

Article

# Urban Water Security: Definition and Assessment Framework

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**Abstract:** Achieving urban water security is a major challenge for many countries. While several studies have assessed water security at a regional level, many studies have also emphasized the lack of assessment of water security and application of measures to achieve it at the urban level. Recent studies that have focused on measuring urban water security are not holistic, and there is still no agreed-upon understanding of how to operationalize and identify an assessment framework to measure the current state and dynamics of water security. At present, there is also no clearly defined and widely endorsed definition of urban water security. To address this challenge, this study provides a systematic approach to better understand urban water security, with a working definition and an assessment framework to be applied in peri-urban and urban areas. The proposed working definition of urban water security is based on the United Nations (UN) sustainable development goal on water and sanitation and the human rights on water and sanitation. It captures issues of urban-level technical, environmental, and socio-economic indicators that emphasize credibility, legitimacy, and salience. The assessment framework depends on four main dimensions to achieve urban water security: Drinking water and human beings, ecosystem, climate change and water-related hazards, and socio-economic factors (DECS). The framework further enables the analysis of relationships and trade-off between urbanization and water security, as well as between DECS indicators. Applying this framework will help governments, policy-makers, and water stakeholders to target scant resources more effectively and sustainably. The study reveals that achieving urban water security requires a holistic and integrated approach with collaborative stakeholders to provide a meaningful way to improve understanding and managing urban water security.

**Keywords:** urban water security; drinking water; sanitation; ecosystem; socio-economic; climate change; water-scarce cities

## 1. Introduction

The world is becoming predominantly urban, dominated by human settlements and economic activities. According to the 2018 revision of World Urbanization Prospects [1], more than half of the global population—4.2 billion people—lives in urban areas, and this number is projected to grow by 68% to 2.5 billion people by 2050. Urbanization, urban water security, and economic growth move in tandem. However, for growth to be sustainable, the urban water security implications of rapid urbanization need to be at the center of the national and municipal development agenda [2–4].