

RESEARCH RESULTS INFORMATION

1. General information:

- Project title: **Reduce greenhouse gas emissions through reasonable using of water in Da Nang city, Vietnam.**

- Code: **B2016-ĐN02-12**

- Project Leader: Msc. Nguyen Lan Phuong

- Coordinator:

+ Msc. Mai Thi Thuy Duong

+ Msc. Phan Thi Kim Thuy

+ Msc. Hoang Ngoc An

+ Msc. Duong Gia Duc

- Responsible agency: Danang University of Science and Technology , The University of Danang.

- This research is combined and supported by “*A new approach of reducing greenhouse gas (GHG) emission through changing lifestyle toward water and electricity saving in urban households in Danang, Vietnam*” project, chaired by Environment Protection Research Center (EPRC), The University of Danang and Institute for Global Environmental Strategy (IGES), Japan.

- Period: from October 2016 to December 2018

2. Target:

Evaluate current water supply system in Da Nang city and base on the data collection and survey, propose the solution to meet the needs in water used of households at reasonable cost, towards reducing water pressure, saving electricity costs, minimizing wastewater and reducing greenhouse gas emissions.

3. Innovation and Creativity:

- Be able to determine the amount of water used for each purpose in household needs as well as the way of water use in Da Nang city.

- The proposed reasonable using of water solutions are water-use solutions that still meet individual living needs but less water.

- Be able to determine the amount of water saved and the amount of CO₂ emission reduction due to the reasonable use of water.

4. Summary of research results:

- Da Nang city water supply system has designed capacity of 216,000 m³ / day. The actual output is 310,000 m³ / day. Water shortage usually occurs in the summer months when the salinity is high at the Cau Do project, the water shortage is about 7500 m³ / day.

- The water supply system inside the house is designed mainly based on the experience of the designer, have not been paid attention to the pressure of the water supply network outside.

- Water saving sanitary equipment have not been used recently. According to survey results, about 27.3% of households using shower and 33.3% of households using water saving wash basin faucets. The flow of sanitary equipments is still large thus the potential for saving water is quite high.

- The amount of water used for the average daily living needs of 134 liters / person/day. The demand for bathing (22%), sanitation (20%), kitchen (25%), washing (18%), cleaning house (3%), face & hand washing (4%) and another (8%).

- Proposed average water volume for living needs in Da Nang city for design in 2030 orientation: 160 l / person/day.

- The research has proposed the solution of using water properly. The amount of water saved when replacing water-saving sanitation is (12-15)% and when combining both measures of sanitation and water usage is 18% .

- Significant social and environmental meaning: The amount of water saved for the whole city is calculated from 8,975.60 (m³/day) to 23,863.66 (m³/day), which could solve the problem of water shortage for Da Nang city . Greenhouse gas emissions can decrease from 7,234 tCO₂/day (2,640.4 tCO₂/year) to 19.234 tCO₂/day (7020,198 tCO₂/yr).

5. Product name

No.	Product	Achievement
1	Science product	- 01 article on international workshop named "Sustainable water protection and water treatment in Vietnam", Binh Duong, 11/2018. - 01 article published by Journal of Science and Technology – The University of Da Nang - 3/2018.

		- 01 report at the international conference "International Conference for Taking Actions towards Sustainable Lifestyles and Education in Asia", Hanoi, January 2018. - 01 article of the scientific conference "Advanced construction technology and sustainable development", 2016.
2	Training product	- 04 groups of students research and defend successfully the graduation project
3	Application product	- 01 forecast document

6. Effectiveness, method of transferring research results and applicability:

- Effectiveness:

This research can be used with:

+ For households: The implementation of the results from the topic will help people gain awareness in using water, saving and protecting environmental.

+For water supply company: The data can be used in the task of calculating, designing and managing water quality on the network.

+ For Department of Construction: The data can be used in planning tasks of water supply system in the future closely to the development orientation of Da Nang.

+ For Design consultant: Provide data for calculation and design of water supply and drainage system inside and outside the project.

+ Being reference materials for teaching and research purposes in the field of environmental engineering and natural resource & environment management.

- Method of transferring research results and applicability:

Organize seminars for consultation with relevant stakeholders: water supply companies, construction departments, design consultants, teachers and students to incorporate the results of the project into the planning, calculating, the water supply system, communication to improve the sense of water savings for people and the subject content "Water supply."

Danang city, 12th December, 2018

Admisnistor

(Signature, full name and seal)

PHÓ HIỆU TRƯỞNG
BỘ GIÁO DỤC VÀ ĐÀO TẠO
TRƯỜNG ĐẠI HỌC BÁCH KHOA
ĐẠI HỌC ĐÀ NẴNG
PGS. TS. LÊ THỊ KIM OANH



Manager

(Signature, full name)



Nguyen Lan Phuong