा सरल, निष्पक्ष र लागत प्रतिफको सुनिश्चितता प्रदान भने पक्कै गर्नु पर्दछ । नीतिगत तहमा व्यवस्था भइसकेकोले व्यवहारिक प्रयोगको टड्कारो आवश्यकता देखिन्छ । भविष्यमा हुन सक्ने संरचनागत परिवर्तनका संकेतहरुलाई मुल्यांकन गर्दा नेपाल विद्युत प्राधिकरणले आन्तरिक विखण्डिकरणको अभ्यास गरी प्रशारण मुल्य सहितको छुट्टै वासलात राख्न आवश्यक देखिन्छ भने, नीजि क्षेत्रलाई पनि व्यवसायिक रुपमा अगाडी बढ्ने अवसर प्रदान गर्नु राज्यको दायित्व रहन्छ ।

सन्दर्भ सामाग्रीहरु:

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[6] Able Guidance of Associate Prof. Dr. Netra Prasad Gyawali, Associate Professor Dr. Arbind Kumar Mishra, Mr. Surendra Rajbhandari, Mr. Hitendra Dev Shakya, Assistant Prof. Mr. Akhileshwar Mishra

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ईन्जिनियर, ने.वि.प्रा.

कोभिड महामारीको दोश्रो लहरका कारण सारा विश्व आक्रान्त भएको बेला नेपाल पनि त्यसको असरबाट अछुतो हुने कुरै भएन । फलस्वरुप सरकारले आह्वान गरेको लकडाउनका कारण सवै सेवाहरु लगभग ठप्प प्राय : थियो तर विद्युत वितरण जस्तो अत्यावश्यक सेवामा नेपाल विद्युत प्राधिकरण सधैं झैं चौविसै घण्टा अनवरत लागिरहयो । सार्वजनिक आवत जावत बन्द गर्नुपर्ने जस्तो अत्यन्तै प्रतिकुल परिस्थितिमा सरकारको निर्देशन पालना गर्ने भन्दा दोश्रो विकल्प कोहि कसैसँग थिएन, अत : विद्युतको मिटर रिडिङ्ग समेत गत वर्षको सोहि महिनाको खपतको आधारमा हिसाव गरेर आफ्ना ग्राहकहरुलाई विल पठाउने निर्णय वितरण केन्द्रहरुले गरिसकेको अवस्था थियो ।

तथापि ने.वि.प्रा. ले पाईलट प्रोजेक्टको रुपमा काठमाण्डौं उपत्यका भित्र रत्नपार्क र महाराजगञ्ज वितरण केन्द्र र तिनका उप वितरण केन्द्र अन्तर्गतका ग्राहकहरुको घरमा अत्याधुनिक प्रविधि सहितको स्मार्ट ईनर्जी मिटर गत वर्ष देखि नै जडान शुरु गरि करिव ६० हजार मिटरहरु पूर्ण रुपमा प्रयोगमा ल्याईसकेको छ भने चालु योजनामा केहि महिना भित्रै बाँकी ३७,००० मिटरहरु जडान गर्ने लक्ष्य राखेको छ । न त मिटर रिडिङ्ग गर्न जाने झन्झट , न ग्राहकलाई डिस्टर्भ, महिना पुरा भएपछि डाटा सेन्टरबाट आफै मिटर रिडिङ्ग हुन्छ , विल हिसाव गर्छ र ग्राहकको मोवाईलमा मेसेज पठाउँछ । यसै गरी ने.वि.प्रा. को वितरण तथा ग्राहक सेवा निर्देशनालय अन्तरगत रहेको स्मार्ट मिटर स्मार्ट ग्रिड आयोजनाबाट समेत करिव आठ हजार टी.ओ.डी तथा चालिस हजार थ्रि फेज ग्राहकहरुको लागि रिमोट मिटर रिडिङ्ग तथा स्मार्ट मिटरिङको काम पुरा गरिसकेको छ भने विगत केहि वर्ष अगाडी देखि कम्प्युटाईज्ड विलिङ्ग तथा नेटवर्क डिभिजन महाशाखा मार्फत विभिन्न बाणिज्य बैंक, इ सेवा लगायतका अनलाईन सेवा प्रदायक मार्फत महशुल भुक्तानी गर्ने प्रविधी लागु भैसकेकोले ती वितरण केन्द्रका ग्राहकहरुलाई स्वचालित प्रविधि (Automation) मार्फत विद्युत प्राधिकरणले सेवा दिईरहेको छ । विद्युत चोरी, मिटर टेम्परिङ, स्विकृत भन्दा बढी लोड खपत जस्ता गलत प्रयासहरुमा डाटा सेन्टर बाटै सु सुचित हुन सकिने, समयमै विल भुक्तानी नभए लाईन काट्न सकिने र भुक्तानी भएपछि तुरुन्त लाईन जोड्न समेत सकिने र यी सवै काममा फिल्डमा कुनै कर्मचारी पठाउनु नपर्ने भएकोले स्मार्ट ईनर्जी मिटरहरु साँच्चै नै यो प्रतिकुल समयको आवश्यकता हो भन्ने महशुश भएको छ ।

प्राविधिक पाटो

साधारणतया स्मार्ट ईनर्जी मिटरहरु ग्राहकको घर घरमा जडान गरिन्छ र आधुनिक संचार प्रविधिहरुको प्रयोग गरी डाटा सेन्टरसँग जोडिन्छ । विश्वभर PLC, GPRS/GSM, Radio Frequency जस्ता संचार माध्यमहरुको प्रयोग गरि मिटर र डाटा सेन्टरलाई जोड्ने काम गरिन्छ तर नेपाल विद्युत प्राधिकरणले हालसम्म GPRS / RG Frequency लाई मात्र संचार माध्यम बनाई काम गरिरहेको छ । जसमा GPRS मा आधारित प्रविधीको लागि टेलिकम सेवा प्रदायक मार्फत सिम कार्ड खरिद गरी सेवा लिनु पर्ने हुन्छ भने Radio Frequency मा आधारित प्रविधिमा नेपाल विद्युत प्राधिकरणको आफ्नै रेडियो नेटवर्क तयार गरिन्छ । यसरी टेलिकम सेवा प्रदायक मार्फत सिम कार्ड खरिद गरि सेवा लिदा डाटा वापतको

शुल्क हरेक महिना प्रति ग्राहकको हिसावले तिर्नुपर्ने हुन्छ भने Radio Frequency मा आधारित प्रविधिमा एक पटक उपकरण खरिद गरे पछी त्यो शुल्क तिर्नु पर्दैन । जुनसुकै माध्यम मार्फत भएपनि हरेक स्मार्ट ईनर्जी मिटरको डाटा ने.वि.प्रा.. को डाटा सेन्टरसम्म आउँछ र HES (Head End System) सर्भरमा संग्रहित हुन्छ। HES (Head End System) एउटा यस्तो प्रविधि हो जसले मिटरसँग लगातार सम्पर्कमा रहिरहन्छ र केहि समयको अन्तरालमा डाटा संकलन गरी फाईल गरेर राख्ने गर्दछ साथ साथै डाटालाई आवश्यकता अनुसार MDMS (Meter Data Management System), BI (Business Intelligence) प्रणालीमा समेत डाटा उपलब्ध गराउने गर्दछ । MDMS (Meter Data Management System) स्मार्ट मिटरिङ्ग सिस्टमको अर्को अत्याधुनिक प्रविधि हो जसले ग्राहकको सवै रेकर्ड चुस्त दुरुस्त राख्ने, आवश्यकता अनुसार रिपोर्ट तयार गर्ने, विलिङ्ग सिस्टमसँग समन्वय गरि काम गर्ने आदि काम गर्दछ । आधुनिक प्रविधिको दुनियामा BI (Business Intelligence) अर्को एउटा नविनतम प्रविधि हो जसले भविष्यमा विद्युत सेवा सुविधा विस्तार गर्नको लागि चाहिने तथ्याङक विश्लेषण तथा योजना तर्जुमाको लागि आवश्यक आधार तयार गरी सहयोग पु-याउने गर्दछ ।

हाल नेपाल विद्युत प्राधिकरणले Radio Frequency मा आधारित प्रविधि मार्फत प्रयोग गरिराखेको स्मार्ट ईनर्जी मिटरहरुमा Radio Frequency, UHF Band को ३९६.५ देखि ३९९.५ मेगा हर्ज विच पर्ने ३ मेगा हर्ज व्याण्डविथ प्रयोग गरिहेको छ । जसमा हरेक स्मार्ट ईनर्जी मिटरहरुलाई RF Modem द्वारा उल्लेखित फ्रिक्वेन्सीमा काम गर्ने गरि DCU (Data Concentrator Unit) र अन्य मिटरहरुसँग समेत संचार सम्पर्क हुने गरी मेश नेटवर्क तयार पारिएको छ भने हरेक DCU देखि ने.वि.प्रा. को डाटा सेन्टरसम्म जोड्न तथा ईनर्जी मिटरहरुलाई नियन्त्रण गर्नको लागि नेपाल टेलिकमको 3G डाटा नेटवर्क प्रयोग गरिएको छ । त्यसैगरी GPRS प्रविधिमा आधारित स्मार्ट ईनर्जी मिटरहरुमा GPRS Modem जडान गरिएको हुन्छ जसमा नेपाल टेलिकमको 3G डाटा सिमकार्ड खरिद Modem मा गरी जडान गरिन्छ र हरेक मिटरको डाटालाई ने.वि.प्रा. को डाटा सेन्टरसँग जोडिएको हुन्छ। यसरी RF तथा GPRS दुवै प्रयोग गरी नेपाल विद्युत प्राधिकरणले आफ्नो ग्राहकहरुलाई प्रविधिको उच्चतम सदुपयोग गर्दै सेवा दिईरहेको छ ।

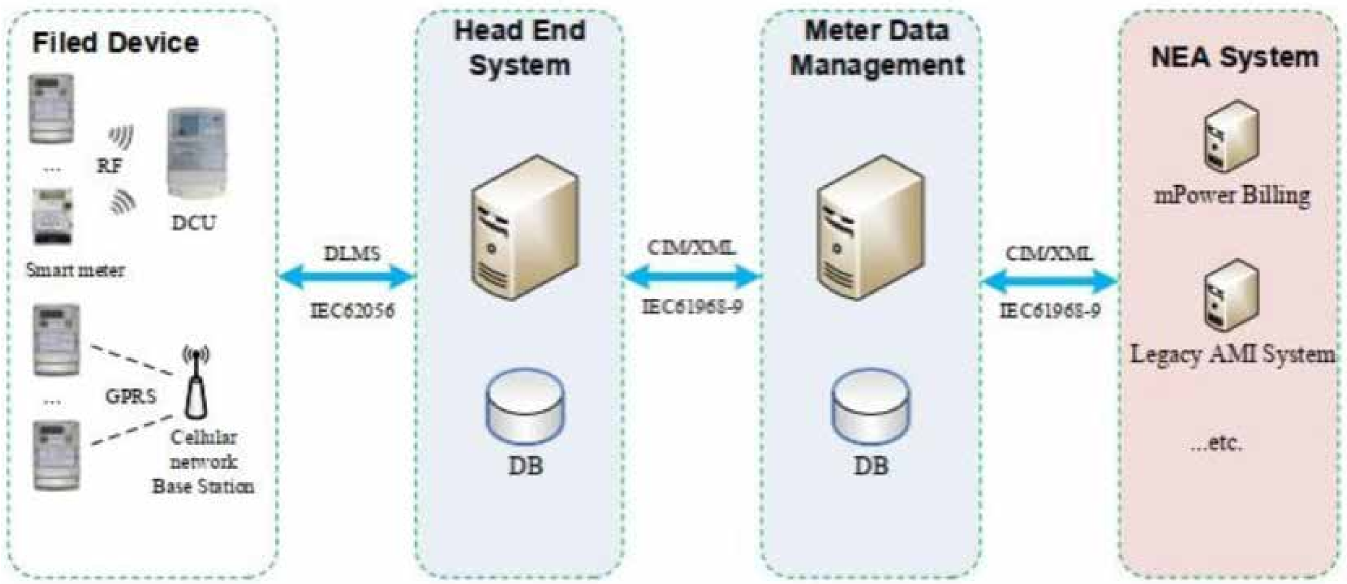

Fig: - A Simple Overview of Smart Metering System

प्राविधिक रुपमा स्मार्ट ईनर्जी मिटरहरु पुराना ईलेकट्रोमेकानिकल मिटर भन्दा सटिक (Accurate) पाईएको छ, जसले न.वि.प्रा. को संकलित महशुलमा समेत सकारात्मक असर पारेको देखिन्छ भने ग्राहकले पाउने सुविधा र प्रविधिको सदुपयोगमा त एउटा नयाँ आयम नै थप गरेको छ । प्रविधीको विकल्प अझै उच्च प्रविधी मात्र हुन सक्दछ, यस्ता खाले संकटको विच स्वचालित प्रविधि (Automation) भन्दा उत्तम प्रविधी अरु हुनै सक्दैन भन्ने कुरामा कुनै दुविधा छैन । विद्युत प्राधिकरण व्यवस्थापन पनि छिटो भन्दा छिटो उपत्यकाका सवै वितरण केन्द्र लगायत उपत्यमा बाहिर समेत अत्याधुनिक प्रविधि सहितको स्मार्ट ईनर्जी मिटरहरु जडान गर्ने पक्षमा रहेको देखिन्छ। उपत्यकाको विद्युत वितरण प्रणालीलाई समेत स्वचालित प्रविधिमा समाहित गर्न केवुल भुमिगत गर्ने काम छुट्टा छुट्टै चार आयोजना मार्फत भईरहेको छ भने यसरी भुमिगत गरिएका केवुलमा जडान

भएका कन्ट्रोल उपकरणहरुलाई स्वचालित रुपमा निरिक्षण, अनुगमन, तथा नियन्त्रण गर्ने हेतुले वितरण प्रणाली नियन्त्रण केन्द्र (Distribution System Control Centre) र सूचना प्रविधिसँग सम्वन्धित उपकरण तथा डाटाहरुलाई सुरक्षित राख्ने तथ्याङ्क केन्द्र (Data Centre) समेत निर्माण हुने चरणमा छ जसले उपत्यकाको वितरण प्रणालीलाई स्वचालित बनाउने छ भने प्राधिकरणको सूचना प्रविधी सम्वन्धी तथ्याङ्क प्रणाली समेत चुस्त हुनेछ ।

विश्वभर फैलिएको कोभिड महामारी वीच यसरी नविन प्रविधिलाई आत्मसाथ गर्दै ग्राहकको मिटर रिडिङ्ग र विलिङ्गमा आउने गरेको समस्यालाई सम्वोधन गर्न स्मार्ट ईनर्जी मिटरिङ्गको प्रविधिले धेरै सहजता प्रदान गरेको प्रारम्भिक अनुभवबाट बुझिएको छ । यसरी स्मार्ट ईनर्जी मिटरिङ्ग प्रविधिको पूण् रुपमा अधिराज्यभर विस्तार गर्न सके ने.वि.प्रा. लाई समयमा नै मिटर रिडिङ्ग गरेर आय संकलन तथा मिटर र अन्य कारणले हुने विद्युत चुहावट नियन्त्रणबाट समेत आर्थिक रुपमा फाईदा हुने कुरा त छदै छ, स्मार्ट ईनर्जी मिटरको जडान पछि ने.वि.प्रा. को ग्राहक सेवामा नयाँ तथा आमुल परिवर्तन आउने कुरामा दुईमत छैन । हाल काठमाण्डौं उपत्यका भित्रको केही वितरण केन्द्रहरु र उपत्यका बाहिर थ्री फेज ग्राहकहरुमा समेत पाईलटिङ भईरहेको यस प्रविधिले ग्राहक सेवामा ने.वि.प्रा. लाई आगामी दिनमा थप सकारात्मक बनाउने विश्वास गर्न सकिन्छ ।

अत : संकटको समयमा प्रविधिको सदुपयोग गरि आजको युगको आवश्यकतालाई आत्मसाथ गर्दै अगाडी बढिरहेको नेपाल विद्युत प्राधिकरण पुरै देशभर स्मार्ट ईनर्जी मिटर लागु गर्ने लक्ष्यमा स्पष्ट हुनु जरुरी छ । आशा छ परिस्थितिले बेलाबेलामा देशमा सिर्जना गर्ने यस्ता असामान्य पिडालाई शक्तिमा बदल्ने प्रयासमा विद्युत प्राधिकरणको स्मार्ट ईनर्जी मिटर र अटोमेसन प्रणाली कोशेढुङ्गा सावित हुनेछन् ।

विद्युतीय शासन र यसको अभ्यास

भोला शर्मा
सहायक निर्देशक,
तनहुँ हाइड्रोपावर लि.

विश्वमा शासकीय सुधारका नयाँ नयाँ ढाँचाहरु समयको क्रमसंगै विकास हुँदै आएका छन् । त्यसै क्रममा E–Governance भनेर चिनिने विद्युतीय शासन पनि एक नविनतम अबधारणा हो । शासकीय प्रबन्धमा सूचना र सञ्चार प्रविधिको अधिकतम उपयोग गर्नु नै विद्युतीय शासन (E–Governance) हो । अर्को तरिकाबाट भन्नु पर्दा सरकार र सार्वजनिक सेवाको प्रभावकारीता अभिबृद्धिका लागि नयाँ सूचना तथा सञ्चार प्रविधिको प्रयोग मार्फत नागरिक सेवा प्रवाह गर्ने नीति नै विद्युतीय शासन हो । यसले शासकीय प्रणालीमा सेवाग्राहीहरुको भौतिक उपस्थिति र कागजी प्रकृया न्यून गरी Faceless / Paperless Office को अबधारणालाई साकार पार्ने जमर्को गर्दछ । आज सरकार, नागरिक तथा अन्य सरोकारवालाहरु बीच विद्युतीय सूचना तथा सञ्चार प्रविधिबाट अन्तरक्रिया सहितको कारोबार गरी समन्वयात्मक सेवा प्रवाह गर्न सहज भएको छ । विद्युतीय शासनले सीमा विहीन शासकीय प्राणालीको मान्यता आत्मसात गरी सुशासनको खोजीका सन्दर्भमा ICT को अभ्यास गर्दछ ।

विद्युतीय शासनका पूर्वशर्तहरु

एक्काइसौं शताब्दीको प्रारम्भसँगै विद्युतीय उपकरणको प्रयोग उच्च गतिमा हुँदै आएको छ । विद्युतीय उपकरणको प्रयोगका कारण आज विश्व एउटा सानो गाउँमा परिणत हुन पुगेको छ । यसको विकास र विस्तार पनि अकल्पनीय ढंगले अगाडि बढिरहेको छ । विगतमा एक ठाँउवाट अर्को ठाउँमा समाचार पुऱ्याउन चिट्ठी-पत्र, टेलिफोन, वायरलेस आदिको प्रयोग गरिन्थ्यो भने आज कम्प्युटर नेटवर्क, मोबाइल फोन, टेलिफोन मार्फत यो कार्य गरिदैं आएको छ । एउटै पुस्ताका व्यक्तिले पनि थरिथरिका विद्युतीय उपकरणको उपयोग गर्न पाएका छन् । यो पक्कै पनि सुखद् समाचार हो । यस्तो विद्युतीय शासनका पूर्वशर्तहरुलाई निम्न बमोजिम उल्लेख गरिन्छः-

(क) नियमित विद्युत आपूर्तिको व्यवस्था,

(ख) टेलिफोन, मोबाईल, फ्याक्स, फोटोकपी, कम्प्यूटर, आईप्याड, ट्याब, सर्भर, स्क्यानर, सीसी टी.भी. लगायत आधुनिक प्रविधिजन्य उपकरणहरु,

(ग) ईमेल, ईन्टरनेट, वेभसाईट, फेसबुक, म्यासेन्जर लगायतका सफ्टवेयर प्रोग्रामिङहरु,

(घ) ICT मा निपूर्ण सीपयुक्त दक्ष जनशक्ति,

(ङ) वायर/वायरलेस नेट/वाईफाईको व्यवस्था,

(च) राजनीतिक तथा प्रशासनिक प्रतिबद्धता,

(छ) विद्युतीय कारोवारलाई मामान्यता दिने नीति र कानून आदि

विद्युतीय शासनको आबश्यकता

समकालिन प्रशासन र पछिल्लो पुस्ताका लागि विद्युतीय शासन आवस्यक मात्र नभई अनिबार्य क्रियाकलाप बन्न पुगेको छ । डिजिटल सूचना तथा तथ्याङ्क आदान प्रदान गरी उपयोग गर्ने संस्कारको गौरबशाली समयको अबसरका रुपमा विद्युतीय शासनलाई लिने गरिन्छ । यस प्रकारको विद्युतीय शासनको आवश्यकतालाई तपसिलका बुँदाहरुबाट स्पष्ट पारिन्छ-

(क) कार्यालयको कामकाबाहीमा कागजी प्रकृयाको अनावश्यक झन्झट न्यूनिकरण गर्न,

(ख) सेवाग्राहीहरु सार्वजनिक सेवा प्राप्तीका लागि सेवा प्रदायक समक्ष भौतिक रुपमा उपस्थित हुन नपर्ने वातावरण सृजना गर्न,

(ग) Office At Home को अबधारणालाई साकार पार्न,

(घ) सेवाग्राहीलाई शिघ्रतापूर्वक, निष्पक्षतापूर्वक, सहजतापूर्वक र सहभागितामूलक र पारदर्शी ढंगले सेवा प्रवाह गर्ने समूचित वातावरण सृजना गर्न ।

(ङ) कम स्रोतसाधन तथा जनशक्तिबाट बढी कार्य उपलब्धी हाँसिल गर्न,

(च) डिजिटल नेपाल निर्माणको अबधारणालाई साकार पार्न,

(छ) सार्वजनिक प्रशासन र यसका सेवाग्राहीहरुको दक्षता अभिबृद्धि गर्न,

(ज) कोरोना लगायत संक्रमणयुक्त महामारी रोगका समयमा मानिस मानिसको भीडभाड कम गर्न,

(झ) सार्वजनिक प्रशासनमा सुशासन अभिबृद्धिका लागि फराकिलो आधार निर्माण गर्न आदि ।

विभिन्न मुलुकहरुमा विद्युतीय शासनको अभ्यास

समयक्रमसंगै विकसित एवं विकासोन्मुख देशले विद्युतीय शासनको अभ्यास बढाउँदै लगेका छन् । विकासोन्मुख मुलुकले पनि आफ्नो गतिविधिलाई पछिल्लो समयमा तिब्रता दिएका छन । संयूक्त राष्ट्रसंघले गरेको सर्भेक्षण अनुसार विद्युतीय शासन सूचकाङ्कमा सबैभन्दा अग्रिम स्थानमा गणतन्त्र कोरिया रहेको छ । यो प्रणाली सफलतापूर्वक सञ्चालन गर्ने अन्य केही मुलुकहरु छन्ः

जर्मनीले डी ११५ नामक परियोजना कार्यान्वयन गरी उदाहरण पेश गरेको छ । यस अन्तर्गत वन स्टप ई-सर्भिस प्रदान गरिन्छ । त्यहाँ सञ्चालनमा रहेको विगतको प्रशासनिक अभ्यासलाई विकेन्द्रीत रुपमा सञ्चालन गर्न उक्त परियोजनाले निकै सघाउको पुचाएको छ ।

त्यसैगरी छोटो समयमा द्रुत विकास सम्पन्न गर्न सकेको अर्को राष्ट्र सिंगापुर हो । त्यहाँ मास्टर प्लान मार्फत विद्युतीय शासन कार्यान्वयन गरिएको छ । सरकारले निर्माण गरेको दश वर्षे विद्युतीय गुरुयोजना मार्फत १६०० किसिमका अनलाइन सेवाहरु सुलभ गराइएका छन्, जसका कारण सिंगापुरले आज विद्युतीय शासनमा शिघ्र फड्को मार्न सफल भएको छ ।

छिमेकी मुलुक भारतमा विद्युतीय शासनको प्रवर्द्धनमा सार्वजानिक निजी साझेदारीको अवधारणा अनुरुप कार्य सञ्चालन गरिएको छ । नमुनाको रुपमा गुजरात प्रान्तको राजधानी गान्धिनगरमा स्टप ई-गभर्नेन्स सेन्टर मार्फत ९७ किसिमका सार्वजानिक सेवाहरु प्रवाह गरिएका छन् ।

समकालिन प्रशासनमा विकासोन्मुख र अल्प विकसित मुलुकले समेत सुशासन स्थापित गर्ने सम्बन्धमा विद्युतीय शासनको क्रियाशीलता अभिबृद्धि गरेका छन् । परिवर्तित वर्तमानमा विश्व एक गाउँमा परिणत भइसकेकाले यसको प्रयोगमा अनकनाउने मुलुक विश्व रंगमञ्चबाट एक्लो हँदै जाने प्रबल संभावना छ । अतः यसको विकास, प्रबर्द्धन र अभ्यासमा सरकार, निजी क्षेत्र, नागरिक समाजको साझा प्रयत्न आवश्यक देखिन्छ ।

नेपालमा विद्युतीय शासनको व्यवस्था र अवस्था

विद्युतीय शासन नेपालको रहर मात्र होईन, यो विश्वव्यापी लहर पनि हो । सूचना प्रविधि नीति, २०५७ बाट बिजारोपण भएको नेपालको विद्युतीय शासनले दुई दशक पार गरी एक्काईसौं शताब्दीको यो नवआधुनिक युगमा प्रबेश गरेको छ । एउटा अनुपम प्रविधियुक्त नविनतम शासकीय गतिविधीको रुपमा सुपरिचित यसप्रकारको शासकीय क्रियाकलापका सम्बन्धमा भएका व्यवस्था र अवस्थालाई यसप्रकार उल्लेख गरिन्छ :

- सूचना तथा सञ्चार प्रविधि मन्त्रालय, शिक्षा, विज्ञान तथा प्रविधि मन्त्रालय, सूचना प्रविधि विभाग, सूचना प्रविधि उच्चस्तरीय आयोग, राष्ट्रिय सूचना प्रविधि केन्द्र, सूचना प्रविधि विकास पार्क, नेपाल दूर सञ्चार प्राधिकरण, नेपाल विद्युत प्राधिकरण लगायत धेरै संस्थाहरु विद्युतीय शासनमा क्रियाशील रहेका छन । त्यसैगरी सूचना प्रविधिमा आधारित नयाँ व्यवसायिक मोडल भएका कम्पनीहरु जस्तै वर्ल्ड लिंक, सुबिसु पठाओ, टुटल, फुडमाण्डु आदि वजारमा प्रवेश गरेर आकर्षक लहर सृजना भएको छ ।
- नेपालको संविधानको धारा ५१ (च ५) ले निर्दिष्ट गरे बमोजिम राष्ट्रिय आवश्यकता अनुसार सूचना प्रविधिको विकास र विस्तार गरी त्यसमा सर्वसाधारण जनताको सहज र सरल पहुँच सुनिश्चित गर्ने तथा राष्ट्रिय विकासमा सूचना प्रविधिको उच्चतम उपयोग गर्ने राज्यको नीति रहेको छ । सो अनुरुप विद्युतीय शासनको प्रयोग र प्रविधि प्रबर्द्धनका सम्बन्धमा विद्युतीय कारोवार ऐन, २०६३ र नियमावली २०६४, सुशासन (व्यवस्थापन तथा सञ्चालन) ऐन २०६४ र नियमावली २०६५, दूरसञ्चार ऐन २०५३ र नियमावली २०५४, सूचनाको हक सम्बन्धी ऐन, २०६४ र नियमावली २०६५, सूचना तथा संचार प्रविधि नीति २०७२, पन्ध्रौं योजना (२०७६/०७७-२०८०/०८१) र आर्थिक वर्ष २०७८/०७९ को बजेट बक्तब्य लगायतका कानूनी तथा नीतिगत व्यवस्थाहरु क्रियाशील रहेका छन् ।
- E-education, E-library, E-Service, E-Banking, E-Biding, E-Payment, E-Registration,

E-taxation, E-service, E-mail, Internet, E-advice, E-coordination, E-direction, E-controlling, E-monitoring, E-feedback System लगायतका विद्युतीय सेवाहरुको अभ्यास गरि देशमा Disital Divide कम गर्ने प्रयत्न गरिएको छ ।

- सार्वजनिक निकायबाट प्रदान गरिने सेवालाई सहज र प्रविधि मैत्री बनाउनका लागि गत आर्थिक वर्ष देखि नागरिक मोबाईल एप्स प्रयोगमा ल्याईएको छ ।
- सरकारी सूचना एवं तथ्याङ्कलाई एक भन्दा बढी स्थानमा भण्डारण गर्न हेटौडामा Disaster Data Recovery Center सञ्चालनमा ल्याईएको छ ।
- गत आर्थिक वर्षको फागुन मसान्तसम्म हेलो सरकार कक्षमा दर्ता भएका जम्मा ७६७१ गुनासो मध्ये ५२७३ वटा फछ्र्यौट गरिएको छ । त्यसैगरी हेलो सरकारको पोर्टललाई स्तरोन्नती गरी आम नागरिकको आवाज प्रतिबिम्बित गर्ने माध्यमका रुपमा विकास गर्न नयाँ पोर्टल सञ्चालनमा ल्याईएको छ ।
- अत्यावश्यक सेवाको सूचिमा Internet सेवालाई समावेश गरी विद्युतीय शाासनलाई प्रवर्द्धन गरिएको छ ।
- गत आर्थिक वर्ष देखि नै कोभिड संक्रमणमा विद्युतीय शासनको सहयोगमा Zoom Meeting / Work From Home मार्फत कार्यालयको कार्य सञ्चालन तथा समन्वय गरिएको छ ।
- शिक्षण संस्थाको पठनपाठन अनलाईन मार्फत सञ्चालन गरी शैक्षिकसत्रलाई निरन्तरता दिईएको छ ।
- शिक्षण संस्थामा कम्प्युटरको ज्ञान र प्रोग्रामिङलाई पाठ्यक्रममा राखि पठनपाठन कार्य प्रारम्भ गरिएको र वि.सं. २०६७ देखि सबैलाई कम्प्युटर शिक्षा व्यवहारमा ल्याइएको छ ।
- लोकसेवा आयोगको दरखास्त संकलन कार्य अनलाईन प्रणाली मार्फत गरी हजारौंको संख्यमा हुने भिडभाड हटेको छ । त्यसैगरी आयोगले सञ्चालन गरेको वस्तुगत परीक्षाको उत्तरपुस्तिका अप्टिकल मार्क रिडर (OMR) को सहायताले परीक्षण गर्न थालिएको छ ।
- विभिन्न केन्द्रीय निकायले आफ्नो बेबसाइटहरु निर्माण गरी सञ्चालनमा ल्याएका छन् ।
- मन्त्री परिषद्को निर्णय तथा सूचनाहरु वेभसाइटहरुमा राख्ने गरिएको छ ।
- संघिय मामिला तथा सामान्य प्रशासन मन्त्रालय अन्तर्गत निजामती किताब खानामा कर्मचारी सूचना प्रणाली व्यवहारमा ल्याईएको छ ।
- अर्थ मन्त्रालय अन्तर्गत बजेट व्यवस्थापन सूचना प्रणाली, विषयगत मन्त्रालय सूचना प्रणाली, स्वचालित भन्सार तथ्याङ्क प्रणाली, एकल खाता कोष प्रणाली र आन्तरिक राजश्व विभागले आय कर, अन्तः शुल्क, मूल्य अभिवृद्धि करलाई ई-पान माार्फत अनलाइन सेवा प्रवाह गरेको छ ।
- त्यसैगरी विभिन्न संवैधानिक निकायले आफ्नो बेबसाइट राख्ने गरेको, नेपाल प्रहरीले विभिन्न किसिमको विद्युतीय उपकरणको प्रयोग व्यवहारमा ल्याएको, गृह मन्त्रालयले राष्ट्रिय परिचयपत्रको कार्य प्रारम्भ गरेको, विभिन्न मन्त्रालय/विभागले विद्युतीय बोलपत्रको कार्य व्यवहारमा ल्याएको, सर्वोच्च अदालतले मुद्दाहरुको अद्यावधिक अवस्थाको अनलाइन जानकारी दिने गरेको, काठमाण्डौ महानगरपालिकाले पञ्जीकरणको कार्य व्यवहारमा ल्याएको, विभिन्न पत्रपत्रिकाहरुले अनलाईन समाचार सेवा शुरु गरेका, बैंक एवं वित्तिय संस्थाले सूचना प्रविधिको उपयोग वृद्धि गर्दै वित्तिय सुशासनमा छलाङ मार्न सफल भएका छन् ।
- प्राय सवै कार्यालयहरुमा टेलिफोन सेवा र ईन्टरनेट सेवाको व्यवस्था गरिएको साथै प्राय सवै कार्यालयहरुको आधिकारीक E-mail / Facebook Page सृजना र अद्यावधिक गर्ने गरिएको छ ।
- समग्रमा पछिल्लो समयमा ICT Based Technology को विकास र अभ्यास गरी Less Government Is The Best Government को मान्यतालाई प्रश्रय गर्नुका साथै E-Service मार्फत Faceless / Paperless Office को अवधारणालाई साकार पार्ने प्रयत्न गरिएको छ ।

नेपाल विद्युत प्राधिकरणमा विद्युतीय शासनको अभ्यास

विद्युतीय शाासनको अनुशरण गर्न नसक्ने वा नरुचाउने संस्था विकासको मुलधारबाटै अलग्गिने सम्भावना रहेकाले पनि नेपाल विद्युत प्राधिकरणमा यसलाई कार्यान्वयनमा ल्याउनुको विकल्प देखिन्न । पछिल्लो समयमा नेपाल विद्युत प्राधिकरणले यसको अभ्यासलाई तिब्रता दिंदै विद्युत उत्पादन, प्रशारण र वितरणलाई सक्षम, भरपर्दो र सर्वसुलभ गरी विद्युत आपुर्तिको समुचित व्यवस्था गर्ने स्थापनाकालिन उद्देश्य पुरा गर्ने जमर्को गरेको छ ।

नेपाल विद्युत प्राधिकरणमा भएका यस सम्बन्धी गतिविधीका केही नमुना उदाहरणहरु यसप्रकार छन:

- सुचना प्रविधि विभाग र पीडीबी (Personal Data Bank) को संस्थागत व्यवस्था गरिएको छ ।
- सरुवा, बढुवा वा नियुक्ति सम्बन्धी पत्र लगायतका पत्राचारहरु E-Mail मार्फत गर्ने गरिएको र PIS (Personal Informatiom System) का लागि कार्य भैरहेको ।
- पदपूर्ति विभागमा अनलाईन दरखास्त दिने व्यवस्थाको शुरुवात गरिएको छ ।
- वितरण तथा ग्राहक सेवा अन्तर्गत महाराजगञ्ज र रत्नपार्क वितरण केन्द्रबाट Smart Meter System शुरुवात गरिएको छ ।
- विद्युतीय बोलपत्र प्रणाली (E-Bidding System) अबलम्बन गरिएको छ ।
- विद्युत महशुल तिर्न बुझाउनका लागि Online Payment System / Any Branch Payment System लागु गरिएको छ ।
- प्राधिकरणको लेखा प्रणालीमा CAIS Software को व्यवस्था लागु गरिएको छ ।
- Online Grievance Management System लागु गरिएको छ ।
- प्राधिकरणका समसामयिक गतिविधीहरुका साथै महत्वपूर्ण प्रकाशनहरु, परिपत्रहरु र सूचनाहरु प्राधिकरणको आधिकारीक वेव साईट www.nea.org.np मा राख्ने गरिएको छ ।
- उच्च व्यवस्थापन तहमा समय समयमा Zoom Meeting गर्ने अभ्यास भएको छ ।
- प्राय सवै कार्यालयहरुमा विद्युतीय हाजिरी प्रणाली (E-Attendence System) लागु गरिएको छ ।
- मुलुक ऊर्जामा आत्मनिर्भर भई दूरदराजसम्म विद्युत सेवा विस्तार भएको परिप्रेक्ष्यमा प्राधिकरणको अर्थतन्त्र दिन प्रतिदिन ऊर्जा सघन भएर गएको छ । यसबाट विद्युतीय शासनमा महत्तम टेवा पुग्न गएको छ ।

नेपालमा विद्युतीय शासनका समस्या

एक्काइसौं शताब्दीमा विद्युतीय शासन लोकप्रिय बन्दै गइरहेको छ । यसको अभावमा कुनै पनि कल्याणकारी सरकारले सुशासन स्थापित गर्न सक्ने देखिदैन । तथापी यसको कार्यान्वयनमा अनेकौं समस्याहरु देखिएका छन् । ती समस्याहरु यसप्रकार छन्:

- मौजुदा ऐन, कानून र नीति नियमहरु जटिल छन्, सरल र प्रविधि मैत्री छैनन् ।
- सार्वजानिक सेवामा कार्यरत कर्मचारीहरु आमूल परिवर्तनको पक्षमा देखिन्नन् । नयाँ ज्ञान प्रविधि सिक्ने प्रयोग गर्ने कर्मचारीको संख्या सीमित छ, सम्बन्धित दक्ष जनशक्तिको आवश्यकता आपूर्ति हुन नसकेबाट पनि बजारमा उपलब्ध प्रविधिको उपयोग गर्न सकिएको छैन ।
- सूचना प्रविधिको विकास सहरी क्षेत्रमा बढी केन्द्रित भएको र यसको विस्तार मोफसलका जिल्ला र स्थानीय तहमा अपेक्षित रुपमा हुन सकेको पाइदैन ।
- सरकारी निकायवाट स्थापना गरिएका बेवसाइटहरु आवश्यकता अनुरुप अद्यावधिक गरिएको पाइदैँन । निर्माण भएका सफ्टवेयरहरु कार्यान्वयनमा ल्याउन सकिएको छैन ।
- बढ्दो साइबर अपराधका समाचारले यसको कार्यान्वयन सर्व स्वीकार्य हुन सकेको छैन । सरकारले आवश्यकता अनुसार साइवर अपराध विरुद्धको कानूनहरु निर्माण गरेको पाइदैन ।
- सबै जिल्लास्थित कार्यालयहरुमा आवश्यक प्रविधिजन्य उपकरणहरु र इन्टरनेटको पहुँच पुऱ्याउन सकिएको छैन । उपलब्ध उपकरण पनि विभिन्न वहानामा काम नगरेको, बिग्रेको भन्ने, उपकरण नै बिगार्ने आदि प्रवृत्ति विद्यमान छ ।
- देशका अब्बल प्रतिभाहरु विदेशिने प्रवृत्तिका कारण प्रविधिसंग सुपरिचित संबद्ध जनशक्तिको खाँचो अझै पूर्ति हुन सकेको छैन । उच्च पदस्थ कर्मचारीले अपवादलाई यसको प्रयोग नगर्ने र आफ्ना मातहतका कर्मचारीमा भरपर्ने बानी छ ।

समस्या समाधानका उपायहरु

समस्याहरुको पहाड भएकै ठाउँमा पनि अबसरको मैदान हुन्छ । नेपालको सार्वजनिक व्यवस्थापनमा माथि उल्लेखित समस्याहरु समाधान गर्न निम्न बमोजिमका सुझावहरु अबलम्बन गरेर अगाडी बढ्नु बेस हुन्छ :

- विद्यमान ऐन, कानून तथा नीति नियमहरुलाई सरलीकृत र प्रविधिमैत्री बनाउने,
- दक्ष, सिपयुक्त जनशक्ति उत्पादन, विकास, प्रबर्द्धन र टिकाउयोग्य वातावरण सृजना गर्ने,
- सस्तो र सुलभ दरमा प्रविधिमैत्री उपकरणहरु भित्राई प्रविधिको पहुँच दूरदराजसम्म विस्तार गर्ने,

- सरकारी निकायका वेवसाईटहरु आवश्यकता अनुरुप अद्यावधिक गर्ने र निर्माण गरिएका सफ्टवेयरहरु कार्यान्वयनमा ल्याउने,
- विद्युतीय शासनको सर्वस्वीकार्यता अभिबृद्धि गर्न साईबर अपराध विरुद्धका कडा कानूनहरु निर्माण गरी प्रभावकारी कार्यान्वयन गर्ने,
- कर्मचारी अभिप्रेरणाको पक्षमा विशेष ध्यान पुचाई संगठनमा प्रविधिजन्य सिपयुक्त ऊर्जाशील जनशक्तिलाई टिकाउयोग्य वातावरण सृजना गर्ने साथै प्रविधिको ज्ञान कम भएका कर्मचारीहरुलाई प्रशिक्षित गर्ने,
- विद्युतीय शासनका पूर्वाधार निर्माणलाई खर्च होईन लगानी हो भन्ने मानसिकता बनाएर पूर्वाधार निर्माणलाई तिब्रता दिने, आदि ।

निष्कर्षः

गतिशिल समयको माग बमोजिम विद्युतीय शासन मार्फत आज विश्वका धेरैजसो राष्ट्रहरुले विकास र सेवा प्रवाहमा काँचुली फेरि सकेका छन् । परिणाम स्वरुप विश्व नै एक गाउँमा परिणत भएको छ । यसले भौगोलिक दूरता कम मात्र गरेको छैन, शिघ्र र विश्वसनीय सूचना संप्रेषणबाट लालफित्ताशाही कार्यसंस्कृतिको अन्त्य गर्न मार्ग प्रशस्त गरेको छ। जिजुबाजेको पालामा विद्यमान हुकुमी शासनको निरन्तरता आजका नौजवान नातिहरुका लागि पाच्य हुन सक्दैन। त्यसैगरी विगतमा विदेशिएका युवाहरुबाट घरपरिवारमा लेखिएका महिनौं पछि प्राप्त फाटेका र मैलिएका पत्रका आधारमा सञ्चो/विसञ्चो हालखवर प्राप्त गर्ने बाबु आमाहरु विद्युतीय प्रविधिको सहाराबाट आफ्ना परदेशी सन्तानको अनुहार हेरेर आमने सामने जस्तै भएर कुराकानी गर्न पाउँदा मन्त्रमुग्ध भएका छन् । विगतमा सेवाग्राहीहरु सार्वजनिक सेवा प्राप्तिका लागि टाढा टाढा जानुपर्ने र एकैदिनमा काम नसकिएर बास बस्नु पर्ने अवस्थालाई विद्युतीय शासनको अभ्यासले शिघ्र कार्य सम्पन्न हुँदा आज उनीहरुको मुहारमा मुस्कान छाएको छ । एउटा मोबाईल हातमा हुँदा हातमै फोन, हातमै घडी, हातमै रेडियो, हातमै टेलिभिजन, हातमै समाचार पत्रहरु, हातमै क्यामेरा, हातमै एल्वम, हातमै क्याल्कुलेटर, हातमै गीत संगीत, हातमै चिठीपत्र (म्यासेज), हातमै फेसबुक लगायत अनेक सेवा सुविधाले गर्दा आधुनिक मानव जिवन सरल र सुखमय भएको छ । सारमा भन्नुपर्दा विश्वव्यापी प्रतिस्पर्धाको यो दुनियामा सार्वजनिक प्रशासनका हरेक क्रियाकलापहरुमा विद्युतीय शासनको निसंकोच अभ्यास गरी डिजिटल नेपाल निर्माणको अभियानलाई शिघ्र साकार पार्न अत्यन्त आवश्यक छ ।

सन्दर्भ सामग्रीहरुः

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The 13-Year Story of Indo-Pakistan Indus Waters Treaty

Shanta Bahadur Pun
Ex-Managing Director, NEA

Green and White Revolutions for Nepal's Terai!

"Thapa Saheb, you Nepalese do not know the Value of Water. For us Indians, every Drop of Water is equivalent to a Drop of Blood!"

Muchkund Dubey, Indian High Commissioner to Bangladesh (1979-1982) confiding to IGP **Harka Bahadur Thapa**, Nepalese ambassador to Bangladesh (1976-1981) at a time when India and Bangladesh were at loggerheads over the unilaterally constructed **Farakka Barrage** on the Ganges.

Pakistan's 485 ft high Tarbela Dam on Indus river.
Impounded Water: 11.1 MAF (13.7 BCM)
Installed capacity: 4,888 MW
Construction: begun 1968, completed 1976

India's 741 ft high Bhakra Dam on Sutlej river
Impounded Water: 7.5 MAF (9.3 BCM)
Installed capacity: 1,325 MW
Construction: begun 1948, completed 1963

A. Foreword:

The writer believes the Indus waters dispute between India and Pakistan had a profound bearing on the contents of the Indo-Nepal Kosi and Gandak treaties. In terms of timeframe, when the Indus Waters Treaty was still being negotiated, both the 1954 Kosi and 1959 Gandak treaties were already signed, sealed and done with. While negotiating the long-drawn Indus waters dispute, India's political and bureaucratic actors got excellent opportunities to educate themselves on the nuances and complexities of water – that *sanjivani* of life. With both India and Pakistan hiring international consultants of repute and working with top water experts of the *'good officer'* the World Bank, India's key policy makers were thoroughly educated on the fine art of where to dot the i's and cross the t's on international cross-border river treaties. Undoubtedly, these very Indian actors involved in the Indus waters dispute were instrumental in framing the key clauses of the Kosi and Gandak Agreements. Only three years earlier to the 1954 Kosi Agreement, the naïve Nepalese politicians and bureaucrats had managed to unyoke themselves from a century of autocratic Rana rule with the very *'good offices'* of India. Nepal, hence, became an easy prey to the skillfully phrased clauses of the one-sided 1954 Kosi and 1959 Gandak treaties. The 1954 Kosi Agreement was signed amazingly after a mere two days of negotiations, eliciting *'Veni, Vidi, Vici'* by a jubilant Indian newspaper. Though the 1959 Gandak Agreement took a longer seven months to be signed, the water rights clauses on Gandak Agreement are far harsher than those of 1954 Kosi Agreement. Then 1996 Mahakali Treaty, hammered out in just 11 months, made the mother of all blunders by acquiescing to '… ***without prejudice to their respective existing consumptive uses*** *of the waters of the Mahakali River. …..* ***precludes the claim, in any form,*** *by either Party on the* ***unutilized portion of the shares*** *of the waters of the Mahakali River ….* '. These were all lessons India assiduously learned from the Indus waters dispute and merely mirrored them in the Kosi/Gandak/Mahakali treaties. The Indus water dispute, which surfaced soon after partition in August 1947, festered for 13 long years to finally crystallize after 8 years of *'good officering'* by the World Bank into the Indus Waters Treaty in September 1960. The treaty then ushered in an era of Green and White Revolutions in Northern India. Hence, despite the three wars between the now nuclear-armed signatories, the Indus Waters Treaty is still functioning for the last sixty years. Nepal, instead of pursuing such Green and White Revolutions in her Terai, is busy barking up the wrong tree, the Electricity Development Decade 2016-2026 to commission 10,000/17,000 MW in ten years!

B. The Indus Waters Treaty :–

I. **Genesis of Indus Waters Dispute:** Sir Cyril Radcliffe, Chairman of the Punjab Boundary Commission, realizing the vast irrigation networks of undivided Punjab, approached Nehru and Jinnah with the suggestion that *'the* ***Punjab Water System should be a joint venture*** *run by both countries.'* While Jinnah rebuffed him with *'… to get on with his job and inferred he would* ***rather have Pakistan deserts than fertile fields watered by courtesy of Hindus,'*** Nehru, in a not dissimilar tone, told him that ***'what India did with India's rivers was India's affair!'*** It is alleged that Radcliffe, under intense pressure from Nehru and Mountbatten, reversed his allotment of the region that included the two important irrigation head-works of Madhopur on the river Ravi and Ferozepur on the river Sutlej from Pakistan to India. Thus, Pakistan's Punjab, her bread-basket, became a hostage to the water supplies from these two India-controlled barrages.

II. **Standstill Agreement of 20thDecember 1947:** Hence, the two Chief Engineers of partitioned Punjab (*Pakistan's West Punjab and India's East Punjab*) signed the ***"Standstill Agreement"*** on **20th December 1947** to continue the ***status quo ante*** on Madhopur and Ferozepore Headworks till 31st March 1948. When Pakistan's Punjab failed to renew this *"Standstill Agreement"*, India's Punjab on 1st April 1948 discontinued the delivery of waters from these headworks for a full month. Only under instructions from Prime Minister Nehru, "*orders were issued by the East Punjab authorities on 30th April to resume water supply …*". This is best explained by Chaudhri Muhammed Ali, the then Secretary-General of Pakistan and later her Prime Minister:

> *On the side of East Punjab [India] there was Machiavellian duplicity. On the part of West Punjab [Pakistan] there was neglect of duty, complacency and lack of common prudence – which had disastrous consequences for Pakistan.*

Though Prime Minister Nehru promised that India's prosperity would not be built on the misery of Pakistan, he was determinedly moving ahead with the construction of the massive Bhakra-Nangal Dam on the river Sutlej that had been started during the British Raj. Pakistan, on the other hand, was exploring ways to restrict Indian activities on the upper reaches of the Indus River and its tributaries.

III. Inter-Dominion Agreement of 4th May 1948: Inter-Dominion Agreement was signed on 4th May 1948 for India by Prime Minister Jawaharlal Nehru (*with NV Gadgil – Minister Works, Mines and Power and Swaran Singh – Minister Irrigation East Punjab*) and for Pakistan by Finance Minister Ghulam Mohd. (*with Shaukat Hyat Khan and Mumtaz Daultana – both Ministers of West Punjab*). A few highlights of that 4th May 1948 Agreement were:

- *A dispute has arisen between the East and West Punjab Governments regarding the supply by East Punjab of water to the Central Bari Doab (CBDC) and the Dipalpur Canals in West Punjab. East Punjab (India) contended that under the Punjab Partition (Apportionment of Assets and Liabilities) "the* ***proprietary rights in the waters of the rivers in East Punjab vest wholly in the East Punjab Government*** *and the West Punjab Government* ***cannot claim any share of these waters as a right."*** *West Punjab Government disputes this contention.* ***As per international law and equity, it has a right to the waters of the East Punjab rivers.***

- *East Punjab has revived the flow of water into these canals on certain conditions of which two are disputed by West Punjab. One, which arises out of the contention in paragraph 1, is the* ***right to the levy of seigniorage (royalty) charges for water*** *and the other is the* ***question of the capital cost of the Madhavpur Head Works and carrier channels*** *to be taken into account.*

- *Apart, therefore, from the question of law involved, the Governments are anxious to approach the problem in a practical spirit on the basis of* ***East Punjab Government progressively diminishing its supply to these canals in order to give reasonable time to enable the West Punjab Government to tap alternative sources."***

- *The West Punjab Government has* ***agreed to deposit immediately in the Reserve Bank such ad hoc sum*** *as may be specified by the Prime Minister of India. Out of this sum, that Government agrees to the* ***immediate transfer to East Punjab Government of sums over which there is no dispute.***

Pakistan's claim of '***Existing Uses ….***' was rejected outright by India with the argument '***proprietary rights in the waters of the rivers in East Punjab vest wholly in the East Punjab Government.***' Two other important issues raised in this Inter-Dominion meeting were: i) Indian claim of **seigniorage/royalty charges** from Pakistan for the supply of water. [*Before partition, Punjab received from the State of Bikaner* ***seigniorage/royalty charges for the supply of water in addition to proportionate maintenance costs, etc.*** *India, thus, wanted similar charges for water supplied to Pakistan. Though Pakistan objected this royalty claim of India, it had no option but to acquiesce* ***'under dissent'***.] ii) introduction of the **principle of replacement**– *that is, India to slowly withhold water from Pakistan canals so that Pakistan can replace this water by tapping alternative sources.*

Nepal Related:

This 4th May 1948 Inter-Dominion Agreement contains two noteworthy issues for Nepal. One is, as the lower riparian, Pakistan's claim of '***Existing Uses***' and India's stand, as the upper riparian, "***proprietary rights in the waters of the rivers in East Punjab vest wholly in the East Punjab Government.***" The other is, as the upper riparian, India's claim of '***seigniorage/royalty charges for the supply of water in addition to proportionate maintenance costs, etc.***' and Pakistan, as the helpless lower riparian, having no choice but '*to agree under dissent!*'

But, India, as Nepal's lower riparian, skillfully incorporated her *'existing uses'* claim in one form or the other in the Kosi and Gandak treaties – being harsh particularly in the Gandak treaty. However, in the 1996 Indo-Nepal Mahakali Treaty, Nepal '***without any conditions or dissent***' acquiesced to India's '… ***without prejudice to their existing uses…..***'. Regarding the seigniorage/royalty charges claim of India from Pakistan, the ministerial level Enquiry Commission instituted by Prime Minister KI Singh in 1957 to review the Gandak Treaty had also, among the 17 Points, recommended the following royalty claim:

The Gandak Project irrigates a minimum of 25 lakh acres of land in India and the Indian Government ***charges Rs 10/- to Rs 8/- per acre as irrigation tax****. Therefore, if* ***Rs 1/- per acre from that is provided to Nepal as Royalty,*** *then Nepal will receive annually IC Rs 25 lakhs that could be used for her own country's irrigation works etc.*

Despite such '*water royalty*' claim of Nepal in 1957 for waters stored on Nepalese territories, it is incomprehensible why Nepal, *sans the downstream benefit agreement with India,* is proceeding full speed ahead with the 263 meter high 1,200 MW Budhigandaki '*Hydroelectric*' Project with a live storage of 2.23 BCM that would augment the depleting waters for the Gandak Project that irrigates 18.5 lack hectares of land in Up and Bihar.

IV. **Stalemate for Three Years:** Though the stalemate continued for three years, Pakistan, in order to continue getting the water supply, paid '*under duress*' the "*undisputed*" **seigniorage/royalty** charges and deposited the "*disputed*" amount with the Reserve Bank of India as per the May 1948 Inter-Dominion Agreement. Both India and Pakistan proceeded, independently of each other, to plan and develop new uses from Indus and its tributaries.

V. **Hiring of International Consultants:** As early as February 1951 the Government of India employed **Dr. FJ Berber, a German of international repute.** Dr. Berber submitted a preliminary report to the Indian Government on the international law aspects of the dispute emphasizing the need for a comprehensive study of international relations, both legal and technical aspects in relation to rivers in Europe and America. Thus, in October 1951 Dr. Berber and ND Gulati visited different countries in Europe and America to study the nature of the problems met with on rivers flowing through two or more countries: ***'how they had been dealt with and to study related international practices and treaties, in the context of hydrological and other technical factors concerning each case. It was necessary to find out what factors in the past had been taken into account in determining equitable apportionment of river waters.'***

Pakistan also hired as its Counsel the American firm of **Covington and Burling** where **John G Laylin** and **John Lord O'Brian** worked. With Pakistan threatening to take the dispute to the International Court of Justice at Hague, India finally on 18th September 1951 agreed to '*seek judicial decision from an impartial international authority on the question of the validity of the May 1948 Agreement*' – ***not for the dispute as a whole of the Indus waters but restricted merely to the validity of the May 1948 Agreement.***

Nepal Related:

Regarding the hiring of international consultants, immediately after the signing of the Kosi Agreement in April 1954, an irate BP Koirala in his scathing article in **Nepal Pukar** (*Nepali Congress mouth-organ*) questioned his half-brother MP Koirala's government, if Nepal lacked capable technical people, then why were foreign consultants not hired. The government gave no reply. The irony, however, is that Prime Minister BP Koirala himself did not bother to hire foreign consultants for his 1959 Gandak Agreement. This is an important issue for Nepalese researchers to delve into. Apparently, the Indian-factor must have played the role in Nepal's reluctance to hire foreign consultants.

VI. **Enter DE Lilienthal, ex-Chairman of TVA and Atomic Energy Commission, USA:** In such a stalemated environment, David E Lilienthal came to India and Pakistan in February 1951 on a private visit. Before his visit, Lilienthal consulted the Secretary of State Dean Acheson as also President H Truman. In Pakistan he met Prime Minister Liaquat Ali Khan, Foreign Minister M Zafrulla Khan and Secretary General Muhammed Ali discussing both the Kashmir and the Indus waters disputes. In India, Lilienthal was a guest of Nehru discussing India-US relations and visited Damodar Valley Corporation (DVC) modeled after

TVA, the Hirakud Project and even **the site of the dam in Nepal then proposed on the Kosi River.** He also met Sheikh Abdullah to discuss Kashmir. On return to USA, Lilienthal published a series of article on Kashmir and the Indus waters disputes with the headline – ***Another Korea in the Making:***

> *India and Pakistan were on the* ***verge of war over Kashmir****. …. I propose India and Pakistan work out a program* ***jointly to develop and jointly operate the Indus Basin river system****…. With new dams and irrigation canals, the Indus and its tributaries could be made to yield additional water each country needed to increased food production….. the* ***World Bank might use its good offices to bring the parties to agreement and help in financing of an Indus Development program…***

VII. **Enter the World Bank:** Eugene R Black, President of International Bank for Reconstruction and Development Washington DC (World Bank) said Lilienthal's proposal "*makes good sense all round*" – the continuance of the Indus Dispute could only be a serious handicap in the progress of agriculture and hydro-electric development. On September 6, 1951, the Prime Ministers of India and Pakistan each received Black's letter offering the good offices of the Bank towards formulating a constructive program for effective use of the Indus river system, essentially stating that "*the development of the Indus Water Resources should be* ***dealt with on an engineering basis – separately from the political issues with which India and Pakistan are confronted****.*"

VIII. **Prime Ministers of India and Pakistan Agree:** On September 25, 1951 Jawaharlal Nehru replied that the Lilienthal proposal was ***"to a large extent, in line with what we have ourselves suggested in the past****…. it may not be* ***practicable for a joint agency to operate*** *them…… and that the* ***Bhakra-Nangal Project*** *will of course have to continue.*" Prime Minister Liaquat Ali Khan of Pakistan in his formal reply also dated September 25, 1951 thanked Black for his initiative towards "*a constructive solution of the dangerous dispute over the division of the irrigation supplies of the rivers common to India and Pakistan….. would be* ***greatly facilitated were the Bank to exercise its tendered good offices****.*"

IX. **Understanding of 13th March 1952:** President Black visited New Delhi and met Nehru on 11th February 1952. He also met the Pakistan Prime Minister, Nazimuddin, at Karachi. Following the two visits, the World Bank President on 13th March 1952 recorded that both Governments formally agreed to participate in the meeting of engineers with the association of the World Bank as a **"good officer",** and agreed to: i) *jointly prepare a comprehensive long-range plan for the entire Indus system of rivers, not merely for the Ravi, Beas and Sutlej which Pakistan had earlier called* ***"common waters"*** *ii) plan would secure most effective utilization of the water resources of the system and iii) provide each side with irrigation uses substantially beyond those each side was enjoying at the time.*

X. **Working Party with the Bank:** The Working Party comprised of: i) **India's Designee** – AN Khosla (*Chairman, Central Water and Power Commission, ex-officio Additional Secretary GOI Ministry of Natural Resources and Scientific Research*) assisted by ND Gulhati (*Deputy Secretary in Ministry plus Chief of Natural Resources Division, Planning Commission*) and Dr. JK Malhotra (*Officer on Special Duty in Ministry*) ii) **Pakistan's Designee** – Mohammad Abdul Hamid (*Chief Engineer Punjab assisted by four senior engineers representing Central Pakistan Government, Bahawalpur, Sind and North-West Frontier Province*) and iii) **World Bank Representative** – Lieut. General Raymond A Wheeler (*Engineering Advisor to the Bank, former Chief of US Army Corps of Engineers and Deputy Commander South-east Asia Command* *during World War II*) assisted by Neil Bass (*formerly of TVA*) and Dr. Harry Bashore(*formerly Presidential Representative and Chairman of Upper Colorado River Basin Compact Commission and former Commissioner of US Bureau of Reclamation*). Dr. Bashore was actually in place of another eminent US engineer who was not acceptable to Pakistan.

XI. **Bank's 5th February 1954 Proposal:** As no agreement was reached despite two years' of negotiation, the Bank asked both India and Pakistan to present their plans on the sharing of the Indus waters.The Plans presented were:

Indian Plan: *For **India** – **all Eastern** Rivers and **7% of Western** Rivers;*

*For **Pakistan** – **none of Eastern** Rivers and **93% of Western** Rivers.*

Pakistani Plan: *For **India** – **30% of Eastern** Rivers and **none of Western** Rivers;*

*For **Pakistan** – **70% of Eastern** Rivers and all **of Western** Rivers.*

As the Plans were totally irreconcilable, the World Bank on 5th February 1954 presented its own Proposal:

*The entire flow of the **Western Rivers (Indus, Jhelum and Chenab)** would be available for the exclusive use and benefit of **Pakistan** except for the insignificant volume of **Jhelum** flow presently used in **Kashmir**;*

*The entire flow of the **Eastern Rivers (Ravi, Beas and Sutlej)** would be available for the exclusive use and benefit of **India** except that for a specified **transition period** India would continue to supply from these rivers, in accordance with an agreed schedule, the historic withdrawals from these rivers in Pakistan;*

XII. **Bank Proposal: Pakistan Very Unhappy, India Not Unhappy!**

India's designee Khosla informed the Bank that the Proposal would be acceptable to India provided some modifications were done on the Western Rivers i.e on existing uses on the Chenab as well as some new developments for Kashmir. But Pakistan's designee Hamid told General Wheeler that'***the Working Party might be considered as having come to an end and that most of Pakistan delegation were leaving Washington shortly.***' President Black then told Nasir Ahmad, Secretary of the concerned Ministry, Pakistan was at liberty to withdraw from negotiations at any time but to walk out without saying anything to anyone would be a behavior no responsible Government should indulge. Wiser counsels prevailed. Pakistan delegation postponed their departure and started to ask the Bank about its Proposal. Pakistan argued that the Bank engineers were wrong in assuming that Link Canals could replace all the waters that India would take away from Pakistan canals, that Storage would be necessary, that the transition period would be more than five years and that India's financial responsibility would be much more than that in the Bank Proposal. The Working Party thus remained in a state of suspended animation.

XIII. **India's Official Acceptance:** On 11th February 1954 the Indian Cabinet approved the recommendation sent from Washington by its Working Party accepting the Bank's Proposal of the estimated costs of Link Canals, to be borne by India, as Rupees 68 crores (Pakistani). Prime Minister Nehru's formal letter followed on 22nd March 1954 pointing that to bar India **to withdraw Chenab waters at Marhu** will make some parts of **Rajasthan "*a desert forever.*"**He wrote that India accepted "*the principles of the Bank Proposal as the Basis of Agreement. The actual agreement will naturally have to be carefully worked out in detail and should **safeguard the existing uses within the State of Jammu and Kashmir and future local development therein which would involve relatively insignificant consumptive uses……..**giving this **acceptance in the expectation that Pakistan will at an early date likewise accept the principles of the Bank Proposal….. my acceptance cannot, as you will appreciate, stand unilaterally for an indefinite period**…… a number of new projects in both countries are nearing completion….*"

Nepal Related:

The Indian Cabinet's decision of February 1954 and Prime Minister Nehru's letter of March 1954 to the World Bank are important milestones for Nepal. Prime Minister Nehru's letter mentions two important issues for India: *the necessity for India to withdraw Chenab waters to prevent parts of Rajasthan from becoming a desert forever* and ***safeguarding the existing uses within the State of Jammu and Kashmir***. Having gained such vital experiences from the Indus waters negotiations with Pakistan, it was but natural for the Indian Cabinet to clinch, as early as possible, the deal with Nepal on the Kosi river, the *Sorrow of Bihar*. Two months later, Irrigation Minister Gulzari Lal Nanda was, hence, dispatched to Nepal. After three meetings in just two days, Minister Nanda clinched the Kosi Treaty on 25th April 1954! An Indian English newspaper (*probably the Calcutta-based **Statesman***) jubilantly exulted: '*India's central Minister came to Nepal with the India-prepared agreement and returned with that same agreement approved while Nepalese Ministers looked on as mere spectators. **He** (Indian Minister) **Came, He Saw** (Nepal's plight), **He Conquered** (Nepal).*'

XIV. **India Commissions Bhakra Canal:** Though the Bhakra Dam was far from completion, India, on 8th July 1954, opened the Bhakra Canals that had been constructed to get waters from about mid-June to mid-September for *kharif* irrigational use. There was, naturally, strong resentment in Pakistan and an emergency Cabinet meeting was held. Retaliation was urged as the opening of Bhakra Canal was understood as attempts to strangulate Pakistan's economy. Chief Minister of Bahawalpur suggested the dispute be taken to the United Nations. However, Pakistan's Prime Minister Mohammad Ali stated at a news conference on 15th July 1954: "*The opening of the Bhakra Canal on July 8 [1954] is the most serious and most recent violation of the agreement of March 13, 1952...... India's unilateral action culminating in the opening of Bhakra Canal is against all canons of international law and equity.... The cooperative effort with the good offices of the Bank has not been abandoned. The Pakistan Government, while taking every step to safeguard Pakistan's interests, will do all they can to reach a just and peaceful settlement of this seven-year-old dispute....*"

XV. **World Bank's Adjustment of February 1954 Proposal through Aide-Memoire of 21st May 1956:** In order to address Pakistan's grievances, the Bank issued a Memorandum, later called the Aide-Memoire, on 21st May 1956 that stated:

*The Bank continues to hold the view that the 'division of waters' contemplated by the **Bank Proposal of February 1954** affords the best prospects for a settlement of the Indus Waters question; that out of the flow-cum-storage potential of the rivers allocated to them, India and Pakistan could each develop very substantial irritation uses, additional to those that they now enjoy; and that no insuperable engineering difficulties are likely to arise in either country in constructing the physical works necessary to develop these additional supplies. **The Works would, however, be costly and their financing would present a serious financial problem.** After taking into account the possibilities of the transfer of flow supplies of the Indus, Jhelum and Chenab by a system of link canals i) there would be **no shortages in Kharif,** except for occasional 10-day periods in April and September in occasional years ii) there would be consistent surpluses in Kharif significant in quantity, duration and frequency and iii) there would be **consistent shortages in Rabi, occasionally beginning in late September or extending into early April of a degree, duration and frequency which the Bank group could not regard as "tolerable".***

As the stalemate continued, President Black wrote to the Prime Ministers of India and Pakistan asking for their formal concurrence *"of the extension of the cooperation work until September 30, 1957"*. **Many in the Bank and outside regarded this letter as the beginning of the end of the Bank's good offices.** However, while Prime Minister HS Suhrawardy of Pakistan on 11th April 1957 agreed to the proposal, Prime Minister Nehru on 24th April 1957 stressed: '*...... seriously concerned at the absence of any progress .... The Bhakra Canals were opened in Kharif 1954, the Bhakra Dam and Sirhind Feeder will soon come into operation ...... **to feed the arid areas of Rajasthan**.....you will appreciate that they cannot be held up because Pakistan Government have delayed indication of their attitude to Bank Proposal for over three years.*'

India was also very concerned about *'Safeguarding the future local irrigation developments from the* ***Western Rivers in the State of Jammu and Kashmir*** *and development in India of* ***hydro-electric power from these rivers*** *before they enter Pakistan…'.* Pakistan, on the other hand, wanted that '***new uses in the State of Jammu and Kashmir would have to be fixed quantitatively***' but India, citing the general practice prior to 1947, wanted **No Limit imposed** on such uses.

Nepal Related:

This dispute over the use of Western Rivers (Pakistan's allotment) in India's State of Jammu and Kashmir is very noteworthy. While Pakistan wanted '***new uses from her Western Rivers in the State of Jammu and Kashmir to be fixed quantitatively***', India wanted '**No Such Limit**' to be imposed on her. But the irony then is what India refused Pakistan, India had this '*quantitative clause of her own water requirements from the Gandak river*' (**India's Schedule of Water Requirements**) inserted on the uneducated Nepal in the 1959 Gandak Treaty – very much in the spirit of *'Jiske hath me lathi, uska bhains!'* (*He, who holds the stick, takes the buffalo!*)!

XVI. **Enter General Ayub Khan in Pakistan:** One of the main reasons why the Indus waters dispute festered for such a lengthy period was the political instability in Pakistan. While Nehru continued to remain India's Prime Minister from the birth of the Indus waters dispute in 1947 to the signing of the Indus Waters Treaty in 1960, Pakistan, on the other hand, suffered the ignominy of having the following seven Prime Ministers and one President during that 13 year period:

1. *Liaquat Ali Khan – 14th August 1947 to 16th October 1951;*
2. *Sir Khawaja Nazimuddin – 17th October 1951 to 17th April 1953;*
3. *Mohammad Ali Bogra – 17th April 1953 to 12th August 1955;*
4. *Chaudhry Mohammad Ali – 12th August 1955 to 12th September 1956;*
5. *Huseyn Shaheed Suhrawardy – 12th September 1956 to 17th October 1957;*
6. *Ibrahim Ismail Chundrigar – 17th October 1957 to 16th December 1957;*
7. *Sir Feroze Khan Noon – 16th December 1957 to 7th October 1958;*
8. *President Ayub Khan*

On 7th October 1958, President Sikandar Mirza, who incidentally was from Prime Minister Feroze Khan Noon's own Republican party, declared a coup d'etat abrogating the constitution, dissolving the Central and State Assemblies and clamping martial law on Pakistan with General Mohammad Ayub Khan as the Martial Law Administrator. Two weeks later, General Ayub Khan replaced Sikandar Mirza as the President of Pakistan.

President Ayub Khan in his book *'Friends Not Masters'* made the following illuminating remarks regarding the Indus waters dispute:

The Indus Basin waters dispute between Pakistan and India has a long and chequered history…. A major contributory factor was the ***policy of weakness and vacillation followed by successive governments in Pakistan…..*** *Somewhere about 1955 or 1956 when I was Commander-in-Chief…..I knew very little about the problem, so I asked for elucidation. The West Pakistan government sent two engineers who explained the case in great detail to me.* ***My main worry was the vulnerability of Pakistan …. Every factor was against us. The only sensible thing to do was to try and get a settlement….*** *I should like to describe the confrontation I had with our own technical experts and administrators. I sensed that they* ***did not fully realize the gravity of the situation*** *and* ***were asking for the moon when we were in a position of weakness*** *all along the line. They were also trying to dictate policy and were taking extreme positions…."*

XVII. **Pakistan Accepts Bank Proposal Unconditionally - 22nd December 1958:** With the army man Ayub Khan at the helm in Pakistan, G Mueenuddin, Pakistan's representative at the Bank, in his letter of 22nd December 1958 to the Bank stated: '…. *My Government do now* ***accept without condition or reservation the Bank Proposal of February 5, 1954 and the Aide-Memoire of May 21, 1956*** *as the continuing basis for reaching a co-operative solution of* *the Indus Waters question* ***with the assistance of the Bank****. Furthermore, my Government agree that all differences as to interpretation of the Bank Proposal and Aide-Memoire or implementation that cannot be promptly resolved by agreement should be resolved by arbitration."*

Finally, the solution of the Indus waters dispute rested on:

i) *Bank negotiating with India the amount she would pay towards the costs of replacement and*

ii) *Bank negotiating with Pakistan outlines of a realistic plan of Replacement-cum Development works which could be met from such aid as the Bank could raise from United States, other friendly countries and the Indian financial contribution.*

On 17th April 1959 a formal agreement was signed by India and Pakistan. World Bank President Black met President Ayub Khan at Karachi on 17th May 1959. President Ayub is supposed to have told Black [*Friends Not Masters*]:

"....people have told me very plainly ***that if they have to die through thirst and hunger they would prefer to die in battle****....our jawans and the rest of the people feel the same way. So this country is* ***on the point of blowing up if you don't lend a helping hand****.... What* ***we are being called upon is to barter away naturally flowing waters into our canals for storage water*** *and the history of storage is that it begins to silt the moment it is completed....unless we get our additional needs of water, apart from replacements, there is going to be chaos in this country. So a* ***dam at Tarbela is a must."***

XVIII. Treaty Making – in 15 Months from May 1959: May 1959 marked the beginning of the end of the Indo-Pakistan negotiations with regard to the Indus Waters held with the good offices of the World Bank. There were still hurdles like **Delimiting the Indian uses on the Western Rivers** and **Transitional arrangement** under which India will continue to supply water to Pakistan from her Eastern Rivers. The understanding finally was that the transition period would run from April 1960 to March 1970 and any extension beyond the World Bank will pay India from the Indus Basin Development Fund.

- **First Draft of Treaty (9th December 1959)** dealt with the principle of storage by India on the Western Rivers and the setting up a **permanent Indus Commission** and **resolution of differences and disputes** in implementation of the treaty.

- **On 1st March 1960 the World Bank announced the Financial Plan:** As India refused not to pay more than 62.06 Million Pound Sterling for construction of system of works to meet the needs of Pakistan's '*existing use*' replacement from India's Eastern Rivers, the World Bank was able to garner grants and loans from the following countries:

Australia	*15.54 million US$ grants*
Canada	*22.19 million US$ in grants*
Germany	*30.21 million US$ in grants*
New Zealand	*2.78 million US$ in grants*
United Kingdom	*58.48 million US$ in grants*
United States	*177.00 million US$ in grants*
United States	*103.00 million US$ in Loans*
TOTAL:	*409.20 million US$*
United States	*235.00 million US$ in grants for Local Currency*

Note: *These grants and loans were forthcoming as Pakistan was a member of the SEATO (South East Asia Treaty Organization) and CENTO (Central Treaty Organization) military pacts to contain communism in South-east Asia and Central Asia.*

- **Second Draft of Treaty (20th April 1960)** dealt primarily with the "*Agricultural use by India from the Western Rivers*", particularly in India's Jammu and Kashmir from Pakistan's Western rivers.

- **Third Draft of Treaty (8th June 1960)** dealt with: *Agricultural use by Pakistan from certain* *tributaries of Ravi; Generation of hydro-electric power by India on Western Rivers; Construction of storage works by India on the Western Rivers; Neutral Expert and Court of Arbitration.*

- **Agreement on Disputed Charges Payment by Pakistan:** *Of the accumulated* ***Rs 143 lakhs*** *Pakistan had deposited in escrow with the Reserve Bank of India a sum of* ***Rs 29 lakhs.*** *This sum of* ***Rs 143 lakhs*** *'disputed charges' comprised of* ***Rs 71 lakhs as seigniorage/royalty charges and Rs 72 lakhs as share of interest on capital outlay of Madhopur headworks*** *and carrier channels. India agreed* ***not to recover seigniorage/royalty*** *charges and against the sum of Rs 72 lakhs Pakistan agreed to pay a sum of* ***Rs 62 lakhs*** *(inclusive of Rs 29 lakhs to be released from escrow).*

- **Treaty Signing – 19th September 1960:** The Treaty comprised of 79 paragraphs under 12 Articles setting out the principal rights and obligations and 8 detailed annexures covering 102 pages. On 19th September 1960 at Karachi, Field Marshall Mohammad Ayub Khan/President of Pakistan, Jawaharlal Nehru/Prime Minister of India and WAB Iliff/ of International Bank for Reconstruction and Development signed the Indus Waters Treaty on the lawns of the President's House where leading citizens of Karachi and dignitaries from different countries of the world collected to witness the historic ceremony. Then representatives of Pakistan, World Bank, USA, UK, Australia, Canada, New Zealand and Germany also affixed their signatures to the 900 million US Dollar Indus Basin Development Fund Agreement.

Negotiations were conducted both at London and Washington. Counting from May 1959, the **process of treaty-making alone took a little more than 15 months.**

C. Final Words:– Green and White Revolutions for Nepal's Terai!

As envisaged by DE Lilienthal '….. *with new* ***dams and irrigation canals,*** *the Indus and its tributaries could be made* ***to yield additional water each country needed to increased food production***…..' and with the full concurrence of World Bank President ER Black, the 13 year saga of the Indo-Pakistan dispute over the sharing of the Indus waters ended in 1960. Construction of the Mangla and Tarbela dams on Jhelum and Indus began in Pakistan. In India also construction of dams at Thein on Ravi and Pong/Pandoh on Beas began plus works on the Sutlej's Bhakra Nangal continued. The River Links followed from these storages: in Pakistan Chasma/Indus to Jhelum, Mangla/Jhelum to Chenab and in India Ravi-Beas and the Beas-Sutlej Links to augment the Bhakra Nangal storage. In October 1963, Prime Minister Nehru dedicated to the nation Bhakra Nangal Dam, as a temple of resurgent India, that annually supplies 28 MAF (*34.5 billion cubic meters*) of water to the three States of Punjab, Haryana and Rajasthan for not only irrigating 135 lakh acres (*54.6 lakh hectares*) of thirsty farmland but also for drinking water purposes to those three States as well as Delhi. This ushered in India's much acclaimed Green Revolution that transformed the food importing nation into an exporting one as well as the not so well known White Revolution – that massive increase in milk production. It is **water, freshwater** of Ravi, Beas and Satluj impounded by Bhakra, Thein, Pong and Pandoh, that transformed the region into the *'bread-basket'* of India.

Nepal, though belated, should mull over India's Green and White Revolutions of the 1960s and 1970s? For reasons best known only to our policy makers, ***Water - Freshwater,*** unfortunately, is ***not Nepal's priority***. Nepal's ***top priority is Hydroelectricity*** which she has been tirelessly pursuing for the last seven decades. Soon after the creation of a separate Energy Ministry in 2008, this pursuit for ***hydroelectricity*** became far more frenetic. A series of **Power Summits**, attended by ambassadors from India, China and Bangladesh, were conducted in expensive five-star hotels extolling the ***virtues of hydropower***. Such Power Summits led the government to announce in February 2016 the ***Electricity Development Decade 2016-2026*** to commission 10,000 MW in 10 years. However, mandarins in New Delhi's South Block, to apparently neutralize the Chinese investment forays into Nepal's hydropower development, smartly issued on December 5, 2016 India's ***Guidelines on Cross Border Trade of Electricity.*** Nepal's own mandarins turned both blind and deaf to that December 2016 Guidelines wherein it cites '***electricity trade as issues of strategic, national***

and economic importance.' The Delhi-based consultant IRADe submitted two reports to the USAID-SARI/EI supported program in January and December 2017 that continued to trumpet: '*Nepal can* ***sell India 13,000 MW in 2030 and 34,000 MW in 2045****, earning annual* ***revenues of Rs 310 Billion and Rs 1,069 Billion*** *respectively and* ***attract more than Rs 28.93 trillion in foreign capital*** *into the energy sector.*' An agog Nepalese media merely reported '*Nepal can* ***earn Rs 1 Trillion a year*** *by selling power to India*' but was completely silent about the huge social and environmental price Nepal has to pay. Nepal's over-enthused policy makers continued that pursuit with the following 2017/'018 government budget:

- *Additional* ***17 thousand Megawatt*** *of electricity will be generated* ***within seven years*** *through* ***"Brighter Nepal Campaign"*** *under* ***"Nepalko Pani Jantako Lagani"*** *program.*
- ***Construction of all Reservoir and peaking projects*** *including Nalsingh Gad (410 MW), Veri-1[617 MW],Jagdulla[307 MW],Utterganga (300 MW), Noumure (245 MW), Sunkoshi-2 and 3 (1,110 MW and 536 MW), Dudhkoshi (300 MW), Tamor (692 MW) will be expedited simultaneously.*

There was nothing, nothing at all about the ***valuable Freshwater*** stored by these storage projects, only Megawatts and ***Megawatts of hydropower*** to a market that has already cited '***electricity trade as issues of strategic, national and economic importance.***' A major component under this program is the ongoing 1,200 MW Budhigandaki project. The 263 meter high Budhigandaki dam, with a gross storage of 4.47 BCM and live storage of 2.23 BCM, is still called *hydroelectric* and not *multipurpose* project. To Nepal's policy makers the 2.23 BCM of ***Freshwater* stored** at undetermined social and environmental costs to Nepal has had no consequence at all. Sans the benefit sharing agreement with India, Nepal is determinedly moving full-steam ahead with the Budhigandaki hydroelectric project. Salman Haider, India's former Foreign Secretary, at an Indo-Nepal Mahakali Treaty discussion in New Delhi uttered what many mandarins in India would hesitate to utter ' … ***India has alternative sources of power supply. We do not have alternative sources of Water Supply…. The long-term interest of India in Water from Mahakali outweighs our interest in power supply…***' The now enlightened Dr. PC Lohani, former Foreign Minister who signed the 1996 Mahakali Treaty, ruefully ruminates: '***For India free water and cheap electricity, for Nepal submergence!***' One only hope that our elite policy makers, ensconced comfortably at Singha Durbar, also get enlightened like Dr. Lohani and pursue the Green and White Revolutions in Nepal's own Terai rather than attempt to export electricity under the Electricity Development Decade 2016-2026 to a '***strategic, national and economic***' termed market!

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[1] The name Indus has a religious/historical connotation for India. During the reign of Darius I, the Persian emperor of around 500 BC, the Indus river was called Sindhu for being inhabited by Hindus. Sindhu later degenerated into 'Indie' that the British from the 17th century onward termed 'India'.

[2] This is the famous "I came, I saw, I conquered" letter of Julius Caesar to his Rome Senate after his swift victory in 47 BC at the battle of Zela (now Zile in northern Turkey). Calcutta's Statesman, in all probability, was the Indian newspaper.

[3] Seven months from the time BP Koirala became Prime Minister on 27th May 1959 to the signing of Gandak Treaty on 4th December 1959. BP Koirala's Atmabrittanta and Grishma Bahadur Devkota's Nepalko Rajnitik Darpan do not give any indication whether or not the delegations of the two countries sat down to negotiate the Gandak Treaty like in the Kosi Treaty!

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[4] Though Sher Bahadur Deuba was the Prime Minister when the Mahakali Treaty was signed in February 1996, it was actually the third Koirala brother, Prime Minister GP Koirala, who, with his Tanakpur MOU of 1991, brought up the issue of Nepal's third river, Mahakali with India. The 'Mahakali Package Seed' was actually planted by Deputy Prime Minister and Foreign Minister Madhav Kumar Nepal in February 1995 during his India visit. The Mahakali Treaty was ratified by the Nepalese Parliament on September 20, 1996 under MK Nepal's rallying clarion call: 'Sarada barrage of yesterday, Tanakpur barrage of today and Pancheshwar Dam of tomorrow!'

[5] There are disputes like the Chenab's Baglihar dam and Jhelum's Kishanganga and Wullar Barrage that were resolved through the Indus Commission.

[6] The writer wishes to acknowledge that his article is merely a synopsis of the 472-page book, Indus Waters Treaty – An Exercise in International Mediation, by Niranjan D Gulhati first published in 1973 by Allied Publishers Pvt. Ltd. Bombay, Calcutta, New Delhi, Madras and Bangalore. Except for a few Nepal related items inserted by the writer, this is the 13-year saga of the Indus Waters Treaty as seen through the eyes of an intimately involved Indian. For nineteen years from 1926 to 1945, Mr. Gulhati 'worked on canals which, at partition, came to lie in Pakistan and was, thus, intimately acquainted with the Pakistan irrigation system and associated problems.' As Mr. Gulhati's duties since October 1948 related to the Government of India's 'Canal Waters Dispute', he was tasked from June 1949 onwards with the Indo-Pakistan Indus waters dispute till its very culmination into treaty in September 1960. He called his 12 year negotiation experiences 'one of the most exquisite, baffling, delightful, frustrating, exhilarating, fatiguing, intriguing experiences known to man'.

[7] Barney White-Spunner. Partition – The Story of Indian Independence and the Creation of Pakistan in 1947. 2017. Simon & Schuster UK Ltd. London.

[8] This interesting 1951 visit of Lilienthal to the Saptakosi High Dam site in Nepal is mentioned by ND Gulhati in his book Indus Waters Treaty. To control Kosi, Sorrow of Bihar, the Saptakosi High Dam at Barahchhetra in Nepal was envisaged towards the end of the British Raj. India must have taken Lilienthal, former Chairman of the much-acclaimed Tennessee Valley Authority, to the SaptaKosi High Dam site in Nepal. To be noted is that the Rana-Nepali Congress coalition government with Mohan Shumshere still as Prime Minister was formed on 17th February 1951. The visit of Lilienthal, hence, was possible into Nepal, the Forbidden Country of the Ranas! Some believe India's Saptakosi High Dam moving southwards to the border to ultimately become the Kosi Barrage was a stupendous blunder of the Government of India!

[9] Prime Minister Liaquat Ali Khan was assassinated on 16th October 1951 at Karachi and Sir Khawaja Nazimuddin, also of Muslim League, succeeded him.

[10] Note the term 'Common Waters' of only the Ravi, Beas and Sutlej rivers that Pakistan used in her Indus water dispute with India whereas the World Bank called for the entire Indus system of rivers. India had this 'common waters' converted to 'common rivers' in the secret 1990 Draft MOU to Nepal that King Birendra spurned. But then the interim Prime Minister KP Bhattarai himself, for the first time, used this 'common rivers' term to the delight of Indian mandarins.

[11] This is, of course, that laconic "Veni (I came), Vidi (I saw), Vici (I conquered)" letter of Julius Ceasar to his Senate in Rome after his swift victory in 47 BC over Pharnaces II of Pontus at Battle of Zela (now Zile in northern Turkey).

[12] After the 1948 assassination of Gandhi and the 1951 death of Vallabh Bhai Patel (Nehru's only real contender), the Indian Congress was totally under the control of Jawaharlal Nehru.

[13] While negotiations to formulate the Indus Treaty, even with the good offices of the World Bank, took about 8 years, the Treaty drafting alone took 15 months. Nepal's Treaty negotiations, drafting etc. for 1954 Kosi Agreement took only two days and the 1959 Gandak Agreement took a longer 7 months. Even the 1996 Mahakali Treaty took only 11 months – from February 1995 when DPM/Foreign Minister MK Nepal raised the 'Mahakali Package' issue during his India visit to the signing of the Mahakali Treaty at Kathmandu on January 29, 1996 by the two Foreign Ministers, Nepal's Dr. Prakash Chandra Lohani and India's Pranab Mukherjee!

[14] This is about the same time when Prime Minister BP Koirala asked the Indian ambassador Bhagwan Sahay for insertion of Nepal's fishing rights clause in the Gandak Agreement. According to BP Koirala himself in his Atmabrittanta, the Indian ambassador Sahay angrily rebuffed in Hindi 'Kya yaha bachcho ka khel hai?...... ap aap change karne ki bat kar rahehai?....... Nahi, ham logonke yahan yah tarika nahihai!' Despite such nasty rebuttal of the Indian ambassador, Nepalese researchers should delve into why a personality like BP Koirala had to bow down to have the Gandak Agreement signed.

[15] One year 3.125 Million Pound Sterling, two years 6.406 Million Pounds and three years 9.850 Pounds;

[16] India Today August 21, 2017: Bhakra-Nangal Dam irrigates both Green and White Revolutions

[17] According to Dr. Laxmi Devkota, ex-Chairman of Budhigandaki Project Development Committee, the Rs 260 Arab project needs to acquire 58,000 ropanis (about 3,000 ha) of land in 27 VDCs of Gorkha and Dhading districts. The compensation amount , already being distributed, ranges from Rs 5,24,000/- to Rs 8,35,000/- per ropani (0.05 ha) – i.e over 40 billion Rupees. While 3,560 houses (17,372 persons @ 4.88 per household) will be completely submerged, another 4,557 houses (22,238 persons) will be partially affected.

[18] Feasibility Study and Detailed Design of Budhi Gandaki HPP. Executive Summary - 1st November 2014. Tractebel Engineering. Budhigandaki Hydroelectric Project Development Committee.

[19] The beneficiary is India's Gandak Project at Bhainselotan that irrigates 18.5 lakh hectares of land in Bihar and UP. Nepal has only 0.46 lakh hectares irrigated (0.12 lakh ha in Nawalparasi and 0.34 lakh ha in Parsa/Bara/Rautahat.)

[20] India-Nepal Relations. Observer Research Foundation. 2004. Rupa & Co. Discussion III organized by Nepal Centre of ORF Institute of Asian Studies in New Delhi on February 13&14, 2003.

[21] After concluding the negotiations, the 1996 Mahakali Treaty was actually signed on 29th January 1996 by the two Foreign Ministers, Dr. PC Lohani and Pranab Mukherjee, at Kathmandu. For public consumption, Prime Ministers, Sher Bahadur Deuba and PV Narasimha Rao, signed the Treaty with much fanfare again on 12th February 1996 at New Delhi.

Enabling Electricity Consumption in Nepal

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This paper briefly highlights possible options to increase the consumption of electricity in Nepal and indicates how surplus electricity can be used in reducing the trade deficit of Nepal.

Status of electricity demand and supply in Nepal

The electrical age began on September 4, 1882, with the illumination of New York City by electric lamps for the first time[1]. After29 years, some parts of Kathmandu were electrified with the help of the then GoN-fully financed Pharping Hydroelectric Plant (500 kW) in 1911, which was the third of its kind in South Asia. The GoN has declared 2075-2085 BS as an Energy Decade (Urja Dashak) and the production of electricity is to be increased significantly during this period.As of Falgun 2077, 93% population has access to electricity, NEA consumers reached 5 million mark and, total electricity connected to the national grid reached 1458 MW. In the first 8 months of FY 2077/78, 1488.94 GWh electricity was imported from India[2]. If the average cost of imported electricity is considered to be NRs 4.84/kWh [3], total cost of imported electricity would be around Rs. 7.2 Arab. In the first eight months of FY 77/78,out of 4779.64 GWh electricity consumed in this period, the electricity distribution was 45 % for domestic use, 37% for industrial and 7% for commercial sectors. GoN has already issued generation license to 17,064 MW hydropower projects under IPP and several other large-scale hydropower projects are under construction. In this context, there will be a surplus electricity generation shortly if the consumption rate does not increase significantly. To maintain a healthy business, the demand and supply process needs to maintain for the benefit of all concerned parties.

Here are some of the possible ways, but not limited to, that Nepal can increase the electricity consumption:

1. Electricity consumption in Chemical Fertilizer Plant

The GoN has spent Rs 18.904 billion to import 400,541 tons of fertilizer in FY 2076/77 [2]. Suchatrend was there in the past for many years. This is one of the reasons for the ever-increasing trade deficit of Nepal. This situation can be improved if chemical fertilizer can be manufactured in Nepal itself. In addition, if chemical fertilizer is produced using electricity, asignificant amount of hydroelectricity can be consumed in Nepal. There are two methods available to manufacture chemical fertilizer (urea) as explained in Figure 1.

In the second method, a huge amount of electricity can be used to produce hydrogen gas and flue gas emitted from the cement factories can be used to produce chemical fertilizer.

There were three studies carried out in Nepal: 2017 Report Submitted by Indian Consultants, 1984 JICA Report and 1981 UNIDO report.

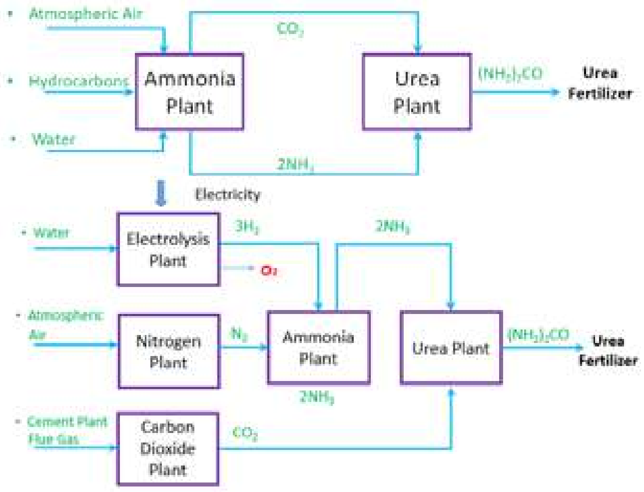

Figure 1 Methods of Chemical Fertilizer Production: 1) Using fossil fuel (top) 2) Using electrolysis of water (bottom)[4]

There is no proven source of hydrocarbons in Nepal and hence method 1 mentioned above is out of the discussion for time being whereas method 2 can be considered as suggested by the JICA study in 1984. The proposed establishment of a urea fertilizer plant in Hetauda (using flue gas from Hetauda Cement Industry) with a production capacity of 275 Tons per day could not be realized due tounavailability of needed electrical power.

Now the situation has changed. There is enough evidence that Nepal will have an additional, at least, 1000 MW of electrical power soon. There are 61 cement industries currently in operation in Nepal as per the association of Cement Industries Nepal (ACIN). The required urea fertilizer can be manufactured by establishing a fertilizer plant based on method 2 in five top cement industries of Nepal at different locations with a supply of about 500 MW of electrical power majority of which can be supplied during nighttime when the electricity tariff is significantly low. In this case, the cost of urea will be competitive with the imported cost of urea. In addition, the timely production and availability of chemical fertilizer can increase the crop yield, and therefore the import of agriculture products can be minimized.

Former PM KP Oli emphasized the establishment of a chemical fertilizer plant in Nepal by using our electricity, water, air, carbon dioxide from cement factories' smoke. He urged that a dedicated hydroelectric project could be assigned to such national pride project [5][6].

2. E-Cooking to Displace LPG in Nepal

In the fiscal year 2076/77, Nepal has imported 449,063 MT LPG (equivalent to 86,642 LPG cylinders per day) (around 17% of total petroleum import) which ismainly used for cooking purposes [2]. If Nepal continues to depend on imported energy sources it is going to be very difficult to reduce the ever-increasing trade deficit of Nepal. The country needs a new energy policy, which will be helpful to discourage the use of imported fuel by promoting the clean energy sources available within the country. To increase the internal consumption of NEA produced electricity, switching of cooking fuel from LPG to electricity could be the easiest and fastest way, which also saves billions of Nepalese Rupees (actually the hard-earned convertible currency of Nepal).

Therefore, it is high time to promote the use of induction /infrared and or efficient electric cooker preferable with two burners powered by electricity in Nepalese kitchen to save energy, save cooking time, reduce indoor pollution and above all the cost of cooking.

Table 1 Summary of Feasibility Study of Chemical Fertilizer Plant Development in Nepal, JICA study[4]

Item	Quantity	Supply
Electric Power	76.1 MW (out of available 122 MW HP)	Nepal Electricity Corporation
Industrial Water	4,800 Tons per day	Self Supply, Free of charge
Atmospheric Air	19,000 Nm3 per hour	Self supply, free of charge
Cement plant flue gas	32,459 Nm3 per hour	Hetauda Cement Industry, free of charge
Coal	76.8 Tons per day	Import from India or from Dang or electricity to generate steam

Fertilizer Bag Product	6060 Sheet per day	Nepal Domestic Product
UREA FERTILIZER, BAGGED	275 Tons per day	Sell to Agricultural Inputs Corporation
Total Cost:145 Million US$ Exchange Rate(1 US$ = Rs15.65, Sept 1984		Local Currency Portion: 30% Foreign Currency Portion: 70%

Table 2 Time, energy and cost comparison of rice cooking using different cooker [7]

Key indicators	LPG	Mud Cooker	Rice Cooker	Induction Cooker	E-chulo (Infrared Cooker)(a)	Infrared Cooker (b)
Cooking time (minutes)	11.18	21.3	28	7.82	12	19.33
Energy Consumed (kWh)	0.32	0.33	0.19	0.14	0.2	0.35
NRs/cooking	2.46	3.24	1.87	1.42	2.03	3.46

Advantages/Disadvantages of Using Induction Cookers in Nepalese Context: The details of comparison over different cookers like LPG, Electric rice cooker, infrared cooker, mud heater, etc. are presented in the study [7].

An experiment conducted in CES, IOE/Pulchowk [7] shows that cooking food using an induction cooker is 40% much more efficient as compared to LPG, details presented in the Table 2(a Chinese, b Indian).

- Among 4,172,202 domestic consumers of NEA, 84.11% use 5A fuse and they consume around 60% of total sectoral consumption. Similarly, 12.16% use 15A fuse with 27% sectoral consumption, 3.62% use 32A with 13% consumption and 0.11% use 60A fuse [4]. In this context, the following parameters need to consider before switching LPG to induction/ Infrared based cooking:

- Supply of QUALITY Electricity (220 V AC, 50 Hz even at a distance of say 5 km from distribution transformer)

- SUFFICIENT electricity (the size of distribution transformer should be adequate.)

- A REGULAR supply of electricity

- DEPENDABLE SUPPLY

- The AFFORDABLE price of electricity (should be less than the cost of LPG) (reduce electricity cost by 10% now to motivate people)

- Appropriate FUSING of consumer energy meter An appropriate size of the Induction/ Infrared based cooker (with 2 or 3 burners)

1. The thermal energy content of an LPG cylinder containing 14.2 kg of LPG is about 185 kWh. This means the total thermal energy required per day will be 16,028,770kWh, which means for about 2 hours of cooking, electrical energy needed per day during morning and evening cooking hours will be 8014MW (neglecting conversion efficiency). Roughly, it can be said that at least 4000 MW will be required to replace at least 50% import of LPG in Nepal during cooking hours. This will help in not only reducing the trade deficit of Nepal especially with India but also will stop emitting Green House Gases 3.85Tons per day if 86,642 LPG cylinders are displaced per day.

3. Electric vehicle to displace fossil fuel

In FY 2076/77, a total of 1473,536 kL diesel (57% of total fuel) and 512,128 kL petrol (20% of total fuel) were imported in Nepal and it is mainly used in the transportation sector. In FY 2076/77, the total trade deficit of Nepal was Rs 10.4 Kharab, reached Rs 13.98

Kharab in FY 77/78 [8].The total import of petroleum products was Rs 1.6 Kharab (which is around 15% of the total trade deficit or 1.42 times the total country export) [2]. This figureindicates that if we can reduce the consumption of importedpetroleum products, the country's economy will boost up due to reduction in trade deficit. To do so, electricity consumption in transportation sector should increase and electric vehicle is the bright future of Nepal.

Many countries like India, China, the USA and the EU are rapidly promoting EVs with a clear target of emission reduction.For example,India will be 100% electric in small vehicles by 2030, Norway is going to ban the selling of gasoline vehicles by 2025and China by 2040[9].

Nepal's transportation sector is entirely dependent on imported fossil fuels leading the country to an ever-increasing trade deficit. On the other hand, the country's abundant renewable energy potential like hydropower, solar remain untapped. EVs help to minimize the pollution of the city like Kathmandu where one in every 10 people suffers from chronic lung diseases like COPD, bronchitis and emphysema. Up to 35,000 Nepalese lose their lives annually [10]due to diseases caused by air pollution, which is mainly due to gasoline/diesel vehicles.In addition, EVs are more energy efficient, less noisy and it is a perfect energy saving device for a city. The operation and maintenance cost of EVs isless as compared to a gasoline vehicle, which also saves money particularly, in the lubricants, parts and maintenance in the long run.

National Policy in EV

The GoN has brought forth various incentives to promote the EV market. Generous import taxation duties and a yearly road tax exemption are among the main incentives. Nepal currently aimed to replace fuel-driven vehicles with EVs by 2031 as mentioned in the budget speech of 2078 Ashad. In a bit to do so, NEA is under process to establish 50 charging stations across the nation and expand to 500 numbers in the near future.

2. Until Falgun 2077, a total of 3,987,267 vehiclesregistered in Nepal out of which 1.4% are buses and 79.3% are two-wheelers [2].A four-passenger electric car consumes around 0.15 kWh energy per km of travel. If a vehicle travels 50 km in a day, the total energy consumption would be 7.5 kWh/day/vehicle. If there were one million such electric cars, daily energy consumption would be 7.5 GWh/day and 2,727.5 GWh/year, which is around 40% of today's electricity sold by NEA. Until Falgun 2075, the total number of Cars/Jeep/Van registered in Nepal was 237,658 [11].If 50% of Car/Jeep/Vanare replaced by EV, 0.89 GWh/day or 324 GWh/year electricity will be needed (around 5% of total energy sold by NEA).

4. Green Lift Irrigation for Food Security in Nepal

According to Maslow's hierarchy of needs, the basic needs for survival of human beings are air, water, food and shelter. As per FAO, about 180 kg of staple food is required per person per yearfor maintaining a healthy life. The use of electricity is one of the most important tools for providing food security that can greatly improve the sustainable physical quality of life. In Nepal, Food Deficiency increased from 15 % to 23 % due to COVID 19 impact [12]. Vegetables imported worth more than NRs. 38.5 billion and fruits imported 21 billion in FY 76/77 [8]. Nepal imported cereals worth of NRs 66.8 billion (rice 50.8 b and maize 16 b) in FY 76/77[8].

Nepal is rich in Natural Energy Resource where about 6,000 rivers, (fed by23000[1] rivulets and tributaries)with a total length of about 45,000 km with an annual discharge of 220 billion cubic meters of water, are available in the country. Figure 2 indicates that only 1.33% of total grid electricity has been used for irrigation purposes in FY 2018/19.

As per the Department of Irrigation, there is enough arable land in all geographic regions of Nepal as shown in Figure3. In all about 1460000 hectares of land, still waiting to be irrigated through lift irrigation based on electricity. Depending upon the type of soil and crop around 2500 kg to 4000 kg of agricultural products can be produced per hectare. This will help in ensuring the food security of Nepal.

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[1] *Minister Barsha Man Pun, Budget Supplementary speech at Parliament of Nepal dated 2077/02/27*

About 1450 MW of electrical power will be required if on average one kilowatt of electrical power is allocated for lift irrigation of each hectare of arable land in all three geographic regions of Nepale specially after the rainy season. From an economic point of view, extending the national grid may not be feasible in some cases. In such cases, standalone renewable energy sources like mini micro hydropower, wind power systems (both mechanical and electrical) and solar photovoltaic power systems can be used for decentralized lift irrigation.

As per Figure 3 potential area of arable land that could be irrigated with the help of electricity for lift irrigation in Terai, Pahad and Mountain areas are very significant. By using surplus electricity/renewable energy technology, around 1,460,000 hectares of land can be irrigated which accounts for 396,000 ha in Terai, 875,000 ha in Hills and 175,000 ha in the mountains of Nepal.

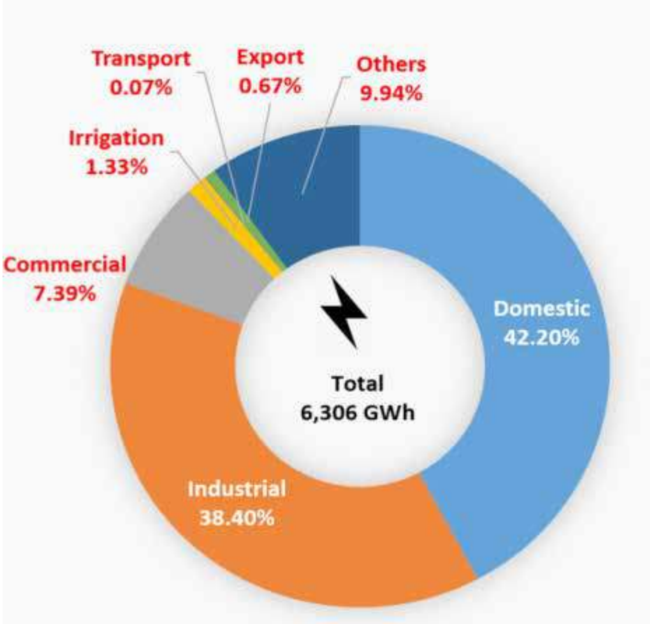
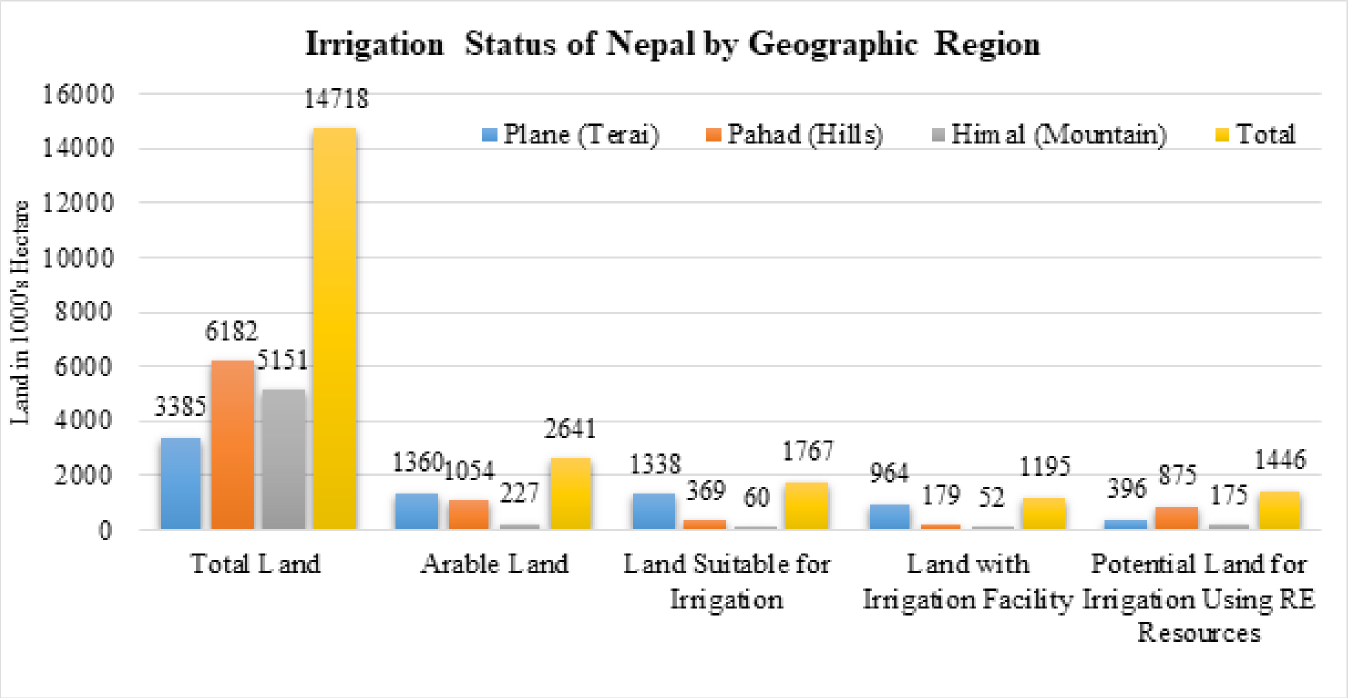


Figure 2 Electricity Consumption by Sector in FY 2018/19 (Source: NEA 2019)

Food and Energy Independence is a key Issue in modern society. There is a close relationship between Samrida Nepal, Sukhi Nepali and Food and Energy Security.



5. Food Storage

For ensuring stable income of farmers, post-harvesting activities such as storage of food are required. The cost of constructing different cold stores with sizes 10 m^3, 100 m^3 and 1000 m^{3}at room temperature maintaining 2 degree Celsius (24 hours), ambient temperature 35^{o}Cis shown in Table 3.It clearly indicates that at least 400 MW of electrical power is required if 10000 numbers of each cold store are installed at different locations of Nepal. This will help the consumers to get fresh vegetables and fresh fruits almost all the time in Nepal, which will attract young people to modern farming activities.

Table 3 Cost and Power required for Cold Sores of different Sizes (Source: Vishwa Prasanna Amatya, IOE/TU)

Volume in m3	Storage Capacity, Ton	Energy Required/day, kWh (effective 16 hours)	Power Required, kW	Cost using local materials, Lakh	Product to be stored
10	2.5	36	2.2	6	Vegetable+
100	25	125	8	13	“
1000	250	439	27	115	“

6. Electricity usages in cutting stones, timbers and export the finished goods to the third countries

Nepal needs to explore its natural resources such as minerals, stones, timbers etc. and utilize them properly in a scientific mannerfor the benefit of the country. Identification of such resources, their excavation, collection, processing and packaging will require a huge amount of energy. Exporting the finished goods to the third countries could be a good source of foreign currency earning.

Following are some other possible areas where electricity can be consumed:

❖ Himalayan spring water purification, bottling and export to SAARC countries

Energy is required to make, package, transport, chill, use, and recycle bottled water and its packaging. The energy required bringing the water to the consumer, including specifically the energy to make the plastic materials used in bottles, fabricate that plastic into the actual bottles, process the water prior to bottling, fill and seal the bottle, transport the product to the end-user, and chill it for use is 5.6 to 10.2 MJth per liter[13]. If the average energy consumption for producing 1-liter water is considered 8.0 MJ (equivalent to 2.22 kWh thermal or 0.74 kWh electrical), producing 10 million such bottlesneed 740 MWh electricity. A detailedstudy needs to be carried out in the case of Nepal.

❖ Timber production and export to third countries

Nepal is very rich in forestresources.44.74%of the total land in the country is covered with forest [14]. Nepal's per capita tree is 119 number, which is very high as compared to India with per capita 28 trees. Despite this, the country's dependence on other countries for timber is growing [15].

Statistics show that Nepal's annual import of wood and wooden materials exceeds Rs 6.5 billion,out of which around 65% is from India. In the fiscal year 2075-76 BS, Nepal spent Rs 6.61 billion against 5.56 billion in the previous year in the import of timber and timber related products from several countries including India, Indonesia, China, Myanmar, Malaysia, Singapore, Germany, Ukraine, the United Arab Emirates and the United States of America [16].

According to the data of the Ministry of Forest and Environment, timber measuring 17.55 million cubic feet were produced (from government, community and private forest) in the fiscal year 2074-75 BS. However, the annual demand for timber in the country is around 30 million cubic feet [16]. In addition, billions of Nepalese rupees spent for the import of UPVC/Aluminum windows and doors in the replacement of timber, which are locally available in large amounts within the country.

Therefore, the excess electricity that would be available in near future in Nepal can be utilized in timbers and wood processing factories.

A study [17]carried out in the USA shows that the average energy requirement for processing timber in nine different factories is 298.6 kWh/mbf of lumber or 3.58 kWh/cu.ft of processed timber ready for commercial sale. A detailed study needs to be carried out in the case of Nepal along with its issues. Taking the above study as a reference, an additional 35.8 GWhof electricity is required to produce 10 million cubic feet ofseasoned lumber that can fulfill the national lumber demand.

❖ Energy needed for AC of the fishery industry both in ponds and cold stores

Per capita fish consumption in Nepal is 3.36 kg whereas the global average consumption is 17.13 kg per capita. A total 71,252 tons fish were produced in Nepal in 2019, additionally; around 10,000 tonswere imported in the same year [18]. If 30% of the global average fish consumption per capita is achieved in

Nepal, around 150,000 tons offish should be produced annually. According to a study [19], a total of25,742.9 TJ energy was consumed in Japan to produce 459,694 tons of Salmon fish i.e. 56 GJ/tones. If this study can be considered as a reference, around 8400 TJ (around 700 GWh electrical) energy can be consumed to produce fish in Nepal.

- Energy in brick production industry

Brick making is one of the labor-intensive and most polluting industries in Nepal. Nepal is producing conventional bricks by baking using fossil fuels mainly coal that consumed 2230 Wh per brick and contribute 8% of the black carbon emission.About 1600 brick kilns in Nepal produce about 5 billion bricks per year and the annual demand for bricks in Nepal is expected to reach 12 billion [20].

“Good Brick System” is the new technology that produces non-baked bricks using a mixture of 90% soil, 9.8% cement and 0.2% soil stabilizer.Good brick system hardens and cures bricks using soil stabilizers instead of baking in kiln reducing the emission and reducing the production time.The technology is highly productive, eco-friendly and labor friendly. Conventional brick kilns require a 28 to 30 days per cycle, whereas this technology requires only 5 to 7 days until sales. A typical Good Brick System consumes62.30 KW power and produces 18 bricks per stroke; about 3600-3800 bricks per hour which are more in production compared to the existing conventional brick kilns. The total investment for a single site is about NPR 44,509,000 except labor costs. If only 500 Good Bricks Systems are installed in Nepal to replace about 50% of brick demands, it requires about 31.15 MW power supply regularly and a total investment of about 2,200 crores [20].The machine can be operated in one shift or double shift or even triple shift depending on the demand for bricks. In this way, a huge amount of NEA electricity can be consumed in Nepal replacing the imported coal.

- **Grid-Scale Lithium-Ion Battery Storage for the stability of INPS with integration of more renewable energy resources.**

Installation of 500 MW grid-connected solar (in different locations of Nepal with average cost NRs 6-7 crore/MWac) is going to be achieved soon. If 25% of the energy can be stored for at least 4 hours, 500MWh Li-Ion battery bank is needed. A recent study [21] estimated that capital costs for a 1MW/4MWh standalone battery system in India are $203/kWh in 2020, $134/kWh in 2025, and $103/kWh in 2030. When co-located with PV, the storage capital cost would be lower such as $187/kWh in 2020. If this study can be taken as a reference, investment for 125 MW/500 MWh battery bank co-located with PV plants in Nepal would cost around 93.5 million USD in 2020 reference price.

Every day, 500 MWh (equivalent to 20 MW full storage hydropower) grid electricity which is expected to spill in the night hours can be used to charge the battery bank and discharge during the peak load or when required. This will also help to make the INPS more stable when grid penetration of intermittent renewable energy sources such as solar, wind, etc.increased overthe time. The cost of battery storage energy would be less than NRs 3.0/kWh if a similar case of India is considered. However, a detailed study in the case of Nepal needs to be carried out.

There might be other tens of feasible ways of increasing indigenous electricity consumption in Nepal. But above all what is needed is that NEA must ensure the availability of sufficient reliable quality electricity on the 24/7 basis.

Finally, it is recommended that:

- Electrical Technology be blended with social sciencesstudies for creating enabling business environments
- Start Detail Study about the Possibility of Establishing Chemical Fertilizer Plants at least at five locations near the top five Cement Factories in Nepal
- Create Research Division/Cell at NEA in collaboration with Universities of Nepal with a special focus on ways of increasing electricity consumption with ALL NECESSARLY DATA for the peace, progress and prosperity of Nepal.

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“ईश्वरबाट दया भयाको आफ्ना मुलुकमा पाइने वस्तुबाटै मिल्न सक्ने फाइदा हामीले उठाउन सकेनौं भने त्यसभन्दा अपसोचको कुरा के छ?” -Shree 3 Chandra Shamsher JBR, Jestha 23 1968 BS, Gorkhapatra

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Prospects of Reactive PowerPricing and Management in Integrated Nepal Power System

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Abstract

For reliable operation of a power system, balance between demand and generation at every instant of time is the prerequisite condition. This restriction applies not only to the real power but equally to the reactive power. Reactive power is very much related to bus voltages throughout a power network and has a significant impact on system security. Augmentation of Integrated Nepal Power System (INPS) without consideration of reactive power management's optimum strategy is expected to result in poor voltage regulation and huge transmission power loss in the system. Penetration of real power generation from Independent Power Producers (IPPs) to INPS is increasing, and as of now, the government has not initiated any directive to offer incentive and mandatory obligations for reactive power services to them.

Consequently, to date, IPPs rarely participate in reactive power support to the system. In this paper, two strategies, one requires the utility to install shunt compensators for overall reactive power management, and the other includes reactive power support from IPPs are analyzed. Sensitivity index, dV/dQ is applied for exploring candidate locations of shunt compensators and Genetic Algorithm is used as an optimization tool. Results show that with the decrease in operating power factors of IPPs generators, there is a noticeable improvement in bus voltages and reduction in system losses.

Key Words: IPP, MATLAB, Optimal power flow

1. Introduction

The necessity of rotating magnetic field in AC machines and maintaining magnetic flux in transmission lines has made planners to look upon the reactive power management in power system whenever any changes in real power generation and consumption is anticipated. Distributed reactive power compensation in the system, enhance the system voltage profile and real power losses are reduced. It can be achieved by installing static or dynamic reactive power compensators at substations and utilizing the alternators capability to behave as both the source and sink for reactive power.

The reactive power support to the INPS is maintained only by NEA owned generators and capacitors at substations. IPPs rarely generate reactive power mainly due to lack of any incentive to them. Also, some machines (small size generators) are even not equipped with varying their excitation voltage to regulate reactive power generation/consumption. It is often observed that, during the summer season, specific regions of Nepal suffer from low voltage problem while during winter very high voltage at night. Only in some exceptional cases, IPPs support reactive power services to the system on request by the system operator. With an increasing share of power penetration by IPPs, it would be impractical for system operators to request private producers for reactive power services individually. Hence, specific incentive mechanism and implementation of some mandatory obligations for reactive power support from IPPs seem essential to maintain the power quality of INPS at par with international standard.

Samahy *et al.* (2007) have proposed a model that takes both technical and economic aspects for optimal reactive power dispatch with minimizing the total cost of reactive power required by the system. In the study, real power dispatch was made fixed, allowing some slack bus space to compensate for any changes in losses with the system's reactive power flow change. Mozafari *et al.* (2006) have presented a methodology for the competitive reactive power market. Bidding for reactive power takes place after obtaining equilibrium for active power. Participants for reactive power market include winners from active power market as well as independent reactive power producers. Ucheniya *et al.* (2020) have performed a simulation study for optimal reactive power dispatch considering minimization of real power losses.

This paper analyzes the upshot of reactive power support by IPPs in INPS. Two strategies have been identified to mitigate the problem: one requires the utility to install shunt compensators for overall reactive power management, and the other includes reactive power support from IPPs. The purpose of the study is to make a comparative techno-economic assessment of the strategies mentioned above. Optimal sizing of reactive compensation is obtained with minimization of the sum of operational and installation cost. The optimal power flow (OPF) tool of DIgSILENT is used to calculate the optimal reactive power generation from generators, whereas the genetic algorithm tool of MATLAB is used to find the optimum size of reactive power compensators. The variables for optimization in MATLAB represent the locations for reactive compensation identified from dV/dQ sensitivity index. The hypothesis is tested for the projected generation and demand scenario of INPS in 2023 and 2028.

2. Methods

The overall approach is to formulate the strategies mentioned above as optimal reactive power dispatch problem. In DIgSILENT software, the OPF module optimizes a specific objective function in a network whilst fulfilling equality and inequality constraints. The user can choose between interior-point and linear optimization methods. In the case of linear optimization, contingency constraints can also be enforced within OPF. But in AC Optimization, the OPF performs a non-linear optimization based on the state-of-the-art interior-point algorithm. The controls in the OPF module used for the study are: i) Generator Reactive Power Dispatch and ii) Switchable Shunts.

2.1 Mathematical formulation

The objective function is to minimize the total cost of annual energy loss and shunt compensators. Mathematically to Minimize;

f(x) = Ke × Annual energy loss + Ca × Capacitor Size

Where;

Ke is the present worth of the cost of a unit of energy

Ca is the annual cost of a unit of Capacitor

Subjected to;

a. Equality constraints;

i.) Bus real and reactive power balance from load flow;

$$P_i(V,\delta) - P_{Gi} - P_{Di} = 0$$
$$Q_i(V,\delta) - Q_{Gi} - Q_{Di} = 0$$

ii.) Load balance equation

$$\sum_{i=1}^{NG}(P_{Gi}) - \sum_{i=1}^{ND}(P_{Di}) - P_L = 0$$

b. Inequality constraints;

i) Bus voltages

$V_{imin} < V_i < V_{imax}$ for i = 1 to N buses

ii) Reactive power generation limit

$Q_{jmin} < Q_j < Q_{jmax}$ for generators and reactive compensation buses

2.1 The interface between MATLAB and DIgSILENT

There is no direct interfacing tool in MATLAB and DIgSILENT, but the coding feature is available in both the software. Since both software can create, amend and modify excel file from code itself, an excel file "data. csv" is used as an interface for communication. This "data.csv" file is a comma-separated data file initially created in MATLAB, allowing DPL script to amend as well as modify when required. For preventing the use of CSV file by both software simultaneously, a flag file is created which is also in CSV format, i.e. flag.csv. Flag file has only one value at one time, either 0 or 1. Initially, MATLAB does all initialization from creating a data file (data.csv) to run a genetic algorithm. There is the provision of changing flag value in the fitness file of MATLAB and DPL script of DIgSILENT. Since the flag's initial value is set to 1 by default, MATLAB does the feeding size of reactive compensators to the data file and changes its value to 0. As soon as flag value is set to 0, the DPL script gets data from the data file, performs load flow, feeds the fitness value to the data file, sets the flag value to 1 and continues till the optimum result is obtained.

3. System Modeling

Integrated Nepal Power System for the projected years have been modelled in DIgSILENT PowerFactory 15.1. Altogether five different scenarios have been considered for the analysis. NEA generators have been considered a voltage-controlled bus with power factor variation up to a limiting value of 0.85 lag-lead modes in all these scenarios. These scenarios are as follows;

i) **base case unity p.f.**: IPPs generators operation at unity power factor and no additional shunt compensation in the system.

ii) **The optimum case at unity p.f.**: IPPs generators operate at unity power factor together with optimal placement of shunt compensation.

iii) **IPPs up to 0.95 p.f.**: IPPs generators operation within 0.95 lead/lag power factor together with optimal placement of shunt compensation.

iv) **IPPs up to 0.90 p.f.**: IPPs generators operation within 0.90 lead/lag power factor together with optimal placement of shunt compensation.

v) **IPPs up to 0.85 p.f.:** IPPs generators operation within 0.85 lead/lag power factor together with optimal placement of shunt compensation.

3.1 INPS demand and generation:

NEA forecasted demand for the year 2019 was 2225.7 MW. However, as per the Nepal Electricity Authority annual report (2019), the same year's actual peak demand was only 1407 MW. Therefore, a correction factor (actual demand/forecasted demand) is employed to suppress the yearly forecasted peak demand to match with the actual. Therefore, the corrected peak demand for 2023 and 2028 is taken as 2341 MW (forecasted 3703.3 MW) and 3497 MW (forecasted 5531 MW). System Load Power factor at the peak demand is considered as 0.89. Projected supply for the respective years is taken as per the white paper by the Ministry of Energy (2018), assuming that the surplus power will be exported to India. The power needs to be exported is considered as lump loads at the unity power factor at the cross border exit points.

3.2 Economical parameter

Following economic parameters have been used in the study;

Energy Cost = NRs. 10/kWh.

Reactive Power Compensators Cost = NRs. 2.88 million/MVAR

Loss of Load Factor (LLF) = 0.59

Interest rate = 15%

Economic life = 20 years

Annual Plant Factor = 0.675

4. Results and Discussion

Fig.1 depicts the voltage profile of INPS as obtained from the load flow analysis for the year 2023. Table 1 supplements the actual locations of buses marked by their corresponding number in Fig.1. Before and after optimization, the figure denotes without and with optimal shunt compensation (scenarios i & ii mentioned in the previous section) respectively. It can be observed that when IPPs generator operates at unity power factor, system voltage without shunt compensation is significantly poor and beyond the acceptable standard limits at many buses. It is apparent that with the implementation of optimal shunt compensations, it is possible to bring the system voltage profile to a satisfactory level even all IPPs generators operate at the unity power factor.

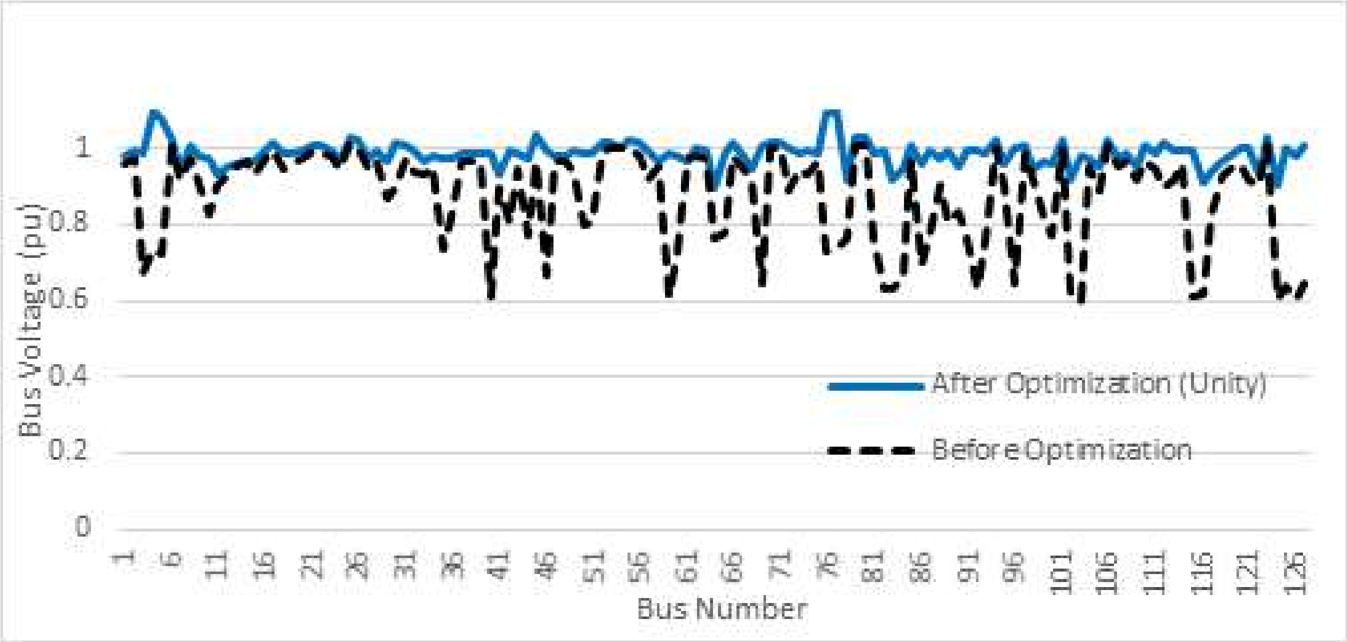

Fig.1. Bus voltage Profile for the year 2023 with IPPs operating at a unity power factor

Table 1. Bus number and corresponding location

Bus No.	Bus Name	Rated kV	Bus No.	Bus Name	Rated kV	Bus No.	Bus Name	Rated kV
1	Aadhikhola220	220	44	Lumki	132	87	Bhaktapur132	132
2	Anarmani	132	45	M-Mars	132	88	Bharatpur	132
3	Attariya	132	46	Mahendranagar	132	89	Bhotekoshi	132
4	Bajhang	132	47	Maintada	400	90	Birgunj	66
5	Balanch	132	48	Maintada132	132	91	Changunarayan	132
6	Baneshwor220	220	49	Manang220	220	92	Chapali	66
7	Bardaghat	132	50	Matatirtha	132	93	Chapali132	132
8	Barhabise	400	51	Matatirtha 220	220	94	Damak400	400
9	Bharatpur220	220	52	Mirchaiya	132	95	Damauli	132
10	Burigaon	132	53	Mirchaiya400	400	96	Devighat	66
11	Burtibang132	132	54	Muzzafapur	400	97	Dhalke220	220
12	Butwal	132	55	Newbasantpur	220	98	Gandak	132
13	Butwal220	220	56	Newkhimti400	400	99	Hetauda	132
14	Butwal400	400	57	Newmarsyangdi220	220	100	Hetauda66	66
15	Chapur	132	58	Parwanipur132	132	101	Inaruwa400	400
16	Dadakhet	220	59	Patan	66	102	Indrawati	66
17	Damak	132	60	Phalampur	132	103	K-3	66
18	Damauli220	220	61	Phulbari	400	104	Kataiya	132
19	Damauli400	400	62	Phulkot	400	105	Kawasoti	132
20	Dana	220	63	Rahughat	220	106	Khadbari	220
21	Dhalke400	400	64	Simara	66	107	Kushaha	132
22	Dhalkebar	132	65	Switchatar	132	108	Kushma132	132
23	Dodhara	400	66	Tamakoshi	220	109	Kusum	132

24	Duhabi	132	67	Seti NEA small	132	110	Lapsiphedi400	400
25	Ilam	132	68	Ramnagar	132	111	Lekhnath220	220
26	Inaruwa220	220	69	Chilime	66	112	Likhu132	132
27	Jhimruk	132	70	Tingla132	132	113	Marsyangdi	132
28	Kga	132	71	Tingla220	220	114	Modi	132
29	Kamane	132	72	Trishuli 3B	220	115	Newchabil	66
30	Khimti132	132	73	Umadi220	220	116	Panchkhal	66
31	Khimti220	220	74	Udipur220	220	117	Parwanipur	66
32	Khudi220	220	75	Umodi132	132	118	Pathlaiya	132
33	Kohalpur	132	76	Upper Khalangad	132	119	Pokhara	132
34	Kohalpur400	400	77	West Seti	132	120	Ratamate	400
35	Kul-1	66	78	Amlekhgunj	66	121	Ratamate 220	220
36	Kul-2	132	79	Arun3_220	220	122	Shivapur	132
37	Kusma220	220	80	Arun400	400	123	Sitalpati220	220
38	Kusma400	400	81	Balaju132	132	124	Sunkoshi	66
39	Lahan	132	82	Balaju66	66	125	Switchatar66	66
40	Lainchaur	66	83	Banepa	66	126	Teku	66
41	Lamahi	132	84	Baneshwor	66	127	Trisuli	66
42	Lamosanghu	132	85	Barhabise220	220	128	Switchatar	132
43	Lekhnath	132	86	Bhaktapur	66			

4.1 Identification for optimum location and size of shunt compensator

From the load flow and dV/dQ sensitivity analysis, it has been noticed that at some buses though having significantly low voltages, still exhibits a lower sensitivity index. The specifics above for a few selected buses is illustrated in Table 2. The final compensator locations have been chosen based on a combined bus voltage and sensitivity index criterion because of such status. Also, in many cases, it is realized that neighbourhood buses have the almost same value of sensitivity indexes. In such a situation, shunt compensators' installation in one of these neighbouring buses can address an entire region's problem. The optimal sizes of capacitors at identified locations for a varying operating power factor of IPPs generators are presented in Table 3. The voltage profile for the same is shown in Fig. 2.

Table 2. Results of dV/dQ sensitivity index at a few selected bus

Bus	Bus Voltage	dv/dQ index	Bus	Bus Voltage	dv/dQ index
Sunkoshi	0.603	0.0102	Bhaktapur	0.691	0.0020
Indrawati	0.628	0.0074	Kataiya	0.951	0.0017
Panchkhal	0.620	0.0059	Simara	0.764	0.0016
Banepa	0.632	0.0046	Parwanipur	0.826	0.0015
Baneshwor	0.657	0.0035	Modi	0.960	0.0015
Jhimruk	0.943	0.0024	Kushaha	0.951	0.0013
Birgunj	0.836	0.0021	Duhabi	0.943	0.0013

Table 3. Optimum Reactive Compensators for varying Operating power factor of IPPs generators

Location	Size in MVAR			
	Unity pf	0.95 pf	0.90 pf	0.85 pf
Parwanipur	28.08	13.38	8.13	5.94

Suichatar	176.03	150.76	150.49	139.03
Bhaktapur	80.12	36.92	0.06	12.71
Lalpur	19.45	37.87	41.29	41.69
New Chabil	79.36	66.4	70.4	63.91
Butwal Reactor	171.19	13.94	14.06	10.58
Phulbari Reactor	188.96	285.04	302.63	300.36

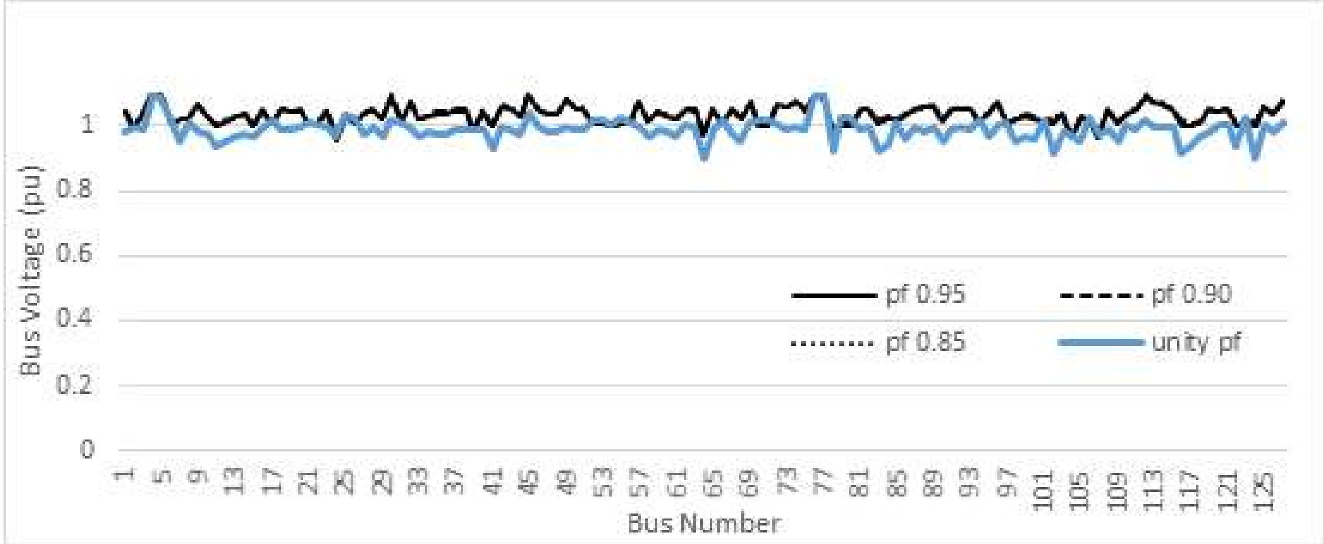

Fig. 2. Bus voltage Profile for the year 2023 with IPPs generators operation at varying power factors

4.2 Economic analysis

As explained, optimal shunt capacitor placements possess the capability of producing the system voltage profile within the acceptable limit even all the IPPs generators operate at unity power factor. However, the annual energy loss and overall saving vary with the variation of reactive power share by IPPs generators. As depicted in Table 4, it is evident that with an increase in the reactive power support from IPPs generators, the required size of the shunt capacitor is reduced and there is a substantial decrease in system loss. It is to be noted that with an increase in the operational power factor range of IPPs generators, the generators MVAR contribution to the system is higher than that of decrease in the MVAR from shunt compensators. It is presented in Table 5. The additional MVAR has been utilized in raising the overall voltage profile and hence is a major contributing factor for system loss reduction.

Table 6 summarizes the results for projected demand generation scenario for the year 2028. Similar to that of the year 2023, the results show that with reactive power support from IPPs generators, there is a significant reduction in system operation cost.

Table 4. Performance comparison for a varying operating power factor of IPPs generators

	Unity pf	0.95 pf	0.90 pf	0.85 pf
Total Required Shunt Capacitor Capacity (MVAR)	743.2	604.31	587.07	574.21
Total Capacitor Installation Cost (Million NRs.)	2140.4	1740.43	1690.75	1653.71
Annual Compensator Installation cost (Million NRs.)	341.95	278.05	270.12	264.2
Power Loss (MW)	128.71	119.79	118.76	118.28
Annual Energy Loss (GWh)	665.22	619.11	613.77	611.32
Annual Energy loss cost (Million NRs.)	6652.25	6191.12	6137.73	6113.18
Total Annual cost (Million NRs)	6994.2	6469.17	6407.85	6377.38
Annual cost Saving w.r.t unity pf (Million NRs.)	0	525.03	586.35	616.82

Table 5. MVAR from compensators and generators with a varying operating power factor of IPPs generators

	Unity pf	0.95 pf	0.90 pf	0.85 pf
Shunt Compensators MVAR	743.2	604.31	587.07	574.21
Generators MVAR	143.06	858.2	986.75	1071
Total MVAR	886.26	1462.51	1573.82	1645.21
Average System Voltage (p.u)	0.989	1.033	1.034	1.036

Table 6. Performance summary for the projected the year 2028.

IPP Generators Operationpf Range	Real Power Loss (MW)	Shunt Compensators (MVAR)	Annual Cost		
			Loss Cost (Million NRs)	Shunt Compensators Cost (Million NRs)	Total (Million NRs)
1	242.14	397	1251.48	182.66	1434.14
0.95	190.73	125	985.77	57.51	1043.28
0.9	190.36	128	983.86	58.89	1042.75
0.85	190.45	124	984.32	57.05	1041.38

5. Conclusions

It has been observed that when IPPs generator operates at unity power factor, system voltage without shunt compensation is significantly poor and beyond the acceptable standard limits at many buses. With the implementation of optimal shunt compensations, it is possible to bring the system voltage profile to a satisfactory level even all IPPs generators operate at the unity power factor. With the operation of IPP generators at lower power factors range, the combined cost of reactive compensation and system energy loss decreases. The MVAR contribution from IPPs generators has multiple benefits, e.g. significant reduction of required MVAR from shunt compensators, power and energy loss reduction together with improved voltage profile. The net operational benefits vary with variation in operating power factor of IPPs generators. The amount that could be saved by operating IPPs generators in lower power factor mode may be used to introduce as an incentive to the IPPs for reactive power support to the INPS. However for the determination of the exact rate for reactive power pricing needs further analysis.

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Ex-President, SEEN

Safety First

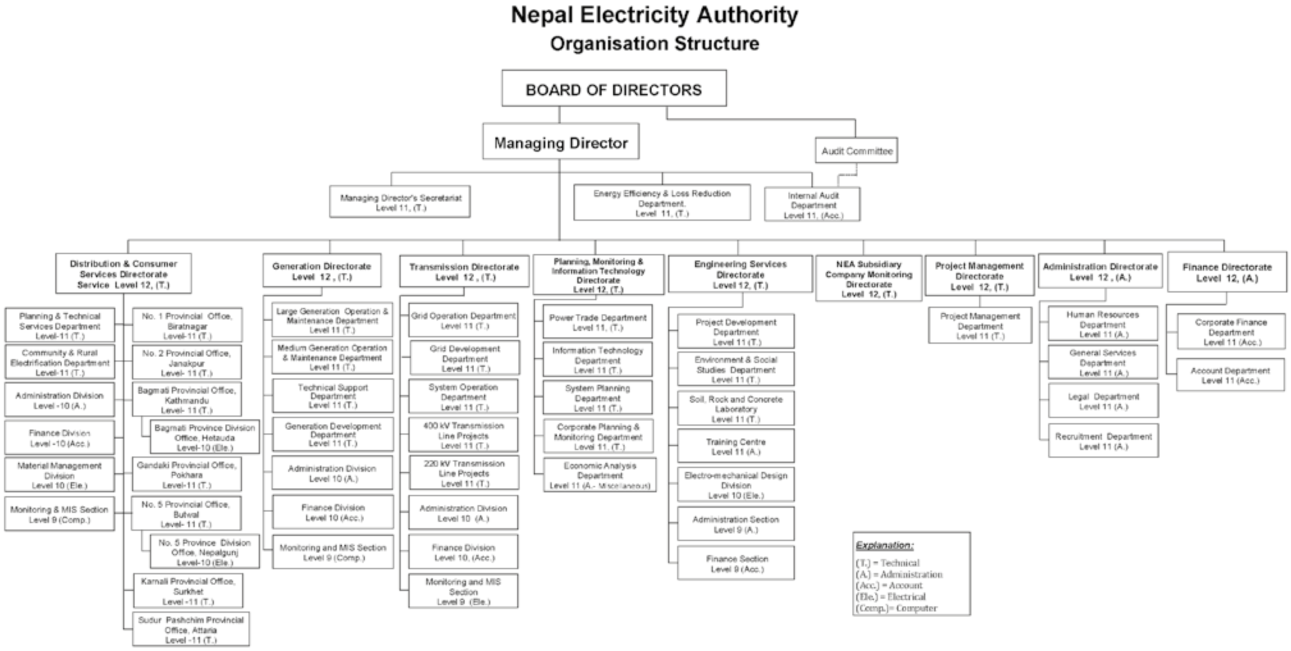
Electricity is an important part of our lives that cannot be taken for granted and must be treated with caution and precaution. The safety is utmost importance in the use of electricity and should not dismiss safety as someone else's responsibility. Human life is very precious and must be protected against such electric hazards. Despite its immense importance, no universally accepted definition of electrical safety so far exists. Carelessness and ignorance of the basic safety rules and procedures are the main cause of any type of accidents. All types of injuries are preventable. The operating process that could result in injury can be checked and controlled provided the consumers are aware of the electricity hazards, the employees are trained to work safely, safety is the prerequisite of the employment that starts the very first day of carrier, and there exists regular audits of the work places and surroundings, and safety is a part and parcel of the job as well as off the job for the overall safety efforts. Therefore safety aspect must be integrated as a core personal value in all walks of life.

We do take electricity usage lightly and generally forget the potential danger it can cause to any one if it is not used in a proper way despite electricity has become the necessity and the integral part of our life relying it for our comfort and convenience. Every year, electricity and lightning related incidents in Nepal are found quite alarming with the more access of electricity resulting in fire broke out, burns, property damages, electrocution and deaths and bring forth the irreparable losses in terms of human life, live stokes and also property loss. NEA Engineer Sanu Raja Joshi got 11000 V electric shocks late 40s BS and forced to lose both hands. Kanchha katuwal of then Bijuli adda was badly electrocuted late 30s BS and his both arms imputed close to the shoulders thus depriving him the opportunities to have artificial limbs. Collie Loknath Gautam had the similar fate like Sanu Raja, and totally incapacitated his movement below hips due to his spinal cord injury. Manager Vishnu Hari Shrestha died due to a heavy flash over on him while repairing the naked and damaged circuit breaker diesel power house. Maili Tamang of Jhor VDC of Kathmandu district was electrocuted after the high voltage fell in the field she was working. Amrit Lama of Mahankal died while fixing the hoarding board after touching the live line. Similar cases had happened since then to many NEA engineers, technicians and also civilians and their grieved families returned empty handed without appropriate Government support, compensation and the Government did not value the contributions of their deceased have offered to the country. When we look back 20 years , 2059 BS alone, 12 civilians, 3 NEA personnel and including 2 elephants have died due to electrocution, fire broke out, touching high voltage lines, leakage in electric pumps, and high Voltage lines directly touching Over the low voltage lines. Similarly if we look back to search out the records of similar electrical accidents from 2066 to 2070 BS, there were 13 deaths and 39 electrical serious accidents within NEA which was indicated in their NEA bi-annual Vidhyut magazine. These recorded accidents were only those of NEA employees and not of its consumers. The Government has not maintained records of electrical related accidents so far of the general public which need to be addressed on the part of the Government as immediately as possible so as to figure out the trend in electricity related accidents and way forward to safe guard the people and prevent accidents in future.

These accidents has happened due to not following the basic safety procedures, lack of follow up the safety culture, and also due to poor repair maintenance by the concerned utility that resulted an enormous loss in terms of property, human and also livestock. This is just some of the unfortunate electrical related incidents happened in past years. The above unfortunate incidents are some of the examples and reveal that that there should be no compromise with safety at all. Let us give safety measures a top priority in the installation, repair, maintenance, engineering design and all important facets of engineering activities including generation, transmission and lastly the households electrification works so that the trauma of the survivors like Sanu Raja, Kanchha Katuwal's, and their families grieves not befall on the other family members as a unbearable pressure. These accidents would have been avoided then and there provided there could have an adequate and basic safety procedures implemented in the working areas. It is quite obvious that most of the electrical incidents which has occurred due to not having proper working tools, negligence and safety procedures.

But why is there negligence of not recording accidents of general public? Is this the responsibility of NEA, DOED? Is it not the responsibility and duty of the Government to make the public aware and keep record of such accidents? In an attempt to find out the answer to that of Government negligence in electrical safety, I have gone through the organizational structure of electricity utility company that is (NEA) and Department of electricity development (DOED), just to figure out the current scenario of how safety is perceived by the decision makers of those organizations in true sense.

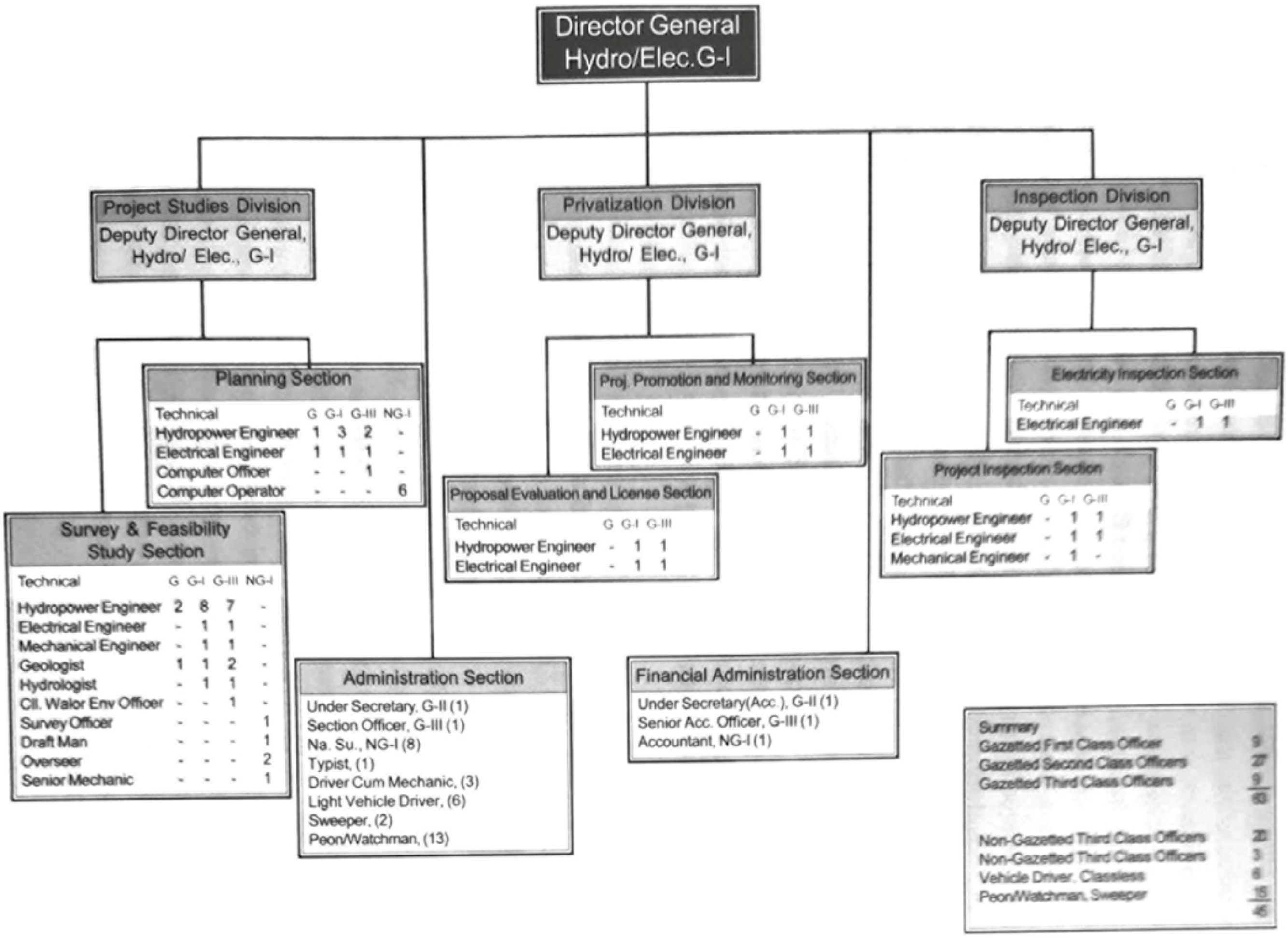
NEA Organizational Structure Chart



If we follow up the organization structure of Nepal Electricity Authority, we will find that there are nine directorates including admin and finance. Under these directorates there are as many 50 departments, divisions and sections including energy efficiency and loss reduction, general services department, economic analysis etc. NEA is continuing more or less the similar organizational structure for many years but with some recent additional installation in their structure such as energy efficiency department and loss reduction and so on. The NEA management finds the requirement to have legal, general, economic analysis department but finds no necessity to incorporate a safety inspectorate, department, division or single unit under Nepal

Electricity Authority's organization structure of over 8344 working force now and serving more than 50 lakh consumers. From the above chart one could draw conclusions very easily how much NEA management has given importance to the electrical safety in practice. It is to note that there is not even a single institutional mechanism on safety in NEA structure so far.

Department of Electricity development (DOED) organizational Structure

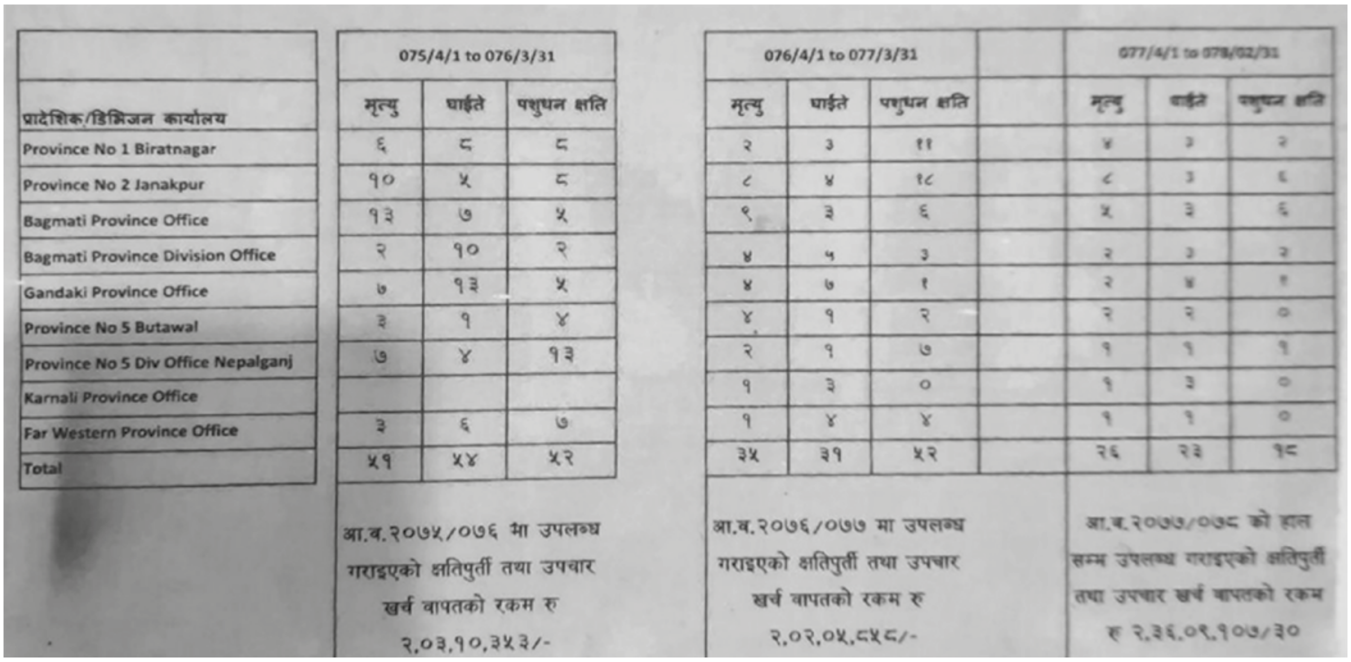


The above organization structure indicates that DOED has incorporated the inspectorate division and it has two sections, along with other directorates. While talking to the electrical inspectorate, one section is electricity inspection and the other section is the project inspection divisions. The electricity inspection section has comprised of 2 officers while the project inspection section is manned by five officers. Thus one can clearly visualize the travesty of electrical safety even in DOED that the more glamorous project inspection has five officers whereas jus electricity inspection has been managed only by two officers.

But if we go back 2030 BS, the electrical inspectorate was directly under the then ministry of water and power. At that period of time the system peak was just 8MW and number of electricity consumers was less than 30,000. Fifty years later, when the peak demand reached 1290 MW and the consumers have jumped for more than 50 lakh, we find that the electrical inspectorate has been downgraded from the ministry level to the department level status in DOED and NEA finds no necessity to incorporate even a safety section in their organization structure.

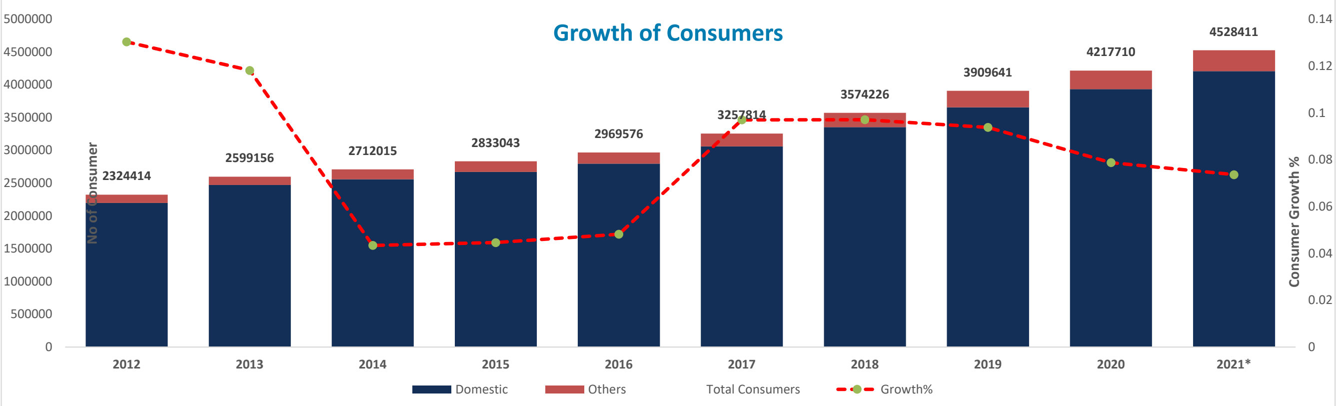
Compensation provided from NEA to the victims

From the above NEA compensation chart, the amount paid to the electricity related death, general accidents, and livestock figure for the last 3 fiscal year is more than 6 Crore 41 lakh. The figure shown in the chart reveals that electricity related death, general accidents, and livestock figure for the last 3 consecutive year is on the decreasing trends. In 2020/21, the death figure is 26, general accidents, 23 and livestock loss, 18 as compared to 51, 54 and 52 respectively in 2018/19. However it is irony to see from the above figure that the compensation amount has increased considerably in 2020/21 as compared to 2018/19 despite having less electrical accidents, hazards and victims in recent years. This could be due to increase in the compensation modality by NEA and other related contributing factors.



	075/4/1 to 076/3/31			076/4/1 to 077/3/31				077/4/1 to 078/02/31		
प्रादेशिक/डिभिजन कार्यालय	मृत्यु	घाईते	पशुधन क्षति	मृत्यु	घाईते	पशुधन क्षति		मृत्यु	घाईते	पशुधन क्षति
Province No 1 Biratnagar	६	८	८	२	३	११		४	३	२
Province No 2 Janakpur	१०	५	८	८	४	१८		८	३	६
Bagmati Province Office	१३	७	५	९	३	६		५	३	६
Bagmati Province Division Office	२	१०	२	४	५	३		२	३	२
Gandaki Province Office	७	१३	५	४	७	१		२	४	१
Province No 5 Butawal	३	१	४	४	१	२		२	२	०
Province No 5 Div Office Nepalganj	७	४	१३	२	१	७		१	१	१
Karnali Province Office				१	३	०		१	३	०
Far Western Province Office	३	६	७	१	४	४		१	१	०
Total	५१	५४	५२	३५	३१	५२		२६	२३	१८
	आ.व.२०७५/०७६ मा उपलब्ध गराइएको क्षतिपुर्ती तथा उपचार खर्च वापतको रकम रु २,०३,१०,३५३/-			आ.व.२०७६/०७७ मा उपलब्ध गराइएको क्षतिपुर्ती तथा उपचार खर्च वापतको रकम रु २,०२,०५,८५८/-				आ.व.२०७७/०७८ को हाल सम्म उपलब्ध गराइएको क्षतिपुर्ती तथा उपचार खर्च वापतको रकम रु २,३६,०९,१०७/३०		

Consumers' Growth



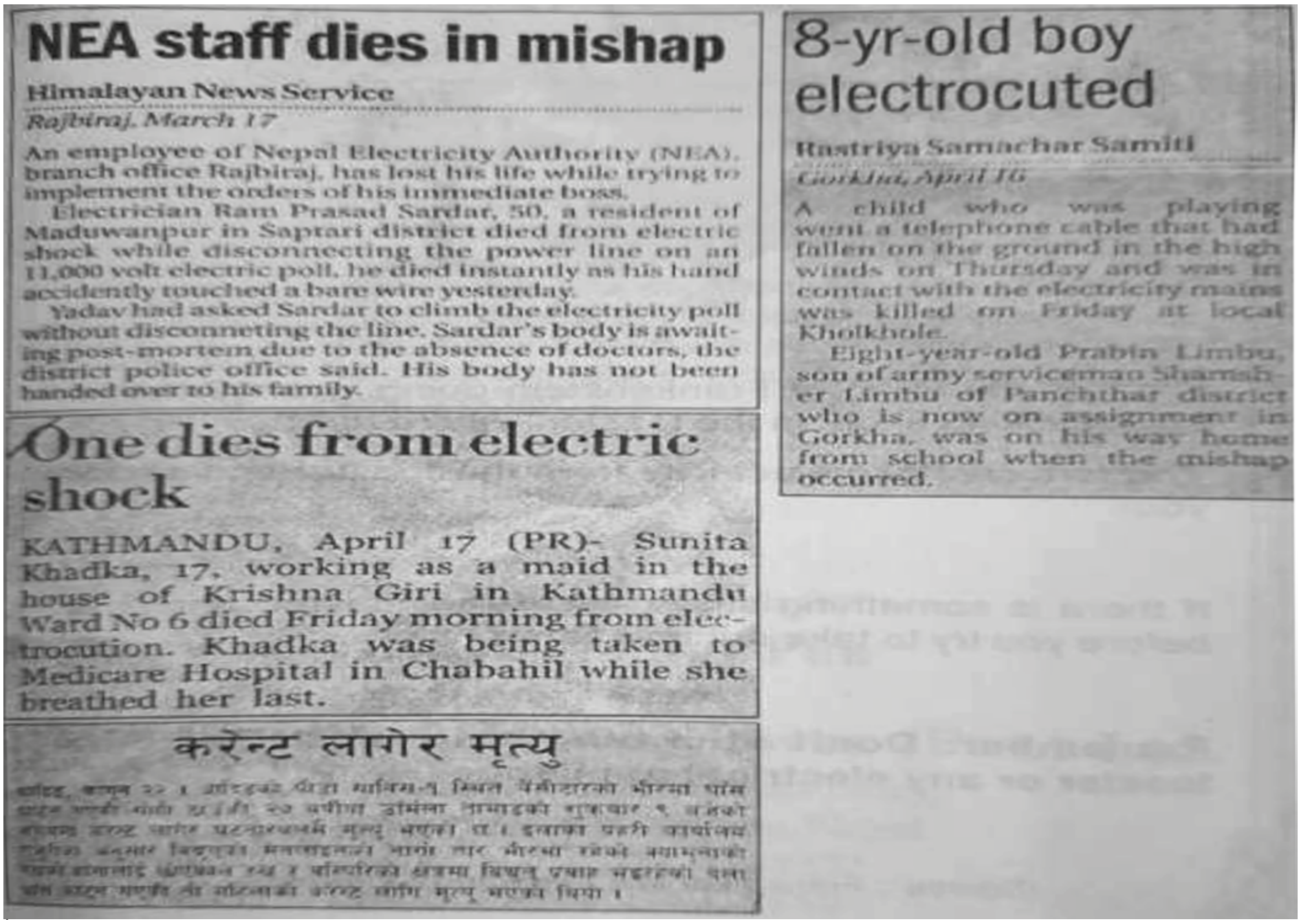
Category	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021*
Domestic	2,198,680	2,472,264	2,558,726	2,671,039	2,796,621	3,061,709	3,355,830	3,657,887	3,933,574	4,208,208
Non Commerical	14,055	15,179	16,155	16,717	17,732	19,257	21,094	23,493	26,011	29,010
Commercial	13,297	13,096	14,955	15,899	17,191	18,860	21,716	25,746	29,522	32,321
Industrial	36,409	37,498	40,265	41,825	43,639	46,345	48,800	52,697	55,888	60,782
Water Supply	860	834	1,141	1,266	1,426	1,675	2,063	2,460	2,960	3,494
Irrigation	53,165	51,520	71,845	77,066	83,283	98,626	111,493	131,935	152,485	174,917
Street Light	2,590	2,878	2,774	2,813	2,829	2,935	3,010	3,266	3,726	4,577
Temporary Supply	619	768	726	733	883	1,070	1,520	1,682	1,577	1,817
Transport	44	51	1	44	43	44	44	40	43	51
Temple	3,529	3,857	4,048	4,181	4,391	4,673	5,182	5,890	6,611	7,481
Non Domestic	-	-	-	-	-	977	1,735	2,735	3,260	3,678
Entertainment	-	-	-	-	-	45	107	150	170	192
Community Sales	1,161	1,207	1,377	1,459	1,537	1,597	1,631	1,659	1,882	1,882
Bulk Supply to India	5	4	2	1	1	1	1	1	1	1
Total Consumers	2,324,414	2,599,156	2,712,015	2,833,043	2,969,576	3,257,814	3,574,226	3,909,641	4,217,710	4,528,411
Growth%	13%	12%	4%	4%	5%	10%	10%	9%	8%	7%

* Provisional Figures (Subject to Audit)

If we follow the consumers growth patterns from the chart as published by NEA, it reveals that the average consumers' growth is 8.5 % over the last ten years from 2011 to 2020 and the total number of electricity consumers till 31st Ashadh is 45,28,411 and Rural electricity community users are 5,50,000. The total number of consumers is 50, 78,411 till date. The number of consumers has increased by 1984044 from 2011 and reached to 3933574 in 2020 in domestic sector alone. The second highest electricity consumers are in irrigation sectors and the third highest consumers are in industrial sectors. The highest electricity consumers' growth was 13% in 2012 and lowest was 4% in 2014/15. From the chart, we find that the consumers' growth trend is downwards and it is only 8% in 2020 as compared to 9% in 2019.

However it is to note that over the past few years Nepal Electricity Authority and Society of Electrical Engineers Nepal have started observing the safety day jointly on 26 Chaitra every year not only in the NEA distribution centers but also managing electricity safety awareness programs for the public too in different parts of the country. The consumers have felt that this is a good beginning and it should continue in future towards empowering the technicians, engineers within or out of NEA and consumers at large about electrical safety awareness campaign. This could be also one of the reasons why there is a decreasing trend now in electrical related hazards in NEA despite there is a substantial consumers growth and have more access of electricity even in rural community users.

If we can organize such kind of programs in education institutions and public on regular basis, we can save lives and also money which NEA is paying millions of Rupees to the electrical victims. As everyone is aware that organizing a Safety day once a year is definitely not enough unless the top management is committed for the enhancement of safety and enforcement of electrical safety protocols. We generally find high words and find strongly stress the importance of safety by the concerned ministers and top management officials in the seminar, and safety related workshops, but they do not realize that they lack safety inspectorate in their own institutional mechanisms like the one in neighboring countries.



NEA staff dies in mishap

Himalayan News Service

Rajbiraj, March 17

An employee of Nepal Electricity Authority (NEA), branch office Rajbiraj, has lost his life while trying to implement the orders of his immediate boss.

Electrician Ram Prasad Sardar, 50, a resident of Maduwanpur in Saptari district died from electric shock while disconnecting the power line on an 11,000 volt electric poll, he died instantly as his hand accidently touched a bare wire yesterday.

Yadav had asked Sardar to climb the electricity poll without disconneting the line. Sardar's body is awaiting post-mortem due to the absence of doctors, the district police office said. His body has not been handed over to his family.

One dies from electric shock

KATHMANDU, April 17 (PR)- Sunita Khadka, 17, working as a maid in the house of Krishna Giri in Kathmandu Ward No 6 died Friday morning from electrocution. Khadka was being taken to Medicare Hospital in Chabahil while she breathed her last.

करेन्ट लागेर मृत्यु

8-yr-old boy electrocuted

Rastriya Samachar Samiti

Gorkha, April 16

A child who was playing went a telephone cable that had fallen on the ground in the high winds on Thursday and was in contact with the electricity mains was killed on Friday at local Kholkhole.

Eight-year-old Prabin Limbu, son of army serviceman Shamsher Limbu of Panchthar district who is now on assignment in Gorkha, was on his way home from school when the mishap occurred.

With more and more power projects are underway and more Nepalese people having greater access to electricity, there is likely hood of more electrical related accidents. To minimize such accidents, the government owned NEA, DOED needs to review its organization structure and electrical safety inspectorate, inspection be given due recognition.

The following recommendations are being made in this regard,

+Electrical safety committee comprising of stake holders MOE, NEA, DOED, Electrical manufacturers, like minded Societies, electrical entrepreneurs and contractors be formed to prepare the report and need gap analysis on where we stand and where we wish to reach in regard with electrical safety so that all institutional mechanisms can be restructured on the basis of the report and findings.

Establish and offer the inspectorate directorate a full autonomy so that defaulting agencies will be dealt with rigorous task to give electrical safety a top agenda.

DOED's electrical inspectorate be strengthen in electricity inspection sections with full-fledged man power with the task of mandatorily publish the reports of the project related accidents along with other inspection activities.

Accidents of both public and NEA staff are to be published in the NEA/DOED annual report and electrical safety wings on directorate level be immediately established in central and division level all seven provinces.

The safety day should be observed every year not only by the electricity providers but also the public at large. To raise awareness regarding the safe use of electrical equipment, one should organize public awareness campaign, review the safety status and achievement and launch new programs as deem necessary.

In cooperation with Nepal Bureau of Standards and Metrology, NEA, a national code of Safety and construction standards should be prepared and implemented.

All the construction works requiring in the electrical projects should be certified by the electrical safety engineer prior to supply the new line connections as well as system up-gradation, enhancement etc. The NBSM should also certify the Nepalese products with Nepal Standard for those who met the product safety criteria.

Safety inspectors should be appointed by the concerned ministry not only in DOED but also in each and every Government offices, agencies like NEA, municipality and so on. The electrical safety inspectors should be Government certified professionals having a special electrical safety related training and safety audit certificates with greater autonomy of power so as to stream line the safety related issues.

Cooperation and coordination among various Government and private entities like NEA, DOED, NTC, Water supply and sewerage, road department is absolutely necessary to promote safety and mitigate such preventable accidents.

Safety related workshop, seminars should be held by the utility on regular basis in all the provinces whereby more and more professionals and public could participate and be able to motivate public at large so as to raise the awareness on the issues of safety.

The concerned department has to revise and update the building electrification codes as earliest as possible. It was prepared almost two decades ago and it needs revision and restructuring as per the 21st century requirements. Similarly, there is a need of revision of construction standards in NEA and also implement safety standard by installing safety wings just to start with the safety inspectors.

The Government should make an electrical Contract Act, Policy and should practice its effective implementation as immediately as possible so that a safe electrical design and installation works could be performed in line with the contract Act, regulation and standard. As such there is not such body or a mechanism in place in the country whereby the electrical related construction could be checked, monitored and validate. The existing civil contract Act is meant only for the purpose of regulating the civil construction which can be justified by its clauses. It does not reflect any electrical contracting jobs. In such scenario, we cannot expect a safe electrical installation so as to ensure a safe electrical installation. Therefore there is a dire need of electrical contract Act in Nepal. The use of Residual Current Circuit Breakers should be mandatory and it is guaranteed by the contract Act and local regulations in some of the key areas such as in Government building, commercial and industrial premises.

As we know that electricity service provider is a customer focused organization and has a duty to protect the people, employees, and mitigate the unsafe effects of electricity operation. In this regard, there is a need of Professionals' and consumers' safe working habits to avoid accidents as far as possible. Despite consumers more access of electricity and the rate of electrical accidents are on decreasing trend now, the electrical related accidents that one gets to read in the newspapers as shown in the newspapers cutting remind us that there are many things still undone for the electrical safety both for public and NEA staff.

Generally there are two schools of thoughts on safety initiatives. Those that are behaviorally-based and those that are process based. Those that are behaviorallybased approach seek to change the way an employee acts as a means of increasing safety. The process based initiatives augment the work process to reduce the likelihood of injury. Especially in the electricity utility like NEA, there is need of both safe behaviors with safe work process culture where everyone will be actively involved in the safe working practice.

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- Electrical technical Data Book- published by Nepal Electrical Contractors' Association (NECA)
- NEA yearly reviews, publications and feedback

सूचना !

नेपाल विद्युत प्राधिकरणले नियमित रूपमा प्रकाशन गर्ने अर्धवार्षिक पत्रिका “विद्युत” वर्ष ३२ अंक २, मिति २०७८ साल फाल्गुनमा प्रकाशित गरिने भएकाले इच्छुक लेखक महानुभावबाट स्तरीय लेख रचना सामान्यतया २ हजारदेखि ३ हजार शब्दमा नघटाई/नबढाई कम्प्युटर टाइपिङ्ग (लेख नेपाली भाषामा भए प्रिति फन्टमा) गरी पेनड्राइभ वा इमेल मार्फत् २०७८ साल पौष मसान्तभित्र नेपाल विद्युत प्राधिकरण, सामान्य सेवा विभाग, जनसम्पर्क तथा गुनासो व्यवस्थापन शाखामा आइपुग्ने गरी उपलब्ध गराई दिनु हुन अनुरोध छ । साथमा लेखकको पासपोर्ट साइजको तस्बिर पनि उपलब्ध गराईदिनु हुन अनुरोध गरिन्छ ।

नेपाल विद्युत प्राधिकरण
जनसम्पर्क तथा गुनासो व्यवस्थापन शाखा
दरबारमार्ग, काठमाडौं, फोन. ४१५३०२१, आन्तरिक : २००२, २००३, फ्याक्स : ४१५३०२२
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Unmasking Policy Sinkholes in India's Initiatives towards Cross Border Power Trading for Long-Term Indo-Nepal Solidarity in Power Sector

ABSTRACT

Some forms of power trading like exchange between Nepal and the Indian states of Bihar, Uttar Pradesh and Uttarakhand of India have been existing since long past in the form of exchange at different voltage levels under the bilateral mechanism called the Power Exchange Committee (PEC). However, the PEC became less functional after many of its issues fell under the Joint working group (JWG) and the Joint Steering Committee (JSC) headed by the Joint Power/Energy Secretaries and the Power/Energy Secretaries respectively as provisioned in the Power Trade Agreement, popularly known as PTA signed between the two countries in 2014. Despite the PTA and many other collaborative efforts, conventional mindsets and hesitation against power trade still prevail in these countries and need to be gradually faded away through building a climate of trust and cooperation at Government levels. Not only Nepal and India, but also the region as a whole should derive benefit from regional energy integration, for which India needs to play a pivotal role and regional institutions such as SAARC, SAFIR and BIMSTEC may create an enabling environment for the same. There has been a notable advancement in the cross border power trading after India took the lead role in formulating Guidelines, Regulations and Procedure from 2016 to 2021 in this regard. India is appreciated by the neighbouring countries for initiating the course, but it is not enough. In fact, cross border power trading should cross all borders - land and sea – irrespective of any nations and nationalities which may be involved in generation, transmission and trading businesses of electricity including investment or ownership in it directly or indirectly. It is imperative that the policy documents of India in cross border power trading should undergo review in order to remove its still-prevailing restrictions attributable to some forms of national interest or strategies.

KEYWORDS: *Power Trade, Exchange, Guidelines, Regulations, Procedure, Policy, Designated Authority*

1. Background

India introduced a new policy in 2016 in cross border power trading with its neighboring countries which had hoped that India's initiatives would be a big boost to remove the uncertainty and skepticism looming over the effectuality of bilateral cooperation in power sector for years. It was the "Guidelines on Cross Border Trade of Electricity" and was obviously considered a sequel to the Agreement on Electric Power Trade, Cross Border Transmission Interconnection and Grid Connectivity signed between Nepal and India on October 21, 2014 emphasizing on the free, unrestricted and non-discriminatory power trading between Nepal and India. Nonetheless, the uncertainty hung over the policy and the neighbouring countries feared that their confidences in bilateral, sub-regional and regional power trading may be compromised by its enforcement. It's great to recall that Nepal did not decline to come forward with its comments and feedbacks for ameliorating it in all respects where it seemed to have restricted free and fair power trading by fostering strategic concerns of India. It was widely asserted by Nepal, too, that the policy simply needed to be changed.

Though not very promptly, India probably heard our voices and concerns and replaced the earlier policy document by a new one called "Guidelines on Import/ Export (Cross Border) of Electricity – 2018" which seemed to be more favorable to us and also captured the spirit of the Power Trade Agreement signed between Nepal and India to a larger extent. The move was appreciated by the neighboring countries, but the clouds of skepticism did not flee completely. Its implementation further required the framing of regulations by Central Electricity Regulatory Commission (CERC) and Procedure of the Designated Authority by Central Electricity Authority (CEA).

After a few months, the central regulator of India, CERC, issued the "CERC (Cross Border Trade of Electricity) Regulations, 2019" and, after more than two years spent with multiple requests by Nepal at JWG/ JSC forums, even consolidated by the Note Verbal from the Ministry of Foreign Affairs, Government of Nepal, Central Electricity Authority (CEA), the Designated Authority (DA) of India for cross border power trade, issued the "Procedure for approval and facilitating Import/ Export (Cross Border) of Electricity by the Designated Authority" on February 26, 2021, as approved by the competent authority in the Ministry of Power, Government of India.

This Procedure finally led to the operationalization of the "Agreement for Power Trading through Exchange Markets" signed with the Indian power trader, NTPC Vidyut Vyapar Nigam Limited (NVVN), on April 22, 2019 for day-ahead power trading in Indian Energy Exchange (IEX) and Power Exchange India Limited (PXIL). NEA became the first client member of the Indian Energy Exchange (IEX) and started commercial transaction for the purchase of power from its day-ahead platform since May 1, 2021. In fact, NVVN purchased power for Nepal Electricity Authority (NEA) through IEX on the earlier date, April 19, 2021, and with this, India launched the cross border power trade on its largest Exchange platform towards building an integrated regional power market with Nepal as the first entrant to it in South Asia.

Nepal has been using the Dhalkebar-Mujaffarpur 400 kV Transmission Line, the first high voltage transmission interconnection between Nepal and India, for power purchase through the IEX in addition to bilateral mode. Besides the power purchase, NVVN has also applied for the day-ahead power export through the IEX by using the same transmission line on behalf of NEA and the DA's approval is awaited in this regard. NEA has authorized NVVN to act on behalf of NEA for these transactions since a Nepalese entity cannot directly be an applicant to the DA for obtaining approval to participate in import/ export of electricity as a participating entity as per the Procedure of the DA.

2. Guidelines on Cross Border Trade of Electricity, 2016

Ministry of Power, Government of India, issued Guidelines on Cross Border Trade of Electricity on December 5, 2016 in order to facilitate and promote the cross border trade of electricity with greater transparency, consistency and predictability in regulatory approaches across jurisdictions and minimize perception of regulatory risks. It, however, seemed that this was not all about non-discriminatory power trading in any way. There were big rooms for doubts and criticism in it.

Some of the provisions stipulated in the Guidelines are stated below:

- Regulation framed by CERC shall be binding on all the participating entities.
- Cross border trade shall be governed by the policies of the respective countries.
- Electricity trade shall be involving issues of strategic, national and economic importance.
- Eligible Participating Entity(ies) - with one time approval of the DA
- Import by Indian entities - from GoI funded or ≥ 51% Indian owned Projects
- Import by Indian entities- from 100% Indian or 100% GoN owned/controlled Projects

- Import by Indian entities - from traders in Nepal with ≥ 51% Indian ownership
- Export by Indian PSU -if surplus capacity is available and certified by PSU
- Other participating entities - on approval of the DA on case to case basis
- Coal based Indian plants- eligible for export only if surplus capacity is certified by DA
- Developers of neighbouring countries participating in power trade required to submit technical, commercial and financial information to CEA.
- Tariff for import by India -through competitive bidding

  - hydropower may be determined by CEA if approached through GoN
- Tariff for export by India - as mutually agreed or through competitive bidding
- Generators may, if required, develop transmission lines to the pooling station at their cost.
- Transmission access priority - to be determined by CTU
- Transmission charges, scheduling, etc. - as per CERC regulations.
- Ministry of Power, GoI - to notify Nodal Agency for settlement of grid operation-related charges.

The Guidelines considered electricity trade as involving issues of strategic, national and economic importance. The following eligibility criteria as per the Guidelines invoked criticism from the neighbouring countries regarding power export to India:

- The generation projects should be owned or funded by Government of India or by Indian Public Sector Units or by private companies with 51% or more Indian entity (ies) ownership. It clearly required us to seek and prioritize Indian investment in the Nepalese hydropower projects to qualify them for exporting power to India. Also, private generating companies were required to form JV with Indian companies as majority equity holder.
- The generation projects should comprise 100% equity by Indian entity and/or the Government/ Government owned or controlled company(ies) of neighbouring country. The generation projects developed by domestic IPPs would not be eligible to export power to India under these criteria. Of course, Government or Government owned/controlled entity alone like NEA will not be able to make sufficient investment in the capital-intensive hydropower projects. This provision also prevented the neighbouring countries like Nepal from building big size projects which requires huge investment.

Likewise, the Guidelines also prevented the Indian power trading companies except Indian distribution companies and Public Sector Undertakings from exporting power to neighbouring countries. Further, India expressed so much concern to the equity pattern of the participating entity that any change in the pattern after obtaining the Indian approval would require to obtain fresh approval. The Guidelines did not acknowledge the Nepalese power trading companies having more than 51% entity ownership to export power to India. The Indian policy was also interpreted as India' reaction to perceptions of increased Chinese investment and influence in the energy sectors of its neighbouring countries. In a nutshell, the provision of Article-IV (b) of PTA signed between Nepal and India to allow the authorized/licensed electricity producers/ buyers/traders of each country to engage in cross border power trading was grossly violated in the Guidelines.

This Guidelines has already been superseded by the new one issued in 2018.

3. Guidelines on Import/Export (Cross Border) of Electricity – 2018

On December 18, 2018, the Ministry of Power issued a seemingly anodyne memo setting the rules for the power transfer across South Asian borders. It is considered as a startling departure from previous stance. It is important not only because it leads the cross border power trading in progressive directions, but also because it is the course correction in the form of a response to backroom pressure from neighbouring countries, particularly Bhutan and Nepal. It gave the impression about India that it has acknowledged the economic interdependency through cross border power trading in the South Asia region. The new Guidelines also allowed tripartite power trading arrangements by routing the power generated in a country over the Indian territory to the third country, enabling Nepal to trade power with Bangladesh, too.

Also to be recalled at this point of time are the talks between Hon. Barshaman Pun, the then Minister for Energy, Water Resources and Irrigation, Government of Nepal and Hon. R K Singh, the then Minister of State (Independent Charge) for Power and Renewable Energy, on February 11, 2019 at New Delhi about the new Guidelines issued by India. The Minister from Nepal had expressed in this meeting that this is going to be a milestone not only for Nepal-India power cooperation but also in promoting regional cooperation in power sector and further hoped that the Guidelines will come into operation soon. However, though CERC Regulations were issued within a few months, the cross border power trading Procedure as the conduct of business rules – India seemed visibly reluctant to it – took almost a couple of years for its issuance. This abnormal delay in the issuance of the Procedure gave rise to skepticism among the neighboring countries whether India was willing to start the cross border power trading without any restrictions.

Though India re-issued the Guidelines on cross border power trading with less restrictive tone than before, it did not incorporate the much-awaited policy provision of energy banking despite several requests made by Nepal for it at various meetings including PEC/JWG/JSC. The seasonal complimentarity of demand and supply of electricity that exists in Nepal and India makes energy banking a highly suitable model to benefit both counties as Nepal's predominantly hydropower system, further dominated by Run-off-River hydropower plants, generates surplus energy in its wet season months from June/ July to September/October, whereas electricity demand is very high in India during these months. Similarly, Nepal's electricity demand in dry season can be fulfilled through the import of the same power from India, benefitting both the countries by virtue of power transaction in the mode of energy banking which prevails among various States of India.

After the Guidelines was issued, the Minister from Nepal in the above mentioned courtesy meeting in his Delhi visit had highlighted the importance of energy banking to Nepal and the Indian counterpart's reply was like this: "*Energy banking will require regulation. My understanding is that such banking is possible only after your generation capacity exceeds demand. We will have to look at the terms and conditions of banking that includes pricing. Do we go by identical pricing model or price of the day model? We need to be clear on that.*" Later on, after Nepal learnt that energy banking between the two countries is not possible until it is incorporated in the policy of India, i.e., cross border power trade Guidelines, Nepal has been requesting India for the same in the subsequent JWG/ JSC meetings in addition the 6th JC meeting.

In fact, India's actions are shaped not by the merits of policies alone but also by the looming geo-political events among us so far as regional connectivity and seamless power transfer are concerned. Nonetheless, policies have profound consequences in shaping any country's actions. In this sense, the Guidelines issued by India can be a window to pass big initiatives which the neighbouring countries of India may prefer to see in cross border power trading ahead. It is only a cruder tool unless it is under execution and well tested - the execution requiring associated Regulations and Procedure to be in place. That's why we must be particularly mindful to ensure that the new version of the Indian Guidelines is not intended to invoke the forgotten paths like restrictions in funding or ownership of the power projects and in equity pattern of the trading companies again. This should be reason enough to move forward for analyzing how its words sound and whether they bear any foul smell for future. Since South Asia enjoys the natural luxury of enormous and invincible resource endowment for power generation, India should reconfirm itself that the Guidelines has offered enough justice to it and prompted the neighbouring countries to reassess their futures tinted with huge economic transformation through the generation and transmission of electricity. Let's be familiar with how the Guidelines on Import/Export (Cross Border) of Electricity – 2018 goes:

❖ **Objectives**: They cover four areas, namely, facilitation of power import/export, transmission infrastructure, regulatory mechanism and grid operation. Here, it's important to point out that a collaborative approach in harnessing diverse natural resources in the neighbouring countries has been a missing element while laying objectives. Without investments, electricity cannot be produced and hydropower development requires huge investments. And, of course, investment is investment irrespective of sources where it comes from. In the earlier version of the Guidelines, objectives comprised meeting demand of participating entities by utilizing available resources in the region. It was an essential objective except that India's involvement in generation projects or trading companies of the neighboring countries should not have been mandatory as eligibility criteria for export of electricity from these countries. India removed this objective regarding resources in the new policy document.

- **Import/Export Routes**: The Guidelines has allowed import/export of power through bilateral agreements between two countries, competitive bidding, mutual agreements between two entities and tripartite agreements involving Government of India, Government of power importing country and Government of power exporting country.

- **Transaction Approval**: The proposal for power import/export needs approval of the Designated Authority. Concurrence of Government of India required before the said approval makes the process unnecessarily lengthy because there is no time limit for the approval by the Ministry of Power. The reason behind is cited in the Guidelines as international relations involved in the cross border trading of electricity. However, it may give space to affect power trading under geopolitical anxiety among the countries in the region which are often subjected to some kinds of ups and downs in relations. Of course, geopolitical factors should not be allowed to besmirch the spirit of seamless power trading. Politics and electricity should not dwell together.

- **Eligibility Criteria for Import by India**: The present Guidelines does not prevent investment in generation projects from any countries. It does not require the generation projects to have ownership or funding from the Indian sources (Government or PSU or Indian entities) as it was one of the eligibility criteria in the earlier version. As per the present version, permission to export power to India from the generation projects located in the neighbouring countries by the respective Governments and the approval of the Designated Authority of India are enough. Indian entities are allowed to import the power from the generation projects of the neighbouring countries directly or through Government or Government company or a licensed trader of that country. The present provision gave the impression that India changed the mindset this time by hearing the concerns of its neighbouring countries.

- **Eligibility Criteria for Export by India**: Generation companies or distribution companies can export power to neighbouring countries directly or through a licensed Indian trader after obtaining the DA's approval as per the new Guidelines. In the earlier version, only distribution licensees and PSUs of India were allowed to export power to neighbouring countries. Any coal-based thermal power projects other than PSUs in India could be eligible for export earlier, but the new Guidelines has barred linkage coal to be used for power export as it is cheaper than i-coal (imported coal), e-coal (spot e-auction coal) and c-coal (coal from commercial mining) which will be used for power generation to be exported to the neighbouring countries. Though it looks natural that India intends to provide electricity generated at cheaper cost first to its people, this coal-based restriction has not been able to convey positive message to India's neighbours.

- **Right to Import/Export**: Although the Guidelines has stipulated that approval for import/export of electricity shall be granted by taking into account available generation capacity and demand, Government of India reserves the right to import/export electricity from/to neighbouring countries for reason of larger policy interests. This statement is vague and clearly consists of duality since it may be interpreted positively or negatively depending on what the Government of India wishes for as if import/export of electricity would be at the mercy of India.

- **Inter Government Agreement (IGA)**: As per the Guidelines, approval of the Designated Authority will not be necessary where import/export is taking place under the IGA signed by India and neighbouring countries. However, the IGA is required to be project-specific and the tariff, whether import or export of electricity, can be mutually agreed. Under this arrangement, if the tariff has been already been determined through G2G negotiations including under the IGA, the tariff for import/export shall continue to be decided through G2G negotiations. This provision may also be applied in the days to come in relation to the power import by Nepal from Bihar, Uttar Pradesh and Uttarakhand States of India under Nepal-India Power Exchange Committee, a historic G2G mechanism long existing between the two countries. Since January 1988, this Committee is functional in power exchange at 11 kV, 33 kV and 132 kV voltage levels including the associated tariff decision since 1998 between these Indian States and Nepal. Though PEC has continued working till date even after the set up and functionality of Joint Secretary/Secretary-level bilateral committees, JWG/JSC, it seems that concerns may be raised in the present context whether PEC should continue and why JWG/JSC should not prevail over PEC which was born before PTA came in 2014. The present Guidelines has allowed continuity for the tariff negotiation at Government level but it may be further discussed in this regard whether this task should be transferred to JWG/JSC or continued at PEC .

- **Tripartite Agreement**: The Guidelines has incorporated the provision of tripartite agreement between India and the two neighbouring countries which would like to undergo power trading. This provision has paved the way for Nepal-Bangladesh power trading. As per the Guidelines, its steps shall be as follows:

    - **Step I**: Tripartite Agreement to be signed by the concerned countries with India at government level
    - **Step II**: Transmission Agreement to be signed by the participating entities (being involved in power trading) with the Power Grid Corporation of India Limited (PGCIL), which is the Central Transmission Utility (CTU) of India, for obtaining transmission corridor access within Indian territory
    - **Step III**: Concurrence from Government of India and necessary regulatory approvals to be obtained by PGCIL for the construction of transmission system across the territory of India under cross border trade of electricity (CBTE)

4. Applicability of Tripartite Agreement among Nepal, Bangladesh and India

Arguments have been expressed by power sector critics whether the present Guidelines can be interpreted to have allowed dedicated transmission system from one country to other country across India. The Guidelines has not spelled anything out about the dedicated transmission line except that in the case of Indian power plants exclusively supplying power to neighbouring countries. However, it has been clearly stated that technical and strategic considerations will be kept in view for allowing this, too, even as the Indian generating stations and the Indian entities are involved in the transaction.

In this context, it is hard to believe that India may allow Nepal and Bangladesh to build dedicated transmission system between the pooling stations of these countries by using the Indian territory- the Siliguri corridor comprising a narrow stretch of land of about 60 km length and 22 km width, also known as the Chicken Neck that connects Nepal and Bangladesh since this corridor is considered to be India's one of the strategic interests. That is why the Guidelines has not forgotten to mention 'strategic considerations' while talking about dedicated transmission system for power export from a specific Indian power station to the neighbouring countries. Further. It is to be noted that the DA's procedure has defined the dedicated transmission system that rules out its possibility for generating projects of the neighbouring countries.

Nevertheless, at the time when the tripartite agreement is signed, Nepal and Bangladesh can request India for building a dedicated transmission line by expressing their full commitments that while building such a line through the Indian territory, they shall neither harm at any cost the strategic concerns of India nor get involved in any activities triggering the Indian anxiety concerned with the strategic matters of this corridor. Although this will be a shortest route between the Nepalese border and the Bangladeshi border for a dedicated transmission line to be built, the chance of getting India's consent for it looks quite slim because India's intelligence agency is known to be closely observing Nepalese, Bhutanese and Bangladeshi activities in this corridor and an attempt to reach a free-trade agreement through a tripartite discussion for the facilitation of the movement of goods across the Siliguri corridor of India has already ended in a fiasco in 2002. However, the new attempt to have Indian concurrence under the CBTE Guidelines in the present context will not for the movement of goods but merely the transfer of electricity. Nepal and Bangladesh may put their arguments in light of the para 8.2 and para 8.3 of the Guidelines that the provisions have not prevented them for building a direct transmission line between the pooling stations of the respective countries through a pooling station in India.

The Nepali side, during the 8th meeting of the power/Energy Secretary-level Joint Steering Committee (JSC) on Cooperation in Power Sector held on 11th December, 2020, had enquired whether Ministry of External Affairs (MEA) of India made any plans to convene a tripartite meeting among India, Nepal and Bhutan regarding exchange of power between Nepal and Bangladesh through Indian grid as agreed in the 7th JSC meeting. In reply to the same, Indian side stated that such a meeting was beyond the remit of bilateral mechanisms and it may be discussed by the External Affairs Ministries of India and Nepal separately. But it should be noted that JWG/JSC are the bilateral Committees created under the PTA related to the cross border power trading and the tripartite agreement is an inbuilt provision of the Guidelines on Import/Export (Cross Border) of Electricity–2018 issued by the Ministry of Power itself. For these reasons, the Indian statement expressed in the 8th JSC meeting seems a contradiction to its own policy document. Of course, a tripartite agreement cannot be possible without a tripartite meeting. That's why Nepali side emphasized the need for concluding a tripartite arrangement between Nepal, India and Bangladesh for export of power from Nepal to Bangladesh even during the 6th meeting of the Foreign Minister-level Nepal-India Joint Commission (JC) held in New Delhi on January 15, 2021 and the Indian side replied that the provisions in this regard already exist in the Guidelines on Import/Export (Cross Border) of Electricity–2018. It clearly shows that the two Foreign Ministers have no objection to proceed for the tripartite meeting between the three countries on the subject matter already incorporated in India's policy document in the form of the Guidelines.

It is important to recall here the meeting of the Second Joint Technical Team (Transmission) between Nepal and Bangladesh held on December 9-10, 2019, in which both sides had proposed the shortest route of the dedicated transmission system for power trading between Nepal and Bangladesh connecting Anarmani in Nepal to Pachagarh/Thakurgaon in Bangladesh over the Indian territory. During the meeting, Bangladesh also stated that Purnea (India) will be the most suitable point from which power transmission to Bangladesh is feasible due to the short distance of about 105 kilometre only. But this may be proposed when Bangladesh will get synchronous grid connection with India. Consequently, the transmission link between Purnea (India) and Bangladesh-India Border point is possible to be connected up to the planned 230 kV Purbasadipur substation in Bangladesh.

5. Procedure for Approval and Facilitating Import/Export (Cross Border) of Electricity by the Designed Authority, 2021

Nepal side stated in the 7th meeting of JWG on Nepal-India cooperation in Power Sector held on October 14, 2019 in Bengaluru, India, that the approval of the Procedure of DA at the earliest is very important to start the transaction in the Indian power exchanges, whereas Indian side informed that the Procedure was under active consideration and was expected to be notified shortly. However, as it was not issued ever after almost 4 months, the Ministry of Foreign Affairs of Government of Nepal sent a Note Verbal on February 12, 2020 to the Embassy of India in Kathmandu stating that it would be appreciated if the Embassy of India could kindly transmit the same to the appropriate authorities of Government of India. Furthermore, in the 8th JSC meeting held on December 11, 2020, Nepal requested India again for the expeditious approval of the Procedure as Nepal is expected to be power surplus in the monsoon season. NEA had also communicated its views/suggestion on the draft Procedure to the DA of India on July 14, 2019 for incorporating them into its final version.

Finally, it was issued by the concerned authority of India on February 26, 2021, but the apprehension expressed by the neighbouring countries, while appreciating the new Guidelines, whether India was sincerely willing to allow the power export to India as per the new set of eligibility criteria instead of those stipulated in the 2016 - version came true. The eligibility criteria for import of electricity by Indian entities, i.e., export of electricity from the neighbouring countries, in the Procedure issued is different from what they were mentioned earlier in the draft version of the Procedure and is also against the spirit of the PTA and the words of the Guidelines. As per the eligibility criteria, the generating company for power export to India should not be owned, directly or indirectly by any natural/legal personality(ies) whose effective control or source of funds or residence of beneficial owner, is situated in/a citizen of a third country with whom India shares land border and that third country does not have a bilateral agreement on power sector cooperation with India.

The provision of the Procedure without taking the name of any countries prevents Nepal for exporting power from the projects built under the Chinese investment. It is to be noted that there are many hydropower projects at different phases of development in Nepal associated with the Chinese investment and the power generated from these projects does not fulfill the eligibility criteria for export to India because China, which shares land border with India, does not have a bilateral agreement on power sector with India. It will have tremendous negative impact on the hydropower development of Nepal, if not corrected by India, and, as such, Nepal is bound to review many of its policies including those associated with license, Grid Connection Agreement and PPA. Further, Nepal and India have been planning to build several high voltage transmission lines between the two countries in various time-frames under the cross border transmission master plan, but if the power from certain generating plants only can flow through these lines due to the restricted eligibility criteria of generating companies or projects, it will not justify the huge investment in the cross border transmission infrastructure in the years to come.

There are only two ways to avoid the above criteria:

- The provision may be relaxed through consultation by the DA with Ministry of Power and Ministry of External Affairs, Government of India.
- The provision will be inapplicable if the power export is taking place under the IGA and the Indian entity nominated by the Government of India is importing this power by signing PPAs with DISCOMs. However, this does not hold true for the power trading in Indian Power Exchanges.

6. Conclusion

Government of Nepal is required to request Government of India for the review of the "Procedure for approval and facilitating Import/ Export (Cross Border) of Electricity by the Designated Authority" as the eligibility criteria for the generating company/ project of the neighboring countries to export power to India are not favourable to Nepal from the perspectives of hydropower development and cross border power trading. As the Guidelines on Import/Export (Cross Border) of Electricity–2018 has incorporated the provision for power trading through IGA, Nepal should benefit from it. Further, wet season power surplus and dry season power deficit of Nepal can be managed by using the day-ahead transaction in the Indian Power Exchanges. The shortcomings of the Guidelines and the DA's Procedure may be overcome during their execution by creating the atmosphere of mutual trust and cooperation between the two countries at political and bureaucratic levels.

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नेपाल विद्युत प्राधिकरण उपदानकोष

व्यवस्थापन तथा सञ्चालन कार्यविधि, २०६५

यस कार्यविधि अनुसार कुनै पनि कर्मचारीले अनिवार्य अवकाश पाउनु अगाडि राजीनामा स्वीकृत गराई सेवाबाट अलग भएमा वा भविष्यमा प्राधिकरणको सेवाको निमित्त अयोग्य नठहर्ने गरी सेवाबाट हटाइएको अवस्थामा प्राधिकरणबाट थप भएको रकम र सो को ब्याज मध्ये देहायअनुसारको दरले उपदान कोष रकम भुक्तानी पाउनेछ ।

सेवा अवधि	अवकास प्राप्त व्यक्तिले पाउने रकम	कैफियत
५ देखि १० वर्ष	जम्मा भएको रकमको ५० प्रतिशत र सो को ब्याज	ने.वि.प्रा.को तर्फबाट जम्मा भएको
१० देखि १५ बर्ष	जम्मा भएको रकमको ७० प्रतिशत र सोको ब्याज	ने.वि.प्रा.को तर्फबाट जम्मा भएको
१५ देखि २० बर्ष	जम्मा भएको रकमको ९० प्रतिशत र सोको ब्याज	ने.वि.प्रा.को तर्फबाट जम्मा भएको
२० वर्ष वा सो भन्दा बढी	जम्मा भएको रकमको १०० प्रतिशत र सोको ब्याज	ने.वि.प्रा.को तर्फबाट जम्मा भएको

तर कर्मचारीले निजको तर्फबाट कट्टा गरेको १० प्रतिशत रकम र सो को ब्याज, कर्मचारी जुनसुकै किसिमबाट सेवाबाट अलग भए पनि १०० प्रतिशत नै भुक्तानी पाउनेछ ।

Construction of Under Ground Distribution System – Benefits and Challenges

Nava Raj Ojha
Director, NEA

Background

Established in 1911AD in the name of Bijuli Adda, the government-owned electricity utility has reached to present structure of Nepal Electricity Authority after passing the stages of several forms and reforms in different time intervals. During the establishment in the current structure in 1985, Nepal Electricity Authority was the only utility in the country responsible for constructing and operating the Generation, Transmission and Distribution system. After implementing the Electricity Act in 1991, Private companies came into the generation sector as Independent Power Producers (IPP). Presently out of 1333MW total power connected to the national grid, 696MW is being contributed by IPPs. The Electricity Act has also opened the door to the transmission and distribution sector. However, no private company entered into these sectors due to their complex nature and the involvement of multiple stakeholders. In the year 2015 Government has established a company to construct and operate the transmission lines, namely Rashtriya Prasharan Grid Company Limited (RPGCL), which is studying several transmission lines. The distribution sector is taken care predominantly by Nepal Electricity Authority except few small areas where Butwal Power Company and some isolated generators are supplying. Hence, Nepal Electricity Authority is only a dominant player in the field of electricity distribution.

Present Status

The distribution system in the country has an overhead system with bare ACSR (Aluminium Conductor Steel Reinforced) conductors of different sizes. In some areas, ABC (Aerial Bunched Conductor) is also being used mostly to control the pilferage of electricity and to improve the safety of general public and operation & maintenance personnel. NEA had implemented undergrounding of electric cables in very limited areas of Kathmandu city (New Baneshwore, Durbar Marg etc.) in the past to enhance the beautification of the city. In the meantime, all major cities of the world have already adopted the underground distribution system to improve the aesthetic view of the city, improve the safety of common people and those involved in the operation of the network and increase the quality and reliability of the power supply. NEA has also realized that the time has come to switchover to an underground distribution system from the existing overhead system. So, NEA considered starting implementation of underground LT and HT network from the national capital city Kathmandu and requested development partner Asian Development Bank (ADB) to finance the project. ADB agreed to provide the loan for it. Hence, process of rolling out the underground distribution network on a large scale started in July 2017 with financial assistance from the Asian Development Bank (ADB). In the first phase, NEA invited two bids to construct the underground distribution network in different areas of

Maharajgunj, Ratnapark and Baneshwor distribution centers. The contractor M/S KEI Industries, India, got the contract and now working in these areas.

Further, In May 2019, NEA invited another bid for the construction of underground distribution network in different areas of Kuleshwor, Kirtipur, Baneshwor, Balaju and Jorpati Distribution Centers. The contract agreement was signed with M/S Larsen & Toubro Limited, India, on June 24, 2020, and the contractor has just started the construction works. Similarly, NEA has recently signed the contract agreement on June 4, 2021, with the contractor M/S Tata Projects Limited, India, to construct underground distribution networks in different areas of Lagankhel, Pulchowk, Bhaktapur and Thimi Distribution Center of Lalitpur and Bhaktapur districts. Furthermore, Bharatpur and Pokhara are the two cities outside Kathmandu valley where NEA has considered constructing an underground distribution network in the first phase after signing the contract agreement with the successful bidder for which bid evaluation is going on at the moment.

Inauguration of underground works by Former Prime Minister KP Sharma Oli in Maharajgung, Kathmandu.

In all the above projects, along with the undergrounding of the distribution network, automation of the distribution system is also included, for which optical fiber is being laid in parallel with HT and LT power cables. Optical fiber connection to the equipment and Distribution Command & Control Center, which is being constructed in the premises of Load Dispatch Center to achieve proper communication for control and to know the status of the equipment from/to the Distribution Command and Control Center is the important feature of the underground system. Hence, the embedding of the optical fiber and associated accessories along with power cable will help the distribution system to be transformed into the automated distribution system.

Benefits of Underground Distribution System

- ❖ Aesthetically much more pleasing than the overhead system
- ❖ Safety: eliminates hazards of electrocution due to breakage of overhead lines
- ❖ Less susceptible to severe weather impacts like heavy wind, rain etc. hence more reliable than overhead lines
- ❖ Elimination of theft of electricity (hooking)

The approach used for Construction of Underground Distribution Network

Initially the existing overhead electric network was surveyed and based on the survey report the load flow was conducted on the existing network. Considering the survey and load flow analysis of existing network, complete new electric network was designed including identification of new & augmented Distribution Transformers as per the anticipated load growth of ten years. Ring Main Units (RMU), LT Feeder pillars, underground cable & optical fibre routes were identified for the automation of the distribution system taking account on contingency analysis, network reliability and future load growth.

Further, to minimize the effect on the traffic movement, undergrounding and laying of power cables and the optical fiber is being done by Horizontal Direction Drilling (HDD) method. Open cut trench method has been adopted only where HDD is not possible.

In order to minimize the existing underground utilities damage, Ground Penetrating Radar Survey (GPRS), was performed to identify the safe path before trenchless HDD works for laying of HDPE Pipes.

Challenges

Social Issue:

- Local Public Hindrance during the construction of Panel Foundation as locals seem reluctant on allowing the construction of panel foundation in the footpath in front of their boundary wall.
- The community welfare committees, at times, seem very reluctant to allow us to work on their area. As people already have an electricity supply, they do not bother about the construction of underground line and explaining people about the benefits of underground system and convincing them is challenging.
- Change in Civil Foundation drawings due to unavailability of space on the footpath and existing utilities resulting in delays.
- Unavailability of good passage in some routes for cable laying.
- Inter-related agencies:
- Road Cutting Permission from Road Department is very difficult to obtain.
- Existing Underground Utilities with no GIS mapping causing the potential risk of damage on the utilities which further causing delay in construction works.
- Digging by unknown agencies even locals in already cable laid zone causing damage of cables.
- Closing of Site (including pits, removal of construction materials, backfilling) during VIP movement on the road section, causing delay and increasing financial liability of the contractor.
- Traffic Rules not allowing the construction material transport at day time, resulting in material storage on the roadside as the construction sites are all along the road section.
- Unavailability of the shutdown when needed.
- Inter-agency Coordination with the Local Ward, Road Department, Water, and sewage department is challenging.

Weather Concern:

- Weather conditions break the continuity of work.
- High groundwater level resulting in delaying the construction works.

Pandemic:

- Maintaining the COVID safety protocols at sites is challenging.
- Labour and construction material shortage during the lockdown.
- Inter-agency permission to work during lockdown is challenging.

Miscellaneous:

- Working with the deadline of road restoration during the pandemic is challenging.
- Working at nights in critical sections.
- Coordinating with traffic to manage the congestion in peak hours.
- Supervising all sites at different locations with a limited workforce is difficult to manage.
- Addressing the individual concerns of the public arising during the construction activities at the site.
- Maintaining and supervising a good work safety environment for the labors, pedestrians, and vehicles is critical and challenging.

Despite the abovementioned difficulties and challenges, the transformation of existing overhead distribution systems into underground distribution systems and automation in major cities with large population density is inevitable because of its benefits and safety to utility, general public as well as the consumers. So, NEA is planning to replace the existing overhead distribution system with an underground distribution system in phase wise manner in other major cities of the country in the coming years.

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Solar Generation for Energy Security in Nepal

Abstract

Nepal has made tremendous achievement in the last two decades in providing electricity access to its people; recent reports of Nepal Electricity Authority (NEA) and Alternative Energy Promotion Centre (AEPC) show that 86% of the population has access to grid electricity and another 10% from isolated renewable energy (RE) systems. Despite such a high household connection rate, the Trilemma Indices of the World Energy Council; (i) Energy Security, (ii) Energy Equity (Accessibility and Affordability) and (iii) Environmental Sustainability, published on October 2020, ranked Nepal 102 out of 108 countries. The main reasons given in this report for such low rank for Nepal are due to poor energy security because of high share of imported electricity and lack of generation diversity. The imported electricity from India has been helping to meet the current demand and thus reliability. However, as witnessed during the economic blockade, import is not a reliable source. Thus, even if we rely on imported electricity for the short term, it is imperative that we think about indigenous energy generation. Further, the earthquake and flood and landslides during monsoon clearly demonstrate the shortfall due to lack of generation diversity as hydropower plants are very vulnerable to natural disasters.

Keywords: Energy Security, Power Generation Mix, Utility Scale Solar PV, Distributed Generation, Levelized Cost of Energy (LCOE)

Background

Nepal is among the countries that have made significant achievement in providing electricity access to its people in the last decade. According to the AEPC's Annual Report 2076/77, 86% of the population has access to grid electricity and another 10% to isolated renewable energy (RE) systems. However, the Multi-Tier Framework (MTF) study carried out by the World Bank shows that only 67% of the population has access to reliable and adequate electricity when solar home systems, solar lanterns and rechargeable batteries are discounted. Following the Sustainable Development Goal (SDG 7) which is signed by Government of Nepal (GoN) too, access to affordable, reliable, sustainable and modern energy to all by 2030, only Tier 3 (200-800W, minimum for 8 hours) and above should be considered as access to electricity. This calls for providing adequate access to still one third of the total population.

Furthermore, the Trilemma Indices of the World Energy Council; (i) Energy Security, (ii) Energy Equity (Accessibility and Affordability) and (iii) Environmental Sustainability, published on October 2020, ranked Nepal 102 out of 108 countries. The main reasons given in this report for such low rank for Nepal are due to poor energy security because more than a fifth electricity consumed in the country is imported and lack of generation diversity. However, as witnessed during the economic blockade, import is not a reliable source. Thus, even if we rely on imported electricity during the short term, it is imperative that we think about indigenous energy generation. Besides, the earthquake and flood and landslides during monsoon clearly demonstrate the shortfall due to lack of generation diversity as hydropower plants are very vulnerable to natural disasters as more than 60 percent of the components are civil structures. According to the Independent Power Producers' Association of Nepal (IPPAN), the recent excessive rain-induced landslide and flood has damaged 10 operational hydropower plants and 16 under construction ones (myRepublica, 17 June 2021). On the other hand, the Post Disaster Need Assessment (PDNA) report published by the National Planning Commission (NPC) estimated that 115MW of hydropower were damaged by 2015 earthquake which is worth Rs. 11.4 billion. Moreover, regarding hydropower plants under construction, about 1,000 MW owned both by independent power producers (IPP) and the Nepal Electricity Authority were partially damaged. Additionally, diversification of generation mix has become more urgent as the country is highly vulnerable to climate change as studies have reported the receding of glaciers and unpredictability of river flow globally including Nepal.

Why Generation Diversification?

This philosophy of portfolio diversification follows the famous saying of “don’t put all eggs in one basket”, in the case of electricity sector, diversification applies for both generation sources and geography (Distributed Generation) so that even if some generation sources are down others continue to supply electricity smoothly. Even hydro rich country like Brazil has diversified its generation capacity by addition 9100 MW of solar generation and plans to reach 36,000 MW by 2030.

Opportunities for Solar Generation in Nepal

As discussed above, Nepal’s electricity sector is highly vulnerable as more than a fifth of the total electricity consumed in the country is imported from India. According to NEA Annual Report 2076/77, Nepal has imported 1729 GWhr from India in FY 2019/2020 alone. The daily load curve depicts that there is import round the clock. If we consider to replace the import during sunshine hours, it would require at least of 200MW of solar PV systems. The reduction in day time import of around 900 GWhr would reduce the use of peaking run of river (PROR) and storage hydropower plants during the sunlight hours and provide electricity for longer periods in peak time.

The government has ambitious target of 15,000 MW of installed capacity by 2028. If we consider 10% of generation from variable renewable energy (VRE) sources as per “National Energy Crisis Mitigation Plan and Ten Year Electricity Development Plan 2016”, there is potential of 1500 MW by Solar and Wind by 2028. Nepal has agreed to expand clean energy generation from around 1,400 MW to 15,000 MW, of which 5-10 % from renewables like mini and micro-hydro power, solar, wind and bio-energy and ensure 15% of the total energy demand is supplied from clean energy sources by 2030 as its Nationally Determined Contribution (NDC) to the Paris Agreement. The government strategy of gradual decrease in LPG imports, replacement of diesel pumps by electricity and promotion of EV will tremendously increase the demand for electricity. Further, domestic loads like space heating/cooling will also increase if the tariff for domestic consumers is affordable. If only 20% of total households switched to electric cooking, 2200 MW of additional electricity will be required. A demand forecast published by Water Energy and Commission Secretariat (WECS) in 2017 shows that Nepal would require 11.1GW by 2030 and 29.4GW by 2040 to achieve economic growth of 7.2%. This allows addition of 2.9 GW of solar and wind generation even if we consider only 10% generation capacity from VRE.

In 2020 alone, the global solar capacity addition was 139 GW which is 7 times more than hydro and even surpassed wind mainly due to declining cost. Following the world trend, Nepal should also accelerate deployment of solar through appropriate policy intervention and incentives to achieve power generation mix target.

Challenges in Solar Sector in Nepal

Despite tremendous opportunity for solar PV in Nepal only 24.28 MW solar has been added in the grid. Although Department of Electricity Development (DoED) has issued generation license of around 92MW and Survey Licenses of around 600 MW, only a fraction will actually be developed because there are some challenges that are yet to be addressed. The challenges are discussed below.

- Licensing and permitting process is too long: There are several permits and licensing required to develop solar PV in Nepal such as survey license, generation license, Initial Environment Examination (IEE) or Environment Impact Assessment (EIA), Connection Agreement, Consent of Nepal Electricity Regulatory Commission, PPA etc. The construction time of MW scale solar PV project is around 6 months. However, these licensing and permits are not obtained from single door and it usually takes 1-2 years which increases the project cost.

- Financing: The solar sector is still not matured in Nepal and the Banking and Financial Institutions (BFIs) are reluctant to invest as they yet to believe that solar is financial feasible in Nepal. If lending in renewable energy sectors other than hydropower is also made mandatory, BFI's would be more willing to invest.

- IEE and EIA boundary for 10MW: As a solar power plant does not have severe impact on the environment, many countries do not put additional environmental clearance requirements. For example, in India, there is no environmental clearance required up to 50MW capacity. On the other hand in the case of Nepal, Environmental Protection Rule (EPR) 2077 requires IEE for 1-10 MW and EIA above that. This has been limiting the plant capacity to 10 MW as it puts substantial burden on IPPs and ultimately the economy of scale is lost.

- Restriction in land use: The Grid Connected Alternative Energy Working Modality 2078 of the Government restricts development of solar power plant in the command area of existing and under construction irrigation projects, which increases the transmission line cost as the project site has to be further away from the load center. Alternatively, GoN could encourage Agro-Voltaic, canal top solar, parking lot, industrial roof, floating solar, etc. with proper incentives. In fact, only 0.3% of total land area of Nepal would be required to deploy 1000 MW solar.

- Unclarity in Royalty: As water is a national resource, there is provision of royalty to be paid by hydropower developers. On the other hand, there is no clarity in the policies in Grid Connected Alternative Energy Working Modality 2078 on royalty to be paid by solar developers. As sun is a global resource, royalty should not be applied for solar plants.

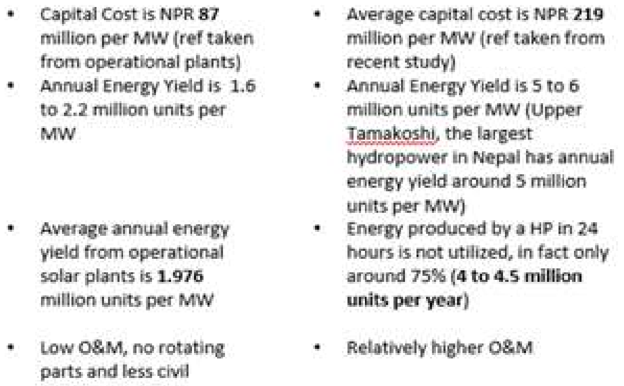
- Dynamic Reactive Power Requirement: Utility might ask developer for dynamic reactive power requirement and Q-at-night. Most of the PV inverters available in the market can provide reactive power both during day time and night time. There should be a provision of incentive for supplying reactive power to the grid which is in practice in other countries. For example India is planning to pay Indian Rs 0.1265 per kVARhr for reactive power supplied to the grid which will be escalated at Indian Rs 0.006/kVArh per year thereafter

- Black start capability: The PPA clause in Nepal have Black Start Capability for grid connected solar PV. The grid tied inverter (or grid following inverter) doesn't have this feature to operate in off-grid mode. If there is grid outage, it can't supply power to the islanded network. Thus, this provision need to be removed if Nepal is to meet its solar generation target.

- Intermittent sources in generation mix: The National Energy Crisis Mitigation Plan and Ten Year Electricity Development Plan 2016 provisioned 10% penetration from intermittent sources like wind and solar in the total generation mix of Nepal. This limitation is very conservative compared to other countries. In the recent development, especially in European countries, there is a movement to go for 100% renewable by 2050. Even in our neighborhood, India and Pakistan are promoting grid connected RE systems rapidly; India has already reached 25.24% renewable in the total energy mix and Pakistan plans to deploy 30% by 2030. Nepal should also conduct a study on "Grid Integration of variable renewable energy (VRE) sources" to ascertain the optimal penetration percentage in the energy mix.

How is solar compared with hydro in Nepal ?

In case of Nepal, the grid connected solar power plant of the same scale, the capital cost (CAPEX) including land would almost be half of that of hydropower plant. The average capital cost of MW solar PV (calculated for generating and under construction projects taken from Urja Khabar) in Nepal comes to be Rs 87 million per MW while the average cost of hydropower development in Nepal is found to be diverse with an average per megawatt cost of Rs 219 million. On the contrary, the operation and maintenance cost of solar which has all non-rotating components and less civil structure is lesser compared to hydropower plants. In terms of energy yield, a 1 MW solar can generate 1.6 to 2.2 million units per year. A calculation conducted from the contract energy of under construction and operational projects in Nepal shows that the average annual energy yield from 1 MW solar plant is 1.976 million units. It solely depends on the location, module efficiency, design parameters, etc. In case of Q40 design of 1MW hydropower plant, the annual energy yield comes to be 5 to 6 million units per year.



• Capital Cost is NPR **87** million per MW (ref taken from operational plants)	• Average capital cost is NPR **219** million per MW (ref taken from recent study)
• Annual Energy Yield is 1.6 to 2.2 million units per MW	• Annual Energy Yield is 5 to 6 million units per MW (Upper Tamakoshi, the largest hydropower in Nepal has annual energy yield around 5 million units per MW)
• Average annual energy yield from operational solar plants is **1.976** million units per MW	• Energy produced by a HP in 24 hours is not utilized, in fact only around 75% (**4 to 4.5 million units per year**)
• Low O&M, no rotating parts and less civil	• Relatively higher O&M

All the energy produced by a HP in 24 hours is not utilized, in fact only around 75% (4 to 4.5 million units per year) is actually utilized. Consequently, the Levelized Cost of Electricity (LCOE) of hydropower is actually 25% more than indicated in financial calculations done by IPPs and does not differ much from solar systems until all the generated hydropower is utilized. In addition, the LCOE of grid connected solar is lesser than NEA commercial tariff. Saral Urja Nepal, a renewable energy service company (RESCO) is selling electricity from solar PV to commercial customers for their day time load (without battery storage) at a 10-15% lower tariff than NEA normal (5AM-5PM) tariff of NPR 11.10 per unit. The beauty of solar is that the project cycle is shorter, less vulnerable to natural calamities as it has less civil structure and it can even support grid by supplying dynamic reactive power even when there is no sunshine.

Why is solar energy expensive in Nepal ?

While we talk about solar tariff in Nepal, we often compare with other countries, is it fair? For example, the lowest bid price for solar park in India is just NPR 3.18 per kWhr which has been awarded for a 500 MW project in Gujarat in 2020 compared to NPR 7.3 per kWhr asking rate by solar IPPs in Nepal. Government of India (GoI) provides several incentives to IPPs to install solar power plants. GoI provides, soft loan - subsidized interest rate of 8% for the entire loan tenure, accelerated depreciation, tax holidays, capital incentive of INR 2 million per MW for project preparation, access of transmission line up to the project site and access road, drainage, fencing, etc. Further, GoI and state governments develop solar parks and lease-out levelled land at subsidized rates. Apart from this, there is no cost associated with environment and social safeguards for the projects upto 50 MW. Above all, in India irradiance is higher compared to Nepal and grid availability is more than 98%. The incentives provided by GoI and state government in India is summarized in the box.

Incentives for solar energy development in India

- Solar Parks developed with GOI support of INR 2 million per MW for projects greater than 50MW.
- Solar parks are graded, have access and interior roads, drains, fencing and readied prior to auction
- Easy and cost-effective land acquisition and aggregation process for projects less than 50MW
- Transmission line up to solar farm
- Accelerated depreciation
- Interest rate subsidy – 8% fixed for full debt period
- Detailed Project Report (DPR) and environmental approvals prior to auction
- For less than 50MW projects, no environmental studies or approvals required.
- All techno-economic clearances received prior to bid.
- Project to be developed within 18 months of bid award. Ready-to-construct.
- No restriction in irrigable land
- No royalty

Moreover, these large scale solar park projects are in the capacity of hundreds of MW and developed under reverse auctioning provision. In Nepal's case, the most feasible size is seen to be 10MW as larger projects are constrained due to land acquisition, grid stability, IEE/EIA boundary of 10 MW in EPR 2077. A study has shown that we can't inject more than 20 MW solar in any bus in the grid due to low inertia of INPS. Thus, economy of scale cannot be achieved in our case. A cursory look at the cost of developing a 10 MW solar power project in Nepal shows that the Levelized Cost of Energy (LCOE) comes to be NPR 6.33 per kWhr. A sensitivity analysis with variation of PPA rate is shown below;

The above LCOE of NPR 6.33 per kWhr was derived by CAPEX of NPR 87 million per MW, operating cost (OPEX) of 14 million per MW including O&M service, staff cost, land lease and insurance. Under the assumption of above quoted CAPEX and OPEX, with PPA rate of NPR 7.3 per kWhr and other parameter as per prevailing financial practices in Nepal, the internal rate of return (IRR) of projects comes to be 13.95%, payback period of 10.61 years. This financial indicators shows that the current PPA rate of NPR 7.3 is marginally feasible for solar IPPs in Nepal.

Conclusion

The article is mainly focused on need of power generation mix in Nepal for Energy Security. Although hydro is potentially mainstream generation source, utility scale solar can definitely contribute towards power generation. Since, GoN has set target of 15000 MW installed capacity by 2028, solar power can contribute 10% of it, i.e. 1500 MW can be targeted by 2028. Moreover, the grid connected solar tariff offered by RESCO companies to commercial consumers has seen that the solar has already achieved the grid parity in Nepal. Grid parity is a situation when generating electricity from alternative sources of energy like solar costs more or less the same as conventional sources such as hydropower in Nepal. Through financial analysis with consideration of incentives in other counties, electricity import substitution etc., it is possible to build powerful explanations that the prevailing rate of NPR 7.3 per unit set by "Grid connected working modality 2074" is marginal and lowering this rate may jeopardize the solar power development in Nepal by de-motivation developers in this field.

As of now, grid-connected solar has not reached 10% of self-determined penetration level of 10% VRE. So far, only 24.28 MW grid connected solar is operational in Nepal and 5 MW is about to be commissioned besides NEA owned 25 MW project in Nuwakot which is under construction. The low achievement so far in development of grid connected solar generation is due to improper policies, bureaucratic hassles and lack of incentives.

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12. Mr. Mallik is Solar Power Expert at Alternative Energy Promotion Center (AEPC) - RERL Project. Renewable Energy for Rural Livelihood (RERL) is joint project of GoN and UNDP Nepal.

13. Disclaimer: The views expressed in this article are his own and should, in no way, be considered as views of the organization he is affiliated with.

दुर्घटनाका कारण कर्मचारीको मृत्यु भएको अवस्थामा वीमा दावीका लागि आवश्यक कागजात

- आवश्यक विवरण भरिएको वीमा दावी फाराम
- कार्यालयले तयार पारेको दुर्घटना प्रतिवेदन
- शव परिक्षण प्रतिवेदन
- दुर्घटनाको प्रहरी प्रतिवेदन
- मृत्यू दर्ता प्रमाणपत्र
- मृतकको नागरिकताको प्रतिलिपि
- हकवालासँगको नाता प्रमाणपत्र

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Seepage Control Measures along Dam Axis in UTK's HW

ABSTRACT:

It is very important/difficult task to make rigid (without slippage) and minimum seepage flow beneath the foundation in the structure that is situated in the thick alluvium deposits of more than 100m. Establishment of Jet Grouting Curtain (JGC) wall with combination of sheet piles as cutoff structures serves both objectives of rigidity and seepage control with also mitigating construction difficulties by eliminating huge open excavation. As Headworks (HW) of Upper Tamakoshi project is situated in alluvium deposit, it is designed and constructed as floating foundation with combination of filter layers, cutoff walls constituted with JGC & Sheet pile in dam-intake axis. This paper is about the design phenomena & implementation of the measures along the dam-intake axis for seepage control beneath/along HW foundation.

1. Introduction

A Background

Upper Tamakoshi (UTK) (456 MW), a Peaking Run of River (PROR) Hydroelectric Project (HEP), is located in the north of Dolakha District in the high Himalayan Zone. This project has 822m gross head with design discharge of 66m3/s in upper head of Tamakoshi River with average run off of 68.0m3/s and less sedimentation (1450 ppm). The overall layout of Headworks (at elevation 1970m) is shown in Figure 1 indicating Abutments, Intake, Dam and Left Bank Protection works.

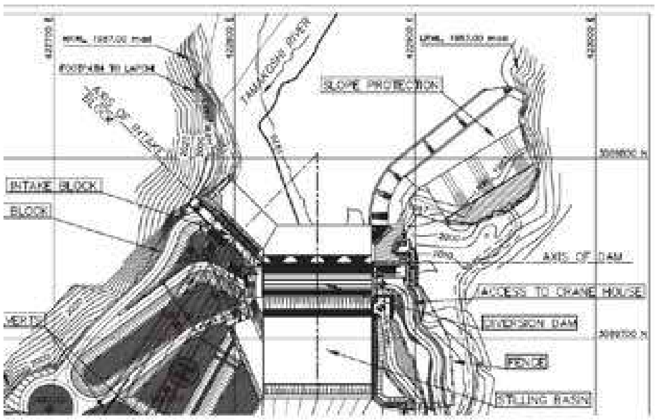
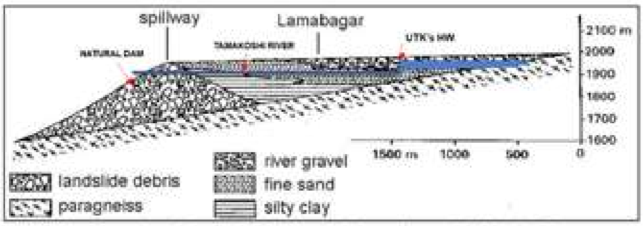


Figure 1: Headworks: Overall Layout



Idealized cross-section of the landslide dam and the sediment-filled basin. The sedimentary inventory is compiled by investigations on eroded landslide dams within similar environmental setting (Uhlir, 1999)

Figure 2: Idealized X-Section of Landslide Dam (Natural Dam) (Uhlir 1999)/1/

The dam and Intake of UTK are founded in the alluvial deposit of about 122m/2/ formed by natural dam of 300m height at 2.5km d/s created before thousands of year (Figure 2).

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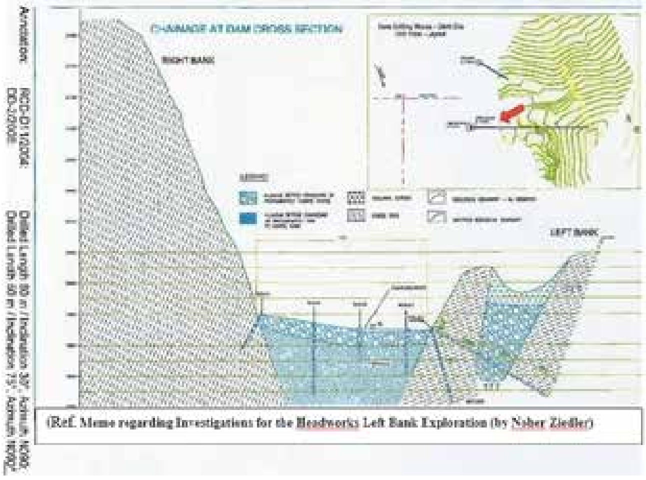
[1] Idealized Cross Section of Landslide Dam & sediment filled basin (Uhlir 1999)

[2] Final Report on Subsurface Investigation works in HW of UTKHEP, Soil Rock Concrete Laboratory,



(Ref. Memo regarding Investigations for the Headworks Left Bank Exploration (by Noher Ziedler)

Figure 3: Intake-Dam Axis: X-section (D/S view)[3]

UTK's dam has 22 m height, 60m length while Intake has 27m height and 45m length. On both sides there are 10m wide abutments. Due to 122m deep alluvial deposit, the dam and intake are designed as floating type. So, it is required to design to minimize the seepage beneath the foundation and from the banks. Furthermore, there is a big boulder/rock massive at left bank with alluvial-colluviums deposit behind expanding up to upstream side (Figure 3), where it is anticipated a big seepage/erosion problem in future if no protection otherwise.

B Foundation Treatment

Following foundation treatments were included in the dam design to secure stability and seepage control[4]:

1. Excavation and infill of high-quality well compacted material.
2. A cut-off sheet pile wall down to elevation 1960m.
3. A low-permeability zone by jet grouting down to elevation 1950m.
4. A concrete slab, 15m wide, on upstream side of dam/weir and intake.
5. A semi-permeable blanket & erosion protection on the slope of upstream left bank.
6. Consolidation/Contact grouting in Abutments
7. Shear-Key & Water-stop in Contraction joints between the structures (Right Abutment-Intake, Intake-Dam, Dam-Left Abutment)

The aim of this design is to:

- ❖ Increase the bearing capacity under the dam and provide drainage (1 & 3).
- ❖ Elongate the seepage path from the reservoir to the drainage layer beneath the stilling basin in order to minimize the seepage (2, 3 & 4).
- ❖ Increase the shear resistance of the structures in order to obtain sufficient factor of safety against sliding at extreme load conditions.(2).
- ❖ Avoid erosion and reduce seepage through the weathered zone at the upstream, left abutment (5).
- ❖ Stop/check seepage along the joins at the abutments (6).
- ❖ Stop/check seepage along the contraction-expansion joints between the structures (7).

For all these purpose, the following control measures had been designed and accordingly constructed in site.

1. Increase flow path i.e. U/S apron and D/S Stilling basin (105m, straight)
2. Filter Layer beneath the foundation for smooth flow of underground water.
3. Sheet Pile (7m deep, 1967m to 1960masl)
4. JGC Wall (15m deep, in Dam-Intake Axis, 1965 to 1950masl)
5. Jet Grouting Curtain Wall (in Dam at left to Left bank towards u/s, 1976 to 1950masl)
6. Grout Curtain: Right Bank in Axis at depth proportion to water-head (upto 27m inside)[5]
7. Consolidation Grouting : Left in 3D plane around left boulder depth 3m[6]
8. Contact Grouting: At interface of abutment and banks (left and right)
9. Left Bank Protection System: Guide walls, seepage control concrete blanket.
10. Contraction/Expansion Joint in Right Abutment-Intake, Intake-Dam, Dam-Left Abutment

Among them, measures from 1 to 4 are described hereinafter:

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[3] Memo Investigations of HW, Left Bank Exploration (Novert Zeidler)

[4] Final Report, Feasibility Study of UTKHEP, Geological Investigation Chap 7, NorConsult-AS, 2005

[5] Shilpakar, R.B., Grout Curtain in Abutments of UTK's Headworks

[6] Ref /5/

2. Increase flow path (U/S apron to D/S Stilling basin)

C Seepage Path

There are 15m long upstream apron and 81m Dam with stilling basin, altogether 96m straight flow path (Figure 4). With upstream apron level at 1970m, and foundation level of dam body 1965m, JGC bottom level 1950m and foundation level of stilling basin 1963.5 with d/s spillway level at 1969 m, the vertical path is 5+15*2+1.5+5.5=42m. Adding with horizontal path of 96m, the total flow path is 42+96 =138m.

The seepage path is also lengthened by the upstream slab and cutoff walls, which is assumed impermeable. The average gradient (i) is in the order of 0.3, the average permeability down to a depth of 10 m below the grout curtain is in the order of 2x 10^{-4} m/s and the seepage area is approximately 15 m^2 per m length of dam and intake (total length of 100 m). The calculated total seepage (Q), assuming laminar flow at HRWL, beneath the dam and intake structure will be: **"Q = k i A = 2x10^{-4}x 0.3x15x100 = 0.09 m3/s (90 l/s)**[7] " The input parameters in the above calculation may be uncertain, but ***will indicate the order of magnitude of the "normal" seepage***.

D Filter Layer

A filter layer of selected granular material was provided beneath the dam and intake structures for better underground flow. A Filter-layer (950mm deep, 0-20m granular size) was placed in intake and upto 40m d/s in dam. After 40m d/s, Filter-layer of 20-60mm granular material of 950mm thick layer was placed upto 56m d/s i.e. upto end of stilling basin. After that, 4.5m thick filter layer of >60mm granular material was placed from 1963.5 to 1968.5m for better flow.

E Rip-Rap

A rip rap (0.95m thick , boulder size of 400mm to 600mm) was place at U/S of apron (in Dam/intake) and at D/S of stilling basin on top of >60mm granular material for easy flow of ground/surface water flow. The riprap with >60mm granular material at U/S ensure smooth entry and flow of ground/subsurface water flow while same at D/S side ensure smooth exit without any loss of material. A rip rap of 950mm thick with size> 600mm to 800mm at top of >600m granular material at d/s of stilling basin and on ward up to >100m d/s in negative slope 1:100 were also provided. The combination of i) 20mm to 60mm beneath the stilling basin; ii) >60mm granular material just d/s of stilling basin and iii) Rip-Rap at top (up to >100m d/s in negative slope 1:100) ensures a better flow of ground/seepage water without loss of material, while big size rip rap will prevent the scouring by surface flow/flood water discharging from dam through stilling basin.

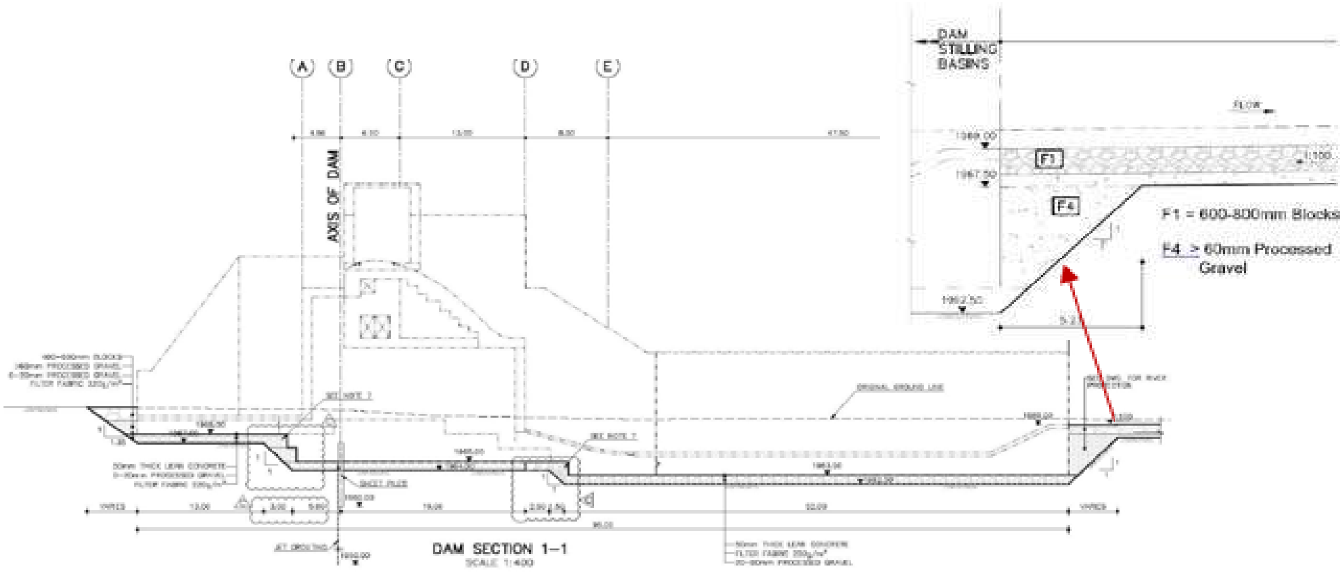

Figure 4: L-Profile of Dam

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[7] Final Report, Feasibility Study of UTKHEP, Geological Investigation,, NorConsult, AS, 2005

3. Sheet-Pile

It was designed & inserted the sheet pile (mild steel) of 7m deep (from elevation 1967m to 1960m), 60cm wide of trapezoidal section with plate thickness of 10mm throughout the axis of the dam and intake from left to right as shown in the following Figures 5-7.

Installation/Driving of sheet pile was started on 8 March 2012.The sheet-piles were driven/inserted by the jack hammer (TH45A-450KN weight)

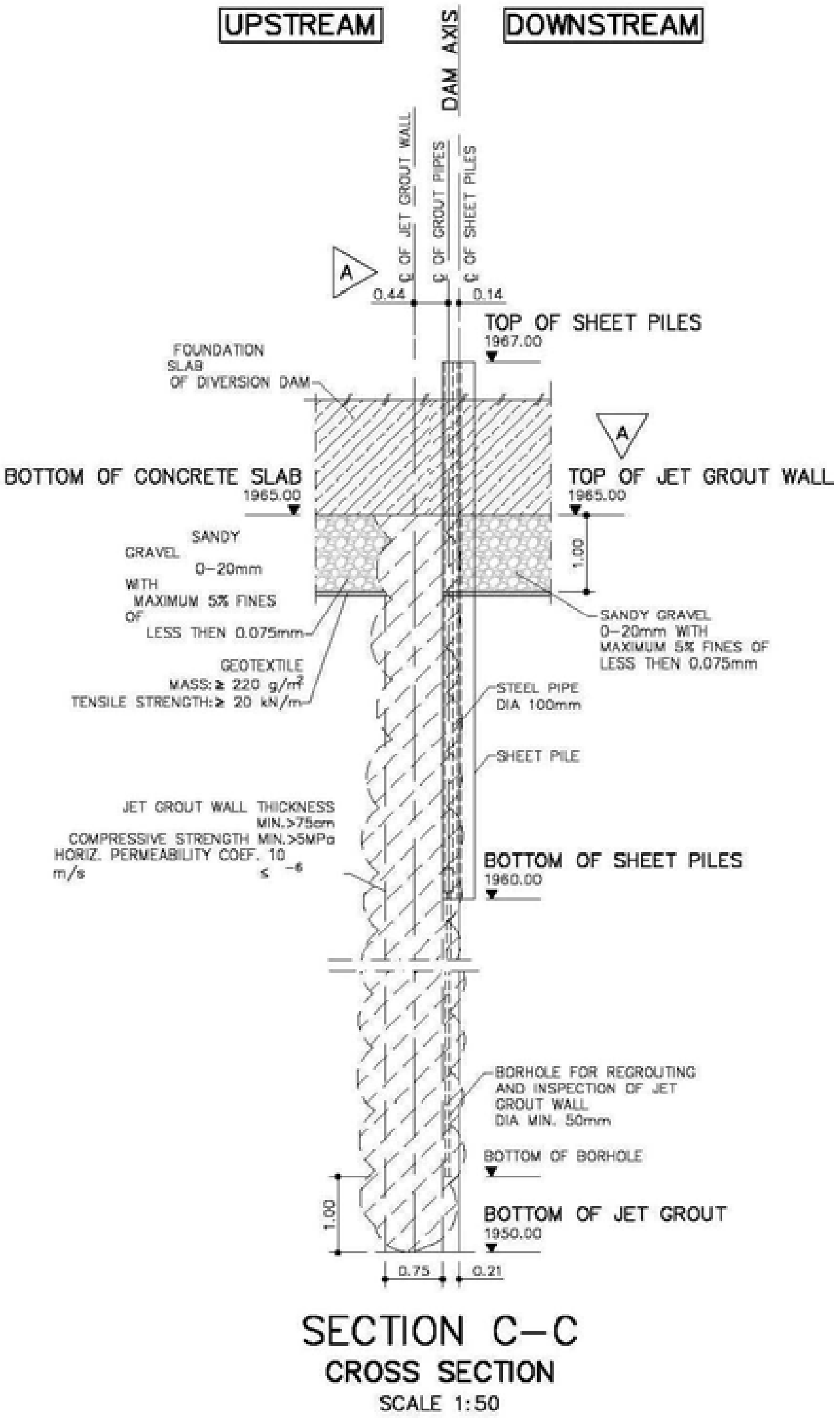


Figure 5:: V-Section of Sheet pile and JGC

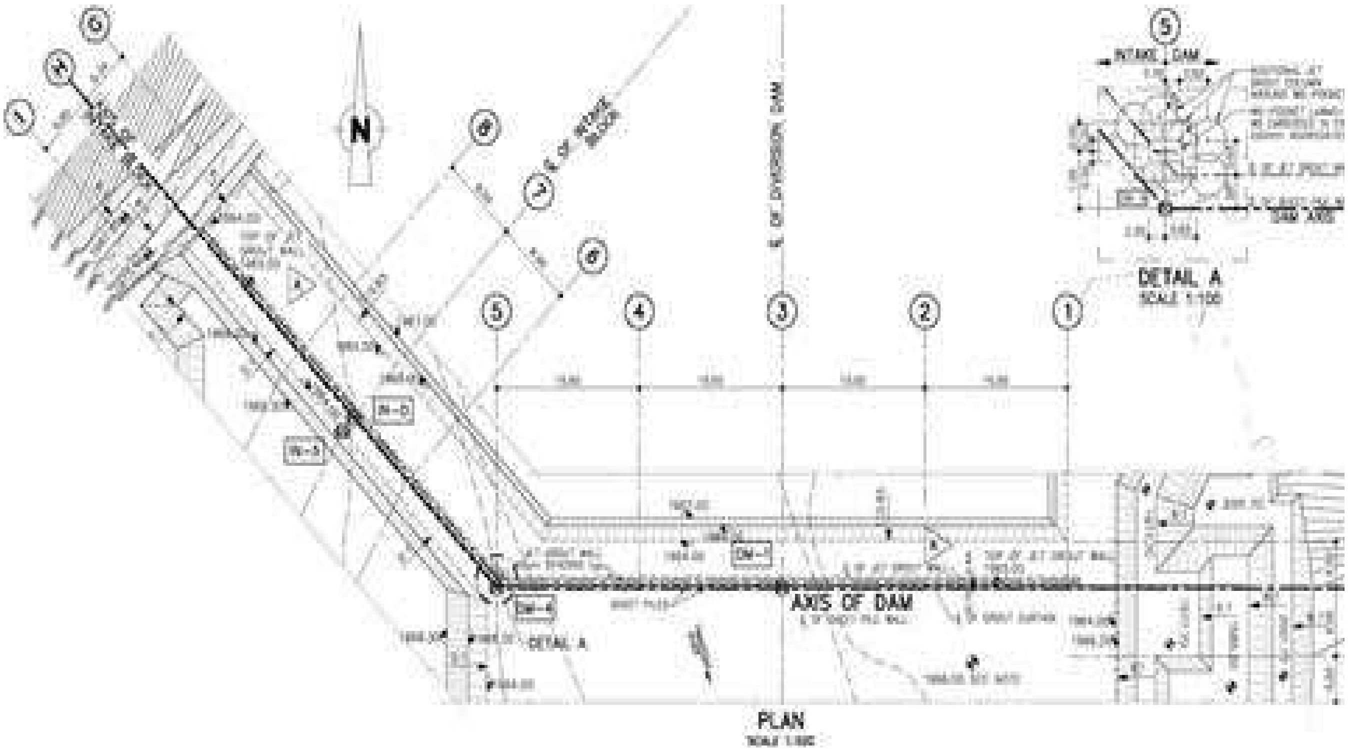


Figure 6 Dam and Intake: Plan showing Sheet Pile and JGC wall

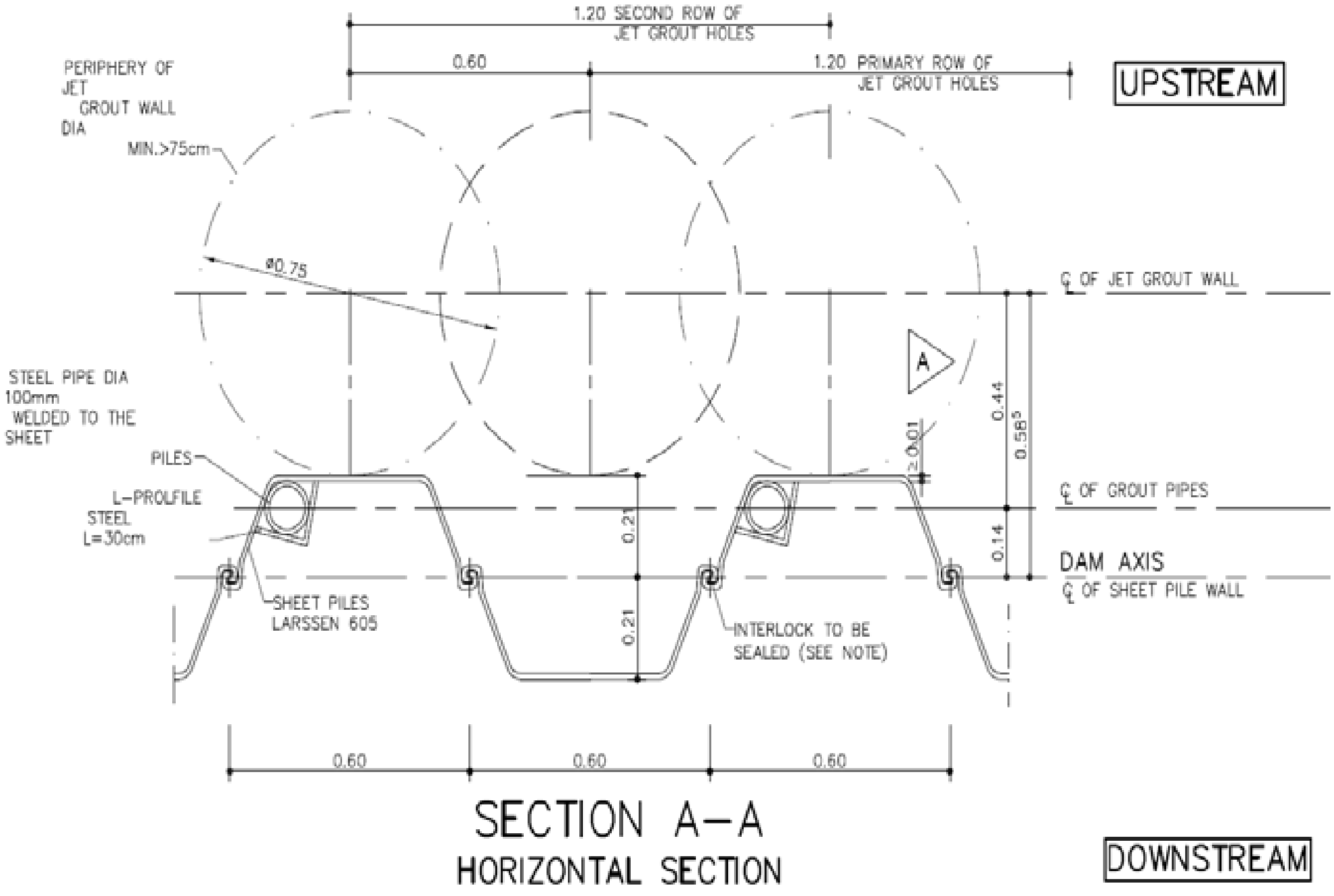


Figure 7: X-Section of Sheet pile and JGC

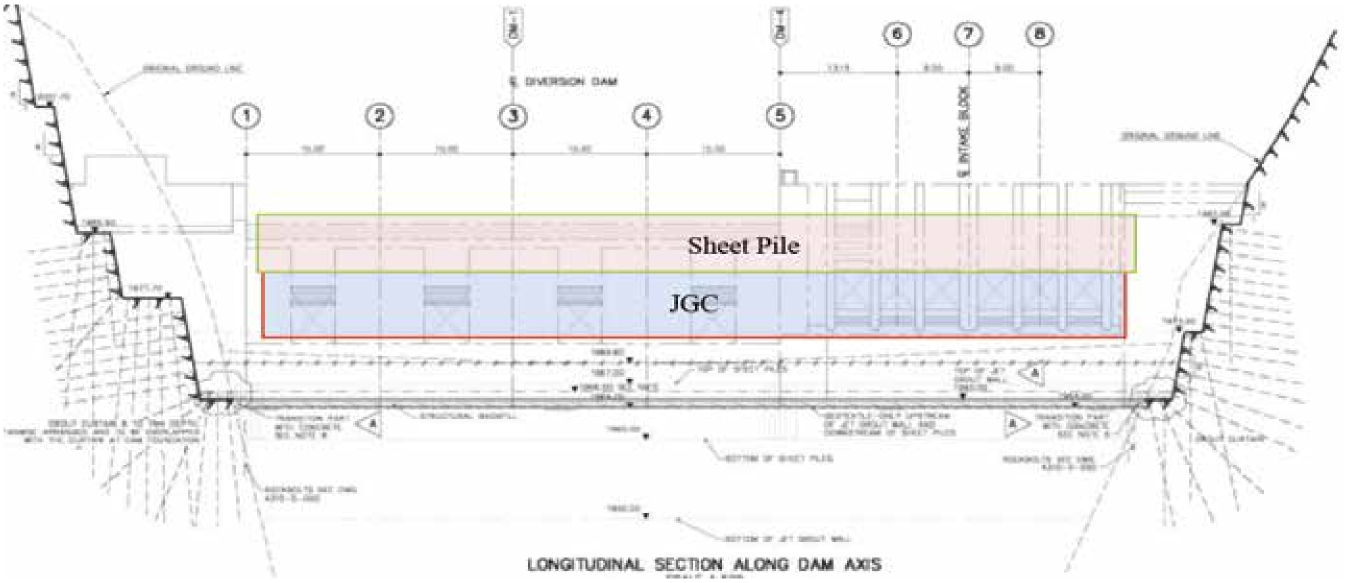


Figure 8: Dam/Intake axis: X-Section showing Sheet Pile and JGC wall

Photo 1: Installation of Sheet Piles

Total numbers of sheet pile was 171 and driving/ installation of all these sheet pile was finished on the 4th May 2012. Details of installation/driving was presented in Table1.

Table 1: Details of Driving/Installation of sheet piles

Details of Installation of Sheet Pile in axis of Dam and Intake (2012 March 8 to May 04)			
Weekly		Monthly	
Wk	Nos	Monthh	Nos
10th wk	12	Mar	68
11th wk	28	Apr	46
12th wk	24	May	57
13th wk	5		171
14th wk	31		
15th wk	-		
16th wk	-		
17th wk	10		
18th wk	61		
Total	171		171

Installation Statics			
Maximum	1	Nos./Day	
Minimum	1	Nos./Day	
Average	3	Nos./Day	
Fastest	1	Minute	
Slowest	520	Minute	8hr 40min
Average	50	Minute	
Longest	7	m	
Shortest	3.6	m	
Wideset	0.49mTop+1.0Botm, Trapezoidal		
No of Working days		33	days
No of Working Hours		5Day 23Hour 48Min	

4. Jet Grouting Curtain (JGC) Wall

F Theory

Jet-grouting improves the mechanical characteristics of the soil using a fluid jetting with very high kinetic energy that breaks up the soil structure and mixes the soil particles in-situ with a grout to create a homogeneous mass of high strength reinforced soil-cement material. Jet-Grouting involves a combination of following three phenomenon.

- Break-up of soil structure by a fluid injected into soil at high velocities;
- During treatment, extraction of excess part of spoils to surface;
- In-situ mixing of soil particles with a hydraulic binder (slurry).

G Implementation and methodology[8]

The equipment consists in a fixed grout production plant (silos, grout mixer, high pressure pump…) attached to a drilling rig with high pressure grout lines (Photo 2).

The drill bit is equipped with injection nozzles whose characteristics depend on the type of soil and on the geometrical and mechanical characteristics of the anticipated column or element (shape, diameter, compressive strength).

For each injection point, the following steps are carried (Photo 3):

1. Rig is positioned at drilling location;
2. A small diameter hole is drilled (70-120 mm) through the layer of soil requiring treatment;
3. Grout is pumped through the rod with a very high flow (200-400 L/min) and high velocity using a high pressure pump and exits through one or several small diameter injection nozzles (1-10 mm) installed on a monitor at the tip of the drilling rod (diameter 70-120 mm);
4. Slow withdrawal of the tool with rotation of the drilling rod for column formation an no rotation for panel formation.

Although it is technically possible to use any type of grout, a cement slurry is commonly used in practice to create, after mixing with the surrounding soil, a high strength soil-cement material. When the main purpose is to create an impervious cut-off system, a bentonite cement slurry can be used.

Jet-Grouting is effective across a wide range of soil types presenting wide variations in permeability and grain size distribution. The technique can theoretically be used in any type of soft soils, from soft clay to sand and gravel. However, the technique is not suited to coarse gravel or soils with underground water flow.

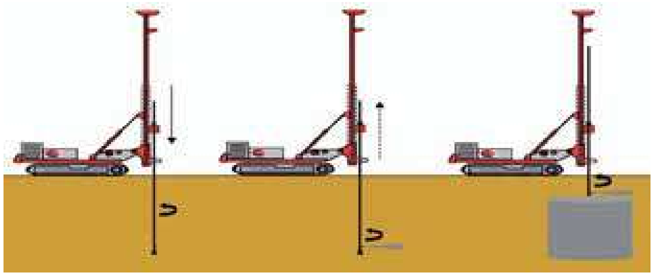
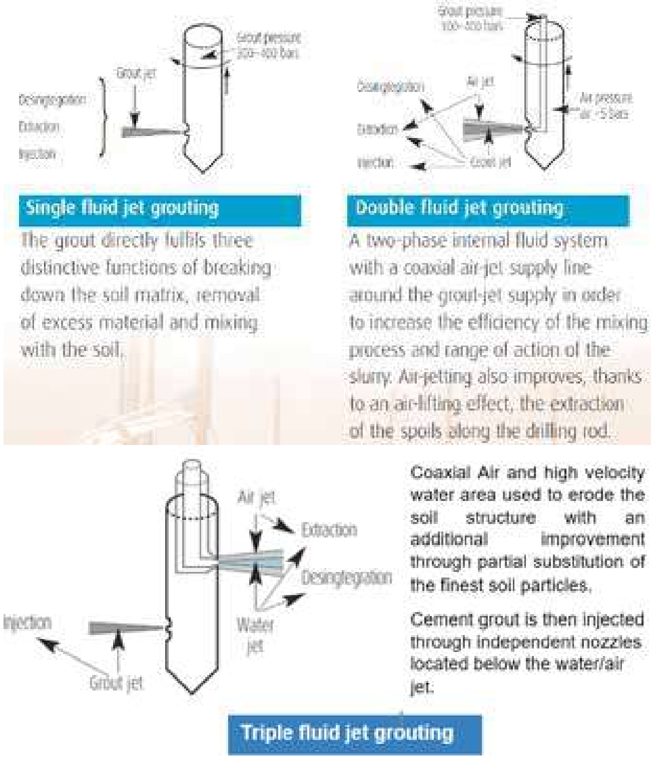


Photo 2: Implementation of JGC (menARD)

There are three Jet Grouting methods. Selection of the most appropriate method is generally determined by the soil conditions, the geometry of the element to be constructed and the application (Photo 3):



The grout directly fulfils three distinctive functions of breaking down the soil matrix, removal of excess material and mixing with the soil.

A two-phase internal fluid system with a coaxial air-jet supply line around the grout-jet supply in order to increase the efficiency of the mixing process and range of action of the slurry. Air-jetting also improves, thanks to an air-lifting effect, the extraction of the spoils along the drilling rod.

Coaxial Air and high velocity water area used to erode the soil structure with an additional improvement through partial substitution of the finest soil particles.

Cement grout is then injected through independent nozzles located below the water/air jet.

Photo 3: Types of Jet Grouting Methods (menA)

H Applications

Jet Grouting offers a very wide range of applications as:

- Ground improvement under uniform loading (heavy storage platforms, embankments, quays, slabs…) or under localized loads (building footings, bridge piers…). In those cases, a load transfer platform (LTP) is usually required above the jet grouting columns;
- Impervious cut-off wall/impervious bottom for deep excavations can be formed with Jet-Grout panels (without rotation of the injection rods) reinforced with Jet-Grout columns, or using secant columns to create a continuous wall.
- This technique is particularly adapted for deep shaft construction and isolation, deep impervious bottom, and deep excavation in urban areas along existing sensitive structures;
- Retaining walls using secant Jet-Grout columns designed as gravity walls or retaining walls. Steel reinforcement can be inserted in the Jet Grouting columns as required (tube, rebars, cages);

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[8] Shilpakar, R.B., Grout Curtain in Abutments of UTK's Headworks

- Underpinning (settlement mitigation, excavation of additional underground floors under existing building, excavation along existing structures…);
- Tunnel pre-arching structures;
- Reinforcement of soils where existing utility lines and burred structures are present;
- Projects with limited headroom or in cramped spaces, …
- Impervious cut-off wall/impervious curtain wall to create the barrier for seepage and increase the bearing capacity at bottom for deep excavations beneath the dam/intake where open excavation requires for construction solid concrete cutoff wall

I Determination and Optimization of parameter for Jet Grouting (In-Situ Test)

The characteristics (column's diameters, length of the panels, composition of the mix, permeability, compression strength,…) of the jet-grouting elements depend on the treatment parameters (extraction speed, speed of rotation, pressure of injection of the grout, flow, density of the grout…), as well as the soil conditions (type of soil, grain size distribution, compaction,…) and on the selected method of construction (mono, double or triple-Jet). The requirement of the establishing JGC Wall in the UTK is as follows:

I) Compressive Strength : >=5MPA

II) Persmissible permeability: <= 1x10^{-6}m/s

III) Width of JGC wall : >= 750 mm

To determine the best parameter, the test JGC wall (4m Long by 3m deep) was established at the d/s of dam/spillway by double jet and triple jet with various combination of Presures (water, Air and cement Slury), density of slury, raising speed and rotational speed of the grouting pipe/nozzle.

Table 2: Method and Parameters of Jet Grouting

Grouting Method	Raising Speed (cm/min)	Rotatation Speed (rot/min)	Water Pressure (MPa)
Triplicate pipe (hole dia. 90mm)	7 to 9	7 to 9 & 15 to 20	35 to 40
Air Pressure (MPa)	Slurry Pressure (MPa)	Cement Slurry Water/Cement	Sp. Gr. Of Slurry
0.6 to 0.8	1	<=1.0	1.5 to 1.6

Photo 4: Existing Tested JGC Wall (Red Mark)

This tested JGC wall was even stood during consucative four monsoon/floods from 2012 to 2017 season even after the Great Earthquake of 25 April 2015 (Photo 4) until it was not broken by excavator for river training/protection work in d/s of dam.

J Establishment of Jet Grouting Curtain Wall in Dam-Intake Axis (1965 to 1950m asl)

JGC wall was established with holes in three stages: I, II and III. Initially JGC was established in I stage holes, then secondly in II stage hole and finally/thirdly in remaining intermittent III stage holes (Figure 9).

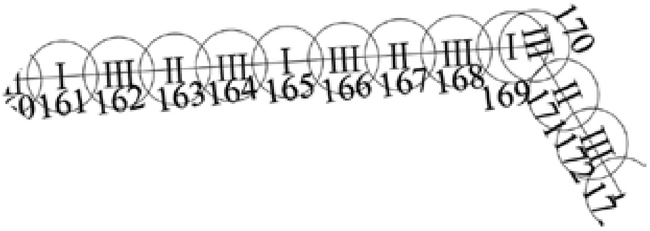

Figure 9: Stages of JGC Establishment

The drilling for JGC wall in hole no. 38 (numbering is from left to right bank) was started on 13 April 2012. Establishment of JGC column (diameter ≥ 75cm) started (by injecting cement slurry) and finished (the same hole no. 38) on same date 24 April 2019. The establishment of JGC wall was continued up to 27th June 2012 (hole no. 136).

Photo 5: JGC Machines (Triplets)

Photo 6: Established JGC wall and Installed Sheet piles (View:: Left to Right)

Establishment of JGC wall was postponed during the monsoon season of 2012. The establishment of JGC resumed on the 28 September 2012 on hole no. 139. Establishment of whole JGC wall was completed on 29 October 2019 by hole no 170. Photos 5 shows JGC machine while Photo 6 shows established JGC wall along with driven sheet piles. Details of Establishment of JGC wall was summarized in Table 3.

Table 3: Details of Establishment of JGC Wall

Details and Statics of Establishment of JGC Wall				
2012 April 24 to June 29 and 2012 Sep 28 to Oct 29				
Weekly				
Wk	Length (m)	Area (m^2)	Cement (ton)	Nos. of Hole
17th wk	127	76	68	9
18th wk	182	109	90	13
19th wk	-	-	-	-
20th wk	-	-	-	-
21st wk	243	146	106	17
22nd wk	270	162	113	18
23rd wk	375	225	162	25
24th wk	195	117	79	13
39th wk	75	45	45	5
40th wk	105	63	59	7
41st wk	225	135	119	15
42nd wk	210	126	106	14
43rd wk	225	135	113	15
44th wk	45	27	25	3
45th wk	-	-	-	-
Total	**2,277**	**1,366**	**1,085**	**154**

Monthly				
Month	Length (m)	Area (m^2)	Cement (ton)	Nos. of Hole
Apr	155.00	93.00	80.80	11.00
May	502.00	301.20	227.60	35.00
Jun	1,065.00	639.00	449.05	71.00
Jul	-	-	-	-
Aug	-	-	-	-
Sep	75.00	45.00	45.00	5.00
Oct	810.00	486.00	423.00	54.00
Total	**2,607**	**1,564**	**1,225**	**176**
Statics				
Maximum	375	225	162	25
Minimum	45	27	25	3
Average	186	112	88	13
			Per Hole	
Maximum			10.80	
Minimum			4.50	
Average			6.96	

K Testing of JGC wall

The already established JGC wall was tested to verify with the requirement by the 9 test holes from the 2-8 December 2012.

Test was performed with taking core drill for compressive strength, permeability (lugon) test in the drilled holes and measurement of width at various sections in the JGC wall. The summary of test with requirement was shown in Table 4. The thickness/width of established JGC wall was found from 0.82m to 1.32m.

Table 4: Required and tested Parameters of the Established JGC

Hole No	**In Between JGC holes**	**Permeability ($1x10^{-7}$m/s)**	**Uniaxial Compressive Strength (MPA=N/mm^2)**	**Width of JGC wall (mm)**
I	45-46	0.31	25.95	
II	60-61	1.72	29.78	
III	72-73	0.70	23.42	
IV	81-82	1.19	21.60	
V	90-91	0.76	21.70	
VI	99-100	2.50	21.03	
VII	109-110	1.92	28.08	
VIII	117-118	1.39	30.38	
IX	141-142	0.90	22.13	
	Average	1.27	24.90	
	Max	2.94	34.50	820
	Min	-	16.45	1,320
	Average	**1.27**	**24.90**	**1,070**
	Requirement	**< 10**	**> 5**	**> 750**

L Conclusion

Cutoff wall made of JGC & Sheet Piles full filled both objectives of seepage control measures and enhancing foundation as rigid by monolithic structures since it connects whole HW with the abutments/banks. Furthermore, as JGC established by drilling/jet grouting of cement slurry, it was not necessary of huge open excavation otherwise unavoidable for construction of solid structure in alluvium deposit. The system of increase flow path by aprons, JGC, Sheet pile, filters with proper riprap at U/S and D/S has controls seepages and scouring in addition of enhancing bearing capacity & structural rigidity as per design anticipation, thereby least construction cost.

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FIDIC Emerald Book: Allocations of Risk Between the Parties

Overview on FIDIC Contract System

The International Federation of Consulting Engineers (commonly known as FIDIC) is an international standards organizations for the consulting engineering and construction best known for the FIDIC family of contract templates. The very first FIDIC Conditions of Contract titled "Conditions of Contract (International) for Works of Civil Engineering Construction" (Red Book) was published in 1957 (prepared on behalf of FIDIC and the Federation Internationale du Batimentet des TravauxPubliques). FIDIC currently has 102 member associations around the world. Society of Consulting Architectural and Engineering Firms (SCAEF) is the official member association of FIDIC for Nepal.

Over the years FIDIC has consistently improved on its contracts. The organization has added new forms of contract, replaced previous ones and updated important terms. The table below gives a brief overview of FIDIC contracts to date.

FIDIC contract	Year released	Notes
The (old) Red Book	First published in 1957, the fourth and final edition was published in 1987, with asupplement added in 1996.	These contracts were aimed at the civil engineering sector, as differentiated from the mechanical/electrical engineering sector.
The (old) Yellow Book	First published in 1967 with the third and last edition in 1987.	These contracts were aimed at the mechanical/electrical engineering sector.
The Orange Book	The first and only edition of this contract was released in 1995.	This was the first design and build contract released by FIDIC.

FIDIC Emerald Book: Allocations of Risk Between the Parties

FIDIC contract	Year released	Notes
The (new) Red Book	Released in 1999.	The Red Book is suitable for contracts when the majority of design rests with the Employer.
The (new) Yellow Book	Released in 1999.	The Yellow Book is suitable for contracts when the contractor has the majority of the design responsibility.
The Silver Book	Released in 1999	The Silver Book is for turnkey projects. This contract places significant risks on the contractor. The contractor is also responsible for the majority of the design.
The Green Book	First edition1999	Short form of contract

The Pink Book	First published 2005 – an amended version was published 2006, with a furtheir edition in June2010	This is an adaptation of The Red Book created to fit the purposes of Multilateral Development Banks.
The Gold Book	Released in 2008	This is FIDIC’s first Design-build and operate contract.

In December,2017 FIDIC officially launched the following new versions of FIDIC Suites of Contracts at the FIDIC International User's conference in London. This edition succeeds the previous Rainbow suite of contracts.

- Conditions of Contract for Construction, Second Edition 2017 (the “Red Book”)
- Conditions of Contract for Plant & Design Build, Second Edition 2017 (the “Yellow Book”); and
- Conditions of Contract for EPC/Turnkey Projects, Second Edition 2017 (the “Silver Book”)

In May,2019 the first edition of " **Conditions of Contract for Underground Works**" so called Emerald Book was published by FIDIC in a joint endeavor with the International Tunneling and Underground Space Association(ITA-AITES) at the World Tunnel Congress in Naples, Italy.

Features of the FIDIC Construction Contracts

RED BOOK	YELLOW BOOK	SILVER BOOK
Building and engineering works;	Electrical and / or mechanical plant and building & engineering works;	Process or power plant, a factory or similar facility, or an infrastructure project;
Designed by (or on behalf of) the Employer;	Designed by (or on behalf of) the Contractor;	Contractor takes total responsibility for the design and execution;
The Contract is administered by the Engineer, appointed by the Employer;	The Contract is administered by the Engineer, appointed by the Employer;	The Contract is administered by the Employer;
Disputes are referred to the Dispute Adjudication Board;	Disputes are referred to the Dispute Adjudication Board;	Disputes are referred to the Dispute Adjudication Board;
Contractor to complete the Works in accordance with the Contract and the Engineer's instructions;	Contractor provides plant, and designs (except as specified) and executes the other works, all in accordance with the Contract, which includes his Proposal and the Employer's Requirement;	Contractor provides plant, and designs and executes the other works, ready for operation in accordance the Contract, which includes his Tender and the Employer's Requirements;
Interim and final payments are certified by the Engineer, (determined by measurement	Interim and final payments are certified by the Engineer, typically	Interim and final payments are made without any certification:
of the actual quantities of the works and applying the rates and prices in the Bill of Quantities or other Schedule)	determined by reference to a Schedule of Payments.	typically determined by reference to a Schedule of Payments.

FIDIC Emerald Book

Everyone would agree that it is very difficult to predict underground condition or behavior. No matter how detailed the soil and other geotechnical investigation reports, often ground conditions are such that they can only really be understood during the actual encounter at the construction site.

The FIDIC Emerald Book is essentially a modified version of the Ed.2017 "Conditions of Contract for Plant and Design Build"(the Yellow Book), with special provisions to address the contractual challenges typical forthe allocation of risk of subsurface physical conditions.

Any approach to just allocate risk to one party like in EPC/ Turnkey Contract (Silver Book,2017) would not be feasible. It is now more important for the Contractor and the Employer to both share the risk of the underground conditions by carefully allocating risk under the Contract.

FIDIC Emerald Book is mainly used for Tunnelling & underground works. Tunnelling works has some unique features, mainly it has large or extensive excavation works and the method of which in ground support form part of the works. So, works itself is defined very widely. In respect of underground works discrepancies between the site conditions envisaged at the tender stage and those actually encountered often generate significant delays and cost overruns. It occurs a highfinancial investment by the Contractor for construction underground excavation and lining works if there is any changes in subsurface condition.

Emerald Book aims to mitigate the risks inherent in underground projects that arise from the uncertainties ever present in the subsurface space.

Types and Ways of Risk sharing

There are number of key areas to bear in mind when using FIDIC suite of Contracts including communication issues, time limits, agreements and determination by the engineer, programming, employer requirements, contractors' design, claims, disputes, arbitration etc. One of the major areas is fair allocation of risks between the Employer and the Contractor which has been developed in accordance with basic risk management principles. Many contractual issues will arise if the contract is designed without dealing with " Unforeseeable Physical Conditions".

In orderto avoid disputes between the parties the most important thing during the preparation of Tender documentation is the selection of the right type of FIDIC Contract on the basis of risk sharing. The Conditions of Contract for Underground Works reflects the fundamental principle of balanced risk allocation between the parties to the Contract.

What are the key changes to the allocation of risk ?

The introductory Notes to the Emerald Book state the Underground Works are predominantly characterized by three unique features:

- ❖ the method of excavation and ground support are major factors for the successful realization of the project, and therefore part of the Works
- ❖ physical access to the Works is often limited to just a few locations or even a single location, which places serious constraints on construction logistics and environment
- ❖ the land, beneath which the Works are to be constructed, typically belongs to a number of third parties

A key element for an improved contractual practice in underground construction is a clear definition of " Foreseen Physical Underground Conditions" in the contract. For achieving a fair allocation of risks among the parties balanced risk allocation is specifically adapted to the risks inherent and unique for underground works. The Geotechnical Baseline Report (GBR) provides a single contractual source of risk allocation related to the subsurface physical conditions that serve as the basis for the execution of the excavation and lining works.GBR has the highest priority among the documents then followed by General Conditions and the Employer's Requirements (Sub-Clause 1.5) . As per the order of precentive the definition of GBR at SC 1.1.51 includes the following :

"means the report entitled geotechnical baseline report as included in the Contract that describes the subsurface physical conditions to serve as the basis for the execution of the Excavation and Lining Works, including design and construction methods, and the reaction of the ground to such method. The GBR sets out the allocation of risk between the Parties for such subsurface physical conditions."

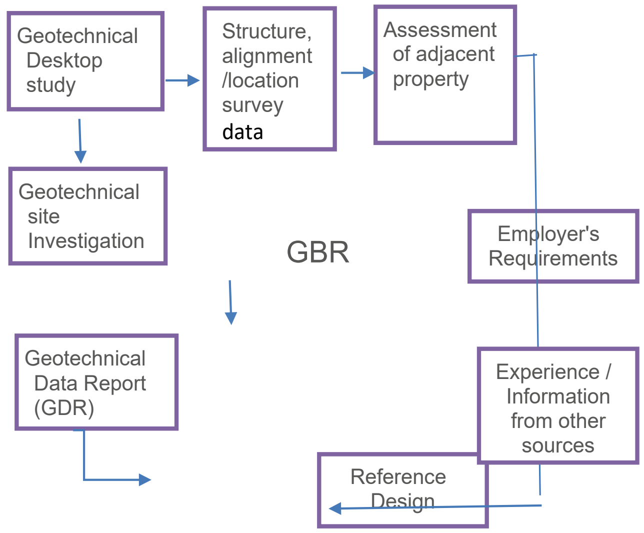
The Guidance Notes to the Emerald Book set out the purpose of the GBR to describe how the anticipated subsurface conditions can influenced the construction plans and specifications.All subsurface conditions in accordance with GBR are considered foreseeable and all subsurface physical conditions not addressed in the GBR will be considered unforeseeable.

The main purposes of GBR areas follows but not limited to :

- establish the baseline subsurface conditions to be used as the only basis for evaluating changes condition .
- describe the site geology and subsurface conditions along the Project alignment
- address constructional issues related to the site geology and subsurface conditions.

Information required for the GBR:

Fundamental to the risk allocation inherent in this contract is that ground condition related risks are borne by the Employer, and it is the responsibility of the Employer to provide clarity through realistic statement in the GBR. General descriptions in GBR should not be deemed foreseeable exclusion of foresight for any raw data.



GBR shall include parameters that help to describe the physical characteristics of the ground and groundwater conditions, as well as the most likely ground behaviors to be expected during the Excavation and Lining activities.

GBR's structure & scope according to FIDIC Contract

Sectors	Description of Scope
Part- A	Informative only and shall include general project information, such as layout and description of Works, construction methods, Excavation & Lining Works subdivision
Part- B	Corresponds to the actual contractual baselines of physical and behavioral subsurface conditions, together with the baseline of Excavation & Lining Works for each relevant work type and section.
Appendices	Project layout, geological map and longitudinal profile, Excavation and support classes, typical cross section and profiles etc.

Part-A : General Information

Part- B : Contractual geotechnical baselines (conditions not addressed in GBR, Part-B, deemed unforeseeable)

Who bears the risk ?

Within this context, Emerald Book has established the following general approach for risk sharing between the Parties for the described subsurface physical conditions.

Employer		Contractor
Hydrogeological, geological and geotechnical properties of theground, or contamination conditions not addressed by the GBR are considered to be " unforeseeable" and therefore any differences are then deemed to be at the Employer's risk ; if ground condition is "worse" than anticipated Employer bears the cost.	GBR	If GBR conditions are encountered, contractor must meet its schedule and technical deliverables. The risks arising out of the foreseen ground conditions, as described in the GBR are assigned to the Contractor; if the site conditions are less onerous than expected in GBR Contractor takes the risk of pricing due to higher production rates.

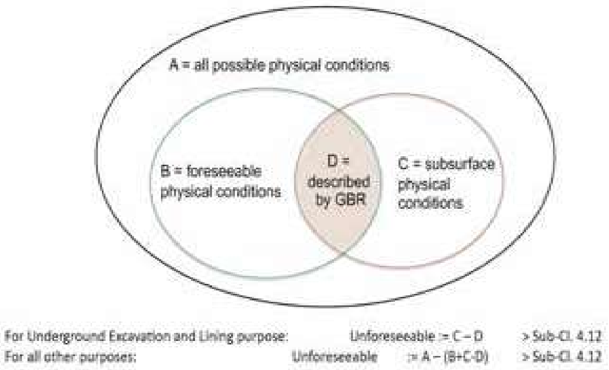
The FIDIC Conditions of Contract for Underground Works are based on the principles of fairness and therefore of balanced risk allocation between the Employer and the Contractor. Each risk of foreseeable subsurface physical conditions shall be allocated in the GBR to the Party that is best positioned to control it, which leads to more effective risk controls.

Fundamental to the risk allocation inherent in Emerald Book is that ground and ground water related risk are only borne by the Employer. All subsurface physical conditions not addressed in the GBR will be considered "Unforeseeable"and shall be deemed to be at the Employer's risk. Claims for unforeseeable physical conditions which falls outside the limits of the GBR are covered by SC 4.12 [Unforeseeable Physical Conditions]. Only actual additional costs incurred are recoverable if the physical conditions encountered are outside GBR. Normally only the Excavation and Lining works are subject to measurementand the accepted Contract amount is deemed to cover all other underground works and all things necessary for the proper execution and completion of the Contract.

Claims for subsurface physical conditions which are within GBR are dealt with by SC 13.8 [Measurement of Excavation and Lining Works and Adjustment of Time for Completion and ContractPrice], risk is shared through mechanisms for adjusting the contract price and the time for completion.

If more difficult ground conditions are encountered then Time for completion can be extended but conversely if easier ground conditions are encountered than expected Employer should gain the benefit of risk sharing by requiring the Contractor to complete in less time, presumably on the basis that less onerous conditions will allow for higher production rates.This potential reduction in the timefor completion has been explained on the basis of a fair and balanced risk allocation.

Balanced risk allocation: Unforeseeable physical conditions



Limitations:

The GBR sets out the allocation of the risk between the Parties for subsurface physical conditions(Sub-Clause 1.1.51). All subsurface physical conditions not addressed in the GBR will be considered Unforeseeable. The risk allocation in the GBR depends on the Employer's preferred level of risk acceptance. As far as possible the selected baseline parameters shall describes the geotechnical conditions anticipated to be encountered during underground and subsurface condition. While preparing GBR, Employer has to carry out extensive site investigations determining the range of possible ground behavior and potential impact on projects. Based upon the conditions described in GBR, the Contractor's tender shall include production rates for each Excavation works. When assessing a tender under the Emerald Book the Employer should also look beyond the overall tender price and carefully consider the Contractor's proposed production rates as they could have significant impact on the time for completion. For a successful project outcome, the Employer should give careful consideration in preparing GBR since GBR plays a very crucial role keeping project on time and budget .

Conclusion:

It is not possible to exactly estimate the required quantities for the support before excavation. The appropriate required excavation and lining works of subsurface conditions depends on the geological / geotechnical situation encountered during excavation. An unbalance risk allocation will lead to escalation of project cost and even make a project economically unviable.

It is inherent for any project, particularly in the construction industry, to involve risks. It is not possible to eliminate all risks, but what can be done is to allocate the risks to the various parties. The standard forms of FIDIC Conditions of Contract for Underground Works provide a balanced risk allocation by defining the rights and obligations of both parties.The basic principle to achieve this is by allocating the risk to the parties best able to control and manage the risk event and bear the risk consequences.

In an area of engineering where disputes are common,"risk sharing", approach can result to less disputes as the Contractor will be paid a fair amount and given a reasonable time for the Works. Risk sharing mechanism is based on the remeasurement of excavation support and lining unit rates as construction proceeds.It is the responsibility of the Employer to minimize errors in the GBR. The GBR formulation will directly influence the allocation of risk. An overly cautions GBR may result in higher bid prices, whereas as overly simplified GBR may excuse Contractor from otherwise foreseeable risks.

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Dispatch Instructions and Compensation Issues in execution of Power Purchase Agreements: Procedural Matters with Implications

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Abstract

The current energy balance scenario of Nepal has mismatches between demand and supply. As most hydropower projects connected through low voltage networks do not have SCADA systems, they cannot be monitored and it becomes difficult for system operators to employ proper dispatching as per system requirement. In the system, energy mix has been incorporated which involves energy generation from different resources like hydro (RoR, PRoR, storage), solar and bagasse. Most of the base demand is met from generation from IPP's and NEA's power plants and deficit energy is fulfilled by importing from India. Power purchase rates as per standard PPAs for hydropower projects varies from one scheme to other, depending on ROR, PROR or Storage Projects. Power purchase rates for solar, bagasse and import from India are also different. NEA has been procuring power from IPPs on take-or-pay basis and a few are on take-and-pay basis under contingency plan. From system operation and market perspectives, some projects are required to have 10% reserve margin. As mostly 33kV lines are under congestion, projects are required to be dispatched at a capacity lesser than their available capacity. NEA is liable to pay compensation to private sector developers if NEA is not able to evacuate power generated from projects due to outage of any of its transmission lines and interconnecting facilities or due to dispatch of the project generation. It is of utmost importance for dispatchers that they issue dispatch instruction considering all aspects of the Agreement, system conditions and technical limits so as to realize economic dispatch of the generation projects in operation.

Key words: IPP, Dispatch, PPA, Availability Declaration, Compensation

Introduction

The introduction of Electricity Act, 1992 and Hydropower Development Policy, 1992 heralded private sector participation in the development of hydropower projects, as a result of which the first Power Purchase Agreement (PPA) was signed between Nepal Electricity Authority (NEA) and Himal Power Limited on January 15, 1996 A.D. for Khimti-1 Hydropower Project (60 MW). It started commercial operation in 2000 A.D. Till date, NEA has already signed PPAs for a total of 6,173 MW capacity comprising of 4,872 MW ROR, 1,083MW PROR and 140MW Storage types of hydropower plants, accounting to a total of 6,095 MW for hydropower, 72MW for solar and 6MW bagasse respectively. Out of 1,462 MW total Installed capacity connected to Integrated Nepal Power System (INPS), the installed capacity of IPP projects only accounts to 815 MW. NEA has been procuring power from IPPs on take-or-pay basis, the term of PPA being 30 years and 25 years from commercial operation date (COD) for hydropower projects and solar projects respectively. In rudimentary stage, PPA rate was fixed through mutual agreement between the signing parties, but at present the rate has been decided by Electricity Regulation Commission as per which the base rate for ROR type of hydropower projects is Rs.4.80 and Rs.8.40 per unit for wet and dry season respectively with an escalation of 3% per annum for 8 years and that for solar energy has been fixed as Rs.7.30 per unit. There is a separate rate for PROR and storage type of hydropower projects with an escalation of 3% per annum for 8 years. The base rate of energy from PROR plants in wet season is Rs. 4.80 per unit, while that during dry season varies from Rs. 8.40 to Rs. 10.55 depending upon the number of peaking hours required to generate at rated capacity. Similarly, for storage type of plants, the wet season energy rate is Rs. 7.10 per unit and Rs. 12.40 per unit for dry season. If the wet season energy exceeds 50% of total energy generation in a year for a storage HEP, the wet season rate is further decreased below Rs.7.10.

Load Dispatch Centre (LDC), NEA, together with local dispatchers are responsible for managing the generations from generating plants to maintain a balance between demand and generation complying to all the technical limits by issuing Dispatch Instructions (DI). Dispatch Instruction is the instruction or the set of instructions given to the generating company by the designated body of NEA from time to time regarding the operation of the project. Companies shall submit Availability Declaration (AD) for each month to the Dispatcher as mentioned in the Operating Procedure (OP), using the format given in respective Operating Procedure. AD is a written notice given to the Dispatcher mentioning the energy to be delivered at delivery point for the months starting after Commercial Operation Date (COD) that should be filled by the company in the format provided in OP. Dispatcher is designated to undertake dispatching functions with regard to the operation of the power stations and transmission lines and instruct power station operators to vary outputs by issuing DI. While issuing DI, the AD submitted by the Companies, operating limits and system conditions should be considered. The instruction is issued by Dispatcher from time to time regarding the operation of the project. Company will have to operate the plant under recently issued DI.

NEA is bound to purchase power from IPP_operated projects upto the quantity of contract energy specified in AD. But if NEA fails to take this energy due to Forced outage in any of its transmission lines or interconnecting facilities or due to under dispatch, NEA will have to pay for the undelivered energy. The irony is many of the transmission line projects are in a state of time overrun and as a result, many power plants are compelled to be evacuated through a different route under contingency arrangement. Further, most of 33kV lines under operation are already overloaded and hence to maintain grid integrity projects are required to be dispatched at a capacity less than their available capacity. As per the provision in PPA,NEA is liable to IPPs for the payment of energy that cannot be delivered due to NEA default.

Grid Connection Agreements and Dispatch Provisions

Grid code, 2005 has vested the responsibility of full operational autonomy in responsibility for Scheduling and Dispatching of generation upon System Operator. The System Operator is responsible for preparing the monthly, weekly and daily Generation Schedule on an hour to hour basis. Hierarchy-wise, the Generation Schedules have the prevalence in the order of daily, weekly, monthly and annual Generation Schedules so that the daily Generation Schedule prevails over the rest of the Generation Schedules in the event of any discrepancy. It is also responsible for allocating and monitoring the availability of Generating Units for Ancillary Services, ensuring such Generating Units are strategically located in the Grid. Also System Operator is responsible for issuing Dispatch Instructions for scheduled Generating Units including those scheduled for Ancillary services.

The Grid Owner is responsible for providing the System Operator with monthly, weekly and daily Scheduled Grid Maintenance and Outage Program on hour to hour basis to determine the constraints of the Grid for scheduling and dispatching to meet forecasted demand. In our case, NEA is both Grid Owner and System Operator.

Generator is responsible for providing the System Operator with a monthly, weekly and daily Capability and Availability Declaration on an hour by hour basis. Generator is responsible for ensuring that it complies with all dispatch instructions from the System Operator subject to constraints imposed by the characteristics of Scheduled Generating Unit and safety considerations of plant or personnel.

Dispatch Provisions in PPA

After NEA starts receiving electricity from the Power plants, Dispatcher will have the right to issue dispatch instructions to increase/decrease generation, shut down the plant for a specified period of time, to Black-Start, to operate under Off-grid Mode or instruct any other action related to operation. While doing so, Dispatcher should consider the Availability Declaration of company, technical limits and system requirements. NEA is bound to purchase energy from IPP-operated projects upto the quantity of contract energy as specified in Availability Declaration. But if NEA fails to take this energy due to Forced outage in any of its transmission lines or interconnecting facilities or due to under dispatch instructions, NEA shall pay the company for the undelivered energy.

Operating Procedures and dispatch provisions

Local Dispatcher will have to issue the Dispatch Instruction on the same AD form provided in OP with authorized signature. But DI given in a standard memo or office letterhead with authorized signature will also be valid.In the lower part of the form, Local Dispatchers may give additional instructions, in addition to hourly generation like instructions to act in support of system frequency, instructions to act in support of system voltage through the generation or consumption of reactive power, instructions relating to the operation of any switching or clearing devices relating to the interface between NEA and Project in accordance with the provisions of OP and instructions during a system emergency. After issuing standing DI, Dispatchers may issue other Dispatch Instructions as per the system requirement for any period of time. In such a case, Company will have to operate the Project according to the recent Dispatch Instruction until another Dispatch Instruction is issued. All DIs issued by Local Dispatcher have to be in written form except during emergency conditions. Any verbal instructions issued by Local Dispatcher during system emergencies will have to be confirmed in writing as soon as possible. Following an outage, after energization of the transmission line, Company will have to operate under recently issued Dispatch Instructions.

While issuing dispatch instructions, simple and clear texts in imperative sentences should be used (e.g., "Keep the load at 2 MW until further instruction.") with the name of the Project for which the Dispatch Instruction has to be given by clearly mentioning the full name, designation and signature of the issuing Dispatcher along with the date (both Nepali and English) and time (in hour) of the Instruction issued.

Importance of economic dispatch

A Economic Dispatch Definition

The purpose of the economic dispatch is to schedule the outputs of all available generation units in the power system such that the fuel cost is minimized while system constraints are satisfied. Also, it can be explained as the process of allocating generation among the committed units such that the constraints imposed are satisfied and the energy requirements are minimized. Furthermore, the economic power dispatch for interconnected power systems can be explained as the process of finding the total real and reactive power schedule of each power plant in such a way as to minimize the operating cost. This means that the generator's real and reactive power is allowed to vary within certain limits so that it can meet the demand with minimum fuel/operating cost. This is called the optimal power flow. The optimal power flow can be achieved by minimizing selected objective functions, while maintaining an acceptable system performance in terms of generators' capability limits and the output of the compensating devices.

B Objective of the Economic Power Dispatch

The main objective of the power economic dispatch is to find the total power generation output so as to minimize operating cost. Besides the main objective, there can also be number of other objectives that involves minimization of emissions, maximization of profit by reducing total cost, maintain system stability and security constraint, etc.

In the current scenario, INPS constitutes generation facilities that are based on Hydro, solar, bagasse and Diesel (currently not functional). The load demand is met from generations from the Independent Power Producers'(IPP) power plants as well as generation from power plants under NEA's ownership, whereas shortfall of quantum is met through import from India. LDC can only monitor the generation from plants that are connected to SCADA, while others remain overlooked which makes it difficult to dispatch their generations in real time. Demand forecast is performed on the basis of load patterns of consecutive days and moreover, it is greatly dependent upon operator's expertise and speculations. Dispatching is done on merit order basis, wherein must-run plants having take-or-pay provision in PPAs are scheduled first and then comes generation from NEA's own power plants. After that excess energy from IPPs are scheduled. Afterwards, power from NEA's storage plants are scheduled and rest is imported from India in the wet season, whereas in dry season, after power import, the storage power plant is scheduled at last. While dispatch is being carried out to some extent on merit order, a more economic dispatch solution could be discovered through use of sophisticated tools, objective functions and technology.

As the projects in operation have Take-or-pay provision, contract energy is a must-buy, but excess energy can be procured as per the requirement from the cheapest generator. In order to minimize the overall cost of operation, these generators are to be optimally scheduled. Another factor to be considered for economic load dispatch is the network constraints. Many transmission line projects are in a state of time overrun ultimately affecting the evacuation of power plants whose construction has been completed and are ready for commercial operation. Generally, such plants are evacuated through contingency plan arrangement on take-and-pay basis, whereas the other plants under operation are being evacuated under take-or-pay basis. Most 33kV lines are operating under overloaded condition, thus a wise decision is to be sought by the system operator to commit or decommit the generating units and what capacity of which unit to commit such as to optimally make the power flow complying to the technical limits of transmission lines and interconnecting facilities.

NEA Decisions and Dispatch Formats

For the purpose of better clarity of issuing DI,coordination between various dispatchers, verification and approval of the dispatch instructions issued by local dispatchers, forms and formats have been created in order to issue DI, summarize monthly DI and calculate undelivered energy. DI form is used by local dispatcher to fill the details of dispatch instruction to be issued to power plants. It mainly comprises the start and finish date and time for which the project is required to operate at a specified capacity and the reason for doing so. Dispatch Instruction Monthly Summary Report should be used for the compilation of all the dispatch instructions issued by local dispatcher. It requires to be approved by the corresponding Chief/Director of the Provincial Office/Grid Operation Department/LDC. Validation of capacity delivered during DI is carried out on the basis of data downloaded from energy meter as far as practicable. If data downloading is not possible, delivery point logsheet should be used for validation, but in this case annual reconciliation of compensation should be performed by availing the data through meter downloading.

Billing and Compensation

Most IPPs have provision in their PPA to submit Availability Declaration for a particularmonth 30 days before the start of a billing or contract month. A contract month starts at 12:00 noon on the first day of the particular month and ends at 12:00 noon on the first day of the following month. Similarly, if there is any probability that the hydrology will change, IPPs can submit revised Availability declaration 7 days prior to the start of contract month. If the company fails to supply the prescribed quantity due to reasons other than scheduled outage or emergency maintenance or forced majeure event or due to NEA, the company will have to pay compensation to NEA as per the following formula:

Compensation amount (Rs.) = [0.8* Energy specified in AD upto the quantity of contract energy - Energy supplied in the month – Energy not made available from the project during the period due to NEA or due to scheduled outage or due to emergency maintenance or due to forced majeure event] * Energy rate

But for projects which are commissioned by 2077/12/08 and which have PPA capacity above 1MW and upto 10MW, as per the recent ERC's decision which was further endorsed by NEA Board, the above penalty provision has been eliminated.However, Declaration

Deviation Charge (DDC) requires to be imposed on projects whose commercial operation would start after 2077/12/08. Companies need to submit their monthly AD for a particular month 30 days prior to the start of that month mentioning the capacity and energy on weekly basis. Furthermore, the provision for weekly revision of AD is also introduced, wherein companies are required to submit revised AD for a particular week at least 7 days prior to the start of that week. Revised weekly AD will have prevalence over monthly AD. Though NEA Board has already removed hydrological penalty provision for PPAs to be signed from 1MW to 10MW capacity, even such projects are required to submit AD to dispatcher.

As per the provision of PPA, NEA will also have to pay compensation to the company if the contracted energy as required to be procured by NEA cannot be taken due to NEA Forced Outage or Dispatch Instruction. In case,dispatcher issues Dispatch Instructions to Project to generate less than Available Capacity, compensation amount payable to IPP shall be calculated as shown below:

Compensation Amount (Rs.) = Undelivered Energy x Purchase Price

'Undelivered Energy' shall be calculated for Non-dispatch case as given hereunder:

$$UE = \sum_{i=1}^{n} (UC_i \times PT_i);$$

Where,

UC = (Available Capacity-the greater of Capacity Dispatched and Capacity Delivered):

$$PT = \left(\frac{\text{Available Capacity} - \text{the greater of Capacity Dispatched and Capacity Delivered}}{\text{Monthly Capacity as specified in Column E of Table II of Schrdule 2}} \right) \text{x Nondispatched Hours}$$

Notwithstanding the provisions given above, Compensation Amount shall be considered equal to zero if and so long as the following conditions hold true:

- the cumulative of PT (Prorated Time) is equal to or less than 'N' hours in the Fiscal Year, where N= 72 for 132kV and N=144 for 33kV
- The dispatched and delivered energy in the month is equal to or greater than 100% of the smaller of Contract Energy and the energy according to Availability Declaration for the Month. In such an event Non-dispatched Hours shall be considered as zero.

Furthermore, the reduction in the delivery of power from the project shall not be considered for calculation of Compensation Amount if and as long as such reduction is caused by Force Majeure Event or Scheduled Outage or by Company or by Company's contractors.Available Capacity of project is the Average kW capacity of the project as specified in Energy Table of the project or as declared by the Company which shall not in any case be greater than installed capacity of the project. Also, availability capacity during outage hours or Non-Dispatch hours shall not be greater than the smaller of kW capacity of the project as specified in Energy Table and Capacity as mentioned in availability declaration. Similarly, Non-Dispatched Hoursrefers to the duration in hours for which the project is required to generate power less than the Available Capacity pursuant to a Dispatch Instruction.

Whenever there is a situation that any of the projects are required to be dispatched below their available capacity due to overloading in the transmission route or due to any sort of system requirement, dispatcher shall have to issue Dispatch Instruction. For this purpose, Dispatch Instruction Form needs to be used by the dispatcher. All such dispatch instructions issued by the dispatcher shall have to be compiled in Dispatch Instruction Monthly Summary Report Form which needs to be further approved by the corresponding Director / Chief of Provincial office or Grid operation department/LDC on the basis of which the generating company can calculate the undelivered energy due to dispatch instruction using above formula and submit before the local dispatcher for approval and later submit it along with the monthly invoice.

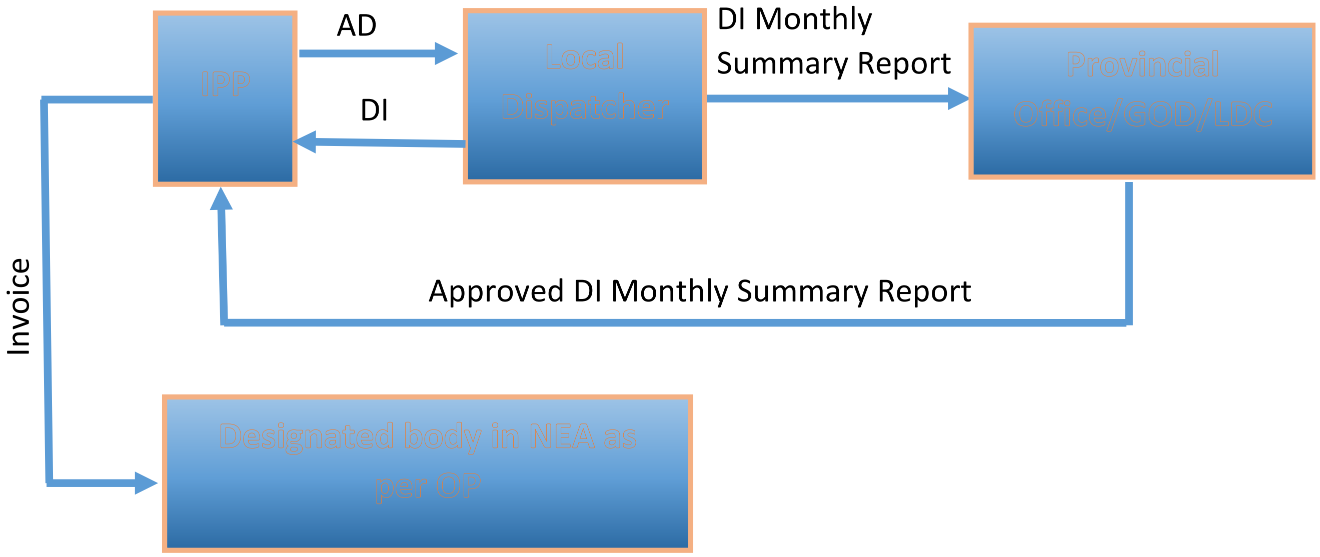

Fig 1: Process flow diagram of AD and DI

For an under-dispatch condition of duration less than 24 hours,kW delivered one clock hour prior to under dispatch period shall be used for determination of available capacity. For instance, if a project is dispatched from 11:15 hrs to 16:30 hrs, kW capacity at 10:00 hrs shall be used for determination of available capacity. Likewise, for under-dispatch periods of duration greater than 24 hours, the kWh delivered on full clock hour basis preceding and following the dispatch period shall be used for determination of available capacity. Suppose the under-dispatch starts at 14:15 hrs and lasts till 14:45 hrs of the next day, the first, second and third hours data before under-dispatch shall be recorded on 14:00 hrs, 13:00 hrs and 12:00 hrs and so on. Similarly, the first, second and third hours data after an under-dispatch period shall be recorded on 15:00 hrs, 16:00 hrs and 17:00 hrs respectively and so on. Validation of capacity delivered during DI shall be carried out on the basis of data downloaded from energy meter as far as practicable. If data downloading is not possible, delivery point logsheet shall be used for validation but in this case annual reconciliation of compensation shall be performed by availing the data through meter downloading.

Coordination between local dispatchers is also equally important as generations from different projects having different local dispatchers while being evacuated together might cause overloading in some other section(s) of the transmission route. Presently, the bottleneck in Dharan-Dhankuta 33kV line section has given rise to the urgency to issue dispatch instructions to projects getting evacuated through that route. Khadbari DC is the local dispatcher for Sabha Khola (4MW), Lower Piluwa khola (0.99MW), Piluwakhola (3MW) and Hewa khola (4.455 MW) Hydro power plants. For Upper khorunga (7.5 MW), Therathum DC is the local dispatcher and for Pikhuwa khola (5MW) and Taksar Pikhuwa (8MW), Bhojpur DC is local Dispatcher. Likewise, for Leguwa khola (40kW), it is Dhankuta DC. The generation of all these plants are required to be evacuated through Dharan-Dhankuta 33kV line section. But due to the bottleneck in that section, these projects are required to be dispatched at a lower capacity. A proper coordination between these dispatchers is required so as to settle what capacity of which project is required to be dispatched in order to economically and optimally evacuate the power rendering less number of trippings.

Conclusions

The role of dispatch instruction is vital as it facilitates operation of the system to be technically sound and economically optimum. There is clearly mentioned role assigned to dispatcher in Operating Procedure and terms related to dispatch instruction need to be followed. We are not yet able to completely harness the technical and economic benefits that can be accessed through implementation of dispatch instruction, for which we need to improve SCADA system by incorporating all energy generating sources so as to have sound communication access networks. Dispatchers taking into consideration the availability declaration from all the generators and network constraints should schedule the generators while trying to reduce the transmission losses as well as overall cost of power purchase. Key factors like energy rate and excess energy rate according to PPA, location of plant and load centre, effective scheduling of take-or-pay and take-and-pay based plants could be considered for economic dispatch. Despite having all the theories and formula for calculation of undelivered energy, the availability of timely monthly meter downloaded data still remains a challenge due to inadequacy of remote access to the energy meters. In current scenario, the dissemination of authority of downloading energy meters to corresponding local dispatchers might mitigate the problem to a great extent.

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विद्युत उपभोक्तामा
नेपाल विद्युत प्राधिकरणको अनुरोध

- अनाधिकृत विद्युत प्रयोग नगरौं ।
- विद्युत चोरी गर्नु कानुनी र सामाजिक अपराध हो ।
- विद्युत चोरी नगरौं र चोरी गरेको थाहा भएमा यथाशीघ्र नजिकको विद्युत कार्यालयमा जानकारी गराई सचेत नागरिकको परिचय दिऊँ । यस्तो सूचना दिनेको नाम गोप्य राखि उचित पुरस्कार दिइनेछ ।
- तपाईको घरटोलमा चुहावट नियन्त्रणका लागि आउने कर्मचारीलाई सहयोग पुऱ्याई विद्युत चुहावटमुक्त समाजको निर्माणमा सहभागी होऔं ।

Significance Of Probability Of Exceedance Of Flow In The Assessment Of Power And Energy Generation Of Hydropower Projects In nepal

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Abstract

Plentiful availability of water resources along with the fortunate geophysical features and steep topography provides colossal opportunities for hydropower production in the country. Studies during sixties show the theoretical hydro potential of Nepal as 83,000 MW, however latest studies explicate that around 40,000-45,000 MW would be techno-economically feasible. And out of these less than 3% has been harnessed so far. Despite the suitability of huge power production in-house, many schemes have delivered less than the expected and estimated energy generation. One of the major reasons could be an inaccurate estimation of the water availability. The under and over estimation of flow in the river could mislead the expected generation. Thorough understanding of hydrology of the upstream catchment along with the detailed study of flow regime of the river is therefore essential for estimating actual hydropower potential of any project. Mostly projects with no artificial storage or pondage rely entirely on the flow conditions of the stream for power generation. During most of the hydropower design, the conventional method used to describe the availability of water in the river is by using the flow duration curve, FDC. FDC, basically is the plot of flow in the stream against the percentage of time the flow was equaled or exceeded, common term we use is Probability of Exceedance (PoE) of the flow. In case of Run-off-River hydropower projects, Nepal Electricity Authority, NEA has made Q_{40} criteria mandatory for Power Purchasing agreement with the purpose of providing full capacity generation for almost five months a year. If we look through the actual energy generation of already commissioned projects, the lack of thorough study of hydrology can be well observed.

Keywords: Flow duration curve, probability of Exceedance, sustainability, seasonal variation of energy,

1. Introduction.

“Nepal is the second richest country in the world in terms of Water resources”, we all have probably learnt it since we were kids. Well, sadly the statement is a myth. Nepal isn’t in the second position not even within the South Asia, neither in the total area covered by water nor in the hydropower generating capacity. It is learnt that if we harness the full potential it would not be enough to light up half of India or China. But, this doesn’t change the fact that hydropower potential per sq.m area of Nepal is 1000 times more than that of India. Nepal, even with such a small area, has a colossal hydropower potential of 83,000 MW of which about 43,000 MW is techno-economically feasible.

Nepal is blessed with abundant water resources, which, if properly harnessed can act as a catalyst for the all-round development and economic growth of the country. In addition to hydropower other benefits such as, irrigation, water supply, medium of transportation etc. can be achieved through these amply available natural resources. Some 6000 rivers and all the major river systems crisscross the country and drain into India. Over a short distance of some 190 km from northern to southern border, the elevation drops dramatically from 8848 to 70 masl. Such diverse topographic features along with the plentiful availability of water resources make Nepal highly capable for hydropower development, especially for Run-off-the river schemes.

Blessed with so many rivers having the drainage area of 191000 sq.km, 74% of which lies in Nepal alone, more than 30 rivers with drainage area exceeding 1000 sq.km, are here. Rivers of Nepal can be broadly classified into 3 types, on the basis of their origin. Currently, about 10% of total precipitation here falls as snow, about 23% of total area lie above precipitation snow line, about 3% of Nepal in terms of area is covered by glaciers. Nearly 3500 glaciers cover an area of more than 5000 sq.km. Classification of rivers of Nepal can be characterized as follows on the basis of their origin and from the perspective of hydropower:

- ❖ **Originating from Glacier and snow-fed river:**
    - ➢ Mahakali, Koshi, Gandaki, Karnali
    - ➢ They carry snow-fed flows with significant discharge even in dry seasons, which makes them suitable for year- round energy generation with significant dry season energy as well.
    - ➢ They are perennial and carry tremendous potential for hydropower.
- ❖ **From Mahabharat Range: Babai, West Rapti, Bagmati, Karnali, Kankai and Mechi**
    - ➢ These rivers originate in the Midlands or the Mahabharat Range
    - ➢ They are fed by precipitation as well as groundwater regeneration (including springs). These rivers too, are perennial but are commonly characterized by a wide seasonal fluctuation in discharge.
- ❖ From Chure hills
    - ➢ Basically, rivers originating from chure hills are considered as small rivers and causes flash flood during monsoon rains and remain without any flow or very little flow during the dry seasons which makes them comparatively less fit for year-round hydropower generation for run-of-the river schemes.
    - ➢ Hydropower Plants based on these rivers need more comprehensive and in-depth detailed study of hydrology.

Rivers of Nepal are characterized by wide seasonal fluctuation of flow. Monthly flow generally reaches maximum during July-August and declines to their minimum in February-March. Even with enormous water availability and hydropower potentiality Nepal still faces power deficit during few months, because of the seasonal variation of the flow in the stream.

Stream flow is acombined response of non-homogenous and spatial variability of precipitation, infiltration, evapotranspiration and other hydrological process. Therefore, for identifying the trend of stream flow, understanding the impact of climatic variability and changes in the region is vital. These things fall under the hydrological and geomorphological study of any projects.

More than a century ago, Nepal experienced its first hydropower plant, however the development in the sector remained stagnant five decades later NEA introduced its first ever MW project of Nepal (Panauti, 2.5 MW). Although NEA has been a major contributor in the expansion of energy sector. flexibility of policies came into the favor of private developers and some 35 years later after the commissioning of Panauti Hydropower plant, private sector operated its first hydro plant Khimti HPP with an installed capacity of 60 MW.

Department of Electricity development (DoED) was established in order to facilitate and promote electricity sector also to improve financial effectiveness of this sector at the national level by attracting private sector investment. Similarly, Electricity Regulatory Commission, (ERC) aiming to regulate the entire energy sector was established in the year 2017.However, we should accept the reality: Too many stakeholders, yet too less development. Nepal has failed to deploy its hydropower potential even with an involvement of large bodies. Even with the flexible policies, directives and proper guidelines by Government, we have not been able to fetch the right amount of energy, we could possibly have. Apart from the political involvement, reason could be insufficient technical knowledge, very less study and more assumptions while doing hydrological estimation. Hydrological assessment is the foundation for any hydropower project.

Talking of hydrology, Nepal with a limited number of Gauging Stations to measure stream flow installed in the major riversonly hasmade the study of hydropower design in small riversmore imprecise.

Projects built on water bodies, aimed to achieve productivity out of the steam flow require fairly reliable, timely information on the expected regime of the water bodies, i.e. hydrological forecasts. In the area of hydropower, this is the most crucial and requires in-depth study of stream flow in order to achieve the expected and estimated output. Correct use of forecasts makes it possible to increase the hydroelectric power output substantially.Especially in the run-off-river power plant, with no natural or artificial storage, hydrological uncertainty due to daily flow variability and the effect of climate change on water resources is a critical topic in the feasibility evaluations. If we look over the energy generation trend of the commissioned hydro projects in Nepal, vague estimation of hydrology could be seen. Many of them have failed to achieve their minimum estimated energy. In-depth study on river hydrology is crucial while designing hydropower projects.

We are endowed with huge potential for hydropower due to huge water availability in conjunction with verticality of landscape. However, it is imperative for developers to have a comprehensive understanding about the changes in hydrological cycle and the uncertainties associated with it while developing a hydropower plant. With the increasing number of hydropower projects in the country, developers have started doing in-depth hydrological study to avoid the power fluctuation due to seasonal flow variation and other uncertainties. Most of the hydropower projects in Nepal falls under small sized projects. These are mostly built on small rivers, which lacks the gauging station, instrument that measures the stream flow of the river and are installed by Department of Hydrology and Meteorology. Since they lack the historical data of the river, flow of such rivers are co related using other nearby hydrologically similar catchments having the historic data available. Some of the common methods used to calculate the flow at ungauged rivers are, Catchment Area Ratio(CAR), Regional Regression, Medium Irrigation Project (MIP),etc. After obtaining the long term flow correlated at the intake, design discharge of the project is fixed. During most of the hydro power design, the conventional method used to do so is by using the flow duration curve, FDC. FDC, basically is the plot of flow in the stream against the percentage of time the flow was equaled or exceeded, common term we use is Probability of Exceedance (PoE) of the flow. General practice in Nepal is that design discharge is fixed at 40% of probability of exceedance for the purchase Agreement . PoE of the flow 40% means that the power plant will generate the full installed capacity for 40% of 365 days in a year, near about 5 months. Fixing PoE will have mainly two significances, lower PoE will optimize the water resources but for lesser time, whereas higher PoEwill ensure generated installed capacity for longer run in a year, ensuring the increased dry energy. Since the country is subjected to seasonal flow variation, dry energy has become major concern. For same reason, NEA has also addressed the need of Q_{40}criteria while making policies and directives. Of course, the policy is also related to the sale of surplus energy during wet season.

2. Significance of flow assessment especially in RoR plant

As per the published White Paper, 2075 by Ministry of Energy, Water Resources and Irrigation (MoEWRI), the Ministry is planning to increase the consumption of electricity per person to 700 kWH (Kilo watt hour) in 5 years and to 1500 KWH in 10 years. It also depicts that the Ministry is more focused on the storage and P-RoR kind of projects, keeping in consideration of the fact of seasonal fluctuation of river hydrology can be addressed by projects with reservoir.

If we look over the private sector's involvement in the hydropower development, we see that RoR projects have taken over the energy sector and majority of projects are RoR -based. Dominance of RoR-based hydropower projects are illustrated in the graphical form below. The following data represents the numbers and capacity of projects from the private sector.

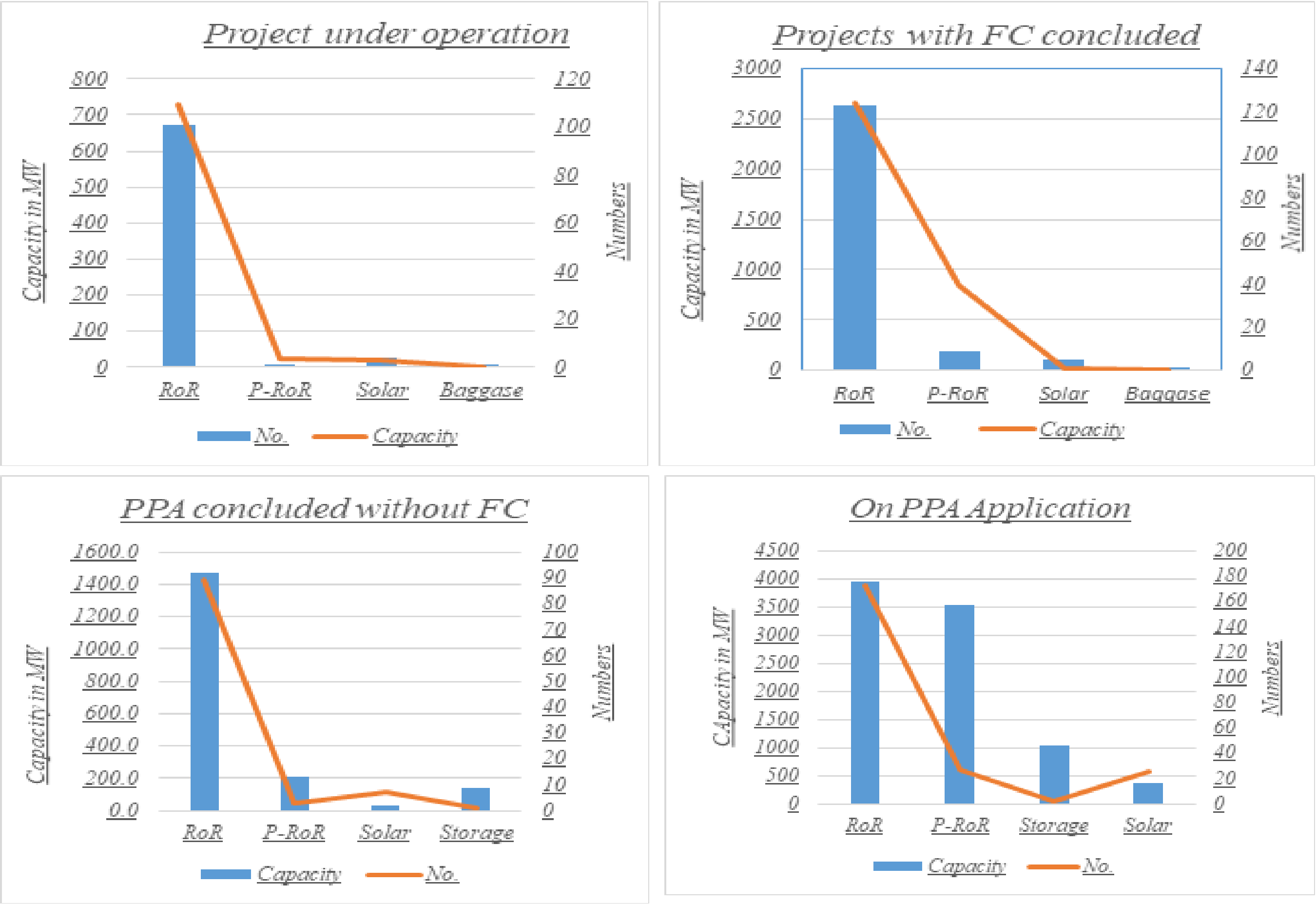

Figure 1 Projects under Private sector Development

Note: FC: Financial closure

RoR based hydropower plant uses the instantaneous flow in the river. It does not regulate under the natural or artificial storage. That is why a thorough understanding of river hydrology is very essential. For the RoR types of project, capacity and generation of energy depends on the river discharge. Energy generation from a project is calculated on the basis of the long-term monthly average flow of the river. However, the flow of a given month can vary significantly from the designed flow. Such variation can hit on the estimation of annual energy of a project.

Flow assessment is significant, and in the context of RoR sehemes even more critical. General practice of hydropower design in Nepal is based on Q_{40}, which is derived using historic daily flow data. If proper in-depth study on hydrological study is not given, that will affect the estimated energy generation and private sector developers will be liable to hydrological penalty for the energy shartfall as per the provision in the Power Purchase Agreement done with NEA.

As mentioned earlier, increment and decrement of probability of Exceedance of flow affects the dry seasonal energy and the installed capacity of the project. Wise selection of design discharge should be made in order to achieve maximum outcome. Same is explained in tabular form below:

Impact on	Probability of Exceedance of flow	
	If increased	If decreased
Dry season energy	Increases	Decreases
Capacity of Project	Decreases	Increases
Optimum use of resources	Decreases	Increases

Table:1 Impact of PoE on energy and Capacity

RoR projects are more subjected to flow variation compared to projects with natural or artificial storage. As discussed earlier, energy generation by a hydropower project on a particular month is calculated on the basis of long term average flow of that month,Q_{MA}. Following are the possible cases of flow in the RoR-based projects if the design discharge of the project is Qd:

For Wet seasons	Q> Q_{MA}& Q>Qd	-	Spill of resources by (Q-Qd)
	Q< Q_{MA}& Q>Qd	-	Spill of resources by (Q-Qd)
	Q< Q_{MA}& Q<Qd	Power Loss	Deficit
For Dry seasons	Q> Q_{MA}& Q>Qd	Power Gain	Spill of resources by (Q-Qd)
	Q> Q_{MA}& Q<Qd	Power Gain	No spill of resources
	Q< Q_{MA}& Q<Qd	Power Loss	No spill of resources

Where,

Q=River discharge of any particular month

Qd=Design discharge

Q_{MA}= Long term mean monthly flow of the river

As aforementioned, energy calculation of a power plant is done based on long term monthly average flows Q_{MA} and design discharge Q_d. However, during operation, the discharge on the river for any month can be unlike from $Q_{MA.}$ If the flow is higher than Q_{MA}, there will be condition of spill whereas if flows are lesser than estimated $Q_{MA,}$ then there will be less power generation. Further, PPA tariffs for different seasons are different. Hence, the proper adaptation of Q_d while designing and thorough understanding of the stream flow should be made before applying for PPA since, over-estimation of power and energy leads to hydrological penalties to developers.

3. Flow Duration Curve and Probability of Exceedance of flow

Small-scale hydropower is a robust and reliable form of sustainable energy supply. Potential of hydropower generation does not only depend on the river flows but also on the climatic variability, precipitation, catchments characteristics, like topography land use etc. Very few gauging stations are installed in the country, so in absence of these data recording gauging stations, the available river flow for hydropower production can be estimated in the form of flow duration curve based on these variables. Most of the hydro power designer in Nepal also uses this conventional method to describe the availability of water in the river.

Hydrological forecast is always of a probabilistic nature, expressed by number of values whose probability of occurrence in the given year is various.FDC represents the relationship between the magnitude and frequency of stream flow for a particular river basin. It provides a simple, yet comprehensive, graphical view of the overall historical variability associated with the stream flow. Forecasts of the inflow to the hydroelectric power plants are used for planning the energy generation.

A flow duration curve characterizes the ability of the basin to provide flows of various magnitudes. Information concerning the relative amount of time that flows past a site are likely to equal or exceed a specified value of interest is extremely useful for the design of structures on a stream. For example, a structure can be designed to perform well within some range of flows, such as flows that occur between 20 and 80% of the time.The shape of a flow-duration curve in its upper and lower regions is particularly significant in evaluating the stream and basin characteristics. The shape of the curve in the high-flow region indicates the type of flood regime the basin is likely to have, whereas, the shape of the low-flow region characterizes the ability of the basin to sustain low flows during dry seasons.

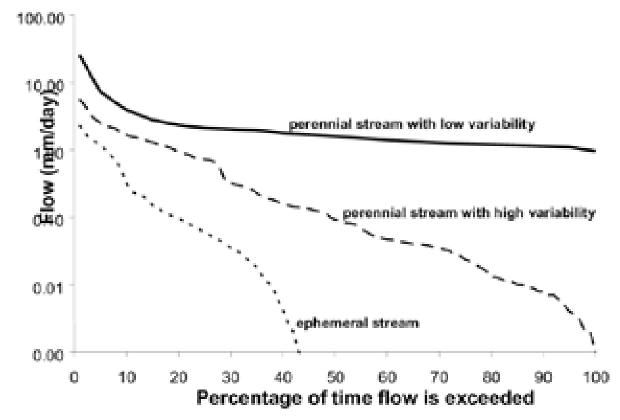

Figure: 2 Flow Duration Curve for different rivers

- ➢ For streams with high flows for short periods, a very steep curve would be expected. It is due to rain-caused floods on small watersheds. Ephemeral streams show these characteristics where water flows only during, and for a short duration after, precipitation events in a typical year.
- ➢ Streams with perennial flow but with high variability makes a curve much flatter that those of ephemeral streams but steeper than that of perennial stream with low variability.
- ➢ And a very flat curve indicates that moderate flows are sustained throughout the year due to natural or artificial stream flow regulation, or due to a large groundwater capacity which sustains the base flow to the stream.Perennial rivers show these characteristics of low variability in river flows.

4. Seasonal Energy and Effect of PoE

Rivers of Nepal are characterized by wide seasonal fluctuation of flow. These variations are driven by weather conditions and seasonal climatic patterns in the watershed. As already mentioned ahead, different rivers in Nepal carry different forms of flow variation depending upon their originality.

- ❖ Glacier and snow-fed rivers carry snow fed flows with significant discharge even in dry seasons, which makes suitable for year round energy generation with significant dry season energy as well. Those are perennials and carry tremendous potential for hydropower. IF hydropower projects do be developed on these rivers, sensitivity of PoE is lesser.
- ❖ Precipitation as well as groundwater regeneration (including springs). Fed rivers too are perennial but are commonly characterized by a wide seasonal fluctuation in discharge. For e.g., Babai, West Rapti, Bagmati, Karnali, Kankai and Mechi. Projects built on these rivers may suffer the generation fluctuation as the flow on the river may vary seasonally. Optimizing PoE to achieve maximum capacity as well as to ensure sustained dry energy is crucial here.
- ❖ Basically rivers originating from chure hills are considered as small rivers and causes flash flood during monsoon rains and remain without any flow or very little flow during the dry seasons which makes them comparatively less fit for year-round hydropower generation for run-of-the river schemes.Most of the small Hydropower Plants are built on these kinds of river. And due to lack of proper hydrological assessment, energy generation of such plants is very low during the operation. That's why projects to be built on those rivers need more comprehensive and in-depth detailed study of hydrology.

In general, smaller the size of river catchment area, the wider is the range of flow fluctuation. As per the WECS, analyses of monthly flow trend of some of the rivers indicate that the contribution of snow melt in runoff is in increasing trend for snow-fed rives, while for non-snow fed rivers, dry season flows are decreasing and wet season flows are increasing. From the perspective of energy generation from hydropower plants, projects built on the first kind of rivers fetch more dry energy than those built on later kinds.

5. Policies and Directives aligned with Probability of Exceedance of flow

Directives on licensing of hydropower project by Ministry of Energy

DoED, under MoEWRI issues the license and provides guidelines for the development of hydropower projects in Nepal. As, per the Directives on Hydropower Licensing, 2073,capacity of the hydropower project will be estimated based on the 40% dependable flow of the stream if the produced energy is to be injected on National Grid. However, the provision does not include the project aimed to build for rural electrification. Three months later the directives wereamended and made the design discharge to be fixed at Q_{45}, however the implementation seems to be questionable. The decision was highly criticized by the private sector developers, as they considered it as a rigid move by the Government with the reasoning that it kills the resources and discourages the high capacity projects also increases the energy cost. They even doubted the intention of Government to encourage the power import from India while clearly not promoting domestic investors for increasing generation. Increasing the probability of Exceedance to 45, the project now needs to operate its plant for 5 and half months, while before it was only for 5 months at full capacity.

Requirement of Q40 for Power Purchase Agreement

NEA signs power purchase agreement with the private sector developers, with different tariffs for different types of projects.NEA has madeQ_{40} criteria mandatory if the project intends to produce energy for commercial purpose, it needs to be designed at Q_{40}. However, on 2073/10/12, NEA Board made a decision that if any RoR project intends to generate energy corresponding to the discharge greater than Q_{40} then NEA can purchase additional energy at the same PPA tariff under Take-and-Pay provision or can sell somewhere else using NEA's transmission infrastructure with certain wheeling charge. Later on 2074/02/19, NEA board included P-RoR projects in the above provision. However, they already had the provision for minimum dry season energy to be 30%.NEA has signed the Power Purchase Agreements of few Independent Power Producers (IPP's) projects with these provisions.

Limiting Q_{40} for P-RoR projects would compromise the peaking capacity which is of great substantial in the current scenario of country. Releasing the fact later on 2078/03/09, NEA Board removed the criteria of Q_{40} on Peaking RoR projects while keeping the minimum criteria of dry energy to be 30% as it was.

7. Energy generation calculation trend

To elaborate the practice done in Nepal while adopting design discharge, let us take an example of a river with an installed gauging station by Department of Hydrology and Meteorology, having a recorded daily flow in the rivers for few years. For an instance Gauging station umber 690, installed on Tamor River at Mulghat. The drainage area was calculated to be 5858 sq.km. Daily flows from 1965 to 2013 were available

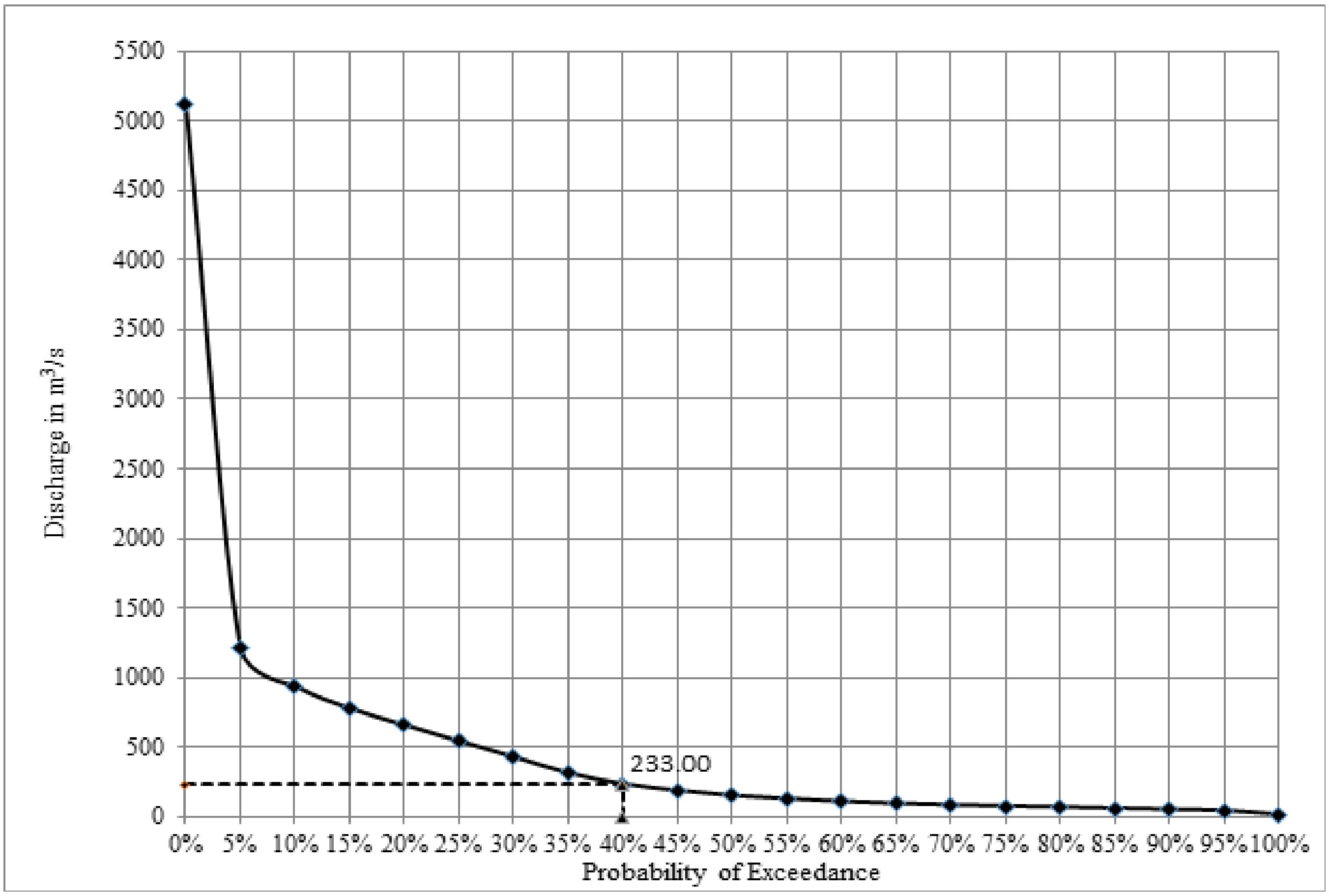

Figure :3 A typical FDC

From the FDC above, it can be expected that the river is perennial with the sustained flow available throughout the year. If a project is designed on such rivers, one need not to worry on sustained power flow because the flow fluctuation on these river is very low.

After fixing the design discharge, from the long term daily/monthly data of the river, average monthly flow is calculated. Since the published data are in the form of Gregorian calendar, the flows are converted to Nepali (Bikram Sambat) calendar. As for PPA, NEA follows

Bikram Sambat calendar if not FDI-related PPA. Head of the project is fixed, once the diversion head works and power house location is fixed. All the head losses are incorporated and the net head of the project is calculated. With the design discharge, net head and overall efficiencies of electromechanical machines, installed capacity of the project is fixed. As, for the ror based plant, since the flow of every month is different, apart from the wet season (flow will be Qd), energy generation will be different. Out of the total energy, dry energy is segregated and the higher PPA tariffs will be given to the dry season energies.

8. GLOF and its impediments on Hydropower Projects

Glacier lakes are basically the lakes formed by melting of glaciers behind loosely consolidated and moraine dams. These lakes are inherently unstable and are subjected to catastrophic drainage. They are potential sources of danger to the downstream. The torrent of water and associated debris that sudden lake discharges produce is known as Glacier Lake Outburst Flood (GLOF). It is caused by sudden release of stored water and associated debris due to breach in the glacier moraine dam. They are characterized by high peak discharge, high velocity, and very high sediment/debris load. Besides the peak discharge (floods), the high magnitude of sediment it carries is the major threat to hydropower plants and other structures along with the communities in the downstream.Recent study has shown that such lakes are in increasing rate in Nepal and passing threats. So far Nepal has experiences 24 GLOF events.

Few of the GLOF events that hit the some of the hydro powers so far are:

- The Zhangzangbo GLOF (July 11, 1981), originated in China caused substantial damage to the diversion weir of the Sun Koshi Hydropower Plant.
- Dig Tsho GLOF (4 August 1985) in the Khumbu region (Eastern Nepal) destroyed nearly completed Namche small hydroelectric plant.

Hydropower projects to be developed in the higher altitude region are susceptible to the danger of Glacier Lake outburst flood. Guidelines of Study of Hydropower Project, 2018 prepared and published by DoED has included the study of GLOF during the feasibility study report. An important consideration of assessing GLOF risks on hydropower projects is to compare the peak flood from GLOF and the hydrological design flood that is used to design the hydraulic structures. For an instance, Thulagi Lake, lies at the end of Thulagi Glacier to the southwest of Mount Manaslu in the headwaters of the Dana Khola, a tributary of the Marsyangdi river. This lake has attracted much more attention because several hydropower projects are planned in the Marsyangdi river basin. Marsyangdi and Midlle Marsyangdi HPPs have already been commissioned, and nearly above 700 MW capacity of projects have already applied for PPA application. This lake began to form some 50 years' ago and in expanding rate ever since. As per the report by ICIMOD, the area of the lake has increased from 0.76 to 0.94 sq.km and the length from 1.97 to 2.54 km from 1995 to 2009.

9. Conclusion:

Run-off-river projects that are designed for higher dependable flows (higher value of probability of exceedance of flow) are less vulnerable to flow reductions than those designed for higher design discharge. This is because higher design flows lead to more energy variations with flow variations. Run- off-the river has the dominance in the energy sector, and are comparatively more affected by hydrological variability. 80% of rainfall occurs in the four monsoon months, coinciding with seasonal snow melt, resulting to the seasonal variation of the flow and eventually seasonal power generation. Hydropower production in Nepal is highest in summer, when demand is lowest, and lowest in winter, when it is most needed. The electricity surplus in summer cannot be stored, nor the energy consumption is high in the country, nor it can be exported because of the insufficient transmission network and unfavorable commercial framework. Storing water during the wet season and producing power in the dry season is crucial for the viability of the power sector and for meeting the country's needs.This depicts the role of PoE on designing hydropower projects. Government has tried to address the gap of seasonal load fluctuation in the country by issuing the directives to have projects designed at Q_{45}, whereas the private sector, which now has become one of the major contributors to energy generation in the country has clearly denied to accept the provision of Q_{45} as it would discourage the investment on high capacity projects.

Looking over the increasing rate of development of the hydropower sector in Nepal, the power deficit during dry season should be addressed by encouraging and constructing reservoir based projects. Next challenge for NEA and the Energy sector is going to be the utilization of generated energy in wet seasons. We should resolve it either by encouraging the energy consumption inside the country or by cross-border power trading with India. Also, bilateral power exchanges have been slowly evolving in the South Asia. If wheeling services are provided by Indian National Grid for using its transmission network, we can be a major exporter of power to other countries as well. Also a study of USAID had concluded that through energy exchanging, technical social-economic benefits would accrue to South Asia Growth Quadrangle (SAGQ) involving India, Nepal, Bangladesh, and Bhutan.

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POWER MARKET PORTFOLIO TO UTILIZE AND ECONOMIZE THE SURPLUS ENERGY

Abstract

Nepal's power market has always been largely focused on maximization of energy generation in the country with a long term goal of exporting the excess energy to neighboring countries. With significant contribution from NEA and private power project generators, Nepal is envisioned to be in energy surplus in next few years. Hence, it is the time to think of a proper energy market. Looking at the demand pattern and developmental activities, it is less likely that all the energy generated will be consumed in the domestic market. We cannot solely depend on cross-border power trade because at times of geo-political hiccups or fluctuations in energy requirements in neighboring countries, it would be too big a risk to deal with. It would be ideal to maintain a portfolio of power market comprising of cross-border trading, energy storage, and increasing internal consumption so as to utilize as well as economize the surplus energy. Proper utilization of available energy is directly linked with economic development of a country and it's a high time that we weigh upon the constraints, the key enablers and the way forward.

Keywords: Power Market, Power Market Portfolio, Energy Surplus, Cross Border Power Trade, Power Exchange, Energy Storage, Green Hydrogen, Electric Vehicle

1. Background

It is always a pleasure to begin every write-up saying that Nepal is blessed with tremendous hydro electricity generation potential and a good share of solar energy potential. There are numbers of hydro and solar developers who are working in developing power plants using these resources. The present installed capacity of Nepal is 1,462 MW which is about 10% increment compared to the previous Fiscal Year 2076/77. It is estimated that about 1,700 MW of power will be added to the national grid by Fiscal Year 2078/79. The national pride project, Upper Tamakoshi Hydropower Project is also expected to start generating energy in its full capacity in the coming few months. There are many other large hydropower projects under planning and under-construction phase. The White paper 2075 issued by Ministry of Energy, Water Resources and Irrigation envisions generating 15,000 MW of power by the year 2028 A.D. To reinforce energy generation in the country, White paper, 2075 also talks about energy generation mix which comprises of power generation from Storage/Pumped Storage, PROR, ROR types hydropower projects and alternative energy sources (mostly Solar).

Given that the large hydropower projects to be commissioned by next 10 to 15 years, as envisaged, we would have lots of energy flowing in the national grid. Even as we stay in the lower probability side, it is most likely that there would be near about 3,000 MW power addition in the system in next few years. But as compared to the expected generation, no significant increment has been observed in domestic energy demand in our system. The highest demand for energy, recorded in Fiscal Year 2077/78 was about 1,482 MW (as recorded in the month of Baisakh, 2078), which is just about 5% increment over the earlier Fiscal Year's demand. The White Paper, 2075 envisions increasing energy demand to 5,000 MW but it is difficult to reach such a goal with mere increment in household consumption and limited industrial and commercial consumptions.

2. Utilizing and economizing the available energy

Most of the ambitious goals and aggressive progress of energy generation in the country was out of two basic reasons. First, the country required more energy to combat power crisis the country was facing for decades till 3 years back; and second, to export the surplus energy to earn out of it. Assuming that the energy generation continues to grow, we would have an energy surplus situation soon in the country. So, the second option is still an ideal one. We do need a proper energy market to utilize the available energy. Otherwise, we would be incurring huge financial and energy losses. Nepal's meager economy cannot handle such risks. To minimize risks, therefore, we should be exploring energy market mix as in portfolio of energy market, just as we talk about energy generation mix to reinforce generation.

A portfolio of energy market is because the risk appetite of Nepal is not too strong at present. If we consider the recent events such as in late January, 2021, Nepal lost its first ever bid submitted to Indian DISCOM, BSES Rajdhani Power Ltd. to sell electricity to India due to the simple fact that Nepal's selling price was not competitive enough for India's highly competitive power market. Further, India's solar power tariff went down to IRs. 2/unit in November, 2020. With the present cost of generation going down in India, Nepal will be facing difficulty to compete with such price discovery. Atop this, India's recently published cross border power trading procedure, namely; *"Procedure for Approval and Facilitating Import/Export of Electricity by Designated Authority"* restricts Nepal to sell power generated from projects involving Foreign Direct Investment (FDI) from certain countries. Nepal has always had diplomatic ties with all other nations so FDI has always been welcomed in the country. However, due to the cross border guidelines of India, our national goal of selling energy in Indian market has been somehow restricted. These series of events have triggered some insecurities in Nepalese power sector which has been aggressively emphasizing hydropower generation. So, all our generation ambitions directed towards export might backfire which would be too onerous on the Nepalese economy.

Therefore, this article tries to touch upon the importance of maintaining a portfolio comprising plans like cross-border trading, energy storage, and strategies for increasing domestic consumption so as to utilize as well as economize the available energy. First, let us scrutinize the importance of having them one by one:

2.1 Cross border power trading and exchange

India has a well-developed power market. As an immediate next step, it is beneficial for Nepal that we explore their market options. Nepal shares a decade's long power trading and exchange relationship with India. In fact, Nepal has been relying heavily on Indian power market to fulfil the peak demand in the country, especially in our dry season. However, as we move towards harnessing our energy generation potential, we would need market to export energy as well. Nepal can be especially benefitted from the energy resource endowment and demand/supply complementarities that it shares with India. Nepal has already entered as a buyer in Indian power exchange market (Indian Energy Exchange – IEX) apart from the existing bilateral agreements with Indian power traders. Nepal is expected to be granted approval soon enough by Ministry of Power, India through Designated Authority of India, i.e., Member (Power System), Central Electricity Authority for selling power in the same platform. NTPC Vidyut Vyapar Nigam (NVVN) has already submitted project wise applications to the Designated Authority on behalf of Nepal Electricity Authority to sell power to exchange market of India.

At the regional and sub-regional level, there have been ongoing dialogues about collaborating with BBIN regions involving Bangladesh, Bhutan, India and Nepal and among SAARC nations to initiate regional power trading and exchange. There are many other benefits of being connected with other countries especially when they share such complementing relationship such as power utilization and economization, daily load variation management, improvement of system reliability, competitive energy price discovery, helping each other meeting global renewable energy obligations and so forth.

There are many challenges for Nepal to initiate such collaborative approaches such as the obvious existence of poor power transmission network and weak infrastructure. The threat is equally there in the form of policy constraints. Trading is not yet identified as a licensed activity by Electricity Act, 1992 of Nepal and we do not have cross border guidelines, open access regulations as of now. Thus, we do have lots of challenges but it is essential that we overcome them to the soonest possible so that we may connect to the regional grid network so as to reach wider power market for our surplus (envisioned) energy. Therefore, establishing regional trading and exchange platform is an ideal matter to be accomplished as a long term development in power sector.

2.2 Energy storage

About 75% hydropower projects that are in operation and under various stages of construction phase are Run-off-River (RoR) type hydropower projects, whereas only about 21% and 4% are Peaking Run-off-River (PRoR) and Storage type projects respectively. The geography of Nepal is such that it is difficult to build storage dams and peaking ponds in many hydropower projects. So, the percentage of peaking and storage hydropower projects does not seem to rise very high in future, too.

As we move towards the surplus situation, we had better explore the energy storage options, too. Thapa et al., 2021 carried out a study to forecast the green hydrogen production potential from envisioned surplus hydroelectric energy for the period of 2022-2030. It was found that hydrogen production potential ranges from 63,072 tons to 3,153,360 tons with the utilization of surplus energy at 20% and 100% respectively, in 2030.[1] There are many projects planned as well as running around the globe that uses the electricity generated from hydro, solar and wind power plants to run the electrolyzer which then converts the electricity into green hydrogen through electrolysis process.

Green hydrogen is the clean form of hydrogen, which has very versatile usages as chemical storage, energy carrier, and feedstock for industrial production. Increased hydrogen use can substantially reduce Green House Gas (GHG) emissions in hard-to-abate sectors, particularly steel and cement production, heavy-duty transportation, shipping, and aviation, help to address challenges in balancing intermittent renewables, and reduce air pollution in cities.[2]

The Kathmandu University (KU), on the occasion of World Environment Day 2021 on June 5, 2021, proposed "National Hydrogen Initiate (NHI) 2021-2030" which is a joint initiative of Nepal Government and KU that mandates to establish the policy foundations, develop an implementation action plan and incubate a value chain for the business development with Green Hydrogen as the driving factor to address the existing and upcoming challenges of the environment, fuel, energy, economy, and industrial development in Nepal.[3]

KU and Nepal Oil Corporation (NOC) signed an agreement on February 25, 2021 to initiate the project "Technology Transfer and Local Adaptation for developing NOC as a hydrogen fuel producing and distributing company".[4] This is a very commendable initiative that has following two major significances:

a) Firstly, we may use the surplus energy from RoR hydropower plants to produce green hydrogen and then use the same as transportation fuel. Thus, we will be utilizing the excess energy rather than spilling them in the absence of proper market.

b) Secondly, we may minimize our dependency on fossil fuels and maximize the usages of green hydrogen as transportation fuel which would contribute towards lesser carbon emission.

The prospect of trading of green hydrogen cannot be ignored. Globally, countries are struggling to comply with Paris Agreement, 2015 to limit the global warming

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[3] http://ghlab.ku.edu.np/nhi/

[4] http://ghlab.ku.edu.np/agreement-signed-between-ku-and-noc-for-green-hydrogen-project/

to 1.5 degree Celsius. In such a scenario where many countries are struggling to keep up with such accord, Nepal could pitch in to contribute through trading of green hydrogen. Challenges would be there in the form of infrastructure, technology, policy, and investment. However, it would be worthwhile if green hydrogen could be accounted for the prospect of economizing the surplus energy.

2.3 Strategies for increasing consumption

Nepal has always been carrying out export – oriented generation strategies. Export of energy depends on many things such as geo-political ties with neighbouring countries, domestic and international policy and regulatory frameworks, investments and country – specific power requirement. Contemplating the recent events as discussed earlier, there is this fear of being unable to tap the cross border power market for export. In case some hurdles come on the way for cross border transactions of power, we cannot risk spilling our energy. So, there is an urgent need to develop the strategies to consume the energy produced in the country. It should be our priority also from the perspectives of national economy and energy security.

Energy consumption is directly linked with economic development of the country. 93% of electricity consumers in Nepal are household consumers. Only about 2% of total consumers belong to Industrial and Commercial sectors that have altogether 52% of contribution in total Electricity Sales Revenue (Source: NEA, A Year in Review, 2076/77). Household consumption alone cannot increase the demand significantly unless we are planning to replace cooking fuel by electricity which may increase the demand to some extent and also, contributes largely towards minimizing our dependency upon the expensive Liquefied Petroleum Gas (LPG) in urban areas and firewood in rural areas. However, to lay the foundation for sustainable development and economic upliftment alongside, it is imperative that the transportation and industrial sectors should be electrified if we are talking about increasing the energy consumption in the country.

Nepal has definitely launched steps towards promotion of electrical vehicles in the country. Nepal Electricity Authority (NEA) has initiated a project, “Electric Vehicle Charging Station Construction Project” which aims to support the government’s vision of clean transportation system to reduce the fuel import in the country. A total of 50 numbers of DC fast chargers are being planned to be installed under this project, especially along the major highways and cities of Nepal. Such infrastructure building is very essential along with governmental intervention through enabling policy framework to encourage the usages of electric vehicles.

Similarly, the surplus energy can be better justified if massive industrialization happens in the country. The ambitious goal of Government to increase energy demand to 5,000 MW and per capita electricity consumption to 1,500 MWh by 2028 A.D. can be only met if we are to expand this group of consumers. Interestingly, industrial and commercial sector can largely impact the economy of any countries as they contribute towards job creation, manufacturing of goods/services and availability of goods/services for consumption at a competitive rate thus, pushing the country towards self-subsistence.

3. Way Forward

For a predominantly hydro country like Nepal, energy plays a significant role in economic development. Our long term plan has always been export-oriented generation of hydro-electricity. Ambitious target in the field, of course, requires heavy investment. As a result, numbers of private players have also entered the market. In fact, private players are leading the sector with 108 generation projects having 814.6 MW of installed capacity connected to national grid and another 224 hydropower, 12 solar and 1 bagasse projects having total installed capacity of 5,358 MW that have signed power purchase agreement with NEA and are under construction phase. Besides them, many large size hydropower projects are under preliminary study phase such as Upper Arun, Dudhkoshi (Storage), Tamakoshi V, Uttar Ganga, Betan Karnali, Phukot Karnali and so forth. So, we can say that, sooner or later, we are bound to have surplus situation in the country, when they come in operation. Presently, we have a small market where demand stays below 1,500 MW only. Apart from exporting, it seems that we don’t have any concrete plans at the moment to utilize excess energy though Government is very much intent on increasing demand and per capita electricity consumption. It’s good to learn that Government has emphasized on promoting electric vehicles and induction stoves with a vision to replace fossils with electricity as transportation and cooking fuel. However, we need even more aggressive planning to utilize the surplus energy that we are hopeful to have in the system.

The major drawback that we have often encountered in the power system of Nepal has been the inadequacy of required transmission infrastructure. At present, we have only one cross-border transmission line, i.e., 400 kV Dhalkebar – Muzaffarpur transmission line. In addition to this, ten other high voltage cross border transmission lines have been identified for power import/export to/from neighboring countries to be commissioned in different time frames, namely, 2018-19, 2021-22, 2025 and 2035. Hopefully, the second cross border transmission line of 400 kV, New Butwal – Gorakhpur, will be started soon which is expected to ease the cross border power transaction as it gets completed. Even the domestic transmission network is not strong and the transmission losses and outages that we bear are quite huge at the moment. NEA has been working relentlessly to strengthen the network. Hopefully, this constraint will be solved soon.

The constraint is equally there in the form of policy frameworks. Mostly in the case of cross – border or regional connectivity, it would be essential to have harmonized grid codes, rules and regulations, market monitoring and surveillance frameworks to guide the operationalization of exchange and trading platform. Similarly, when the G – G collaboration comes, there needs to be a proper rapport building among the nations so as to keep the energy transactions free of geo-political hiccups.

Apart from the required infrastructure, governmental intervention and investment shall be the key enablers for maintaining a portfolio as such. Firm intervention from governmental level is very much essential to develop the required policy frameworks to mandate the environmental and energy standards. Adequate investment often forbids countries to jump into action no matter how good the policy looks like. Once the policy framework gets outlined, deciding upon the funding modality becomes important. These kinds of activities deliver timely and better results when executed through public – private collaboration. Lastly, newer technological breakthrough becomes effective only when driven by trained human capital. So, alongside, to prepare human capital for such changes, proper training and development should be embedded while exploring the effective power market dynamics.

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Impact of Existing Hydropower Policy to Encourage Investment

In fact, low-cost hydropower generation in Nepal is rare in the world. The main reason for this is that the big river originates from the mountains. Many rivers flow uninterruptedly due to the melting of snow from the east-west mountain ranges on the northern border of Nepal. Gandaki, Koshi and Karnali are the major rivers in Nepal. However, rivers flowing in flat geography cannot be useful from the point of view of hydropower. Out of 83,000 MW, 32,000 MW from Karnakarli Basin, 21,000 MW from Gandaki Basin, 22,000 MW from Koshi Basin and 8,000 MW from other rivers can be generated of which, 42 thousand 133 MW has been deemed financially and technically suitable.

In fact, Nepal has failed to grasp the opportunity that exists in Nepal. Obviously, there are many problems in the areas of hydropower sector. The implementation of hydropower policy has been very weak. The market for sale of electricity produced has not been guaranteed. Promoters have faced many procedural problems in connection with the construction of hydropower projects. The construction of medium size hydropower project has not been completed for ten years. Stakeholders' demands have been ignored while formulating hydropower policy. Hydro developers have been facing problems in terms of survey, construction, distribution, cash subsidy, tree felling, land acquisition, rehabilitation, demand of locals, transmission lines, industrial security, inter-agency coordination etc.

1. Probability of Hydro Electricity in Nepal

In the Constitution of Nepal 2072, the policy provision of multi-purpose development of water resources has been adopted by giving priority to internal investment based on public participation. The constitution stipulates the development and promotion of the hydropower sector through government, private and community investment as well as foreign investment to attract investors.

After the adoption of liberal economy, the tradition of selling electricity generated by the private sector by constructing hydropower projects to the Nepal Electricity Authority began. At present, hydropower projects are being constructed by Nepal Electricity Authority, subsidiaries of Nepal Electricity Authority and domestic and foreign private investors.

In terms of modalities, public, private and public-private partnership have been practiced. Trishuli, Kulekhani, Marshyangdi, Kaligandi A, Rahughat, Trishuli 3A etc. are the projects owned by Nepal Electricity Authority. The 22.1 MW Chilime Hydropower Project and the 456 MW Upper Tamakoshi HEPS are built on Public Private Partnership Model have been adopted. Rasuwagadhi, Madhya Bhotikoshi, Syanjen are under construction by sister company Chilime Hydropower Company Ltd. Khimti, Bhotekoshi etc. are projects with direct foreign investment. Mistrikhola, Khanikhola, Hewa, Balefi etc are the projects being constructed by the domestic private sector.

2. Importance of hydro electricity

Hydropower is also the cornerstone of industrial development. With the construction of the hydropower project, there is an opportunity to invest the money being spent on the import of petroleum products in the productive sector. The importance of hydro electricity is illustrated as below-

(i) Promotion of agriculture sector

Energy is obtained when hydropower projects are constructed. Operating pump set or lift irrigation with electricity means increasing the production of the agricultural sector. During the construction of the hydropower project, roads and bridges will be constructed up to the project site. The construction of the road will help in transporting the agricultural products to the trading center. With the construction of hydropower projects, local agricultural products not only gain market, but also promotes economic activities.

(ii) Job creation

The hydropower project is a productive industry in itself. During the construction of the project, a large number of skilled, unskilled and semi-skilled manpower gets employment. Even after the completion of the project, there will be regular employment for certain manpower. On the other hand, access road, electricity, telephone and drinking water may have to be provided during the construction of the hydropower project. Similarly, promoters can build schools, health centers, parks and gardens. The problem in energy supply can be management of agriculture, tourism, manufacturing or other similar sectors. Due to all these activities, it will help in job creation.

(iii) Industrialization

The availability of cheap electricity means that the cost of industrial production is reduced or the products can compete. Where energy is available at affordable prices, investors are attracted to invest. If more energy is not available, the demise of industry is inevitable. If we look at our example in the past, there is a precedent that 68 percent of industries have collapsed due to energy.

(iv) Petroleum products import substitution

At present, Nepal imports 1.4 million cylinders of LP gas annually. Ironically, most LP gas is used for cooking or operating three-wheeled vehicles. Similarly, more than 100 billion petroleum products are imported annually. These are things that can be replaced by electrical energy.

(v) Forest conservation

In Nepal, 68 percent of the total energy requirement is being supplied from firewood, 8 percent from animal dung, 8 percent from fossil fuels, 8 percent from agricultural products and 1 percent from electricity. This means that large-scale deforestation is taking place in rural areas to meet energy needs. Which can be replaced by electrical energy.

This study is considered to be important to formulate new policy and make necessary amendments in the existing policy before addressing the policy shortcomings in the hydropower sector which are very important in the fields of agriculture, forest, industry, employment, foreign exchange, energy supply etc.

3. An overview of existing laws

Several laws relating to hydro electricity such as Electricity Act 2049, Water Resources Act 2050, Electricity Regulations 2050, Electricity Leakage Control Policy 2058, Hydropower Development Policy 2058, Water Resources Strategy 2058, Water Resources Plan 2061, Investment Board, Act 2068, Hydropower Project Directive 2068, Hydropower Project License Survey Directive 2068, Load Shedding Minimization Action Plan 2069 and Hydropower Development Agreement Procedure 2071 have been issued.

(i) Water Resources Act, 2049

The Water Resources Act, 2049 provides for the use of water resources for drinking water, irrigation, hydropower, water transportation and tourism promotion. Similarly, private and public houses and lands can be used for the construction of hydropower projects and conservation of water resources should be taken care of while using water resources.

(ii) Electricity Act, 2049

The Electricity Act, 2049 provides for obtaining permission for hydropower survey, generation, transmission and distribution. However, there is a provision that permission is not required for projects up to 1000 kW capacity. Survey license will be issued for a maximum of 5 years. If the survey is not completed within that period, the license can be revoked. Survey permission must be given within 30 days, after the survey permission must be given for production, broadcasting and distribution. The maximum period of production, transmission and distribution is 50 years.

(iii) Hydropower Development Policy, 2058

After the Hydropower Development Policy, 2058, non-tourist visas and work permits are provided to the investors, skilled workers, their families. Investors can use private and public land for hydropower generation purposes. Similarly, study survey license for projects up to 10 MW capacity should be given within 60 days of submission of full details and all other types of permits should be given within 120 days of submission of full details. Validity period of survey license should be 5 years and generation license period should be 35 years for internal demand supply.

(iv) Foreign Investment Policy, 2071

One step center service has been made in the Foreign Investment Policy, 2071 There are good provisions foreign exchange facility, industrial security, treatment like the natives, non-nationalized capital till the concession period and return earned. In the case of hydropower generation and transmission, a lump sum cash grant can be provided on the basis of unit cost of tax and tariff paid by the investor on the materials used in the hydropower project.

(v) Industrial Business Act, 2076

In the Industrial Business Act, 2076 the hydropower sector has been listed as a national priority industry. The Act provides for 100 percent exemption in income tax for the first 10 years and then 50 percent for the next five years if hydropower is generated, transmitted and distributed by 2080.

4. Problems faced by hydro electricity sector

A. Based on secondary data :

Hydro sector of Nepal is facing numerous issues. Hydro developers are facing especially political, economical, social, technical, institutional, environmental, ecological, physical and geological issues during developing hydro power projects. On the basis of secondary data, following problems and issues are indicated :

i) Payment disputes

Hydro sector is facing payment disputes. "As the hydropower projects are often associated with high construction costs, it is a common trend in Nepal to delay payments to the contractor, sometime creating many issues related to severe cash flow problems. In addition, the Contractor always claims for more than what it has really performed. Thus, the Client/ the Consultant wants to delay or decrease the items to be certified.",(Abhushan Neupane, p, 57). Such statements indicate that prevailing policy is not able to address the Payment disputes.

(ii) Transportation cost

High transportation cost is an issue regarding hydro sector. "The developers have to bear the high costs of transporting the heavy machinery and equipment required to these remote areas.", (Gopal K. Sarangib , Anju Panditae , Sultan Ishaqc , Nabir Mamnund , Bashir Ahmadc , Muhammad Khalid Jamilc,p. 451). Such statements state that existing policy is not able to combat with Transportation cost.

(iii) Design/model Changes during Construction

Change in circumstances is an issue for hydro sector. "The circumstances anticipated during the project planning, designing and contracting changes during the construction of the project. The changed circumstances often require lengthy variation order procedures. The approval and payment are often laden with difficulties from various watchdogs and authorities."(Abhushan Neupane, p.57). It means there are policy problems regarding change in designs or variation order.

(iv) Transmission lines

Transmission line delay is one of the repeatedly occurring problems of hydro sector. "Lengthy transmission lines passing through the mountainous terrain need to be installed to evacuate power to the main grids, resulting in increased project costs." (Gopal K. Sarangib , Anju Panditae , Sultan Ishaqc , Nabir Mamnund , Bashir Ahmadc , Muhammad Khalid Jamilc, p.453

(v) Unfair demands of local people

Hydro developers are suffering with unfair demands of local people. "project implementation faces the problem as local people unfair demands and cause disruption in the construction work (Hari Dhungana, p,18). It is obvious that existing policy is not able to address unfair demands of local people.

(vi) Lack of technical manpower

Lack of trained technicians and engineers is also resulting in poor maintenance of plants. Technical constraints related to design of micro-hydro turbines are also resulting in lower production efficiency. (Gopal K. Sarangib , Anju Panditae , Sultan Ishaqc , Nabir Mamnund , Bashir Ahmadc , Muhammad Khalid Jamilc, p. 450)

(vii) Resettlement and Rehabilitation

Resettlement and Rehabilitation is an unsolved issue of hydro sector. "Unlike the 1992 policy, which is silent on the resettlement of project affected people, the 2001 Hydropower policy encourages the development of large storage and multipurpose projects. It mentions that the project has to rehabilitate and resettle the families to be displaced while generating, transmitting and distributing electricity in accordance with the standards set by the Government of Nepal. The standards, however, have not been developed.",(Hari Dhungana, p.18). Such statements indicate that prevailing policy is not able to address the problem of resettlement and rehabilitation.

(viii) Acquisition of land

Local communities living in areas adjoining hydropower projects are the most vulnerable to the impacts of these projects. Most influential issues are the acquisition of land for project development, including displacement of local people.

(ix) Bank interest

Long term capital is essential for hydro sector. "Nepal's electric power sector has been trapped in low-level investment equilibrium. ", (ADB). "Problems are compounded by issues related to mobilizing private capital, asset–liability mismatch and lack of awareness in the banking communities about such projects. High interest rates combined with short loan tenures further complicate the problem.", (Gopal K. Sarangib , Anju Panditae , Sultan Ishaqc , Nabir Mamnund , Bashir Ahmadc , Muhammad Khalid Jamilc) .

(x) Environmental protection and IEE Issues

Environmental protection and IEE/EIA issues are rally challenging "There was no clear environmental law during the formulation of 1992 electricity act and the hydropower development policy. Both these policy and legislation mentioned that the hydropower projects have minimum adverse impact on the environment. However, after the introduction of Environmental Protection Act (1996) and Regulations (1997), environmental standards were enforced in a wide variety of projects. The regulations categorized projects that required environmental impact assessment (which are generally likely to have greater impacts) and initial environmental examination (IEE) for smaller projects. "(Hari Dhungana, p.20)

B. Based on primary data

On the basis of primary survey, following problems can be identified :

(i) Regarding shortcomings in policy formulation,

Regarding shortcomings in policy formulation, 63.6 % respondents indicate shortcomings in policy gap analysis, 36.4 % respondents indicate shortcoming in involvement of stakeholders and 27.3% respondents indicate ambitious policy formulation. Hence nearly two third respondents indicate weakness in policy gap analysis.

(ii) Regarding problems faced during project development

Regarding problems faced during project development, 40.9% are related with land acquisition and rehabilitation, 36.4% are related with transmission line construction delay, 22.7% are related with regional policy implementation as well as demand and pressure from locals, 18.2% related with behavior of the bureaucracy and 13.6% are related with power purchase agreement (PPA) as well as concessional loans.

(iii) Regarding problems within the policy cycle

Regarding problems within the policy cycle respondents constitute %40.9 with enforcement, 27.3%, with policy monitoring, 22.7 % with policy analysis and 13.6% with policy evaluation. Hence we can conclude that there is problem in policy execution rather than sound policy formulation. Regarding responsibility to implementing policy, 95% respondents opinion that political and administrative will is responsible for weak execution of hydro power policies. Hence survey shows that policy execution is major weakness in the policy cycle

(iv) Regarding investment friendly hydro electricity policy

Regarding investment friendly hydro electricity policy, 31.8 % respondents suggest to exact implementation of laws and regulations as well as improving the behavior of the bureaucracy, 27.3% suggest for long-term loans at concessional rates, 18.2% suggest for tax and fee waiver and 13.6% suggest formulating new policy as well as ensuring market. Here also implementation of existing policy is regarded as a major bottleneck.

(v) Regarding delay of mega projects

Regarding delay of mega projects like West Seti (750 MW) Upper karnali (900 MW) and Budhigandaki(1200 MW) respondents (90.9 %) point out political will as responsible.

(vii) Regarding exact implementation of hydro related policies

Regarding exact implementation of hydro related policies 45.5% respondents expressed less satisfactory, 18.2 % expressed satisfactory and 36.4 remain neutral. In context of exact implementation of policy nearly 50 % respondents are not seen satisfactory.

5. Conclusions

Secondary data shows that there are problems in terms of payment disputes, high transportation cost, confusion in model determination, transmission lines delay, unfair demands and pressure of local people, lack of technical manpower, resettlement and rehabilitation, acquisition of land, compensation for harms, high rate of bank interest, and environmental impact assessment procedure. On the other hand implementation of existing policy is weak due to high ambition in policy and there is no guarantee of market for electricity selling. Developers are facing many bureaucratic or procedural problems.

Primary data shows that one fourth respondents are unknown about hydroelectricity related policy matter. Nearly two third respondents indicate shortcomings in policy gap analysis during policy formulation. Respondents indicate problems in terms of land acquisition, rehabilitation, transmission line, regional policy implementation, pressure from locals, and behavior of the bureaucracy, policy enforcement, policy monitoring, policy analysis, policy evaluation and power purchase agreement. Respondents think that political will is responsible for delaying mega - projects. On the other hand they express less satisfaction in implementation of prevailing policies. Hence it is found that the participation of stakeholders is overlooked. Respondents suggest for exact implementation of laws and regulations, improving the behavior of the bureaucracy, providing long-term loans at concessional rates, tax and fee waiver, and ensuring market.

Recommendations

Hydroelectricity - related policies should be objective - oriented and result- oriented. Policy monitoring, evaluation and implementation should be on prior focus for achieving the desired goals on time.

- Hydroelectricity policies still lack farsighted, sustainable and resilient vision and mission. Policy should be formulated by bottom - up approach and government must create the environment to implement it.

- Company registration process and other legal procedures are lengthy which is frustrating the investors. So company registration process and other legal procedures must be made easier.

- In Nepal, most of the plans remains on paper because of lack of proper implementation. Many issues like political instability, fluctuating environment, lack of commitment, top-down approach in planning, dependency on other countries for financial, technical and human resources, corruption, low citizens-and-stakeholders participation, weak monitoring and evaluation and lack of benefit sharing need to be sorted out.

- There is the trend of occupying the license of hydropower projects by the elite communities, relatives of the higher ranking officials because of which interested communities are forced to purchase the license by paying huge amount which is hiking the price per Megawatt. So, if any license holder fails to launch the project on time, license must be cancelled and it should be handed over to next.

- There is the conflict and communication gap between the concerned government authorities. One provides the license for the hydropower generation, whereas the next does not grant permission to cut down the trees for the construction of the transmission line. So these things should be analyzed before providing the license.

- Due to the provision in hydro sector that the promoter share will be converted into the public share after three years of issuing the shares to the general public, promoters are hiking the price of the share during the time of share conversion, issuing right shares just to pay the bank loan and auctioning the undistributed shares at the high rate. Because of these activities, new investors are forced to lose their hard-earned money. Therefore, a strong regulatory body is required to regulate the hydro sector. It is expected that Electricity Regulatory commission will pay adequate attention to it.

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Future Necessity: Up gradation of Distribution System

Nepal has undergone a lot of changes since development of first hydropower project (Pharping Hydropower Project). At first, only royal families and royal palaces in Kathmandu had the privilege of using electricity but later, other common peoples beside royal families also start to get the chance of consuming electricity. With time, slow progress was seen in energy sector but after establishment of Nepal Electricity Authority (NEA), very rapid and lot of progress can be seen in very short period of time. Distribution and consumer service directorate (DCS) of NEA possess the responsibility of distributing electricity at each and every household at required demand. It deals with the expansion of distribution line, maintenance of distribution line and operation and maintenance of the substation of 33KV/11 KV.

Nepal has faced different kind of problem from time to time in energy sector. There used to be up to 18 hours of loadshedding which is due to imbalance between generation and distribution. At that time, generation of power in Nepal is low but now a lot of new hydropowers (Both NEA and IPPS) are being interconnected to national grid and furthermore, many new projects of high rated capacity are soon to be connected which is going to cause excess surplus energy that is why now NEA has focused on increasing the power consumption and encouraging the consumer to use more electrical appliances.

Even though, problem of load shedding is dealt couple of years ago, consumer are still facing problem of frequent power outage which is due to many reasons such as lack of proper bush cutting, overloading of transformer, very lengthy feeders, old distribution structure. All the problems mentioned above can be solved in very short period of time except old distribution structure. This very problem is going to cause a lot of effect in near future if it is not dealt and upgraded as soon as possible.

The physical structure of distribution system (i.e. pole, conductor) has become old and in most of the area, same structure are being used from its establishment which were decade ago. At that time, the structure were made in order to withstand the load of that time so conductor used are of small size, pole used are of small height. Now the number of consumers are increasing in exponential manner so does the load hence the structure are getting overstressed and likely to fail in near future.

These below givens are the factors that are related to up gradation of distribution system.

1. Conductor Size

Every conductors has its own specification such as physical measurement, current carrying capacity, thermal withstand level, flexibility. Usually, diameter of conductor is directly proportional to the current carrying capacity and thermal withstand level. eg dog conductor has more stress handling capacity than rabbit and weasel. As we can see in our existing distribution system, conductors are being used not by calculative requirement but rather by ease while stringing it. For eg weasel conductors are being used for 11kv line which is risky because there is very high chance of breaking of conductor if fault occurs in line. In LT line small size conductor causes more loss as compared to large size conductors. So for sake of both protection and loss reduction, large size conductors is suitable to use so NEA should upgrade the size of conductor of distribution system. Breaking of conductor occurs in large number and a lot of accidents are due to breaking of conductor.

2. Insufficient load center/ substation

For good voltage regulation and for less loss, sufficient number of load center has to be installed but due to various reason such as problem in land acquisition, unfavorable landscape, it is getting hard to form new load center. Large sized substation required large area of land and high voltage tower requires large right of way which cannot go through populated area. If there is only few substation then feeder length will be very long which causes more unreliability and power quality will be low.

3. Inappropriate load center placement

For better voltage regulation, load center placement plays the major role. The ideal placement for load center is in middle of the load consumption so that loss would be same which provides good voltage regulation but it is not feasible in practical because of land acquisition problem, geographical reasons. Substations are usually built at feasible, access area so distribution of load is not uniform so system become unreliable.

4. Automation

The reliability of DCS is in direct connection with the automation of system and equipment. More the automatic system, higher will be the reliability. New added Substation and hydropower projects are made to operate automatically but old projects are semi automated and Complete manual. In DCS, most of the 33/11 KV substation are semi-automated but all the equipment after 11 KV to 400 V are completely manual. Lack of automation increases the time taken to clear fault which decreases the reliability of system.

5. Reliability

Reliability is now a major issue related to the DCS. People nowadays want reliable power with good voltage regulation. Reliability is now NEA's major challenge after load shedding. Large number of power cut during a day has misled the consumer thinking that load shedding has started again which is completely false but reliability is very poor which is due to lack of proper bush cutting, very lengthy feeder, non-updated substation, old distribution structure.

6. Loss Reduction

There are two types of loss in electrical system. One is technical loss which is due to heat loss, earthing loss (due to bush, tree) in distribution system and another is electricity theft which also causes loss in system. In order to maintain technical loss, large conductor is used, proper bush cutting is done and in order to reduce electricity theft, seal is used in every household properly, inspection should be done from time to time.

Demand Side Management

Demand side management encourages efficient and optimum use of electricity at the consumer end which reduces peak load so that installed capacity can be reduced, increases reliability and reduces cost of system. Demand side management is also used in order to reduce load shedding and can also be used in order to increase the reliability of system

Conclusion

Above given points are the necessities for up gradation of DCS in near future because it is very hard to sustain the system with existing infra structures and methods. The distribution infra structures should gradually be upgraded so that the power supply becomes reliable. Electricity now has become essential part of life because all the electronics gadget, internet, network systems are operated using electricity, so fraction of power outage causes large effect and for this, system should be made more reliable necessitating up gradation of DCS urgently.

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NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydro Power Projects (Operation) as of Ashadh 31, 2078

S.N.	Developer	Projects	Location	Installed Capacity (kW)	PPA Date	Commercial Operation Date
1	Himal Power Ltd.	Khimti Khola	Dolakha	60000	2052.10.01	2057.03.27
2	Bhotekoshi Power Company Ltd.	Upper Bhotekoshi Khola	Sindhupalchowk	45000	2053.04.06	2057.10.11
3	Syange Electricity Company Limited	Syange Khola	Lamjung	183	2058.10.03	2058.10.10
4	National Hydro Power Company Ltd.	Indrawati - III	Sindhupalchowk	7500	2054.09.15	2059.06.21
5	Chilime Hydro Power Company Ltd.	Chilime	Rasuwa	22100	2054.03.11	2060.05.08
6	Butwal Power Company Ltd.	Jhimruk Khola	Pyuthan	12000	2058.03.29	1994
7	Butwal Power Company Ltd.	Andhi Khola	Syangza	9400	2058.03.29	2071.12.22
8	Arun Valley Hydropower Development Co. (P.) Ltd.	Piluwa Khola Small	Sankhuwasabha	3000	2056.10.09	2060.06.01
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	Dhading	500	2059.08.27	2061.08.01
10	Sanima Hydropower (Pvt.) Ltd.	Sunkoshi Small	Sindhupalchowk	2500	2058.07.28	2061.12.11
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchowk	3000	2056.11.03	2062.03.01
12	Khudi Hydropower Ltd.	Khudi Khola	Lamjung	4000	2058.03.04	2063.09.15
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	Sindhupalchowk	4200	2058.12.14	2063.09.27
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	Dhading	1650	2059.11.23	2064.07.13
15	Gautam Buddha Hydropower (Pvt.) Ltd.	Sisne Khola Small	Palpa	750	2061.04.29	2064.06.01
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	Sali Nadi	Kathmandu	250	2062.04.24	2064.08.01

17	Khoranga Khola Hydropower Dev. Co. Pvt. Ltd.	Pheme Khola	Panchthar	995	2057.12.31	2064.08.05
18	Unified Hydropower (P.) Ltd.	Pati Khola Small	Parbat	996	2062.10.28	2065.10.27
19	Task Hydropower Company (P.) Ltd.	Seti-II	Kaski	979	2063.06.08	2065.11.14
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	Gulmi	2400	2063.05.08	2066.07.10
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	Sindhupalchowk	991	2064.04.07	2066.07.22
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	Kaski	4800	2060.07.07	2066.10.08
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	Ilam	4500	2063.11.19	2067.10.14
24	Baneswor Hydropower Pvt. Ltd.	Lower Piluwa Small	Sankhuwasabha	990	2064.07.21	2068.04.01
25	Barun Hydropower Development Co. (P.) Ltd.	Hewa Khola	Sankhuwasabha	4455	2061.04.02	2068.04.17
26	Bhagawati Hydropower Development Co. (P.) Ltd.	Bijayapur-1	Kaski	4410	2066.03.30	2069.05.04
27	Kathmandu Upatyaka Khanepani bewasthapan Board	Solar	Lalitpur	680.4	2069.06.12	2069.07.15
28	Nyadi Group (P.) Ltd.	Siuri Khola	Lamjung	4950	2064.04.17	2069.07.30
29	United Modi Hydropwer Pvt. Ltd.	Lower Modi 1	Parbat	10000	2065.10.20	2069.08.10
30	Synergy Power Development (P.) Ltd.	Sipring Khola	Dolakha	9658	2065.10.20	2069.10.03
31	Laughing Buddha Power Nepal (P.) Ltd.	Middle Chaku	Sindhupalchowk	1800	2066.11.03	2069.11.15
32	Aadishakti Power Dev. Company (P.) Ltd.	Tadi Khola (Thaprek)	Nuwakot	5000	2061.12.15	2069.12.14
33	Ankhu Khola Jal Bidhyut Co. (P.) Ltd.	Ankhu Khola - 1	Dhading	8400	2066.02.22	2070.05.05
34	Nepal Hydro Developer Pvt. Ltd.	Charanawati Khola	Dolakha	3520	2067.01.13	2070.02.24
35	Laughing Buddha Power Nepal Pvt. Ltd.	Lower Chaku Khola	Sindhupalchowk	1800	2063.07.02	2070.04.24
36	Bhairabkunda Hydropower Pvt. Ltd.	Bhairab Kunda	Sindhupalchowk	3000	2065.08.02	2071.02.22
37	Radhi Bidyut Company Ltd.	Radhi Khola	Lamjung	4400	2066.10.18	2071.02.31
38	Pashupati Environmental Eng. Power Co. Pvt. Ltd.	Chhote Khola	Gorkha	993	2067.11.09	2071.03.09
39	Mailung Khola Hydro Power Company (P.) Ltd.	Mailung Khola	Rasuwa	5000	2058.04.09	2071.03.19
40	Joshi Hydropower Development Company Ltd.	Upper Puwa -1	Illam	3000	2066.01.23	2071.10.01
41	Sanima Mai Hydropower Limited	Mai Khola	Ilam	22000	2067.01.08	2071.10.14
42	Bojini Company Private Limited	Jiri Khola Small	Dolakha	2200	2065.10.23	2071.11.01

43	Ruru Hydropower Project (P) Ltd.	Upper Hugdi Khola	Gulmi	5000	2066.04.04	2071.12.09
44	Prime Hydropower Co. Pvt. Ltd.	Belkhu	Dhading	518	2064.04.04	2071.12.30
45	Api Power Company Pvt. Ltd.	Naugadh gad Khola	Darchula	8500	2067.01.19	2072.05.02
46	Kutheli Bukhari Small Hydropower (P).Ltd	Suspa Bukhari	Dolakha	998	2069.04.32	2072.06.03
47	Sanima Mai Hydropower Ltd.	Mai Cascade	Ilam	7000	2069.10.12	2072.10.29
48	Chhyangdi Hydropower Limited	Chhandi	Lamjung	2000	2068.12.23	2072.12.13
49	Panchakanya Mai Hydropower Ltd. (Previously Mai Valley and prior to that East Nepal)	Upper Mai Khola	Ilam	9980	2061.12.19	2073.03.09
50	Sayapatri Hydropower Private Limited	Daram Khola A	Baglung	2500	2068.12.19	2073.03.12
51	Electro-com and Research Centre Pvt. Ltd.	Jhyadi Khola	Sindhupalchowk	2000	2067.01.30	2073.05.31
52	Khani Khola Hydropower Company Pvt. Ltd.	Tungun-Thosne	Lalitpur	4360	2069.04.05	2073.07.09
53	Daraudi Kalika Hydro Pvt. Ltd.	Daraudi Khola A	Gorkha	6000	2068.05.19	2073.08.13
54	Khani Khola Hydropower Company Pvt. Ltd.	Khani Khola	Lalitpur	2000	2069.04.05	2073.08.20
55	Sapsu Kalika Hydropower Co. Pvt. Ltd.	Miya Khola	Khotang	996	2069.08.10	2073.09.03
56	Sinohydro-Sagarmatha Power Company (P) Ltd.	Upper Marsyangdi "A"	Lamjung	50000	2067.09.14	2073.09.17
57	Madi Power Pvt. Ltd.	Upper Madi	Kaski	25000	2066.05.21	2073.09.25
58	Panchthar Power Company Pvt. Ltd.	Hewa Khola A	Panchthar	14900	2068.05.30	2073.10.22
59	Sanvi Energy pvt. Ltd.	Jogmai	Ilam	7600	2069.08.07	2074.01.18
60	Bhugol Energy Dev Compay (P). Ltd	Dwari Khola	Dailekh	3750	2069.12.30	2074.01.23
61	Mai Valley Hydropower Private Limited	Upper Mai C	Ilam	5100	2068.12.23	2074.04.09
62	Dronanchal Hydropower Co.Pvt.Ltd	Dhunge-Jiri	Dolakha	600	2068.09.25	2074.06.01
63	Dibyaswari Hydropower Limited	Sabha Khola	Sankhuwasabha	4000	2068.11.17	2074.06.02
64	Puwa Khola-1 Hydropower P. Ltd.	Puwa Khola -1	Ilam	4000	2070.10.09	2074.06.23
65	Shibani Hydropower Co. Pvt. Ltd.	Phawa Khola	Taplejung	4950	2063.12.01	2074.07.14
66	Mount Kailash Energy Pvt. Ltd.	Thapa Khola	Myagdi	13600	2067.10.11	2074.08.22
67	Mandakini Hydropower Limited	Sardi Khola	Kaski	4000	2068.11.11	2074.08.23
68	Garjang Upatyaka Hydropower (P.) Ltd.	Chake Khola	Ramechhap	2830	2065.11.06	2074.08.28

69	Union Hydropower Pvt Ltd.	Midim Karapu	Lamjung	3000	2069.10.28	2074.10.15
70	Syauri Bhumey Microhydro Project	Syauri Bhumey	Nuwakot	23	2072.11.16	2074.10.18
71	Molung Hydropower Company Pvt. Ltd.	Molung Khola	Okhaldhunga	7000	2069.11.21	2074.12.12
72	Sikles Hydropower Pvt. Ltd.	Madkyu Khola	Kaski	13000	2066.08.03 2072.12.10	2074.12.19
73	Himal Dolkha Hydropower Company Ltd.	Mai sana Cascade	Ilam	8000	2069.11.14	2074.12.26
74	Barahi Hydropower Pvt.ltd	Theule Khola	Baglung	1500	2066.12.16	2075.03.24
75	Leguwa Khola Laghu Jalbidhyut Sahakari Sastha Ltd.	Leguwa Khola	Dhankuta	40	2072.11.21	2075.03.28
76	Super Mai Hydropower Pvt. Ltd.	Super Mai	Illam	7800	2073.12.06	2075.07.11
77	Chimal Gramin Bidhyut Sahakari Sanstha Ltd.	Sobuwa Khola-2 MHP	Taplejung	90	2074.11.15	2075.07.14
78	Surya Power Company Pvt. Ltd.	Bishnu Priya Solar Farm Project	Nawalparasi	960	2074.04.08	2075.08.13
79	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	Lamjung	100	2070.02.20	2075.09.04
80	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola A	Lamjung and Kaski	8800	2069.10.28 2073.02.13	2075.12.04
81	Mandu Hydropower Ltd.	Bagmati Khola Small	Makawanpur/ Lalitpur	22000	2069.10.07	2075.12.19
82	Salmanidevi Hydropower (P). Ltd	Kapadi Gad	Doti	3330	2069.12.11	2076.02.25
83	Eastern Hydropower Pvt. Ltd.	Pikhuwa Khola	Bhojpur	5000	2066.07.24	2076.02.27
84	Mountain Hydro Nepal Pvt. Ltd.	Tallo Hewa Khola	Panchthar	22100	2071.04.09 2075.10.16	2076.04.21
85	Pashupati Environmental Power Co. Pvt. Ltd.	Lower Chhote Khola	Gorkha	997	2072.08.04	2076.05.20
86	United Idi Mardi and R.B. Hydropower Pvt. Ltd.	Upper Mardi	Kaski	7000	2073.02.25	2076.06.20
87	Rairang Hydropower Development Company Ltd.	Iwa Khola	Taplejung	9900	2070.01.29	2076.06.20
88	Api Power Company Pvt. Ltd.	Upper Naugad Gad	Darchula	8000	2073.07.12	2076.07.13
89	Arun Kabeli Power Ltd.	Kabeli B-1	Taplejung, Panchthar	25000	2069.03.29	2076.07.23
90	Rangoon Khola Hydropower Pvt. Ltd.	Jeuligad	Bajhang	996	2071.10.20	2076.08.27
91	Dolti Power Company Pvt. Ltd.	Padam Khola	Dailekh	4800	2074.08.01	2076.09.08
92	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola B	Lamjung and Kaski	6600	2071.4.20	2076.11.05

93	Ghalemdi Hydro Limited (Previously, Cemat Power Dev Company (P). Ltd.)	Ghalemdi Khola	Myagdi	5000	2069.12.30	2076.11.05
94	Terhathum Power Company Pvt. Ltd.	Upper Khorunga	Terhathum	7500	2073.07.29	2076.11.17
95	Upper Solu Hydroelectric Company Pvt. Ltd	Solu Khola	Solukhumbu	23500	2070.07.24	2076.12.10 (Transactional Operation Date-TOD)
96	Sagarmatha Jalabidhyut Company Pvt. Ltd.	Super Mai 'A'	Illam	9600	2074.11.14	2077.02.32
97	Mai Khola Hydropower Pvt. Ltd.	Super Mai Cascade	Illam	3800	2074.12.07	2077.03.31
98	Century Energy Pvt. Ltd.	Hadi Khola Sunkoshi A	Sindhupalchowk	997	2074.05.05	2077.05.12
99	Rawa Energy Development Pvt. Ltd.	Upper Rawa	Khotang	3000	2073.04.24	2077.06.04
100	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11880	2066.05.30	2077.06.12
101	Ridi Hydropower Development Co. Ltd.	Butwal Solar Project	Rupandehi	8500	2075.06.09	2077.07.15
102	Manakamana Engineering Hydropower Pvt. Ltd.	Ghatte Khola	Dolakha	5000	2070.04.28	2077.07.23
103	Everest Sugar and Chemical Industries Ltd.	Everest Sugar and Chemical Industries Ltd.	Mahottari	3000	2075.06.17	2077.10.26
104	Civil Hydropower Pvt. Ltd.	Bijayapur 2 Khola Small	Kaski	4500	2072.09.12	2077.11.18
105	Eco Power Development Company Pvt. Ltd	Mithila Solar PV Electric Project	Dhanusha	10000	2075.09.16	2077.11.22
106	Taksar-Pikhuwa Hydropower Pvt. Ltd.	Taksar Pikhuwa	Bhojpur	8000	2073.09.01	2078.01.01
107	Shiva Shree Hydropower (P.) Ltd.	Upper Chaku A	Sindhupalchowk	22200	2067.05.22	2078.02.01
108	Robust Energy Ltd.	Mistri Khola	Myagdi	42000	2067.10.20	2078.03.03
			TOTAL	814,645.4		

IPPs' Hydropower Projects (Under Construction) as of Ashadh 31, 2078

(Financial Closure concluded projects)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	Required Commercial Operation Date
1	Upper Tamakoshi Hydropower Ltd.	Upper Tamakoshi	Dolkha	456000	2067.09.14	2072.9.10 - 4 Units, 2073.3.30 - 2 Units
2	Nama Buddha Hydropower Pvt. Ltd.	Tinau Khola Small	Palpa	1665	2065.03.31	2066.11.1 (990kw) 2077.09.15 (675kw)
3	Jumdi Hydropower Pvt. Ltd.	Jumdi Khola	Gulmi	1750	2066.10.21	2069.10.11
4	Hira Ratna Hydropower P.ltd	Tadi Khola	Nuwakot	5000	2067.01.09	2075.10.01
5	Energy Engineering Pvt. Ltd.	Upper Mailung A	Rasuwa	6420	2067.03.25	2075.10.01
6	Greenlife Energy Pvt. Ltd.	Khani khola-1	Dolakha	40000	2067.06.24 2074.02.21 (upgraded 25MW)	2074.12.17 (25MW) 2076.09.03 (15MW)
7	Himalaya Urja Bikas Co. Pvt. Ltd.	Upper Khimti	Ramechhap	12000	2067.10.09	2075.3.32
8	Green Ventures Pvt. Ltd.	Likhu-IV	Ramechhap	52400	2067.10.19	2077.06.30
9	Manang Trade Link Pvt. Ltd.	Lower Modi	Parbat	20000	2068.05.20	2074.3.31
10	Mathillo Mailung Khola Jalbidhyut Ltd. (Prv. Molnia Power Ltd.)	Upper Mailun	Rasuwa	14300	2068.05.23	2075.10.01
11	Sanjen Hydropower Co.Limited	Upper Sanjen	Rasuwa	14800	2068.06.23	2076.09.15
12	Middle Bhotekoshi Jalbidhyut Company Ltd.	Middle Bhotekoshi	Sindhupalchowk	102000	2068.07.28	2074.03.01 2076.12.28
13	Chilime Hydro Power Company Ltd.	Rasuwagadhi	Rasuwa	111000	2068.07.28	2076.09.15
14	Water and Energy Nepal Pvt. Ltd.	Badi Gad	Baglung	6600	2068.08.13	2072.2.14
15	Sanjen Hydropower Company Limited	Sanjen	Rasuwa	42500	2068.08.19	2076.09.15
16	Gelun Hydropower Co.Pvt. Ltd	Gelun	Sindhupalchowk	3200	2068.09.25	2074.06.14
17	Dariyal Small Hydropower Pvt.Ltd	Upper Belkhu	Dhading	750	2068.11.28	2071.7.16
18	Suryakunda Hydroelectric Pvt. Ltd.	Upper Tadi	Nuwakot	11000	2068.12.03	2075.10.01
19	Himalayan Power Partner Pvt. Ltd.	Dordi Khola	Lamjung	27000	2069.03.01	2076.05.14
20	Sasha Engingeering Hydropower (P). Ltd	Khani Khola(Dolakha)	Dolakha	30000	2069.03.25	2074.12.17

21	Rising Hydropower Compnay Ltd.	Selang Khola	Sindhupalchowk	990	2069.03.31	2071.6.15
22	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	25000	2069.06.02	2076.05.14
23	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990	2069.06.08	2074.12.30
24	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14	2071.11.30
25	Moonlight Hydropower Pvt. Ltd.	Balephi A	Sindhupalchowk	22140	2069.07.14	2076.12.28
26	Middle Modi Hydropower Ltd.	Middle Modi	Parbat	15100	2069.08.21	2077.03.31
27	Reliable Hydropower Co. Pvt. Ltd.	Khorunga Khola	Terhathum	4800	2069.08.26	2077.08.16
28	Rara Hydropower Development Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekh	2150	2069.08.28	2071.12.17
29	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08	2073.06.20
30	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18000	2069.09.16 2073.07.25 (PPA Revived)	2074.10.01
31	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6500	2069.09.26	2073.05.31
32	Universal Power Company Ltd.	Lower Khare	Dolakha	11000	2069.10.22	2074.9.16 (8.26MW) 2076.04.03 (2.74MW)
33	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3100	2069.10.23	2072.5.1
34	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25	2071.7.24
35	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13700	2069.12.06	2075.10.01
36	Himalaya Urja Bikas Co. Ltd.	Upper Khimti II	Ramechhap	7000	2069.12.09	2075.12.01
37	Dovan Hydropower Company Pvt. Ltd.	Junbesi Khola	Solukhumbu	5200	2069.12.29	2076.08.30
38	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19	2071.8.1
39	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20	2073.7.1
40	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990	2070.02.21	2071.08.01
41	Essel-Clean Solu Hydropower Pvt. Ltd.	Lower Solu	Solukhumbu	82000	2070.07.15	2076.8.30
42	Consortium Power Developers Pvt. Ltd.	Khare Khola	Dolakha	24100	2070.07.15	2075.08.15
43	Singati Hydro Energy Pvt. Ltd.	Singati Khola	Dolakha	25000	2070.07.27	2075.05.31 (16MW) 2077.04.01 (9MW)
44	Maya Khola Hydropower Co. Pvt. Ltd.	Maya Khola	Sankhuwasabha	14900	2070.08.30	2076.9.1

45	Idi Hydropower Co. P. Ltd.	Idi Khola	Kaski	975	2070.09.01	2074.09.16
46	Buddha Bhumi Nepal Hydro Power Co. Pvt. Ltd.	Lower Tadi	Nuwakot	4993	2070.12.10	2075.10.01
47	Dordi Khola Jal Bidyut Company Ltd.	Dordi-1 Khola	Lamjung	12000	2071.07.19 (10.3 MW) 2073.04.19 2075.11.21 (1.7 MW)	2076.08.16 (10.3 MW) 2077.04.02 (1.7 MW)
48	River Falls Hydropower Development Pvt. Ltd.	Down Piluwa	Sankhuwasabha	9500	2071.10.18	2076.09.01
49	Peoples' Hydropower Company Pvt. Ltd.	Super Dordi 'Kha'	Lamjung	54000	2071.11.13 2075.11.15	2077.03.29
50	Hydro Venture Private Limited	Solu Khola (Dudhkoshi)	Solukhumbu	86000	2071.11.13	2077.06.10
51	Global Hydropower Associate Pvt. Ltd.	Likhu-2	Solukhumbu/ Ramechap	33400	2071.11.19	2077.04.01
52	Paan Himalaya Energy Private Limited	Likhu-1	Solukhumbu/ Ramechap	51400	2071.11.19	2077.04.01
53	Numbur Himalaya Hydropower Pvt. Ltd.	Likhu Khola A	Solukhumbu/ Ramechap	24200	2071.11.22	2077.04.01
54	Dipsabha Hydropower Pvt. Ltd.	Sabha Khola A	Sankhuwasabha	9990	2071.12.02	2076.07.15
55	Research and Development Group Pvt. Ltd.	Rupse Khola	Myagdi	4000	2071.12.17	2076.08.02
56	Hydro Empire Pvt. Ltd.	Upper Myagdi	Myagdi	20000	2071.12.17	2077.05.30
57	Chandeshwori Mahadev Khola MH. Co. Pvt. Ltd.	Chulepu Khola	Ramechhap	8520	2071.12.23	2075.04.15
58	Nyadi Hydropower Limited	Nyadi	Lamjung	30000	2072.02.12	2077.01.06
59	Suri Khola Hydropower Pvt. Ltd.	Suri Khola	Dolakha	6400	2072.02.20	2074.12.30
60	Bungal Hydro Pvt. Ltd. (Previously Sanigad Hydro Pvt. Ltd.)	Upper Sanigad	Bajhang	10700	2072.03.15	2076.05.29
61	Kalanga Hydro Pvt. Ltd.	Kalangagad	Bajhang	15330	2072.03.15	2076.05.29
62	Sanigad Hydro Pvt. Ltd.	Upper Kalangagad	Bajhang	38460	2072.03.15	2077.04.15
63	Dhaulagiri Kalika Hydro Pvt. Ltd.	Darbang-Myagdi	Myagdi	25000	2072.04.28	2075.12.25
64	Menchhiyam Hydropower Pvt. Ltd.	Upper Piluwa Khola 2	Sankhuwasabha	4720	2072.05.11	2076.04.01
65	Kabeli Energy Limited	Kabeli-A	Panchthar and Taplejung	37600	2072.06.07	2076.11.03
66	Upper Syange Hydropower P. Ltd.	Upper Syange Khola	Lamjung	2400	2072.06.14	2075.10.01
67	Peoples Energy Ltd. (Previously Peoples Hydro Co-operative Ltd.)	Khimti-2	Dolakha and Ramechhap	48800	2072.06.14	2078.04.01

68	Chauri Hydropower (P.) Ltd.	Chauri Khola	Kavrepalanchowk, Ramechhap, Sindhupalchowk, Dolakha	6000	2072.06.14 (5 MW) 2076.01.06 (1 MW)	2075.12.30 (5 MW) 2078.08.03 (1 MW)
69	Huaning Development Pvt. Ltd.	Upper Balephi A	Sindhupalchowk	36000	2072.08.29	2075.10.06
70	Upper Hewa Khola Hydropower Co. Pvt. Ltd.	Upper Hewa Khola Small	Sankhuwasabha	8500	2072.09.23	2076.03.17
71	Multi Energy Development Pvt. Ltd.	Langtang Khola	Rasuwa	20000	2072.09.29	2076.12.30 (for 10MW) 2078.04.03 (for upgraded 10MW)
72	Ankhu Hydropower (P.) Ltd.	Ankhu Khola	Dhading	34000	2073.01.30	2076.12.30
73	Myagdi Hydropower Pvt. Ltd.	Ghar Khola	Myagdi	14000	2073.02.11	2076.08.30 (8.3 MW) 2078.10.17 (5.7 MW)
74	Richet Jalbidhyut Company Pvt. Ltd.	Richet Khola	Gorkha	4980	2073.02.23	2075.07.30
75	Rapti Hydro and General Construction Pvt. Ltd.	Rukumgad	Rukum	5000	2073.03.07	2076.09.01
76	Siddhi Hydropower Company Pvt. Ltd.	Siddhi Khola	Illam	10000	2074.05.29	2077.03.31
77	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola	Myagdi	38000	2073.11.30	2080.08.30
78	Siuri Nyadi Power Pvt. Ltd.	Super Nyadi	Lamjung	40270	2074.02.19	2079.04.01
79	Swet-Ganga Hydropower and Construction Ltd.	Lower Likhu	Ramechhap	28100	2073.09.14	2078.08.15
80	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola-2	Myagdi	62000	2074.03.05	2081.08.30
81	Sano Milti Khola Hydropower Ltd.	Sano Milti	Ramechhap and Dolakha	3000	2073.01.13	2075.08.01
82	Diamond Hydropower Pvt. Ltd.	Upper Daraudi-1	Gorkha	10000	2072.08.14	2075.09.17
83	Chhyangdi Hydropower Limited	Upper Chhyangdi Khola	Lamjung	4000	2074.03.22	2078.4.05
84	Rasuwa Hydropower Pvt. Ltd	Phalanku Khola	Rasuwa	5000	2071.08.24	2076.8.01
85	Makari Gad Hydropower Pvt. Ltd.	Makarigad	Darchula	10000	2072.08.29	2076.02.32
86	Super Madi Hydropower Ltd. (Previously Himal Hydro and General Construction Ltd.)	Super Madi	Kaski	44000	2073.10.27	2078.02.28
87	Mount Nilgiri Hydropower Company Pvt. Ltd.	Rurubanchu-1	Kalikot	13500	2074.05.08	2077.11.03
88	Trishuli Jal Vidhyut Company Ltd.	Upper Trishuli 3B	Rasuwa	37000	2074.05.06	2078.11.17

89	Sindhujwala Hydropower Ltd.	Upper Nyasem	Sindhupalchowk	41400	2073.07.24	2077.03.30
90	Samling Power Company Pvt. Ltd.	Mai Beni	Illam	9510	2073.07.26	2078.08.02
91	Energy Venture Pvt. Ltd.	Upper Lapche	Dolakha	52000	2073.04.20	2078.12.30
92	Orbit Energy Pvt. Ltd. (Previously Pokhari Hydropower Company Pvt. Ltd.)	Sabha Khola B	Sankhuwasabha	15100	2074.03.26	2078.2.31
93	Daram Khola Hydro Energy Ltd.	Daram Khola	Baglung and Gulmi	9600	2073.10.09	2076.09.08
94	Sagarmatha Energy and Construction Pvt. Ltd.	Dhalkebar Solar Project	Dhanusha	3000	2075.06.24	2076.12.23
95	Gorkha Congenial Energy and Investment Pvt. Ltd.	Lamahi Solar Project	Dang	3000	2075.06.24	2076.12.23
96	Global Energy and Construction Pvt. Ltd.	Duhabi Solar Project	Sunsari	8000	2075.06.25	2076.12.24
97	Him River Power Pvt. Ltd.	Liping Khola	Sindhupalchowk	16260	2073.02.28	2077.01.22
98	Madhya Tara Khola Hydropower P. Ltd. (Prv. Pahadi Hydro Power Company (P.) Ltd.)	Madhya Tara Khola Small	Baglung	1700	2073.10.26	2075.08.29
99	Nepal Water and Energy Development Company P. Ltd.	Upper Trishuli - 1	Rasuwa	216000	2074.10.14	2080.12.18
100	Mewa Developers Pvt. Ltd.	Middle Mewa	Taplejung	49000	2075.05.04	2080.06.06
101	Solar Farm Pvt. Ltd.	Belchautara Solar Project	Tanahun	5000	2075.04.23	2076.04.03
102	Him Star Urja Co. Pvt. Ltd.	Buku Kapati	Okhaldhunga and Solukhumbu	5000	2074.10.11	2077.04.15
103	Aashutosh Energy Pvt. Ltd.	Chepe Khola Small	Lamjung	8630	2075.02.15	2078.11.09
104	Indushankar Chini Udhyog Ltd.	Indushankar Chini Udhyog Ltd.	Sarlahi	3000	2075.06.10	2076.12.09
105	Sanvi Energy Pvt. Ltd.	Jogmai Cascade	Illam	6000	2075.05.07	2078.04.07
106	Jhyamolongma Hydropower Development Company P. Ltd.	Karuwa Seti	Kaski	32000	2074.04.20	2079.01.12
107	Nasa Hydropower Pvt. Ltd.	Lapche Khola	Dolakha	99400	2074.07.29	2079.04.14
108	Asian Hydropower Pvt. Ltd.	Lower Jogmai	Illam	6200	2074.12.07	2078.04.01
109	Sanima Middle Tamor Hydropower Ltd. (Prv. Tamor Sanima Energy Pvt. Ltd.)	Middle Tamor	Taplejung	73000	2073.09.26	2078.05.28
110	Vision Energy and Power Pvt. Ltd.	Nupche Likhu	Ramechhap	57500	2074.11.28	2080.05.02
111	Three Star Hydropower Company Ltd.	Sapsup Khola	Khotang	6600	2075.03.25	2078.06.31
112	Dolakha Nirman Company Pvt. Ltd.	Isuwa Khola	Sankhuwasabha	97200	2075.06.26	2080.04.01
113	People's Power Limited	Puwa - 2	Illam	4960	2074.05.05	2078.06.11
114	Tundi Power Pvt.Ltd	Rahughat Mangale	Myagdi	35500	2075.03.29	2079.08.29

115	Him Consult Pvt. Ltd.	Rele Khola	Myagdi	6000	2074.01.28	2077.02.19
116	Parbat Paiyun Khola Hydropower Company Pvt. Ltd.	Seti Khola	Parbat	3500	2074.02.22	2076.12.30
117	Chirkhwa Hydropower Pvt. Ltd.	Upper Chirkhwa	Bhojpur	4700	2073.03.01	2077.04.01
118	Yambling Hydropower Pvt. Ltd.	Yambling Khola	Sindhupalchowk	7270	2072.09.29	2077.03.17
119	Gaurishankar Power Development Pvt. Ltd.	Middle Hyongu Khola B	Solukhumbu	22900	2074.12.08	2079.04.01
120	Upper Lohore Khola Hydropower Co. Pvt. Ltd.	Upper Lohore	Dailekh	4000	2074.12.08	2077.04.11
121	Unitech Hydropower Co. Pvt. Ltd.	Upper Phawa	Taplejung	5800	2074.11.11	2078.04.16
122	Omega Energy Developer Pvt. Ltd.	Sunigad	Bajhang	11050	2074.11.30	2080.02.07
123	Arun Valley Hydropower Development Company Ltd.	Kabeli B-1 Cascade	Panchthar	9940	2075.08.09	2078.06.01
124	Gorakshya Hydropower Pvt. Ltd.	Super Ankhu Khola	Dhading	23500	2074.03.15	2080.09.15
125	Api Power Company Ltd.	Upper Chameliya	Darchula	40000	2075.11.15	2079.11.13
126	Vision Lumbini Ltd.	Seti Nadi	Kaski	25000	2075.08.06	2079.04.05
127	Kasuwa Khola Hydropower Ltd.	Kasuwa Khola	Sankhuwasabha	45000	2075.08.13	2082.04.06
128	Lower Irkhuwa Hydropower Co. Pvt. Ltd.	Lower Irkhuwa	Bhojpur	13040	2075.02.16	2079.04.03
129	Apex Makalu Hydro Power Pvt. Ltd.	Middle Hongu Khola A	Solukhumbu	22000	2075.05.14	2079.04.01
130	National Solar Power Co. Pvt. Ltd.	Grid Connected Solar PV Project (VGF)	Nawalparasi	5000	2076.11.23	2077.08.22
131	Tundi Power Pvt.Ltd	Upper Rahughat	Myagdi	48500	2075.03.29	2080.08.29
132	Mabilung Energy (P.) Ltd	Upper Piluwa Khola -3	Sankhuwasabha	4950	2075.12.12	2078.11.16
133	Blue Energy Pvt. Ltd.	Super Trishuli	Gorkha and Chitwan	70000	2075.07.11	2080.11.17
134	Samyukta Urja Pvt. Ltd. (Prv. Sungava Foundation Pvt. Ltd.)	Thulo Khola	Myagdi	21300	2075.02.17	2079.04.15
135	Bhujung Hydropower Pvt. Ltd.	Upper Midim	Lamjung	7500	2074.05.29	2078.04.01
136	Shaileshwari Power Nepal Pvt. Ltd.	Upper Gaddigad	Doti	1550	2075.04.06	2077.12.19
137	Ridge Line Energy Pvt. Ltd.	Super Chepe	Gorkha Lamjung	9050	2075.12.19	2079.05.20
138	Makar Jitumaya Hydropower Pvt. Ltd.	Upper Suri	Dolakha	7000	2075.04.10	2079.12.30
			Total	3,506,785		

IPPs' Hydropower Projects in Different Stages of Development as of Ashadh 31, 2078

(Without Financial Closure)

S.N.	Developer	Projects	Location	Installed Capacity (kW)	PPA Date	Required Commercial Operation Date
1	Balephi Jalbidhyut Co. Ltd.	Balephi	Sindhupalchowk	23520	2067.09.08	2071.09.16 2077.06.30
2	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10	2073.04.01
3	United Modi Hydropwer Ltd.	Lower Modi 2	Parbat	10500	2072.11.14	2076.03.17
4	Salasungi Power Limited	Sanjen Khola	Rasuwa	78000	2072.12.02	2077.03.08
5	Sisa Hydro Electric Company Pvt. Ltd.	Sisa Khola A	Solukhumbu	2800	2073.10.28	2077.12.12
6	Chirkhwa Hydropower Pvt. Ltd.	Lower Chirkhwa	Bhojpur	4060	2074.01.20	2078.04.01
7	Himali Rural Electric Co-operative Ltd.	Leguwa Khola Small	Dhankuta	640	2074.02.08	2075.12.28
8	Sabha Pokhari Hydro Power (P.) Ltd.	Lankhuwa Khola	Sankhuwasabha	5000	2074.02.21	2077.09.14
9	United Mewa Khola Hydropower Pvt. Ltd.	Mewa Khola	Taplejung	50000	2074.02.21	2078.04.01
10	Sewa Hydro Ltd.	Lower Selang	Sindhupalchowk	1500	2074.02.22	2075.12.30
11	Nyam Nyam Hydropower Company Pvt. Ltd.	Nyam Nyam Khola	Rasuwa	6000	2074.03.27	2077.12.31
12	Saptang Hydro Power Pvt. Ltd.	Saptang Khola	Nuwakot	2500	2074.04.08	2076.04.12
13	Himalayan Water Resources and Energy Development Co. Pvt. Ltd.	Upper Chauri	Kavrepalanchowk	6000	2074.07.27	2078.04.04
14	IDS Energy Pvt. Ltd.	Lower Khorunga	Terhathum	5400	2074.08.24	2078.04.01
15	Langtang Bhotekoshi Hydropower Company Pvt. Ltd.	Rasuwa Bhotekoshi	Rasuwa	120000	2074.09.07	2078.09.07
16	Upper Richet Hydropower Pvt. Ltd.	Upper Richet	Gorkha	2000	2074.09.20	2077.04.01
17	Khechereswor Jal Vidhyut Pvt. Ltd.	Jadari Gad Small	Bajhang	1000	2074.10.12	2077.07.30
18	Khechereswor Jal Vidhyut Pvt. Ltd.	Salubyani Gad Small	Bajhang	233	2074.10.12	2077.09.29
19	Gaughar Ujjyalo Sana Hydropower Co. Pvt. Ltd.	Ghatte Khola Small	Sindhupalchowk	970	2074.11.11	2077.03.01
20	Seti Khola Hydropower Pvt. Ltd.	Seti Khola	Kaski	22000	2074.11.11	2079.04.15
21	Super Hewa Power Company Pvt. Ltd.	Super Hewa	Sankhuwasabha	5000	2074.12.27	2078.04.01
22	Baraha Multipower Pvt. Ltd.	Irkhuwa Khola B	Bhojpur	15524	2075.02.14	2079.04.15

23	Jhilimili Hydropower Co. Pvt. Ltd.	Gulangdi Khola	Gulmi	980	2075.02.24	2078.01.14
24	North Summit Hydro Pvt. Ltd.	Nyadi Phidi	Lamjung	21400	2075.02.24	2079.12.15
25	Himali Hydro Fund Pvt. Ltd.	Sona Khola	Taplejung	9000	2075.03.14	2080.07.30
26	Tanahun Hydropower Ltd.	Tanahun	Tanahun	140000	2075.03.15	2080.12.30
27	Sailung Power Company Pvt. Ltd.	Bhotekoshi-1	Sindhupalchowk	40000	2075.03.15	2079.07.01
28	Jalshakti Hydro Company Pvt. Ltd.	Ilep (Tatopani)	Dhading	23675	2075.03.25	2081.08.25
29	Arati Power Company Ltd.	Upper Irkhuwa	Bhojpur	14500	2075.04.01	2079.08.01
30	Mount Everest Power Development Pvt. Ltd.	Dudhkunda Khola	Solukhumbu	12000	2075.04.01	2079.06.30
31	Palun Khola Hydropower Pvt. Ltd.	Palun Khola	Taplejung	21000	2075.04.06	2080.06.21
32	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola-1	Dolakha	5500	2075.04.10	2079.12.30
33	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola	Dolakha	20000	2075.04.10	2079.12.30
34	Annapurna Bidhyut Bikas Co. Pvt. Ltd.	Landruk Modi	Kaski	86590	2075.04.13	2081.09.15
35	Madame Khola Hydropower Pvt. Ltd.	Madame Khola	Kaski	24000	2075.04.15	2080.12.30
36	Mid Solu Hydropower Company Pvt. Ltd.	Mid Solu Khola	Solukhumbu	9500	2075.04.21	2079.05.14
37	Apolo Hydropower Pvt. Ltd.	Buku Khola	Solukhumbu	6000	2070.02.02 2075.04.22 (Revived)	2074.04.01
38	Thulo Khola Hydropower Pvt. Ltd.	Upper thulo Khola-A	Myagdi	15000	2075.04.24	2080.06.30
39	Kalika Energy Ltd.	Bhotekoshi-5	Sindhupalchowk	62000	2075.04.25	2080.09.15
40	Api Power Company Ltd.	Chandranigahpur Solar Project	Rautahat	4000	2075.04.27	2076.02.26
41	Api Power Company Ltd.	Parwanipur Solar Project	Parsa	8000	2075.04.27	2076.02.26
42	Api Power Company Ltd.	Dhalkebar Solar Project	Dhanusha	1000	2075.05.03	2076.03.02
43	Api Power Company Ltd.	Simara Solar Project	Bara	1000	2075.05.03	2076.03.02
44	Super Ghalemdi Hydropower Pvt. Ltd.	Super Ghalemdi	Myagdi	9140	2075.05.05	2080.12.12
45	Dibyajyoti Hydropower Pvt. Ltd.	Marsyangdi Besi	Lamjung	50000	2075.05.10	2079.06.06
46	Amar Jyoti Hydro Power Pvt. Ltd.	Istul Khola	Gorkha	1506	2075.05.13	2079.10.25
47	Ichowk Hydropower Pvt. Ltd.	Gohare Khola	Sindhupalchowk	950	2075.05.25	2076.07.29
48	Pike Hydropower Pvt. Ltd.	Likhu Khola	Ramechhap and Okhaldhunga	30000	2075.05.26	2082.02.17

49	Sita Hydro Power Co. Pvt. Ltd.	Nyasim Khola	Sindhupalchowk	35000	2075.05.26	2080.03.15
50	Sushmit Energy Pvt. Ltd.	Kunaban Khola	Myagdi	20000	2075.05.29	2080.11.03
51	Masina Paryatan Sahakari Sanstha Ltd.	Masina	Kaski and Tanahu	891	2075.06.02	2076.10.29
52	Hydro Village Pvt. Ltd.	Myagdi Khola	Myagdi	57300	2075.06.04	2080.05.29
53	Shikhar Power Development Pvt. Ltd.	Bhim Khola	Baglung	4960	2075.06.10	2078.06.05
54	Dhading Ankhu Khola Hydro Pvt. Ltd.	Upper Ankhu	Dhading	38000	2075.06.14	2079.09.15
55	Phedi Khola Hydropower Company Pvt. Ltd.	Phedi Khola (Thumlung)	Bhojpur	3520	2075.06.21	2079.12.01
56	Bikash Hydropower Company Pvt. Ltd.	Upper Machha Khola Small	Gorkha	4550	2075.07.11	2080.03.30
57	Sita Hydropower Co. Pvt. Ltd.	Dudh Khola	Manang	65000	2075.07.11	2080.03.15
58	Kalinchowk Hydropower Pvt. Ltd.	Sangu (Sorun)	Dolakha	5000	2075.08.09	2079.12.30
59	Ruru Hydroelectric Company Pvt. Ltd.	Rurubanchu Khola-2	Kalikot	12000	2075.08.20	2079.05.25
60	Gumu Khola Bhyakure Hydropower Pvt. Ltd.	Gumu Khola	Dolakha	950	2075.08.21	2078.05.30
61	Alliance Energy Solutions Pvt.Ltd.	Upper Sit Khola	Argakhanchi	905	2075.08.23	2077.05.04
62	Ekikrit Byapar Company Pvt. Ltd.	Brahamayani	Sindhupalchowk	35470	2075.08.24	2080.04.13
63	Integrated Hydro Fund Nepal Pvt. Ltd.	Upper Brahamayani	Sindhupalchowk	15150	2075.08.24	2080.04.13
64	Perfect Energy Development Pvt. Ltd	Middle Trishuli Ganga	Nuwakot	19410	2075.09.03	2080.02.17
65	Kabeli Hydropower Company Pvt.Ltd.	Kabeli-3	Taplejung	21930	2075.10.03	2079.09.01
66	Union Mewa Hydro Ltd.	Mewa Khola	Taplejung	23000	2075.10.04	2080.09.15
67	North Summit Hydro Pvt. Ltd.	Hidi Khola	Lamjung	6820	2075.10.04	2080.05.15
68	Sajha Power Development Pvt. Ltd.	Lower Balephi	Sindhupalchowk	20000	2075.10.06	2080.07.18
69	Sindhujwala Hydropower Ltd.	Upper Nyasem Khola A	Sindhupalchowk	21000	2075.10.06	2079.03.30
70	Mount Rasuwa Hydropower Pvt. Ltd.	Midim 1 Khola	Lamjung	13424	2075.10.07	2080.04.04
71	Habitat Power Company Pvt. Ltd	Hewa Khola "A"	Panchthar	5000	2075.10.07	2078.04.01
72	Ruby Valley Hydropower Company Ltd	Menchet Khola	Dhading	7000	2075.10.15	2080.02.13
73	Dudhpokhari Chepe Hydropower Pvt. Ltd.	Dudhpokhari Chepe	Gorkha	8800	2075.10.15	2080.01.28
74	Maa Shakti Engineering & hydropower Pvt. Ltd.	Luja Khola	Solukhumbu	23550	2075.10.16	2080.11.14

75	Sankhuwasabha Power Development Pvt. Ltd.	Super Sabha Khola	Sankhuwasabha	4100	2075.10.23	2080.06.03
76	Hilton Hydro Energy P. Ltd.	Super Kabeli	Taplejung	12000	2075.11.02	2079.10.04
77	Snow Rivers Pvt. Ltd.	Super Kabeli A	Taplejung	13500	2075.11.02	2080.01.01
78	Jal Urja Pvt. Ltd.	Nuagad	Darchula	1000	2075.11.03	2078.10.22
79	Champawati Hydropower Pvt. Ltd	Chepe khola A	Lamjung	7000	2075.11.07	2079.04.04
80	Barpak Daruadi Hydropower Pvt. Ltd.	Middle Super Daraudi	Gorkha	10000	2075.11.23	2080.03.01
81	Helambu Construction Pvt. Ltd	Ksumti khola	Sindhupalchowk	683	2075.11.29	2078.03.04
82	River Side Hydro Energy Pvt. Ltd.	Tamor Khola-5	Taplejung	37520	2075.12.04	2080.04.10
83	Hydro Connection Pvt. Ltd.	Rauje Khola	Solukhumbu	17712	2075.12.04	2080.10.15
84	Milke Jaljale Hydropower Pvt. Ltd.	Upper Piluwa Hills	Sankhuwasabha	4990	2075.12.04	2081.04.04
85	Ambe Hydropower Pvt. Ltd.	Upper Bhurundi	Parbat	3750	2075.12.10	2079.04.16
86	Orbit Energy Pvt. Ltd.	Sabha Khola C	Sankhuwasabha	4196	2075.12.10	2079.04.02
87	Raghuganga Hydropower Ltd.	Rahughat	Myagdi	40000	2075.12.18	2079.10.17
88	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola A	Baglung	3000	2075.12.26	2077.12.31
89	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola B	Baglung	4500	2075.12.26	2078.02.31
90	Bhalaudi Khola Hydropower Pvt. Ltd.	Bhalaudi Khola	Kaski	2645	2076.01.06	2080.04.16
91	Kalika Construction Pvt. Ltd.	Upper Daraudi B	Gorkha	8300	2076.01.09	2080.09.15
92	Kalika Construction Pvt. Ltd.	Upper Daraudi C	Gorkha	9820	2076.01.09	2080.09.15
93	Super Khudi Hydropower Pvt. Ltd.	Upper Khudi	Lamjung	21210	2076.01.11	2080.10.09
94	Nepal Solar Farm Pvt. Ltd.	Som RadhaKrishna Solar Farm Project (VGF)	Kaski	4000	2076.11.23	2077.03.16
95	Saidi Power Co. (Pvt.) Ltd.	Saiti Khola	Kaski	999	2077.06.13	2078.02.20
96	Isuwa Energy Pvt. Ltd.	Lower Isuwa Cascade	Sankhuwasabha	37700	2077.09.27	2080.12.30
97	Manang Marsyangdi Hydropower Company P. Ltd.	Manang Marsyangdi	Manang	135000	2077.12.09	2081.12.18
98	First Solar Developers Nepal Pvt. Ltd.	Bhrikuti Grid-tied Solar Project	Kapilvastu	8000	2077.12.20	2078.12.17
99	Saurya Bidhyut Power Pvt. Ltd.	Grid Connected Solar Project, Nawalparasi	Nawalparasi	2000	2077.12.20	2078.06.17
			Total	**1,851,343**		

केन्द्रिय कर्मचारी प्रशासन् अभिलेख

अनिवार्य अवकाश भएका कर्मचारीको विवरण

(मिति २०७७/१०/०१ देखि मिति २०७८/०३/३१ सम्म)

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	अवकास हुँदाको कार्यरत कार्यालय	कैफियत
१	छजभ्कत ११५५२	११	निर्देशक	ज्ञानेन्द्र मान जोशी	२०७७।११।१५	अनिवार्य	आयोजना विकास विभाग	
२	ड्पफबभम ८७८०	१०	सह(निर्देशक	रुकमिणी घिमिरे (पौडेल)	२०७७।१०।०६	अनिवार्य	पदपूर्ति विभाग	
३	छजभ्कत्र ११६१९	१०	प्रबन्धक	मनोज कूमार सिंह	२०७७।११।२५	अनिवार्य	प्रदेश नं.२, प्रादेशिक कार्यालय जनकपूर	
४	ड्पफबभम ८७१६	१०	सह-निर्देशक	रमेश कूमार कार्की	२०७७।१२।०३	अनिवार्य	अर्थ महाशाखा, प्रशारण निर्देशानालय	
५	छजभ्कत्र ११७२४	१०	प्रबन्धक	राज बहादूर बिष्ट	२०७८।०१।१९	अनिवार्य	हाइड्रासेडिमेन्टोलोजी महाशाखा (आधीखोला	
६	छजभ्कत्र ११६५३	१०	प्रबन्धक	नारायण जैशी तिवारी	२०७८।०२।१८	अनिवार्य	माथिल्लो तामाकोशी हाइड्रोपावर लिमिटेड	
७	ड्पफब ८६८१	८	सहायक निर्देशक	कूवेर लाल श्रेष्ठ	२०७७।१०।१२	अनिवार्य	अपर अरुण हाइड्रो इलेक्ट्रिक लिमिटेड	
८	पफब १२८०३	८	सहायक निर्देशक	दिल बहादूर गिरी	२०७७।१२।११	अनिवार्य	आन्तरिक लेखापरिक्षण विभाग	
९	नचछ्ज ७५६६	८	सहायक प्रबन्धक	राजेन्द्र कूमार के.सी.	२०७८।०२।०६	अनिवार्य	वितरण तथा ग्राहक सेवा निर्देशनालय	
१०	नचछ्ज ७६८०	८	सहायक प्रबन्धक	रामानन्द सिंह	२०७८।०३।१९	अनिवार्य	लूम्बिनी प्रदेश डिभिजन कार्यालय, नेपालगञ्ज	
११	ड्पफ ८८०४	७	लेखा अधिकृत	सनातन पौडेल	२०७७।१०।२२	अनिवार्य	केन्द्रीय लेखा महाशाखा	
१२	घड्पफ ३२८३	७	प्रशासकीय अधिकृत	भोज कूमार सिटौला	२०७७।११।१०	अनिवार्य	वितरण तथा ग्राहक सेवा निर्देशनालय	
१३	घड्पफ ३३१९	७	लेखा अधिकृत	राजू शर्मा	२०७७।१२।१२	अनिवार्य	तामाकोशी जलविद्यूत कम्पनी लि.	
१४	नचछ्र ७८४४	७	ईन्जिनियर	नरी चन्द	२०७७।१२।२७	अनिवार्य	कर्णाली प्रादेशिक कार्यालय, सूर्खेत	
१५	नचछ्र ८००९	७	प्रशासकीय अधिकृत	सोनिया मानन्धर	२०७८।०१।०३	अनिवार्य	ईलेक्ट्रोमेकानिकल डिजाईन महाशाखा	
१६	घड्पफ ३४०३	७	लेखा अधिकृत	मूकून्द राज आचार्य	२०७८।०१।१२	अनिवार्य	सूनवल १३२ के.भि. सव(स्टेशन आयोजना	
१७	घड्पफ ३१२४	७	प्रशासकीय अधिकृत	शम्शेर बहादूर न्हूछें प्रधान	२०७८।०३।०४	अनिवार्य	खिम्ति(बाह्रबिसे(लप्सिफेदी ४०० के.भि.	
१८	नचछ्र ७८६४	७	ईन्जिनियर	श्रवण कूमार अर्याल	२०७८।०३।१६	अनिवार्य	माथिल्लो त्रिशूली ३ए जलविद्यूत केन्द्र	
१९	घड्प ३५९१	६	सहायक प्रशासकीय अधिकृत	इन्दिरा शाक्य	२०७७।१०।०३	अनिवार्य	कूलेश्वर वितरण केन्द्र	
२०	घड्प ३६२७	६	सहायक प्रशासकीय अधिकृत	जय बहादूर खड्का	२०७७।१०।०४	अनिवार्य	आन्तरिक लेखा परिक्षण बिभाग	
२१	घड्प ३६८०	६	सहायक प्रशासकीय अधिकृत	केशव प्रसाद श्रेष्ठ	२०७७।१०।१५	अनिवार्य	वितरण तथा ग्राहक सेवा निर्देशनालय	
२२	घड्प ३६६५	६	सहायक प्रशासकीय अधिकृत	गणेश बहादूर कटूवाल	२०७७।१०।१७	अनिवार्य	काठमाण्डौ उपत्यका स्मार्ट मिटरिङ्ग आयोजना	
२३	धनच ७१४२	६	सहायक ईन्जिनियर	धन बहादूर जि.सि.	२०७७।१०।२५	अनिवार्य	तनहू वितरण केन्द्र	
२४	घड्प ३६२९	६	सहायक लेखा अधिकृत	कृष्ण कूमार गौतम	२०७७।११।०७	अनिवार्य	गूलरिया वितरण केन्द्र	
२५	धनच ७२१३	६	सहायक ईन्जिनियर	वीर बहादूर राई	२०७७।११।१२	अनिवार्य	ओखलढूङ्गा वितरण केन्द्र	
२६	घड्प ३५३४	६	सहायक प्रशासकीय अधिकृत	लोकनाथ सूवेदी	२०७७।१२।०१	अनिवार्य	लगनखेल विरतण केन्द्र	
२७	घड्प ३४५६	६	सहायक प्रशासकीय अधिकृत	कमल प्रसाद लम्साल	२०७७।१२।१४	अनिवार्य	रत्ननगर टाडी वितरण केन्द्र	
२८	गधनच २६५७	६	सहायक ईन्जिनियर	केशव प्रसाद रिमाल	२०७७।१२।१५	अनिवार्य	ग्रिड सोलार एण्ड ईनर्जि ईफिसियन्सी	
२९	दघड्प ५७०४	६	सहायक लेखा अधिकृत	सूभद्रा कूमारी सिलवाल	२०७७।१२।१५	अनिवार्य	बजेट तथा ट्रेजरी महाशाखा	
३०	धनच ७१२९	६	सहायक ईन्जिनियर	बिरेन्द्र जोन्छे	२०७७।१२।२२	अनिवार्य	मर्स्याङ्गदी-काठमाण्डौ २२०	

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	अवकास हुंदाको कार्यरत कार्यालय	कैफियत
३१	दघङप ५७७१	६	सहायक प्रशासकीय अधिकृत	अच्यूत महत	२०७७।१२।२३	अनिवार्य	पूल्चोक वितरण केन्द्र	
३२	धनच ७२६७	६	सहायक ईन्जिनियर	चक्र बहादूर चन्द	२०७७।१२।२८	अनिवार्य	अत्तरिया ग्रिड शाखा	
३३	दघङप ५७३०	६	सहायक प्रशासकीय अधिकृत	अनिरुद्र प्रसाद न्यौपाने	२०७८।०१।०४	अनिवार्य	अपर अरुण हाइड्रो-इलेक्ट्रिक लिमिटेड	
३४	नच ७८७४	६	सहायक प्राविधिक अधिकृत	हरिकृष्ण कार्की	२०७८।०१।०७	अनिवार्य	हेटौंडा वितरण केन्द्र	
३५	दघङप ६३०९	६	सहायक प्रशासकीय अधिकृत	बसन्त कूमार द्विवेदी	२०७८।०१।१५	अनिवार्य	केन्द्रीय कर्मचारी प्रशासन शाखा, अभिलेख	
३६	गधनच २६४८	६	सहायक इन्जिनियर	राज कूमार श्रेष्ठ	२०७८।०२।०४	अनिवार्य	बानेश्वर वितरण केन्द्र	
३७	घङप ३४६२	६	सहायक लेखा अधिकृत	खेम प्रसाद सिवाकोटी	२०७८।०३।१३	अनिवार्य	अनारमनी वितरण केन्द्र	
३८	घङप ३७८०	६	सहायक कम्प्यूटर अधिकृत	माधव प्रसाद तिमिल्सिना	२०७८।०३।२०	अनिवार्य	आयोजना विकास विभाग	
३९	घङप ३७७०	६	सहायक लेखा अधिकृत	श्यामकला काउचा	२०७८।०३।२९	अनिवार्य	केन्द्रीय लेखा महाशाखा	
४०	घङप ३५३३	६	सहायक लेखा अधिकृत	पोषराज सूवेदी	२०७८।०३।३१	अनिवार्य	ट्रान्सफरमर वर्कशप	
४१	दघङ ५७१४	५	लेखापाल	रामशरण खत्री	२०७७।१०।०३	अनिवार्य	बानेश्वर वितरण केन्द्र	
४२	दघङ ६२७९	५	लेखापाल	प्रेमलाल कर्माचार्य	२०७७।१०।०८	अनिवार्य	ठिमि वितरण केन्द्र	
४३	गधन २४१०	५	सूपरभाईजर	कृष्ण गोपाल श्रेष्ठ	२०७७।१०।०९	अनिवार्य	हेटौंडा ग्रिड महाशाखा	
४४	गधन ३१६६	५	सूपरभाईजर	लोक बहादूर थापाक्षेत्री	२०७७।११।०८	अनिवार्य	बूटवल वितरण केन्द्र	
४५	गधन २७३३	५	सूपरभाईजर	ज्ञान बहादूर पराजूली	२०७७।११।१७	अनिवार्य	सूनकोशी जल विद्यूत केन्द्र	
४६	दघङ ५६९३	५	लेखापाल	श्रीराम थापा	२०७७।११।२५	अनिवार्य	रत्नपार्क वितरण केन्द्र	
४७	गधन ३००९	५	सूपरभाईजर	टेक बहादूर थापा	२०७७।१२।०५	अनिवार्य	कालिगण्डकी ए जलविद्यूत केन्द्र	
४८	खगधन १०२१	५	सूपरभाईजर	बल बहादूर प्रजा	२०७७।१२।०८	अनिवार्य	कूलेखानी प्रथम जलविद्यूत केन्द्र	
४९	दघङ ६१८३	५	लेखापाल	देव प्रसाद बराल	२०७८।०१।०९	अनिवार्य	गण्डकी प्रादेशिक कार्यालय, पोखरा	
५०	गधन ३०३३	५	सूपरभाईजर	एकेन्द्र बहादूर स्वार	२०७८।०१।१०	अनिवार्य	राजापूर वितरण केन्द्र	
५१	गधन २८९७	५	सूपरभाइजर	सूदर्शन खड्का	२०७८।०१।१८	अनिवार्य	पूल्चोक वितरण केन्द्र	
५२	दघङ ६०५८	५	लेखापाल/स्टोरकिपर	लाल बहादूर साह	२०७८।०१।२१	अनिवार्य	कन्चनपूर वितरण केन्द्र	
५३	गधन २८९४	५	सूपरभाईजर	नन्द्रिका ठाकूर	२०७८।०२।०३	अनिवार्य	प्रदेश नं.२, प्रादेशिक कार्यालय जनकपूर	
५४	दघङ ५५४३	५	लेखापाल/स्टोरकिपर	तूलसी प्रसाद धिताल	२०७८।०२।०५	अनिवार्य	बिराटनगर वितरण केन्द्र	
५५	दघङ ६०२२	५	वरिष्ठ सहायक	सिद्धि बहादूर बैद्य	२०७८।०२।१०	अनिवार्य	केन्द्रीय कर्मचारी प्रशासन शाखा, अभिलेख	
५६	गधन ३३७२	५	सूपरभाईजर	उमाकान्त खवास	२०७८।०२।१९	अनिवार्य	धूलाबारी वितरण केन्द्र	
५७	दघङ ५८८७	५	ब.स./मि.रि.सू.भा.	राम निवास सिंह राजपूत	२०७८।०२।२७	अनिवार्य	चन्द्रनिगाहपूर वितरण केन्द्र	
५८	दघङ ६२४३	५	लेखापाल/स्टोरकिपर	उमाकान्त बस्याल	२०७८।०३।०५	अनिवार्य	नयामिल वितरण केन्द्र	
५९	गधन २८११	५	सूपरभाइजर	जनक राज उपाध्याय	२०७८।०३।०५	अनिवार्य	कूलेखानी दोश्रो जलविद्यूत केन्द्र	
६०	दघङ ५८१८	५	कम्प्युटर अपरेटर	निर्मला देवी उप्रेती	२०७८।०३।१५	अनिवार्य	भक्तपूर वितरण केन्द्र	
६१	गधन २८९२	५	सूपरभाईजर	कृष्ण बहादूर क्षेत्री जि.सि.	२०७८।०३।२०	अनिवार्य	परासी वितरण केन्द्र	
६२	कखगध १३०८	४	फोरमेन	बालकृष्ण तिमल्सीना	२०७७।१०।०३	अनिवार्य	सूनकोशी जल विद्यूत केन्द्र	
६३	खगध २३३४	४	फोरमेन	चूडामणी शर्मा	२०७७।१०।१८	अनिवार्य	मोदीखोला जल विद्यूत केन्द्र	
६४	खगध १५२५	४	फोरमेन	रामेश्वर कामत	२०७७।११।०५	अनिवार्य	दूहवी वितरण केन्द्र	
६५	गध ३३६१	४	फोरमेन	गूणराज आचार्य	२०७७।११।२०	अनिवार्य	लालबन्दी वितरण केन्द्र	
६६	कखगध ८८	४	फोरमेन	श्याम कृष्ण बस्नेत	२०७७।११।२५	अनिवार्य	फर्पिङ्ग जलविद्यूत केन्द्र	
६७	गध ३२७३	४	फोरमेन ड्राइभर	कपिल देव चौधरी	२०७७।१२।२५	अनिवार्य	गौशाला वितरण केन्द्र	
६८	कखगध१४५	४	फोरमेन	राजेन्द्र थापा	२०७७।१२।२९	अनिवार्य	रत्नपार्क वितरण केन्द्र	
६९	कखगध १५४	४	फोरमेन	टंकराम गोले	२०७७।१२।३०	अनिवार्य	पूल्चोक वितरण केन्द्र	
७०	खगध१६४०	४	फोरमेन	सानू कान्छा गोतामे	२०७७।१२।३०	अनिवार्य	पालूङ वितरण केन्द्र	
७१	खगध १०१९	४	फोरमेन	गोपाल बहादूर थापा	२०७७८।१५	अनिवार्य	बानेश्वर वितरण केन्द्र	
७२	तथदघ ४७२१	४	सिनियर मिटर रिडर	सुर्य प्रसाद पौडेल	२०७८।०१।०१	अनिवार्य	जोरपाटी वितरण केन्द्र	
७३	कखगध २८६	४	फोरमेन	चन्द्र कूमार लिम्बू	२०७८।०१।०१	अनिवार्य	धरान वितरण केन्द्र	
७४	खगध २१५०	४	फोरमेन	यामूना यादव	२०७८।०१।०२	अनिवार्य	यदूकवा वितरण केन्द्र	
७५	खगध २१४३	४	फोरमेन	रामअवध नाउ	२०७८।०१।०५	अनिवार्य	भैरहवा वितरण केन्द्र	
७६	गध ३५१३	४	फोरमेन ड्राईभर	मोहन मान श्रेष्ठ	२०७८।०१।०५	अनिवार्य	बागमती प्रदेश, प्रादेशिक कार्यालय हेटौंडा	
७७	दघ६२८०	४	सहायक लेखापाल	रुप बहादूर खड्का	२०७८।०१।१५	अनिवार्य	महेन्द्रनगर वितरण केन्द्र	
७८	खगध १७९६	४	फोरमेन	इन्द्र देव पन्त	२०७८।०२।०२	अनिवार्य	महेन्द्रनगर वितरण केन्द्र	
७९	गध ३२४०	४	फोरमेन	रेवतीरमण खतिवडा	२०७८।०२।१५	अनिवार्य	बालाजू वितरण केन्द्र	
८०	कखगध ७३७	४	फोरमेन	हरि प्रसाद रिजाल	२०७८।०२।२५	अनिवार्य	कूलेश्वर वितरण केन्द्र	
८१	खगध १८१०	४	फोरमेन	जय बहादूर रावल	२०७८।०२।२८	अनिवार्य	वाजूरा वितरण केन्द्र	
८२	गध ३५०५	४	फोरमेन	ओम प्रसाद दहाल	२०७८।०३।११	अनिवार्य	कोशी कोरीडोर२२० के.भि. प्रसारण लाईन	
८३	खगध १४९७	४	फोरमेन	विष्णू लाल श्रेष्ठ	२०७८।०३।१५	अनिवार्य	देवीघाट जल विद्यूत केन्द्र	
८४	कखग ९३३	३	ईलेक्ट्रिसियन	सूदामा कायस्थ	२०७७।१०।०१	अनिवार्य	परासी वितरण केन्द्र	

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	अवकास हुँदाको कार्यरत कार्यालय	कैफियत
८५	तथद ४४२७	३	मिटर रिडर	नीर बहादूर रिजाल	२०७७।१०।०५	अनिवार्य	त्रिशूली जल विद्यूत केन्द्र	
८६	तथद ४८७३	३	मिटर रिडर	गम्भिर सिंह बिष्ट	२०७७।१०।१५	अनिवार्य	धनगढी वितरण केन्द्र	
८७	तथद ४८१७	३	मिटर रिडर	राम एकवाल महासेठ	२०७७।१०।१९	अनिवार्य	हेटौंडा वितरण केन्द्र	
८८	तथद ४९९३	३	मिटर रिडर	पूष्पा थापा	२०७७।११।०१	अनिवार्य	लेखा विभाग	
८९	खग २३८१	३	इलेक्ट्रिसियन	बल भद्र तामाङ्ग	२०७७।११।११	अनिवार्य	खादबारी वितरण केन्द्र	
९०	कखग ३६०	३	इलेक्ट्रिसियन	चन्द्र बहादूर वल	२०७७।११।१९	अनिवार्य	कूलेखानी प्रथम जलविद्यूत केन्द्र	
९१	तथद ५१५१	३	मिटर रिडर	ज्ञान बहादूर रिजाल	२०७७।११।२३	अनिवार्य	त्रिशूली जल विद्यूत केन्द्र	
९२	कखग ७०५	३	इलेक्ट्रिसियन	जगन्नाथ अधिकारी	२०७७।१२।०५	अनिवार्य	पोखरा वितरण केन्द्र	
९३	कखग १३०५	३	इलेक्ट्रिसियन	वद्री बहादूर लामिछाने	२०७७।१२।०७	अनिवार्य	रत्ननगर टाडी वितरण केन्द्र	
९४	खग २११२	३	इलेक्ट्रिसियन	मनिवर राइ	२०७७।१२।१०	अनिवार्य	नूवाकोट वितरण केन्द्र	
९५	कखग ५३६	३	जूनियर मिस्त्री	ठूलो कान्छा पाखिन लामा	२०७७।१२।१५	अनिवार्य	हेटौंडा डिजेल केन्द्र	
९६	तथद ४३९७	३	मिटर रिडर	सानू केशरी पोडे	२०७७।१२।१६	अनिवार्य	ठिमि वितरण केन्द्र	
९७	द ३३००५४	३	कर्ल्क	नेत्र बहादूर सिंह ठकूरी	२०७७।१२।२२	अनिवार्य	उदयपूर वितरण केन्द्र	
९८	खग २१७५	३	इलेक्ट्रिसियन	इन्द्र बहादूर श्रेष्ठ	२०७७।१२।२८	अनिवार्य	संस्थागत सूदृढिकरण आयोजना	
९९	तथद ४९४१	३	मिटर रिडर	मैया महर्जन	२०७८।०१।०१	अनिवार्य	प्रशासन निर्देशनालय	
१००	तथद ४९०३	३	मिटर रिडर	पुर्ण कूमारी डंगोल	२०७८।०१।०१	अनिवार्य	उपलब्धी शाखा	
१०१	खग २३६७	३	ईलेक्ट्रिसियन	डिल्लीराम मगर	२०७८।०१।०४	अनिवार्य	पाचथर वितरण केन्द्र	
१०२	खग २२१२	३	ईलेक्ट्रिसियन	रामचन्द्र कामत	२०७८।०१।०५	अनिवार्य	विराटनगर वितरण केन्द्र	
१०३	कखग १४८८	३	इलेक्ट्रिसियन	नागेन्द्र लाल कर्ण	२०७८।०१।१०	अनिवार्य	जलेश्वर वितरण केन्द्र	
१०४	तथद ४९७२	३	मिटर रिडर	दिक बहादूर राई	२०७८।०१।२२	अनिवार्य	ओखलढूङ्गा वितरण केन्द्र	
१०५	कखग १०५४	३	ईलेक्ट्रिसियन	श्रीराम प्रसाद पौडेल	२०७८।०२।०१	अनिवार्य	बानेश्वर वितरण केन्द्र	
१०६	कखग ९३१	३	ईलेक्ट्रिसियन	गोवर्धन वूढाथोकी	२०७८।०२।०५	अनिवार्य	ठिमि वितरण केन्द्र	
१०७	ग ३७१०	३	ईलेक्ट्रिसियन	टिकेन्द्र कूमार ओझा	२०७८।०२।२८	अनिवार्य	दमक वितरण केन्द्र	
१०८	तथद ४७३४	३	मिटर रिडर	रामशरण बोहरा	२०७८।०२।३०	अनिवार्य	सूनकोशी जल विद्यूत केन्द्र	
१०९	खग २२५१	३	ईलेक्ट्रिसियन	पूनदेव महतो धानूक	२०७८।०३।१५	अनिवार्य	बिरगंज वितरण केन्द्र	
११०	कखग १३५९	३	इलेक्ट्रिसियन	राम कूमार गिरी	२०७८।०३।१८	अनिवार्य	विराटनगर वितरण केन्द्र	
१११	कखग ११४४	३	ईलेक्ट्रिसियन	अर्जून प्रसाद प्याकूरेल	२०७८।०३।२०	अनिवार्य	त्रिशूली जल विद्यूत केन्द्र	
११२	कख १९१४	२	हेल्पर	शकून्तला ढूंगाना	२०७७।११।०७	अनिवार्य	बानेश्वर वितरण केन्द्र	
११३	तथ ५१६७	२	कार्यालय सहयोगी	चन्द्र बहादूर लामा	२०७७।११।१२	अनिवार्य	केन्द्रीय भण्डार हेटौंडा	
११४	कख १८०९	२	हेल्पर	राममिलन मिश्र	२०७७।११।२०	अनिवार्य	जलेश्वर वितरण केन्द्र	
११५	ख १२००४५	२	हेल्पर	उद्धव देव भट्ट	२०७७।११।२७	अनिवार्य	बैतडी वितरण केन्द्र	
११६	तथ ३१००२९	२	कार्यालय सहयोगी	कासीराम खडायत	२०७७।१२।०४	अनिवार्य	धनगढी वितरण केन्द्र	
११७	तथ ३१००१६	२	कार्यालय सहयोगी	राज कूमार राई	२०७७।१२।३०	अनिवार्य	इलाम वितरण केन्द्र	
११८	कख ११०४४४	२	हेल्पर	रामजी आलेमगर	२०७८।०१।०१	अनिवार्य	रामेछाप वितरण केन्द्र	
११९	तथ ५३८२	२	कार्यालय सहयोगी	ऋषिराम पाध्या	२०७८।०१।१५	अनिवार्य	मोदीखोला जल विद्यूत केन्द्र	
१२०	कख १६२९	२	हेल्पर	महेन्द्र साह	२०७८।०१।१६	अनिवार्य	जलेश्वर वितरण केन्द्र	
१२१	ख १२००१२	२	हेल्पर	हरिशचन्द्र घिमिरे	२०७८।०१।२५	अनिवार्य	लालबन्दी वितरण केन्द्र	
१२२	कख ११०४०९	२	हेल्पर	पूष्पा भट्ट	२०७८।०२।१०	अनिवार्य	महेन्द्रनगर वितरण केन्द्र	
१२३	कख ११००६६	२	हेल्पर	सोम बहादूर थापा	२०७८।०३।०१	अनिवार्य	स्याङ्गजा वितरण केन्द्र	
१२४	ख १२०१३६	२	हेल्पर	गोविन्द बहादूर कार्की	२०७८।०३।०४	अनिवार्य	हेटौंडा ग्रिड महाशाखा	
१२५	ख १२०१००	२	हेल्पर	जिवनाथ बास्कोटा	२०७८।०३।०६	अनिवार्य	रत्नपार्क वितरण केन्द्र	
१२६	कख ९१७	२	हेल्पर	धन बहादूर कार्की	२०७८।०३।१०	अनिवार्य	भक्तपूर वितरण केन्द्र	
१२७	ख १२०१६७	२	हेल्पर	राज प्रसाद पाण्डेय	२०७८।०३।२३	अनिवार्य	डडेल्धूरा वितरण केन्द्र	
१२८	त ३१०१३६	१	कार्यालय सहयोगी	नन्दा देवी क्षेत्री	२०७७।१०।११	अनिवार्य	प्रदेश नं.२, प्रादेशिक कार्यालय जनकपूर	
१२९	क ११०११८	१	जूनियर हेल्पर	रत्न बहादूर बजू तामाङ्ग	२०७७।१०।३०	अनिवार्य	हेटौंडा वितरण केन्द्र	
१३०	क११०२३३	१	जूनियर हेल्पर	नरसिंह लिम्बू	२०७७।११।१८	अनिवार्य	बेलवारी वितरण केन्द्र	
१३१	त३१००१५	१	कार्यालय सहयोगी	हेम प्रसाद अधिकारी	२०७७।१२।२७	अनिवार्य	अनारमनी वितरण केन्द्र	
१३२	त ३१००४२	१	कार्यालय सहयोगी	वूद्धिमान विश्वकर्मा	२०७८।०१।१०	अनिवार्य	सूनकोशी जल विद्यूत केन्द्र	
१३३	क ११०४५६	१	जूनियर हेल्पर	तालूक मण्डल राजवंशी	२०७८।०३।०१	अनिवार्य	दूहवी वितरण केन्द्र	

स्वेच्छिक अवकाश लिएका कर्मचारीको विवरण

(मिति २०७७/०४/०१ देखि मिति २०७८/०३/३१ सम्म)

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	अवकास हुँदाको कार्यरत कार्यालय	कैफियत
१	घङपफ ३१३१	७	प्रशासकीय अधिकृत	महामन चन्द्र खनाल	२०७७।०७।२६	स्वेच्छिक	वितरण तथा ग्राहक सेवा निर्देशनालय	छुट
२	नचछ ७९२०	७	इन्जिनियर	जनार्दन पराजुली	२०७७।०८।०१	स्वेच्छिक	काठमाण्डा उपत्यका पुर्व तथा दक्षिण वितरण प्रणाली सुद्धढीकरण आयोजना	छुट
३	दघङप ५७३७	६	सहायक प्रशासकीय अधिकृत	राधा कृष्ण कार्की	२०७७।१०।०७	स्वेच्छिक	उत्पादन विकाश विभाग	
४	घङप ३६५०	६	सहायक प्रशासकीय अधिकृत	मात्रिका बजिमय	२०७७।११।०१	स्वेच्छिक	सिन्धूपाल्चोक वितरण केन्द्र	
५	दघङप ६३१६	६	सहायक कम्प्यूटर अधिकृत	रामहरी आचार्य	२०७७।११।०१	स्वेच्छिक	ठिमी वितरण केन्द्र	
६	गधनच २३६६	६	सहायक ईन्जिनियर	जनक कुमार थापा	२०७७।११।०१	स्वेच्छिक	तामाकोशी(काठमाण्डौ २२० के.भि. प्रसारण	
७	घङप ३४४१	६	सहायक प्रशासकीय अधिकृत	शिव खड्का	२०७७।११।२१	स्वेच्छिक	रत्नपार्क वितरण केन्द्र	
८	घङप ३५२५	६	सहायक प्रशासकीय अधिकृत	अर्जुन बन्जारा	२०७८।०१।०१	स्वेच्छिक	रत्नपार्क वितरण केन्द्र	
९	दघङ ६१२२	५	लेखापाल	अम्बिका भट्टराई	२०७७।०७।१२	स्वेच्छिक	परासी वितरण केन्द्र	छुट
१०	दघङ ५९६१	५	लेखापाल	खुलराज ढुङ्गाना	२०७७।०९।२६	स्वेच्छिक	लहान वितरण केन्द्र	छुट
११	दघङ ६२४९	५	लेखापाल/स्टोरकिपर	रामचन्द्र तिवारी	२०७७।१०।०१	स्वेच्छिक	लेखनाथ वितरण केन्द्र	
१२	दघङ ६२६३	५	लेखापाल	धर्म प्रसाद सापकोटा	२०७७।१०।०५	स्वेच्छिक	धरान वितरण केन्द्र	
१३	गधन २९६४	५	सूपरभाईजर	सूरेश कुमार गूप्ता	२०७७।१०।११	स्वेच्छिक	नेपाल भारत विद्युत प्रशारण तथा व्यापार	
१४	दघङ ५९३९	५	लेखापाल	रोमीला आचार्य	२०७७।१२।१०	स्वेच्छिक	वेरुजू फछ्र्यौट शाखा	
१५	खगध १५२४	४	फोरमेन	महेन्द्र के.सी. खत्री	२०७७।०८।१६	स्वेच्छिक	हेटौंडा ग्रिड महाशाखा	छुट
१६	कखगध १०४०	४	फोरमेन	राधानन्दन लाल दास	२०७७।०९।२६	स्वेच्छिक	बरहथवा वितरण केन्द्र	छुट
१७	खगध १६४५	४	फोरमेन	अनिक बहादूर थापा	२०७७।०९।२९	स्वेच्छिक	ठिमी वितरण केन्द्र	छुट
१८	खगध १७७०	४	फोरमेन	जंग बहादूर चन्द	२०७७।१२।०१	स्वेच्छिक	चमेलिया जलविद्युत केन्द्र	
१९	खगध १६७५	४	फोरमेन	उत्तम प्रसाद पोखरेल	२०७८।०२।०४	स्वेच्छिक	पुल्चोक वितरण केन्द्र	
२०	तथद ५००४	३	मिटर रिडर	बिष्णु बहादूर रायमाझी	२०७७।०९।०५	स्वेच्छिक	बागमति प्रदेश, प्रदेश डिभिजन कार्यालय	छुट
२१	कखग १४५३	३	इलेक्ट्रिसियन	यम बहादूर बस्नेत	२०७७।०९।२२	स्वेच्छिक	धनगढी वितरण केन्द्र	छुट
२२	कखग ९७४	३	ईलेक्ट्रिसियन	केशव कार्की	२०७७।१०।०१	स्वेच्छिक	ठिमी वितरण केन्द्र	
२३	कखग ३८	३	इलेक्ट्रिसियन	सानूकाजी थापा मगर	२०७७।१०।०१	स्वेच्छिक	कूलेश्वर वितरण केन्द्र	
२४	तथद ५०१०	३	मिटर रिडर	शिव प्रसाद आचार्य	२०७७।१०।१४	स्वेच्छिक	कर्मचारी कल्याण महाशाखा	
२५	तथद ५२२७	३	मिटर रिडर	धन बहादूर विश्वकर्मा	२०७७।१२।०१	स्वेच्छिक	हेटौंडा वितरण केन्द्र	
२६	तथद ४९६०	३	मिटर रिडर	संघरत्न महर्जन	२०७७।१२।२९	स्वेच्छिक	सामान्य सेवा विभाग	
२७	कखग ६१२	३	इलेक्ट्रिसियन	बालिदास तत्मा	२०७८।०१।०१	स्वेच्छिक	कलैया वितरण केन्द्र	
२८	कखग ७०३	३	इलेक्ट्रिसियन	मान बहादूर घलान	२०७८।०२।०१	स्वेच्छिक	हेटौंडा वितरण केन्द्र	

मृत्यु भएका कर्मचारीको विवरण

(मिति २०७७/०४/०१ देखि मिति २०७८/०३/३१ सम्म)

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	कारण	कार्यरत कार्यालय	कैफियत
१	धनचछ ७२५१	७	ईन्जिनियर	राज किशोर साह	२०७७।०८।१७	मृत्यू	मंलगवा वितरण केन्द्र	छुट
२	ङप ८८७१	६	सहायक लेखा अधिकृत	हिरामणी जमरकट्टेल	२०७८।०१।१०	मृत्यू	पोखरा वितरण केन्द्र	
३	दघङ ५९३८	५	लेखापाल	शिव नारायण मण्डल	२०७७।१०।०३	मृत्यू	सिरहा वितरण केन्द्र	
४	गधन २९४९	५	सूपरभाइजर	केशव राज सिह स्वार	२०७७।१२।२१	मृत्यू	धनगढी वितरण केन्द्र	
५	दघङ ५८१७	५	मि.रि.सू.भा.	शंकर प्रसाद कहार	२०७८।०१।२०	मृत्यू	विरगंज वितरण केन्द्र	
६	गधन २८६७	५	सूपरभाइजर	शम्भू सिंह क्षेत्री	२०७८।०२।०६	मृत्यू	भैरहवा वितरण केन्द्र	
७	खग १७५९	३	ईलेक्ट्रिसियन	रोशन लाल चौधरी	२०७७।१०।०२	मृत्यू	टीकापूर वितरण केन्द्र	
८	द ३३०१६४	३	मिटर रिडर	रामाकान्त प्रसाद चौरसिया	२०७७।१०।१९	मृत्यू	पोखरिया वितरण केन्द्र	
९	ग ३२५९	३	ड्राईभर (४ तहको सूविधा)	भोज कूमार पाण्डे	२०७७।१०।२३	मृत्यू	हेटौंडा ग्रिड महाशाखा	
१०	कखग १२२४	३	ईलेक्ट्रिसियन	गंगा बहादूर थापा	२०७८।०१।२३	मृत्यू	काठमाण्डौ ग्रिड महाशाखा	
११	ग १३००३७	३	ईलेक्ट्रिसियन	नागेन्द्र पण्डित	२०७८।०१।२९	मृत्यू	ढल्केवर ग्रिड शाखा	
१२	खग २१७६	३	ईलेक्ट्रिसियन	चन्द्रदिप कूमार साह	२०७८।०३।१२	मृत्यू	जनकपूर वितरण केनद्र	
१३	कख १७६०	२	हेल्पर	धन बहादूर गाहा	२०७७।१०।०५	मृत्यू	बूटवल वितरण केन्द्र	
१४	तथ ५०५७	२	कार्यालय सहयोगी	इनदल कूमार झा	२०७८।०१।१६	मृत्यू	जलेश्वर वितरण केन्द्र	
१५	कख ८३७	२	हेल्पर	ज्ञान बहादूर तामाङ्ग	२०७८।०२।०८	मृत्यू	काभ्रे वितरण केन्द्र	
१६	क ११०१८२	१	जूनियर हेल्पर	सूदिप राज अधिकारी	२०७७।०९।०९	मृत्यू	नुवाकोट वितरण केन्द्र	छुट
१७	क ११००२५	१	जूनियर हेल्पर	साधूराम थापा	२०७७।१०।२०	मृत्यू	बानेश्वर वितरण केन्द्र	
१८	त ३१०१०९	१	कार्यालय सहयोगी	चन्देश्वर मरिक	२०७७।१२।१८	मृत्यू	प्रदेश नं.१, प्रादेशिक कार्यालय विराटनगर	
१९	क ११००२३	१	जूनियर हेल्पर	मोतिलाल वोहोरा	२०७७।१२।१९	मृत्यू	रत्ननगर टाडी वितरण केन्द्र	

राजीनामा दिएका कर्मचारीको विवरण

(मिति २०७७/०४/०१ देखि मिति २०७८/०३/३१ सम्म)

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	कार्यरत कार्यालय	कैफियत
१	छज १७००७३	८	सहायक प्रबन्धक	तेज कृष्ण श्रेष्ठ	२०७८।०१।११	राजिनामा	बिद्यूत ब्यापार बिभाग	
२	छज १७००५१	८	सहायक प्रबन्धक	सन्तोष महर्जन	२०७८।०१।१४	राजिनामा	अपर अरुण हाइड्रोइलेक्ट्रिक लिमिटेड	
३	दघङ ५८८५	५	लेखापाल	रज्जू बस्नेत	२०७७।१२।०३	राजिनामा	रत्नपार्क वितरण केन्द्र	
४	खगधन १५५३	५	सूपरभाईजर	जगत बहादूर खड्का	२०७७।०९।१२	राजिनामा	काली गण्डकी ए जलविद्यूत केन्द्र	छूट
५	द ३३०२७२	३	मिटर रिडर	शोभा पाण्डे	२०७७।१२।०२	राजिनामा	बालाजू वितरण केन्द्र	
६	कख ७९३	२	हेल्पर	रामचन्द्र कोहार	२०७७।०९।२९	राजिनामा	भैरहवा वितरण केन्द्र	छूट
७	क ११०४८३	१	जूनियर हेल्पर	रमेश भण्डारी	२०७७।०९।१६	राजिनामा	महाराजगंज वितरण केन्द्र	छूट

सेवाबाट हटाइएको कर्मचारीको विवरण

(मिति २०७७/०४/०१ देखि मिति २०७८/०३/३१ सम्म)

सि.नं.	क्र.सं.नं.	तह	पद	नामथर	अवकास मिति	अवकासको किसिम	कार्यरत कार्यालय	कैफियत
१	छज ११८५१	८	सहायक प्रबन्धक	सजय कूमार लाल	२०७७।०४।१२	सेवाबाट हटाइएको	वितरण तथा ग्राहक सेवा निर्देशनालय	छूट

नेपाल विद्युत प्राधिकरण

कर्मचारी कल्याण महाशाखा

थप आर्थिक सहायता

आ ब २०७७।०७८ को माघ १ देखि असार मसान्त सम्म थप आर्थिक सहायता लिने कर्मचारीहरुको विवरण ।

सि.नं.	पद	कर्मचारीको नाम थर	कार्यरत कार्यालय	रोगको प्रकार
१	ई.सि.	श्री अमर सिंह वली	कोहलपुर वितरण केन्द्र	क्यान्सर
२	जुनीयर हेल्पर	श्री शिवका सहनी	रंगेली वितरण केन्द्र	मृगौला सम्बन्धी रोग
३	सि.मि.रि.	श्री सन्त बहादुर तामाङ्ग	उर्जा दक्षता तथा चुहावट नियन्त्रण विभाग	क्यान्सर
४	सु.भा.ईले	श्री सुवर्ण अधिकारी	हेटौंडा ग्रिड महाशाखा	मुटु रोग
५	इन्जिनियर	श्री सविना ताम्राकार	तनहुँ हाईड्रोपावर लिमिटेड	ब्लड क्यान्सर

आर्थिक सहायता अनुदान

आ ब २०७७।०७८ माघ १ देखि असार मसान्त सम्ममा आर्थिक सहायता अनुदान लिने कर्मचारीहरुको विवरण ।

सि.नं.	विवरण	अनुदान लिने कर्मचारीहरुको विवरण	जम्मा रकम रु.
१.	काजक्रिया अनुदान	१४७ जना कर्मचारीको परिवारलाई १० हजारका दरले र १३ जना कर्मचारी स्वंमको मृत्यु भएकोले १५ हजारका दरले गरी जम्मा १६० जनालाई काजक्रिया अनुदान उपलब्ध गराईएको ।	रु. १६,६५,०००।

आ ब २०७७।०७८ माघ १ देखि असार मसान्त सम्ममा आर्थिक सहायता अनुदान, सापटी, वीमा लगायतका विवरण ।

सि.नं	विवरण	किसिम	संख्या	जम्मा रु
१	अनुदान	कडा रोग अनुदान		
		काज किया	१६३.00	१,३२0,000.00
२	औषधोपचार विमा	दुर्घटना	१.00	७00,000.00
		औषधोपार	६२४.00	२८,६0९,१४0.00
३	सावधिक जिवन बिमा	बिमा कम्पनीबाट	१५७.00	३४,९४0,८१९.११
		ने.वि.प्रा. बाट थप		१५0,0३८,८८२.0८
		विमा नविकरण		५५५,२८६,३३१.६७
४	सापटी	औषधोपार सापटी	१४८.00	१,४८0,000.00
		सामाजिक व्यवहार सापटी	१४८.00	२,९६0,000.00
		घर मर्मत सापटी	१४५.00	७,२५0,000.00
		दैवि प्रकोप सापटी		
		घर जम्मा खरीद सापटी (१ लाख)		–
		घर जम्मा खरीद सापटी (२ लाख)	१५.00	१,५00,000.00
		घर जम्मा खरीद सापटी(३ लाख)	४.00	१,२00,000.00
		घर जम्मा खरीद सापटी (५ लाख)	१४५.00	७२,५00,000.00
		कुल सापटी जम्मा (घर जग्गा खरीद)	*१६४.00*	*७५,२00,000.00*

नेपाल विद्युत प्राधिकरण
प्रशासन निर्देशनालय
जनसाधन विभाग
केन्द्रीय कर्मचारी प्रशासन शाखा
२०७८ आषाढ मसान्त

पद	सेवा	स्वीकृत दरबन्दी			मौजुदा कर्मचारी		
		नियमित	आयोजना	जम्मा	स्थायी	म्यादी/करार/ ज्यालादारीमा कार्यरत कर्मचारी संख्या	जम्मा
कार्यकारी निर्देशक		१	0	१	१	0	१
उप कार्यकारी निर्देशक	(प्राविधिक/प्रशासन)	९	0	९	८	0	८
अधिकृत स्तर (तह ६ देखी ११ सम्म)	प्राविधिक	१२५४	११३	१३६७	१0९१	0	१0९१
	प्रशासन	५९0	२३	६१३	५२६	९	५३५
	जम्मा	१८४४	१३६	१९८0	१६१७	९	१६२६
सहायक स्तर (तह १ देखी ५ सम्म)	प्राविधिक	५९१३	0	५९१३	४२0५	६१	४२६६
	प्रशासन	३२८५	0	३२८५	२४३९	४६	२४८५
	जम्मा	९१९८	0	९१९८	६६४४	१0७	६७५१
	कुल जम्मा	११0५१	१३६	१११८८	८२७0	११६	८३८६

1.25 MW Solar Plant nearby Devighat Hydropower Forebay Area

नेपाल विद्युत प्राधिकरणको कर्मचारीले लाईन मर्मत कार्य गर्दै ।

132/33KV Samundratar Sub-Station.

नेपाल विद्युत प्राधिकरण
जनसम्पर्क तथा गुनासो व्यवस्थापन शाखा
दरबारमार्ग, काठमाडौं, फोन : ०१-४१५३०२१
आन्तरिक : २००२, २००३, फ्याक्स नं.: ४१५३०२२
ईमेल: pro@nea.org.np