

SALIENT FEATURES OF THE PROJECT

A. General

Name of the Project	:	Sardi Khola Hydropower Project
District	:	Kaski
Location of the Project Site	:	Sardi Khola VDC
Name of the river	:	Sardi Khola
Type of Scheme	:	Run of River
Installed Capacity	:	4000 kW

B. Hydrology

Catchment Area (up to intake)	:	27.00 km ²
Catchment Area up to powerhouse	:	33.25 km ²
Average precipitation	:	4046mm
Long term average flow	:	3.33 m ³ /s
Minimum monthly flow	:	0.65 m ³ /s
Design discharge (Q ₄₀)	:	2.14 m ³ /s
Design flood discharge (at intake)	:	131.0 m ³ /s
Design flood discharge (at powerhouse)	:	160.0 m ³ /s

C. Headworks & Intake structure

Type of weir	:	Boulder riprap with Concrete core
Type of Intake	:	Orifice type side intake (2x1.5x1.0)
Weir waterway length	:	25m
Undersluice Section	:	2x2.5m
Undersluice Crest Level	:	1546.0m
Crest elevation of weir	:	El 1548.5m
Crest level of intake	:	El 1547.0m
Intake gates and stop logs	:	1.5m (W) x1.2m (H)

D. Gravel Trap

Length	:	15 m
Width	:	3.5 m
Height	:	1.5 m
Slope	:	1:20
Gravel trap flushing gates	:	1 No, 0.60 m (H) x 0.6m (W)

E. Settling Basin

Type	:	Surface double basin rectangular type
Design Discharge	:	2.46 m ³ /s
No of bays	:	two
Dimension (Length x width)	:	30m X 3.0 m (each)
Particle size to be settled	:	0.2mm
Length of the Flushing Channel	:	10.0m
Full Supply Level	:	El 1546.6m
Settling basin inlet gates	:	2 Nos, each 1.0 m (W) X 1.0 m (H)

Settling basin outlet gates : 2 Nos, each 1.0 m (W) X 1.0 m (H)

F. Fore-bay

Design Volume : 420.0m³
 Length of Fore-bay : 30.0m
 Width : 4.0m
 Height : 3.5m
 Fore-bay flushing gates : 1 No, 0.50 m (H) x 0.5m (W)
 Full Supply Level : EL 1537.5m

G. Headrace/Penstock Pipe

Design Discharge : 2.14 m³/s
 Type : Exposed on surface
 Material : Mild Steel
 Thickness : 8mm upto 1435m and varies from 10mm to
 16mm from 1435m to powerhouse
 Internal diameter : 1.00 m
 Length of Headrace (up to forebay) : 1092m
 Length of Penstock (forebay to PH) : 2059m
 No of anchor blocks : 33

H. Powerhouse

Type : Surface
 Size : 24.5m x 10.2m
 Height : 8.5m
 Centre line of Runner : El 1298.0m
 Depth of excavation from existing ground : 3.0m

I. Tailrace Canal

Type : Rectangular stone masonry
 Length : 40m after tailrace junction
 Size : 1.6m X 1.6m rectangular
 Slope of Canal : 1:1000
 Normal Water level of tailrace : El 1293.00 m
 High Flood Level at tailrace : El 1295.80m

J. Turbine

Type of Turbine : 2000 kW, 600rpm, Pelton
 Number of units : 2 Nos
 Rated efficiency : 89 %
 Axis : Horizontal
 Centre line of turbine : 1298.0m

K. Generator

Type	:	2500 kVA, 3 Phase Brushless Synchronous
Rating	:	6.6kV, 50 Hz, 600 rpm (6.6 kV)
Rated Efficiency	:	95%

L. Transformer

Step-up Transformer	:	3-Phase, ONAN Cooled
Capacity/Rating	:	4911kVA, 6.6/33 kV
Rated Efficiency	:	98%

M. Transmission Line & Grid Connection (Banskot, New Hemja)

Transmission line	:	33 kV, 3-Phase, 50 Hz
Length	:	33kV National Grid at about 8km to new Hemja
Grid connection	:	Proposed, 132/33 kV NEA Substation at Banskot, New Hemja, Kaski
Construction power	:	4 km 11/0.4 kV <i>(or by standalone generator)</i>

N. Power

Gross head	:	248 m
Rated net head	:	230.7m
Net head variation	:	230.7-240.9m
Overall efficiency	:	83 %
Installed capacity	:	4000 kW
Plant Factor	:	63.1 %

O. Energy

Dry season Energy	:	3.553 GWh
Wet Season Energy	:	18.553 GWh
Total Energy	:	22.106 GWh
Gross Revenue from Energy Sales	:	118.90 mil NPR at first year

P. Project Cost

Total Project Cost including IDC	:	NRs. 641.14 mil
Financing	:	70:30 (Bank Loan:Equity)
Loan amount	:	440.00 Mil Rs
Promoters Equity	:	200.10 Mil Rs

Q. Financial Indicators

Debt:Equity Ratio	:	70:30
Net Present Value	:	154.56 Mill NRs.
Borrowing Interest rate	:	12%
FIRR	:	19.70%
B/C Ratio	:	1.28
Payback period	:	6.30 years