



Project Funding Proposal

Hydroelectric Project in Pawakhola, Nepal

October 13, 2025

1. Introduction and Objectives of the Proposal

SEED of LIGHT is a non-profit association founded in July 2025 by three volunteers – Francesco Balestrero, a mechatronics graduate; Nicola Ritter, a mechanical engineer (ETH Zürich); and Tommaso Fava, a biologist (ETH Zürich) - with the aim of promoting humanitarian and sustainable development projects in vulnerable communities worldwide. The association focuses on environmentally sustainable initiatives, carried out in collaboration with local populations and based on their expressed needs. This proposal outlines a micro-hydropower project aimed at providing clean electricity to the remote village of Pawakhola, Nepal, which currently has no access to power. The total estimated budget for the project is 2'077'881.50 NPR (14'812.48 \$, 11'972.68 CHF)¹, and we are seeking financial support to cover the full implementation cost.

2. Project Background

Pawakhola is a remote village in the Sankhuwasabha District of eastern Nepal, located at 27°37'1.5"N 87°25'56.8"E, with 104 inhabitants and 21 houses. The community currently lives entirely without access to electricity, and therefore without lighting. After sunset, residents live in complete darkness. This severely limits every aspect of daily life: children cannot study in the evening and families cook and move around in the dark. The area has suitable conditions for the installation of a small-scale hydropower system, thanks to the presence of perennial streams with sufficient water flow and elevation. This project aims to design and construct a micro-hydropower plant with an estimated installed capacity of 2 kW, sufficient to meet the village's energy needs. The project will be implemented in collaboration with the Nepalese *Hydro Steels Company* during the months of November and December 2025, with the active involvement of the local community. The resulting system will provide stable, renewable, and affordable electricity. It will enable reliable lighting in homes and school, improving the overall quality of life of the community. By using sustainable technology, building local capacity, and involving local labor, the project aims to create an enduring energy solution capable of operating indefinitely, contributing to the self-reliance and development of Pawakhola.

¹Currency conversion from Nepalese Rupees (NPR) to United States Dollars (USD) and Swiss Francs (CHF) was performed using the market exchange rates as of August 12, 2025. The rates applied were: 1 NPR = 0,0071 USD and 1 NPR = 0,0058 CHF

3. Context and Motivation

During the months of March to May 2025, the three founding partners Francesco Nicola and Tommaso took part in a three-month project in the same valley (Sankhuwasabha District, Eastern Nepal), where a hydropower system (12 kW) was successfully designed and constructed in the villages of Chasuwatar and surrounding areas. The project brought clean and stable electricity to 1,064 inhabitants and 143 houses across the valley and was implemented in collaboration with the *Hydro Steels Company* and with the help of local technicians and residents. While working on this initiative, our team visited several nearby villages. During one of these visits, we reached the remote mountain village of Pawakhola, located in the same valley. The residents of Pawakhola, who were aware of the ongoing electrification project, asked whether it would be possible to extend the system to reach their village, or alternatively, to implement a similar solution locally. According to the villagers, they had previously submitted a request to the Nepalese government for electrification through the national grid. However, the request was denied due to the lack of economic return. Pawakhola's geographic isolation makes it extremely difficult and costly to connect to the central electricity network. Additionally, the socio-economic conditions of the local population, who live in conditions of poverty, make it impossible to pay for the electricity. It was in response to such needs, and with the aim of providing continuity to this type of intervention, that our association was established. The community of Pawakhola has formally requested our support to implement a micro-hydropower system that would bring electricity to their village. The project will use two nearby streams to build a small hydropower plant that will generate electricity. The system would provide clean, reliable energy to all 21 households in Pawakhola, improving their quality of life.



Figure 1: Pawakhola Village.

4. Technical Description

The hydroelectric plant, designed to supply electricity to the village of Pawakhola, comprises a water storage tank fed by intake pipelines sourcing water from two nearby streams. These streams have a sufficient flow rate to ensure, year-round, a continuous supply to the reservoir and, subsequently, to the turbine, which requires a flow of 4.5 liters per second. Hydrological studies and flow measurements have confirmed that the combined discharge of the two rivers never falls below the minimum required for plant operation.

As shown in Figure 2, the planned hydraulic head is 90 meters, corresponding to the vertical drop between the water reservoir and the turbine inside the power house. The potential energy of the water will be converted into mechanical energy by the turbine, which is connected to an electric generator capable of producing 2 kW of power. This output will be sufficient to meet the electricity needs of the entire village, as illustrated in Figure 3, which shows the electrical distribution network layout.

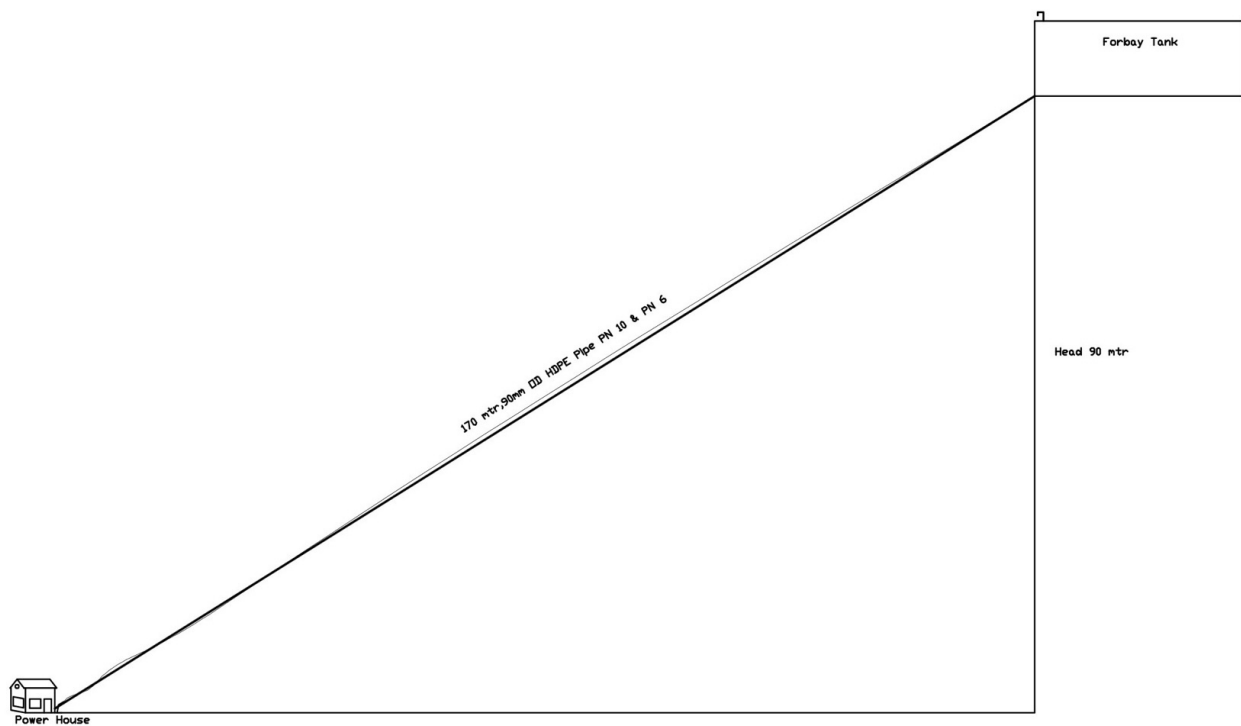


Figure 2: 90 m hydraulic head layout.

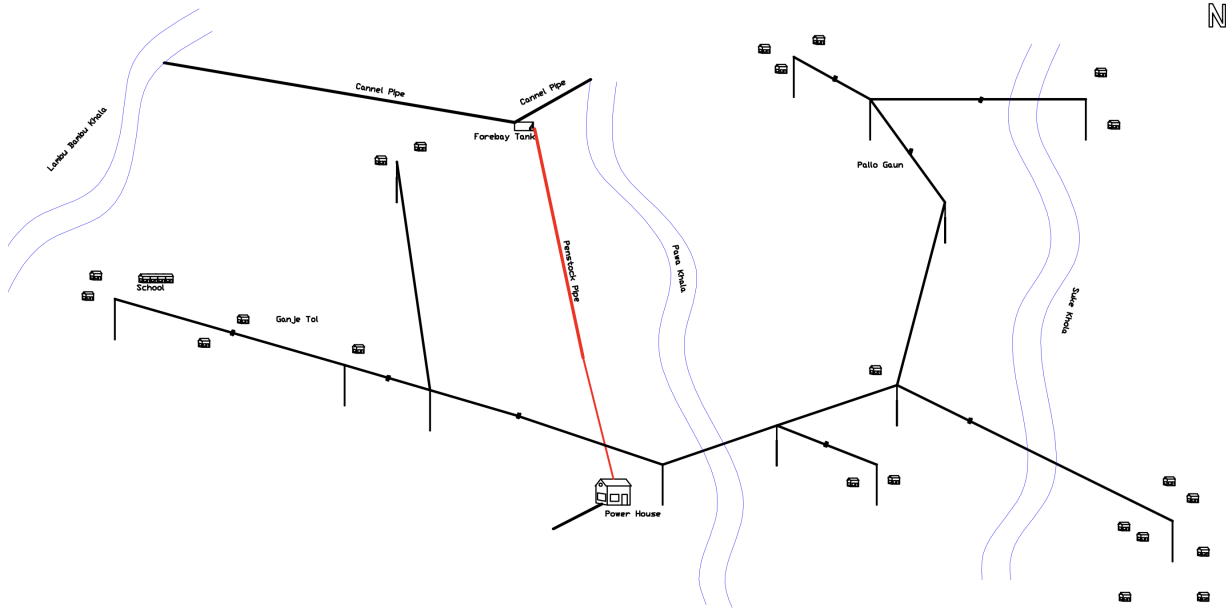


Figure 3: Electrical distribution network layout.

5. Estimated Project Costs

Budget Item	Amount NPR	Amount CHF ²
1. Mechanical components	462 525	2 665.05
2. Electrical components	815 025	4 696.14
VAT (13%)	166 081.50	956.96
3. Electromechanical installation	210 000	1 210.01
4. Transportation to road head	193 500	1 114.94
5. Powerhouse civil works	230 750	1 329.57
Grand Total	2 077 881.50	11 972.68

Table 1: Budget estimate for the micro-hydropower project in NPR and CHF

For a detailed breakdown of the estimated costs, please refer to the attached budget document. In accordance with the contractual terms agreed upon with *Hydro Steels Company*, the total amount must be paid in three instalments: 30% prior to the start of the project, around the end of September; 40% after verification of material delivery and completion of 50% construction works; and the remaining 30% after completion of all works, submission of the completion report, and successful handover.

²Currency conversion from Nepalese Rupees (NPR) to Swiss Francs (CHF) was performed using the market exchange rates as of August 12, 2025. The rate 1 NPR = 0,0058 CHF was applied.

6. Deliverables and Goals

The primary goal of the project is to provide stable, clean, and affordable electricity to the village of Pawakhola. This will improve the overall quality of life and enable access to basic services such as lighting.

Specific goals include:

- Eliminate energy poverty in Pawakhola by providing reliable electricity to 104 inhabitants.
- Enable evening activities in schools and households through electric lighting.
- Create job opportunities and local income through the involvement of porters and technicians.
- Build long-term local capacity for operation and maintenance of the hydropower system.

Project Deliverables

At the end of the implementation phase, the following deliverables will be completed:

- **One fully operational micro-hydropower plant** with 2 kW capacity, flowing water system (*run-of-river*), built in partnership with *Hydro Steels Company*.
- **Connection of 21 households** to the local grid system, including house wiring, with approximately 3–5 light bulbs and 2–3 power sockets per house.
- **Basic training** provided to local operators for turbine maintenance and troubleshooting.
- **Local employment** generated through the use of local porters and labor during construction and logistics.
- **Maintenance plan** and documentation for the long-term operation of the plant.

7. Conclusion and Funding Request

This project offers a simple and effective solution to bring electricity to the remote village of Pawakhola. By using the natural water resources available in the area, and by working closely with local people, clean and reliable energy will be provided, that will improve daily life for the entire community. Logistics are already secured with the *Hydro Steel Company*. What remains is the financial support required to launch and complete the work. Through this proposal, we formally request your support to cover the full cost of the project. Your contribution will directly enable the delivery of clean, stable, and renewable energy to an isolated rural community. This will improve education, healthcare, and overall quality of life.

We welcome the opportunity to discuss this proposal further and explore how your support can bring light and opportunity to Pawakhola.

Contacts

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