

The Jhikhu Khola Suspension Bridge

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1. INTRODUCTION

The main hydrometric station in the Jhikhu Khola watershed was established in 1989, about 3 km below the village of Baluwa. The drainage area at this point is 11,141 ha, and the stream cross-section at high flow is about 18 m wide. Initially, a gauge plate and an automated pressure transducer were installed at the site and in 1990, a cable way was constructed to facilitate high flow stream measurements during the monsoon period. Because of safety concerns and as a result of requests from local residents, it was decided in 1993 to construct a suspension bridge. Many people wanted to use the cable way during the monsoon season when it is almost impossible to cross the river. Also, the transport of goods over this time period is restricted. The cable way system was never designed for the transport of people or materials; it was built strictly to measure stream flow. Due to the apparent need and concerns about possible accidents, the construction of a suspension bridge was initiated in April 1993.

The bridge represents a link between science and development in that requirements by scientists and the local people were considered to be of equal importance, thus justifying the construction of a multi-purpose bridge. Given the limited funds available, an agreement was struck between the local residents and project personnel: the former provide free labour and the latter, finances, technical assistance and materials. The engineering was provided by Raj K. C. Lokendra, Structural/Geotechnical Engineer, and all materials were organized and transported to the site by the Nepali project staff.

2. DESIGN OF THE BRIDGE

A plan of the design is provided in Figure 1. The bridge was built over a three month time period under the direction of the Nepali team. The final results are provided in Figures 2 and 3. Some 20 villagers volunteered their time over a one month period to help with the earthwork and bridge assemblage. All components were made of steel and metal since wood supplies are very scarce in this part of the watershed. The entire cost of the construction of the bridge was about US \$ 6000, and the project has been a success for both the MRM research project as well as for the local residents.

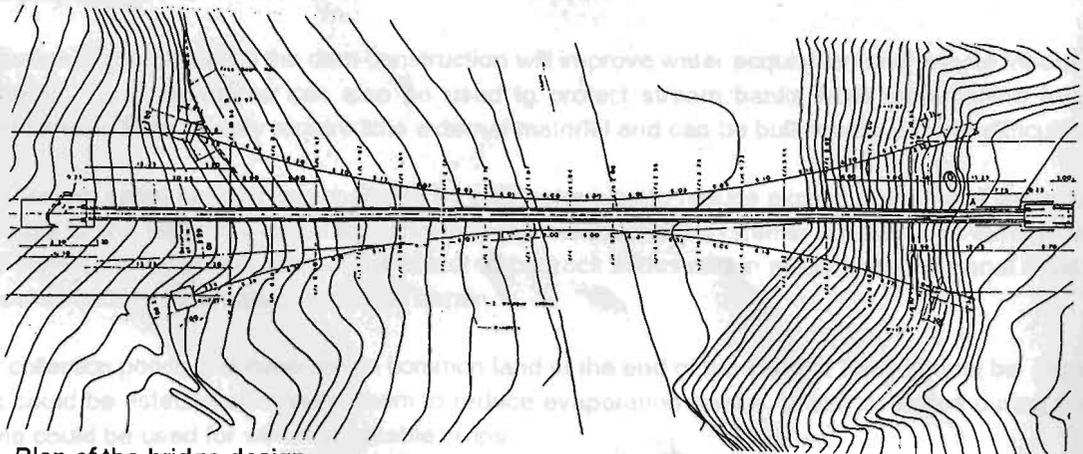


Figure 1. Plan of the bridge design.



Figure 2. Final results of the Jhikhu Khola suspension bridge.



Figure 3. The Jhikhu Khola suspension bridge.

3. EVALUATION OF USE

To better assess whether the bridge is meeting the expected use, three separate surveys were conducted by the project staff to determine the number of people crossing the bridge on a daily basis. The results shown in Table 1 indicate that traffic is heavy even during periods when the river is small and when the bridge is not necessary.

Table 1. Results from the user survey of the suspension bridge.

Time of Survey (1994)	Observation Period	No. of People crossing
Monsoon Period (August)	10 day period	175 people/day
Pre-Monsoon (May)	7 day period	93 people/day
Post Monsoon (September)	5 day period	124 people/day

From a traffic perspective, it is evident that this project has been a success. From the scientific perspective it has greatly facilitated high flow measurements, as it provides a safer and more permanent platform, enabling us to obtain more frequent and precise measurements of stream flow and sediment transport.

4. CONCLUSIONS

Building a suspension bridge was never contemplated as part of this research project, but once initiated it proved to be a very worthwhile venture. Not only did it greatly improve our own scientific monitoring program, but more than anything else it provided a forum for close interaction with the local community. It demonstrated to the local people that we were not only interested in our research but also in the well being of the local community. The goodwill gesture of building a multi-purpose structure, as well as the trust gained through collaborating with the community in the construction, will have many long term benefits for current and future research in the watershed. As an example, we feel that socio-economic surveys in the watershed will be greatly facilitated in the future as a result of this joint project. We also anticipate that the farmers will be more receptive to new ideas for experimentation and environmental management. These benefits cannot easily be measured, particularly in the short term, but will likely have long term dividends.