

**BENCHMARKING WATER DEMAND OF LOW-
INCOME HOUSING APARTMENT COMPLEXES IN
COLOMBO, SRI LANKA**

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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ABSTRACT

Along the main roads, Sri Lanka's coastline regions are fast urbanizing and expanding. The progress of these development works increased the population inside the urban areas, which created new social and economic issues. The high-density apartment complexes as high-rise apartment buildings are introduced to mitigate these social and economic issues. To maintain sustainable development in these urban areas, providing essential facilities for these apartment buildings is important. 70,000 low-cost housing units were scheduled for construction as part of the Urban Regeneration program and Sri Lanka's National Physical Plan (2011-2030). These plan to relocate the people currently residing in underserved areas of Colombo city.

Providing the essential facilities for these apartments does not assure the sustainability of the development. Overuse and waste are also required to be minimized, and optimum usage of these facilities is also to be assured. As a result, efficient buildings that preserve the environment are necessary for sustainable development, and these services need to be standardized. There are building rating systems like LEED, BREEAM, and Green Star that are well recognized in this context. In Sri Lanka, the Green Building Rating system, UDA Green, is recognized to describe a building's efficiency.

Energy efficiency is what these rating systems are primarily concerned with. Concerns about water efficiency are also significant in this context because Sri Lankan water demand benchmarks are not established, which makes it difficult for construction designers to create effective solutions for these structures and monitor the efficiency of the existing apartment buildings.

The study of establishing a benchmark for the water demand of low-income housing apartments requires studying of socio-economic behaviour of this community. A survey questionnaire was used to collect the information required for this study from 500 randomly chosen sample residents spread over 18 low-income apartment complexes in the Colombo area. A benchmark for the water demand in apartment buildings for low-income housing was developed after the survey's results were analysed. The benchmark water demand values for low-income housing are 170.16 litres per person per day and 850 litres per apartment per day.

Keywords: Water demand benchmarking, Low-Income housing apartments, socio-economic behaviour, Survey questionnaire

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LIST OF ABBREVIATIONS

Abbreviation	Description
NWSDB	National Water Supply and Drainage Board
BREEAM	Building Research Establishment Environmental Assessment Method
LEED	Leadership in Energy and Environmental Design
CSH	Code for Sustainable Homes
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning
AMI	Area Median Income
URP	Urban Regeneration Project
SCURP	Support to Urban Regeneration Project
AIIB	Asian Infrastructure Investment Bank
BS	British Standard
IPC	International Plumbing Code
CIBSE	Chartered Institution of Building Services Engineers
ASPE	American Society of Plumbing Engineers
GBCSL	Green Building Council Sri Lanka