

BUILDING 8500+ TRAILBRIDGES IN THE HIMALAYAS

Overcoming harsh terrain to connect remote mountain villages with services and resources through collaborative design for local context, community participation and mutual respect

Author: Robert Groeli, robi@groeli.com

Affiliation: HELVETAS Swiss Intercooperation, Zürich, Switzerland

SDC, Swiss Agency for Development and Cooperation, Berne Switzerland

Keywords: trail bridges, suspension bridges, appropriate technology; mule-trails; rural economy, user's committees; standardization; implementation; institutionalization; lateral vibrations; damping.

Despite the rugged topography of the Himalayan State of Nepal, the people living in the hill areas established and maintained a traditional trail network for centuries. The Himalayan drainage system consists of countless rivers, which divide the country into hundreds of micro-economic areas. Despite great efforts in road construction, a large part of the hill population depends on the traditional trail network. Thus footpaths and mule trails remain the lifelines for the exchange of goods, access to health posts and children going to school where pedestrian trail bridges are the critical links. Rather than designing new bridge concepts from outside, Nepal's Trail Bridge Programme standardized (structural and steel-parts drawings) the indigenous trail bridge techniques and made them conform to modern engineering practices. This approach yielded a very high acceptance and ownership so that thousands user's committees are constructing their own bridges.

Pedestrian trail bridges require specific engineering norms and design parameters (e.g. ideal sag to span ratio = $\frac{1}{20}$ for best dampening effects of catwalk type) which are not part of standard courses in civil engineering. Hence, relevant manuals were compiled and elective courses at Nepal's Institute of Engineering (IoE at BCE level) were implemented. Over 40 educational institutes are imparting the know-how through dedicated courses to practitioners of local governments, civic organizations and the private sector.



Figure 1: Catwalk or suspended Type



Figure 2: Suspension Type

Five decades of Trail Bridge Building implemented through the Government led Sector Wide Approach Programme (TB-SWAp) have yielded 8500 trail bridges (~650km) in Nepal that provide safe access to services and resources to over 18 million people transforming their lives and livelihoods towards prosperity. <http://nepaltrailbridges.org.np/>

Experiences and learning gained over time have evolved the science and art of pedestrian trail bridge building in Nepal to the extent where the country can claim to be a global leader in this sector! The learning is being successfully replicated in Asia and Africa.