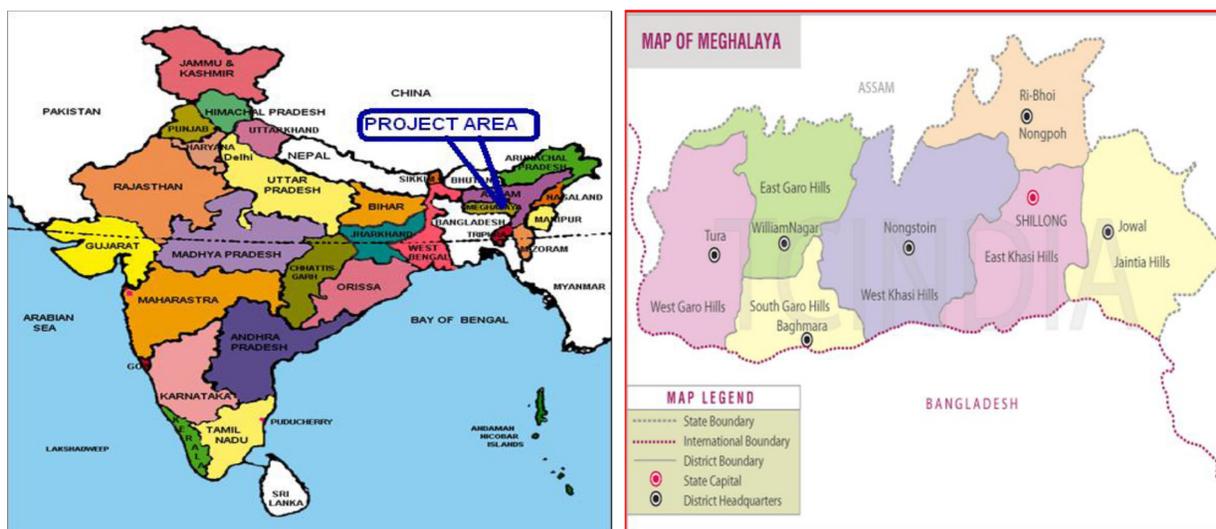


Ka Pasoh pyntreikam jong ka CEIA na ka bynta ka Mawphu H.E. Projek. Stage II ha Meghalaya

1. Ka Jingsdang

Ka Mawphu H.E Projek ka don ha ka wah Umiew kaba tuid lyngba ka East Khasi Hill Distrik jong ka Meghalaya. Ka Mawphu H.E Projek, Stage II ka dei ka jingpynlong kam ia ka kshaid jong ka Wah Umiew kaba long ka wah bah ha East Khasi Hill Distrik. Ka kynjang jong kane ka wah ka long kumba 1850m bad ka iaaid lyngba ia kiba bun tylli ki shnong ha Meghalaya, India shwa ba kan noh sha Bangladesh ban poi sha Brahmaputra lyngba ka wah Surma kaba long ka shnat wah jong ka wah Brahmaputra. Ki wah rit kiba tuid sha ka wah Umiew na shaphang ka mon ki dei ka Wah Umkynrem, Umtong bad Waisu. La kumno kumno ruh ka don ka *head* kaba 232m hapdeng ka dam hajan ka shnong Mawphu bad ka *Tail Race Tunnel outlet* hajan ka shnong Thieddieng. Ia ka map jong ka projek la pyni ha ka **Dur 1**



Dur 1: Ka Map ba pyni ia ka jaka jong ka Projek

2. Ka dur ka dar jong ka Projek

La tyrwa ban pynlong ia ka Mawphu Hydroelectric Project, Stage – II na ka wah Umiew kaba don ha East Khasi Hills District ha Meghalaya. La tyrwa ban pynlang ia ka um ha u latitude $25^{\circ} 18' 32''$ bad u Longitude $91^{\circ} 38' 19''$ Mihngi kumba 2km na shnong Thieddieng shaphang kamon jong ka rud wah. La tyrwa ban pynlong Power House ha u latitude $25^{\circ} 16' 45''$ shatei bad u

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longitude 91° 37' 45" kumba 2km na ka jingtuid sha trai ka shnong Thieddieng.

La thmu ban shna da ka dewbilat kaba ka bor jong ka ka long da ka kyrdan A kaba 51m ka jingjrong (na trai nongrim) bad 140m ka jingjrong (na kliar) kaba kynthup ia 3tylli ki blok bad ki jingpyntuid um ha ki 6 tylli ki kyndong pynlang um (bay) ha ryngkat ki khilon kiba heh 9.0m x 13.70m bad 4 tylli ki blok ki bym pyntuid um bad la thmu ruh ban shna ia ka jaka ban pynmih bording bad ban sam ia kane ka bor. Ka don kawei ka jingpynkhun ia ka um da ka tunnel kaba heh haduh 7.0m ka jingiar, kan don ruh ka dur kjat kulai kaba jrong 384m sha kadiang jong ka wah ha ryngkat ka jingpynlang um kaba 18m ka jingjrong bad 6m ka jingjrong ha ka dam kaba shathie. Ka jingshna ia ka jaka ba lah ban bat ia ka bor (power) kan long haduh 16.0m ka jingiar bad 17.60m ha ka jingjrong sha mar kamon jong ka rud wah bad ka jaka pynnoh ia ki bymler kam. Ka Tunnel kaba khot ka Head Race Tunnel ka long kumba 4.80m ka jingiar bad ka kjat kulai kan long kumba 2.62km ka jingjrong. Ka shyntur jong ka liew krem ka long 10.0m ka jingiar bad 38.35m ka jingjrong ha ka tduh jong ka HRT bad ka thliew ba pynmih bor ka long kumba 3.50m ka jingiar, 873m ka jingjrong bad sa kawei ka tnat thliew kaba pynmih bor (pressure) ka don kumba 2.50m ka jingiar bad 32m ka jingjrong.

Ka jingthew ia ka power house nalar kan long 65.84m (ka lynter) x 18.0m (ka pynkiang) x 35.70m (ka kynjang) ka ban ai jaka ban buh da pynieng ia ka Francis Turbine kaba khlain bor haduh 42.50 MW. Ka trai ne ka race channel ka long 10.0m ha ka jingiar bad ka jrong haduh 70.29m (kynthup ia ka Recovery Bay) ban pyllait ia ka um sha wah. Yn buh ruh ia ka *Gas insulated switch gear* kaba 132kV nalar ki *transformer*.

Ka dor jong ka projek (kynthup ia ka IDC) ka long 1042.13 Crore. Ka dor jong ka bai musur (tariff) kan long Rs. 6.44. Yn pyndep ia ka projek ha ki 60 bnai (kynthup ia ka por ha shwa ban shna).

Ki mat kiba kynthup ha ka projek ki long

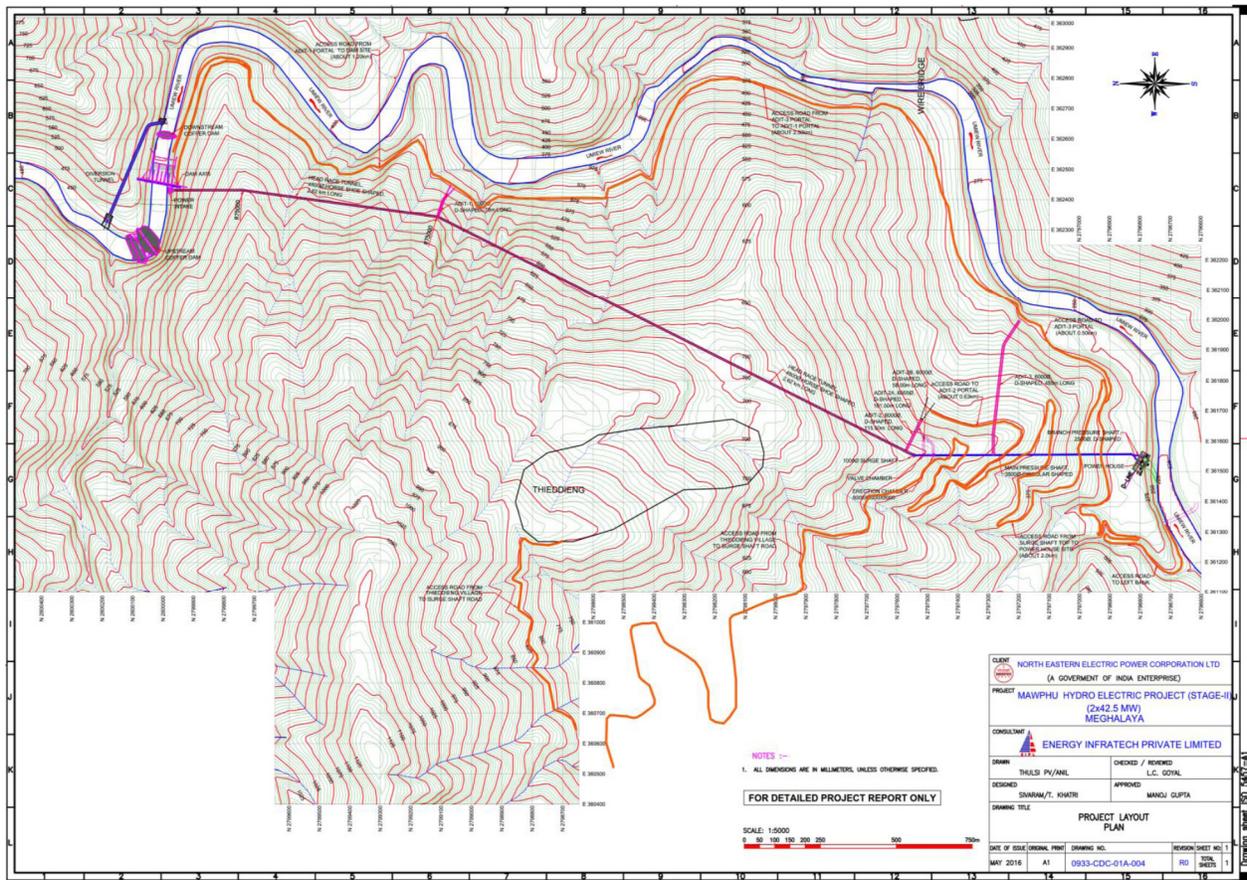
- Ka dam dewbilat kaba 51m ka jingjrong (naduh na trai) bad 140m ka jingjrong (najrong) kaba kynthup ia ki lai tylli ki jaka ban pyntuid um. La pynbeit ruh ban don 6 tylli ki bay bad ka khilon kaba heh haduh 9.0m x 13.70m bad 4 tylli ki jaka ki bym pynshlei ia ka um.
- Kan don ruh ka jingshna ban pynphriang ia ka bording ha ryngkat ka *trajectory bucket*.
- Kan don ka jingpynkhlad ia ka wah kaba kynthup ia ka wei ka tunnel kaba iar kumba 7.0m. kaba long dur kjat kulai (horse shoe shape) kaba jrong haduh 384m shaphang ka diang ka rud wah ryngkat bad ka jaka pynlang um (dam) kaba jrong haduh 18m na shaneng ka wah bad

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sharum jong ka wah ka don ka jaka pynlang um dam kaba jrong haduh 6m.

- Ka jingiar jong jaka pynmih ding ka long 16.0m ha ka pynkiang bad ka jingjrong ka long 17.60m sha kamong jong ka rud wah ryngkat bad ka jaka ba pynnoh ban tuid ka um bym pyndonkam shuh.
- Ka jingiar ka *Head Race Tunnel* ka long 4.80m. kaba long dur kjat kulai kaba jrong 2.62km. Ka shyntur jong ka lieuw krem (orifice type surge shaft) ka iar haduh 10.0m bad 38.35m ka jingjrong ha tduh jong ka HRT.
- Ka thliw pynmih bor (pressure) ka iar haduh 3.50m, 873m ka jingjrong bad ka tnat thliw pynmih bor (pressure) ka iar haduh 2.50m, bad ka jingjrong ka long 32m kawei.
- Ka jingheh jong ka *power house* nalor ka long 65.84m (ka lynter) x 18.0m (ka pynkiang) x 35.70 (ka jingjrong) bad hapoh jong ka lah ban buh ia ki *Francis turbine* kiba lah ban kit haduh 42.50MW ka bor.
- Ka don ka *tail race channel* kaba iar haduh 10.0m bad jrong haduh 70.29m (kynthup ia ka Recovery Bay) ban pyllait ia ka um shapoh ka wah.
- Yn pyndait ia u Gas insulated Switch Gear uba 132kv ha madan hajrong jong ka *transformer*.

İa ka dur jong ka projek lah ban İohi ha ka **Dur – 2**



Dur – 2: Ka shynrong jong ka map jong ka Mawphu HEP (Stage II)

2.1. Ka Jaka ba donkam

Ka jaka ba donkam na ka bynta ka projek ka long 110ha.

Ha ka Thup – I: La pyni ia ki jingdonkam ia ka jaka na ka bynta ka Mawphu HEP Stage I. Kine ki jaka kin kynthup ia kine harum:

	Area (Ha)
Ki jaka sah/Bym sah briew ha jaka dam	1.5
Ki jaka sah/Bym sah briew ha PH site	1.5
Baroh ka jaka ba donkam na ka bynta ban shna surok	17.7
Ki jaka ban tih maw (Quarry area)	6.5
Ki jaka na ka bynta ka Power House	3.50
Ki jaka pyntuid um ne ki tunnel	2.25

Ki jaka ha ka ban buh ia ka <i>Surge Shaft Top</i>	2.0
Ka jaka na ka bynta ka dam	9
Ka jaka na ka bynta ka HRT ban bteng shaduh <i>power House</i>	6.20
Ka jaka ba donkam na ka bynta ka dam	13.00
Ka jaka na ka bynta u kontraktor/ki nongtrei – Adit I	1
Ka jaka na ka bynta u kontraktor ha jaka dam	1
Ka jaka pynkhreh	1.50
Ka jaka pynmih bording (crushing plant) hajan jaka dam	1
Ka jaka pynmih bording hajan adit – 1	1
Ka jaka pynmih bording hajan jaka PH	1
Ka thliew krem, ka surok ban leit sha power house, ka jaka bret na ka bynta ki SS, ka jaka na ka bynta ka PH bad adit – ha ki lai bynta	25
Jaka bret ia ki maw khyndew etc. (muck)	
Hajan Dam	5.25
Hajan ADIT – I	2.5
Adit 2	2.0
Adit 3	2.0
Na ka bynta ka Power House (Ha ka liang ka mon ka kynriang wah)	2
Na ka bynta ka Power House (Ha ka liang ka diang ka kynriang wah)	1.5
Magazine	
Ha Dam	0.1
Hapdeng Adit 1 & 2	0.1
Baroh	110

2.2. *Ki Surok kiba la don lypa*

Ka don ka surok kali haduh Mawsynram. Mynta dang shna ia ka surok na Mawsynram sha shnong Thieddieng da ka PWD, Meghalaya. Ia mynta hi dang lah shna ia ka surok kaba jrong haduh 4km. Ia kaba mynta hi, lah ban leit sha shnong Thieddieng na ka surok ia id kjat bad lah ban poi sha ka jaka ba mut ban shna dam bad *power House* da kaba leit na ki lynti ia id kjat. Kumta, donkam ban shna ki surok thymmai ban poi sha jaka dam bad sha *Power House*. Ka jingjrong jong ki surok thymmai kan long haduh kumba 19km ka ban poi sha ki jaka ban shna dam: La thmu ban shna 5 tylli ki jingkieng; ar tylli na kita ki dei kiba yn shna ban pynneh syndon ki ban jrong haduh kumba 100m bad lai tylli pat kiba shu shna tang shipor ki ban jrong haduh 50m kawei. Nalor kine yn shna ruh 20 tylli ki muri ha nala.

La tyrwa ban shna ia ki surok sha baroh ki bynta jong ka projek kum kane ka **Jingkdew – 2**.

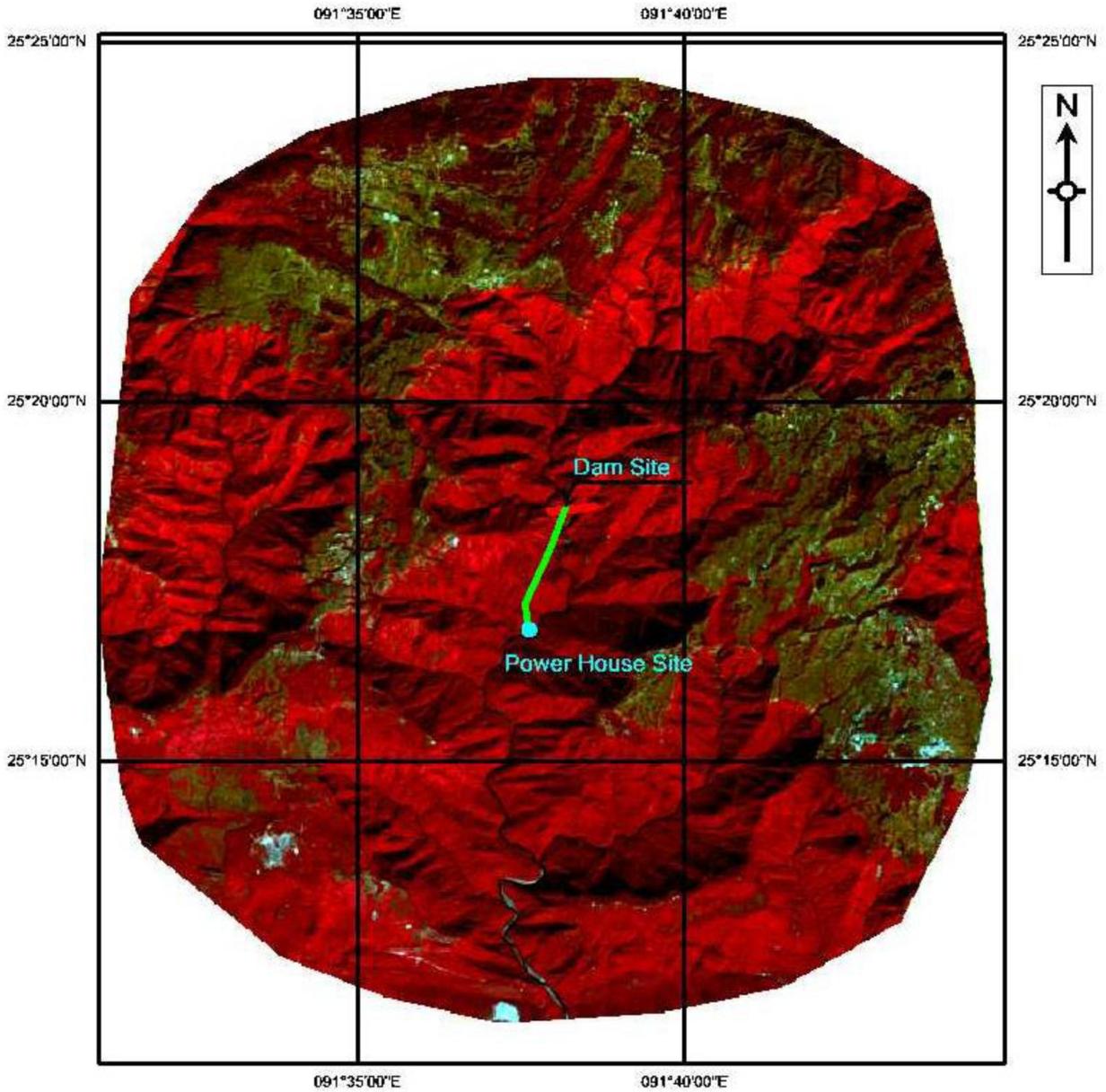
Jingkdeu – 2: Ki surok ba la thmu ban shna ha ka jaka jong ka projek

Sl. No.	Ka Jingbatai	Ka Jingjrong
1.	Ka surok na Adit – I Portal sha jaka dam	1200
2.	Ka surok na Adit – 3 sha Adit – 1	2500
3.	Ka surok sha Adit – 3	500
4.	Ka surok sha Adit – 2	250
5.	Ka surok sha ka jaka jong ka Surge shaft	3800
6.	Ka surok na shnong Thieddieng sha surok ba don ka <i>Surge Shaft</i>	4000
7.	Ki surok ha jaka pyntrei maw (Quarry Roads)	6000
	Baroh	18250 malu mala (approx)

3. Ka jaka ba la dep jurip bniah.

İa ka jaka ba la dep jurip bniah na ka bynta ka CEIA (Peit ha ka Dur – 3) kaba la pyni hapoh:

- Ka jaka ban tih ban pynlang um
- Ka jaka hapoh 10km kaba paw na ka jaka ban pynlong um
- Ka jaka ban shim na ka bynta ban buh İa ki tiar ba donkam na ka bynta ka projek
- Ka jaka hapoh ka 10km jong ka jaka buh tiar (appurtenance)
- Ki jaka dymmiew (catchment) ban pynlang um na ka bynta ka dam



Dur – 3

Ka dur jong ka Mawphu HEP, Stage II ba la shon da u satellite

4. ***Ka Jinglong ka sawdong sawkun (Environment)***

İa ka jinglong ka sawdong sawkun na ka bynta kitei ki jingdonkam la batai ha kine ki thup harum:

La pynbynta İa ka jinglong ka sawdong sawkun ha ki lai bynta. Kita ki long

- Ka jinglong jong ka met jong ka mariang ryngkat bad ki kynja bor tynrai (Physico-chemical)
- Ka jinglong ki khlaw ki btap ha ka sawkun mariang (ecological aspects)
- Ka jinglong ka imlang sahlang bad ka İoh ka kot (socio economic aspects)

İa ka jinglong jong ka sawdong ka sawkun İa ka met-mariang bad ki kynja bor tynrai la pyni ha kane ka lynnong. La jurip-bniah İa ki jaka ha ki lai tylli ki aİom İa kiba la pyni bniah ha ka **jingkdew – 3**.

Jingkdew – 3: Ka jingpyni bniah İa ki jingjurip İa ki jaka kum ka bynta jong ka CEIA

Aiom	Ki Bnai
Por slap	Nailar 2014
Por tlang	Nohprah 2014 – kylla lyngkot 2015
Por lyİur	Iaİong 2015

4.1. ***Ka sawdong sawkun bad ki bor tynrai***

4.1.1. ***Ki Khyndew***

Ka jinglong jong ka khyndew katkum ka jingthew pH ha ki jaka ban pynlong kam İa ka projek ka long ha 7.0 haduh 7.6. Ka jinglong jong ka khyndew katkum ka pH ka shu long pdeng. Katkum ka jingthew ka EC ka kdew İa ka jingduna ka mluh (salt). Ka jingthew İa ka jingsboh ka khyndew ka pyni ba kum kane ka jait khyndew kan pynmih duna İa ki jingthung. Kane ka leit long kumne ka dei namar ba ka jaka ka long lum bad kumta ka sbok ka shah sait noh ha u slap namar ka riat.

Ka *Hydro-electric project* kam ju ktah İa ka jinglong jong ka khyndew ne ka jingktah haba pynlong İa ki jaboh jabaiİ. Watla katta ruh ban pynbha na

ka jingshah ktah la thmu ban shim da ka lynti ban peit bniah halor ki jingshah ktah jong ka khyndew.

4.1.2. **Ka Jait um**

Ka *pH level* jong ka jaka ba la jurip ka long naduh 7.3 haduh 7.7. Īa kine la shim da ki nongmuna ha ki jaka jaka ha kane ka jingwad bniah. Ka *pH level* ka pyni ba ka um ka shu long pdeng bad long ban pynlong umbam umdih ĩa ka.

Ha ka liang ka jingthew katkum ka *EC* bad *TDS value* pat la shem ba ka don ka jinglang jong ki *Cations* bad *anions*. Ka *TDS value* pat ka long naduh 96 haduh 106 mg/l, 92 haduh 97 mg/l bad 87 haduh 92 mg/l ha ka aiom slap, hadien ka aiom slap bad shwa ka aiom slap kaba long kham hapoh ĩa ka 500 mg/l ĩa kaba lah ban pyndonkam umbam umdih. Īa kane la pynshai pynphalang da ka jinglang palat jong ki *cation* bad ki *anion*.

Na ki nongmuna um ba la lum la lap ba ka um ka long kaba eh (hard) kaba don ha ka kyrdan 52-76 mg/l ha ka por slap, 55-61 mg/l haba la dep ka aiom slap bad 50-60 ha shwa ban slap. Ka jingeh ka um ha ki jaka ba duna ka *calcium* bad *magnesium* ka pynlong ĩa ka um ba kan long jem noh.

La pynlong ĩa ka um ba kan eh ka dei namar ka jingtrei jong ki *metallic cations*. Ka um ka long eh namar ka jingdon jong u *calcium*, *magnesium*, *strontium*, *ferrous* bad u *iron*. Ka jingduna jong u *calcium* bad u *magnesium* ka pynlong ĩa ka um ba kan jem.

Ka jingdon jong ka *alkaline* ha ka um ka pyni ĩa ka bor jong ka um ba kan pynbiang ĩa ki *acid*. Ka jingdon jong ka *alkaline* ha ka um na ka mariang ka dei namar ka mluh jong ki acid ba tlot bor. Ka alkaline ka khambun ban ĩa ka jingeh jong ka um ha baroh ki nongmuna ba la shim ha kane ka pule bniah kaba pyni ba ka jingeh jong ka um ka dei namar ka jingdon jong ka carbon bad ym don ka jingeh ha ka um lada ym don ki *bicarbonate*. Ki Chlorides ki don ha baroh ki um na mariang, namar ka um ka don ka bor ban pynjem bad kumta ka pynum noh ĩa ki *chloride* na ka khyndew kaba nalor bad shaduh sha trai. Ka jingdon jong ki *chloride* ka long naduh 6 haduh 11 mg/l, kaba long hapoh ĩa ka 200 mg/l, ka ban pynbiang ĩa ka jingdonkam ban bam ban dih.

U *Sulphate ion* u dei u wei na ki anions ba jubor u ba don ha ka um mariang. U dei uwei na ki bor u ban pynsniew lada u don shibun ha ka um. Ka jingdon jong u sulphate ha ki um ba la shim kum ka nongmuna na baroh ki jaka ka long naduh 3.9 haduh 5.2 mg/l ha baroh ki nongmuna ĩa kiba la shim ha ki lai aiom ha kane ka jingwad bniah. U sulphate u don duna kumba 200 mg/l ban pynbiang na ka bynta ka umbam umdih.

La iohi ba ka jinglang jong u *cations*, kum ka nuksa, u *sodium*, u *potassium*, u *calcium* bad u *magnesium* ka duna ia kaba la pynphalang ruh ha ka TDS. Ia u *iron* ruh la shem ba u duna na ka limit 1 mg/l ka ban bit ban bam ban dih.

Ka jinglang ki kynja nar kiba khia ki long duna bha. Ym don ka jinglang jong ki *phenolic compound* bad ruh ym don umphniang (oil) bad *grease* kumba khmih lynti ba kin don ha kine ki thain. Ym don kano kano ka jingpynjakhlia ia ka um na ki iing ki sem ne ki karkhana. Ka jingduna jong ka COD *value* ruh ka shu biang kaba pyni ba ym don jingpynjakhlia na ki chemical. Ka daw ka long ba kane ka thain ka long ka bym da bun briew than eh bad na ka jingbym don ki karkhana ha kine ki thain. Wat ki jakhlia kiba rit ba ria kiba wan tuid sha ka wah Mawphu, Stage II ruh ki shu jah la ka jah ne kim khlain bor shuh. Ha ka jingshisha, wat ki jakhlia kiba tuid ruh ki shu jah hi noh ha ki um kiba kham heh. Kumta kane ka um ka long kaba bit ban bam ban dih.

Ym don *coliform* ha kane ka jingwad bniah. Te lah ban pynkut nia ba ka um ka long kaba khuid bad kaba long ban pyndonkam ha iing ha sem.

4.1.3. Ka jait lyer ha baroh sawdong.

Lada thew katkum *ka maximum PM₁₀ level* la khmih thuh ha kane ka jurip ba ka lyer hadien ka aiom slap ka long 72.0 $\mu\text{g}/\text{m}^3$. Haba la leit sha kane ka thain ha ka *PM₁₀* la iohi ba ka long duna ia ka 100 $\mu\text{g}/\text{m}^3$ kaba ju don ha ki thain ba don karkhana, ki jaka shong jaka sah, ki jaka nongkyndong.

Ia ka *SO₂ level* la khmih thuh ba ka don $<5.0 \mu\text{g}/\text{m}^3$ ha baroh ki jaka ba la shim nongmuna. Ka Highest *NO₂ value* hadien ka aiom slap ka long 13.2 $\mu\text{g}/\text{m}^3$. Ka *NO₂ level* ha baroh ki jaka ka duna ia ka 40 $\mu\text{g}/\text{m}^3$ kaba donkam na ka bynta ki karkhana, jaka shong jaka sah, ha nongkyndong bad ha kiwei pat ki jaka. Kumta la lap ba ka lyer ha sawdong ka jaka ka long kaba biang ha baroh ki aiom kata, hadien ka aiom slap, ha ka por tlang bad ka por lyur.

4.1.4. Ka Jingsawa ha ka sawdong sawkun

Ka jingsawa ha ka por mynsngi ha ki jaka ba la shim kum ki nongmuna ka long naduh 36.4 haduh 38.1 dB (A) bad 36.5 haduh 37.6 dB (A) hadien ka aiom slap bad ha shwa ban slap. Ha ka por slap, ka jingsawa ha ka por mynsngi ha baroh ki jaka ba la shim kum ki nongmuna ka long naduh 37.3 haduh 38.1 dB (A). Kumta la khmih thuh ba ka jingsawa ka long kat ban biang wat ban shong ban sah ruh ha kine ki jaka.

4.1.5. *Ka rukom pyndonkam ia ki jaka/khyndew*

İa ka rukom pyndonkam ia ki jaka la pyni ha ka **Jingkdew – 4**

Jingkdew – 4: Ka rukom pyndonkam ia ka khyndew ha ka jingjurip na ka bynta ka Mawphu HE Projek, Stage II

Sl. No	Ki jait	Area (ha)	Area (%)
1	Ki jingthung/jingtep	8156	17.47
2	Ki khlaw ki btap	22536	48.27
3	Ki mawsiang ba lah ban İohi	3033	6.50
4	Jaka rep	303	0.65
5	Ki wah	740	1.58
6	Ka rep shyrti	4177	8.95
7	Khyndew ieh shrah	7656	16.40
8	Khyndew ba shong ba sah	89	0.19
Baroh		46690	100.00

Bun hi na ka khyndew ha ka ban shna İa ka Mawphu HE Projek ka dei ka jaka ba long khlaw bad ka tap haduh 48.27% bad kaba bud İa kane ka dei ki jingthung kiba mih sha khlaw (17.47%). Ka rep shyrti ka don kumba 8.95%. Ka khyndew ba shu ieh shrah ka long 16.40%. Ka jaka rep ka kot sha ka 0.65%. Ka jaka shong ka kot sha ka 0.19%. Ki mawsiang ba paw shabar bad ka um ki kot sha ka 6.50% bad 1.58% ha kane ka jurip jaka/khyndew na ka bynta ka Mawphu HE projek.

4.2. *Ka jinglong jong ki khlaw ki btap ha ka sawkun mariang (Ecological aspects)*

4.2.1. *Ki khlaw ki btap*

Katkum ka jingpyntip jong ka State Forest kaba la pynmih da ka Forest Survey of India, ki khlaw ki btap ka Assam ki long haduh 27,645 sq km kaba kynthup jan haduh 32.24% İa ka jaka bad kane ka kynthup İa ki khlaw barben, ki bym da rben eh bad ki khlaw bal ah ban İohi (FSI, 2005). Ki khlaw jong ka jylla ki don haduh 6 jait bad kita ki long ka *Tropical Wet Evergreen*, ka *Tropical Semi-Evergreen*, ka *Tropical Moist Deciduous*, ka *Sub-tropical broad Leaved Hill*, ka *Sub-Tropical Pine* bad ka *Littoral swamp Forests*. Ki jait khlaw kiba don ha ki bynta jong ka projek ki don ha la ki jait ki jait katkum ka jingbuh kynhun u Kanjilal (1934-40), u Champion bad u Seth (1968), u Kataki (1983), u Haridasan & u Rao (1985) u Negi (1989, 1996), bad u Mudgal & Hajra

(1999). Kita ki jait khlaw kiba lah ban lap ha kane ka jaka ki long kumne harum:

- 2B/C1 Assam Valley Tropical semi-evergreen forest
- 2B/C1b Eastern sub mountain semi-evergreen forest
- 8B/C2 Khasi sub-tropical wet hill forests
- 9/C2 Assam sub-tropical pine forests
- 11B/C2 Naga Hills wet temperate forest

Ki Jingmih ki dieng/ki khlaw/ ki dieng phyrngop bad kiwei kiwei ha ki bynta jong ka projek

Don haduh kumba 158 jait ki angiosperms ha ki bynta ne jaka jong ka projek. Kiba kynthup ia ki dieng bah, ki jait dieng phyrngop, ki jait jyrmi bad ki kynbat. Ki jait jingthung ki kynthup ia kito kiba neh tang shipor, kiba neh snem bad kiba neh palat ia ka arsnem bad kita ki kynthup ia ki jait phlang, ki jait kynbat, ki jait dieng ba pynmih soh bad ki jait dieng ba sei syntiew. Kane ka jaka ka hap ha ki ar bynta jong ka East Khasi Hills District ha kaba ka wah Umiew ka ieng kum u pud kata, ki rud wah Umiew kaba na sha ka diang ki hap ha ka bynta jong ka Sohra, katba ki rud wah kiba na sha ka mon jong ka umiew ki hap hapoh ka Mawsynram. Ki kam ha kane ka projek kin hap ha ka rud wah ba sha kamon jong ka Umiew kaba hap hapoh ka Mawsynram namar ka jingdon jong ki *tunnel* bad ka *power house*. Hynrei ki jait khlaw kiba don ha baroh ar jong ka wah ki long ki juh hi ki jait. Ka lum lyndiang (plateau) jong ka Sohra bad Mawsynram ki dei ki lynter lum kiba jrong tam ha Meghalaya. Ia ka jingtip ba bniah la ai ha ka **Jingkdew – 5**.

Jingkdew – 5: Ki jait jingthung ba im ia kiba la lum ha baroh ki aiom bapher na kane ka jingpule bniah.

<i>Jait jingthung</i>	<i>Ka Jingbun jong ki jait jingthung</i>	<i>Percentage jong ki jait jingthung</i>
1. Ki dieng bah	41	25.95
2. Ki dieng phyrngop	40	25.32
3. Ki jait jyrmi	19	12.02
4. Ki kynbat khlaw	47	29.75
5. Ki tyrkhang	11	06.96
Baroh ki don	158	100.00

4.2.2. **Ki Jait Mrad**

Don kumba 29 jait ki jait mrad na ki 15 tylli ki longiing jong ki mrad ha Mawphu HE projek ha Meghalaya. Kane ka jaka ka don ha ki ranab lum jong ka Mawsynram bad Sohra ha Meghalaya. Kine ki jaka ki dei ki jaka ba jur slap ha pyrthei. Ki jait Soricidae ki don lai jait bad kine ki jait mrad ki don ha baroh kine ki jaka. Ki jait khnai ba mih tang mynmiet kiba khot ki *Shrew* kim da don ha kane ka jurip bniah, kumta la shu mutdur ba kita ki jait *Shrew* kin don ha kine ki thaiñ. Ki trai shnong ruh ki tip ba ki *shrew* ki don tang ba kim tip thikna ki don katno.

Ki kynja tngaw/shrieh ki don lai jait ha kaba u jait *Macaca assamensis* u don bun bha ha kine ki thaiñ. Katba kiwei pat ki jait kim da kynrei eh. Ki *Felidae* ki kynthup tang shi jait, kum ka nuksa ki miaw khlaw ki don kynrei ha kane ka thaiñ bad ha ka *Indian sun continent*, tangba ki shong ha ki jaka jaka. Na ka longiing *Canidae* pat ki don ki myrsiang (*canis aureus*) bad ia ki myrsiang la iohi da ki briew hajan jaka ban pynlong ia ka projek. Na ka iing jong ki *Herpestidae* kiba kynthup ia ki *Herpestes urva* bad *Herpestes edwardsii* ia kiba la khot da ki phyllad ne u ksar ruh ki don ha kane ka thaiñ. Kine ki shong hajan shnong briew bad ki don ia bun bha ha kine ki thaiñ. Ki briew kiba na kata ka thaiñ ruh ki tip ia ka jingdon jong ki phyllad ne ki ksar ha ki thaiñ ban shna ia ka projek. Ki longiing *Mustelidae* bad *Hystricidae* kiba don tang shi jait ki don ruh ha kine ki thaiñ.

Ha ka *Artiodactyla*, don arjait ki jait kiba na ka *Cervidae*. Kita ki jait ki dei ka sier pah bad ka sier heh. Lah ban shem ia ka sier pah na ka jingpah jong ka. Ki sier heh te ki shong sha lawbah lawsan.

Kiwei pat ki jait mrad kiba don ha kine ki thaiñ ki dei ki *Rodent* kiba kynthup ia ki risang, bad ki khnai. Kine ki jait ki don ha ki khlaw ba don siej bad ha ki jaka shong briew. Ki briew ki tip ia ka jingdon jong ki jait risang, ki khnai bad kiwei pat ki jait mrad, hynrei la pynthikna ba don tang 4 jait ha kane ka thaiñ.

4.2.3. **Ki jait sim**

Na ki 85 jait ki jait sim kiba don ha kane ka thaiñ jong ka projek Mawphu, 73 na kita kim dei kiba don jingma ban jah noh katkum ka jingshem jong ka IUCN. Katkum ka Schedule List jongka IWPA (1972) don kumba 81 jait ki sim ia kiba la pynrung ha ka Schedule IV. Don tang ar jait ia kiba la pynrung ha ka Schedule I, shi jait ki dei ki *Polyplectron bicalcaratum* (ki klew jngum) bad ki kohkarang.

4.2.4. **Ki Jait kynhun Dohkha**

Katkum ka jingtip *ichthyofaunal* na Meghalaya kaba sdang na U Sen (2000, 2003), la tip ba don 165 tylli ki jait dohkha na 85 tylli ki genera, 31 tylli kiba long ki juh ki jait bad 9 tylli ki rukom long. Na ka jinglong jong ki lum bad

ki jaka madan kine ki jaka ki pynmih ki jait pa ki jait dohkha na Meghalaya kynthup ha lum Khasi.

Kumba long ha kiwei pat ki thain ha ri India, ki jait dohkha ha Meghalaya kynthup ia kane ka jaka ha kaba la jurip, ka don ka jingma ba ki dohkha kin duh jait noh na ka daw ka rukom khwai, ka jingjngut jong ka um, ka jinghiar noh ka jingdon jong ki jingthaw namar ka jingpomdieng, ka jinghap ka khyndew bad ka rukom tuid ki wah. Watla kine kiei kiei kim pat don hajan ka Mawphu H.E. projek haduh mynta, hynrei ym lah pat ban len ba kine kiei kiei kin sa don hi ha ka thain jong ka projek khamtam lada pynkhih ia ka jingtuid jong ka wah bad kiwei kiwei. Ka jinglap ia ki dohkha mynta kan iarap ban iohi lypa ia kaba shadien khnang ban shim ia ki lad kiba bun ban lait na ka jingduhjait jong ki dohkha.

4.3. Ka imlang sahlang bad ka jingioh jingkot (Socio – Economic Aspects)

4.3.1. Ka Jingbatai ia ka jingbun briew

Ha ka thain jong ka projek, don kumba 49 ki jait kur bad don kumba 263 ki longiing. Kine ki dei ki ban hap ha ka jingshah ktah ha ka ban pyntreikam ia ka projek. Bun na ki longiing ki dei kiba la long khristan bud sa kiwei kiwei kiba bat ia kiwei ki jait niam. Baroh ki longiing ki dei ki Scheduled Tribe. La dep jurip ruh ia ka jingdon jong ki kynthei bad shynrang. Bad ka jingpule la lap ba ki kynthei ki don 45.25% katba ki shynrang ki don 54.75%. Kiba la shongkurim bad ki bym pat shongkurim ka long 49.43% bad 50.57%. Kiba la nang la stad ki long 92.78%. Kiba la trei bad kamai ki long 57.03% katba 42.97% na ki kim shym la trei ne kamai.

5. Ka Jingiohi lypa ia ka jingshah ktah jong ka mariang

5.1. Ka ban ktah ia ka um

5.1.1. Ka jait um

a) Ha ka por ba shna

Ki um ki ban tuid na ki jaka sah ki nongtrei

Ka jingshna ia ka projek kan shim por haduh 5 snem. Yn donkam kumba 800 ngut ki nongtrei bad 200 ngut ki technical staff. Kumta kan don ka jingbun briew ha ka por ba shna bad la khmih lynti ba kin bun briew haduh 4000. Ka jingdonkam jong ka um per capita ka long haduh 70 lpcd, bad ka um

bam um dih yn donkam 0.28 mld. Kumta ka jingtuid noh ka um ka long haduh 80% na kaba la ai. Bad la khmih lynti ba kan tuid noh haduh 0.22 mld.

Ka jingmih na kaba tih maw

Ha ka por ba pyntrei ia ka projek, la kumno kumno ruh kan don kawei ka kor tih maw ha jaka maw kaba la pynbeit da u kontraktor. Tang ki maw ba la dep tylliat yn wanrah ha jaka ka projek. Te baroh ki maw ba yn sei ki long 49 m³/hr.

Ki Pui Pui ba mih

Ka jingshah ktah ba shyrkhei kan long ha ka um namar ka jingtheh noh ia ki shyiap khyhdew etc. sha ki rud wah. Ki bor kiba dei peit ia ka projek ki la jied ia ki jaka ban theh ia ki bym donkam kum ki mawrit mawria. Kine ki mawrit mawria ki mih na kaba shna ia ki surok, na kana tih ia ki tunnel ne ki krem bad ki thliw. Ki jaboh ba mih kiba tuid sha ki wah kin pynmih slem ia ka jingjakhlia ha ka um. Kane kan pynduna ia ka bor photosynthesis bad kan ktah ia ka wah khamtam ia ki jingthaw ba im ha ki wah.

b) *Ka por ba pyntrei kam*

Ki jakhlia ba mih na ki jaka sah ki nongtrei

Ha ka por ba pyntrei kam ia ka projek, namar bym don ki jingshna kiba heh (large scale construction), ka jingpynjakhlia ia ka wah kan pher. Namarba tang khyndiat ngut ki nongtrei kum u O & M staff ki ban iasah ha kito ki thaiñ, yn shna da ki jaka kiba da paka khnang ba yn pyntuid ia ki jakhlia kumta ka jingpynjakhlia ne pynngut ia ka wah kan ym da don. Ha ka por ba pyntreikam ia ka projek, kumba 50 tylli ki longiing (baroh 200 ngut) kin iasah ha kine ki jaka ba la shna. Kumba 0.03 mld ki jakhlia kin mih na kine ki iing. Ka jingpynlang ha ka BOD kan long 11kg /shi sngi.

Ka jingktah ia ki um ba la pynlang

Ka jingpynduh noh ia ki khlaw bad ki lyngkha kan pynbun ne pynlang ia ka sbob namar ka jingpyut ki jingthung jingtep bad phlang kynbat. Kane kan pynmih bun ia ka *phytoplankton* ha ka *euphotic zone* ha ryngkat ka *oxygen* ha shuwa ba kan pynpyut ia ki. Ka um kaba long ryngkat bad ki sbob *organic* bad *inorganic* kan pyneh ia ka um mardor ha shwa ban pyntreikam ia ka projek.

Ka jingma ha ka Jingbun palat ka sbob bad ki minerals

Sa kawei ka jingshah ktah kaba la iohi ha ki jaka pynlang um, ka dei ka jingbun palat ka sbob bad ki mineral kaba wan na ka sbob khyndew jong ki lyngkha ne jaka rep. Hynrei ia mynta hi, ka jingpyndonkam ia ki dawai sbob ha ki jaka rep ki duna bha, kumta, ka wah ne ka um kam da don ia kita ki

sboh. Wat hadien ba la pyntreikam ia ka projek ruh, ym da khmih lynti eh ba ki brier kin pyndonkam dawai sboh. Kumta haba la pyntreikam ia ka projek, yn ym khmih lynti eh ba ki sboh bad mineral ba kin lang.

5.1.2. ***Ka Jingktah ia ka um ba mih na ka ramew***

Ha ka Mawphu H.E. projek, Stage II, la thmu ban pyllang ia ka um ia ka ban pyndonkam pat hadien. Ka jingpyntlang um ka lah ruh ban pynrkiang pat ia ka wah kaba tuid sha ka dam khamtam lada ym dei ha ki por slap. Ka jingshah ktah kan long kham bun khamtam ha ki por ba duna um. Kane kan ktah ia ki wah. Ban pynduna ia kane, lah ban pyntuid ia ki wah ha kata ka dur khnang ba kan ym ktah ia ki jingim kiba don ha ka wah.

Hangne la tyrwa ruh ban pyllait um ha kata ka dur ba kan pynneh ia ki jingim ba don ha um. Ia ka jingbatai ba bniah la ai ha ka **Jingkdew – 6**

Jingkdew – 6: Ka Jingpyllait um ha ki aiom bapher bapher.

Aiom	Ka jingtuid (m³/s)	% jong ka jingtuid	Ka Avg EF sha ki wah ba shathie (m³/s)
Duna um (Nohprah haduh u Lber)	4.23	20	0.85
Ym dei por slap ym da duna um (Risaw-Naiwieng, Iaiong-Jymmang)	28.8 24.43	25	7.20 6.11
Por slap (Jylliew-Nailur)	46.28	30	13.89

5.2. ***Ka jingshah ktah ka sawdong sawkun ha kaba ia dei bad ka lyer***

Ka jingjakhlia ka lyer namar ka jingpyndonkam ia ka umphniang (Fuel)

Khnanng ban pyniaid ia ki atiar trei, donkam ia ka umphniang. Barabor hi la ju pyndonkam da ka diesel. Kaba pynjakhlia eh ia ka lyer namar ka jingthang ia ka diesel ka dei SO₂. Ka jingpynmih SPM ka duna bha namar ym don dpei haba pyndonkam da ka diesel. Ka jingtrei ba tang shipor ha ka SO₂ ka duna namar la pyniaid ia ki engine ha ka bor ba duna, kata duna ia ka 1µg/m³. Te kumta ka lyer kan ym da shah ktah than ha kane ka projek.

Ka Jingmih na ki kor pynpra maw

Ka jingpyntreikam ia ki kor tylliat maw ka lah ban pynmih ia ki pui pui kiba lah ban her haduh 1km shaba beh ka lyer. Ha ka por ba shna ia kane ka projek, lah ban buh kawei kawei ka kor tylliat maw ha ki jaka maw na ka bynta ka dam bad ka power house. Haba pynpra ia ki maw kane kan pynmih ia ki phngit maw. Hynrei namar ba ym don ba shong ba sah hajan ki jaka pynpait maw bad ha jan ka dam, kumta kane kan ym da ktah than. Hynrei haka plan (layout design) yn pynthikna ba ki nongsah hangto (ki nongbylla) kin shong sha kawei pat ka thain (kumba 2km na ka jingbeh ka lyer na ki kor pynpra maw).

Ka jingmih ki jakhlia na kiwei pat ki tyllong

Ha ka por ba shna ia ka projek, kin don bun ki kali ba leit ba wan. Ia ki tiar kum u shyiap yn buh ha ki jaka jaka. Barabor, na ka daw ka jingbeh jong ka lyer, khamtam ha ki por rkhiang, ka lyer ka lah ban beh ia ki bad kumta kine kin her sha ka haw haw. Hynrei kane kan jia tang ha ki jaka ba buh ia ki. Kumta kane kan ym da ktah than ia ka mariang.

Ka Jingpynbthei maw

Ka jingpynbthei maw kan pynkhyñiuh ia ki maw bad ki mawsiang bad kan pynshong kynrong lut ia ki. Kane kan ktah tang na sla khyndew ym ia ka trai. Ha ka por ba shna tunnel, yn mih ki pui pui ha ka por ba pynbthei. Kumta yn pyllait thliw lyer ban pyllait ia ki pui pui. Ki pui pui pat kin sa hap ha ki khlaw katkum ka jingbeh jong ka lyer. Yn ia leh katba lah ban pynduna ia ki pui pui khnang ba kan ym ktah iano iano ruh.

Ka Jingjakhlia ka lyer na ka daw jong ka jingiaid ki kali

Ha ka por ba shna ia ka projek, kan don ka jingiaid jong ki kali wan buh tiar ha ki jaka ka projek. Ki kali kin bun ruh ban kit ia ki khyndew, maw bad ia ki jaka bret ia ki. Ka jingiaid jong ki kali kan long 50 tylli ha ka shi kynta. Ka surok kan pum pum bha namar ka jingiaid ki trok bad ki kali heh. Kan don ruh ka jingbun jong ki Hydrocarbons, SO₂ bad NO_x hynrei kane kan long tang shipor arpor.

Ka jingmih pum pum na ka jingtheh noh ia ki mawrit, mawheh

Ka jingpynkiew bad pynhiar ia ki mawrit, mawheh, maw lyngkhot kan pynmih ia u pum pum. Namar ka jingkit ia kine, la khmih lynti ba kan ym da ktah than.

5.3. *Ka Jingshah ktah ka sawdong ka sawkun ha kaba ia dei bad ka jingsawa*

Ka jingtrei kam ki machine ka lah ban ktah ia ka mariang. Ka jingsawa jam ka lah ruh ban ktah ia kito kiba dei trei bad ki atiar kiba heh. Lada palat than ka sawa palat ia ka 90 dB(A), kane kan ktah ia ki nongbylla bad ia ki operator. Ban khanglad ia kane, lah ban phah pynduna na ka jingshah ia kine ki sawa katkum ba la bthah da ka Occupational Safety and Health Administration (OSHA).

5.4. *Ka Jingshah ktah ka sawdong ka sawkun ha kaba ia dei bad ka khyndew*

Ia ka jingshah ktah jong ka khyndew ha ka por ba shna kan long kumne harum:

Ka Jingtih maw:

Ka jingtih ia ki maw kam pat long kaba katkum ka saians ba thikna. Ka jingtih maw kum ha Arunachal Pradesh namar ba ka long lum, ka jingtih maw ka long da kaba ot ia u lum. Kan don ka dak ot hadien ba la dep khlong ia ki maw. Hadien katto katne por, namar ka jingbeh jong ka lyer bad kiwei pat ki jinghap jong u lum, ha kata ka jaka ba la dep khlong maw kan don beit ka jingkhyllem. Kumta donkam ban khlong maw thikna khnang ba ka khyndew kan ym tuid bad kan ym khyllem.

Ki atiar pyntreikam:

Ha ka por ba pyntrei kam, don bun ki atiar bah ia kiba yn wanrah ha ka jaka. Kine ki atiar ki kynthup ia ki *crushers, batching plant, driller earth movers, rock bolters* etc. Kine ki donkam ia ka jaka baheh ban buh ia ki. Ia ka jaka buh yn pynioh shipor ban buh ia ki maw, ki maw ba la tylliat, ka dewbilat, ki mawria bad kumta ter ter. Dei ban buh bha ia kine ki atiar rit bad atiar bah khnang ba kin ym ktah ia ka mariang ia ki briew bad ia ki mrad ruh.

Ka Jingbret ia ka khyndew, maw etc (muck disposal)

Ka khyndew, maw etc kin mih shibun na kaba tih ia ki. Ka jingmih ka long haduh 10.64 lakh m³, bad lada kheiñ ia ka jingat (swelling) kaba 1.5, te ka jingbun jong ki khyndew, maw shyiap etc kan long haduh 15.95m³. kumba 50% na kine lah ban pyndonkam bad 50% na kine kaba long 7.98 lakh m³ yn bret noh ia ki ha ka jaka ba la buh. Ha ka jaka ban shna ia ka projek yn shna ia ka *coffer dam, diversion tunnel, tunnel, power hour, ki khyrdop TRT, surge shaft* bad *pressure shaft*.

Ki jingkylla ha ka jingpyndonkam ia ka khyndew

Donkam kumba 110.0 ha ka khyndew. Shi bynta na kane ka khyndew yn pyndonkam ha ka ban shna iing ia ki nongtrei, ban tih maw, ban bret maw bret khyndew, buh ia ki tiar ban trei, ban buh ia ki atiar bah bad rit bad ia ka khyndew yn pynphai noh hadien ba la dep shna ia ka projek. Hynrei ka jaka ba la thied syndon ka dei ban shna ia ka *dam axis*, ka jaka tih dam bad ka *project colony* etc.

Ka jingktah ia ki surok

Ka jingjrong jong ka surok ban shna ka long 18.25km. Ia ki jingtip ba bniah la batai ha ka Jingkdew – 7.

Jingkdew – 7 : Ki surok ka Projek.

S.No.	Jingbatai	Jingjrong ka lynter (m)
1.	Ka surok na khyrdop – I Portal sha jaka dam	1200
2.	Ka surok na khyrdop – 3 Portal sha khyrdop – 1 portal	2500
3.	Ka surok sha khyrdop – 3 portal	500
4.	Ka surok sha khyrdop – 2 portal	250
5.	Ka surok sha surge shaft	3800
6.	Ka surok na shnong Thieddieng sha surok ka Surge shaft	4000
7.	Ki surok sha jaka trei maw	6000
	Baroh	18250

5.5. Ka Jingshah ktah ka sawdong sawkun ha kaba ia dei bad ki jingthaw ba don jingim

a) Ha ka por ba shna

5.5.1. Ka Jingshah ktah ki tiew khlaw

Ka jingktah jong ka projek ia ka um ha ki thain jong ki lum Makashang ka long beit thik tang ia ka jingshna. Kumba la ong haneng, kumba (4000) ngut ki bried kynthup ia ki technical staff bad ki nongbylla kin ialum ha kane ka jaka ha ka por ba shna ia ka projek.

Ka jingpynkylla ia ki jaka khlaw

Ha ka por ba shna ia ka projek, yn donkam ia ka jaka ban buh tiar trei, mar mata ban trei, jaka bret mawria, shyiap, ka jingpynheh ia ki surok ba la don lypa bad ka jingshna surok thymmai. Baroh donkam haduh 110 ha, bad na kane 22 ha ka dei ka jaka khlaw.

5.5.2. Ka Jingshah ktah ki mrad ki mreng

Ka jingpynwit ia ki mrad khlaw

Baroh ka jaka ba donkam na ka bynta ka projek ka long 110 ha. Na kane, 13 ha yn tih ia ka kynthup ia ki wah. Na ka jingjurip bad na ka jingiakren bad ki nongshong shnong jong kato ka jaka, la pynshisha ba ym don mrad ba shong ha ki jaka ban pynkylla dam. Ka long kaba donkam ban iathuh hangne ba ki jaka ban pynngam ka dei ki bynta kiba riat bha. Kumta ka jingshna ia ka jaka pynlang um kan ym da ktah than eh ia ki mrad khlaw. Kane ka jaka na ka bynta ka projek kam da dei ka jaka shong jong ki mrad khlaw bad kiwei pat ki jait mrad ruh kim iaaid na kane ka jaka. Hynrei ha ka por ba shna ia kane ka projek kin don bun ki briew ki ban wan ban trei ia ki kam ba bun jait. kumta ka kti briew kan ktah ia ka mariang. Ka ban ktah eh kan long ka jingpynbthei ia ki maw ha ka por ba shna ia ka projek. Kumta ia ka rukom pynbthei yn shim da ka lynti kaba biang da kaba khmih ngor (surveillance) bha kata ka jaka pynbthei maw. Kane ka lah ban pynduna ia ka jingsawa bad ka jingkhyñiuh ka khyndew ha ka por ba pynpait ne pynbthei maw.

Ka jingktah ia ki sim

Ka jaka jong ka projek bad ki jaka sawdong jong ka ki long ki jaka ba bun bha ki sim ki doh. Hynrei ki sim um kim da don ha kine ki thaiñ. Ka daw ka long ba ki sim um ki donkam ia ka um kaba tuid suki jai. Hynrei ha kane ka jaka ban pynlong ia ka projek, ka jaka ka long lum, kumta ka jingtuid jong ka um ka long stet bha bad kam iaidei ban pynjuh ia ki jait sim um. Lada den ia ka um, kane ka jaka kan shim jaka kaba heh haduh 13.0 ha bad hangne ka jaka kan long jai jai bha. Ha kane ka jaka ba la den, ka bneng kan long jhieh baroh shi snem bad ha kane ka rukom lai phew jait ki khlaw kin mih kum ka nuksa ki phlang kin ieng ha kane ka jaka den um. Haba kumne pat, kane ka jaka kan sei bun jait ki sim khamtam ki sim um. Te la khmih lynti ba ki sim um kin mih bun bha.

5.5.3. Ka Jingshah ktah ki jingthung ba mih ha um

a) Ha ka por ba shna

Ha ka por ba shna ia ka projek, ka um kan mih na kaba pyndonkam ki nongtrei. Donkam kumba 0.56 mld ka um ha ka por ba dang iaaid bha ka kam. Na kane 80% (0.45 mld) yn pynnoh/pyntuid biang sha wah kum ka um jaboh na kiba bun tylli ki jaka sah jong ki nongtrei. Ka jingtuid kaba rit eh ha ka por ba duna slap ka long 90% kata kumba 2.44 cumec. Hynrei ka Mawphu, Stage II ka lah ban khleh lut ia kine ki jaboh khnang ba ka DO jong ka wah kan nang bun..

b) Ha ka por ba pyntrei kam

Ha ka jingpyndep ia ka Mawphu, Stage II hydroelectric projek kane kan wanrah bun ki jingkylla ha ka wah, namar ia ka wah la pynkylla na kaba tuid sted sha kaba tuid suki, kan don ruh kiba long kum ki pung. Kane kan wanrah ia ki jingkylla ha ka rukom im ki kynhun mrad um. Katto katne na kine ki mrad ki lah ban im ha kane ka jingkylla bad don na kine pat ki bym lah ban im katkum ka jingkylla ka mariang, te kum kine ki lah ban jah noh sha um. Ki jait jingim *micro-biotic* kum ki *diatoms*, *blue-green* bad ki soh pailen kiba im hapoh ki mawsiang um, ki maw, ki dieng pyut kin don haruh wah. Hynrei lada den noh ia ka um kine ki jait jingthaw kin jah noh na ka daw ka jingjylliew ka um.

5.5.4. Ka Jingshah ktah ki mrad um

a) Ha ka por ba shna

Ka jingktah namar ka jingsei ia ki mar ban shna

La tyrwa ha kane ka projek ban sei ia ki mar na ki kynriang um. Kane kan ktah ia ka um bad ka um kan jakhlia bha.

Ka Jingktah namar ka jingtuid jakhlia na ki jaka sah ki nongtrei

Kane ka hydro-power projek kan shna ia ki jaka sah nongbylla/nongtrei. La thmu ban pynsah ia kine hajan jaka jong ka projek. Lada ka long kumne, bun ki um jakhlia kin tuid sha ka wah. Hynrei yn pynkhuid shwa ia kine ki um jakhlia shwa ba kin tuid sha wah.

b) Ha ka por ba pyntrei kam

Ka jingden ia ka wah Mawphu, Stage II kan pynngam haduh kumba 15 ha. ka khyndew. Ka jingden um kan pynkylla ia ka wah na kaba tuid sted sha kaba tuid suki kum ka pung. Ka jingpynlong ia ka pung kan wanrah shibun ki jingkylla ha ka liang ka mariang, ha ka liang kiba don jingim bad ki bym don jingim ha ka wah kaba shaneng bad kaba sharum jong ka dam site. Kane kan ktah ia ki *micro* bad *macro behthic biodata* ha kane ka jaka den um.

Ka Jingktah ia ki Dohkha

Ka jingthut ka ban mih na ka jingshna dam kan pynwit ia ka jingiaid ki dohkha khamtam ki Mahseers (na sharum shaneng) bad ki *Schizothorax* sp (na shaneng sha kaba sharum). Kine ki dohkha ki ju kynriah jaka kumne man la ka snem khnang ba kin wad bam. Kumta kan don ka jingpynthud ia ki lynti iaaid ki dohkha bad la khmih lynti ba ki dohkha kin ialum sha trai jong ka kynroh dam. Hangne ruh kan don shibun ka jingthut. Bun na ki jait dohkha kin kynriah noh sha jaka ba don bam. Namar ba ka jingjylliew ka long haduh 40m, te ban shna jingkiew ia ki kan long kaba eh. Hynrei la tyrwa ba yn bret ia

ki symbai khnang ba kin pun pylleng ha ka wah ba shaneng bad sharum jong ka dam.

Ki *Schizothorax* pat ki lah ban shah tang katto katne ia ka jingsyaid/jingkhriat. Ha ka por tlang, ki ialeh ban phet na sharum sha ki jaka um ba shaneng khnang ba kin ioh jingbam bad kha pylleng na ki nongmuna ba la shim na wah Mawphu Stage II na kaba na shaneng bad sharum, kane ka jaka ka bit na ka bynta ki macro-benthic bad ka ai 5 units/sq.m na ka bynta ki *Schizothorax* sp. Na kane la iohi ba ki *Schizothorax* sp ki phet jaka ha ka por tlang. Hynrei ynda la sdang ka lyiur, kine ki jait ki phet noh sha ki um ba shaneng. Dei naduh nangta ba kine ki jait dohkha kin lang ha ki jaka den um. La khmih lynti ba hadien kine ki jait dohkha kin ialeh ban juh ha ka jingpher jong ki jaka.

5.6. *Ka jingshah ktah ki um ki wah kiba sharum*

Ia ka jingpyllait um kaba 90% ha katkum ki snem bad ki kynta ha ki por ba bun um ha Mawphu, Stage – II hydroelectric projek la kdew ha ka **Jingkdew – 8**.

Jingkdew – 8: Ki kynta ki ba bun um ha ka 90% katkum ki snem ki snem na ka bynta ka Mawphu, Stage – II hydroelectric project

Bnai	TD	90% ka jingpyllait um (m³/s)	Jingthew pyllait um (cumec)	Ka por (hrs.)
Jymmang	I	29.91	40.81	17.59
	II	36.97	40.81	21.74
	III	61.51	40.81	24.00
Jylliew	I	34.48	40.81	20.28
	II	58.95	40.81	24.00
	III	64.63	40.81	24.00
Naitung	I	49.87	40.81	24.00
	II	29.44	40.81	17.31
	III	44.98	40.81	24.00
Nailar	I	42.85	40.81	24.00
	II	53.39	40.81	24.00
	III	42	40.81	24.00
Nailur	I	44.84	40.81	24.00
	II	49.4	40.81	24.00
	III	40.56	40.81	23.85
Risaw	I	54	40.81	24.00
	II	53.94	40.81	24.00
	III	38.39	40.81	22.58
Naiwieng	I	11.18	40.81	6.94
	II	8.13	40.81	4.78

Bnai	TD	90% ka jingpyllait um (m ³ /s)	Jingthew pyllait um (cumec)	Ka por (hrs.)
	III	6.53	40.81	3.84
Nohprah	I	5.72	40.81	3.36
	II	6.44	40.81	3.79
	III	4.53	40.81	2.66
Kylla lyngkot	I	4.25	40.81	2.50
	II	4.9	40.81	2.88
	III	3.71	40.81	2.18
Rymphang	I	3.42	40.81	2.01
	II	3.23	40.81	1.90
	III	2.55	40.81	1.50
Lber	I	3.23	40.81	1.90
	II	4.01	40.81	2.36
	III	4.73	40.81	2.78
Īaïong	I	4.69	40.81	2.76
	II	4.42	40.81	2.60
	III	9.06	40.81	5.33

Ka tyllong jingtip: DPR

Na ka **jingkdew – 8** la iöhi ia ki kynta ba kan bun ka bor, ha ka 90% (katkum ka snem) ka jingpher kan long naduh 17.31 haduh 24 kynta ha ka aiom slap naduh u Jylliew haduh u Nailur. Ha ki bnai Risaw haduh Naiwieng bad Īaïong haduh Jymmang ka bor kan long naduh 3.84 haduh 24 kynta bad 2.60 haduh 24.00 kynta.

Ha ki por ba duna slap naduh u Nohprah haduh u Lber, ka bor kan long naduh 1.5 haduh 3.79 kynta ha ki 90% katkum u snem u snem. Lah ban iöhi ba ha ki aiom rkhiang, ia ka umwah yn pyllang naduh 20.21 haduh 22.5 kynta. Ka jinglait ka um na Mawphu, Stage – II hydroelectric project ha ki 90% katkum u snem u snem la pyni ha ka Jingkdew – 9.

Jingkdew – 9: Ka Jinglait ka um na Mawphu, Stage – II Hydroelectric project ha ka por ba pyntreikam ha Mawphu, Stage – II HEP na ka bynta ka 90% katkum u snem u snem

Bnai		Ka jingpyllait um ha ka 90% katkum u snem u snem (cumec)	Ka jingthew (cumec)	Ka jinglait na ka jaka pyllang um
Jymmang	I	29.91	40.81	
	II	36.97	40.81	
	III	61.51	40.81	20.7

Jylliew	I	34.48	40.81	
	II	58.95	40.81	18.14
	III	64.63	40.81	23.82
Naitung	I	49.87	40.81	9.06
	II	29.44	40.81	
	III	44.98	40.81	4.17
Nailar	I	42.85	40.81	2.04
	II	53.39	40.81	12.58
	III	42	40.81	1.19
Nailur	I	44.84	40.81	4.03
	II	49.4	40.81	8.59
	III	40.56	40.81	
Risaw	I	54	40.81	13.19
	II	53.94	40.81	13.13
	III	38.39	40.81	
Naiwieng	I	11.8	40.81	
	II	8.13	40.81	
	III	6.53	40.81	
Nohprah	I	5.72	40.81	
	II	6.44	40.81	
	III	4.53	40.81	
Kyllalyngkot	I	4.25	40.81	
	II	4.9	40.81	
	III	3.71	40.81	
Rymphang	I	3.42	40.81	
	II	3.23	40.81	
	III	2.55	40.81	
Lber	I	3.23	40.81	
	II	4.01	40.81	
	III	4.73	40.81	
İaïong	I	4.69	40.81	
	II	4.42	40.81	
	III	9.06	40.81	

5.7. Ka jingshah ktah ka imlang sahlang bad ka ïoh ka kot

a) Ha ka por ba shna ïa ka projek

Ka Lad ïohkam ïohjam

Kane ka projek kan plie lad ban ïohkam ïohjam. Kin don ruh kiwei pat ki lad (indirect) ïohkam ïohjam ki ban pynbiang ïa ka ïoh ka kot ha kito ki thaiñ. Bun tylli ki longüing ki lah ban plie dukan bam, dukan sha, restaurant, ki karkhana bad kumta ter ter. İa kine baroh yn long trai da ki trai shnong. Nalor

kine, kan don ruh ka jingdonkam ia ki nong supply, ki nongkhaai, ki nongpynpoi mar bad ki nongshna jingshna (service providers) etc. Kumta ka treikam la jong kan don ha ka jingiohnong. Dei ha kane ka lad ba ki nongshong shnong kin lah ban pynbit pynbiang ia ka kamai kajih.

Kan pynbha ia ki lad treikam treijam lajong

Kan pynioh ia ki lad kamai ha ki thain ka projek

Kan don ka jingpynbha ha ka liang ka infrastructure

Ha kaba sdang jong ka projek, kin don bun ki jingeh ha ka jingbym biang ki iing ki sem. Watla ki nongbylla ki kloï ban siew na ka bynta ki dawai, ka education bad kumta ter ter, wat la kam pat long kaba biang. Kumta yn pynbiang ia ka um, ka nala ha ka por kaba biang khnang ba yn shim ia ki lad ki lynti kiba biang haba yn sdang ia ka projek

Ki *vector-borne diseases* (kiba mih na ki kain pyrjong, ka um etc) kin sa bun namar ka jingpyniar ia ka jaka kan don ka jingktah ia ka koit ka khiah namar bym biang ka jaka thiah jaka dem bad kumta ter ter.

b) Ha ka por ba shna

Ka jingktah namar ka jingshim jaka bad jingshim ia ki jaka shong jaka sah

Kawei na ki jingktah kaba sniew tam ka long ba kane ka projek ka lah ban pynduh jaka ia ki katto katne ki longiing kumta kine ki longiing kin hap ban phet noh bad kane kan ktah ia ka ioh ka kot jong ki. Katkum ka jingkheih, baroh 74 PAF's kin duh ia ka khyndew jong ki.

6. Ka Jingpynkreh na ka bynta ban pynneh ia ka Sawdong Sawkun

6.1. Ka jingpynkreh ban siew na ka bynta ban thung dieng bad ka jingpynkreh ban pynneh ia ki khlaw ki btap bad ki jingthung jingtep

Ka jaka ban shim na ka bynta ka projek bad ia ka thain ban tih bad ia kiwei kiwei ki jaka ba iadei bad ka projek ka heh kumba 110 ha. Tang 22 ha na kata ka dei ka jaka khlaw. Kumta yn thung dieng haduh kumba (22*2) 44 ha. Ia ka jingthung dieng yn thung da ka State Forest Department. Ia ka kam thungdieng yn pyndep da ka Forest Department. Yn thung da ki jait dieng ba mih ha kane ka thain ban pynmih bujli ia kiba la pynkhylllem noh. Nalor nangta yn shim ia kine ki lad ki lynti harum:

- Ka jingthung dieng
- Yn pynneh ia ka khyndew bad pynbha ia ka um

- Yn pynshlur ban pyndonkam da ka *non-conventional energy* khnang ba kan ym ktah ia ka mariang
- Yn kyrshan ia ki rukom im ha ka liang ka ioh ka kot
- Yn shna ia ki kper dieng na ka bynta ban pynneh ia ki jait dieng
- Yn bat ia ki jaka phlang bad yn shim ia ki lad ban ym pynjem than ia ki khyndew
- Yn ailad ba ki briew kin shim bynta ha ka ban pynneh mariang
- Yn shim bynta ban pynbha ia ka imlang sahlang
- Yn ai jinghikai ia ki briew bad yn pynbna lut ia kiei kiei kiba donkam

6.2. Ka Jingpynbiang ia ki jaka ai jingsumar

Yn don kumba 4000 ngut ki briew ha ka por ba shna ia ka projek. Ka jingbun briew kan long ha ki ar ne lai jaka. Kumta yn buh ia ka *dispensary* ha ka por ba pyntrei ia ka jingtrei khnang ba kan ai jingshakri ia ki nongtrei bad ia ki briew jong kato ka thaiñ.

Ka dei ban don ruh ka jaka ai jingsumar mardor (first aid) khnang ban ioh ai jingiarap ia ki nongtrei mar mar haba ka don kano kano ka jingmysaw.

6.3. Ka jingpynkhreh ia ki jaka ban bret ia ki maw, ki shyiap, khyndew bad kumta ter ter

Yn pynlang ia ki maw ki shyiap ha ka jaka ba ikop ban pynlang ia ki. Ban pynskhem ia kiei kiei kiba la bret, yn pyndonkam da ka rukom kaba biang ha ryngkat ka *phyto-remedial* ka ban kynton ia ki ha ka rukom kaba dei. Ka jingmut ka long ban pynneh ia ka jingitynnat ka mariang ha ki jaka jong ka projek hadien ba la dep shna ia ka projek. Yn peit ruh ba kine ki maw, ki shyiap kin ym pynjngut ia ka wah ne kan pynsniewdur ia ka khyndew. Yn tei ruh ia ki kynroh ba long kyrdan kyrdan ba kan bat ia kine kiba la theh bad yn pynnoh sharing ruh khnang ba kan ym bam ia ka jaka. Yn thung ruh ia ki jingthung ha kane ka jaka.

6.4. Ka Jingpynskhem ia ki jaka ba la tih maw

Ia ki jaka ba sharing ba la tih maw donkam ban pynskhem. Yn pynnoh sharing ia ki ha ka 1:1. Nangta ia ki sharing dei ban tap da ka khyndew haduh kumba 30cm. Khnang ba kan skhem bha dei ban thung da ki phlang, ki jingthung khlaw bad ki dieng phyrngop ha kita ki jaka ba la pynsharing. Yn

thung da ki dieng kiba iadei katkum ka jaka bad kita ki dieng kin long kiba ai jingmyntoi. Kane ka jingleh kan long ha ki artylli ki jaka ba la tih maw.

6.5. *Ka Jingpyn itynnat biang ia ki jaka bad ka jingpynskhem ia ki jaka ba la shna jingshna*

Hadien ba la dep shna lut ia kiei kiei, yn weng lut ia ki iing ba la shu shna shipor bad dei ban pyndap khyndew ia kine ki jaka khnang ba ki jingthung kin mih pat ha ki. Yn thung da ki jingthung kum ki jait dieng kiba im hangta. Ia ki jaka kiba jan pat bad ki jaka shong jaka sah, yn pynlong jaka shongkai (park) bad kper na ka bynta ki khynnah.

6.6. *Yn pynkhreh ban pynitynnat ia ka sawdong sawkun haba shna ia ki surok*

Ia ki surok ban shna dei ban pynhap lang bad ka bynta jong ka projek. Ki surok kiba sharing palat ki lah ban hap ne khylllem. Yn shna ia ki jaka pyntuid um khnang ba kan ym hap ka khyndew. Ban iada na ka jinghap jong ka khyndew yn pyndonkam da kiba bun rukom kum ki *engineering* ne *bio-engineering* khnang ba kan iada na ka jinghap ne khylllem ka khyndew.

6.7. *Yn pynjyrngam ia ka mariang*

La tyrwa ha kane ka projek ban shna ia ki *green belt*. Ia kane yn iakren lang bad ka State Forest Department.

6.8. *Yn pynkhreh ban tep thikna ia ki jaka bala tih (Solid Waste Management)*

Katkum ka *Municipal Solid Waste (Solid Waste & Handling) Rule 2000*, la ong ba dei ban pyndap ia ki jaka ba la tih da ki bympyut (non-biodegradable), ne da ki kynja mar bym lah pat ban pynkylla. Kumta ban pyndap ia ka jaka ba la tih, dei ban bud ia ki rukom kumba la batai ha katei ka rule.

6.9. *Yn ai ka Jingiada ba ka lyer kan ym jakhlia*

Ka lyer kan jakhlia namar ba sei maw na ki jaka bad kan jakhlia ruh naba tylliat ia ki maw. Te ia ki kor tih/tylliat maw dei ban buh bad ka *cyclone* khnang ba kan iada na ka jingmih ki pui pui ha ka por ba tylliat maw. U kontraktor u dei ban buh da ka cyclone ha ka kor tylliat maw.

6.10. *Yn ai ka Jingiada na ka Jingsawa palat ka mariang*

Ki projek ba iadei bad ka um barabor ki ktah bha ha ka por shna. Ki jingsawa ki mih na ki kor khynra khyndew, kor tih maw, pynpait maw, ka jingiaid jong ka kali. Te ia ki nongbylla dei ban pyndeng da ki jingda na shkor kum ki *ear muffs* ne *ear plugs* ha ka por ba ki trei.

6.11. Yn iada na ka Jingjakhlia ka um

Ha ka por ba shna

Ha ka por ba shna, ki kor tylliat ki don ha ki jaka ba kham donkam. Ki pui pui ba mih na ki kin sa lang. Donkam ia ki *tank* khnang ba ki pui pui kin ioh ban lang ha ki.

Ha ka por ba tih ia ki *tunnel*, ka um kan tuid sha ki tunnel ryngkat bad ka um kiba mih naba ksam (drilling). Kumta kin don ki jinglang ha ka um. La tyrwa ban shna ia ka *settling tank* ba kan kjit lut ia ki jakhlia ne pui pui.

6.12. Yn pynkhreh ban ai Jingsumar ia ki dohkha

- a) La tyrwa ban pyllait um ha kata ka rukom ba kan pynneh ia ki jingim ba im ha um. Ia ka jingbatai bniah la ai ha ka Jingkdew – 10

Jingkdew – 10: Ka Jingbatai ia ka jingpyllait um ha ki aiom bapher bapher

Aiom	Ka jingtuid Avg. (m ³ /s)	% jong ka jingtuid	Ka Avg jong ka jingtuid sharum (m ³ /s)
Por tyrkhong um (Nohprah haduh u Lber)	4.23	20	0.85
Por Synrai (Risaw-Naiwieng, por Pyrem (Iaiong-Jymmang)	28.8 24.43	25	7.20 6.11
Por slap (Jylliew-Nailur)	46.28	30	13.89

7. Yn pynkhreh ban sumar ia ki jaka dymmiew (Catchment Area Treatment (CAT))

Yn pyndonkam da ka Silt Yield Index (SYI) ban kham sumar ia ki lum ba pynmih um (Subwater shed) ha kata ka jaka.

Ia ki jaka kiba shong kynrong ki ban shah rong yn kham shim khia bad kine ki don 56.89%. Ia ka jingbatai la kdew ha ka **Jingkdew – 11**

Jingkdew – 11: Ki thaiñ kiba kham shongkynrong (erosion categories)

Jait	Jaka (ha)	Ka jingheh (percentage)
Ba kham duna	4007	12.52
Ba shu biang	9789	30.59
Ba kham bun	18204	56.89
Baroh	32,000	100.00

Īa ka jingpynkhreh na ka bynta ban ĩada ĩa ka ranab lum (Catchment Area Treatment (CAT)) la tyrwa kumne harum:

- Yn thung jingthung da kaba buh nur (Gap plantation)
- Thung jingthung
- Sara ĩa ki dieng bad jingthung
- Yn ker ĩa ki jingthung
- Yn peit bha ĩa ka jaka den um na ka por sha ka por

8. Yn pynkhreh ĩa ki jaka shong jaka sah na ka bynta kito kiba la shah shim ka jaka ka puta

Yn pyntrei kam ĩa ka kyndon ba la buh ha ka, “*Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013*” bad yn jied da ka lynti kaba bha ha ka ban pynkhreh ĩa ka jingai jaka (Rehabilitation Plan) na ka bynta ki PAFs

8.1. Ki lynti ban shim na ka bynta ban pynkhreh ĩa ki jaka shong jaka sah (Rehabilitation)

Yn siew ĩa ka bai jaka ba la shim sha ki trai/ki trai jaka katkum ka kyndon jong ka *Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013*. Ha kane ka projek ba la thmu ban shna, ym don ki ĩing shong ĩing sah kiba yn sa shim, te kumta ym donkam ĩa ka *resettlement* ne ka jingiapynbeit hynrei donkam ban bud tang ĩa ka *rehabilitation plan*.

Īa ki kyndon ba bniah ĩa kiba yn pyntreikam ĩa ka *Rehabilitation Plan* ha ka jaka jong ka projek la pyni harum:

- Yn siew ĩa ka jingshim jaka katkum ka kyndon jong ka *Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013*.
- Yn siew ĩa ka pisa shisien siew ha kaba rit eh kan long 25,000/- ha kawei pa kawei ka longĩing kaba la shah ktah kum ka ĩing u nongbylla sngi, u nongkhaĩi uba rit, ne uba trei kam la jong ne uba shu rep wai ĩa ka lyngkha, ne trei sngi ha ki dukan, ki karkhana ne kino kino ki *institution*.
- Īa uwei u/ka briew jong ki ĩing ba la shah ktah yn phah ba un leit shah hikai ban seng kam ĩalade ne ban ĩoh jinghikai ha ka *technical* ne kam trei kti khnang ba kin seng kam seng jam da lade hi.

- Īa kito kiba la duh Īa ka jaka na ka daw jong ka jingshim jaka jong ki canal, yn siew na ka bynta kine ki jaka katkum ki kyndon jong ka *Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013*.

8.2. *Ka Mang tyngka*

La mang na ka bynta ka jinglut haduh 1033.72 lakh tyngka na ka bynta ka R & R Plan. Īa ki jingtip kiba kham bniah la kdew ha ka Jingkdew – 12.

Jingkdew – 12: Na ka bynta ban pyntreikam Īa ka R & R Plan la mang tyngka kumne harum:

S.No	Kiba kynthup ha ka R & R	Jinglut (Rs. Lakh)
1.	Jingsiew na ka bynta ka jaka	475.02
2.	Ka Grant na ka bynta ki nongbylla	18.50
3.	Ka jingsiew tulop (annuity payment) katkum ka por ba la ĩakut	355.20
4.	Ka jingshna ĩa ki sem mrad bad dukan rit	185.0
	Baroh	1033.72 ne 10.3 crore

9. *Ka jingpynkhereh na ka bynta ban pynbha ĩa ki shnong ki thaw*

Yn pynbha ĩa ki skul ha ka jaka jong ka projek bad ha ki marjan. Yn pyntrei ĩa kine ki kam harum hapoh ka Local Area Development Plan (LADP):

- Yn pynbha ĩa ki skul
- Yn pynbha ĩa ki jaka ai jingsumar
- Yn shna ĩa ki paiñkhana ha ki shnong

Yn pynlut haduh kumba Rs. 450.0 lakh tyngka da ka *Project Proponent for implementation* ĩa kaba la pyni ha ka Local Area Development plan. Īa ki jingbatai bniah la ai ha ka **Jingkdew – 13**.

Jingkdew – 13: Ka Mang tyngka na ka bynta ka Local Area Development Plan

S.No	Ki jait ban shna	Ka mangtyngka (Rs. Lakh)
1.	Ka jingshna/pynbha ĩa ki skul ha ka thaiñ ba don ka projek	185.0
2.	Ka jingpynbha ĩa ki jaka ai jingsumar	130.0

3.	Ka jingshna ia ki paiñkhana ha ki shnong	135.0
	Baroh	450.0

10. Yn pynkhreh lypa ki jingai jingiarap na ka bynta kino kino ki jingjia ba sngewsih (Disaster Management Plan)

- Yn shon ia ki kot ban tip kumno ban sumar ia ki dam
- Ka jingpynbeit ban ai jingiarap mardor (Emergency Action Plan)
- Yn pyntreikam bniah ia ki rukom trei (Administration and Procedural Aspects)
- Yn ai jingiaada (Preventive Action)
- Yn pynsaphriang ia ka jingtip
- Yn pyntip paitbah
- Yn pynbeit ia ka rukom kynriah jaka bad yn don ruh ki kynhun ban trei (Evacuation Plan and Evacuation Team)
- Yn ai jinghikai ia ki paitbah lada don ka jingma
- Yn peit bha haba la hiar ka um (flood water)

11. Ka Jingpyni kyllum ia ka jingiaada ia ka sawdong sawkun (Environmental Monitoring Programme)

Ha ka por ba shna bad pyntreikam ia ka projek, yn don ka jingiaada ia ka sawdong sawkun ia kaba la pyni ha ka **Jingkdew - 14** bad **15**

Jingkdew - 14: Ka Jingpyni kyllum ia ka jingiaada mariang (Environmental Monitoring Programme) ha ka por ba shna ia ka projek

S.No	Ki jait	Parameters	Katno sien	Jaka
1.	Kiba mih na ki septic tank	pH, BOD, COD, TSS, TDS	Shisien man la u bnai	Ha shuwa bad hadien ba la peit ia kawei pa kawei ka septic tank
2.	Ki jait jingpang ba mih na ka um	Ka jingthwet ia ki jingpang ba mih na um, pynbiang ia ka vector ban ai	Lai sien ha ka shisnem	Ha ki jaka trei bad sah ki nongtrei

		jingīada bad ka jingshim jingīada		
3.	Jingsawa	Ka level jingsawa (L_{eq})	Shisien ha ki lai bnai	Ha ka jaka ba bun ki jingshna
4.	Ka jait lyer	PM _{2.5} , PM ₁₀ , SO ₂ bad NO ₂	Shisien man la ka aïom	Ha ka jaka ba bun ki jingshna
5.	Ka jait meteorology	Ka liang ba beh ka lyer bad ka jingjur ka jingkhluit jingkhriat, jingshit bad u slap	Shisien shi aïom	Ha ka jaka ba la shim nongmuna shaphang ka jingbeh ka lyer

Jingkdeu-15: Ka Jingkdeu kyllum ia ka jingīada ia ka sawdong sawkun (Environmental Monitoring Programme) ha ka por ba trei ia ka projek

S.No	Ki jait	Parameters	Katno sien	Ki jaka
1.	Ka um	pH, Temperature, EC, Baroh kiba la pynum, Calcium, Magnesium, Ka Jingeh ka um, Chlorides, Sulphates Nitrates, DO, COD, BOD, Iron, Zinc, Manganese	Lai sien shi snem	<ul style="list-style-type: none"> • 1km ka wah shaneng na jaka don um • Jaka ba saphriang ka um • 1,3 bad 4km na ka wah sharum na ka jaka den um (damsite)
2.	Kaba mih na ka septic tank	pH, BOD, COD, TSS, TDS	Shisien man la ka taïew	<ul style="list-style-type: none"> • Shuwa bad hadien ka jingīada na ki septic tank
3.	Ki khyndew	pH, EC, ka jait rong, organic matter	Shi sien shi snem	<ul style="list-style-type: none"> • Ranab lum (Catchment area)

4.	Ka sawkun mariang (ecology)	Ki jait jingthung ban pyn jyrngam ia ka mariang	Shi sien ha ka ar snem	
5.	Ki jingpang ba mih na ka um	Yn wad ia ka um ba lah ban ioh jingpang, ka jingbuh ia ki vector ban ai jingiaada	Lai sien shi snem	<ul style="list-style-type: none"> • Ha ki shnong ba jan bad ka projek
6.	Ki jait jingim ha um	Phytoplanktons, zooplanktons, benthic life, ki jait dohkha	Shisien shi snem	<ul style="list-style-type: none"> • 1km shaneng ka jaka den um • Jaka ba saphriang ka um • 1,2 bad 4km sharum na jaka den um
7.	Jaka ba pyndonkam	Ki jaka ba pyndonkam ban shim na ka data u satellite	Shi sien shi snem	<ul style="list-style-type: none"> • Ranab lum (Catchment area)

12. Ka jingpyni ia ka jinglut jingsep

12.1. Ka jinglut na ka bynta ka jingiaada ia ka sawdong sawkun (Environmental Management Plan)

Ka jinglut na ka bynta ka jingiaada ia ka sawdong sawkun (Environmental Management Plan (EMP)) kan long kumba Rs. 46.10 crore. Ia ki jingtip ba bniah la ai ha ka Jingkdew – 16.

Jingkdew-16: Ka Dor ban siew na ka bynta ka jingiaada ia ka sawdong sawkun (Environmental Management Plan)

S.No.	Ki Jait	Ka Dor (Rs. Crore)
1.	Jaka ranab lum (Catchment Area Treatment)	13.32
2.	Ka Jingsiew ban thung dieng/khlaw	0.67
3.	Ka Jingpynneh Mariang	2.05

4.	Ka Jingpyn jyrngam ia ka mariang	0.30
5.	Ka Jingpynneh ia ki dohkha	2.61
6.	Ka jingai ia ka jingsumar	1.00
7.	Ka jingsumar ia ka mariang ha ki jaka sah ki nongbylla	2.23
8.	Ka jingbret ia ki maw, shyiap bad kumta ter ter	2.19
9.	Ka jingpynbha ia kaba la tih ha ka mariang	1.00
10.	Ka jingiada ia ka lyer ban ym jakhlia	0.50
11.	Ka jingiada na ka jingsawa	0.25
12.	Ka jingiada na ka jingjakhlia ka um	0.10
13.	Ka jingpynneh ia ka energy	0.20
14.	Ka jingpynkhreh na ka bynta ki jingjia ba wanrah jingmysaw	0.80
15.	Ka plan ban pynioh jaka biang	10.33
16.	Ka jingpynbha ia ka shnong ka thaw	4.50
17.	Ka jingpynbiang ia ki trai shnong	0.26
18.	Ka jingpeit ia ki monitoring fad Evaluation jong ka R & R Plan	0.15
19.	Ka jingiada ia ka sawdong sawkun ha ka por ba shna ia ka projek	1.50
20.	Ka dor ban thied ba donkam na ka bynta ka meteorology	0.10
21.	Ka jingthied ia u mitar ban thew ia ka jingsawa	0.015
	Baroh	46.075 ne 46.10 crore

12.2. Ka dor ha ka ban pyntrei kam ia ki prokram na ka bynta ban pynneh ia ka sawdong sawkun (Environmental Monitoring Plan)

Ka dor ban pyntreikam ia ka ban pynneh ia ka sawdong sawkun (Environmental Monitoring Programme) ka long Rs. 1.50 crore @ Rs. 24.6 lakh/ha ka shi snem. Yn pynjynsur ruh 10% ia ka dor namar ka jingkiew dor ki mar ki mata man la u snem. Yn shim por haduh 5 snem ban pyntreikam ia ka jingiada ia ka sawdong sawkun. Ia ka jingtip ba bniah la kdew ha ka **Jingk dew – 17**. Ka pisa ba donkam ban pyntreikam ia ka jingiada mariang (EMP) kan long Rs. 21.8 lakh/shisnem ha ka por ba shna. Ia ka jingtip ba bniah la ai ha ka *Jingk dew – 18*.

Jingk dew – 17: Ka dor ban pyntreikam ia ka jingiada ia ka sawdong sawkun ha ka por ba shna

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S.No.	Ki Jait	Ka dor (Rs. Lakh/ Shisnem)	Ka jinglut ha ki san snem bad ka jingrah ia ka dor ha ka shisnem (Rs. Lakh)
1.	Ka jait um	4.8	29.28
2.	Ka jait lyer	5.8	35.36
3.	Ka sawdong sawkun	11.0	67.21
4.	Ka jingmih ka um ba pynmih jingpang	3.0	18.33
	Baroh	24.6	150.18 ne 1.50 crore

Jingkdew – 18: Ka dor ban pyntreikam ia ka jingiada ia ka sawdong sawkun (Environmental Monitoring Programme) ha ka por ba pyntreikam ia ka projek

S.No.	Ki Jait	Ka dor (Rs. Lakh/shisnem)
1.	Ka Jait um	5.6
2.	Ka sawkun mariang	7.0
3.	Ka khyndew	1.2
4.	Ka jingmih ki um ba pynmih jingpang	3.0
5.	Ka rukom pyndonkam ia ka khyndew	5.0
	Baroh	21.8