



## Aftermath of the Weather Change of Guwahati Over The Past Decade: Funders: Not Applicable

1. Shreya Barman (corresponding author)

VIT-AP UNIVERSITY, ELECTRONICS AND COMMUNICATION ENGINEERING(SPL. VLSI), AMARAVTI,  
ANDHRA PRADESH, INDIA  
Home Address: Guwahati, Assam

2. Simran Saikia

VIT-AP UNIVERSITY, ELECTRONICS AND COMMUNICATION ENGINEERING(SPL. VLSI), AMARAVTI,  
ANDHRA PRADESH, INDIA  
Home Address: Guwahati, Assam

---

### ABSTRACT:

The weather change has been a vital concern all over the globe. From our detailed analysis of the weather change in the city of Guwahati over the past decade, we have examined the irregular fluctuations in the level of temperature, humidity and precipitation. As an out-turn, we have perceived the increment of flash floods, landslides and heat waves, that cause devastation to the biodiversity and economy of the city. Following this, the government bodies have taken several initiatives for the betterment of the city but along with that, it's the responsibility of the citizens to look after the environment.

### KEYWORDS:

Weather change, flash floods, heat waves and landslides

Received 10 August, 2022; Revised 24 August, 2022; Accepted 26 August, 2022 © The author(s) 2022. Published with open access at [www.questjournals.org](http://www.questjournals.org)

### I. INTRODUCTION:

Guwahati is the fastest developing city in the state of Assam of North East India. There is a crucial need to work on the alarming weather change in Guwahati. Along with the citizens, the public bodies should also support and take immediate action regarding this matter. As we all know, weather refers to the variation of atmospheric conditions during a short period. It includes temperature, humidity, precipitation, air pressure, wind, and cloud cover. The reason behind this atmospheric change is rapid urbanisation, unplanned constructions over the city area and the destruction of natural habitats. Another leading element which influences the lives of the people is global warming which in turn causes heat waves. Henceforth, it causes water logging, landslides and frequent earthquakes which affect the day-to-day activities of the citizens as well as the wildlife, transport systems and the economy of the city. And the recent case is that of the June 2022 flood which is caused due to frequent heavy rainfall that affected the lives of millions of people hailing from the city. Guwahati Municipal Corporation (GMC) stated that increasing constructions, urbanisation and improper waste disposal systems are a few reasons why many areas in Guwahati are experiencing this havoc. The Assam State Disaster Management Authority (ASDMA) has undertaken several measures to improve the water logging situation in Guwahati. The government has also taken plans for the same. The Assam State Action Plan 2.0 is one among them, which aims on mainstreaming climate change action into urban groundwork and government policies.

### GLOBAL WARMING

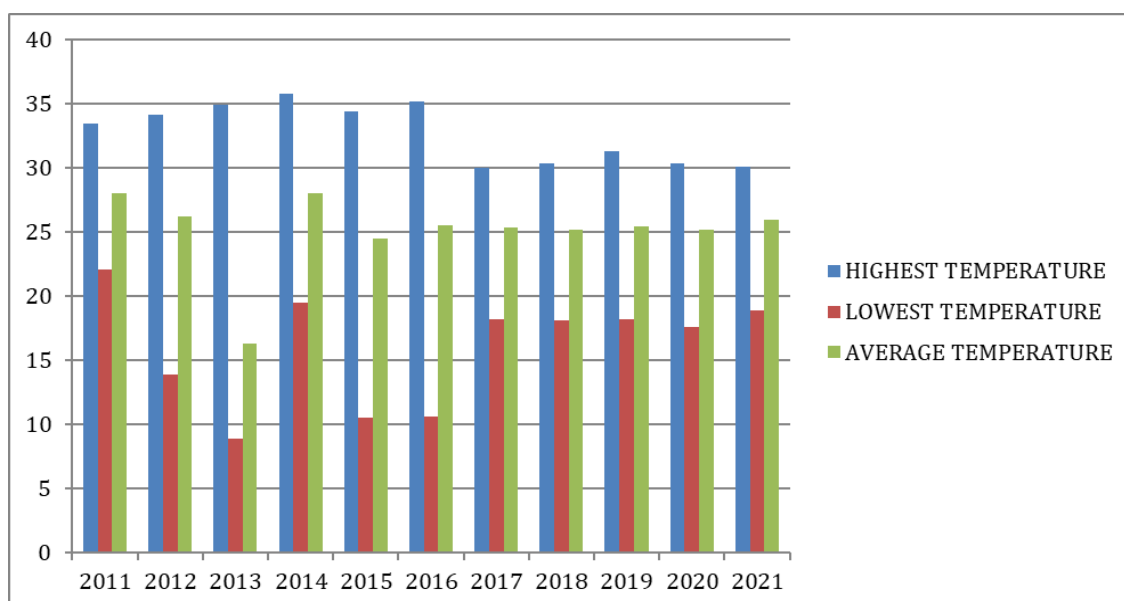
Global warming is the key element of the unusual weather change over the city. Because of this, the temperature (Table 1), humidity and heat waves are fluctuating in recent years. The extreme production of carbon emissions from the increasing number of vehicles and industrialization is the leading factor in the creation of heat waves over the decade. With the sudden change in the weather conditions over the metropolitan,

the citizens are experiencing pre-rainfall sessions and irregular extensions of summer and winter seasons over the past few years. As a result, every year Guwahati experiences harmful flash floods which result in the loss of human lives, and animal stocks and hamper the city's economy. We know Guwahati is also one of the best tourist destinations in the North East and people from all across the city and even internationally prefer to visit the city, but due to the heavy flood and landslides these tourist spots have been badly hampered as a result the city loses its tourists.

**Guwahati weather analysis over the past decade:**

**Table 1:**

YEAR	HIGHEST TEMPERATURE RECORDED (°C)	LOWEST TEMPERATURE RECORDED (°C)	AVERAGE TEMPERATURE (°C)
2011	33.40	22.10	28.00
2012	34.10	13.90	26.20
2013	34.90	08.90	16.30
2014	35.80	19.50	28.00
2015	34.40	10.50	24.50
2016	35.20	10.60	25.50
2017	30.00	18.20	25.30
2018	30.30	18.10	25.20
2019	31.30	18.20	25.40
2020	30.30	17.60	25.20
2021	30.10	18.90	25.90



*Fig1 : Showing the temperatures trend from 2011-2021 of Guwahati city*

**Table 2:**

YEAR	HIGHEST WIND SPEED RECORDED (km/hr)	LOWEST WIND SPEED RECORDED (km/hr)	AVERAGE WIND SPEED (km/hr)
2011	8.5	2.2	5.5
2012	7.5	2.2	1.9
2013	5.8	1.7	3.6
2014	6.5	1.8	3.5
2015	6.3	2.3	3.8
2016	8.8	3.1	3.8
2017	7.7	3.2	5.6
2018	6.1	2.2	3.8
2019	7.4	2.3	4.1
2020	6.3	1.7	4.0
2021	2.8	1.0	1.9

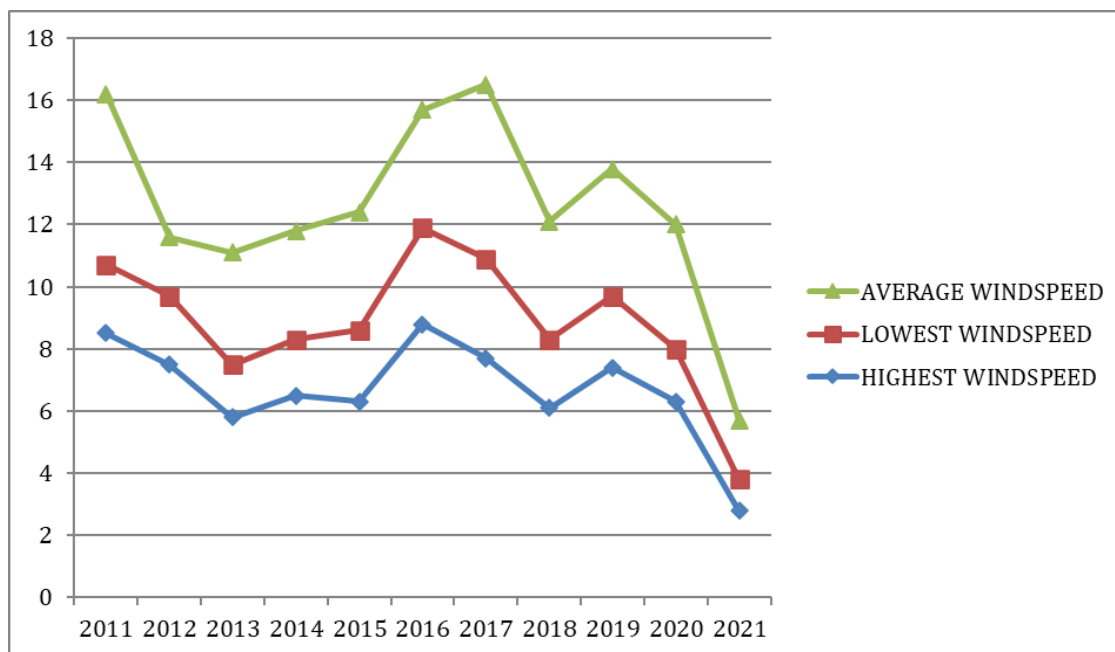


Fig 2 : Showing the wind-speed trend from 2011-2021 of Guwahati city

**HUMIDITY**

The unusual temperature change in recent years, due to this the temperature is exceeding six to eight degrees above normal, especially during the daytime. The India Meteorological Centre (RMC) located in the city recorded a high temperature of around 38 degrees Celcius mostly because of the downfall of precipitation over the years (Table 3), which results in high humidity. During April, May, June, July, August, September, October, and November the humidity was 70 degrees Fahrenheit to 75 degrees Fahrenheit which is oppressive and miserable. Due to the heat and humidity, we can observe low attendance at government offices, including hospitals and even schools and colleges in the city. The Health Department stated that due to prevailing weather conditions, it has given birth to many seasonal conditions like coughs, fever, vector-borne diseases and other ailments. Thus, they advised the citizens to increase the intake of water, fruits and curd to maintain their health and overall body temperature.

**Table 3:**

YEAR	HIGHEST PRECIPITATION RECORDED (mm)	LOWEST PRECIPITATION RECORDED (mm)	ACCUMULATED PRECIPITATION (mm)
2011	310.4	0.0	989.4
2012	400.4	0.0	1470.4
2013	427.8	0.0	1448.7
2014	296.1	0.0	1115.3
2015	268.4	0.8	1310.9
2016	218.5	0.0	826.5
2017	312.6	0.0	1492.7
2018	190.4	0.8	908.0
2019	270.0	0.1	1331.0
2020	336.1	0.0	1450.5
2021	197.7	0.0	969.2

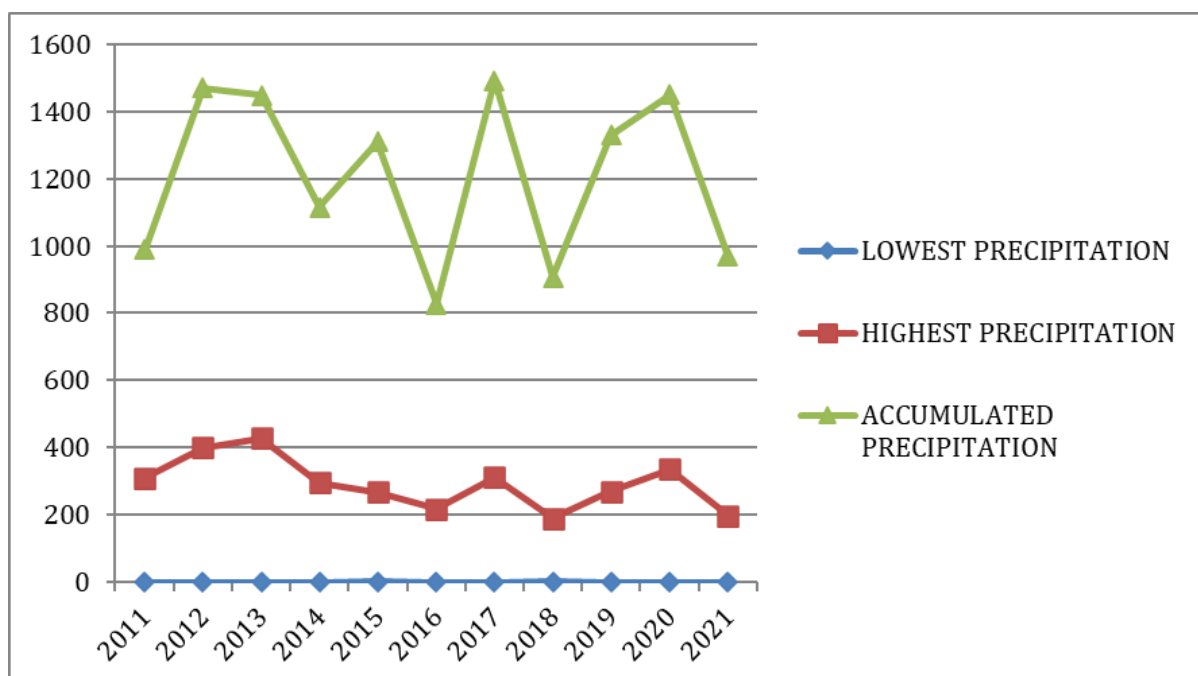


Fig 3 : Showing the precipitation trend from 2011-2021 of Guwahati city

**EFFECTS:**

**1. HEATWAVES**

Over the past decade, the Regional Meteorological Centre (RMC) has already predicted the heat waves hitting the city. The maximum temperature recorded in 2021 was 5 degrees above normal and the minimum temperature was 3 degrees above normal at 27.4 degrees, without any rainfall. 38 per cent rainfall deficiency could be seen in the Month of September. In 2021, the city received 676.3 mm against the normal annual rainfall of 1094.4 mm. This trend of decreasing rainfall could be seen in recent years which in turn increases the overall temperature of the place causing heat waves. The victim of this drastic weather change is the common office-going people and the children going to their school and colleges.

## 2. LANDSLIDES AND WATERLOGGING

Landslides and waterlogging have always been major issues in the city. A recent case is the June 2022 flood that has a severe impact on various parts of Guwahati. Fresh landslides were also reported on June 15 amid heavy rainfall. The Assam State Disaster Management Authority (ASDMA) reported that wreckages caused by landslides have blocked passages in Geetanagar, Sonapur, Kalapahar and Nijarapar areas. The most affected areas by flash floods are Anil Nagar, Nabin Nagar, Rajgarh Link road, Rukminigaon, Hatigaon and Krishna Nagar. Henceforth, this havoc has created destructions of embankments, roads, bridges and other infrastructures of the city. Deputy Commissioner of Kamrup Metropolitan has directed all schools, colleges and educational institutions to remain close because of the worsening of the flood situation in the city. The Assam Power Distribution Company Limited (APDCL) has contributed to help in the matter by restoring the power supply while the drinking tankers have been sent to the flood-affected areas.

## II. DISCUSSION:

Research showed that over the past decade we have seen a prominent change in the weather conditions of Guwahati. Because of this weather change many calamities such as heatwaves, waterlogging and landslides have occurred and affected the biodiversity of the metropolitan. The government have been taking major changes in improving the changing weather condition by forming a climate change management society with a governing body that would be headed by the chief minister. This major decision was taken after a report that highlighted the fact the state will likely be warmer by 2.2 degrees Celcius along with extreme rainfall, drought and floods by 2050. The report has also alerted that the city will experience more frequent and severe floods, losses in the wildlife sector and freshwater scarcity if the major step is not taken by the government and the public together.

## III. CONCLUSION:

From this topic, “Aftermath of the weather change of Guwahati over the past decade” we can conclude that the temperature, humidity and precipitation of Guwahati have shown an irregular trend over the past ten years. This has happened because of the increasing global warming which has led to heatwaves, waterlogging and landslides. Although the government has taken major steps along with that we, the citizens of Guwahati should also take initiatives in improving the living conditions of the city for a better future.

## CONFLICT OF INTEREST :

We, the authors declare that there is no conflict of interest and there is no support from any organization for the work submitted.

**DATA AVAILABILITY:** The data availability in this article are openly available in the following links:

<https://weatherspark.com/h/y/111996/2022/Historical-Weather-during-2022-in-Guwahati-India>

[https://www.weatheronline.in/weather/maps/city?LANG=in&PLZ=\\_\\_\\_\\_&PLZN=\\_\\_\\_\\_&WMO=42410&CONT=inin&R=0&LEVEL=162&REGION=0024&LAND=IAS&MOD=tab&ART=PRE&NOREGION=0&FMM=1&FYY=2016&LMM=12&LYY=2016](https://www.weatheronline.in/weather/maps/city?LANG=in&PLZ=____&PLZN=____&WMO=42410&CONT=inin&R=0&LEVEL=162&REGION=0024&LAND=IAS&MOD=tab&ART=PRE&NOREGION=0&FMM=1&FYY=2016&LMM=12&LYY=2016)

## REFERENCES:

- [1]. <https://waterresources.assam.gov.in/portlets/flood-management>
- [2]. <https://india.mongabay.com/2022/08/a-hope-for-climate-focused-urban-planning-in-assams-cities-reeling-from-severe-floods/>
- [3]. <https://timesofindia.indiatimes.com/city/guwahati/assams-maximum-and-minimum-temperatures-increasing/articleshow/88484626.cms>
- [4]. <https://www.businesstoday.in/latest/trends/story/floods-landslides-impact-normal-life-in-northeast-india-4-lakh-people-hit-in-assam-334003-2022-05-18>
- [5]. <https://www.eastmojo.com/news/2019/04/26/guwahati-faces-the-heat-witnesses-record-temperatures-in-april/>
- [6]. <http://www.skymetweather.com/holidaydestinations/seasonal-forecast/guwahati-kamrup%20metro-assam-india-february>
- [7]. [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/guwahati\\_india\\_1271476](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/guwahati_india_1271476)
- [8]. <https://scroll.in/article/1021434/despote-repeated-climate-related-disasters-in-assam-many-have-no-desire-to-migrate>
- [9]. <https://www.sentinelassam.com/editorial/climate-proofing-guwahati-597457>
- [10]. <https://www.thehindu.com/news/national/other-states/climate-change-casts-a-shadow-on-assam-hydro-project/article65265219.ece>
- [11]. <https://www.worldweatheronline.com/guwahati-weather/assam/in.aspx>
- [12]. <https://www.sentinelassam.com/guwahati-city/this-year-warmer-winter-in-assam-guwahati-recorded-minimum-temperature-of-13c-572669>
- [13]. <https://www.guwahatiplus.com/guwahati/rainy-weather-forecast-for-guwahati-ne-as-heatwave-scorches-rest-of-india>
- [14]. [https://www.researchgate.net/publication/344323511\\_Temporal\\_Variation\\_of\\_Temperature\\_in\\_Guwahati\\_Assam\\_An\\_Application\\_of\\_Seasonal\\_ARIMA\\_Model](https://www.researchgate.net/publication/344323511_Temporal_Variation_of_Temperature_in_Guwahati_Assam_An_Application_of_Seasonal_ARIMA_Model)
- [15]. <https://www.downtoearth.org.in/news/natural-disasters/climate-change-poor-planning-why-assam-s-floods-are-getting-worse-83361>
- [16]. <https://weatherspark.com/h/y/111996/2022/Historical-Weather-during-2022-in-Guwahati-India>