# Experimental Investigation Of Climate Parameters of Nagpur District

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**Abstract:** *Climate play an important role in our life climate give us sunshine rainfall natural air and good refreshing atmosphere, but due to some issues if industrialization and continuously growing population. Man is utilizing natural resource very harshly causing disturbance. To climatic condition of environment which is in broad sense called as global warming. To various parameter of climate we have obtain data from hydrological data user group HDUG (hydrological department Nasik), who have given the permission to use data for study purpose. In this topic, all the suited hydrological and meteorological data are observe from station kamathee-khaire and mathne (both are full climatic station) in Nagpur district. The project has been accomplished by using government approved software HYMOS (hydrological modeling software) AND SWDES (surface water data entry software). Main focus of the study is to determine the climatic variation in all parameter and varies with corresponding study area.*

**Keyword: climatic factor, HYMOS, SWDES.**

## INTRODUCTION

The globe has one-third land and two-thirds Ocean. Evaporation from the surfaces of ponds, lakes, reservoirs ocean surfaces, etc and transpiration from surfaces vegetation, i.e. from planet leaves of cropped land and forest, etc. take place. These vapors rise to the sky and are condensed at higher altitudes by condensation nuclei and from clouds, resulting in droplet growth. The clouds the land rand sometimes burst resulting in precipitation of different forms like rain, snow, hail, sleet, mist, dew, and frost. A part of this precipitation flows over the land called runoff and a part in filters into the soil, which builds up the ground water table. The surface runoff joins the streams and the water table. The surface runoff joins the stream and the water is stored in reservoirs. A portion of surface runoff and ground water flows back to the ocean.

Again evaporation starts from the surfaces of lakes, reservoirs and ocean and the cycle repeats. Of these three phases of the hydrologic cycle, namely, evaporation, precipitation and runoff, is the 'runoff phase' which is important to a civil engineer since he is concerned with the storage of runoff in tanks and reservoirs for the purpose of irrigation, municipal water supply hydroelectric power etc.

**Instruments Used For Climatic Validation**

(1) **Rain gauge** with inner can fix on a masonry platform. Top of rain gauge was 30cm above ground level.
(2) **Evapometer** a pan shape container filled with to measure evaporation of water.
(3) **Sunshine recorder** mounted on masonry pillar. The number of sunshine hours per day is recorded on a strip on cardboard, a spherical magnifying glass burning a hole in middle of the cardboard strip whenever sun is out.
(4) **Stevenson's screen-double louvered** holding maximum and minimum thermometers; and dry and wet bulb thermometers; and PICHE Evaporimeter kept suspended.
(5) **Cup counter anemometer** (three cups) mounted on a masonry pillar.
(6) **Wind vane** with cardinal points N.S.E. &W mounted on masonry pillar. All the measurements is taken twice a day at 08-30 and 17-30 hours at the station.

**STUDY AREA**

This study has been carried out for the Nagpur district of Maharashtra region in India. Nagpur district consist of around 20 Tahsil they are- Narkher, Sawar, Badbaon, Parshivni, Ramtek, Devlapar, Kamthi(Kamthi-khaire), Mouda(Mathni), Kalmeshware, Bazaargaon, Kuhi, Bhivapur, Katol, Bhingad, Ambora, Bela, Shirsi, Khat, Katol, Diras. From which Kamthi(Kamthi-Khaire) and Mouda(Mathani) are Full Climatic Stations (FCS). Hence, Kamthikhari and Mathani are taken in to consideration. The meteorological data has collected from the **water resources and hydrology department** of Nagpur from 2008 to 2012 which comprises following parameters such as Rainfall, Sunshine hours, Temperature, Evaporation, Relative humidity, Wind speed.

**SOFTWARE USE FOR DATA COLLECTION**

**HYMOS (Hydrological Modulated Software)**

HYMOS is an information system for storage, processing and presentation of hydrological and environmental data. It combines an efficient database structure with powerful tools for data entry, validation, completion, analysis, retrieval and presentation. HYMOS optimally serves the needs of water authorities like Hydro meteorological services and water boards responsible for monitoring network operation and database management. The wide variety of data processing and analysis features make HYMOS very suitable typical

project application in water related studies, research and consultancy.

HYMOS offers a wide range of tabular, graphical, computational and statistical validation techniques among which are:

a) Tabulation of series and flagging of outliers.

b) Plotting of series.

c) Relation curve and double mass analysis.

d) Near neighbor checks and series homogeneity test.

**CALCULATION OF DATA**

First of all the required data from Kamthi Khairi Full Climatic Station (F.C.S) was collected. This data entry was done in software named as SWDES (Surface Water Data Entry System). Primary validation was carried out wherever necessary in SWDES. Then that data was exported to HYMOS. After exporting data to HYMOS, the software SWDES was terminated and HYMOS was opened. The data, which was exported from SWDES, was imported to HYMOS.. From the above Map the Kamthi Khairi (Under Nagpur Sub Division) was selected. Then the secondary validation of the data was carried out in the HYMOS. While working in HYMOS, first of all the required time period i.e. 01/01/2008 to 31/12/2012 was selected and time base changed from daily to twice daily. Then all required data is converted into bar charts and compare with each other. Interrelations in parameters are obtained and changes of parameters according to month are observed and explain below.
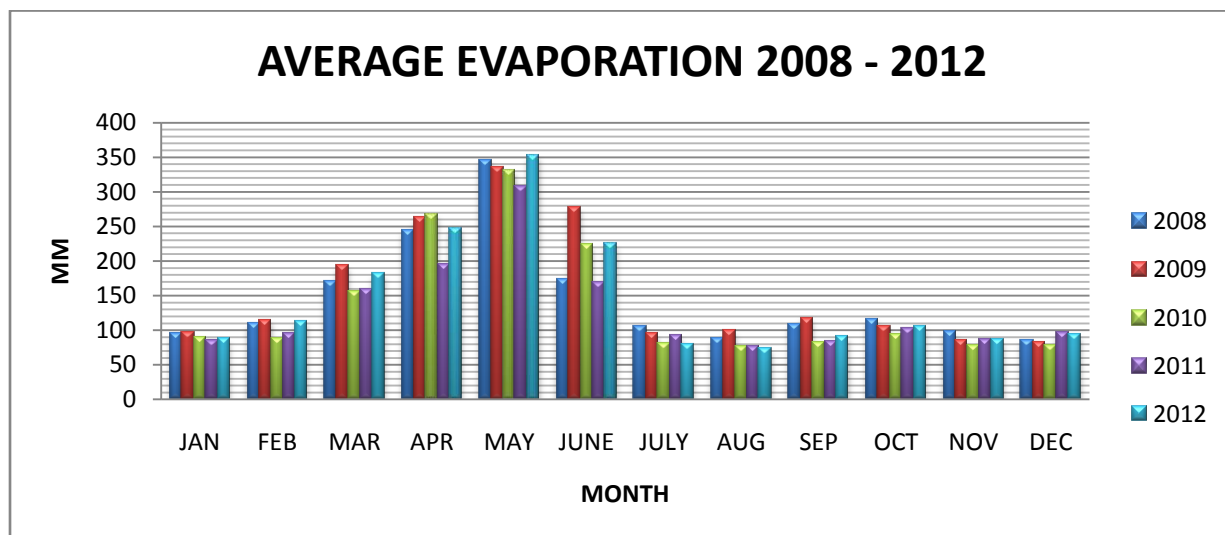
**ANALYSIS AND GRAPHS:**



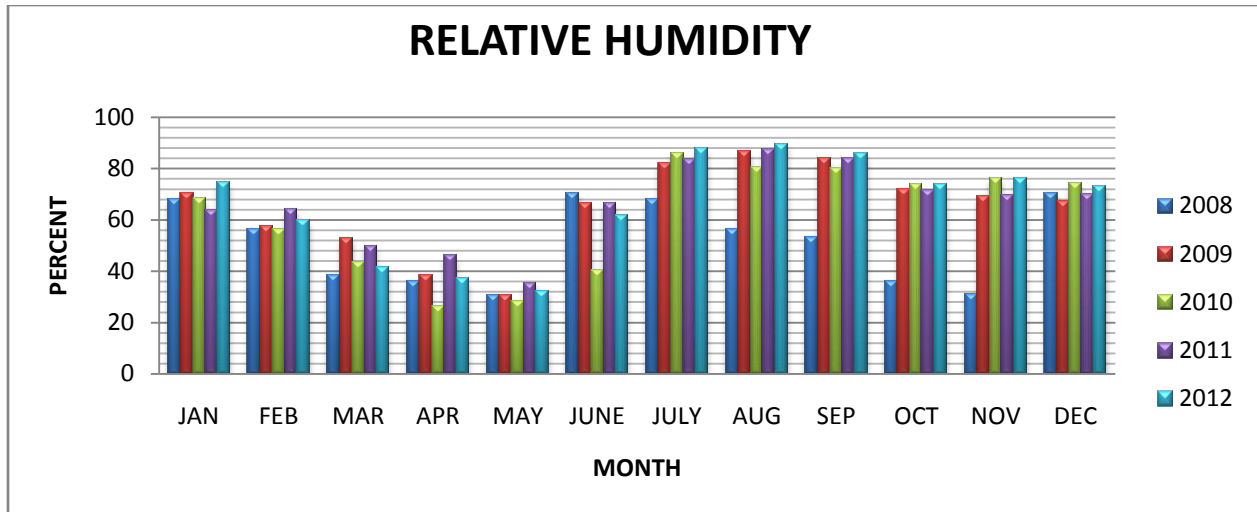Fig no. 1 Average Evaporation measured from 2008-2012

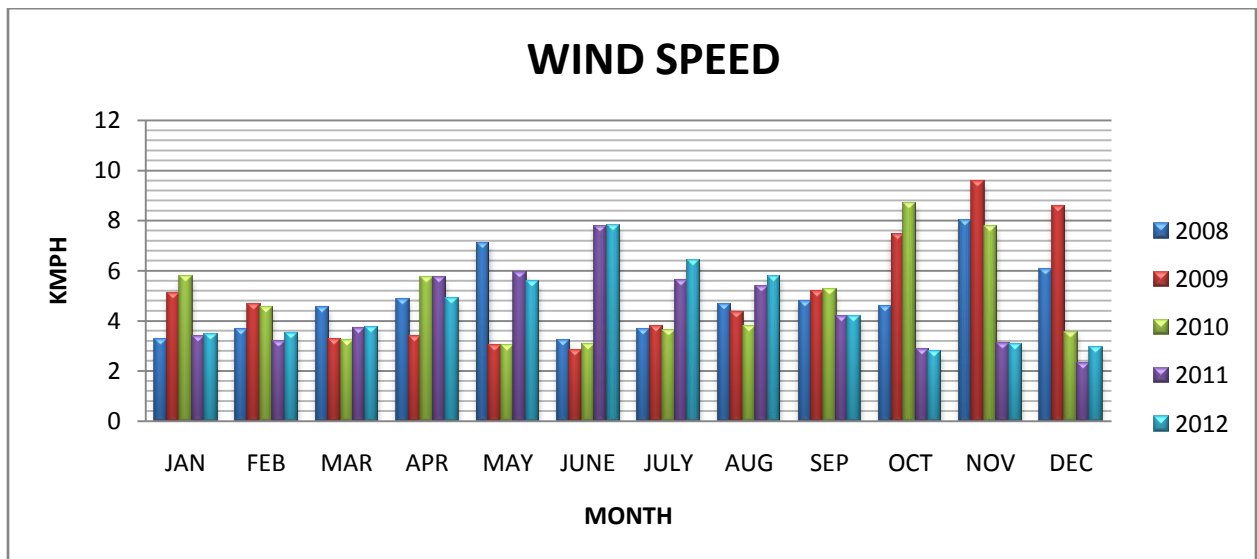Fig no. 2 Relative Humidity measured from 2008-2012



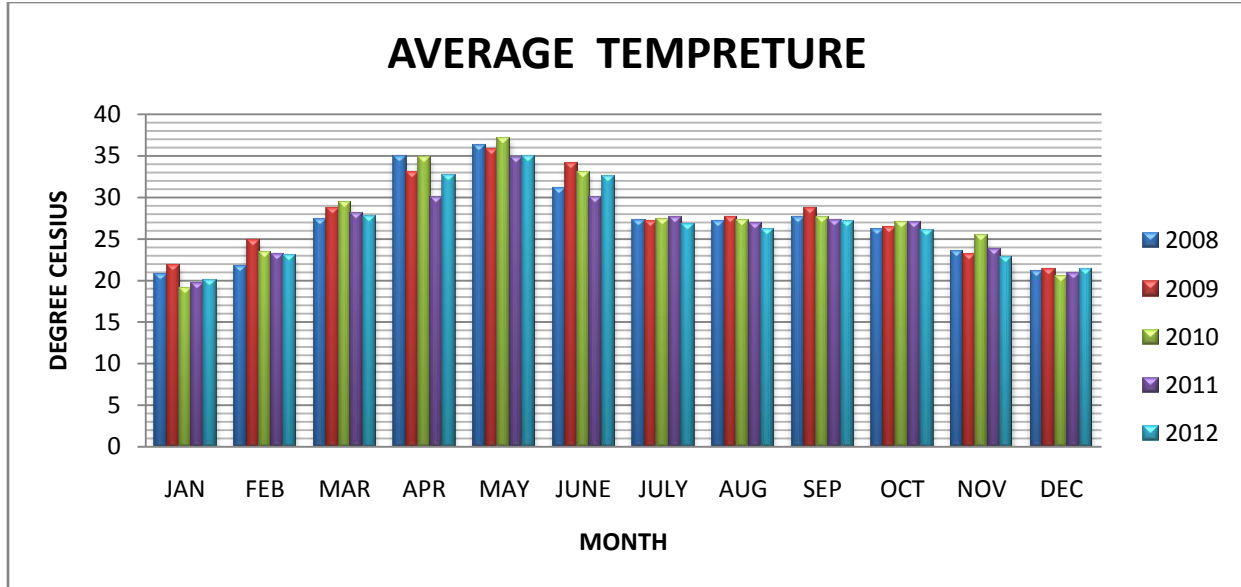Fig. no. 3 Wind speed measured from 2008-2012

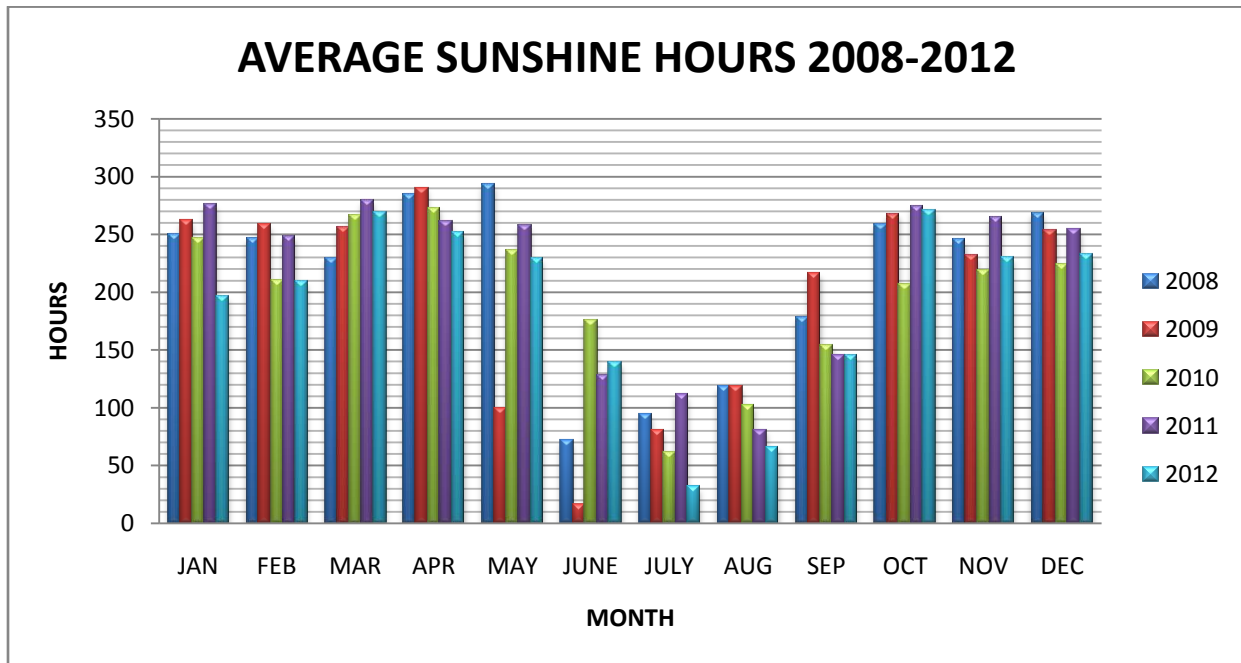Fig. no. 4 Average Temperature measured for 2008-2012



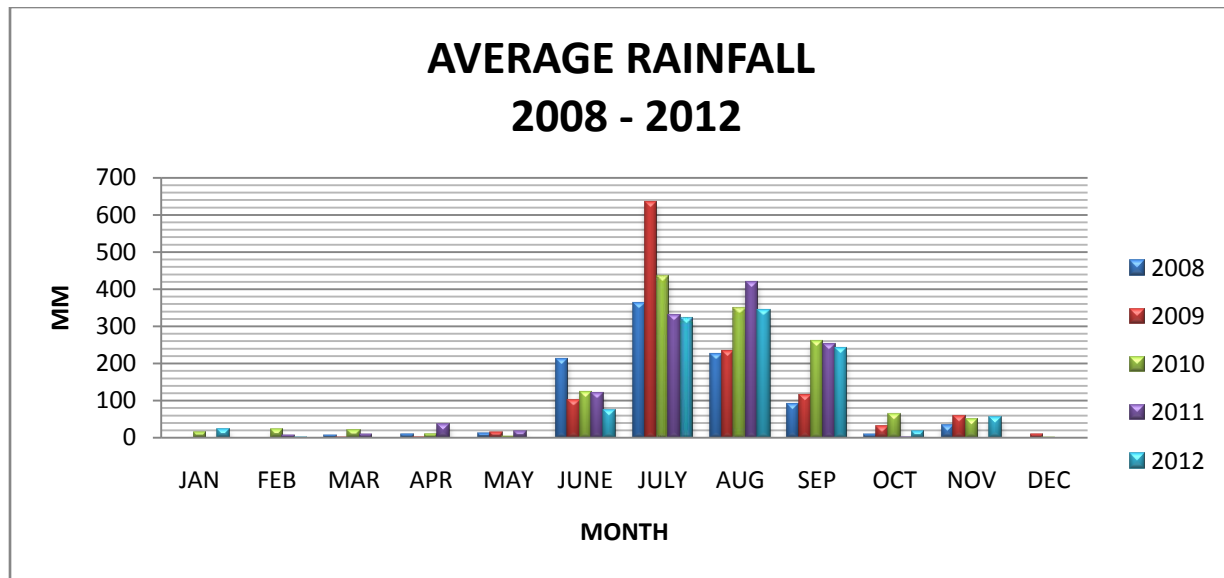Fig. no. 5 Average Sunshine Hours measured from 2008-2012

Fig. no. 6 Average Rainfall measured from 2008-2012

**RESULT AND DISCUSSION:**

1. Rainfall from January to February was low but rainfall intensity increasing by month may to July, it was maximum, then its starts decreasing till October. Then by October it becomes once again low. Evaporation is maximum in month may whereas rainfall is minimum in month may. Rainfall is maximum in July. Where evaporation is minimum in month July.

2. From January to May rainfall is constantly low. Whereas Form January to May relative humidity is decreasing and minimum in may. From May to July rainfall is increasing and it is maximum at July. The relative humidity is also starts increasing from day to July and it is maximum in July. And then from July to December both relative humidity rainfalls start decreasing.

**CONCLUSION**

Following experiment investigation shown that all climatic parameter are related to each other such as rainfall, sunshine, evaporation, temperature and relative humidity

1. in Nagpur district, average yearly max temperature is $32.32^{o}c$ and min temperature is 27.27c,average rainfall is 1101.5mm and average wind sped is 493.5kmph.

2. in 2008-2012,average evaporation is 1717.4mm which is greater than rainfall revised by Nagpur district. same remedial measure is necessary to reduce evaporation such by keeping the free water surface minimum, by spreading surface films on the reservoir and lakes.

## REFERENCES

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4.Data has been collected from Hydrological Data User Group(HDUG), Nashik.