KATHMANDU UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

FINAL DEFENCE PRESENTATION ON:

DEMONSTRATIVE MODEL OF PANAUTI HYDROPOWER PROJECT

PROJECT MEMBERS:
SURAJ KHADKA (18)
SITAL NEUPANE (28)
SWAPNIL REGMI (38)
BIBESH SHIWAKOTI(48)
DHARAMBIR YADAV(58)

PROJECT CO-ORDINATOR :
ER. KAMESHWAR SAHANI
DEPARTMENT OF CIVIL ENGINEERING

PROJECT SUPERVISOR:
ER. SUMAN SHRESTHA
ASSISTANT PROFESSOR
DEPARTMENT OF CIVIL ENGINEERING

Outline of Presentation

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Introduction

- Panauti Hydropower Station is third oldest Hydropower Station of Nepal.
- Run of river scheme hydropower plant
- Located at Khopasi, Kavre, nearly 35 km east of Kathmandu.
- Installed capacity of 2.4 MW and annual design generation of 6.97 GWh.
- Commissioned in 1965 A.D. and developed jointly by Soviet Union Government and GON at a cost of NRs. 27 million.

Figure : Panauti Hydropower Station
Image Source:
*https://www.google.com/.researchgate.net%2Ffigure%2FPowerhouse-of-Panauti-hydropower-plant_*

Objectives

Main objective

- Study and prepare the 3-D demonstrative model of components of Panauti Hydropower.

Specific objectives

- To acquire knowledge of hydropower components and its functions.
- To acquire knowledge regarding different scales.
- To use various materials in making demonstrative model.

Limitations

- It’s not working model.
- It won’t depict detail design and components.
- Represents only major components.

Literature review

Types of hydropower

- Runoff river(Diversion)
- Impoundment(Storage)
- Offshore(Tidal)
- Pumped storage

Literature review

Components of Panauti Hydropower System

- Diversion weir
- Intake structure
- Water canal
- Reservoir/Forebay
- Penstock
- Power house
- Switchyard
- Tailrace

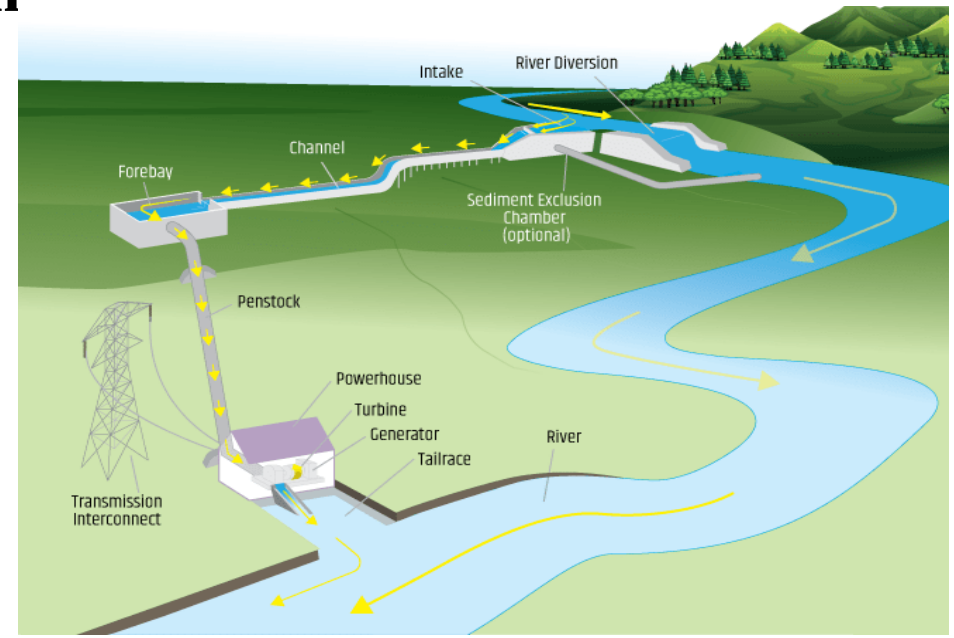

Figure: Layout of run of river Hydropower
Image Source: *https://www.energy.gov/eere/water/types-hydropower-plants*

Methodology

- Preliminary study
- Consultation
- Field visit and Data collection
- Calculation
- Material collection
- Construction of model

Dimensions:

S. N	Name of components	Actual dimensions	Unit	Project dimensions	Unit	R. F
1	Length of diversion weir	45	m	21	cm	1:215
2	Breadth of diversion weir	7.5	m	8.5	cm	1:88
3	Length of water canal	3710	m	70	cm	1:5000
4	Breadth of water canal	2.5	m	2.5	cm	1:100
5	Area of reservoir	13136.9	m^2	620	cm ^2	1:460
6	Length of penstock	370	m	50	cm	1:740
7	Internal diameter of penstock	1.4	m	1.6	cm	1:87
8	Power house(length*breadth*height)	(24.75* 18.4* 7.09)	m^3	(24.75* 18.4* 7.09)	cm^3	1:100
9	Switchyard (length*breadth*height)	(27.40*11.40 * 2.4)	m^3	(27.40*11.40 * 2.4)	cm^3	1:100

Material Used

1. Plywood
2. Adhesive
3. Paint
4. Styrofoam
5. Card board
6. Pipes
7. Small rods

Drawing of project work

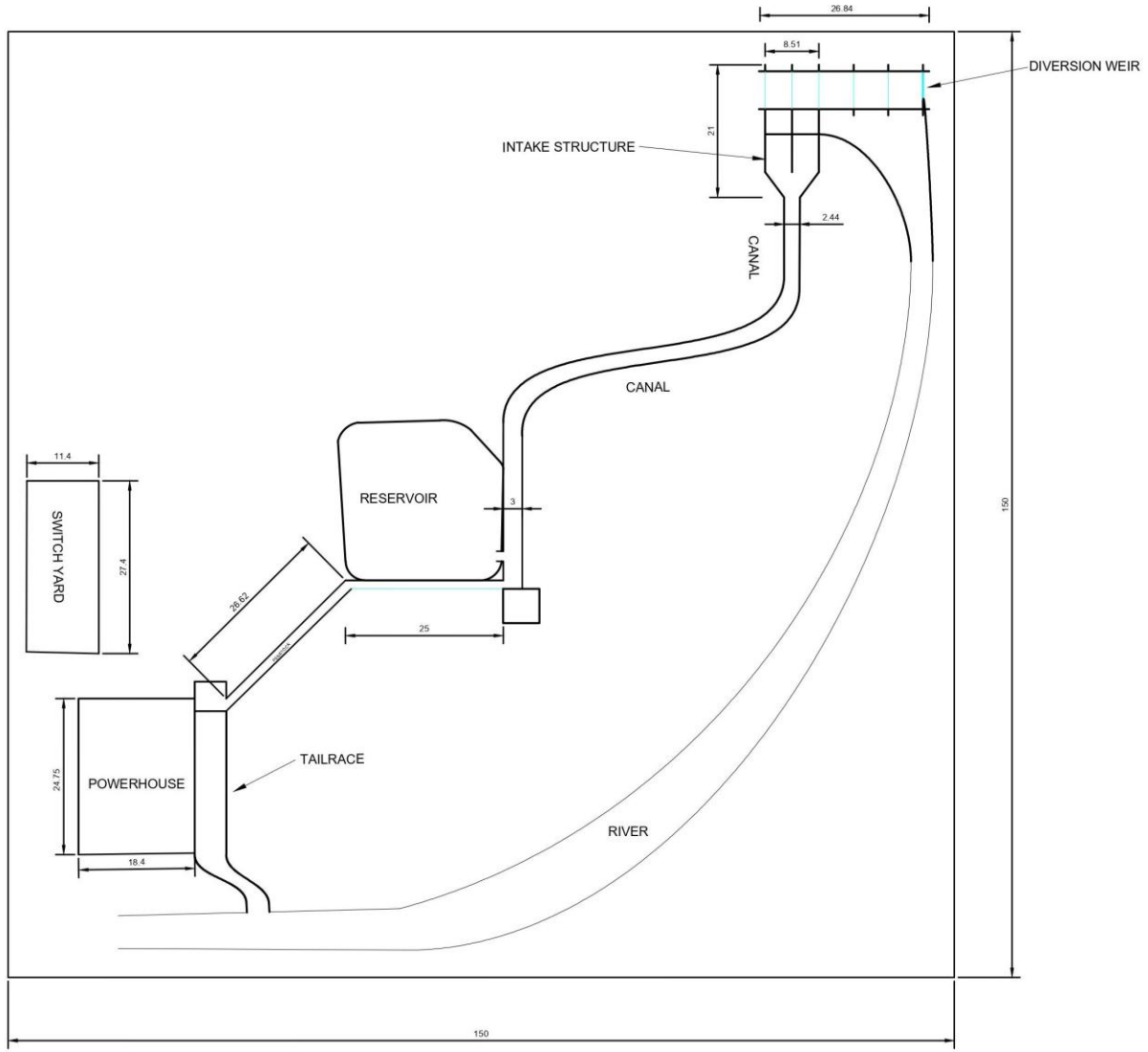

Figure : Layout of Panauti Hydropower

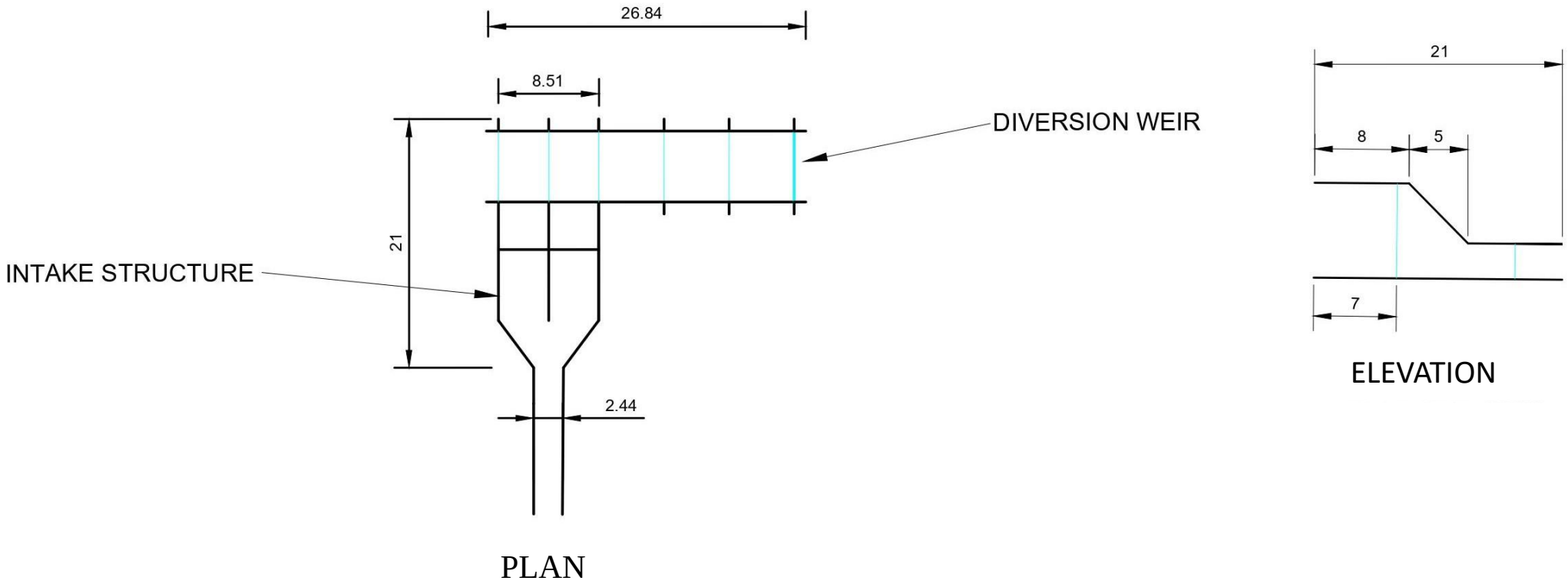

Figure : Plan View and Elevation View of diversion weir

Photographs of construction of the model

Photographs after completion of the model

Work Schedule

Month	December		January				February				March				April				May	
Work / Week	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd
Consultation and literature review																				
Proposal submission																				
Project defense																				
Materials selection and purchase																				
Model construction and fitting																				
Midterm presentation																				
Finishing and coloring																				
Final report submission and presentation																				

Scheduled Work	
Completed Work	
Breaks	

Expenditure

S.No	Materials	Quantity	Unit	Rate (NRs.)	Total Cost (NRs.)
1.	Plywood	2	m^2	700	1400
2.	Adhesive	2	ml	150	300
3.	Styrofoam	3	Pieces	200	600
4.	Cardboard	2	Pieces	15	30
5.	Color brush	2	-	90	180
6.	Paints	4	L	200	800
7.	Pipes	1	Pieces	100	100
8.	Miscellaneous	-	-	-	500
Grand Total					**3910**

Deviations

- Dimension scale had to be readjusted to fit the components on the plywood base.

Table : 1
Dimensions

S.N.	Description	Proposed Dimension(cm)	Dimension readjusted(cm)
1.	Length of diversion weir	15	21
2.	Breadth of diversion weir	2.5	8.5
3.	Internal diameter of penstock	2	1.6

- Sawdust was also used along with Styrofoam to build topography

Conclusions

1. We built a working demonstrative model of Panauti Hydropower Plant.
2. We also got familiar with the engineering terms, skills, and the use of different tools.
3. We completed our project within the expected time and estimated budget

References

- from energy.gov: https://www.energy.gov/eere/water/types-hydropower-plants
- S.Sen. (2015, 06 27). *Top 6 Major Components of Hydro Power Plant*. Retrieved 12 16, 2021, from yourarticlelibrary.com: https://www.yourarticlelibrary.com/water/hydropower-station/top-6-major-components-of-hydro-power-plant/61028
- Wikipedia contributors. (2021, 10 7). *Panauti Hydropower Station*. Retrieved 12 16, 2021, from en.wikipedia.org: https://en.wikipedia.org/wiki/Panauti_Hydropower_Station

THANK YOU !