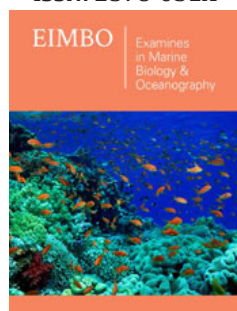


# Analysis of Net-Zero Village Planning Factors to Respond to Climate Change

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**\*Corresponding author:** Dong Kyu Lee, Korea Water Resources Corporation, 200 Shintanjin-Ro, Daedeok-Gu, Daejeon, 34350 Republic of Korea

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**Dong Kyu Lee\***

Senior Manager, Korea Water Resources Corporation, Republic of Korea

## Abstract

Recently, abnormal temperatures, floods, and droughts due to climate change have occurred frequently, and the amount of damage is increasing. To respond to this, the world has set a Net Zero goal for 2050 based on the Paris agreement. However, specific implementation plans for this are still insufficient, and most policies are focused on reducing greenhouse gas emissions and installing renewable energy facilities. As scientific evidence suggests that human activities dominate the impact of climate change, we need to focus on villages, the basic spatial unit where human activities take place. To this end, 20 planning factors applicable to Net-Zero villages were derived and can be used to improve the villages living environment and change lifestyles. In addition, if follow-up research is conducted, such as the development of a model that combines planning factors and basic units for each planning factor, a quantitative analysis of Net-Zero village will be possible.

**Keywords:** Climate change; Net-zero; Mitigation and adaptation; Greenhouse gas

## Introduction

Currently, humanity is faced with two paths: Entering the realm of a hot house Earth, where temperatures rise 4 - 5 °C compared to before the industrial era through continuous emissions of greenhouse gases and stabilizing the climate through controlling greenhouse gas emissions [1]. To prevent hot houses from entering the district, it is necessary to significantly reduce greenhouse gas emissions or secure additional sinks that can absorb them, and efforts to balance energy must also be made [2,3]. Response measures to climate change are largely divided into mitigation and adaptation. Mitigation means quantitatively reducing greenhouse gas emissions. This includes reducing greenhouse gas sources or expanding greenhouse gas sinks. Adaptation refers to reducing damage by controlling various risk factors that are currently occurring or expected to occur in the future due to climate change using natural and artificial systems, and further transforming them to be beneficial to our lives. These include raising the river planning flood level, creating buffer green areas along riversides, and diversifying crops in preparation for climate change. The village is a space where these countermeasures occur in complex ways. A village is the basic unit of human life and the smallest unit of a regional group, meaning a place where several houses live together. As it has been scientifically verified that human activities affect climate change, control and change of human activities are necessary to respond to climate change, it is necessary to build a wide range of basic data by conducting various studies that can lead to Net-Zero at the village level. Consequently, a set of applicable planning factors was systematically developed for the creation of a Net-Zero village, as documented within this paper.

## Net-Zero Village Planning Factors

Applicable planning factors for creating and improving a Net-Zero village were analyzed as shown in Table 1. It was largely divided into a research section and a case study section and was then investigated in parallel with not only domestic but also overseas studies and cases so that it could be utilized for general purposes. As a result, a total of 28 planning factors were





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