

Pro Bhutan e.V.

philanthropischer Verein zur aktiven Entwicklungshilfe
im Himalaja Königreich Bhutan



The new Bazam of the Punakha Dzong and ‘Pro Bhutan, Germany’ (Text)
Protection of Bridge Tower against Floods (Drawing)



The History:

1958, a flood caused by a bursting glacier lakes, high up in the Lunana mountains, destroyed the original Bazam which was built around 1637/38. The flood was reinforced by drift wood of thousands of uprooted trees. It disintegrated the bridge and the right bridge tower opposite the Dzong. The flood wave devoured thousands of tons of earth of the 10 meters high river bank where the tower had stood. The river was widened by more than 20 meters. The bridge tower at the Dzong side was spared.

To give access to the Dzong, a steel cable suspension bridge was built to reach the Dzong from Punakha village. This ungainly improvised solution lasted until 2007 when removed for the construction of the new “Pro Bhutan” Bazam.

In 2000, then Prime Minister Sangay Ngedup asked “Pro Bhutan” to plan, finance and rebuild the Bazam in traditional architecture. A great technical challenge: the new span had to be 56 meters instead of 35 meters of the original Bazam! It would be impossible to build such a long bridge, without intermediate support, by using traditional wooden cantilever technology.

The Planning:

Carlo Galmarini of the engineering company Walt +Galmarini, Dipl. Bauingenieure ETH SIA USIC, Zurich, specialized, among other fields, in designing bridges, offered his generous help. His engineer Wolfram Kübler and “Pro Bhutan”-architect Fritz Baumgartner developed the solution: traditional image combined with most advanced bridge technology. The idea: invisible steel elements would be incorporated into the structure of the overlong Bazam. Only in this way, the high bridge arc could be stabilized and prevented from falling side wards due to horizontal forces caused by strong winds or swaying when a large number of persons would pass the bridge. The concept for the Punakha Bazam was developed in excellent cooperation between “Pro Bhutan” and the Ministry of Home and Cultural Affairs, then headed by Minister Jigmi Y. Thinley.

The Construction:

For the construction, 165 beams were required. Suitable Chir Pine trees had to be found, among them 2 dozen trees of 40 meters. These exceedingly high trees were found only on steep and inaccessible mountain slopes up to 30 km from Punakha. Experienced Bhutanese carpenters, with their simple tools,

carved and joined the 4 massive gates of the two bridge towers, the hand railings, columns and lintels for the roof of the Bazam. All the work force was supervised by “Pro Bhutan” site engineer Padam Bahadur Chuwan.

Attention had to be given to special flood protection of the new tower. Dzong and Bazam are situated in the “red danger area” of GLOFs (Glacial Lake Outburst Floods). Professor Dr. Juerg Speerli of the University of Applied Sciences Rapperswil, Switzerland, designed the concept: 32 armed concrete pipes would form a semicircular barrier and support the platform on which the foundation of the tower is built. They were placed vertically into the river bed. Each pipe is 3.5 meters long and weighs 8 tons, and was cast at the site and filled with concrete and gravel. In addition, 700 “Toskanes” (double-T formed concrete blocks) each weighing 700 kg, were cast at the site and placed into the riverbed in front of the pipe barrier. Hundreds of natural boulders, each weighing 500 to 1000 kg, were piled on top of the “Toskanes”, adding to the protection and hiding the ungainly concrete pipes and blocks.

The total costs of the Bazam were of 850.000,- €. They were covered by “Pro Bhutan” with private donations from Germany.

This sum includes a contribution of 50.000,- € made by the German Embassy in India. The engineering company Walt +Galmarini and Professor Speerli generously contributed their enormously important work free of charge.

The Inauguration:

On 10th of May 2008, the new Bazam was inaugurated by H.E. Jigmi Y. Thinley, now Prime Minister of Bhutan, and “Pro Bhutan, Germany” Chairman, German Ambassador Harald N. Nestroy.

The Prime Minister praised the bridge saying that for the last half a century, the holy Punakha Dzong, without the bridge, was like a human being having lost a limb. He emphasized that the new Bazam was a very substantial contribution to the celebrations of “100 years of Wangchuck Monarchy in 2008” and to the coronation of His Majesty King Jigme Khesar Namgyel Wangchuck in Punakha Dzong on 1. November 2008; and that the Bazam is a symbol of the deep friendship between the peoples of Bhutan and Germany.

More: “Pro Bhutan, Germany” www.proBhutan.com
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Protection of Bridge Tower against Floods by Concret Pipes (red) and Toskanes (yellow)

