

**ANALISIS KONSENTRASI PM₁₀, PM_{2,5}, DAN PM₁ PADA
RUANG PUBLIK (Studi Kasus: Pasar Talawi, Kota Sawahlunto)**

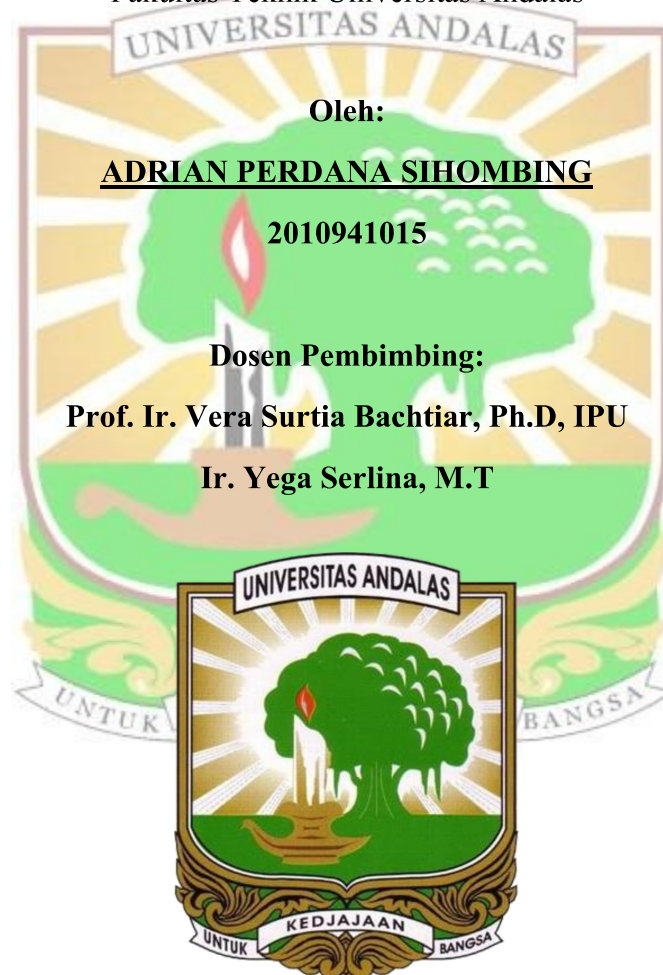
TUGAS AKHIR

Sebagai salah satu syarat untuk menyelesaikan

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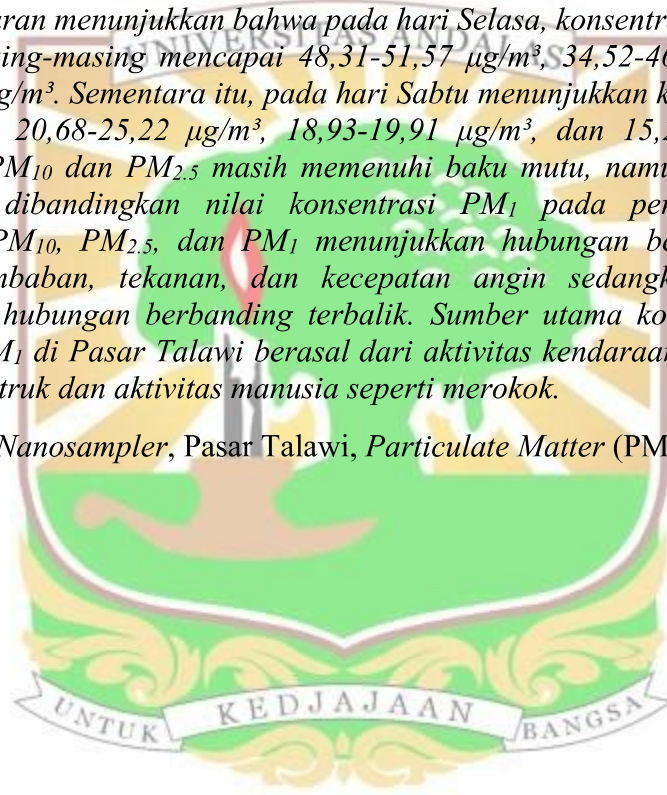
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ABSTRAK

Pasar Talawi di Kota Sawahlunto merupakan salah satu ruang publik yang berfungsi sebagai pusat perbelanjaan dan menjadi tempat berbagai aktivitas masyarakat, yang dapat menghasilkan particulate matter (PM). Penelitian ini bertujuan untuk mengukur konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 di Pasar Talawi, serta membandingkannya dengan baku mutu udara yang ditetapkan dalam Lampiran VII Peraturan Pemerintah No. 22 Tahun 2021 dan penelitian terkait. Selain itu, penelitian ini juga bertujuan untuk mengidentifikasi hubungan antara konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 dengan kondisi meteorologi, serta sumber-sumber yang mempengaruhi konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 di Pasar Talawi. Pengambilan sampel konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 dilakukan pada hari Selasa dan Sabtu menggunakan alat Nanosampler dengan durasi pengukuran selama 24 jam. Kondisi meteorologi diukur setiap 10 menit selama pengambilan sampel. Hasil pengukuran menunjukkan bahwa pada hari Selasa, konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 masing-masing mencapai $48,31-51,57 \mu\text{g}/\text{m}^3$, $34,52-46,04 \mu\text{g}/\text{m}^3$, dan $27,76-28,01 \mu\text{g}/\text{m}^3$. Sementara itu, pada hari Sabtu menunjukkan konsentrasi lebih rendah, yaitu $20,68-25,22 \mu\text{g}/\text{m}^3$, $18,93-19,91 \mu\text{g}/\text{m}^3$, dan $15,23-16,79 \mu\text{g}/\text{m}^3$. Konsentrasi PM_{10} dan $PM_{2.5}$ masih memenuhi baku mutu, namun PM_1 tercatat lebih tinggi dibandingkan nilai konsentrasi PM_1 pada penelitian terkait. Konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 menunjukkan hubungan berbanding lurus dengan kelembaban, tekanan, dan kecepatan angin sedangkan pada suhu menunjukkan hubungan berbanding terbalik. Sumber utama konsentrasi PM_{10} , $PM_{2.5}$, dan PM_1 di Pasar Talawi berasal dari aktivitas kendaraan seperti sepeda motor, mobil, truk dan aktivitas manusia seperti merokok.

Kata Kunci: Nanosampler, Pasar Talawi, Particulate Matter (PM), Ruang Publik



ABSTRACT

Talawi Market in Sawahlunto City is a public space serving as a shopping center and a site for various community activities, which can contribute to the generation of particulate matter (PM). This study aims to measure the concentrations of PM_{10} , $PM_{2.5}$, and PM_1 at Talawi Market and compare these values with air quality standards established in Appendix VII of Government Regulation No. 22 of 2021, as well as with relevant studies. Additionally, this research seeks to identify the relationships between PM_{10} , $PM_{2.5}$, and PM_1 concentrations and meteorological conditions, as well as the sources influencing these concentrations at Talawi Market. Sampling for PM_{10} , $PM_{2.5}$, and PM_1 concentrations was conducted on Tuesdays and Saturdays using a Nanosampler device over a 24-hour measurement period. Meteorological conditions were recorded every 10 minutes during sampling. Measurement results showed that on Tuesday, PM_{10} , $PM_{2.5}$, and PM_1 concentrations reached 48.31–51.57 $\mu\text{g}/\text{m}^3$, 34.52–46.04 $\mu\text{g}/\text{m}^3$, and 27.76–28.01 $\mu\text{g}/\text{m}^3$, respectively. On Saturday, the concentrations were lower, ranging from 20.68–25.22 $\mu\text{g}/\text{m}^3$, 18.93–19.91 $\mu\text{g}/\text{m}^3$, and 15.23–16.79 $\mu\text{g}/\text{m}^3$, respectively. While PM_{10} and $PM_{2.5}$ concentrations met the air quality standards, PM_1 concentrations were noted to be higher compared to values in related studies. The concentrations of PM_{10} , $PM_{2.5}$, and PM_1 showed a direct relationship with humidity, pressure, and wind speed, and an inverse relationship with temperature. The primary sources of PM_{10} , $PM_{2.5}$, and PM_1 concentrations at Talawi Market are attributed to vehicle activities such as motorcycles, cars, trucks, and human activities such as smoking.

Keywords: Nanosampler, Particulate Matter (PM), Public Spaces, Talawi Market

