

Analysis of Temperature and Humidity measurement in the SFRTI campus and four other sites of Raipur City, Chhattisgarh

Introduction

Chhattisgarh State Centre for Climate Change is a state level nodal agency, which is working in the field of climate change in the state. Presently the head office of this centre is housed in the campus of State Forest Research and Training Institute (SFRTI). SFRTI is a premier research and training institute to implement the high-level research in forestry and allied sectors as well as to ensure regular update in knowledge and skills of the staff of forest department. The campus of the institute is spread over in 63 ha, out of this 32.76 ha, area has utilized under various plantations. The major species planted are Sal, Sandal, Teak, Amla, Sisso, Neem, Kahua, Nilgiri, Khamhar, Karra, Saja, Karanj, Baheda, Guava, Aam, Bamboo, Bael, khair, Mahua. This plantation is not only ensuring greenery but also playing an important role to regulate the temperature of the campus as well.

Temperature and humidity assessment at microclimatic level in the campus as well as adjoining sites of the campus will be assessed and compared. The aim of this study is to investigate and comparison of temperature and humidity, which influence of the meteorological changes in short period of climatic variation in campus site as well as four other study microclimate sites of Raipur.

A microclimate is a local set of atmospheric conditions that differ from those in the surrounding areas, often with a slight difference but sometimes with a substantial one. The term may refer to areas as small as a few square meters or square feet (for example a garden bed or a cave) or as large as many square kilometers or square miles. Because climate is statistical, which implies spatial and temporal variation of the mean values of the describing parameters, within a region there can occur and persist over time sets of statistically distinct conditions, that is, microclimates.¹

A) Rational of study

The microclimatic study was conduct campus outdoor measurement of temperature and humidity in SFRTI campus as well as four other selected sites. In hot humid condition during the first week month of June. The outdoor temperature and relative humidity of the SFRTI campus, Mandir hasud (Ring road), Sankar nagar Chouk, Mandhar Station and Dondekhurd

were recorded every 4 hours intervals/day for a minimum of 10 days during the first week of Jun month. To study the changes in average temperature and average humidity, compare the comparative study of data obtained and the development plan for temperature control in the area. Local weather stations were installed in or close to the five monitoring areas to record external meteorological conditions.

B) Climatic condition of Raipur

Raipur has a tropical wet and dry climate, temperatures remain moderate throughout the year, except from March to June, which can be extremely hot. The temperature in April–May sometimes rises above 48 °C (118 °F). These summer months also have dry and hot winds. In summers, the temperature can also go up to 50 °C. The city receives about 1,300 millimeters (51 in) of rain, mostly in the monsoon season from late June to early October. Winters last from November to January, are mild and the lowest falls up to 13 °C, although lows can fall to 5 °C (41 °F) making it reasonably cold.³

C) About State Forest Research & Training Institute, Raipur

Research is the soul of science nature has blessed Chhattisgarh with far-flung sylvan wilderness and breathtakingly amazing wildlife and biodiversity. SFRTI is our humble tribute to the nature for the furtherance in the field of forestry research. forestry research in Chhattisgarh State endowed with 44% forest, to establish a State level forestry research and training institute foundation stone was laid in 21st March 2006 and started functioning in 17th March 2013, majestic institute building constructed in 9544 Sq mtrs was inaugurated by the Hon'ble Chief Minister, C.G. Govt. The institute is located at zero point Raipur in a lush green campus spread over a sprawling area of about 63 hectare.

1. Objectives

Present study has been done with following objectives –

- Meteorological assessment of SFRTI campus & adjoining study sites.
- Contribution of SFRTI floral diversity in temperature control.

2. Methodology :-

A multidisciplinary team of experts from Chhattisgarh State Centre for Climate Change (CSCCC) in State Forest Research and training Institute Raipur has visited in study site of

SFRTI campus and four other adjoining site of the campus. On this four site, team members of SFRTI and SCCC JRF and Field Assistant visited selected study site from 1-Jun-2018 to 10-Jun-2018 to collect the data for measuring temperature and humidity.

Temperature and humidity assessment at microclimate zone¹⁻² level within the campus as well as adjoining sites of the campus will be assessed and compared. Sites falls within the radius of 5-8 km's, and 200m away from main road proposed to collect the temperature and humidity data. The impact assessment of climate during month of June, Temperature and humidity on microclimatic conditions were assessed through established field level meteorological temporary point on the study sites. The temperature and humidity data were measured continuously on 10 day; data were collected three times in every day by using instruments such as Digital Temperature and Humidity Meter (HTC-1) in the selected location.

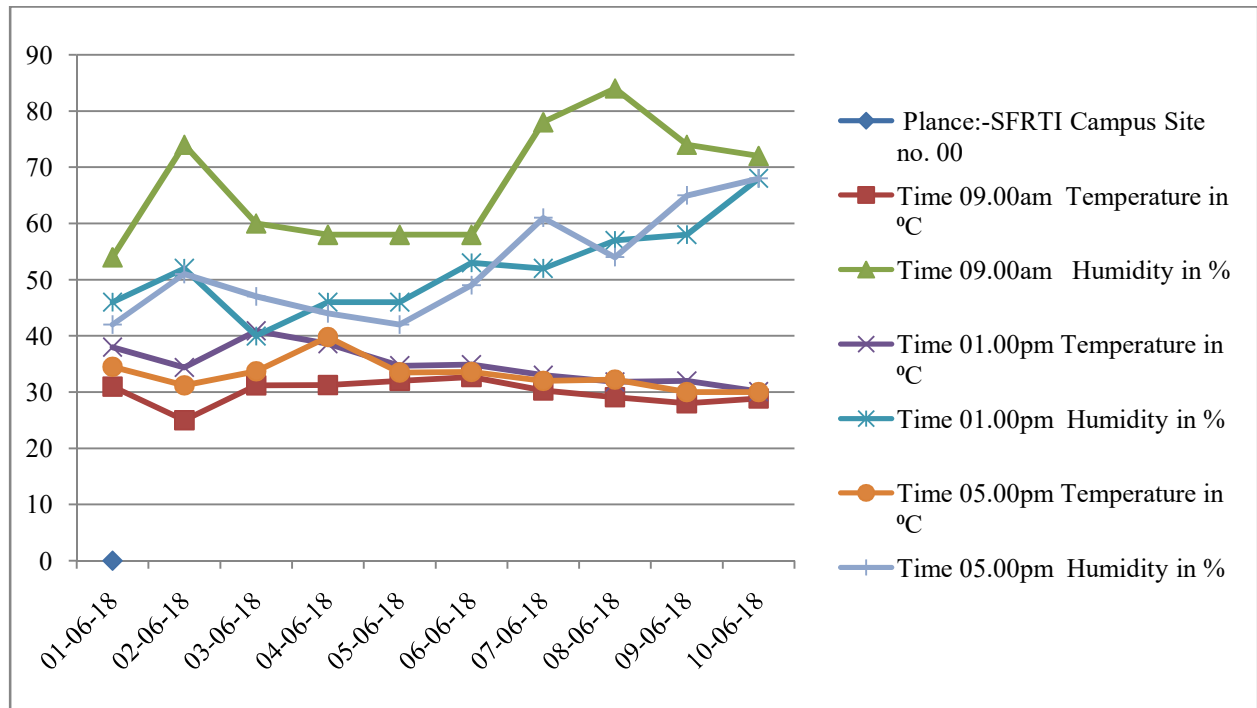
Microclimatic variations of the selected location were analyzed for hot day in month of June 2018. Following sites will be assessed and compared with the campus temperature and humidity -

- SFRTI campus
- Avanti bai chouk, Lodhipara
- Ring road no 3 triangle, Mandir Hasod
- Mandar railway station
- Bus stand chouk Donde khurd

Analysis and Results

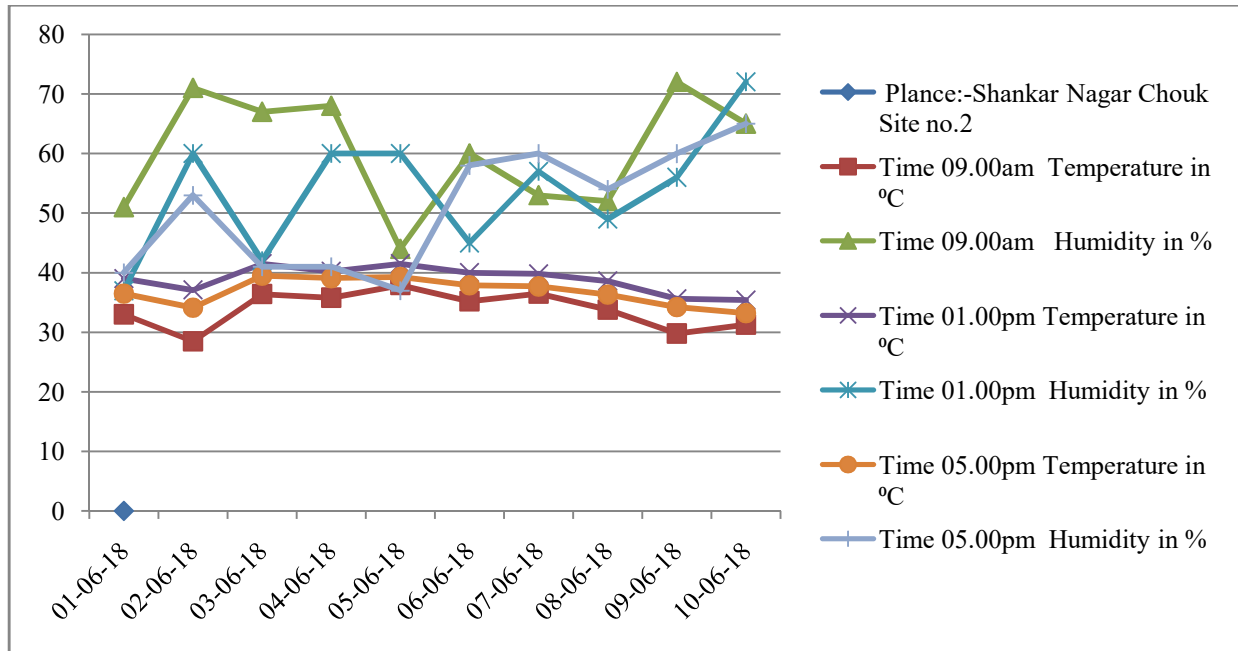
- SFRTI campus

S. No.	Date	Name of Site	Time 09.00am		Time 01.00pm		Time 05.00pm		Average Temp. (°C)	Average Hum. (%)
			Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)		
1	01-06-18	SFRTI Campus	31	54	38	46	34.5	42	34.5	47.33
2	02-06-18		25	74	34.4	52	31.2	51	30.2	59.00
3	03-06-18		31.2	60	40.9	40	33.7	47	35.3	49.00
4	04-06-18		31.3	58	38.6	46	39.8	44	36.6	49.33
5	05-06-18		32	58	34.7	46	33.5	42	33.4	48.67
6	06-06-18		32.7	58	34.9	53	33.6	49	33.7	53.33
7	07-06-18		30.3	78	33	52	32	61	31.8	63.67
8	08-06-18		29.1	84	31.8	57	32.2	54	31.0	65.00
9	09-06-18		28	74	32	58	30	65	30.0	65.67
10	10-06-18		28.9	72	30.1	68	30	68	29.6	69.33



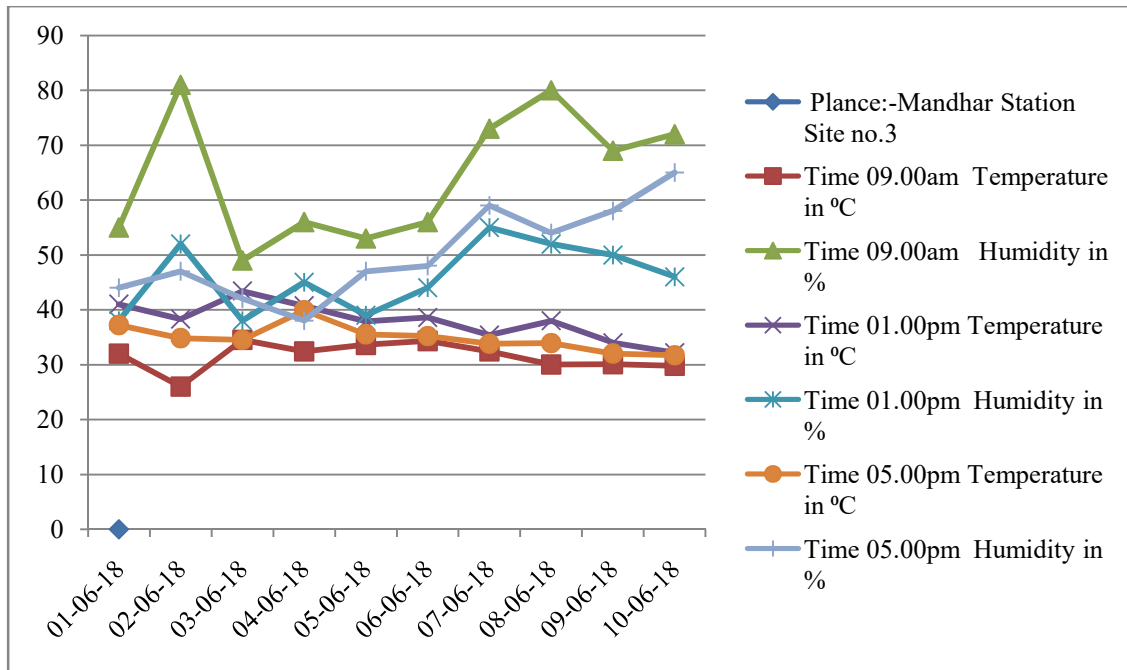
- Avanti bai chouk, Lodhipara

Temperature and Humidity measurement dated sheet (Data collected by Mukesh Kumatr Paikra)										
S. No.	Date	Name of Site	Time 09.00am		Time 01.00pm		Time 05.00pm		Average Temp. (°C)	Average Hum. (%)
			Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)		
1	01-06-18	Site no.2 Shankar Nagar Chouk	33.0	51	39.0	37	36.5	40	36.2	42.67
2	02-06-18		28.5	71	37.1	60	34.1	53	33.2	61.33
3	03-06-18		36.4	67	41.5	42	39.5	41	39.1	50.00
4	04-06-18		35.8	68	40.2	60	39.1	41	38.4	56.33
5	05-06-18		37.9	44	41.5	60	39.3	37	39.6	47.00
6	06-06-18		35.2	60	40.0	45	37.9	58	37.7	54.33
7	07-06-18		36.5	53	39.8	57	37.7	60	38.0	56.67
8	08-06-18		33.8	52	38.6	49	36.3	54	36.2	51.67
9	09-06-18		29.8	72	35.6	56	34.2	60	33.2	62.67
10	10-06-18		31.3	65	35.4	72	33.2	65	33.3	67.33
Average			33.8	60.3	38.9	53.8	36.8	50.9	36.5	55.00



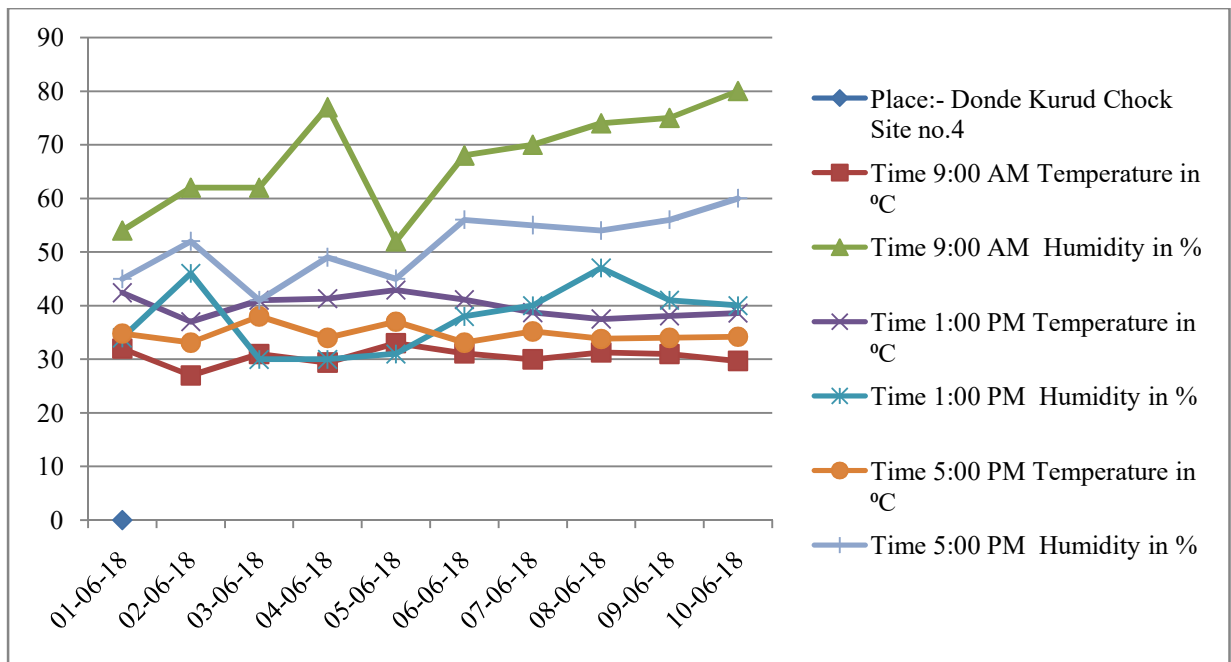
- Ring road no 3 triangle, Mandir Hasod

Temperature and Humidity measurement dated sheet (Data collected by Rakesh Kumar Shrivastava and Abhinav Kumar Agrahari)										
S.No.	Date	Name of Site	Time 09.00am		Time 01.00pm		Time 05.00pm		Average Temp. (°C)	Average Hum. (%)
			Temp (°C)	Hum. (%)	Temp (°C)	Hum. (%)	Temp. (°C)	Hum. (%)		
1	01-06-18	Site no.3 Mandhar Station	32.0	55	41	38	37.2	44	36.7	45.67
2	02-06-18		26.0	81	38.3	52	34.8	47	33.0	60.00
3	03-06-18		34.5	49	43.4	38	34.5	42	37.5	43.00
4	04-06-18		32.4	56	40.7	45	39.9	38	37.6	46.33
5	05-06-18		33.6	53	37.9	39	35.5	47	35.6	46.33
6	06-06-18		34.3	56	38.6	44	35.2	48	36.0	49.33
7	07-06-18		32.4	73	35.4	55	33.8	59	33.9	62.33
8	08-06-18		30.0	80	38	52	33.9	54	34.0	62.00
9	09-06-18		30.1	69	34	50	32	58	32.0	59.00
10	10-06-18		29.8	72	32.2	46	31.7	65	31.2	61.00
Average			31.5	64.4	38.0	45.9	34.9	50.2	34.8	53.50

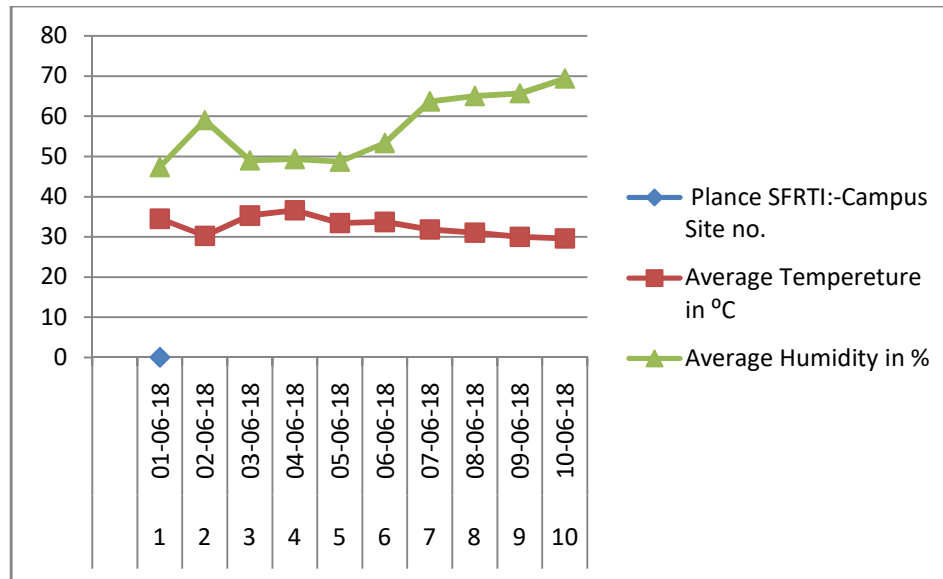


- Bus stand chouk Donde khurd

Temperature and Humidity measurement dated sheet (Data collected by Gulshan Janghel Amit Baghel)										
S.No.	Date	Name of Site	Time 9:00 AM		Time 1:00 PM		Time 5:00 PM		Average Temp. (°C)	Average Hum. (%)
			Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)	Temp. (°C)	Hum. (%)		
1	01-06-18	Site no.4 Donde Kurud Chock	32.0	54	42.4	34	34.8	45	34.8	44.33
2	02-06-18		27.0	62	37.0	46	33.1	52	32.3	53.33
3	03-06-18		31.0	62	41.0	30	38.0	41	36.7	44.33
4	04-06-18		29.4	77	41.3	30	34.0	49	34.9	52.00
5	05-06-18		33.0	52	42.9	31	37.0	45	37.6	42.67
6	06-06-18		31.1	68	41.1	38	33.1	56	35.1	54.00
7	07-06-18		30.0	70	38.7	40	35.2	55	34.7	55.00
8	08-06-18		31.3	74	37.5	47	33.8	54	34.2	58.33
9	09-06-18		31.0	75	38.1	41	34.0	56	34.4	57.33
10	10-06-18		29.7	80	38.6	40	34.2	60	34.1	60.00
Average			30.81	67.4	39.57	37.7	34.72	51.3	35.0	52.13



Name of Study Site	10 day, Average Temp. (°C)	10 day, Average Hum. (%)
Place SFRTI:-Campus Site	32.6	57.3
Place:-Ring Road Chowk (Mandir Hausod) Site no. 1	35.4	55.3
Place:- Shankar Nagar Chouk Site no.2	36.5	55
Place :- Mandhar Station Site no.3	34.8	53.5
Place:- Donde Khurd Chock Site no. 4	35	52.13



Conclusion

Initial variation in Temperature and Humidity SFRTI campus and variation in there microclimate as compare to other study sites, Average temperature varies between 1 to 3°C, whereas average of humidity related data of the campus increased gradually up to 5 to 10% as compare to the other sites.

Maximum Temperature: - The maximum temperatures were markedly above normal on 1st June, appreciably above normal 3th June, 4th, June and 5th, June, normal on 7th, and on 8th, June, and below normal on 6th June during week days of the week.

Minimum Temperature: - The minimum temperatures were markedly below normal on 6th June, below normal on 2nd June, and on 10th June and appreciably above normal on 1st, 3th June, 4th and on 5th, June during week days of the week.

Reference:-

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Note: This paper is under publication with Indian Forester, Research Journal.