

## A REVIEW ON THE MEASURING METHODS OF THE STŪPAS IN SRI LANKA

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### Introduction

The Stūpa is a dominant member of Buddhist symbols which is built in a significant manner with high technology. Though there are different kinds of Stūpa traditions throughout the world, our focus here is only on the Sri Lankan tradition. Many *Stūpas* constructed by the ancient Sri Lankans reveal the utmost devotion of the Buddhists to the Buddha, their dedication and the sound knowledge on constructing technology. The Stūpa constructors in fact, were able to comply with the balance, symmetry, the real features and shapes like circle, squares, cone etc. of the Stūpas and the appropriate raw materials. Without using suitable technical equipment and the measuring methods, it cannot be satisfactorily fulfilled the construction of them. However, the knowledge on Stūpa Architecture revealed by the many scholars so far, shows us how the technology of Stūpas was high in ancient times but there is no an enough study on the measuring methods of it.

### Objectives

This research intends to examine the measuring methods used by ancient Stūpa architects, how the measuring methods have been evolved and the Indian influence on it. It is indeed, worthy to find out and analyse the ancient knowledge for the reconstruction of the ancient ruins and reshaping the modern knowledge.

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## Methodology

The main methodology is studying literary sources, collecting the facts and verifies them in accordance with the theoretical knowledge and the archaeological surveys of modern excavations. The commentaries of *Tripitaka* in Pali, chronicles in Pali and Sinhala, Sanskrit *śilpa* texts and the pertinent archaeological reports will be taken to account for this research.

## Discussion

According to the *Samantapāsādikā*, in the beginning, to construct the *Thūpārāmastūpa* ancient architects have used relative measurements like *Janghappamāṇa* (knee level height), *Hatthikhandhappamāṇa* (shoulder level height). Further, it mentions that the circumference of the *Ratanamāli Stūpa* has been determined by a monk circling on the ground. It does not guide us to reveal the exact measurements of them. Nevertheless, in the subsequent period a standard measurement was popular and vastly used. *Āṅgula*, *vidatthi*, *hattha*, *ratana*, *gāvuta*, *yojana* are some of the units mentioned in *Sumaṅgalavilāsinī*, *Mahāvamsa*, *Thūpavamsa*, *Dhātuvamsa* etc. when they describe the constructions of *Ratanamāli*, *Sēruvila*, *Mahiyaṅgaṇa* and some other *stūpas*. Most of the times the lesser measurements (*Āṅgula*, *vidatthi*, *hattha*, *ratana*) have been used for measuring small parts especially, internal parts of *Stūpas* and others for height, width and circumference of the *Stūpas* and the big parts of it but *hattha* has been used to measure the both small and big parts. The descriptions of those measuring units can be seen in *Saddanīti* and *Sīmāvisodhanīpāṭha*. In accordance with *Sīmāvisodhanīpāṭha*, the measuring units can be defined as follows.





36 <i>paramāṇus</i> = 01 <i>aṇu</i>	12 <i>aṅgulis</i> = 01 <i>vidatthi</i>
36 <i>aṇus</i> = 01 <i>tajjāri</i>	07 <i>dhaññas</i> = 01 <i>aṅguli</i>
36 <i>tajjāris</i> = 01 <i>rathareṇu</i>	02 <i>vidatthis</i> = 01 <i>ratana / hattha</i>
36 <i>rathareṇus</i> = 01 <i>likkhā</i>	07 <i>hatthas</i> = 01 <i>yaṭṭhi</i>
07 <i>likkhās</i> = 01 <i>ūkā</i>	20 <i>yaṭṭhis</i> = 01 <i>usabha</i>
07 <i>ūkās</i> = 01 <i>dhañña</i>	80 <i>usabhas</i> = 01 <i>gāvuta</i>
04 <i>gāvutas</i> = 01 <i>yojana</i>	

Apart from this, there are different definitions in some other Pali texts. Moreover, though there are some descriptions of measuring units in Sanskrit texts like Mayamata, Līlavati, Mānasāra this etc. the interesting thing is that they are not similar to the Pali definitions and it seems that Pali (Sri Lankan) tradition has developed a significant method with an identity and minor Indian influences. Mañjuśrībhāṣita Vāstuvīdyāśāstra (5<sup>th</sup> Cent. – 7<sup>th</sup> Cent. AD) written in Sri Lanka is the earliest text on Stūpa architecture which gives us the basic plans of the Stūpa and the measurements of the small parts of it even of the measurements of bricks. It has used the standard measurement which was well popular in Indian sub-continent described in Mayamata written in 10<sup>th</sup> Cent. A D.

The measuring method has been changed into proportional measurements afterwards. Indeed, this is the well-practiced method in construction of colossal images of the Buddhas and Gods and the Stūpas in ancient times. According to many palm-leave manuscripts, such as Dāgæb Bændīme Lakṣaṇa, Dāgop Karanḍu Tænīma and Stūpa Nirmāṇa Lakṣaṇa etc. the height of the Stūpas should be 24 or 24 ½ parts and each component such as *pēsāvaḷalu*, *garbha*, *caturasraya*, *devatākoṭṭuva*, *yaṣṭhi*, *yūpa* and *chatra* has a certain proportional height. Likewise, the widths and circumference of components are also determined by this proportion. Sāsanavaṃsa says that the whole height and the circumference of Rājamaṇi cūla Stūpa is a similar measurement, 30 *hatthas* while the manuscripts mention that the diameter of the *garbha* should be fivefold or bit more of the height. Piprahwa and the small Stūpas in the Ratanamāli compound

substantiate it and those small Stūpas are fine illustrations for proportional measurements of the Stūpas.

### **Conclusion**

Concluding all these facts, we have license to say that the special measuring methods including various units have been used by ancient *Stūpa* architects and they have evolved eventually, to a proportional method and it helped to the architects to construct the Stūpas in the prescribed manner.

**Keywords:** ancient architecture, ancient measurements, Māna, Stūpa  
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