

Project : B



Syno Khola Small Hydropower Project (SKHP) is a run-off-river (ROR) type hydropower project on the Syno Khola. The Syno Khola is a minor tributary to Kaligandaki river. The construction site of the SKHP lies in ward no. 8 of Raghu Ganga Gaunpalika, Myagdi. The installed capacity of SKHP is 4.75 MW with 27.43GWh energy annually.

Project Location

Province : Gandaki
 Zone : Dhaulagiri
 District : Myagdi
 Intake Site : Raghuganga Municipality - 8
 Powerhouse Site : Raghuganga Municipality - 8

Geographical Co-ordinates

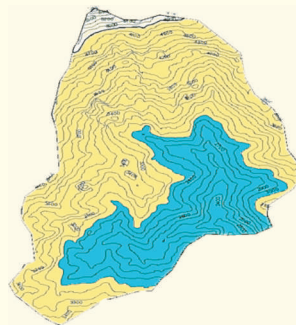
Latitude : 28°33'15" N to 28°31'50" N
 Longitude : 83°30'53" E to 83°29'50" E

General

Name of River : Syano Khola
 Nearest Town : Beni
 Type of Scheme : Run-of-River
 Gross Head : 245.95m
 Net rated Head : 239.46 m
 Installed Capacity : 4.75 MW
 Average Annual Energy after Outage : 27.43 GWh
 Dry Season Energy : 8.51 GWh
 Wet Season Energy : 18.92 GWh

Hydrology

Catchment Area : 44 km²
 Mean Annual Discharge : 5.06 m³/s
 Design Discharge (at 44.55%PoE) : 2.35 m³/s
 Riparian Release : 0.078 m³/s
 Design Flood Discharge : 281 m³/s
 Average Annual Precipitation : 1830 mm



Power house

Type : Sub-surface
 Size (L x W) : 27.65 m x 18.0 m
 Height : 13.0 m
 Turbine Axis Level : 1958.05 m



Diversion Weir

Type of Weir : Broad crest type concrete gravity dam
 Length of Weir : 16.00 m
 Crest Elevation : 2204.00 masl
 Undersluice Opening (W X H) : 1.5m x 3.0m
 Undersluice Crest Level : 2200.0m

Intake Structure cum Gravel Trap

Type of Intake : Orifice side intake
 Nos of Opening : 2
 Size of Intake (W x H) : 2.0 m x 1.0 m
 Intake Sill Level : 2201.00 masl
 Length of Gravel Trap : 4.83 m
 Width of Gravel Trap (Avg.) : 4.0 m
 Overall depth : 3.0 m
 Particle size to be trapped : 5 mm
 Flushing Channel : 0.8 m x 0.8 m

Approach Canal

Type : Open
 No. of canal : 1
 Length : 25.35 m
 Size (W x D) : 1.52 m x 1.5 m

Desanding Basin

Type : Concrete, double bay
 Dimension (L x B x H) : 25.0 m x 5.0 m x 4.25 m
 Inlet Transition Length : 8.24 m
 Particle Size to be settled : 0.15 mm
 Trapping Efficiency : 90%

Headrace Pipe

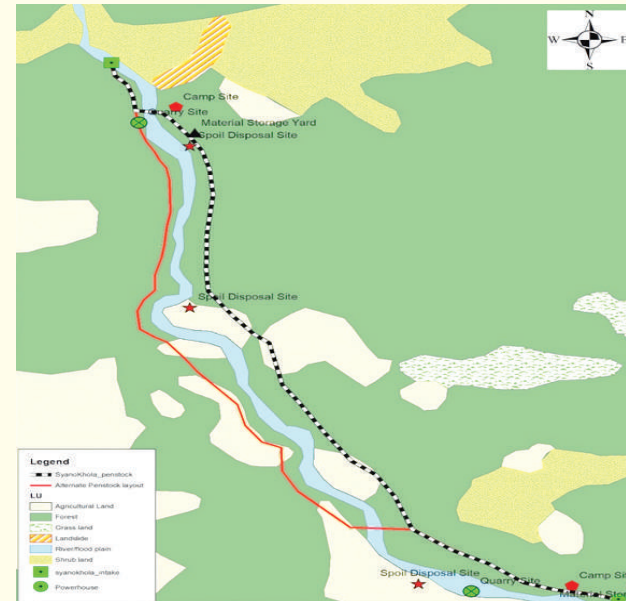
Type : Mild steel welded pipe
 Internal Diameter : 1.4 m
 Length : 3186.0 m
 Steel Thickness/Type of Lining : 8-16 mm
 Nos. of Anchor Blocks : 39

Surge Tank

Type : Sub-surface, concrete
 Effective Depth : 25.0 m
 Diameter (Or size) : 3.2 m
 Up Surge Level : 2207.79 m
 Down Surge Level : 2197.047 m
 Normal Operation Level : 2198.91 m

Steel Penstock Pipe

Type : Exposed on surface
 Internal Diameter : 1.40 m
 Length : 65 m
 Steel Thickness : 8-16mm
 Nos. of Anchor Blocks : 9
 Nos. of Saddle Supports : 32



Tailrace

Type : Rectangular open
 Tailrace Length : 50 m
 Size (W x D) : 1.5 m x 1.5 m
 Tailrace Water Level : 1958.00 amsl

Turbine

Type : Horizontal peltron
 Number : 2
 Rated Output Capacity per unit : 2.60 MW
 Turbine Axis Level : 1958.05 m
 Net Head : 239.46 m
 Discharge per Unit : 1.175 m
 Efficiency : 90 %

Governor

Type : Electronic with PID control
 Adjustment for Speed Drop : Between 0 to 5%

Generator

Type : Synchronous, 3 Phase, Brushless
 Rated Output Capacity per Unit : 2.9 MVA
 Power Factor : 0.85
 Generation Voltage : 6.6 kV
 Frequency : 50 Hz
 No of Units : 2
 Excitation System : Brushless
 Efficiency : 96 %

Transformer

Type : Three phase, Oil immersed, Outdoor
 Rated Capacity : 6.5 MVA
 Voltage Ratio : 33 kV/6.6 kV
 No of Units : 1
 Vector Group : Ynd11
 Frequency : 50 Hz
 Efficiency : 99%

Transmission Line

Voltage Level : 33 kV
 Length : 20 Km Approx.
 Conductor Type : ACSR Dog
 From : Power house
 To : Dana Sub-station



Accessibility

Kathmandu - Pokhara -195 km - Black
 Pokhar - Beni - 83 km
 Beni - Dhunikharka- 45 km - eastern
 Dhunikharka - Powerhouse - 2 km- under construction
 Powerhouse- internsite- 2km

Financial Indicators

Project Cost (Including IDC) - 931.500
 Interest Rate - 12%
 IRR - 14.93%
 B/C - 1.74
 NPV (NRS. 0000) - 272,946.62
 Payback Period - 10 Years

Completed Work

Feasibility Completed
 IEE Completed
 PPA in Process
 Generation License in Process



कर्णाली जलश्रोत लिमिटेड (कार्जल) KARNALI JALASHROT LIMITED (KARJAL)

Registration:
(CRO # 106988/069/070)
(PAN # 600830715)

An Alternative Development Model

A Public Limited Company based on mass participation, Believing in Development for the People by the People, Financed by Crowd Funding, and Devoted to people-centric Water Resources Development mobilizing their full potential in the fields of:

**Drinking Water, Irrigation, Fisheries,
Electricity Generation, Recreation & Navigation**

Sister Company:



**हिमालयन वाटर रिसोर्सेज एण्ड
इनर्जी डेभेलपमेन्ट कं. प्रा.लि.
Himalayan Water Resources &
Energy Dev. Co. (p) Ltd.**

Registration:
(CRO # 104905/053/054)
(PAN # 302265596)

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Project : A



Upper Chauri Khola Small Hydropower Project (UCKHP) is a run-off-river (ROR) type hydropower project on the Chauri Khola. The Chauri Khola is a minor tributary to Sunkoshi river. The construction site of the UCKHP lies in ward no. 2 & 3 of Chaurideurali Gaunpalika, Kavre. The installed capacity of UCKHP is 6.0 MW with 35.618GWh energy annually.

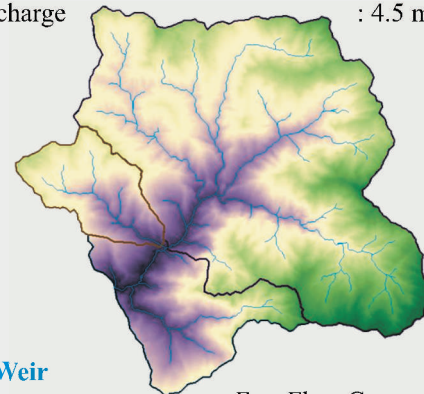
Salient Features of the Project:

General

Name of Project	: Upper Chauri Khola Hydropower
Project District	: Kavrepalanchok
Intake Location	: Chaurideurali-02,
Power House Location	: Chaurideurali-03, Bila
Latitude	: 27°34'18"and 27°35'55"N
Longitude	: 85°49' 33"and 85°51'59"E
RCOD	: 2080/04/02 (2023/07/18)
Type of Scheme	: Run-of-River
Installed Capacity	: 6 MW
Nearest Town	: Dhulikhel
Gross Head	: 164.74m
Net Rated Head	: 153.11m Average Annual
Energy	: 35.618 GWh
Construction Period	: 2 Years

Hydrology

Catchment Area	: 150 Km ²
Mean Annual Discharge	: 8.73 m ³ /sec
Design Discharge	: 4.5 m ³ /sec



Diversion Weir

Type	: Free Flow Concrete Weir
Length of Weir	: 34 m
Under Sluice Opening	: 2.5 m X 2.5 m

Intake Structure

Number of Intake Opening	: 2 nos
Size of Intake (W*H)	: 2 X 1.2 m each

Gravel Trap

Length	: 15.0 m
Size (Width and Depth)	: 5.0 m X 4.5 m
Gravel Flushing Duct (W and D):	: 1.0 m X 0.8 m



Settling Basin

Type	: Two bay flat bed
Conventional Dimension (LXBXH)	: 49 x10 x 5.0m
Inlet Transition Length	: 10.0 m

Powerhouse

Type	: Surface
Dimension (L*B*H)	: 30 X 15 X 16m
Installed Capacity	: 6 MW (2 X 3MW)
Type of Turbine	: Francis (Horizontal)

Turbine

Type	- Francis Horizontal Axis
No. Of Units	- 2 (Two)
Rated Output Capacity	- 3.15 MW
Rated Net Head	- 156.714 m
Rated Efficiency	- 92 %

Penstock Pipe

Length	: 295.40 m
Internal Diameter	: 1.55m
Thickness	: 10-16 mm

Head Race Pipe

Type	: Mild Steel
Length	: 3755 m
Internal Diameter	: 1.70m,1.60 m & 1.50m

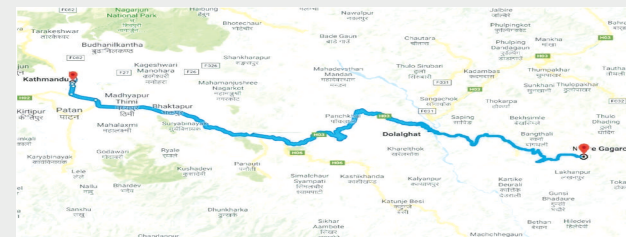


Transmission Line

Voltage Level	: 33 kV
Length	: 2.5 Km
Sub-station	: Kafle, Kavre

Project site Accessibility

Kathmandu- Dolalghat	: 58 Km (Blacktopped)
Dolalghat – Headwork site	: 42 Km
Dolalghat – Powerhouse	: 40 Km

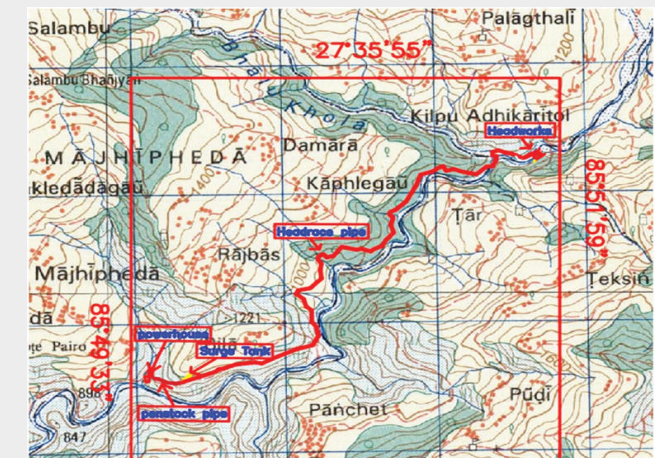


Ongoing works:

- Civil Construction of Headworks
- Excavation of Headrace pipe alignment

Major Attractions of UCKHP

- Renewable, Green, Reliable & Safe Energy
- Low Cost, High Return (Payback) Project
- Easy Construction Site/Components
- Easily Accessible to Site
- Excellent Topography & Geology
- Efficient Plant
- Minimal Social Issues
- Enthusiastic Professionals Team
- Short transmission line (2.5 Km)
- Construction power available



Financial Aspects

Total Project Cost	: Nrs.1.12billion
Project Cost Per Mw	: Nrs. 186.6million
Debt-Equityratio	: 65:35
Cost-Benefitratio (B/C)	: 2.21
Internal Rate of Return (IRR)	: 17.33%
Payback Period	: 6Yrs.(with interest)
Total Yearly Revenue (1st year)	: Nrs. 210.972 million
Annual increment in Revenue	: 3% p.a. (up to 6 yrs.)
Equity Internal Rate of Return	: 28.71%
Wet season revenue rate	: 4.8/Kwh
Dry seasons revenue rate	: 8.4/Kwh

Completed works:

- Land acquisition
- The power purchase agreement (PPA)
- Initial Environment Assessment (IEE)
- Contract agreement finalized for civil, hydro- mechanical, electro-mechanical and survey licence acquired for transmission lines
- Bank fund mobilized
- Upgrading access road
- Construction of Camp facilities