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Annual observations of Air Quality using Cost-efficient Sensors in Cabo Verde

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Numerous Sources of Pollutants in Cabo Verde

Anthropogenic







https://core.ac.uk/download/pdf/38681085.pdf https://dtudo1pouco.com/bruma-seca-gera-troca-deacusacoes-entre-paicv-e-governo-em-cabo-verde/ https://expressodasilhas.cv/



Numerous Sources of Pollutants in Cabo Verde (Cont.)

Natural

Saharan Dust

DRUDO ROUCO



- Cabo Verde experiences frequent dust storms, with strong seasonal patterns
- Also have problems with respiratory illnesses

Objectives

- Evaluate Purple air device against Clarity device in a dusty environment (PM₁₀, PM_{2.5}) at Sal, Cabo Verde (CV);
- Compare PM against AOD in Sal;
- Compare PM at Praia and Sal;
- Scan time series of COVID-19 cases and mortality at Sal and Praia, CV (March 2020-July 2021);
- Examine weekly $PM_{2.5}$ concentrations and new COVID-19 cases at Praia and Sal.

Experiment: Sampling location sites vs Data







Praia

G Sal, Cabo Verde (16.7542 ° N, -22,9458 ° W) – INMG Praia, Cabo Verde (14.911585° N, 23.526135° W)

Daily Aeronet AOD located at Sal, Cabo Verde

Purple air devices (PA) devices and Clarity IO sensors are used in this work (Bi et al., 2020; Ardon-Dryer, 2021, Ojungo et al. 2021; Kiser et al. 2021)

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$PM_{2.5}$ and PM_{10} (Sal)



Ratio $PM_{2.5}$ and PM_{10} (Sal)



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PM_{2.5} and AOD (Sal)



PM_{2.5} and PM₁₀ (Sal and Praia)



PM_{2.5} reached ~ 120ug/m³ in Praia and PM₁₀ ~210ug/m³ in Sal during dust event in 2021 9

PM_{2.5} and PM₁₀ (Sal and Praia)

Dust concentrations are normally higher in winter and spring relative to the summer season with the dust is overhead in the Sal island



Covid-19 cases and deaths



winter and spring 2021

Covid-19 cases and PM_{2.5}



Conclusions

- Good air quality in Sal and in Praia (Cabo Verde), but not during dust event.
- Measured data from 2020-2021 data show that:
 - Praia (capital) has the highest PM_{2.5} concentrations followed by Sal;
 - monthly PM_{2.5} and PM₁₀ peaks are coherent but of a smaller value for Sal.
- Low cost-sensors can be used for Air quality measurements in Cabo Verde (10 islands), and real-time measurements could provide guidance to the public and decision-makers.



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