

SCIENTIFIC CONTRIBUTIONS OF THE DISSERTATION

Thesis Title: *Development of an integrated Water Stress Index (WSI)–Life Cycle Assessment (LCA) model for supporting the sustainable management of the water supply system in Da Nang City.*

Major: Environmental Engineering; Code: 9520320

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Training Institution: University of Science and Technology - The University of Da Nang

New Contributions of the Thesis:

The thesis contributes a new methodological approach to the life cycle assessment of urban water supply systems by integrating the Water Stress Index (WSI) into the Life Cycle Assessment (LCA) method. This approach simultaneously reflects environmental impacts and the level of water resource stress according to the specific geographical and social conditions of each locality:

- The thesis is the first to develop and validate an integrated model between the Water Stress Index (WSI) and Life Cycle Assessment (LCA) specifically for urban water supply systems under conditions of water resource fluctuations and saltwater intrusion. This approach is generalized and can be expanded for application in other urban areas in Vietnam.

- The thesis applies the integrated WSI–LCA model to evaluate and compare water supply scenarios for the 2030–2045 period. Through this application, it identifies optimal solutions for the environment and water security under the conditions of climate change.

Keywords: Water Stress Index, water scarcity, Life Cycle Assessment, greenhouse gases, climate change, environmental impact, saline water, safe water supply, water treatment plant.

Da Nang, date...../...../2026

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