

Green and sustainable city planning in ancient time: Historical lessons from citadel in Anuradhapura

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Abstract

In Sri Lanka, this concept has been used in ancient city planning with various objectives particularly to establish ecological and liveable cities. The aim of this paper is to investigate the concept of green and sustainable city planning applied in ancient Citadel in Anuradhapura. In this connection, the following points were focused by the study: 1) water management techniques adopted under the green and sustainable city planning in the Citadel, 2) key tools considered in the ancient concept of green and sustainable city planning, and 3) ecosystem services generated to the ancient city dwellers by the green and sustainable city concept. As the study deals with ancient city planning concept, a mixed of two types of methods - review of historical and archaeological primary sources and ancient city observational method - was used. The study was carried out during April to July 2018. According to the excavation report (1971) of Shiran Deraniyagala, Sri Lankans have known the concept of the city planning in 400 BC. The Mahawamsa records revealed that plan of the Citadel in the Anuradhapura was established in 4th Century BC under King Pandukabhaya and well-developed with Mahindagamanaya in 3rd century. According to the analysis, the Citadel plan is based on amazing water management concept applied to evolutionary build a green and sustainable city environment via converting dry zone into the intermediate zone. For that, three water canals - Halpanuela, which was built blocking Malwathu Oya, and water channels from Basawakkulama tank and Bulankulama tank - have been used. These three sources of water canals have been used to manage water at three different height levels of the Citadel zone - the lowest zone by Halpanuela, the middle zone by the channel from Bullankulama tank and upper zone by the channel from Basawakkulama tank. The assurance of constant water supply from the channels of two tanks has been established shifting the water from Kalawewa to Thisawewa via Yodaela. This water management system established in and around the Citadel have resulted to create an intermediate zone in the Citadel in long term providing ecosystem services such as positive externalities of improved biodiversity and favourable humidity and water facilities for city dwellers in addition to protection from invaders and natural disasters such as drought. The analysis of plant species in the Citadel revealed that many plants, which grow in intermediate and wet zones, exist in the Citadel zone. The density and diversity of plant species indicate the green and sustainable city environment created for the Citadel dwellers. Thus, it can be concluded that the Citadel in Anuradhapura is the first city planned under the concept of green and sustainable city. According to historical literature, the similar green and sustainable city plans have been later applied in different locations of the country such as Kingdom of the Magama.

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