

C-02 Bu Wewa: the design and construction of a 12th Century *bisokotuwa* type sluice on ancient Parakrama Samudra

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Sluices are the most complex of the archaeological remains of Sri Lanka's ancient irrigation system. A chronology of their variations in form and construction technology is vital as they are the most likely structures to document ancient developments in scientific knowledge and engineering design.

A small well-preserved *bisokotuwa* type sluice, probably of late 12th century date, was discovered in 1995 on the ancient Parakrama Samudra bund at Bu Wewa, about 15 km south of Polonnaruwa. Stratigraphic excavations covering over 75m² were carried out in 1996-97 at 6 key locations along the sluice.

The *bisokotuwa* has a square central valve chamber which is lined with well-cut flat stone slabs backed by bricks set in mortar and faced on the exterior by interlaced roughly cut stone blocks. The sluice barrel is a massive mortar-covered structure of mortared brick that was built around a small stone slab lined water culvert.

The construction materials and the microstratigraphy of the soil units were studied in detail. They indicated the construction sequence of the sluice structure, the careful selection of materials for bund construction, the use of mortars and clays to prevent seepage, and the addition of boulders to the latter to stabilize the structure. These provide evidence that the ancient engineers understood the problems of water storage and release and that they carefully managed their manpower and materials.

The Bu Wewa sluice was built as a well planned, utilitarian architectural structure in which labour was minimized for construction expediency. The use of stone-work, and especially its fine finishing, were kept to a minimum. Although the final stone-cutting was done on site, evidence suggests that an islandwide standardized design model that would have further expedited construction was used for the 12th century *bisokotuwa* type sluices.