

ANEXOS E APÊNDICES

APÊNDICES

Systematic review guide diagram in ePPI reviewer

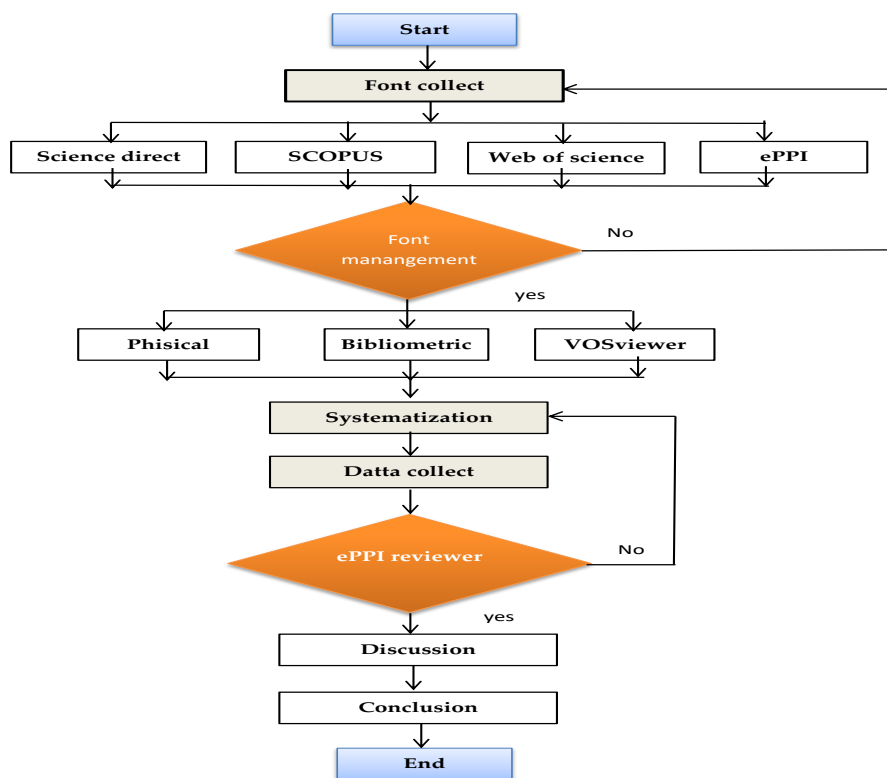


Figura A1: Desenho exploratório de recolha de dados.

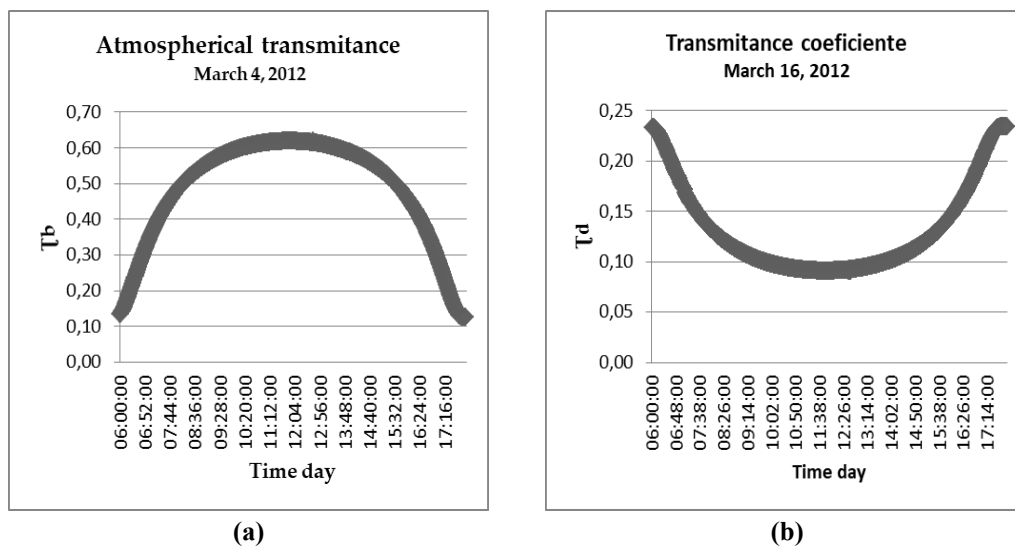


Figura A2: Comportamento da: (a) Transmissão atmosférica e (b) Coeficiente de transmissão.

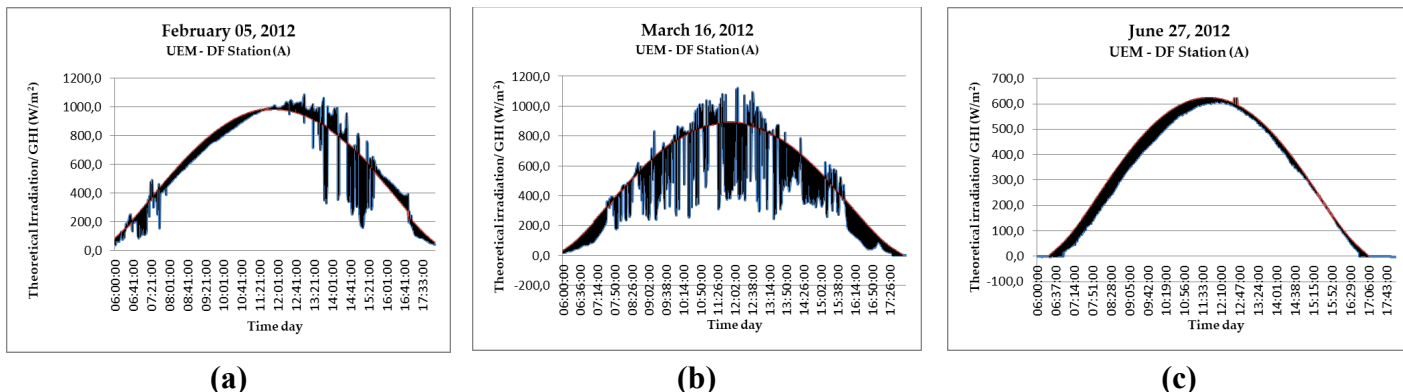


Figura A3: Irradiação teórica em céu limpo: (a) $\Delta t=1$ minuto no dia 5 de fevereiro de 2012 e (b) $\Delta t=10$ minutos no dia 14 de novembro de 2012 e (c) $\Delta t=10$ minutos no dia 30 de junho de 2012 .

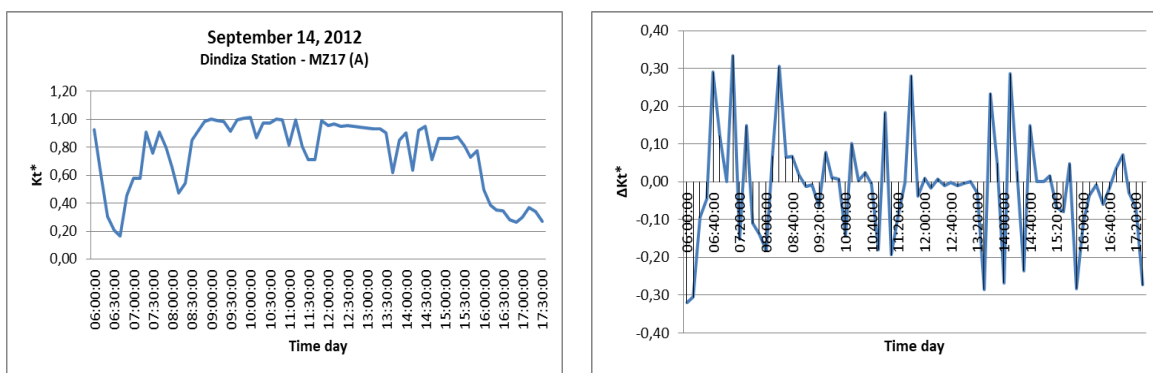
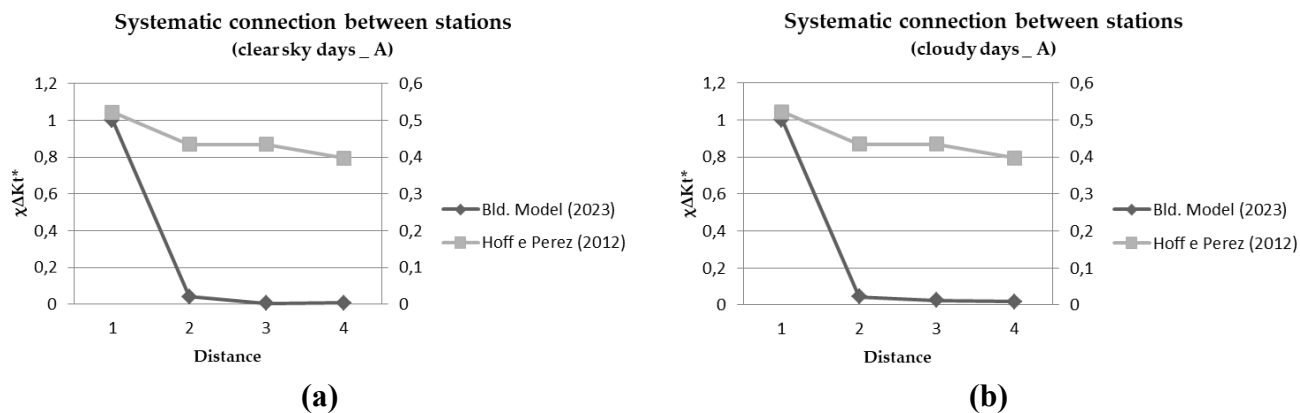
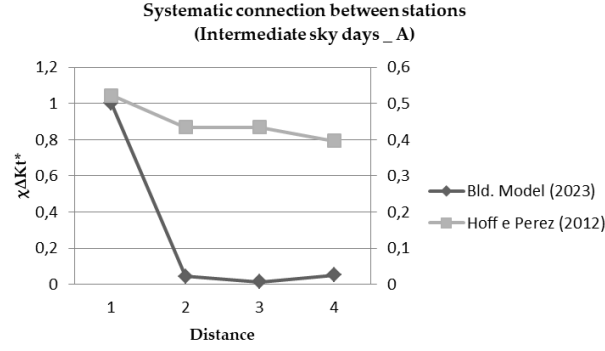


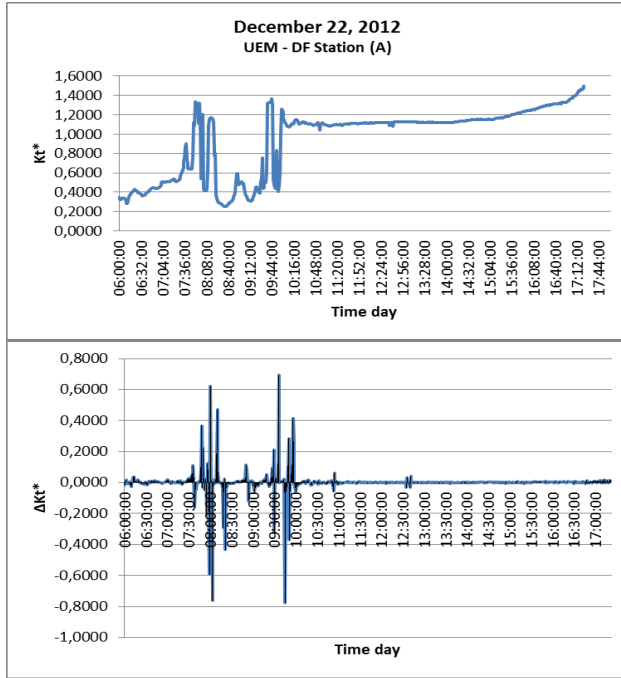
Figura A4: Distribuição de K_t^* e ΔK_t^* em função da hora do dia, para um intervalo de tempo de um minuto e uma amplitude de um dia, ao longo do dia 14 de setembro de 2012.



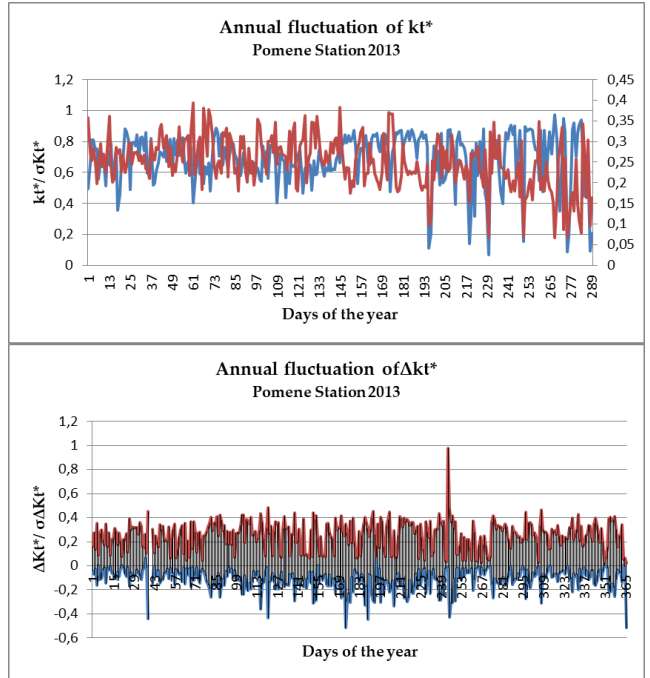


(c)

Figura A5: Coeficientes de correlação espacial de dois pontos na região centro-oeste de Moçambique para dias inaceitáveis do tipo: (a) céu limpo, (b) céu nublado e (c) céu intermédio.

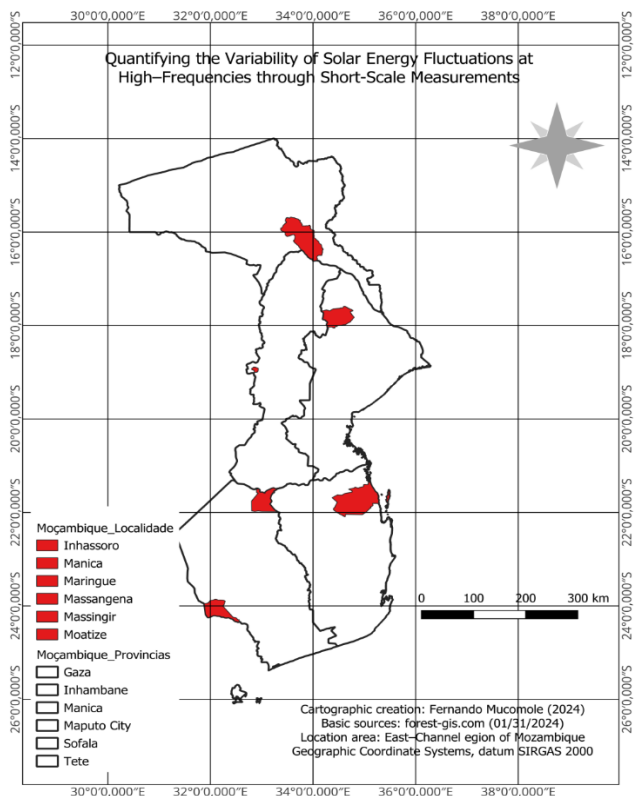


(a)

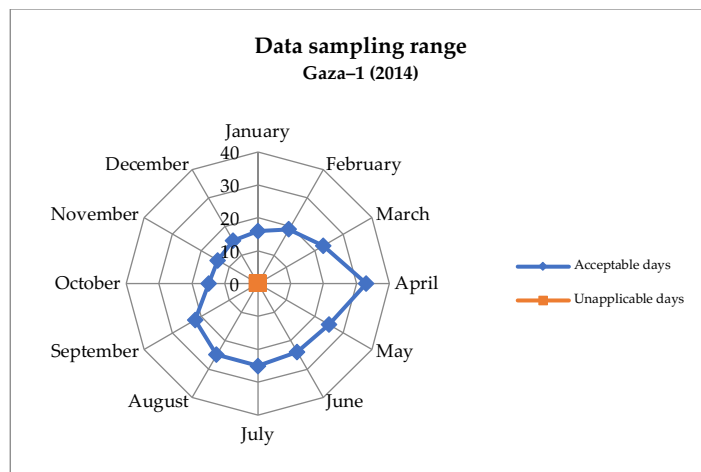


(b)

Figura A6: Distribuição de (a) K_t^* e ΔK_t^* em função da hora do dia, para: (a) Um intervalo de tempo de um minuto e uma amplitude de um dia (22 de dezembro de 2012); (b) um intervalo de tempo de um minuto e uma amplitude de um ano.

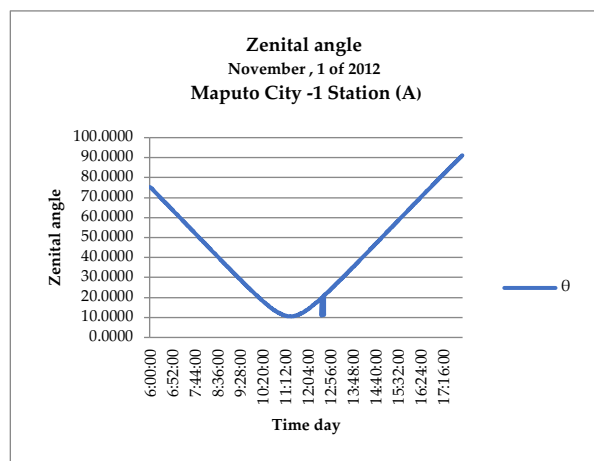


(a)

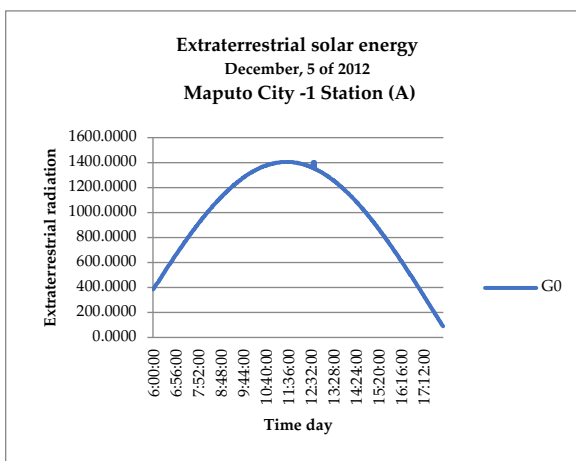


(b)

Figura A7: (a) Diagrama de acessibilidade à energia solar em termos de tipos de dias e Diagrama da estrutura de investigação de desenho estatístico, **(b)** Intervalo de dados de radiação solar global amostrados durante a campanha (exemplo da estação Gaza-1 em 2014) e **(b)** Escolha de datas na estação Barue-1 para o ano de 2014.

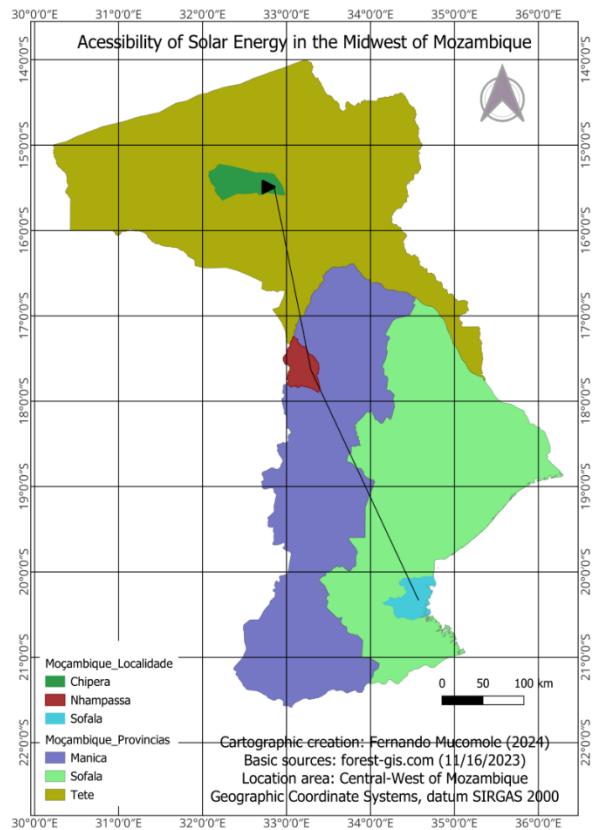


(a)

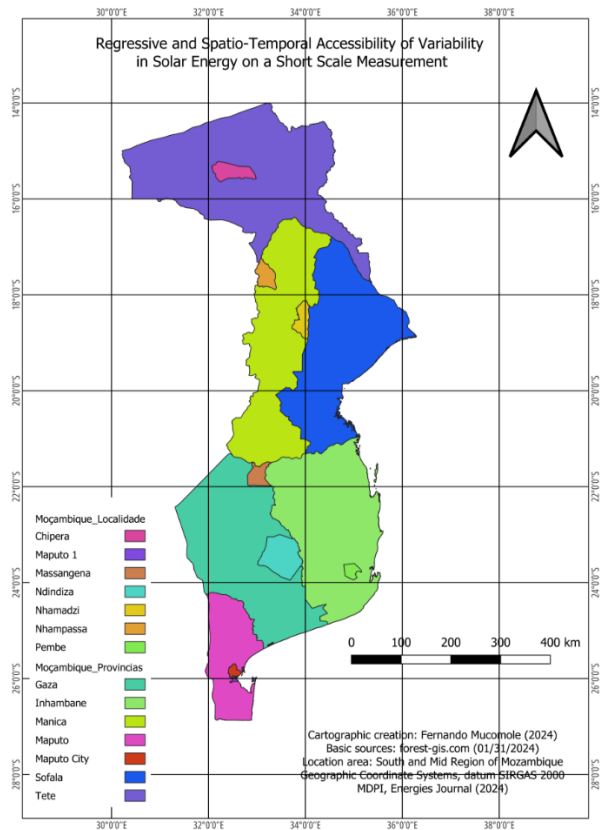


(b)

Figura A8: (a) Ângulo zenital (estação de Maputo-cidade: Ano 2012), **(b)** Exame dos padrões de radiação extraterrestre (estação de Maputo-cidade: Ano 2012).

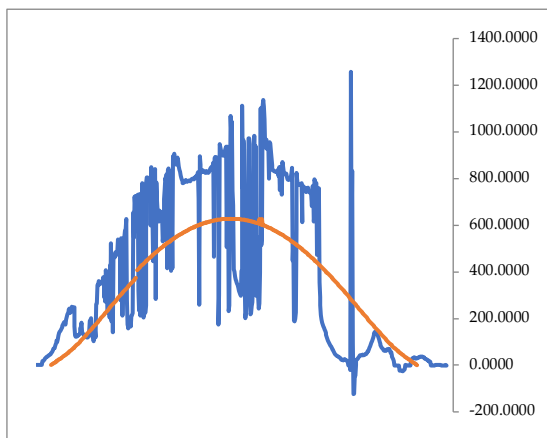


(a)

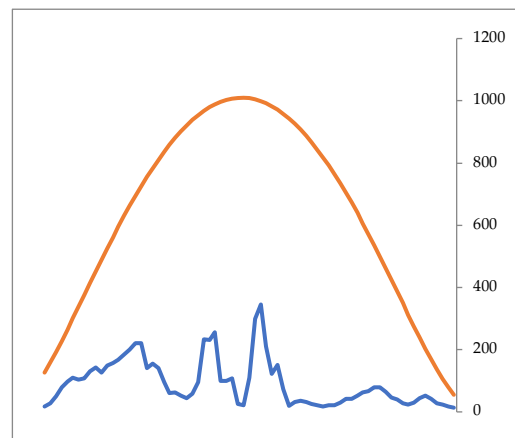


(b)

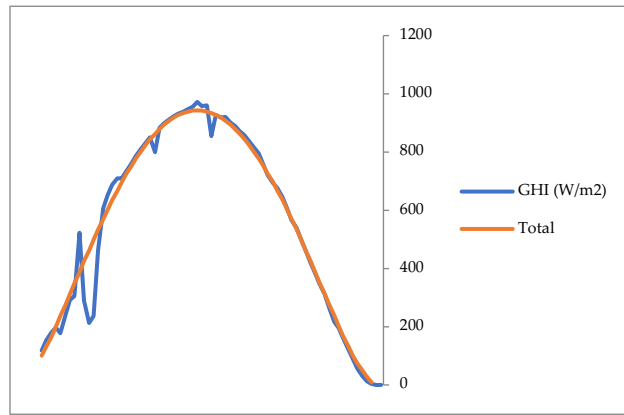
Figura A9: (a) Secção da área de estudo: Região Centro-Oeste de Moçambique Tamanho da amostra e **(b)** Secção da área de estudo: dimensão das regiões sul e centro da amostra de Moçambique.



(a)

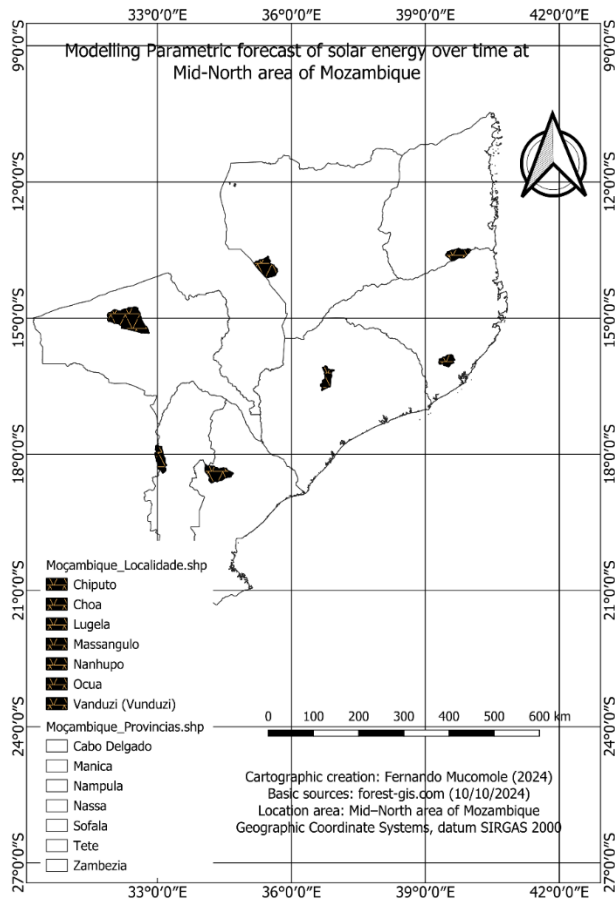


(b)

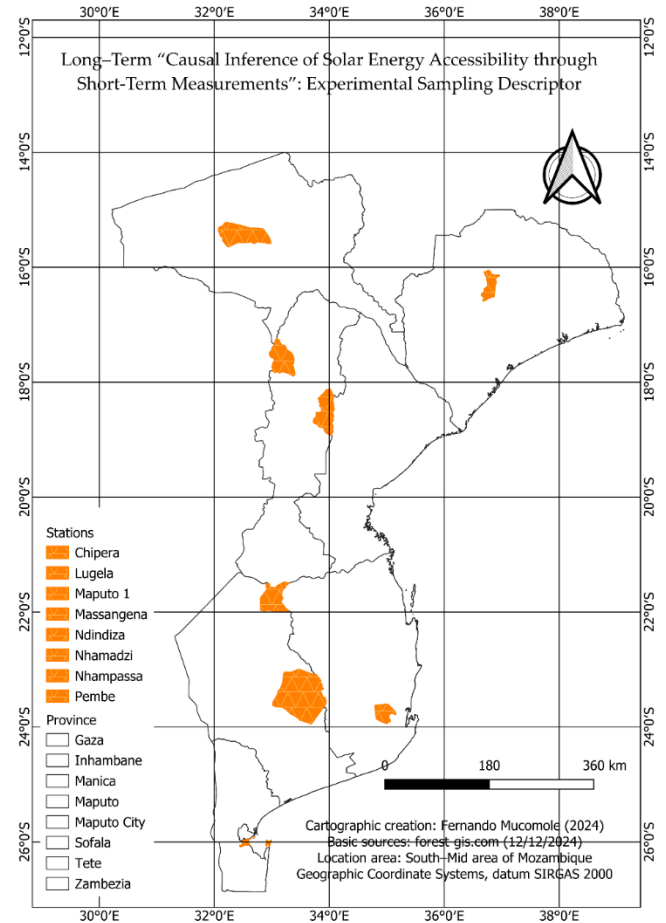


(c)

Figura A10: O contraste entre a radiação experimental e a radiação teórica está a ser examinado.



(a)



(b)

Figura A11: (a) Secção da área de estudo: região Centro-Norte de Moçambique Tamanho da amostra e (b) Área de estudo e recolha de dados.

Tabela A1: Localização dos postos de estudo.

ID	Estação	Província	Torre	Longitude (X)	Latitude (Y)
MZ11	MZ11_Nhangau	Sofala	FUNAE	35°2'18,72" E	19°43'46,64" S
MZ21	MZ21_Nhapassa	Manica	MceL	33°13'0,79" E	17°47'32,54" S
MZ06	MZ06_Maravia	Tete	FUNAE	31°40',3,3,7"E	14°58'28,07" S

onde MceL – significa Moçambique celular

Tabela A2: Quantificação da classificação dos tipos de dias

Classificação				
Mês	Claro	Nublado	Intermediário inferior	Intermediário superior
Abril	2	6	2	0
Maio	0	5	3	2
Junho	2	3	3	2
Julho	5	1	1	3
Agosto	3	0	3	4
Setembro	2	2	2	4
Outubro	1	3	2	4
Novembro	7	0	1	2
Dezembro	0	4	5	1
TOTAL	22	24	22	22

ANEXOS

Table A3: Assessment of spatio-temporal variability on a short measurement scale.

Type	Source	Data source	Interval	Contributions	Methods/ Models	Year	Location
<i>In sitio</i>	(Mucomole <i>et al.</i> , 2023)	GHI	1 –10 min.	Temporal variability in the South	Analytical	2023	Mozambique
	(R. Perez <i>et al.</i> , 2016)	GHI	0,01s	Spatial and Temporal Variability of GHI	Correlative	2016	USA
	(Stetz <i>et al.</i> , 2015)	GHI	1 Hour	The Impact of Solar on Germany's Energy	Analytical	2015	Germany
	(Suri <i>et al.</i> , 2007)	GHI	1 Hour	Solar electricity GHI prediction fluctuation	Analytical	2007	France
	(Hoff & Perez, 2010)	GHI	1, 2, 3, 4 Hours	Modeling PV fleet output variability	PV fleet	2010	USA
	(Elsinga, B. and van Sark, W., 2014)	GHI	1 min.	Urban rooftop PV systems &fluctuation	Correlative	2014	Netherlands
	(Calif <i>et al.</i> , 2013)	GHI	0,01 s	Intermittency of GHI in a tropical climate	Correlative	2013	France
	(Lave <i>et al.</i> , 2013)	GHI	20 s	Calibration of K_t^* as a function of distance	Correlative	2013	USA
	(Nwokolo <i>et al.</i> , 2022)	GHI	1 Hour	Methods/formulas of K_t for regions	Gumbel probabilistic	2022	Africa
	(Nwokolo <i>et al.</i> , 2023)	GHI	1 Hour	Impact of Climate Change on Solar PV	Physical models	2023	Africa
	(Almorox <i>et al.</i> , 2021)	GHI	1 Hour	Extraterrestrial/clear-sky radiation	Analytical	2021	Spain
	(Klima & Apt, 2015)	GHI	0,01 s	Geographic solar PV smoothing	Correlative	2015	USA
	(Lohmann <i>et al.</i> , 2016)	GHI	15 min., 1 s, 0,01s	Day type behavior	Correlative	2016	Germany
	(Lohmann & Monahan, 2018)	GHI	15 min., 1 s, 0,01s	Quantifying GHI in the short term	Correlative	2018	Germany

(Lohmann & Monahan, 2017)	GHI	15 min., 1 s, 0,01s	Quantification of the intermediate-sky	Correlative	2017	Germany
(Fernando, D. M. Z, 2018)	GHI	1–24 Hours	Mozambique K_t behavior	Analytical	2018	Brazil
(de Souza <i>et al.</i> , 2019)	GHI	1 Hour	GHI Vale do Rio Doce estimate	Analytical	2019	Brasil
(Lonij V. P. <i>et al.</i> , 2013)	GHI	1–24 Hours	Forecasts of solar power production	Correlative	2013	Canada
(Luoma, J. <i>et al.</i> , 2012)	GHI	0,01 s	K_t evaluation and correlation	Correlative	2012	Canada
(Madhavan, B. L. <i>et al.</i> , 2016)	GHI	0,01 s	Observe small-scale cloud inhomogeneity	Correlative	2016	Mexico
(Marcos <i>et al.</i> , 2011)	GHI	1 s	Power fluctuations: the PV plant/ filter	Correlative	2022	Spain
(Mills, 2011)	GHI	1 min.	Variability GHI Wide-Area Geographic	Correlative	2011	USA
(Inman, R. H. <i>et al.</i> , 2013)	GHI	0,01 s; 1 min.	Renewable energy integration	Forecasting	2013	UK
(Hinkelman, L. M., 2011)	GHI	1 min.	Characteristics of GHI Variability	Correlative	2011	USA
(Van Haaren <i>et al.</i> , 2014)	GHI	1 min.	Assessment of short-term PV variability	Empirical	2012	USA
(Bailek <i>et al.</i> , 2020)	GHI	1 min.	New model of GHI in Algeria	New prediction	2020	Algeria
(Guermoui M. <i>et al.</i> , 2022)	GHI	1 s, 1 min.	New temperature-based predicting GHI	Vector regression	2022	France
(Rodriguez-Abreo, O., <i>et al.</i> , 20221)	GHI	1 min.	Climate classification by neural irradiance	Irradiance models	2022	Mexico
(Takilalte, A., <i>et al.</i> , 2020)	GHI	5 min.	Estimate GHI data on tilted from horizontal	New approach	2020	Algeria
(Toufik Arrif, <i>et al.</i> , 2022)	GHI	1–24 Hours	Potential assessment of GHI	TVF-EMD	2022	Algeria
(Obiwulu <i>et al.</i> , 2022)	GHI	1 Hour	Modeling optimal tilt angle GHI of PV	Modeling correlate	2022	Africa
(Hassan <i>et al.</i> , 2022)	GHI	1 Hour	Forecasting of PV power production	Non-linear regressive	2022	Egypt
(Y. Zhang <i>et al.</i> , 2018)	GHI	1 min.	Validation of GFS day-ahead solar China	Correlative	2018	China
(Arias-Castro <i>et al.</i> , 2014)	GHI	1 min.	Anisotropic solar ramp rate correlations	Poisson	2014	USA
(Aryaputera <i>et al.</i> , 2015)	GHI	50 s	Very short-term irradiance forecasting	Kriking	2015	Singapore
(Assuno, H. F., <i>et al.</i> , 2003)	GHI	10 min.	Frequency of 5 min. GHI indexes by Beta.	Probabilities	2003	Brasil
(C. Yang & Xie, 2012)	GHI	1 min.	A ARX-based multi-scale PV forecast	ARX	2012	USA
(D. Yang <i>et al.</i> , 2017)	GHI	5 min.	Forecasting by covariance structures	Kriking	2014	Singapore
(Wilcox <i>et al.</i> , 2010)	GHI	1 Hour	Variability of the GHI in the united states.	SUNY model	2010	USA
(Vijayakumar, 2004)	GHI	1, 3 min., 1 Hour	Assessment of GHI in solar energy systems	HDKR model	2004	USA
(Tovar <i>et al.</i> , 2001)	GHI	1 min.	Dependence of one-minute GHI PDF	HELIOSAT and GISTEL	2011	Spain
(Roversi, K., & Rampinelli, G. A., 2020)	GHI	1–24 Hours	Grid connected inverter analysis	On grid	2020	Brazil
(Sha & Aiello, 2020)	GHI	1 min.	Decentralised, Energy Exchange Smart Grid	Monte Carlo method	2018	Netherlands
(Keeratimahat <i>et al.</i> , 2017)	GHI	5 min.	short-term variability, renewables penetrate	Analytical	2017	Australia
(Koudouris <i>et al.</i> , 2018)	GHI	1 Hour	GHI process for renewable manage	Stochastic	2018	Greece
(Kreuwel <i>et al.</i> , 2020)	GHI	15 min.	High frequency PV energy fluctuations	Analytical	2020	Netherlands
(Habte <i>et al.</i> , 2020)	GHI	1 Hour	Variability over America (1998–2017)	Correlative	2020	USA
(Haegel <i>et al.</i> , 2017)	GHI	1 Hour	Terawatt-scale photovoltaics	Correlative	2017	USA

(Hoff & Perez, 2010)	GHI	20 s	Quantifying PV power Output Variability.	Novel	2010	USA
(Ohtake <i>et al.</i> , 2013)	GHI	1 Hour	Accuracy of the solar irradiance in Japan	Analytical	2013	Japan
(M. J. R. Perez & Fthenakis, 2015)	GHI	>1Hour	On the spatial decorrelation	Correlative	2015	USA
(Mills, 2011)	GHI	1 min.	PV variability for Integrate Electric	Correlative	2011	USA
(Monjoly <i>et al.</i> , 2019)	GHI	1 min.	Forecast Horizon and Solar Variability	MHFM	2019	France
(Nam, S., & Hur, J., 2019)	GHI	1 min.	A hybrid spatio-temporal forecasting	Physical	2019	Korea
(Come Zebra <i>et al.</i> , 2021)	GHI	1 Hour	Renewable Energy Tariff in Mozambique	Analytical	2021	Mozambique
(Dambreville, R. <i>et al.</i> , 2014)	GHI	15 min.	Forecasting GHI by autoregressive model	Autoregressive	2014	France
(Dantas, 2018)	GHI	1 Hour	Sizing a PV system	Physical	2018	Brazil
(Keeratimahat <i>et al.</i> , 2017)	GHI	5 min.	Variability of utility-scale PV Australian	Correlative	2017	Australia
(Hummon <i>et al.</i> , 2012)	GHI	>1 Hour	Sub-Hour Solar Data for Power System	Static Spatial	2012	USA
(Ibanez <i>et al.</i> , 2002)	GHI	1 Hour	Frequency Hourly and Daily K_t	Correlational	2022	Madison
(Lave <i>et al.</i> , 2012)	GHI	0.01s, 1 min.	High-frequency GHI fluctuations geo	Correlational	2012	India
(Lefèvre <i>et al.</i> , 2013)	GHI	1 min.	Estimating ground GHI in clear-sky	New model	2013	France
(Litjens <i>et al.</i> , 2018)	GHI	1 min.	Assessment of residential PV power	Analytical	2018	Netherlands
(Barry <i>et al.</i> , 2017)	GHI	5 s	Power fluctuations in solar-storage clusters	Correlative	2017	Germany
(Lan, H. <i>et al.</i> , 2018)	GHI	1 Hour	Forecasting GHI along a navigation route	Correlative	2018	China
(R. Perez <i>et al.</i> , 2018)	GHI	1 s	Solar Resource Variability	Different methods	2018	USA
(R. Perez, Rábago <i>et al.</i> , 2016)	GHI	0,01 s; 1s	High PV penetration for effective electricity	Grig, correlate	2016	USA
(Zhou <i>et al.</i> , 2019)	GHI	1 Hour	Assessment of the zero energy potential	Correlative	2019	USA
(Shakirov, 2019)	GHI and wind	1 min.	Wind and solar power variability	Anisotropic model	2019	Russia
(Lucaciu <i>et al.</i> , 2016)	GHI and irradiative	0,01s, 1 min.	Variability based on the clearness Index	Correlative	2016	Romania
(Y. Liu <i>et al.</i> , 2013)	GHI and wind	1 Hour	China's solar and wind in a wide area	Correlational	2013	China
(Ciampi <i>et al.</i> , 2013)	GHI and Thermal	1 min.	Energy efficiency in buildings: for thermal	Thermal	2013	Netherlands
(Jerez <i>et al.</i> , 2019)	GHI and wind	1 Hour	Future temporal variability PV Europe	Analytical	2019	Spain
(Gueymard & Wilcox, 2011)	GHI and DNI	1 Hour	Variability in direct irradiance (Sahara)	Correlative	2010	USA
(Qiu, R. <i>et al.</i> , 2022)	GHI hist.	1 min.	Boosting model predicting daily GHI	Boosting	2022	China
(Lozano <i>et al.</i> , 2022)	GHI and DNI	1 Hour	Analysis of cloud effects Mediterranean	Analytical	2022	Spain
(Belúcio, L. P. <i>et al.</i> , 2022)	Insolation	1 min.	GHI of Heatstroke	Estimative	2014	Brasil
(Hassan <i>et al.</i> , 2022)	PV systems	1 min.	Energy affected by environmental factors	Physical models	2022	Egypt
(Yordanov, G. <i>et al.</i> , 2013)	Cloud speed	15 min.	Temporal cloud-enhanced sunlight	Clod enhanced	2013	Bulgaria
(Uti, M. N. <i>et al.</i> , 2023)	Ocean speed	5 min.	Ocean renewable energy	K-means	2023	Malaysia
(Lave & Kleissl, 2013)	Cloud speed	1 min.	Impact cloud speed solar variability	WVM	2013	USA
(Gallego, C. <i>et al.</i> , 2013)	Wind power	0,1 s, 1 min.	large wind power ramp characterisation	WVM based	2013	USA
(Charabi & Gastli, 2012)	Solar energy	1 Hour	Assessment of dust risk by proxy data.	MISR	2012	Oman
(Mazumdar <i>et al.</i> , 2014)	PV power	0,01 s	Analysis of utility-scale solar PV power	Empirical model	2014	India
(Perpiñán & Lorenzo, 2011)	PV output	1 min.	Variability of GHI, PV power time vs. wavelet	WVM	2011	Spain

	(Rapti, 2000)	Climate	1 Hour	Atmospheric climatic turbidity, transparency	Atmospherical	2010	Greece
	(Salmanoğlu & ÇetiN, 2022)	Wind	1–24 Hours	Harvest wind-Solar PV for Production	Wind	2022	Harvest
	(Anenberg <i>et al.</i> , 2017)	Air pollution	1 Hour	Air pollution–related in Mozambique	Analytical	2017	Mozambique
	(Obiwulu <i>et al.</i> , 2020)	PV datta	1 Hour	Modeling of back temperature by PV	Temperature model	2020	Africa
	(Neggers <i>et al.</i> , 2003)	Clouds speed	1 min.	Size cumulus cloud populations	large-eddy SIM.	2003	USA
	(Xia <i>et al.</i> , 2023)	GHI	1 Hour	Non–iterative decentralization in multi-micro grid systems	Non–iterative decentralized	2023	China
	(Di Fonzo & Girolimetto, 2023)	PV power	1 Hour	Description of solar forecast rate reconciliation	NWP	2023	Italy
	(Jain <i>et al.</i> , 2023)	GHI, PV power	1 Hour	System planning, variability and operational constraints	Different RES	2023	India
	(Z. Liu <i>et al.</i> , 2013)	PV power	1 Hour	Spatial and temporal assessment of the PV potential of urban buildings	anisotropic sky diffuse	2023	China
	(Wu <i>et al.</i> , 2023)	PV power	1 Hour	Analysis of energy consumption at various scales	Different methods	2023	China
	(Mol <i>et al.</i> , 2023)	GHI, images	1 Hour	Observation of the variability of solar irradiation with cloud	Large eddy	2023	Netherlands
	(Zheng <i>et al.</i> , 2023)	PV, thermal, wind	1 Hour	Power generation from multiple hybrid sources	Auto –Regression	2023	China
	(Shen <i>et al.</i> , 2023)	GHI, thermal	1 Hour	Spatiotemporal analysis of surface energy change and heating	Long–wave	2023	China
	(Kong <i>et al.</i> , 2023)	GHI, thermal	1 Hour	solar radiation for space heating	Convolutional network	2023	China
	(Sørensen <i>et al.</i> , 2023)	GHI	1 Hour	Multivariate wind and solar power forecast	State–of–the art	2023	Denmark
	(Xu <i>et al.</i> , 2023)	GHI	1 Hour	Environmental regulation	GTWR	2023	China
	(S. Zhang & Yan, 2022)	GHI	1 Hour	State representation and identification for the structure of cavitation flow	CFD	2023	China
	(M. Yan <i>et al.</i> , 2020)	GHI	1 Hour	Optimization of the energy distribution network between multimicrogrids	MISOCP	2023	China
	(Alharkan <i>et al.</i> , 2023)	Power energy	1 Hour	Solar energy using architecture	CNN, LSTM, DSCLANet	2023	Saudi Arabia
	(W.-H. Chen <i>et al.</i> , 2022)	GHI and PV	20 s, 1min.	PV power by NARX, Density Peak e cluster	Novel	2022	China
Satellite	(Vindel <i>et al.</i> , 2020)	GHI	1 Hour	Variability analysis of the GHI intertropical	REST2 model	2019	Spain
	(Tapia <i>et al.</i> , 2022)	GHI	1 Hour	Variability of GHI in Ecuador	SFDA	2022	Ecuador
	(Zhu <i>et al.</i> , 2019)	Cloud	1 Hour	Estimating sunshine duration cloud amount	New Physical model	2020	China
	(Q., & Xu, J., 2019)	Cloud	1 Hour	Estimating Sunshine from a Geostationary	Correlative	2019	China
	(R. Perez <i>et al.</i> , 2012)	GHI	20s, 15 min.	Short-term irradiance variability estimation	Correlative	2012	USA
	(Lorenzo, 2017)	GHI	1 min., 1 Hour	Forecasting network, satellite imagery	Interpolation	2017	USA
	(Hoff & Perez, 2010)	Insolation	0,01s; 1 s	Changes K_t two locations/ distance	Correlative	2010	USA
	(Hoff & Perez, 2011)	Insolation	1 Hour	PV Power Output Variability	Correlative	2011	USA
	(Yu <i>et al.</i> , 2021)	Aerosol, water & vapors	1 Hour	Effects of aerosols and water vapors in China	SSR	2020	China
	(Miller <i>et al.</i> , 2018)	GHI	0,01 s; 1 min.	Short-term solar irradiance forecasting	Coupling	2021	Germany
	(Verbois <i>et al.</i> , 2023)	GHI	1 min.	Improvement of satellite–derived GHI	Extrapolation/ statist	2023	France
	(Amillo <i>et al.</i> , 2018)	GHI	1 Hour	Satellite high GHI in South Africa	Correlative	2018	South Africa
	(Ayet & Tandeo, 2018)	GHI	6 Hours	Now casting solar irradiance	NWP	2018	France

	(Kumar, 2021)	GHI	1 Hour	Variability using Meteosat satellite	Derived datasets	2021	India
	(Kühnert <i>et al.</i> , 2013)	GHI	1 Hour	German Satellite PV Forecasting	Analytical	2013	Germany
	(Yu <i>et al.</i> , 2021)	Aerosol, water & vapors	1 Hour	Effects of aerosols and water vapor in China	SSR	2020	China
	(Alharkan <i>et al.</i> , 2023)	GHI	1 min.	Improvement of satellite-derived GHI	Extrapolation/statist	2023	France
	(Gutiérrez, C <i>et al.</i> , 2017)	GHI	1 Hour	A multi-step PV production variability	Multi-Correlational	2017	Spain

where: WVM – Wavelet variability model; NWM – Numerical weather model; NWP – Numerical Weather Prediction; HDKR – Hay, Davies, Klucher and Reindl model; MHFM – Multiscale hybrid forecast model; USA – United States of America; UK – United Kingdom; RES – Renewable Energy Sources; GTWR – Geographically and Temporally Weighted Regression; CFD – Computational Fluid Dynamics; MISOCP – mixed-integer second-order cone programming; CNN – convolutional neural network; LSTM – long short-term memory and DSCLANet – network followed by a self-attention mechanism network.

2.3. Especificações de cada ficheiro

De exemplo Os ficheiros “csv” intitulados “Chiputo_MZ06_PF”, “Vanduzi_1_MZ11_PF”, “Choa_MZ21_PF”, “Nanhupo_1_MZ24_PF”, “Nanhupo_2_MZ24_PF”, “Massagena_1_MZ25_PF” Z25_PF ”e“ Ocuca_MZ03_PF ”são referentes a amostras de dados estimados medidos e de parâmetros recolhidos em Chiputo na província de Tete, Vanduzi–1 na província de Sofala, Choa–1 e Choa–2 na província de Manica, Nanhupo–1 e Nanhupo–2 na província de Nampula, Massangena–1 e Massangena–2 na província de Niassa e Ocuca na província de Cabo-Delgado.

Em cada ficheiro, a coluna A sob a escritura “Ano” refere-se ao ano dos exames médicos no estado, a coluna B sob a escritura “mês” refere-se ao mesmo registo dos exames médicos, a coluna C sob a escritura “Data” refere-se ao dia do registo médico, a coluna D sob a escritura “data” refere-se ao dia acumulativo do registo médico, a coluna e sob a escritura “GHI” refere-se à sondagem global no diário de comunicação social relacionado com o médico registado em intervalos de 1 a 10 minutos, a coluna F escritura “ID” refere-se à identificação atribuída pelo investigador ao posto de medicamentos, a coluna G sob a escritura “Estação” refere-se ao nome do posto de medicamentos, a coluna H sob a escritura “Província” refere-se à província de localização do posto de medições, a coluna I sob a escritura “Torre” refere-se ao nome da torre em que ocorreu a queda do medicamento (proprietário da torre), a coluna J sob a escritura “Código” refere-se ao código do proprietário da torre no país, a coluna K sob a escritura “Longo -se à longitude do local de medição, a coluna L sob a escritura “Lat. (Y) refers to the latitude of the medical site, the column M under scripture “altitude” refers to altitude to the level of the sea of the measurement location, the column N under scripture “ WV_AOT(675_nm) ”refers the exact wavelength of optical aerosol thickness (675 nm) in nanometers, the column O under deed “W V_AOT (440_NM)” refers to the exact

wave comparison of aerosol optical thickness (440 nm) in nanometers, column P under deed “AOT(675_nm)” refers to the optical spot of solar energy in the 675 nm wave composts, the Q column “AOT(440_nm)” refers to solar energy optics feature in the 440 nm wave compliances, column R under deed “PW(cm)” refers to the measured precipitating water, the S column S “Pre(mbars)” refers to Mili Bars, colu96mn T under Scripture “O3(cm)” refers to the thickness of the ozone layer concentration, the column U under deed “N(cm)” refers to NO2 and other ed gases, finally the column V under deed “temperature_(K)” refers to local temperature.

Table A4. Solar radiation and atmospheric parameters.

Station	GHI (W/m2)	Longitude (°)	Latitude (°)	AOT (675 nm)	AOT (440 nm)	Agua precipitáv el (cm)	Pressão (mbars)	Ozone (cm)	NO ₂ (cm)	Temperatu ra (K)
Ocuca	351.13	39.39	-11.55	0.15	0.29	2.69	958.61	2.62	0.001 4	272.99
Chiputo	399.67	31.67	-14.97	0.14	0.30	2.13	1016.35	2.63	0.001 4	299.89
Vanduzi	477.19	35.04	-19.73	0.18	0.34	3.47	1010.30	2.83	0.001 8	308.26
Choa-1	355.49	33.24	-17.79	0.14	0.30	2.13	1016.08	2.63	0.001 4	299.96
Choa-2	354.66	33.24	-17.79	0.14	0.30	2.13	1016.08	2.63	0.001 4	299.96
Nanhupo-1	352.64	39.51	-15.97	0.15	0.29	2.59	958.43	2.61	0.001 5	272.99
Nanhupo-2	349.65	39.51	-15.97	0.15	0.29	2.59	958.44	2.61	0.001 5	272.99
Massangulo- 1	345.91	35.44	-13.91	0.15	0.30	2.59	958.42	2.61	0.001 5	272.99
Massangulo- 2	430.09	35.44	-13.91	0.15	0.30	2.59	958.42	2.61	0.001 5	272.99
Lugela	367.99	36.71	-16.47	0.14	0.29	2.60	958.35	2.61	0.001 4	272.99