

**Typical Climatic
Data for
Selected Radiation Stations**
(The Data Period Covered : 1986-2000)

Solar Radiation Hand Book (2008)

A joint Project of
Solar Energy Centre, MNRE
Indian Metrological Department

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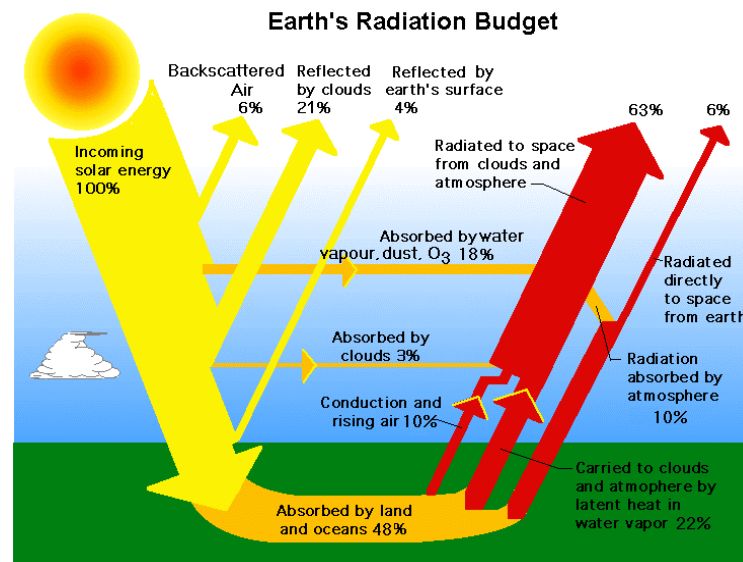
Basics of Solar Radiation

- Solar radiation is the radiant energy emitted by the Sun in the form of electromagnetic waves.
- The sun emits vast amount of radiant energy.
- The earth intercepts only a fraction of it.
- It is essential to drive directly or indirectly all biological and physical processes on the Earth.
- The earth is the only planet in the solar system, which receives an optimum amount of solar radiation that makes life sustainable on it.
- Solar spectrum resembles to that of a black body at approximately 5800K.
- 98% of the total emitted energy lies in the spectrum ranges from 250nm to 3000nm. About half of the radiation is in the visible short-wave part of the electromagnetic spectrum. The other half is mostly in the near-infrared part, with some in the ultraviolet part of the spectrum
- Solar radiation having wavelength less than 0.286nm (called ultraviolet) is absorbed by ozone layer in stratosphere. The ultraviolet radiation not absorbed by the atmosphere is responsible for the change of color in skin pigments.
- The solar radiation, that traverse the atmosphere further, is subjected to scattering, reflection and absorption by air molecules, aerosols and clouds.
- The **radiation budget** represents the balance between incoming energy from the Sun and outgoing thermal (longwave) and reflected (shortwave) energy from the Earth. Globally, the budget is balanced. Otherwise the temperature would rise constantly. Locally, the budget is not balanced. Tropical areas get more than they release, while higher latitudes of the winter hemisphere release more than they receive.

Solar Radiation Budget

The radiation from the Sun travels in the space as electromagnetic wave. Above the earth's atmosphere, sunlight carries 1367 watts of power per square meter. This is known as solar constant. We define solar constant as the amount of solar radiation received outside the earth's atmosphere on a unit area perpendicular to the rays of the sun, at the mean distance of the earth from the sun.

The Earth receives 1.8×10^{17} W of incoming solar radiation continuously at top of its atmosphere. But only half of it reaches the earth's surface. Factors like absorption, scattering and reflection of light during its passage through the atmosphere are responsible for reduction of the amount of solar radiation available on the earth's surface (Fig.1). Solar energy is, by nature, a low-density energy source.



The **solar constant** is the amount of incoming solar radiation per unit area, measured on the outer surface of Earth's atmosphere, in a plane perpendicular to the rays

The Sun - Main features

• Radiant energy output	: 3.94×10^{26} W
• Radius of the Sun	: 6.960×10^8 m
• Mean sun–earth distance	: 149.6×10^6 Km
• Radius of the Earth	: 6.378×10^6 m
• Energy intercepted by Earth	: 1.8×10^{17} W
• Solar constant	: 1367 Wm ⁻²

The Solar Spectrum

When solar radiation is passed through a prism, it gets split into several colours. This is the visible portion of the solar radiation. In fact, the radiation from the sun extends into the ultraviolet and infrared spectral regions as well (Fig.2). Solar spectrum resembles to that of a black body at approximately 5800K. 98% of the total emitted energy lies in the spectrum ranges from 250nm to 3000nm. About half of the radiant energy is in the visible short-wave part of the electromagnetic spectrum. The other half is mostly in the near-infrared part, with some in the ultraviolet part of the spectrum. Solar radiation having wavelength less than 0.286nm (called ultraviolet) is absorbed by ozone layer in stratosphere. The ultraviolet radiation not absorbed by the atmosphere is responsible for the change of color in skin pigments. The solar radiation that traverses the atmosphere further, is subjected to scattering, reflection and absorption by air molecules, aerosols and clouds.

Individual particles of light are called photons. An individual photon is considered to possess single wavelength depending on its energy content. The range of wavelengths in the solar spectrum is directly due to collection of photons of many different energies. The distribution of photons in a wide energy spectrum has a deciding role in the performance of many solar energy utilization devices.

Solar Radiation Spectrum

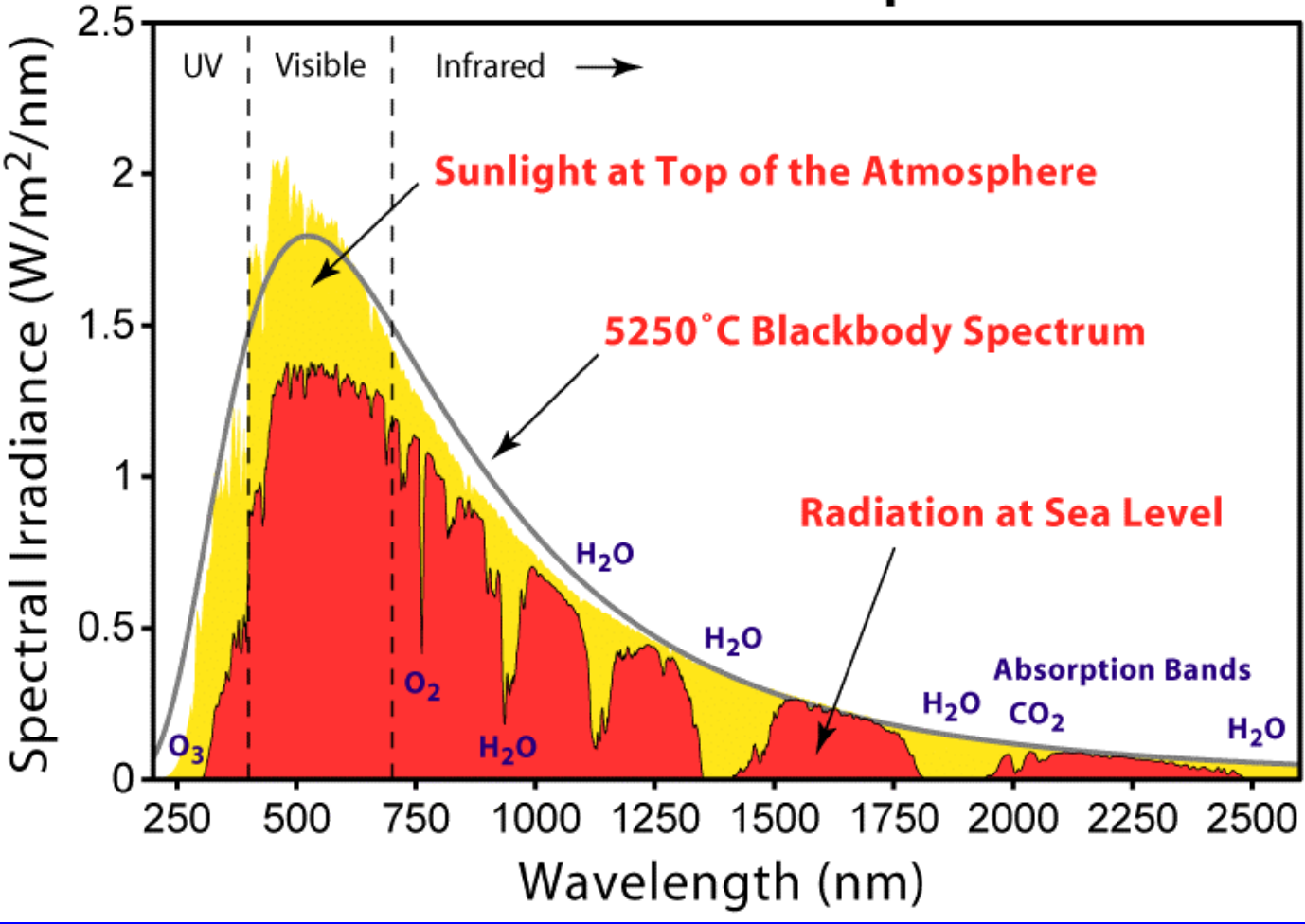


Fig.2 The solar spectrum

Radiation Measurements	
Parameter	Instruments used
<u>Short Wave (0.3μ - 4.0 μ)</u>	
Direct solar irradiance	Ångström and Thermoelectric Pyrheliometers
Global solar irradiance	Thermoelectric Pyranometer
Diffuse solar irradiance	Thermoelectric Pyranometer with shading ring
Reflected solar irradiance	Inverted Pyranometer
Solar spectral irradiance and turbidity	Sunphotometer
<u>Long Wave (4μ - 100 μ)</u>	
Net Terrestrial Radiation	Ångström Pyrgeometer
<u>Total (0.3μ - 100 μ)</u>	
Upward or downward Radiation	Pyradiometer
Net Radiation	Net Pyradiometer



Ångström Pyrheliometer



Thermoelectric Pyrheliometer on Tracker



Pyranometer



Ångström Pyrgeometer

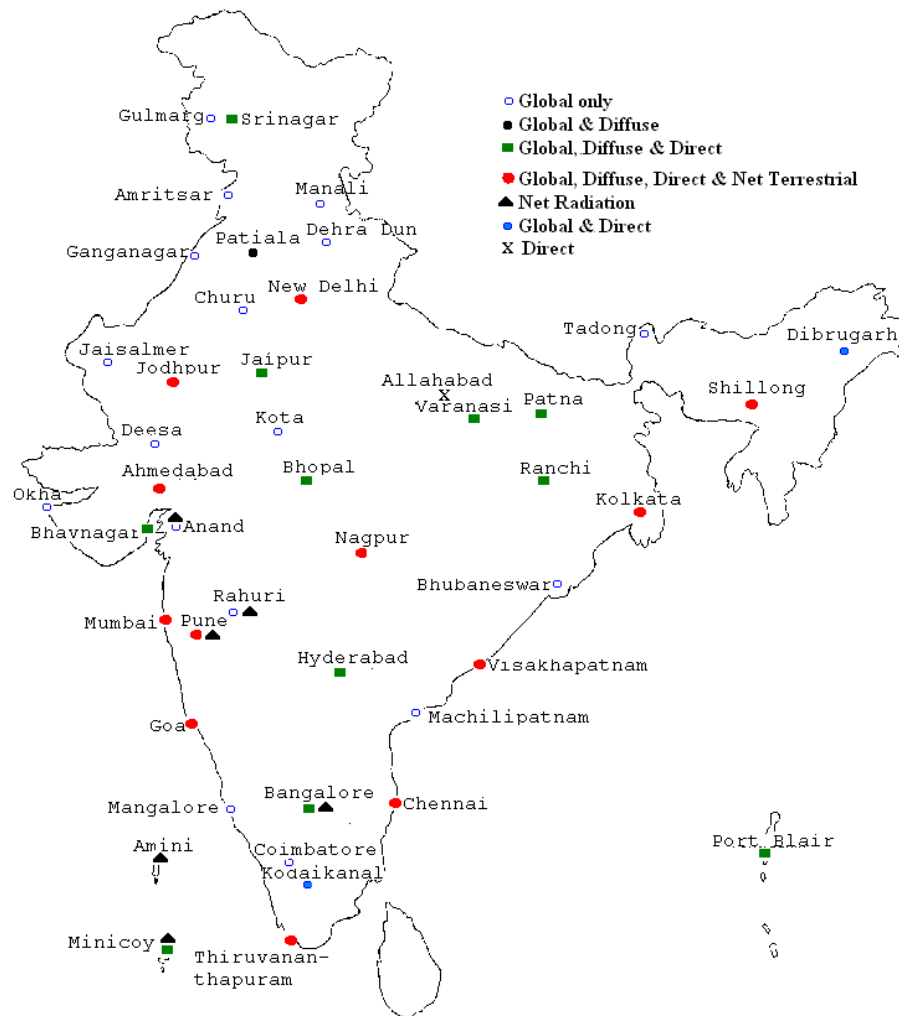


Net Pyrradiometer



Radiometer Sonde

Radiation Network: India Meteorological Department



RADIATION TERMINOLOGY

1. [Irradiance](#) (Wm^{-2}): Amount of radiant energy incident on a surface per unit area per unit time.
2. [Direct solar irradiance](#): Solar irradiance on a surface held perpendicular to sun rays and diffuse sky radiation obstructed.
3. [Global solar irradiance](#): Solar irradiance on a horizontal surface due to both direct sun rays and diffuse sky radiation.
4. [Diffuse solar irradiance](#): Solar irradiance on a horizontal surface due to sky radiation only.
5. [Reflected solar irradiance](#): Upward radiant exitance in the short wave range.
6. [Net terrestrial radiation](#): Upward radiant exitance minus downward irradiance in long wave range through a horizontal surface near earth surface
7. [Net total irradiance](#): Downward irradiance minus Upward radiant exitance in entire spectrum

Index of Station-wise Mean Hourly Air Temperature and Mean Sunshine Hours

S. No.	Station	Mean hourly air temperature	Mean sunshine hours
1	Srinagar	Table-1	Table-2
2	NewDelhi	Table-3	Table-4
3	Jodhpur	Table-5	Table-6
4	Jaipur	Table-7	Table-8
5	Varanasi	Table-9	
6	Patna	Table-10	
7	Shillong	Table-11	
8	Ahmedabad	Table-12	Table-13
9	Bhopal	Table-14	Table-15
10	Ranchi	Table-16	
11	Kolkata	Table-17	Table-18
12	Bhavnagar	Table-19	
13	Nagpur	Table-20	
14	Mumbai	Table-21	Table-22
15	Pune	Table-23	Table-24
16	Hyderabad	Table-25	Table-26
17	Visakhapatnam	Table-27	Table-28
18	Panjim	Table-29	Table-30
19	Chennai	Table-31	Table-32
20	Bangalore	Table-33	Table-34
21	PortBlair	Table-35	Table-36
22	Minicoy	Table-37	Table-38
23	Thiruvananthapuram	Table-39	Table-40

LAT- Local Area Time

IST – Indian Standard Time

Mean Monthly Global Solar Radiant Exposure (MJm⁻²day⁻¹) Over India

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Srinagar	4.77	9.77	14.25	18.24	20.25	22.26	20.16	18.75	18.22	13.89	9.24	6.99	15.40
NewDelhi	13.32	16.42	20.64	24.07	24.43	22.54	19.07	17.79	18.90	16.80	14.13	11.93	18.25
Jodhpur	15.53	18.20	21.76	24.24	25.10	23.58	19.67	19.51	21.06	19.11	16.17	14.84	19.97
Jaipur	15.30	18.02	22.00	25.50	26.11	23.94	18.48	17.60	19.62	18.17	15.40	13.47	19.42
Varanasi	12.91	17.15	20.92	23.12	23.03	20.87	15.67	17.29	16.35	17.16	14.47	12.15	17.68
Patna	13.01	17.00	20.94	22.86	22.66	20.27	15.72	16.71	16.39	16.73	14.71	11.87	17.25
Shillong	14.11	16.67	19.27	21.13	18.41	16.42	16.06	14.93	14.03	15.18	15.63	14.43	16.27
Ahmedabad	16.34	19.57	22.85	25.03	25.18	21.67	15.52	15.50	18.63	18.92	16.74	15.23	19.30
Bhopal	15.80	18.72	22.46	25.34	24.31	19.92	14.42	13.69	18.73	19.17	17.02	16.48	18.65
Ranchi	15.63	17.69	20.82	22.21	21.19	16.75	14.50	13.89	14.90	15.76	15.34	14.68	16.39
Kolkata	13.53	15.68	18.99	21.06	20.64	17.17	15.09	15.57	14.90	15.27	13.85	12.68	16.17
Bhavnagar	17.92	20.92	24.16	26.23	26.54	22.31	16.28	16.16	19.91	21.06	18.33	16.55	20.99
Nagpur	16.15	19.21	21.93	23.95	23.59	18.85	14.81	14.78	17.54	18.66	16.36	15.38	18.34
Mumbai	16.57	19.49	22.24	23.82	23.36	17.49	13.45	14.52	16.35	18.01	16.60	15.46	18.25
Pune	17.29	20.58	23.11	24.49	25.18	19.32	16.10	15.68	18.73	19.25	17.64	16.45	19.51
Hyderabad	19.64	22.03	24.22	24.87	23.87	20.13	18.50	17.56	19.77	18.67	18.07	17.96	20.34
Visakhapatnam	17.42	20.01	21.82	22.99	22.18	17.49	16.02	16.35	17.06	17.62	16.40	16.32	18.51
Panjim	19.88	22.40	23.55	24.22	23.64	16.67	14.78	15.86	19.40	19.53	19.16	18.61	20.00
Chennai	17.62	21.07	23.45	23.76	22.54	20.59	19.00	18.73	19.41	16.41	14.39	14.96	19.34
Bangalore	20.42	23.35	23.70	23.64	22.88	17.72	16.71	16.16	18.89	18.42	17.45	17.35	19.70
PortBlair	18.44	21.06	21.22	20.75	15.76	13.94	13.77	14.50	15.48	16.14	16.74	17.09	17.27
Minicoy	17.77	20.20	21.79	21.38	18.19	16.01	16.49	17.60	18.33	18.01	16.69	16.59	18.34
Thiruvananthapuram	19.93	22.05	23.40	21.38	19.61	17.38	17.84	19.00	20.53	18.17	16.56	18.07	19.45

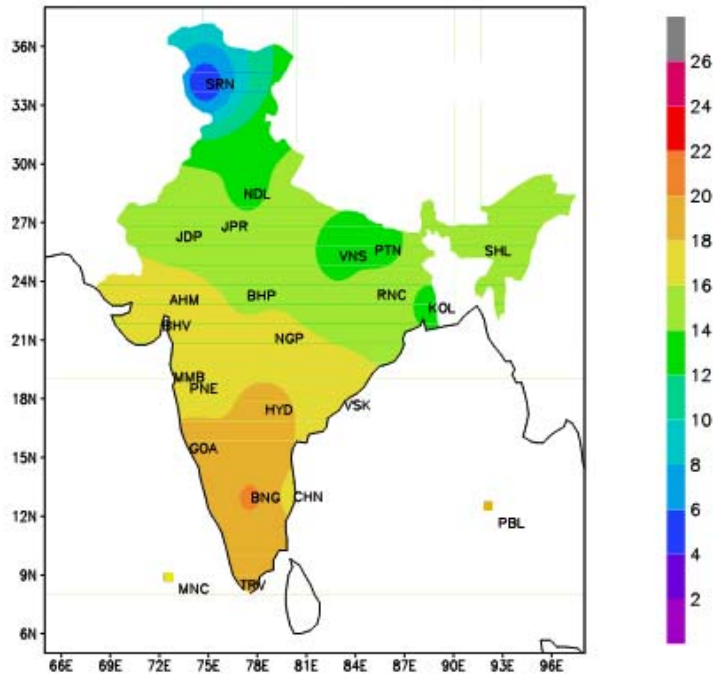


Fig 5.1 - Global solar radiant exposure in January - MJm⁻²

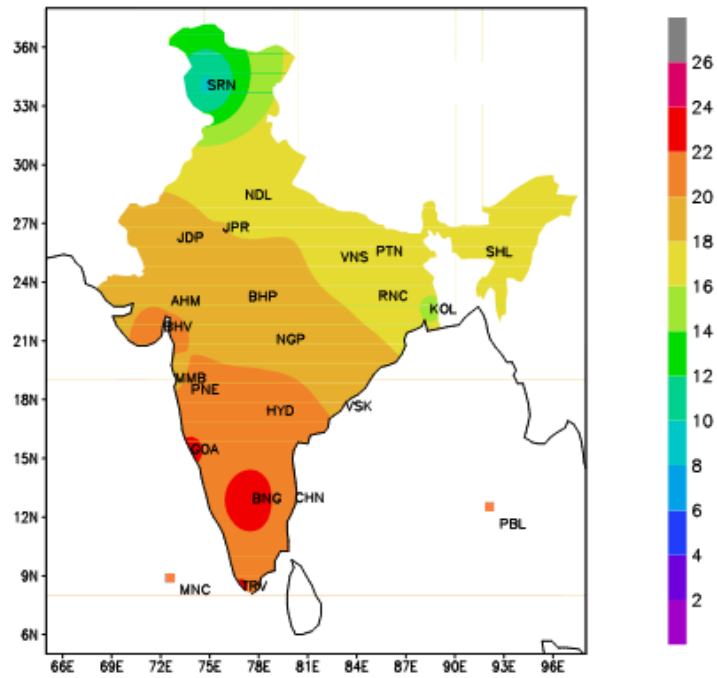


Fig 5.2 - Global solar radiant exposure in February - MJm⁻²

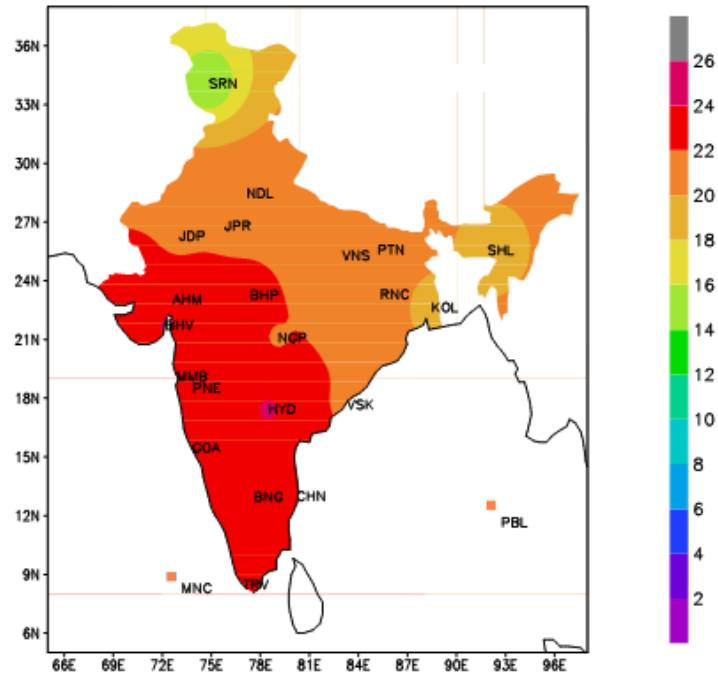


Fig 5.3 - Global solar radiant exposure in March - MJm⁻²

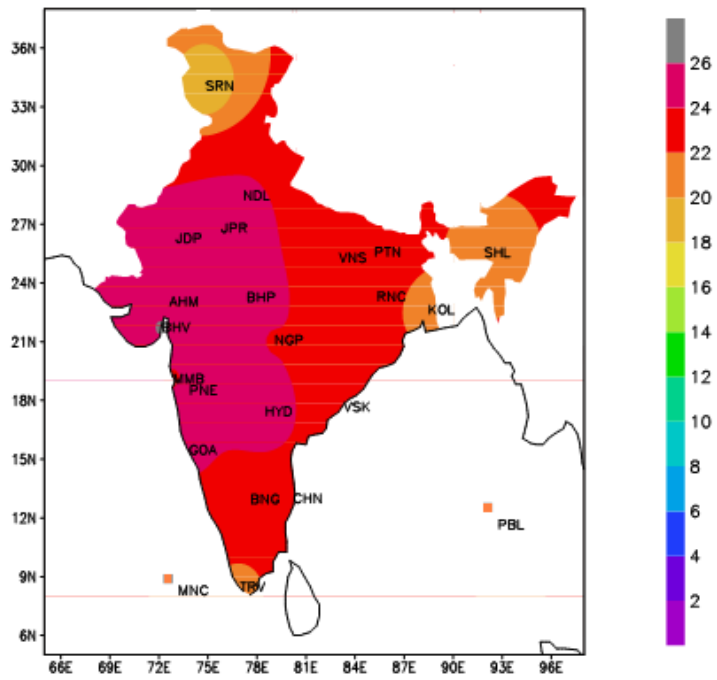


Fig 5.4 - Global solar radiant exposure in April - MJm⁻²

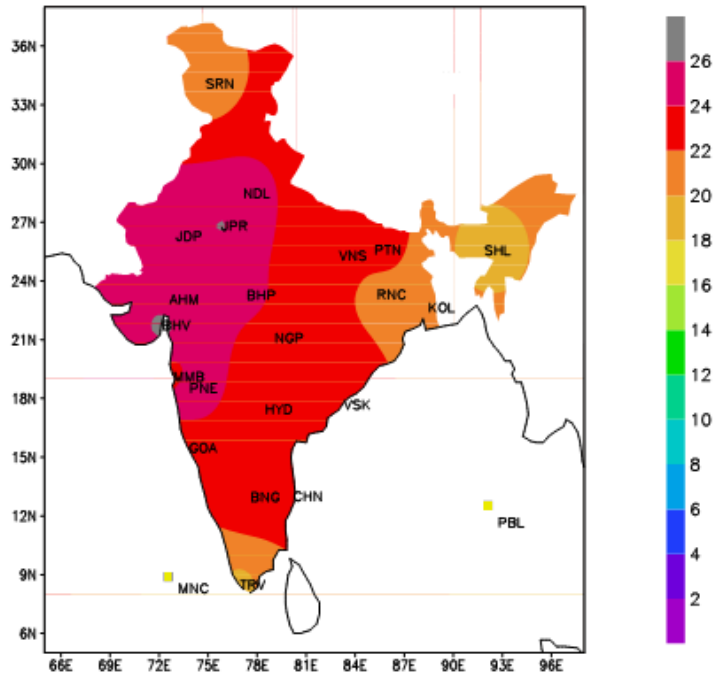


Fig 5.5 - Global solar radiant exposure in May - MJm⁻²

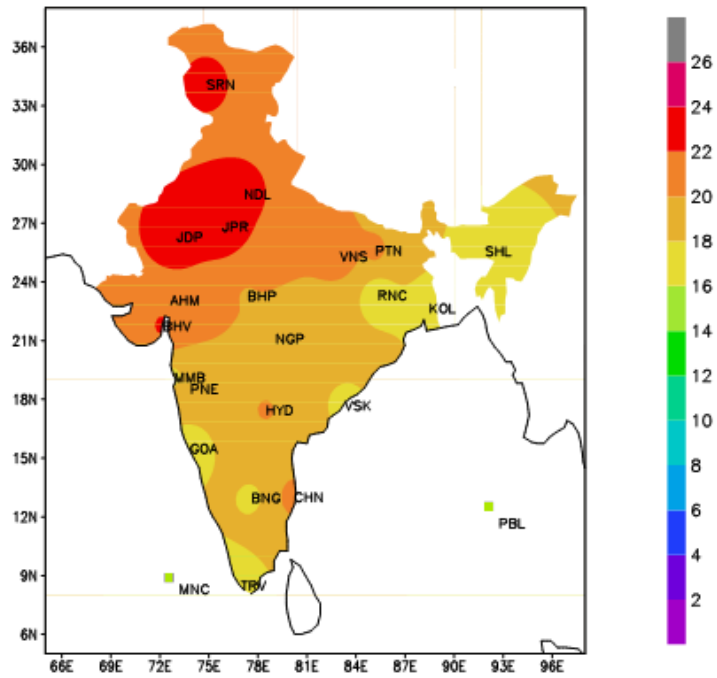


Fig 5.6 - Global solar radiant exposure in June - MJm⁻²

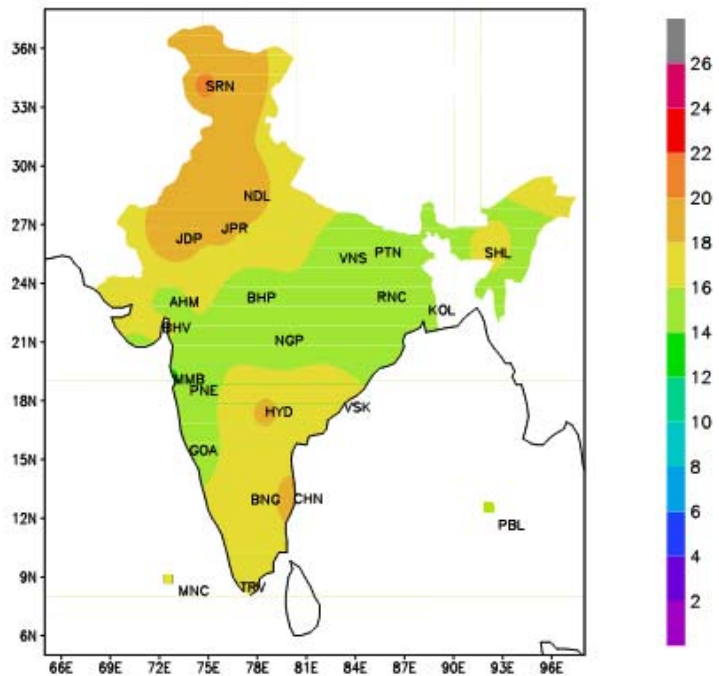


Fig 5.7 - Global solar radiant exposure in July - MJm⁻²

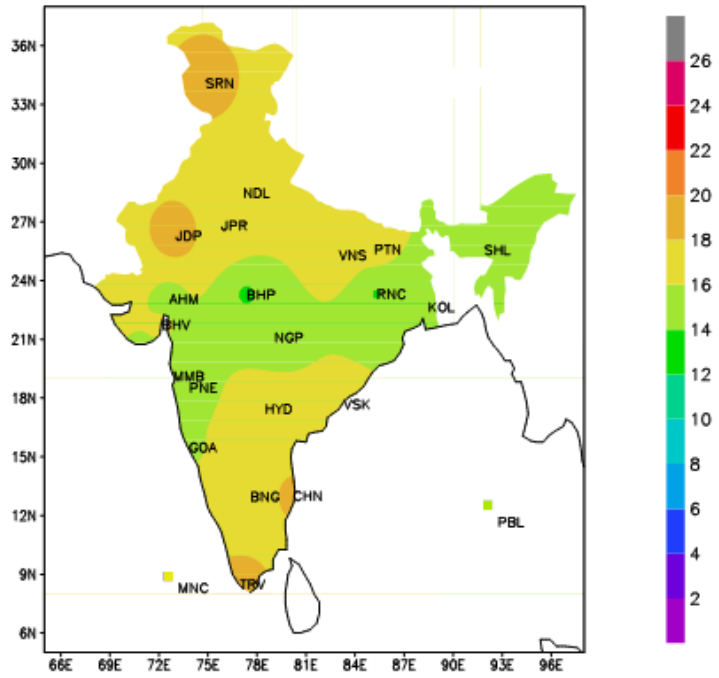


Fig 5.8 - Global solar radiant exposure in August - MJm⁻²

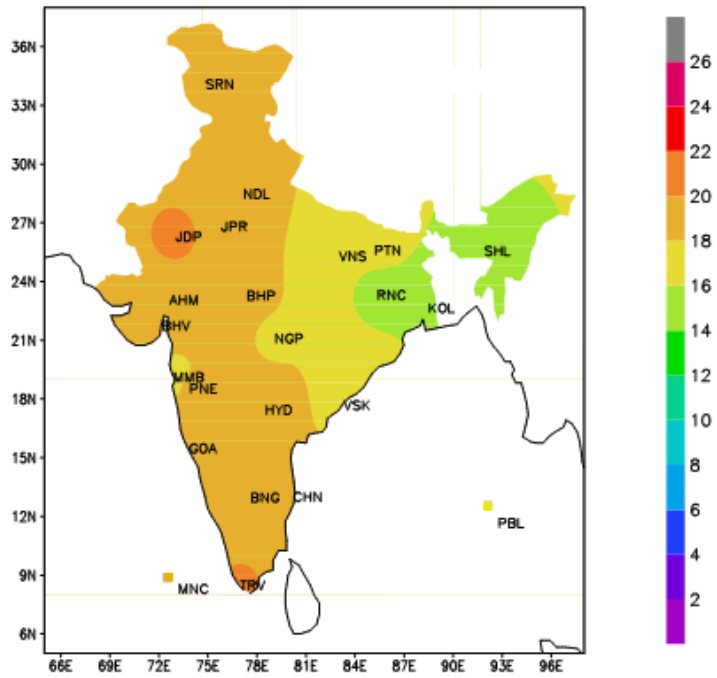


Fig 5.9 - Global solar radiant exposure in September - MJm⁻²

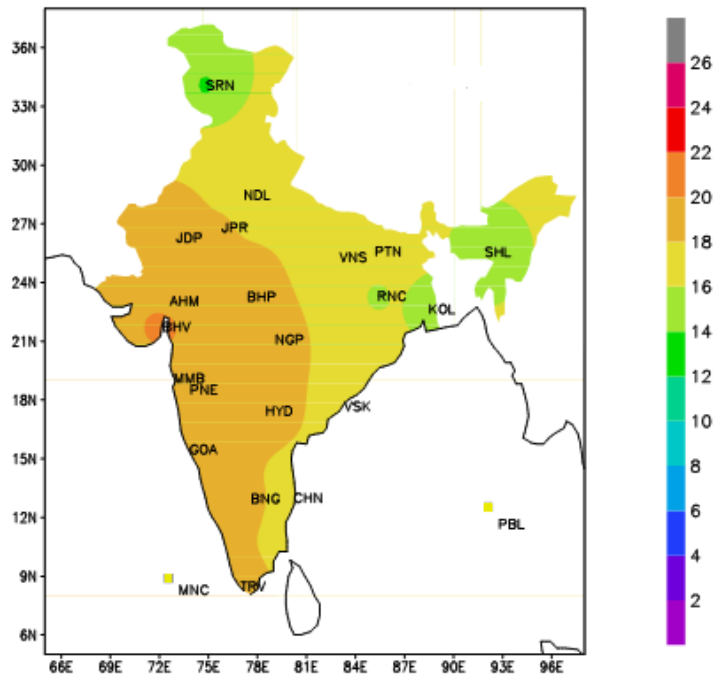


Fig 5-10- Global solar radiant exposure in October - MJm⁻²

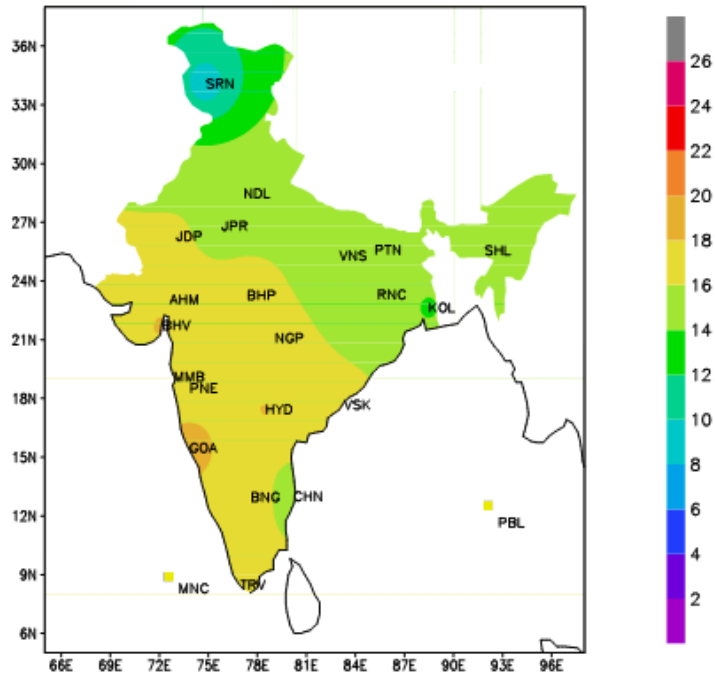


Fig 5.11- Global solar radiant exposure in November - MJm^{-2}

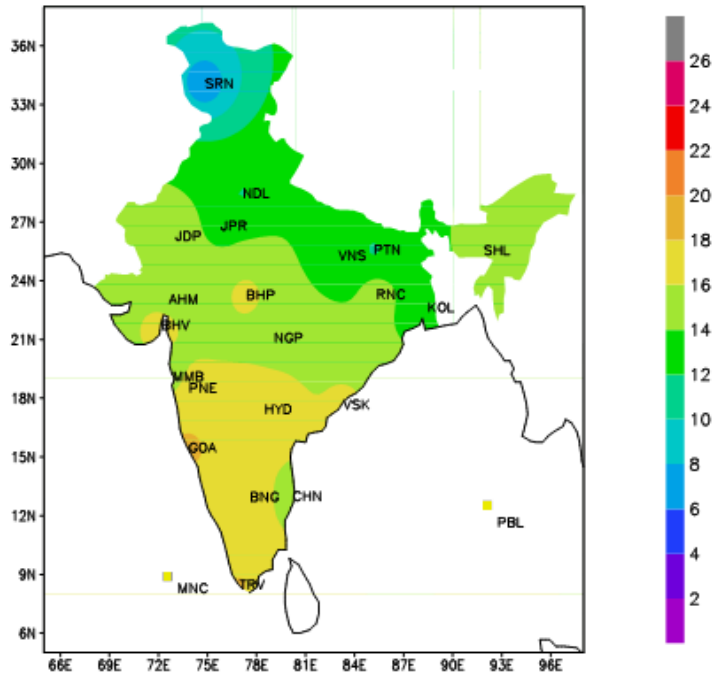


Fig 5-12- Global solar radiant exposure in December - MJm⁻²

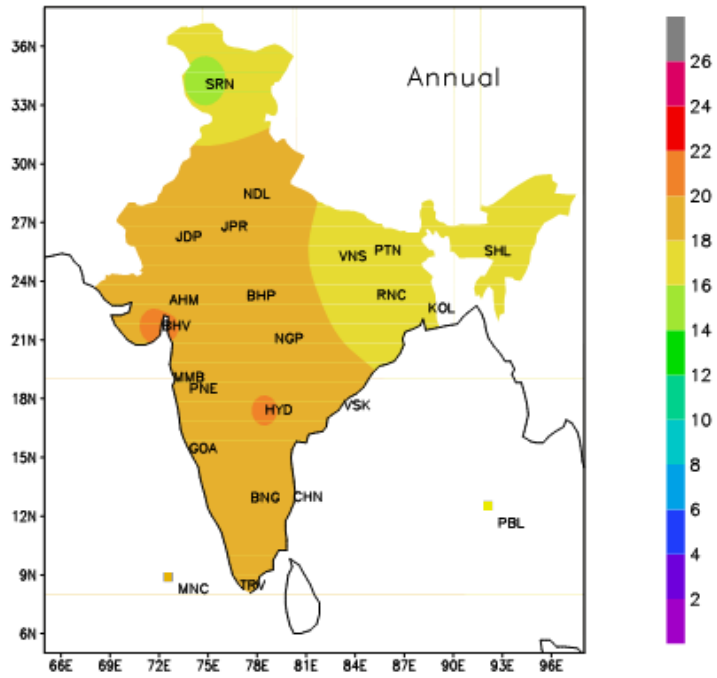


Fig 5.13 - Global solar radiant exposure over the year - MJm⁻²

Mean Monthly Diffuse Solar Radiant Exposure (MJm⁻²) Over India

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Srinagar	3.79	5.51	6.20	5.95	6.14	6.35	6.54	7.22	4.88	3.49	4.38	4.10	5.40
NewDelhi	5.21	6.22	7.56	8.83	10.68	11.66	11.83	10.27	8.27	6.37	4.92	4.87	7.82
Jodhpur	4.23	5.33	6.67	7.97	9.56	10.77	11.90	11.00	7.43	5.25	4.13	3.98	7.15
Jaipur	4.61	6.10	7.29	8.21	9.52	10.78	10.92	10.13	7.57	5.41	5.09	4.63	7.47
Varanasi	5.50	6.07	7.09	8.55	9.94	10.77	10.54	9.84	8.25	6.20	5.36	5.39	7.54
Patna	5.55	6.02	6.82	8.64	10.14	10.77	10.04	9.54	8.16	6.13	5.08	5.19	7.53
Shillong	4.79	5.79	7.11	8.39	9.87	11.14	11.56	10.56	9.35	7.21	4.96	4.00	7.87
Ahmedabad	4.58	5.43	6.63	7.46	8.85	11.11	11.41	11.28	9.17	5.99	4.74	4.43	7.57
Bhopal	4.26	4.87	6.28	7.43	9.56	10.02	9.93	9.95	8.95	5.94	4.86	4.43	7.16
Ranchi	4.85	5.82	5.96	7.06	8.24	9.02	9.12	9.63	8.52	6.64	5.52	5.42	7.21
Kolkata	5.92	6.77	7.72	9.27	10.67	10.67	10.28	9.76	8.68	7.37	5.94	5.37	8.19
Bhavnagar	4.37	5.41	6.55	7.22	8.55	11.71	12.29	12.29	9.41	5.90	4.44	4.62	7.60
Nagpur	4.93	5.77	6.87	7.61	9.16	10.28	10.52	10.38	9.16	6.97	5.37	4.72	7.53
Mumbai	6.09	6.79	7.17	8.25	9.82	10.85	10.45	11.41	10.61	8.73	6.63	6.16	8.52
Pune	4.42	4.77	5.79	6.57	7.83	10.99	11.84	11.66	10.01	6.70	5.15	4.28	7.38
Hyderabad	4.67	4.85	6.22	6.42	7.03	8.64	10.04	9.32	8.20	6.69	5.17	4.32	6.76
Visakhapatnam	6.15	6.23	7.64	8.66	9.59	10.51	10.56	10.56	9.47	6.96	6.26	5.70	8.24
Panjim	5.10	5.55	7.58	8.84	9.87	10.55	10.88	11.64	10.59	8.48	6.14	5.00	8.10
Chennai	7.58	6.88	7.25	8.05	9.20	10.57	11.04	11.18	9.69	8.52	7.75	7.62	8.76
Bangalore	5.64	4.67	6.11	7.37	8.66	10.80	10.68	11.11	10.23	8.45	7.10	6.18	7.83
PortBlair	5.86	5.77	6.22	6.84	8.31	8.47	8.99	9.42	8.96	7.48	6.99	5.92	7.36
Minicoy	6.44	6.93	7.37	7.74	7.77	7.98	8.29	8.28	7.81	6.61	5.75	5.64	7.24
Thiruvananthapuram	6.75	7.01	7.84	9.22	9.69	10.16	10.69	10.70	9.38	8.73	8.10	6.90	8.72

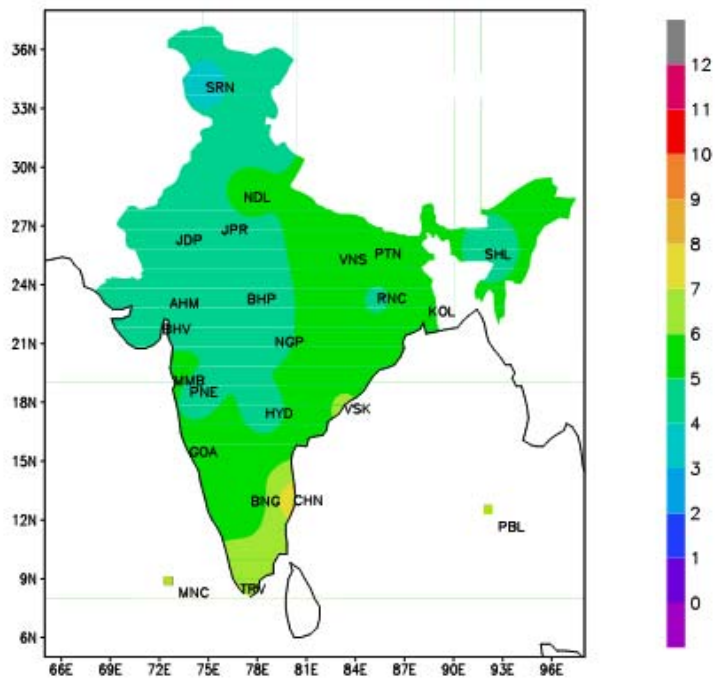


Fig 5.14 - Diffuse solar radiant exposure in January - MJm⁻²

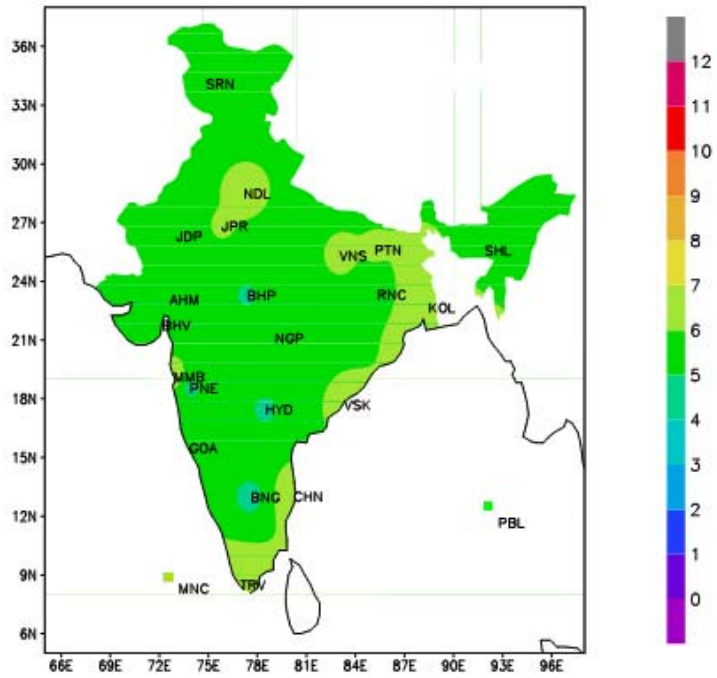


Fig 5.15 - Diffuse solar radiant exposure in February - MJm⁻²

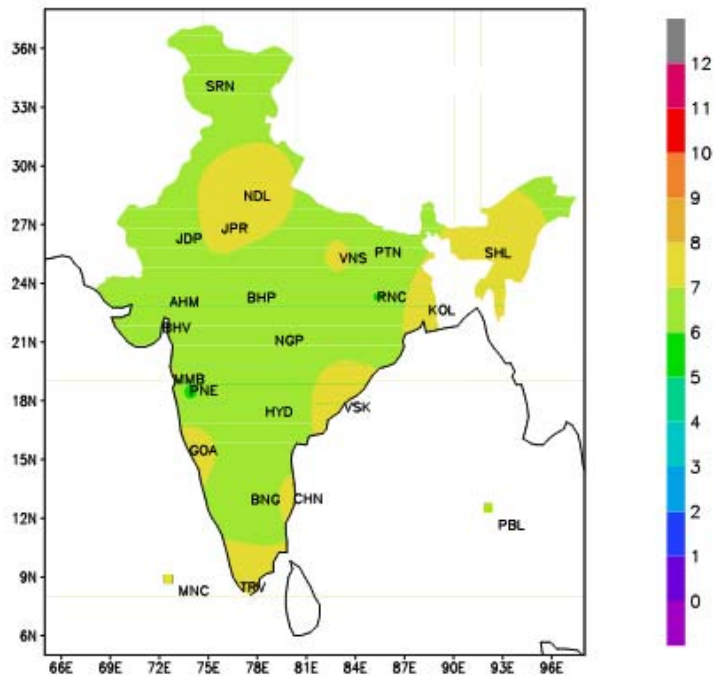


Fig 5.16 - Diffuse solar radiant exposure in March - MJm⁻²

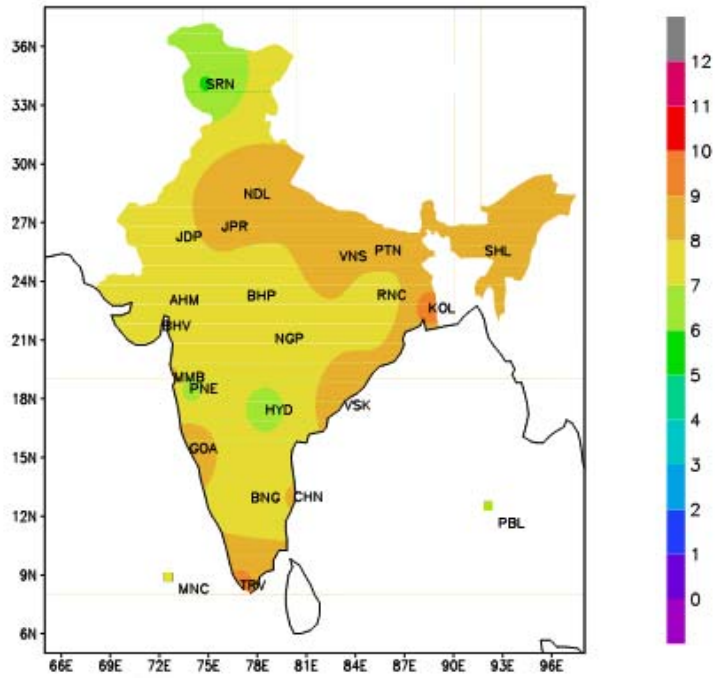


Fig 5.17 - Diffuse solar radiant exposure in April - MJm^{-2}

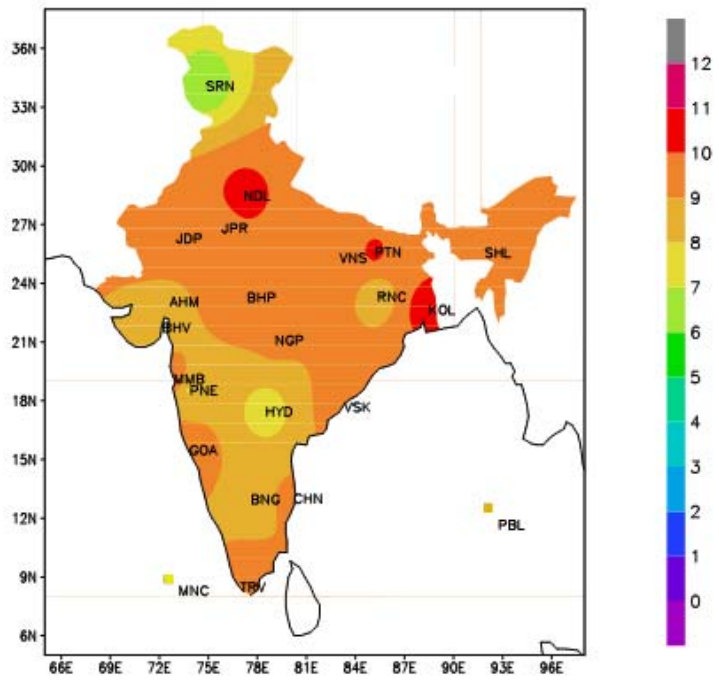


Fig 5.18 - Diffuse solar radiant exposure in May - MJm⁻²

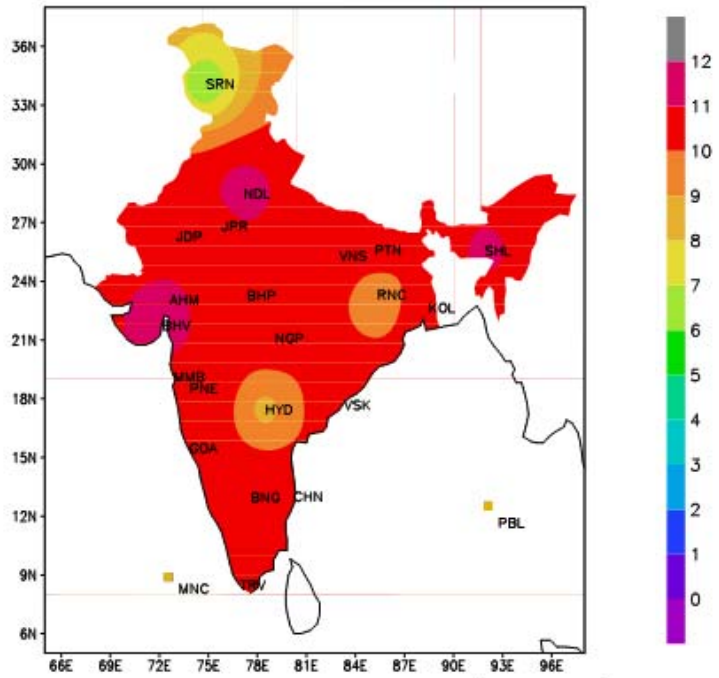


Fig 5.19 - Diffuse solar radiant exposure in June - MJm⁻²

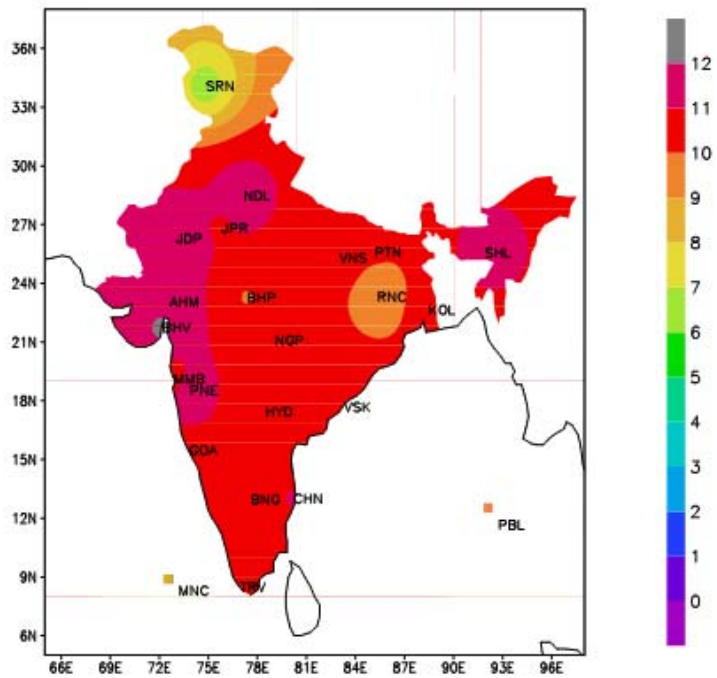


Fig 5.20 - Diffuse solar radiant exposure in July - MJm⁻²

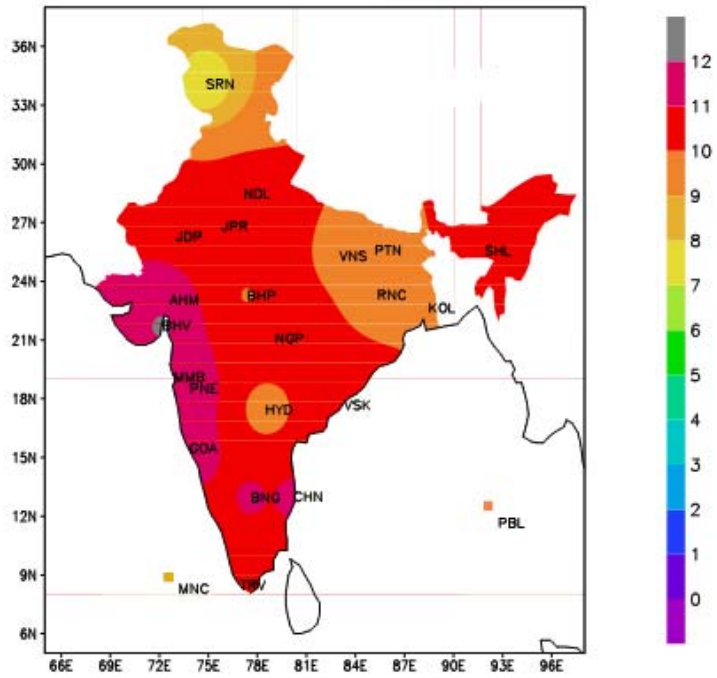


Fig 5.21 - Diffuse solar radiant exposure in August - MJm^{-2}

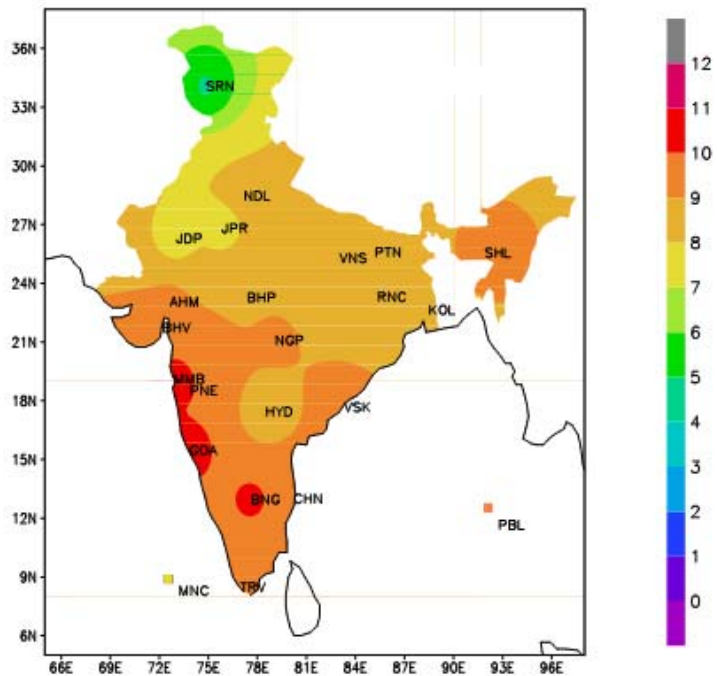


Fig 5.22 - Diffuse solar radiant exposure in September - MJm⁻²

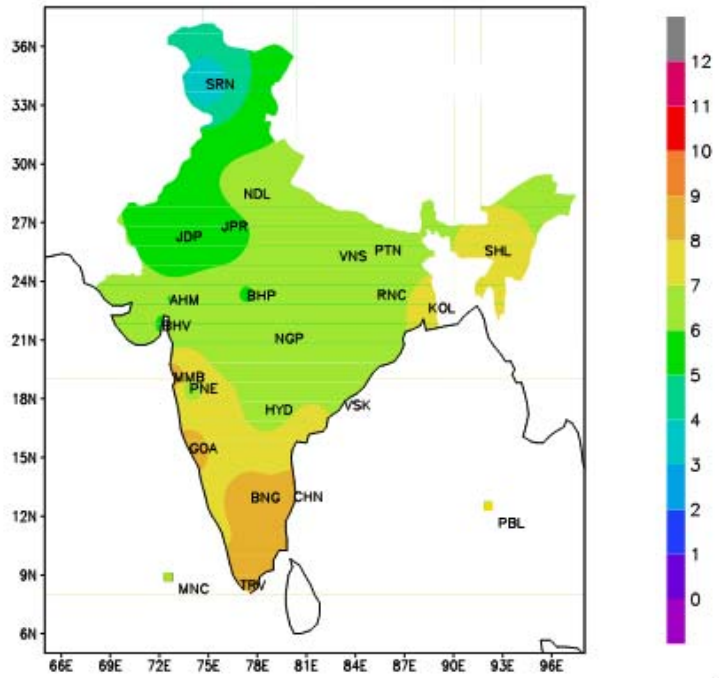


Fig 5.23 - Diffuse solar radiant exposure in October - MJm^{-2}

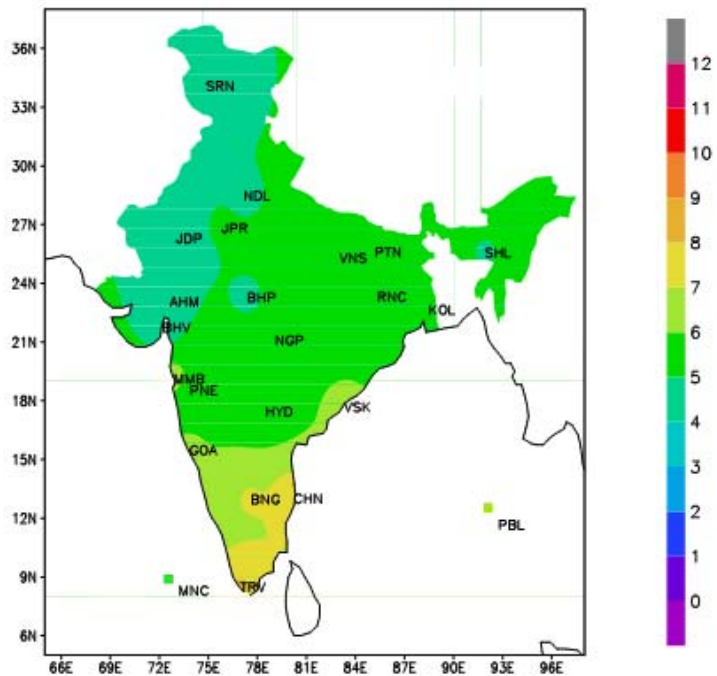


Fig 5.24 - Diffuse solar radiant exposure in November - MJm^{-2}

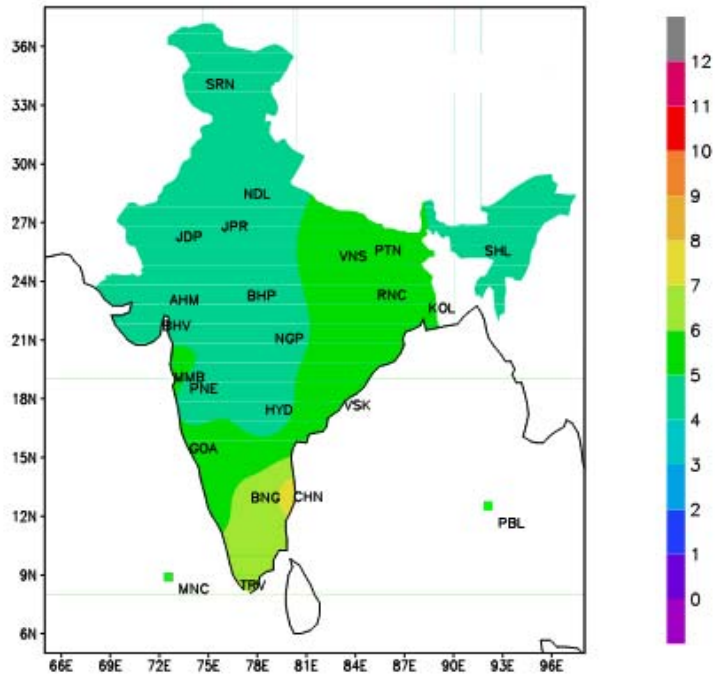


Fig 5.25 - Diffuse solar radiant exposure in December - MJm⁻²

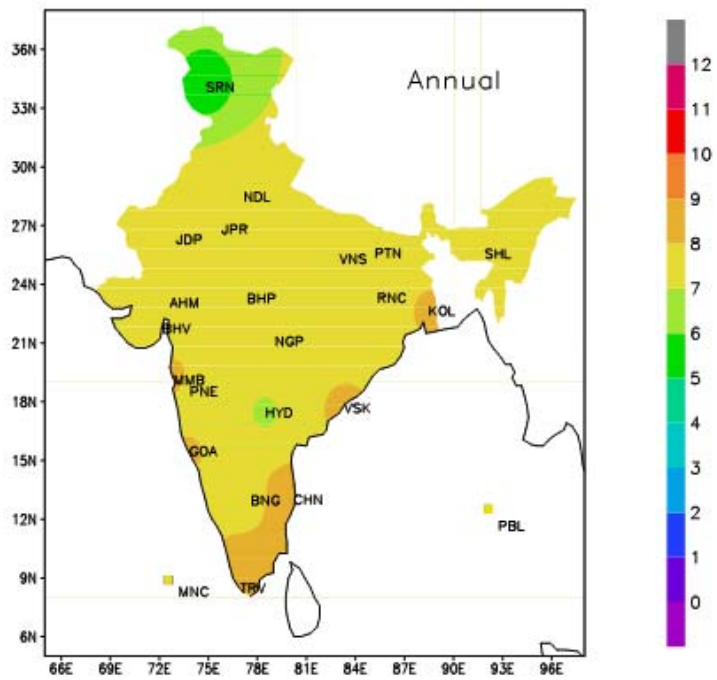


Fig 5.26 - Diffuse solar radiant exposure over the year - MJm⁻²

Table-1
Mean hourly air temperature(°C) at Srinagar

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	0.0	-0.2	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-0.6	-0.1	0.9	2.2
February	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.8	2.4	3.3	4.5	5.9
March	6.9	6.5	6.1	5.9	5.6	5.4	5.2	5.4	6.8	7.8	9.0	10.2
April	11.2	10.7	10.3	9.9	9.6	9.3	9.2	10.2	12.5	13.7	15.1	16.3
May	14.7	14.1	13.6	13.2	12.9	12.6	12.9	14.2	16.6	17.8	19.1	20.4
June	18.5	17.9	17.5	17.0	16.7	16.3	16.8	18.2	20.6	21.7	23.0	24.3
July	21.6	21.2	20.8	20.5	20.2	19.9	20.0	20.8	22.7	23.6	24.8	26.0
August	20.8	20.4	20.0	19.7	19.4	19.1	19.0	19.6	21.6	22.7	24.2	25.6
September	16.8	16.3	15.9	15.5	15.2	14.9	14.8	15.5	18.2	20.0	22.0	23.6
October	9.7	9.3	8.8	8.5	8.1	7.8	7.5	8.0	11.1	13.0	15.4	17.5
November	4.5	4.1	3.7	3.4	3.1	2.8	2.6	2.6	4.6	6.5	9.0	11.1
December	1.0	0.8	0.6	0.4	0.2	0.0	-0.1	-0.2	0.4	1.4	3.1	4.8
	13	14	15	16	17	18	19	20	21	22	23	24
January	3.0	3.6	4.1	4.3	4.1	3.4	2.5	1.8	1.3	0.9	0.5	0.3
February	6.7	7.5	7.9	8.1	8.0	7.4	6.3	5.5	4.8	4.3	3.8	3.4
March	11.0	11.6	12.1	12.2	12.1	11.5	10.7	9.7	9.0	8.4	7.9	7.4
April	17.1	17.9	18.4	18.5	18.4	17.8	16.7	15.1	14.1	13.3	12.6	12.0
May	21.2	22.0	22.4	22.6	22.5	22.0	20.8	19.0	17.7	16.9	16.1	15.4
June	25.2	26.1	26.7	27.0	27.0	26.7	25.3	23.2	21.7	20.9	20.1	19.3
July	26.8	27.5	28.1	28.4	28.4	28.0	26.9	25.3	24.1	23.3	22.7	22.1
August	26.4	27.1	27.6	27.9	27.8	27.1	25.7	24.2	23.1	22.3	21.7	21.1
September	24.7	25.6	26.3	26.5	25.9	24.3	22.0	20.3	19.3	18.5	17.8	17.1
October	18.8	19.7	20.3	20.4	19.7	17.2	14.7	13.3	12.3	11.4	10.7	10.1
November	12.3	13.3	14.1	14.2	13.6	11.1	9.0	7.7	6.7	6.0	5.4	4.8
December	5.9	6.5	7.3	7.6	7.2	5.5	4.1	3.3	2.6	2.1	1.6	1.2

Table-2
Mean sunshine hours at Srinagar

Time in LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.0	0.3	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.7	0.2	0.1	0.0
February	0.0	0.3	0.5	0.6	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.5	0.2	0.0
March	0.0	0.3	0.4	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.2	0.0
April	0.0	0.5	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.4	0.2
May	0.0	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.4	0.2
June	0.1	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.5	0.2
July	1.0	0.4	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.4	0.2
August	0.0	0.3	0.7	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.3	0.5
September	0.0	0.2	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.2	0.0
October	0.0	0.2	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.4	0.0
November	0.0	0.6	0.3	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.0	0.0
December	0.0	0.0	0.6	0.4	0.6	0.8	0.8	0.8	0.9	0.8	0.5	0.3	0.0	0.0

Table-3
Mean hourly air temperature(⁰C) at Delhi

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	11.9	11.3	10.8	10.4	10.0	9.6	9.3	9.1	10.3	12.7	15.2	17.2
February	14.8	14.2	13.6	13.0	12.5	12.1	11.8	11.8	13.5	16.2	18.7	20.6
March	19.8	19.1	18.3	17.6	17.1	16.4	16.1	16.8	19.7	22.6	24.9	26.6
April	26.5	25.8	24.9	24.1	23.4	22.6	22.6	24.1	27.4	30.1	32.3	33.9
May	30.4	29.7	29.0	28.4	27.8	27.3	27.5	28.9	31.6	33.7	35.5	37.0
June	31.3	30.8	30.3	29.9	29.5	29.2	29.3	30.2	32.1	33.5	34.9	36.1
July	29.4	29.2	28.9	28.7	28.5	28.3	28.3	28.8	30.1	31.0	32.0	33.0
August	28.4	28.1	27.9	27.7	27.5	27.2	27.3	27.7	29.0	30.0	30.9	31.9
September	27.3	27.0	26.6	26.4	26.1	25.8	25.8	26.5	28.3	29.8	31.0	32.2
October	23.3	22.7	22.2	21.7	21.3	20.8	20.7	21.5	24.4	27.1	29.2	30.7
November	17.8	17.2	16.6	16.0	15.5	15.1	14.9	15.4	18.2	21.2	23.8	25.6
December	12.7	12.2	11.6	11.1	10.6	10.2	10.0	10.0	11.8	14.4	17.1	19.2
	13	14	15	16	17	18	19	20	21	22	23	24
January	18.6	19.4	19.8	19.9	19.5	18.1	16.5	15.4	14.5	13.8	13.1	12.4
February	21.7	22.4	22.8	22.8	22.5	21.5	19.9	18.7	17.7	16.9	16.2	15.4
March	27.6	28.3	28.7	28.7	28.3	27.4	25.8	24.4	23.3	22.4	21.6	20.6
April	34.9	35.6	36.0	36.0	35.7	35.0	33.5	31.8	30.5	29.4	28.6	27.5
May	38.0	38.7	39.1	39.1	38.8	38.3	36.9	35.3	34.1	33.0	32.0	31.0
June	36.9	37.5	37.8	37.7	37.5	37.1	36.2	34.9	33.9	33.2	32.5	31.7
July	33.6	34.0	34.0	33.9	33.5	33.2	32.6	31.7	31.1	30.6	30.2	29.7
August	32.3	32.6	32.7	32.6	32.3	31.9	31.2	30.5	29.9	29.5	29.1	28.5
September	32.8	33.3	33.4	33.2	32.8	32.1	31.0	30.2	29.4	28.9	28.3	27.6
October	31.5	32.0	32.2	32.0	31.5	30.0	28.4	27.2	26.1	25.2	24.5	23.6
November	26.5	27.1	27.3	27.2	26.4	24.5	22.9	21.7	20.6	19.8	19.0	18.1
December	20.4	21.2	21.6	21.5	20.8	18.9	17.4	16.3	15.4	14.7	14.0	13.1

Table-4
Mean sunshine hours at New Delhi

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.3	0.5	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.4	0.6	0.0	
February	0.0	0.2	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.6	0.2	0.0	
March	0.0	0.2	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.5	0.4	0.2	
April	0.1	0.4	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.4	0.2	
May	0.1	0.4	0.6	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.7	0.4	0.2	
June	0.1	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.5	0.2	
July	0.3	0.5	0.5	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.4	0.3	
August	0.1	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.4	1.0	
September	0.0	0.3	0.5	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.5	0.3	0.0	
October	0.7	0.3	0.5	0.9	1.0	1.0	0.9	1.0	0.9	0.9	0.9	0.5	0.6	0.2	
November	0.0	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.4	0.4	0.0	
December	0.0	0.3	0.4	0.7	0.9	0.8	0.9	0.9	0.9	0.8	0.7	0.4	0.4	0.0	

Table-5
Mean hourly air temperature(°C) at JODHPUR

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	14.7	14.1	13.6	13.1	12.7	12.2	11.8	11.7	13.3	16.3	19.4	21.9
February	17.5	16.8	16.1	15.5	15.0	14.5	14.0	13.9	16.0	19.3	22.3	24.5
March	23.1	22.5	21.9	21.1	20.5	19.8	19.2	19.8	22.3	25.4	28.1	29.8
April	28.7	28.0	27.4	26.7	25.9	25.0	24.5	25.8	28.5	31.2	33.6	35.4
May	32.5	31.8	31.0	30.2	29.5	28.8	28.6	29.6	31.4	33.2	35.1	36.8
June	33.0	32.4	31.8	31.2	30.6	30.1	30.0	30.4	31.6	32.8	34.3	35.9
July	30.0	29.6	29.2	28.9	28.5	28.3	28.2	28.4	29.3	30.1	31.2	32.3
August	28.7	28.3	28.0	27.8	27.5	27.2	27.1	27.3	28.2	28.9	30.0	31.1
September	28.1	27.7	27.4	27.0	26.6	26.2	26.0	26.4	28.0	29.5	31.2	32.5
October	23.3	22.8	22.3	21.8	21.2	20.7	20.3	20.8	24.0	27.3	30.2	32.3
November	18.8	18.4	17.9	17.4	17.0	16.6	16.1	16.5	20.1	23.9	27.2	29.5
December	16.7	16.2	15.8	15.4	14.9	14.5	14.1	14.3	16.6	19.9	23.2	25.7
	13	14	15	16	17	18	19	20	21	22	23	24
January	23.3	24.0	24.3	24.2	23.8	22.2	19.5	18.0	17.1	16.5	15.9	15.3
February	25.8	26.5	26.9	26.9	26.6	25.8	23.5	21.6	20.5	19.6	18.9	18.2
March	31.1	31.7	32.1	32.2	31.9	31.4	29.8	27.7	26.3	25.5	24.8	24.0
April	36.6	37.4	37.8	37.8	37.6	37.1	35.7	33.7	32.2	31.0	30.3	29.6
May	38.2	39.3	39.9	40.0	39.8	39.5	38.5	37.1	35.8	34.8	33.9	33.1
June	37.2	38.1	38.8	38.9	38.9	38.5	37.8	36.8	35.8	35.0	34.4	33.7
July	33.2	34.0	34.5	34.5	34.3	34.1	33.5	32.8	32.0	31.4	31.0	30.4
August	31.9	32.7	33.1	33.1	32.9	32.6	32.0	31.1	30.6	30.1	29.5	29.0
September	33.5	34.2	34.6	34.6	34.3	33.5	32.2	31.2	30.3	29.7	29.1	28.5
October	33.5	34.1	34.4	34.2	33.6	31.1	28.2	26.5	25.5	24.9	24.3	23.7
November	30.5	30.9	30.9	30.7	29.9	26.4	23.4	22.0	21.1	20.4	19.8	19.2
December	27.0	27.7	27.9	27.7	26.9	23.7	20.9	19.6	18.8	18.3	17.7	17.2

Table-6
Mean sunshine hours at Jodhpur

LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.6	0.3	0.0
February	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0
March	0.0	0.1	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.2	0.0
April	0.0	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.5	0.4
May	0.1	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.7	0.2
June	0.2	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.7	0.3
July	0.4	0.5	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.3
August	0.0	0.4	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.4	0.0
September	0.0	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.3	0.0
October	0.0	0.2	0.9	0.9	1.0	0.9	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0
November	0.0	0.3	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.7	0.1	0.0
December	0.0	0.0	0.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6	0.0	0.0

Table-7
Mean hourly air temperature (°C) at JAIPUR

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	12.2	11.7	11.3	10.9	10.5	10.1	9.7	9.8	13.3	16.3	18.3	19.8
February	15.3	14.8	14.3	13.9	13.4	13.0	12.6	13.1	16.5	19.0	20.9	22.5
March	20.7	20.1	19.6	19.0	18.4	17.9	17.4	19.0	22.3	24.5	26.4	28.0
April	26.3	25.7	25.0	24.3	23.7	23.2	23.2	26.0	29.0	31.2	33.1	34.6
May	30.2	29.5	28.9	28.4	27.9	27.4	27.9	30.1	32.5	34.3	36.0	37.4
June	31.0	30.4	30.0	29.6	29.2	28.9	29.2	30.6	32.3	33.8	35.2	36.5
July	28.2	27.9	27.7	27.4	27.2	27.0	27.2	28.0	29.1	30.0	30.9	31.9
August	26.9	26.6	26.3	26.1	25.9	25.8	25.9	26.7	27.9	28.7	29.6	30.4
September	26.0	25.6	25.3	25.1	24.8	24.6	24.6	26.0	27.9	29.3	30.6	31.7
October	22.8	22.4	22.0	21.5	21.1	20.6	20.4	22.5	26.2	28.4	30.2	31.5
November	17.4	16.9	16.5	16.1	15.6	15.2	14.9	16.3	21.3	23.9	25.8	27.1
December	12.7	12.2	11.8	11.4	11.0	10.6	10.3	10.6	14.9	18.2	20.2	21.8
	13	14	15	16	17	18	19	20	21	22	23	24
January	20.9	21.7	22.1	22.1	21.6	19.5	17.2	15.7	14.7	13.9	13.3	12.8
February	23.6	24.3	24.7	24.8	24.3	23.1	20.8	19.3	18.1	17.2	16.5	15.9
March	29.1	29.9	30.3	30.3	30.0	29.1	27.0	25.2	23.8	22.9	22.0	21.4
April	35.6	36.3	36.6	36.5	36.1	35.2	33.3	31.3	29.8	28.7	27.7	27.0
May	38.5	39.2	39.4	39.4	39.0	38.3	36.6	34.8	33.5	32.4	31.5	30.8
June	37.5	38.1	38.3	38.3	37.8	37.2	35.9	34.5	33.5	32.7	32.0	31.4
July	32.5	33.0	33.1	32.8	32.5	32.0	31.1	30.3	29.7	29.2	28.8	28.5
August	31.0	31.4	31.5	31.3	30.9	30.4	29.5	28.8	28.2	27.8	27.4	27.1
September	32.4	32.8	32.9	32.8	32.3	31.4	30.0	28.9	28.1	27.4	26.8	26.3
October	32.3	32.8	32.9	32.7	32.0	29.7	27.7	26.3	25.3	24.5	23.8	23.2
November	28.0	28.4	28.6	28.3	27.2	24.3	22.3	20.9	19.9	19.1	18.4	18.0
December	22.9	23.6	23.9	23.8	22.8	19.7	17.6	16.2	15.1	14.4	13.8	13.2

Table-8
Mean sunshine hours at Jaipur

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	5.4	0.2	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.3	0.0	
February	8.4	0.2	0.8	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.3	0.0	
March	0.0	0.3	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.3	0.0	
April	0.2	0.4	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.4	0.0	
May	0.0	0.5	0.8	0.7	0.8	0.8	0.9	0.8	0.8	0.9	0.9	0.7	0.5	0.2	
June	6.0	0.5	0.8	0.9	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.5	0.7	
July	0.2	0.4	0.7	0.7	0.6	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.4	0.2	
August	0.2	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.5	0.2	
September	0.0	0.3	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.6	0.0	
October	0.0	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.2	0.0	
November	0.0	0.6	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.7	0.2	0.0	
December	0.8	0.8	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.3	0.0	

Table-9
Mean hourly air temperature(°C) at Varanasi

Time in IST	01	02	03	04	05	06	07	08	09	10	11	12
January	12.2	11.8	11.5	11.2	11.0	10.7	10.6	10.8	12.7	14.9	17.1	19.1
February	15.1	14.6	14.2	13.7	13.4	13.1	12.9	13.9	16.8	19.6	21.7	23.5
March	19.7	19.1	18.6	18.1	17.7	17.3	17.3	19.7	23.3	26.2	28.4	30.0
April	25.8	25.1	24.5	23.9	23.3	22.8	23.3	26.2	29.9	32.6	34.6	36.2
May	28.9	28.4	27.9	27.3	26.8	26.4	27.2	29.1	31.7	33.6	35.5	37.2
June	30.0	29.6	29.3	28.9	28.6	28.3	28.8	30.2	32.3	33.6	35.0	36.1
July	28.4	28.2	28.1	27.9	27.8	27.6	27.7	28.3	29.6	30.2	31.0	31.9
August	27.8	27.6	27.5	27.4	27.3	27.1	27.2	27.7	29.0	29.7	30.5	31.2
September	26.8	26.7	26.5	26.4	26.3	26.2	26.2	26.7	28.0	28.9	29.7	30.6
October	23.8	23.6	23.3	23.2	23.0	22.7	22.7	23.6	26.0	27.9	29.4	30.7
November	18.2	17.8	17.5	17.2	16.9	16.6	16.5	17.6	20.5	23.2	25.6	27.4
December	12.8	12.5	12.2	11.9	11.7	11.3	11.2	11.7	14.1	16.6	19.2	21.5
	13	14	15	16	17	18	19	20	21	22	23	24
January	20.3	21.2	21.6	21.5	20.6	18.3	16.6	15.5	14.7	14.0	13.4	12.7
February	24.4	25.1	25.4	25.3	24.7	22.3	20.2	18.8	17.8	17.0	16.3	15.6
March	30.9	31.5	31.8	31.7	31.0	28.8	26.1	24.4	23.1	22.2	21.3	20.5
April	37.1	37.7	37.9	37.8	37.4	35.9	33.1	31.0	29.6	28.6	27.6	26.7
May	38.1	38.8	39.1	39.1	38.6	37.5	35.2	33.4	32.2	31.2	30.4	29.6
June	36.8	37.4	37.6	37.4	36.9	36.0	34.6	33.3	32.4	31.6	31.1	30.4
July	32.2	32.3	32.4	32.1	31.7	31.1	30.5	29.8	29.4	29.1	28.8	28.5
August	31.5	31.6	31.7	31.4	31.1	30.6	29.9	29.3	28.9	28.6	28.3	28.0
September	30.9	30.9	30.9	30.6	30.0	29.2	28.4	28.0	27.6	27.4	27.1	26.9
October	31.3	31.6	31.6	31.4	30.3	28.0	26.7	25.9	25.4	24.9	24.5	24.0
November	28.3	28.8	28.8	28.5	26.5	23.5	22.0	20.9	20.1	19.5	18.9	18.4
December	22.7	23.5	23.7	23.6	21.6	18.8	17.2	16.1	15.2	14.5	13.8	13.1

Table-10
Mean hourly air temperature(⁰C) at Patna

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	12.4	12.2	11.9	11.6	11.4	11.1	10.9	11.5	14.0	16.2	18.1	19.6
February	15.9	15.5	15.2	14.8	14.5	14.2	14.1	15.1	18.2	20.6	22.4	23.8
March	20.7	20.2	19.7	19.3	18.8	18.5	18.5	20.4	23.6	25.9	27.8	29.3
April	25.9	25.4	24.9	24.3	23.8	23.4	23.9	26.3	29.6	31.8	33.6	34.8
May	28.6	28.1	27.6	27.2	26.8	26.6	27.0	28.3	30.4	31.9	33.4	34.7
June	29.6	29.3	29.1	28.8	28.6	28.5	28.6	29.2	30.9	31.7	32.8	33.7
July	28.2	28.1	28.0	27.9	27.8	27.7	27.8	28.2	29.2	29.6	30.2	30.7
August	27.9	27.8	27.6	27.5	27.4	27.3	27.5	28.0	29.1	29.6	30.2	30.8
September	27.1	27.0	26.9	26.8	26.7	26.5	26.7	27.4	28.8	29.4	30.1	30.6
October	23.6	23.4	23.3	23.1	22.9	22.7	22.9	24.4	26.8	28.3	29.4	30.2
November	17.9	17.7	17.4	17.1	16.9	16.6	16.7	18.4	21.6	23.7	25.5	26.8
December	13.7	13.4	13.2	12.9	12.7	12.4	12.3	13.1	16.2	18.6	20.5	21.8
	13	14	15	16	17	18	19	20	21	22	23	24
January	20.4	21.0	21.2	21.1	20.2	18.0	16.4	15.4	14.6	14.0	13.4	12.9
February	24.5	25.0	25.3	25.2	24.5	22.6	20.4	19.2	18.3	17.6	17.0	16.4
March	30.1	30.6	30.9	30.7	30.1	28.6	26.2	24.7	23.6	22.8	22.0	21.5
April	35.6	36.1	36.5	36.4	36.0	34.6	32.1	30.3	29.0	28.2	27.4	26.7
May	35.5	36.0	36.5	36.6	36.2	35.4	33.8	32.3	31.3	30.6	29.9	29.1
June	34.3	34.7	35.0	34.9	34.7	34.1	33.0	32.2	31.5	30.9	30.5	30.0
July	30.9	31.0	31.1	31.0	30.8	30.5	29.8	29.4	29.0	28.8	28.6	28.2
August	30.9	31.1	31.1	30.8	30.6	30.2	29.4	29.1	28.8	28.6	28.4	28.0
September	30.8	30.7	30.6	30.3	29.9	29.3	28.6	28.2	27.9	27.7	27.5	27.2
October	30.6	30.7	30.7	30.3	29.1	27.3	26.1	25.5	25.0	24.6	24.3	23.9
November	27.5	27.7	27.7	27.0	24.7	22.5	20.9	20.0	19.4	18.9	18.5	18.0
December	22.6	23.1	23.1	22.6	20.4	18.1	16.7	15.9	15.2	14.8	14.4	13.8

Table-11
Mean air temperature(⁰C) at Shillong

	00	03	06	09	12	15	18	21	UTC
January	-	10.5	-	-	9.4	-	-	-	
February	-	12.1	-	-	11.5	-	-	-	
March	-	16.2	-	-	15.2	-	-	-	
April	-	18.9	-	-	18.2	-	-	-	
May	-	19.8	-	-	19.3	-	-	-	
June	-	20.6	-	-	20.5	-	-	-	
July	-	20.8	-	-	20.4	-	-	-	
August	-	20.8	-	-	20.2	-	-	-	
September	-	20.2	-	-	19.1	-	-	-	
October	-	19.0	-	-	17.0	-	-	-	
November	-	16.2	-	-	13.8	-	-	-	
December	-	12.6	-	-	10.6	-	-	-	

Table-12
Mean hourly air temperature(⁰C)at Ahmedabad

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	16.4	15.9	15.4	15.0	14.6	14.3	14.0	14.1	17.2	20.4	22.9	24.8
February	19.0	18.4	17.8	17.3	16.9	16.5	16.2	16.4	19.8	22.9	25.4	27.2
March	24.1	23.4	22.8	22.3	21.7	21.2	20.7	21.6	24.8	27.4	29.8	31.7
April	28.6	28.0	27.3	26.6	26.0	25.4	25.0	26.2	28.8	31.0	33.2	35.2
May	31.0	30.4	29.8	29.2	28.7	28.2	28.2	29.0	31.0	32.6	34.5	36.4
June	30.7	30.3	29.9	29.5	29.2	28.9	28.9	29.4	30.8	31.8	33.1	34.6
July	28.1	27.9	27.6	27.5	27.3	27.2	27.1	27.4	28.4	28.9	29.7	30.5
August	27.3	27.1	26.8	26.6	26.5	26.3	26.2	26.5	27.5	28.0	28.8	29.6
September	27.3	27.0	26.7	26.5	26.2	26.0	25.9	26.3	27.9	28.9	29.9	31.1
October	24.9	24.6	24.2	23.9	23.6	23.2	23.0	24.2	27.4	29.6	31.4	32.9
November	20.2	19.8	19.4	19.1	18.8	18.5	18.2	19.2	23.3	26.2	28.5	30.2
December	16.8	16.4	16.0	15.7	15.4	15.1	15.0	15.3	18.8	21.8	24.2	26.0
	13	14	15	16	17	18	19	20	21	22	23	24
January	26.1	26.9	27.3	27.3	27.0	25.6	23.0	21.1	19.8	18.8	18.0	17.1
February	28.4	29.3	29.7	29.8	29.6	28.8	26.5	24.4	22.8	21.5	20.6	19.7
March	33.0	33.9	34.5	34.6	34.4	33.9	32.1	29.7	28.0	26.7	25.7	24.8
April	36.6	37.6	38.3	38.6	38.5	38.1	36.4	34.0	32.3	31.1	30.1	29.3
May	37.8	39.1	40.0	40.4	40.3	39.7	37.9	35.8	34.1	33.1	32.3	31.5
June	35.6	36.6	37.4	37.6	37.6	37.0	35.7	34.0	32.7	32.0	31.5	31.0
July	31.1	31.6	32.0	32.0	31.8	31.4	30.6	29.9	29.3	28.9	28.6	28.2
August	30.2	30.6	30.9	31.0	30.9	30.6	29.8	29.1	28.5	28.2	27.9	27.5
September	31.7	32.3	32.6	32.6	32.4	32.0	30.6	29.6	28.8	28.4	28.0	27.6
October	33.8	34.3	34.6	34.5	34.1	32.5	29.7	28.0	26.9	26.3	25.7	25.1
November	31.2	31.8	32.0	31.8	31.1	28.8	25.6	23.8	22.6	21.8	21.1	20.4
December	27.2	28.0	28.3	28.3	27.7	25.4	22.5	20.6	19.4	18.5	17.8	17.2

Table-13
Mean sunshine hour at Ahmedabad

Time in LAT

	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.0
February	0.1	0.3	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.3	0.2
March	0.2	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0
April	0.0	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.5	0.4
May	0.2	0.6	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.6	0.2
June	0.1	0.5	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.5	0.2
July	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.3	0.3
August	0.0	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.2
September	0.0	0.2	0.7	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.2	0.0
October	0.0	0.3	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.3	0.0
November	0.2	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0
December	0.0	0.2	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.7	0.2	0.1

Table-14
Mean hourly air temperature (°C) at Bhopal

Time in IST												
	01	02	03	04	05	06	07	08	09	10	11	12
January	15.2	14.7	14.2	13.7	13.3	13.0	12.7	13.2	16.4	18.8	20.9	22.6
February	17.6	17.1	16.5	16.0	15.6	15.1	14.8	15.6	18.9	21.5	23.5	25.0
March	22.3	21.8	21.2	20.5	19.9	19.3	19.0	21.1	24.9	27.4	29.3	30.7
April	26.8	26.1	25.5	24.9	24.3	23.8	23.8	26.6	30.3	32.6	34.3	35.7
May	30.1	29.5	28.9	28.3	27.8	27.3	27.7	29.9	32.8	34.9	36.6	38.0
June	28.3	27.9	27.5	27.3	27.0	26.8	26.9	27.9	29.8	31.1	32.5	33.7
July	25.6	25.4	25.2	25.1	25.0	24.9	24.9	25.2	26.0	26.5	27.2	27.9
August	24.6	24.5	24.4	24.3	24.2	24.1	24.1	24.3	25.0	25.5	26.1	26.8
September	24.3	24.1	23.8	23.6	23.4	23.3	23.2	24.0	25.5	26.6	27.8	28.7
October	22.5	22.0	21.6	21.2	20.9	20.6	20.5	22.6	25.9	28.0	29.4	30.5
November	18.7	18.2	17.7	17.3	16.9	16.5	16.3	18.2	22.0	24.4	26.0	27.1
December	15.1	14.5	14.1	13.7	13.3	13.0	12.7	13.4	17.2	19.8	21.7	23.0
	13	14	15	16	17	18	19	20	21	22	23	24
January	23.8	24.5	24.9	24.9	24.5	22.5	20.5	19.2	18.3	17.5	16.7	15.9
February	26.2	26.9	27.3	27.2	26.9	25.5	23.1	21.7	20.6	19.7	19.0	18.2
March	31.7	32.4	32.6	32.6	32.3	31.4	28.9	27.1	25.8	24.8	24.0	23.2
April	36.6	37.1	37.2	37.1	36.8	36.0	33.9	31.9	30.5	29.5	28.6	27.7
May	38.9	39.5	39.7	39.4	39.0	38.4	36.8	34.8	33.4	32.4	31.6	30.9
June	34.4	34.9	34.9	34.5	33.9	33.2	32.2	31.1	30.3	29.7	29.1	28.6
July	28.4	28.8	29.1	28.8	28.5	28.3	27.7	27.2	26.7	26.4	26.1	25.7
August	27.2	27.4	27.6	27.5	27.3	27.0	26.4	25.9	25.5	25.3	25.0	24.7
September	29.2	29.5	29.6	29.3	29.0	28.3	27.2	26.4	25.9	25.5	25.1	24.6
October	30.9	31.2	31.3	31.1	30.5	28.7	26.8	25.6	24.8	24.1	23.5	22.9
November	27.8	28.2	28.3	28.1	27.3	25.0	23.1	21.8	21.0	20.3	19.7	19.1
December	23.9	24.5	24.7	24.5	23.9	21.5	19.7	18.6	17.7	16.9	16.1	15.5

Table-15
Mean sunshine hours at Bhopal

Time in LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.8	0.9	0.9	0.9	1.0	0.9	1.0	1.0	0.9	0.9	0.2	0.0
February	0.0	0.3	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.2	0.0
March	0.0	0.2	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0
April	0.0	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.5	0.0
May	0.3	0.6	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.6	0.2
June	0.2	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.0
July	0.0	0.4	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.5	0.1
August	0.1	0.5	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.1
September	0.0	0.3	0.8	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.2	0.0
October	0.0	0.3	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.2	0.0
November	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.1	0.0
December	0.0	0.2	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.2	0.0

Table-16
Mean hourly air temperature(⁰C) at Ranchi

Time in UTC	00	03	06	09	12	15	18	21
January	10.7	14.1	20.0	22.0	19.5	14.8	13.4	12.0
February	13.6	17.5	23.2	24.9	23.0	18.7	16.7	14.9
March	17.9	22.8	28.0	29.9	27.9	23.4	21.2	19.4
April	22.3	28.0	32.8	34.4	32.3	27.6	25.4	23.7
May	24.3	29.2	33.3	34.6	32.6	28.6	27.0	25.5
June	24.3	27.0	30.2	30.6	29.4	26.4	25.5	24.7
July	23.4	25.0	27.2	27.7	26.1	24.6	24.3	23.7
August	23.2	24.8	26.9	27.4	25.9	24.5	23.9	23.4
September	22.5	24.9	27.1	27.6	25.8	24.0	23.5	22.8
October	19.4	23.5	26.6	27.4	24.8	22.0	21.0	20.0
November	14.8	19.8	24.1	25.1	21.8	18.3	16.8	15.9
December	10.9	15.4	20.8	22.3	19.0	15.0	13.2	12.1

Table-17
Mean hourly air temperature(°C) at Kolkata

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	14.8	14.6	14.3	14.1	13.9	13.7	13.6	15.1	18.2	20.6	22.3	23.5
February	18.8	18.5	18.2	18.0	17.7	17.5	17.5	19.2	22.3	24.4	25.9	27.0
March	23.4	23.1	22.8	22.4	22.2	21.9	22.3	24.4	27.2	29.0	30.4	31.5
April	26.1	25.9	25.7	25.5	25.3	25.2	25.9	27.7	30.0	31.5	32.9	34.0
May	27.4	27.3	27.1	27.0	26.9	26.9	27.8	29.2	31.0	32.1	33.0	33.8
June	27.7	27.6	27.5	27.4	27.3	27.4	28.0	29.0	30.5	31.2	31.8	32.4
July	27.4	27.3	27.2	27.1	27.1	27.1	27.5	28.3	29.5	30.1	30.7	31.1
August	27.4	27.3	27.2	27.1	27.0	27.0	27.4	28.2	29.5	30.1	30.7	30.9
September	26.9	26.8	26.7	26.6	26.5	26.5	27.0	28.0	29.4	30.1	30.6	30.9
October	24.9	24.8	24.6	24.4	24.3	24.2	24.8	26.3	28.3	29.4	30.2	30.6
November	20.9	20.6	20.4	20.2	20.0	19.9	20.2	22.1	24.7	26.4	27.5	28.3
December	16.3	16.0	15.8	15.6	15.4	15.2	15.2	17.0	20.1	22.4	24.0	25.0
	13	14	15	16	17	18	19	20	21	22	23	24
January	24.1	24.4	24.4	24.0	22.8	20.6	18.9	17.8	16.9	16.3	15.8	15.2
February	27.6	28.0	28.1	27.7	26.8	24.9	23.1	22.0	21.1	20.5	19.9	19.3
March	32.0	32.4	32.3	31.9	31.0	29.3	27.5	26.3	25.4	24.8	24.3	23.8
April	34.5	34.7	34.6	34.0	32.9	31.3	29.7	28.6	27.8	27.3	26.9	26.4
May	34.2	34.2	34.1	33.5	32.6	31.3	30.2	29.3	28.7	28.3	28.0	27.7
June	32.6	32.5	32.3	31.8	31.1	30.3	29.5	29.0	28.6	28.3	28.1	27.8
July	31.2	31.0	30.7	30.3	29.8	29.2	28.6	28.3	28.0	27.8	27.7	27.5
August	30.9	30.8	30.6	30.2	29.8	29.1	28.6	28.4	28.1	28.0	27.8	27.5
September	30.9	30.7	30.3	29.9	29.3	28.6	28.1	27.8	27.6	27.4	27.3	27.0
October	30.6	30.6	30.5	29.9	29.1	27.8	27.1	26.5	26.1	25.8	25.5	25.0
November	28.6	28.7	28.6	28.0	26.7	25.0	23.7	23.0	22.4	21.9	21.5	20.9
December	25.5	25.6	25.5	24.9	23.5	21.3	19.8	18.8	18.1	17.5	17.0	16.4

Table-18
Mean sunshine hours at Kolkata

LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.0	0.4	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.5	0.4	0.0
February	0.0	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.4	0.0
March	0.0	0.0	0.4	0.8	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.4	0.2	0.0
April	0.0	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.6	0.3	0.0
May	0.0	0.3	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.4	0.1
June	0.2	0.5	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.3	0.2
July	0.2	0.3	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.5
August	0.2	0.3	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.3	0.2
September	0.8	0.3	0.5	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.3	0.0
October	0.0	0.2	0.5	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.5	0.3	0.0
November	0.0	0.5	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.5	0.2	0.0
December	0.0	0.2	0.4	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.0	0.0

Table-19
Mean hourly air temperature(⁰C) at Bhavnagar

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	19.0	18.5	17.9	17.4	16.9	16.5	16.1	16.0	18.0	20.3	22.6	24.5
February	21.5	20.9	20.2	19.6	19.1	18.6	18.1	18.2	20.9	23.2	25.6	27.4
March	25.7	25.1	24.5	23.9	23.2	22.6	22.1	22.7	25.4	27.8	30.0	31.7
April	29.4	28.7	27.9	27.3	26.5	25.9	25.5	26.9	29.4	31.8	33.8	35.0
May	31.4	30.7	30.0	29.3	28.7	28.1	28.1	29.5	31.7	33.5	35.4	36.8
June	30.5	30.1	29.7	29.4	29.1	28.8	28.9	29.7	31.3	32.3	33.6	34.6
July	28.4	28.2	28.1	27.9	27.8	27.6	27.7	28.2	29.4	30.0	30.9	31.6
August	27.8	27.6	27.3	27.2	27.1	26.9	26.9	27.3	28.5	29.2	30.1	30.9
September	27.7	27.4	27.0	26.8	26.5	26.3	26.2	26.9	28.4	29.5	30.7	31.8
October	27.2	26.7	26.3	25.9	25.5	25.1	24.7	25.9	28.5	30.3	31.9	33.1
November	23.5	22.9	22.4	21.9	21.4	21.0	20.6	21.5	24.3	26.6	28.5	29.9
December	20.1	19.4	18.9	18.3	17.9	17.5	17.2	17.3	19.6	22.0	24.3	26.1
	13	14	15	16	17	18	19	20	21	22	23	24
January	25.9	27.0	27.5	27.6	27.4	26.4	24.4	22.7	21.7	21.0	20.3	19.7
February	28.8	29.7	30.2	30.4	30.2	29.4	27.5	25.6	24.4	23.6	22.9	22.3
March	32.7	33.6	34.2	34.3	34.1	33.5	31.8	29.8	28.6	27.8	27.1	26.4
April	35.7	36.5	37.0	37.1	36.7	35.9	34.4	32.9	31.9	31.2	30.6	30.1
May	37.7	38.4	38.7	38.5	38.0	37.0	35.6	34.4	33.7	33.3	32.8	32.2
June	35.2	35.7	35.9	35.7	35.3	34.5	33.4	32.5	32.0	31.6	31.2	30.8
July	32.0	32.1	32.0	31.8	31.4	31.0	30.4	29.8	29.5	29.1	28.9	28.6
August	31.4	31.7	31.7	31.4	31.0	30.5	29.8	29.2	28.9	28.5	28.3	28.0
September	32.4	32.7	32.8	32.6	32.1	31.3	30.2	29.5	29.0	28.6	28.3	28.0
October	33.9	34.4	34.7	34.6	34.2	33.2	31.4	30.1	29.2	28.6	28.0	27.5
November	31.0	31.7	32.1	32.1	31.7	30.4	28.3	26.9	25.9	25.2	24.5	23.9
December	27.4	28.3	28.9	29.0	28.7	27.2	25.0	23.5	22.6	21.9	21.2	20.6

Table-20
Mean hourly air temperature(°C) at Nagpur

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	17.4	16.9	16.4	16.0	15.6	15.2	14.8	15.7	19.3	22.2	24.5	26.2
February	19.9	19.2	18.6	18.1	17.7	17.3	16.9	18.5	22.0	24.8	27.0	28.6
March	24.2	23.5	23.0	22.5	21.9	21.4	21.3	23.9	27.2	29.8	31.7	33.1
April	29.0	28.3	27.6	27.1	26.7	26.2	26.6	29.6	32.6	34.6	36.4	37.6
May	31.9	31.4	30.9	30.5	30.1	29.7	30.6	32.9	35.2	36.9	38.4	39.6
June	28.9	28.5	28.2	28.1	27.9	27.7	28.1	29.2	30.5	31.8	33.0	34.0
July	26.1	25.9	25.8	25.7	25.6	25.5	25.7	26.3	27.2	28.0	28.8	29.4
August	25.3	25.2	25.1	25.0	25.0	24.9	25.0	25.5	26.5	27.2	27.9	28.5
September	25.2	25.0	24.8	24.7	24.5	24.4	24.6	25.8	27.3	28.6	29.7	30.5
October	22.7	22.3	22.1	21.8	21.6	21.3	21.4	23.5	26.2	28.4	30.0	30.9
November	19.1	18.7	18.3	18.0	17.7	17.4	17.3	19.4	22.7	25.4	27.4	28.7
December	16.1	15.6	15.1	14.8	14.4	14.1	13.9	15.3	19.0	22.2	24.4	25.9
	13	14	15	16	17	18	19	20	21	22	23	24
January	27.3	27.9	28.2	28.1	27.0	24.3	22.3	21.0	20.0	19.2	18.6	18.0
February	29.7	30.4	30.7	30.7	30.1	27.9	25.6	24.2	23.0	22.2	21.4	20.7
March	34.0	34.6	34.9	34.9	34.4	32.8	30.3	28.7	27.6	26.7	25.9	25.1
April	38.6	39.1	39.4	39.3	38.9	37.7	35.3	33.5	32.4	31.5	30.6	29.7
May	40.5	41.0	41.1	40.8	40.4	39.2	37.3	35.8	34.8	34.0	33.3	32.6
June	34.8	35.2	35.0	34.7	33.9	33.0	32.0	31.2	30.5	29.9	29.4	29.0
July	29.7	30.0	29.9	29.8	29.5	29.1	28.5	27.8	27.3	26.9	26.6	26.2
August	28.9	28.9	28.9	28.7	28.3	27.8	27.2	26.6	26.3	26.0	25.7	25.5
September	30.9	31.1	30.8	30.4	29.8	28.8	27.7	27.0	26.5	26.1	25.8	25.4
October	31.5	31.7	31.6	31.1	29.7	27.5	25.9	24.9	24.1	23.6	23.2	22.9
November	29.3	29.5	29.4	28.9	27.0	24.4	22.9	21.7	20.9	20.3	19.9	19.4
December	26.7	27.0	27.1	26.7	25.0	22.1	20.4	19.1	18.2	17.5	17.0	16.5

Table-21
Mean hourly air temperature(°C) at MUMBAI

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	20.6	20.0	19.6	19.4	19.1	18.9	18.7	18.9	22.1	25.6	28.0	29.6
February	21.4	21.0	20.7	20.5	20.3	20.0	19.8	20.0	23.3	26.4	28.4	29.7
March	24.0	23.7	23.3	23.0	22.7	22.4	22.1	22.9	26.1	28.5	30.3	31.1
April	26.8	26.5	26.1	25.8	25.5	25.2	25.1	26.3	28.7	30.3	31.4	31.7
May	28.7	28.6	28.3	28.2	28.0	27.8	27.9	28.9	30.2	31.2	31.9	32.3
June	28.4	28.2	28.1	28.1	28.0	27.9	27.9	28.3	29.2	29.7	30.2	30.7
July	27.4	27.3	27.2	27.1	27.1	27.0	27.1	27.3	27.9	28.2	28.7	29.0
August	26.7	26.6	26.5	26.5	26.5	26.4	26.4	26.6	27.3	27.7	28.1	28.5
September	26.4	26.2	26.1	26.0	25.9	25.8	25.8	26.2	27.3	28.0	28.7	29.3
October	25.6	25.3	25.1	24.9	24.7	24.5	24.4	25.1	27.4	29.3	30.7	31.6
November	23.4	23.0	22.7	22.5	22.3	22.1	22.0	22.9	26.1	28.7	30.6	31.9
December	21.1	20.7	20.3	20.1	20.0	19.8	19.8	20.3	23.5	26.5	28.8	30.4
	13	14	15	16	17	18	19	20	21	22	23	24
January	30.2	30.0	29.6	29.0	28.1	26.7	25.5	24.9	24.3	23.3	22.2	21.3
February	30.0	30.0	29.7	29.1	28.5	27.3	26.0	25.4	24.8	24.0	23.0	22.1
March	31.2	31.1	30.9	30.5	29.9	29.0	27.8	27.1	26.5	25.9	25.2	24.6
April	31.7	31.7	31.6	31.3	30.8	30.1	29.1	28.6	28.2	27.9	27.6	27.1
May	32.4	32.4	32.2	32.0	31.6	31.0	30.2	29.8	29.5	29.4	29.2	28.9
June	30.9	30.9	30.9	30.6	30.4	29.9	29.4	29.1	28.9	28.7	28.6	28.4
July	29.1	29.1	29.0	28.9	28.7	28.4	28.1	27.9	27.7	27.7	27.6	27.4
August	28.7	28.7	28.7	28.5	28.2	27.9	27.6	27.3	27.1	27.0	26.9	26.8
September	29.5	29.6	29.5	29.3	28.9	28.3	27.9	27.6	27.3	27.1	26.9	26.6
October	31.9	31.9	31.7	31.2	30.5	29.4	28.9	28.4	27.9	27.3	26.8	26.2
November	32.4	32.3	31.9	31.3	30.3	28.7	28.1	27.6	26.9	26.0	25.0	24.2
December	31.2	31.3	30.8	30.0	28.9	27.2	26.2	25.6	24.8	23.7	22.5	21.6

Table-22
Mean sunshine hour at MUMBAI

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.0	
February	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.3	0.0	
March	0.0	0.3	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.3	0.0	
April	0.0	0.3	0.8	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.4	0.2	
May	0.0	0.4	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.4	0.1	
June	0.5	0.3	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.4	0.0	
July	0.0	0.2	0.4	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.4	0.2	0.0	
August	0.0	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.0	
September	0.0	0.3	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.3	0.2	
October	0.0	0.2	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.0	
November	0.0	0.2	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.3	0.2	
December	0.0	0.2	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.0	

Table-23
Mean hourly air temperature(⁰C) at Pune

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	15.2	14.5	13.9	13.4	12.9	12.5	12.1	12.6	17.5	21.7	24.3	26.2
February	16.9	16.1	15.4	14.7	14.2	13.7	13.3	14.2	19.7	23.8	26.2	28.1
March	20.6	19.6	18.9	18.1	17.5	17.0	16.6	18.9	24.4	28.0	30.5	32.2
April	24.0	23.2	22.5	21.9	21.3	20.9	20.8	24.1	28.0	30.8	33.1	34.8
May	25.1	24.7	24.3	24.0	23.8	23.5	23.9	26.0	28.3	30.3	32.2	33.7
June	24.2	24.1	24.0	23.9	23.9	23.8	24.1	25.0	26.2	27.2	28.2	29.0
July	23.1	23.1	23.0	23.0	23.0	23.0	23.2	23.9	24.8	25.4	26.0	26.5
August	22.5	22.5	22.4	22.4	22.4	22.4	22.5	23.2	24.2	24.9	25.5	26.0
September	22.2	22.1	21.9	21.9	21.8	21.7	21.7	22.9	24.4	25.7	26.8	27.6
October	21.0	20.6	20.2	20.0	19.7	19.5	19.4	21.3	24.3	26.6	28.2	29.4
November	18.0	17.6	17.1	16.7	16.4	16.1	15.9	17.8	21.9	24.7	26.7	28.0
December	14.7	14.1	13.6	13.2	12.8	12.4	12.1	13.0	18.0	21.7	24.2	25.8
	13	14	15	16	17	18	19	20	21	22	23	24
January	27.5	28.4	28.9	28.8	28.2	26.4	23.0	21.1	19.5	18.1	17.0	16.1
February	29.3	30.2	30.7	30.5	29.9	28.5	25.7	23.9	22.2	20.6	19.2	18.0
March	33.4	34.2	34.6	34.4	33.7	32.2	29.8	27.9	26.4	24.7	23.2	21.9
April	35.9	36.4	36.4	36.1	35.1	33.4	31.3	29.7	28.4	27.3	26.2	25.2
May	34.8	35.3	35.4	34.8	33.7	32.0	30.3	28.8	27.7	26.9	26.3	25.7
June	29.5	29.7	29.5	28.9	28.2	27.1	26.2	25.5	25.1	24.8	24.6	24.4
July	26.6	26.8	26.5	26.1	25.6	24.9	24.4	23.9	23.6	23.5	23.4	23.2
August	26.2	26.2	26.0	25.5	25.1	24.4	23.8	23.3	23.1	22.9	22.8	22.6
September	28.1	28.2	28.0	27.4	26.4	25.3	24.3	23.8	23.3	23.0	22.7	22.5
October	30.1	30.5	30.4	30.0	29.0	27.1	25.0	24.0	23.2	22.5	21.9	21.4
November	28.9	29.3	29.6	29.4	28.7	26.1	23.2	21.9	20.8	20.0	19.2	18.6
December	26.8	27.4	27.7	27.6	27.0	24.6	21.0	19.2	17.9	16.9	16.1	15.3

Table-24
Mean sunshine hours at Pune

Time in LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.2	0.1
February	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.2	0.0
March	0.1	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.2	0.9
April	0.1	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.4	0.4
May	0.1	0.6	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.6	0.2
June	0.1	0.5	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.1
July	0.1	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.3	0.4
August	0.0	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.3	0.3
September	0.0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.3	0.2
October	0.2	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.3	0.0
November	0.0	0.2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.2	0.0
December	0.0	0.1	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.1	0.0

Table –25
Mean hourly air temperature(0C) at Hyderabad

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	19.4	18.7	18.2	17.7	17.3	16.9	16.6	17.4	20.7	23.0	24.9	26.3
February	22.1	21.3	20.6	20.0	19.5	19.1	18.8	19.7	23.0	25.6	27.8	29.3
March	25.7	24.9	24.2	23.6	23.1	22.6	22.5	24.0	27.1	29.5	31.7	33.2
April	28.3	27.6	27.0	26.5	25.9	25.5	25.6	27.1	29.5	31.6	33.5	34.9
May	29.9	29.3	28.8	28.4	27.9	27.5	27.7	28.8	30.9	32.8	34.5	35.9
June	27.3	26.8	26.3	26.0	25.6	25.3	25.4	25.9	27.3	28.5	29.9	31.1
July	25.3	24.9	24.6	24.3	24.1	23.9	23.9	24.3	25.2	26.1	27.1	28.1
August	24.5	24.2	23.9	23.6	23.4	23.2	23.1	23.5	24.5	25.4	26.3	27.2
September	24.8	24.5	24.2	23.9	23.7	23.5	23.4	24.1	25.6	26.7	27.8	28.7
October	23.5	23.1	22.8	22.5	22.2	22.0	22.0	23.3	25.5	26.9	28.1	28.9
November	21.1	20.6	20.3	19.9	19.6	19.4	19.3	20.8	23.6	25.2	26.5	27.4
December	18.9	18.3	17.8	17.4	17.0	16.7	16.5	17.7	21.0	23.1	24.7	25.7
	13	14	15	16	17	18	19	20	21	22	23	24
January	27.2	27.8	28.1	28.0	27.5	26.1	24.7	23.6	22.7	21.8	20.9	20.1
February	30.3	31.1	31.3	31.4	30.9	29.8	28.1	26.7	25.6	24.7	23.7	22.9
March	34.2	34.9	35.2	35.1	34.5	33.4	31.9	30.5	29.5	28.5	27.5	26.7
April	35.9	36.5	36.8	36.6	36.0	35.0	33.6	32.4	31.4	30.7	29.8	29.0
May	37.0	37.8	38.1	37.9	37.4	36.5	35.1	33.8	32.8	31.8	31.1	30.4
June	32.0	32.6	32.9	32.8	32.2	31.5	30.6	29.8	29.2	28.7	28.2	27.7
July	28.8	29.3	29.5	29.4	29.1	28.4	27.7	27.1	26.6	26.2	25.9	25.5
August	27.9	28.3	28.4	28.3	28.0	27.4	26.7	26.2	25.8	25.4	25.1	24.7
September	29.3	29.8	29.8	29.5	29.0	28.1	27.3	26.7	26.2	25.8	25.4	25.0
October	29.4	29.6	29.6	29.3	28.7	27.7	26.8	26.0	25.4	24.9	24.3	23.8
November	28.0	28.3	28.4	28.1	27.5	26.2	25.2	24.3	23.6	22.9	22.2	21.6
December	26.5	27.0	27.2	27.0	26.2	24.9	23.7	22.7	21.8	21.0	20.1	19.4

Table-26
Mean sunshine hours at Hyderabad

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.2	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.0	
February	0.0	0.3	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.1	
March	0.0	0.3	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.6	0.3	0.7	
April	0.2	0.4	0.8	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.7	0.4	0.2	
May	0.4	0.5	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.5	0.3	
June	0.2	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.5	0.4	
July	0.2	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.4	0.2	
August	0.1	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.4	0.2	
September	0.0	0.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.3	0.3	
October	0.0	0.3	0.7	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.2	0.1	
November	0.1	0.2	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.2	0.6	
December	0.0	0.2	0.8	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.7	0.2	0.0	

Table-27
Mean hourly air temperature (⁰C) at Visakhapatnam

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	22.2	22.0	21.7	21.5	21.3	21.1	21.0	21.8	24.2	25.6	26.3	26.8
February	24.0	23.7	23.4	23.2	22.9	22.8	22.7	23.7	26.0	27.3	28.0	28.4
March	26.1	25.9	25.6	25.4	25.1	25.0	25.0	26.1	28.1	28.9	29.4	29.8
April	27.6	27.4	27.2	27.0	26.9	26.8	27.0	28.1	29.4	29.8	30.2	30.4
May	28.8	28.7	28.5	28.4	28.3	28.3	28.6	29.4	30.4	30.6	30.9	31.1
June	28.8	28.7	28.6	28.4	28.4	28.3	28.5	29.2	30.0	30.3	30.5	30.7
July	27.7	27.5	27.4	27.3	27.2	27.1	27.2	27.7	28.5	28.8	29.0	29.2
August	27.5	27.4	27.2	27.1	27.0	27.0	27.1	27.6	28.6	29.2	29.5	29.8
September	27.3	27.1	27.0	26.9	26.8	26.7	26.8	27.5	28.8	29.4	29.7	30.0
October	26.4	26.2	26.1	25.9	25.9	25.8	25.9	26.8	28.2	29.0	29.5	29.8
November	24.5	24.3	24.1	24.0	23.9	23.8	23.8	24.8	26.3	27.3	28.0	28.4
December	22.2	22.0	21.9	21.7	21.5	21.4	21.3	22.2	24.3	25.7	26.5	27.0
	13	14	15	16	17	18	19	20	21	22	23	24
January	27.0	27.0	26.8	26.4	25.6	24.7	24.3	23.9	23.6	23.2	22.9	22.5
February	28.6	28.6	28.4	27.9	27.1	26.2	25.9	25.6	25.3	25.0	24.7	24.3
March	29.9	29.9	29.7	29.2	28.6	27.9	27.6	27.4	27.2	27.0	26.8	26.4
April	30.5	30.5	30.2	29.8	29.4	28.9	28.7	28.6	28.4	28.3	28.1	27.8
May	31.2	31.2	31.0	30.7	30.3	29.9	29.6	29.5	29.4	29.3	29.2	29.0
June	30.8	30.8	30.7	30.6	30.3	29.9	29.6	29.5	29.4	29.3	29.1	28.9
July	29.5	29.5	29.4	29.2	29.0	28.8	28.6	28.4	28.3	28.2	28.0	27.8
August	29.9	29.9	29.8	29.6	29.3	28.9	28.6	28.5	28.3	28.2	28.0	27.7
September	30.0	30.0	29.8	29.4	29.1	28.6	28.2	28.0	27.9	27.8	27.6	27.4
October	29.9	29.8	29.7	29.3	28.8	28.1	27.9	27.7	27.5	27.2	27.0	26.7
November	28.6	28.6	28.4	28.0	27.2	26.5	26.2	26.0	25.7	25.5	25.1	24.7
December	27.2	27.3	27.1	26.7	25.7	24.8	24.4	24.0	23.7	23.3	22.9	22.5

Table-28
Mean sunshine hours at Visakhapatnam

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.2	0.7	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.0	
February	1.0	0.2	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.3	0.0	
March	0.0	0.2	0.6	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.6	0.2	0.0	
April	0.2	0.4	0.7	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.7	0.4	0.2	
May	0.1	0.4	0.7	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.5	0.4	
June	0.0	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.4	0.1	
July	0.2	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.6	0.5	0.3	
August	0.1	0.4	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.6	0.5	0.2	
September	0.0	0.2	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.2	0.0	
October	0.3	0.3	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.0	
November	0.5	0.2	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.2	0.0	
December	0.0	0.2	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.2	0.1	

Table-29
Mean hourly air temperature (°C) at Goa

Time in IST												
	01	02	03	04	05	06	07	08	09	10	11	12
January	22.8	22.3	21.8	21.4	21.1	20.8	20.6	20.7	23.0	25.6	28.6	30.7
February	23.6	23.0	22.5	22.1	21.7	21.3	21.0	21.2	23.7	26.4	29.2	30.9
March	25.3	24.9	24.5	24.2	23.9	23.6	23.4	23.7	26.3	28.1	29.9	30.7
April	27.2	27.0	26.7	26.5	26.3	26.0	26.0	26.7	29.0	30.1	31.2	31.8
May	28.1	27.9	27.7	27.5	27.3	27.1	27.1	28.0	29.9	30.7	31.5	32.1
June	26.5	26.5	26.4	26.3	26.2	26.1	26.2	26.5	27.7	28.0	28.5	29.0
July	25.8	25.7	25.6	25.6	25.6	25.6	25.6	25.8	26.8	27.0	27.4	27.8
August	25.3	25.2	25.2	25.1	25.0	25.0	25.0	25.2	26.4	26.7	27.2	27.7
September	25.4	25.3	25.1	25.0	24.9	24.8	24.8	25.1	26.7	27.4	28.1	28.9
October	25.5	25.3	25.1	25.0	24.9	24.8	24.8	25.1	27.0	28.3	29.7	30.6
November	24.7	24.4	24.0	23.8	23.6	23.4	23.2	23.7	26.1	28.1	30.2	31.6
December	23.2	22.8	22.4	22.1	21.9	21.6	21.4	21.7	24.1	26.4	28.7	30.4
	13	14	15	16	17	18	19	20	21	22	23	24
January	31.5	31.6	31.1	30.6	29.7	28.1	26.9	26.1	25.3	24.8	24.2	23.4
February	31.1	31.2	30.8	30.4	29.6	28.2	27.2	26.5	25.9	25.4	24.8	24.1
March	31.0	31.0	30.9	30.6	30.0	28.8	27.9	27.4	27.0	26.6	26.2	25.7
April	31.9	32.0	31.8	31.4	30.8	29.9	29.1	28.7	28.4	28.2	27.9	27.5
May	32.2	32.3	32.1	31.8	31.2	30.4	29.7	29.3	29.0	28.8	28.6	28.2
June	29.1	29.1	29.1	28.7	28.4	28.0	27.6	27.3	27.0	26.9	26.7	26.5
July	27.9	27.9	27.9	27.6	27.3	27.0	26.6	26.4	26.2	26.1	26.0	25.8
August	27.8	27.8	27.8	27.6	27.2	26.7	26.3	26.0	25.8	25.7	25.5	25.3
September	29.0	29.0	28.9	28.5	28.0	27.3	26.8	26.4	26.1	26.0	25.8	25.5
October	30.9	30.9	30.5	30.0	29.1	28.1	27.4	27.0	26.6	26.4	26.1	25.7
November	32.2	32.4	32.0	31.4	30.1	28.7	27.8	27.2	26.6	26.1	25.6	25.1
December	31.4	31.9	31.6	31.2	30.0	28.2	27.0	26.3	25.5	24.9	24.3	23.6

Table-30
Mean sunshine hours at Goa

	06	07	08	09	10	11	12	13	14	15	16	17	18	19 LAT
January	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.2	1.0
February	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.3	0.0
March	0.0	0.1	0.6	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.7	0.2	0.0
April	0.0	0.3	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.4	0.1
May	0.0	0.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.5	0.2
June	0.1	0.3	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.2
July	0.0	0.3	0.4	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.4	0.1
August	0.0	0.2	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.2
September	0.0	0.1	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.3	0.1
October	0.1	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.0
November	0.0	0.2	0.8	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.3	0.0
December	0.0	0.2	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.2	0.0

Table-31
Mean hourly air temperature(⁰C) at Chennai

Time in IST												
	01	02	03	04	05	06	07	08	09	10	11	12
January	22.6	22.3	22.0	21.8	21.7	21.5	21.4	22.4	24.3	26.0	27.2	28.0
February	23.7	23.4	23.1	22.9	22.7	22.6	22.6	23.8	25.9	27.7	29.1	29.9
March	25.5	25.2	24.9	24.7	24.5	24.3	24.5	26.0	28.1	29.8	31.3	32.3
April	27.9	27.6	27.3	27.1	26.9	26.8	27.2	28.8	30.6	32.2	33.5	34.4
May	29.3	29.1	28.9	28.7	28.5	28.4	28.9	30.3	32.0	33.4	34.7	35.7
June	29.1	28.9	28.8	28.6	28.5	28.3	28.8	30.0	31.4	32.6	33.8	34.9
July	28.2	28.0	27.8	27.7	27.5	27.3	27.6	28.6	29.9	31.1	32.2	33.3
August	27.4	27.2	27.0	26.8	26.7	26.6	26.8	27.7	29.0	30.1	31.2	32.2
September	27.3	27.1	26.9	26.6	26.5	26.3	26.6	27.6	29.1	30.3	31.5	32.5
October	26.1	25.8	25.6	25.4	25.3	25.2	25.4	26.5	27.9	29.0	29.8	30.5
November	24.6	24.5	24.2	24.1	24.0	23.9	24.1	25.1	26.4	27.4	28.1	28.6
December	23.3	23.0	22.8	22.6	22.5	22.3	22.4	23.4	25.1	26.4	27.1	27.7
	13	14	15	16	17	18	19	20	21	22	23	24
January	28.4	28.4	28.2	27.7	27.0	25.9	25.3	24.7	24.2	23.8	23.3	22.8
February	30.3	30.4	30.1	29.5	28.6	27.3	26.4	25.9	25.5	25.1	24.7	24.1
March	32.7	32.6	32.2	31.5	30.5	29.0	28.1	27.6	27.1	26.8	26.5	25.9
April	34.6	34.4	33.8	33.0	31.9	30.6	29.7	29.4	29.0	28.8	28.6	28.2
May	36.1	36.0	35.4	34.4	33.2	31.8	30.9	30.5	30.2	30.0	29.8	29.5
June	35.6	35.8	35.6	34.7	33.6	32.2	31.0	30.3	29.9	29.7	29.5	29.2
July	33.8	34.2	34.1	33.4	32.4	31.3	30.3	29.6	29.2	28.9	28.6	28.4
August	32.9	33.2	33.2	32.7	31.8	30.7	29.6	29.0	28.5	28.2	27.9	27.6
September	33.0	33.0	32.8	32.0	31.0	29.9	29.1	28.7	28.3	28.1	27.9	27.5
October	30.7	30.7	30.5	30.0	29.2	28.3	27.8	27.4	27.1	26.8	26.6	26.2
November	28.8	28.7	28.5	28.2	27.5	26.8	26.3	25.9	25.6	25.3	25.1	24.7
December	27.9	27.9	27.7	27.3	26.7	25.9	25.4	24.9	24.5	24.2	23.9	23.5

Table-32
Mean sunshine hour at Chennai

Time in LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.3	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.2	0.1
February	0.1	0.2	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.3	0.2
March	0.0	0.2	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.2	0.0
April	0.0	0.5	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.4	0.0
May	0.1	0.4	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.8	0.4	0.0
June	0.1	0.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.4	0.0
July	0.3	0.5	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.6	0.3	0.0
August	0.1	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.5	0.3	0.3
September	0.2	0.2	0.7	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.3	0.0
October	0.0	0.2	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.2	0.0
November	0.0	0.2	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.3	0.0
December	0.0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.2	0.1

Table-33
Mean hourly air temperature(⁰C) at Bangalore

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	17.3	17.0	16.6	16.3	16.1	15.8	15.6	16.4	18.9	21.5	23.5	25.0
February	19.6	19.0	18.5	18.1	17.7	17.3	17.1	18.2	21.3	23.9	25.9	27.3
March	22.3	21.7	21.1	20.6	20.2	19.8	19.7	21.3	24.3	26.6	28.5	30.0
April	24.0	23.5	23.0	22.6	22.3	21.9	22.1	23.5	25.6	27.4	29.2	30.8
May	23.8	23.4	23.1	22.8	22.5	22.3	22.5	23.5	25.3	26.8	28.3	29.6
June	22.1	21.8	21.6	21.4	21.2	21.1	21.3	22.1	23.4	24.6	25.8	26.9
July	21.5	21.2	21.0	20.8	20.7	20.5	20.6	21.1	22.3	23.5	24.7	25.8
August	21.3	21.1	20.9	20.8	20.7	20.4	20.5	20.8	21.9	23.1	24.2	25.2
September	21.7	21.4	21.2	21.0	20.8	20.5	20.6	21.1	22.5	23.7	24.9	25.9
October	21.0	20.8	20.6	20.4	20.3	20.1	20.2	21.0	22.6	24.0	25.1	26.0
November	19.5	19.3	19.1	18.9	18.7	18.5	18.5	19.4	21.3	22.9	24.2	25.1
December	17.6	17.4	17.2	17.0	16.8	16.6	16.6	17.2	19.1	21.1	22.7	23.8
	13	14	15	16	17	18	19	20	21	22	23	24
January	25.9	26.5	26.7	26.5	25.9	24.2	22.3	20.9	19.9	19.1	18.4	17.8
February	28.3	29.0	29.3	29.3	28.8	27.5	25.3	23.9	22.8	21.8	21.0	20.2
March	31.0	31.6	31.9	31.8	31.3	30.1	28.0	26.6	25.6	24.6	23.8	23.1
April	31.8	32.5	32.7	32.5	32.0	30.9	29.1	27.8	26.9	26.1	25.4	24.6
May	30.6	31.3	31.5	31.1	30.4	29.4	28.0	26.9	26.1	25.4	24.8	24.2
June	27.7	28.1	28.2	27.9	27.2	26.3	25.3	24.5	23.8	23.3	22.9	22.4
July	26.5	26.9	27.1	26.8	26.2	25.4	24.4	23.7	23.1	22.6	22.2	21.7
August	25.9	26.3	26.5	26.2	25.7	24.8	23.8	23.1	22.7	22.3	22.0	21.5
September	26.6	26.9	26.9	26.7	26.3	25.6	24.6	23.9	23.3	22.9	22.5	21.9
October	26.5	26.7	26.7	26.3	25.6	24.5	23.7	23.0	22.5	22.1	21.7	21.2
November	25.6	25.8	25.8	25.5	24.9	23.5	22.5	21.8	21.1	20.7	20.2	19.7
December	24.5	24.9	25.0	24.8	24.1	22.6	21.2	20.3	19.5	18.9	18.4	17.9

Table-34
Mean sunshine hours at Bangalore

Time in LAT

	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.3	0.1
February	0.0	0.3	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.3	0.0
March	0.0	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.3	0.0
April	0.0	0.3	0.8	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.5	0.0
May	0.1	0.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.4	0.0
June	0.0	0.4	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.4	0.3
July	0.0	0.3	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.3	0.1
August	0.0	0.3	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.4	0.0
September	0.0	0.2	0.5	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.3	1.0
October	0.0	0.2	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.7	0.7	0.3	0.0
November	0.0	0.2	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.7	0.2	0.0
December	0.0	0.2	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.2	0.0

Table-35
Mean hourly air temperature(⁰C) at Port Blair

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	25.0	24.8	24.7	24.6	24.5	24.4	24.6	25.3	26.7	27.0	27.2	27.6
February	24.8	24.6	24.4	24.2	24.1	24.0	24.3	25.5	27.2	27.6	28.0	28.6
March	25.4	25.2	25.0	24.8	24.7	24.6	25.0	26.4	28.2	28.6	28.9	29.4
April	26.7	26.5	26.4	26.2	26.1	26.1	26.8	28.0	29.6	29.9	30.1	30.3
May	26.8	26.7	26.6	26.6	26.5	26.6	27.0	27.7	28.8	28.9	29.1	29.2
June	26.8	26.7	26.7	26.7	26.7	26.7	27.0	27.3	28.0	28.1	28.2	28.4
July	26.3	26.2	26.2	26.2	26.1	26.2	26.4	26.7	27.4	27.6	27.7	28.0
August	26.1	26.1	26.0	26.0	26.0	26.1	26.2	26.6	27.3	27.4	27.6	27.7
September	25.7	25.6	25.6	25.5	25.5	25.6	25.8	26.1	27.0	27.0	27.2	27.3
October	25.7	25.6	25.6	25.5	25.5	25.5	25.7	26.2	27.4	27.5	27.6	27.7
November	25.9	25.8	25.7	25.7	25.7	25.7	25.9	26.5	27.5	27.6	27.7	27.9
December	25.9	25.8	25.7	25.7	25.6	25.6	25.8	26.3	27.3	27.6	27.7	27.9
	13	14	15	16	17	18	19	20	21	22	23	24
January	27.6	27.6	27.5	27.3	26.9	26.3	26.1	26.0	25.9	25.7	25.6	25.2
February	28.5	28.6	28.5	28.3	27.8	27.0	26.6	26.4	26.1	26.0	25.7	25.0
March	29.4	29.4	29.3	29.0	28.5	27.7	27.4	27.1	26.8	26.5	26.3	25.7
April	30.2	30.2	30.0	29.8	29.4	28.7	28.4	28.2	27.9	27.7	27.4	26.9
May	29.1	28.9	28.8	28.5	28.2	27.8	27.7	27.5	27.4	27.2	27.1	26.9
June	28.4	28.3	28.2	28.1	27.8	27.5	27.3	27.2	27.2	27.1	27.0	26.8
July	27.9	27.9	27.7	27.6	27.4	27.0	26.9	26.8	26.6	26.6	26.5	26.3
August	27.7	27.7	27.5	27.4	27.2	26.9	26.7	26.6	26.5	26.4	26.3	26.2
September	27.2	27.2	27.0	26.9	26.7	26.3	26.2	26.1	26.0	26.0	25.9	25.7
October	27.6	27.5	27.4	27.2	27.0	26.6	26.5	26.4	26.3	26.3	26.2	25.9
November	27.9	27.6	27.5	27.3	26.9	26.5	26.5	26.5	26.4	26.3	26.2	25.9
December	27.9	27.8	27.6	27.3	27.0	26.6	26.5	26.5	26.4	26.3	26.2	26.0

Table-36
Mean sunshine hours at Port Blair

Time in LAT	06	07	08	09	10	11	12	13	14	15	16	17	18	19
January	0.0	0.2	0.7	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.2	0.0
February	0.1	0.3	0.8	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.3	0.0
March	0.0	0.2	0.6	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.6	0.2	0.0
April	0.0	0.3	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.3	0.6
May	0.0	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.3	0.1
June	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.3	0.1
July	0.0	0.3	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.3	0.1
August	0.0	0.3	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.0
September	0.0	0.2	0.5	0.7	0.7	0.8	0.7	0.7	0.7	0.6	0.6	0.4	0.3	0.0
October	0.2	0.3	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.3	0.0
November	0.0	0.2	0.7	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.7	0.2	0.0
December	0.0	0.2	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.3	0.0

Table-37
Mean hourly air temperature (°C)at Minicoy

Time in IST

	01	02	03	04	05	06	07	08	09	10	11	12
January	26.0	25.8	25.6	25.5	25.4	25.4	25.4	25.9	27.4	28.6	29.3	29.9
February	26.3	26.1	25.9	25.8	25.7	25.7	25.7	26.2	27.7	29.0	29.8	30.3
March	27.1	27.0	26.8	26.7	26.6	26.6	26.6	27.4	28.9	29.9	30.7	31.2
April	28.2	28.1	28.0	27.9	27.8	27.8	27.8	28.7	30.1	30.8	31.3	31.8
May	28.4	28.3	28.2	28.1	28.0	28.0	28.0	28.7	30.0	30.5	31.1	31.4
June	27.4	27.4	27.3	27.3	27.2	27.2	27.3	27.6	28.7	29.1	29.5	29.9
July	27.0	26.9	26.9	26.8	26.8	26.8	26.8	27.2	28.1	28.6	29.2	29.6
August	27.0	26.9	26.8	26.7	26.7	26.7	26.7	27.1	28.1	28.6	29.1	29.5
September	27.0	26.9	26.8	26.8	26.8	26.7	26.7	27.2	28.2	28.9	29.4	29.8
October	26.7	26.6	26.5	26.5	26.4	26.4	26.5	27.1	28.1	28.9	29.4	29.7
November	26.6	26.4	26.3	26.3	26.2	26.2	26.2	26.9	28.2	29.0	29.5	29.8
December	26.4	26.2	26.1	25.9	25.8	25.8	25.8	26.5	28.0	29.0	29.7	30.2
	13	14	15	16	17	18	19	20	21	22	23	24
January	30.1	30.1	30.0	29.6	28.9	28.3	27.7	27.3	27.0	26.8	26.6	26.2
February	30.4	30.4	30.4	30.1	29.4	28.8	28.2	27.7	27.5	27.2	27.0	26.5
March	31.4	31.4	31.3	31.0	30.5	29.7	29.1	28.6	28.2	28.0	27.7	27.4
April	31.9	31.9	31.8	31.6	31.1	30.3	29.7	29.3	29.1	28.9	28.7	28.4
May	31.5	31.5	31.4	31.1	30.7	30.0	29.5	29.2	28.9	28.8	28.7	28.5
June	29.9	29.9	29.8	29.5	29.1	28.6	28.1	27.9	27.8	27.7	27.6	27.5
July	29.8	29.8	29.6	29.3	28.9	28.3	27.8	27.6	27.4	27.3	27.3	27.1
August	29.6	29.6	29.5	29.4	29.0	28.3	27.8	27.5	27.4	27.3	27.2	27.0
September	29.8	29.8	29.7	29.5	29.0	28.3	27.8	27.6	27.4	27.3	27.2	27.1
October	29.8	29.8	29.7	29.6	29.0	28.3	27.8	27.5	27.3	27.2	27.0	26.8
November	29.9	29.9	29.7	29.4	28.8	28.2	27.7	27.4	27.2	27.1	27.0	26.7
December	30.3	30.3	30.1	29.6	28.9	28.3	27.7	27.4	27.1	26.9	26.8	26.5

Table-38
Mean sunshine hours at Minicoy

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.2	0.0	
February	0.2	0.3	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.3	0.0	
March	0.0	0.3	0.7	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.3	0.0	
April	0.5	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.4	0.0	
May	0.0	0.4	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.5	0.0	
June	0.0	0.4	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.4	0.2	
July	0.0	0.4	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.4	1.0	
August	0.0	0.4	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.4	0.2	
September	0.0	0.2	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.3	0.2	
October	0.0	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.3	1.0	
November	0.3	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.3	0.4	
December	0.1	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.3	0.4	

Table-39
Hourly Net Total Radiant Energy (MJ.m⁻²) at Thiruvananthapuram

	1	2	3	4	5	6	7	8	9	10	11	12	LAT
January	-0.18	-0.18	-0.17	-0.17	-0.17	-0.17	-0.11	0.18	0.54	0.83	0.99	1.11	
February	-0.20	-0.20	-0.20	-0.19	-0.19	-0.18	-0.08	0.25	0.66	0.96	1.15	1.32	
March	-0.18	-0.18	-0.18	-0.18	-0.17	-0.17	-0.05	0.32	0.74	1.03	1.21	1.54	
April	-0.13	-0.13	-0.13	-0.13	-0.13	-0.12	0.01	0.38	0.79	1.03	1.31	1.41	
May	-0.11	-0.11	-0.11	-0.11	-0.10	-0.09	0.05	0.39	0.73	0.97	1.11	1.24	
June	-0.08	-0.07	-0.07	-0.06	-0.06	-0.05	0.07	0.32	0.64	0.87	1.01	1.14	
July	-0.09	-0.09	-0.08	-0.08	-0.08	-0.07	0.05	0.33	0.64	0.88	1.06	1.20	
August	-0.09	-0.08	-0.08	-0.08	0.07	-0.07	0.05	0.33	0.67	0.90	1.03	1.14	
September	-0.12	-0.12	-0.12	-0.11	-0.11	-0.11	0.02	0.37	0.78	1.02	1.20	1.40	
October	-0.09	-0.08	-0.07	-0.07	-0.07	-0.07	0.01	0.28	0.63	0.88	1.06	1.24	
November	-0.10	-0.10	-0.10	-0.09	-0.09	-0.09	-0.04	0.20	0.56	0.85	1.15	1.13	
December	-0.15	-0.15	-0.15	-0.15	-0.15	-0.14	-0.09	0.17	0.54	0.85	1.04	1.15	
	13	14	15	16	17	18	19	20	21	22	23	24	LAT
January	1.14	1.04	0.82	0.47	0.14	-0.16	-0.22	-0.20	-0.20	-0.19	-0.18	-0.18	
February	1.38	1.29	1.02	0.63	0.21	-0.16	-0.24	-0.23	-0.22	-0.21	-0.21	-0.21	
March	1.45	1.35	1.08	0.68	0.26	-0.10	-0.20	-0.19	-0.08	-0.07	-0.07	-0.07	
April	1.46	1.35	1.09	0.66	0.28	-0.04	-0.15	-0.14	-0.14	-0.14	-0.13	-0.12	
May	1.36	1.26	1.02	0.68	0.30	0.00	-0.13	-0.12	-0.12	-0.11	-0.11	-0.11	
June	1.14	1.05	0.87	0.61	0.31	0.02	-0.10	-0.10	-0.09	-0.09	-0.08	-0.08	
July	1.25	1.19	1.00	0.70	0.35	0.02	-0.13	-0.12	-0.12	-0.11	-0.11	-0.10	
August	1.26	1.21	1.03	0.71	0.34	0.01	-0.13	-0.12	-0.11	-0.11	-0.07	-0.10	
September	1.48	1.36	1.07	0.68	0.29	-0.05	-0.16	-0.15	-0.14	-0.14	-0.09	-0.09	
October	1.27	1.09	0.85	0.51	0.22	-0.04	-0.11	-0.10	-0.10	-0.09	-0.09	-0.09	
November	1.14	1.09	0.88	0.56	0.22	-0.07	-0.14	-0.13	-0.12	-0.12	-0.12	-0.12	
December	1.19	1.13	0.88	0.54	0.19	-0.13	-0.18	-0.18	-0.17	-0.17	-0.16	-0.16	

Table-40
Mean sunshine hours at Thiruvananthapuram

	06	07	08	09	10	11	12	13	14	15	16	17	18	19	LAT
January	0.0	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.2	0.0	
February	0.0	0.2	0.8	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.7	0.2	0.0	
March	0.0	0.2	0.7	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.8	0.6	0.2	0.0	
April	0.0	0.3	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.7	0.5	0.3	0.0	
May	0.1	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.3	0.6	
June	1.0	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.3	0.4	
July	0.0	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.3	1.0	
August	0.0	0.3	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.3	0.3	
September	0.0	0.3	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.5	0.2	0.0	
October	0.0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.2	0.3	
November	0.0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.3	0.1	
December	0.0	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.2	0.2	