

## **ABSTRACT**

### ***Rainfall Spectrum Analysis due to Climate Change in the Angke River Basin***

Raden Faiz Yusuf Adiputra <sup>1)</sup>, Tri Nugraha Adikesuma<sup>2)</sup>

<sup>1)</sup> Student of Civil Engineering Department, Universitas Pembangunan Jaya

<sup>2)</sup> Lecturer of Civil Engineering Department, Universitas Pembangunan Jaya

Global climate change has significantly affected rainfall patterns across various regions of Indonesia, including the Angke River Watershed (DAS Angke), which flows through South Tangerang and Jakarta. This study aims to analyze the variation in rainfall spectrum due to climate change within the Angke Watershed by examining the relationship between rainfall and climatic parameters such as minimum and maximum temperature, average humidity, maximum wind speed, sunshine duration, and the El Niño–Southern Oscillation (ENSO) phenomenon. The research employs a quantitative descriptive method using secondary data from BMKG and other relevant sources. Data processing includes watershed delineation using QGIS and statistical analyses, including trend analysis, Pearson correlation, and the Smirnov-Kolmogorov test. The results indicate that rainfall in the Angke Watershed has shown an increasing trend across regional, upstream, and downstream averages, with significant correlations to several climatic variables. ENSO emerged as one of the most influential factors affecting rainfall variation in the study area. Positive correlations were found between rainfall and air humidity as well as maximum wind speed, while negative correlations appeared with sunshine duration and maximum temperature. These findings suggest notable changes in the rainfall spectrum that may increase flood risks within the watershed, thus necessitating adjustments in spatial planning, water resource management, and drainage infrastructure. This study is expected to serve as a reference for local governments, civil engineering practitioners, and related stakeholders in developing disaster mitigation strategies and watershed management that are more adaptive to climate change.

**Keywords:** Rainfall Spectrum, Climate Change, Angke River Basin, ENSO

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