

## ABSTRACT

Soil carbon stocks and nitrogen are two interconnected things. High and low levels of soil carbon stocks and nitrogen can occur due to differences in plant age, in elevation, slope position and soil horizons. Therefore, it is necessary to research to find out how soil carbon stocks and nitrogen levels are based on the above factors. The purpose of this study was to determine the level of soil carbon stocks and soil nitrogen based on biological and pedological approaches in Gayo highland coffee plantation. This research was conducted on Gayo highland coffee plantation land, Bener Meriah Regency, using a survey method consisting of four stages, namely the preparation stage, preliminary survey, main survey, data analysis, and presentation of results. Soil sampling were at each horizon of the soil profile. Soil profiles are made at three slope positions, namely the foot slope, middle slope, and peak slope at four elevations, namely 700-715 meters above sea level, 1000-1090 m.a.s.l, 1300-1351 m.a.s.l and 1600-1616 m.a.s.l and each profile is made on coffee plants aged 5 and 11 years. The results showed that the highest of soil carbon stocks and total-N were found in coffee plants aged 11 years, based on elevation, the highest of soil carbon stocks were found at elevation 700-715 m.a.s.l and total-N was found at elevation 1600-1616 m.a.s.l. According to slope position, the highest soil carbon stocks were found at the foot slope, and total-N at the peak slope. Based on soil horizon average of bulk density value, organic-C, soil carbon stocks and total-N had varied.

Keywords: Carbon stocks, total-N, plant age, elevation, slope position, horizon