Received: Jun '22
Revised:
Accepted: Jul '22

IMPACT OF CLIMATE CHANGE ON RAJASTHAN'S SOUTH-EASTERN REGION

Shofin[1*] and Manish kumar[2]
[1]Research scholar, Department of Geography, Govt. Dungar College, Bikaner
(Affiliated to Maharaja Ganga Singh University Bikaner (Rajasthan)
[2]Research scholar, Dept. of Geography, Govt. Lohia College, Churu
(Affiliated to Maharaja Ganga Singh University Bikaner (Rajasthan)
E-mail: [1]shofinchouhan@gmail.com

ABSTRACT

Climate change has become a major environmental issue in recent years. To sustain the current composition of the atmosphere is now a major task for human beings. The primary driver of climate change is human-caused global warming. CO2, CO, CFC, and other greenhouse gases in the atmosphere have a direct impact on the climate. Several industries, automobiles, and fossil fuel burning are contributing to the emission of these gases. Population growth has resulted in an ever-increasing demand for natural resources. The flora and wildlife of Rajasthan's south-eastern region are abundant. Cutting down trees for use as fuel, timber, or any other purpose is a form of deforestation. The climatic system in the area is in a precarious state, with extremes in temperature, rainfall, wind, and pressure all on the rise. The reason for this is that the annual rainfall is decreasing and the temperature is rising. It is becoming increasingly difficult for some species of plants and animals to survive in their native habitats.

Key Words: Warming, Climate change and global warming.

1. Introduction

Climate change is moving at an incredibly rapid pace at this point in time. An imbalance in the amount of radiation entering and leaving the atmosphere is to blame for climate change, ccording to the expert. As a result of our increased use of natural resources and the subsequent development of new technologies, emissions of greenhouse gases have increased. Ecosystems are under threat from climate change. For a wide range of habitats, it causes food and water insecurity in the food chain. These issues are also plaguing the research area. The natural beauty of the Hadoti region is being obliterated by a rapidly expanding population. Many species of wildlife and flora are in danger of extinction because of a lack of resources in a variety of ways. This is a frightening situation for humans.

2. Study Area

According to the Hadoti region, the research area is located between 75o15'40" East to 77o25'12" East Longitudes and 23o45'19" North to 25o52'50" North Latitudes in the region of South East Rajasthan. Kota, Baran, Bundi, and Jhalawar are the four most common districts in India. This region is bordered by the states of Gujarat and Madhya Pradesh. This region covers 9.6 percent of the state's total land area. The plateau dominates the majority of this area. The dark dirt is extremely fertile. Rivers like Chambal, Kalisindh, Parwati and Parwan make up the bulk of the area's water supply. Rice, maize, soybeans, wheat, and linseed are the most important crops. The Hadoti region's forest is home to a variety of animals, including tigers, panthers, and hyenas. The Hada Rajputs, a Chauhan dynasty clan, gave their name to Rajasthan's Hadoti region. After defeating the Meena kings, they took control of the territory and the kingdom.

3. Hypothesis

Climate change is mostly caused by a decrease in annual precipitation and an increase in annual temperature.

4. Methodology

Defintion of methodology in this research paper is the systematic way to address a research problem by data gathering, applying various techniques, offering an interpretation of data acquired, and drawing conclusions from the research data Data gathered through a survey. Various papers, books and research works from various departments were used to compile the secondary data set.

5. Climate Change

Rainfall, temperature, wind speed, humidity, and other weather variables can all be used to determine a region's climate characteristics. It has a 30-year

lifespan based on the total of these ingredients. Many investigations and researches have shown that the climate is always changing.

The Bay of Bengal branch of the South East Monsoon is responsible for the majority of the region's annual rainfall. The amount of precipitation has varied dramatically since previous time.

The seasons are shifting as well. Also, the day's high and low temperatures fluctuate during the day.

6. Climate Change Major Indicators

Rainfall and temperature are two of the many markers of climate change that are used in this study. That's all there is to it!

6.1. Rainfall

Water that falls to the ground in droplets is known as rain. When atmospheric water vapour condenses to produce rainfall, it is part of the water cycle. Data from stations every five years are used to examine the last 60 years' rainfall trends.

Table 1: Station wise Rainfall in South East Rajasthan (1960 to 2020) (Rainfall in mm.) Station

	Antah	Atru	Keshorai patan	Talera	Bakani	Jhalawar	Digod	Ladpura (Kota)
Year								
2020	592.0	547	548	458	747	842	546	513.5
2015	691	1109	768	828	1340	1316	639	799.4
2010	583	668	678	732	721.3	524.6	638.5	571
2005	1029.2	610	677	506	751.8	743	324.7	458
2000	831	641.2	651	527.1	794.4	655.2	948	791.3
1995	858	879.6	678.5	864.8	900	828.2	814.5	829.2
1990	405	813	541.4	1241	405	792.9	0.0	734.2
1985	575	691.3	576.5	539.5	998.6	1331.2	507	596
1980	519.6	603	361.7	444	595.8	454.9	398	413.4
1975	1086	1439	954.8	674	1106.5	1204.4	906.6	1005.2
1970	844.6	1005	755.9	474	971.6	1099.4	704.7	689.5
1965	0.0	429.2	354.7	441	531.3	625.8	335.9	321.7
1960	938.3	707.6	965.3	596.4	1005.6	970.6	856.4	556.5

***Source*:** Annual Rainfall Data, 1960-2020 water.rajasthan.gov.in

Because the rainfall on these stations fluctuates so much, this table shows that there is a dynamic nature to the amount of rain they receive. Nearly all stations experienced heavy rainfall in years like 2015, 1985, and 1975. However, the results of the investigation suggest that overall, rainfall has decreased. In 2020, precipitation at every station was lower than it was in 1960.

6.2. Temperature

Earth surface stations are used to measure atmospheric temperature. Radiation, humidity, and location all play a role. Station-by-station data from the Indian Meteorological Department's Climatological Normals for 1961-1990 and 1981-2010 have been analysed in this study.

Table 2: Air Temperature Station Kota (A) (1961-1990)

			Mean			Extremes		
Month	**Daily Max (0C)**	**Daily Min (0C)**	**Highest in The month (0C)**	**Lowest in the month (0C)**	**Highest (0C)**	**Year**	**Lowest (0C)**	**Year**
Jan.	23.7	10.6	28.6	7	33.4	1966	1.8	1967
Feb.	27	13.5	33.3	8.6	37	1973	4.5	1971
Mar	33	18.9	38.8	13.1	41.7	1972	8.6	1979
Apr	38.8	25	43.1	19.5	48.5	1984	14	1976
May	42	29.1	45.2	23.4	47	1988	20	1971
June	39.9	29	44.4	23.8	47.3	1979	18.8	1979
July	34.1	26.4	39.2	23.3	43.6	1966	20.4	1986
Aug	32	25.2	36	23.1	41	1987	21.6	1972
Sep	33.9	24.9	37.3	22.1	40.4	1987	16.4	1966
Oct	34.5	21.6	37.6	17.6	40	1965	14.3	1964
Nov	30	16.1	33.9	11.7	36.6	1977	7.1	1970
Dec	25.2	11.8	29.5	8.1	33.2	1963	3.8	1964
Annual Total or Mean	32.8	21	44.8	6.6	48.5		1.8	
No. of Years	30	30	30	30	30		30	

***Source*:** Climatological Normals (1961-1990) Office of the Additional Director General of Meteorology (Research) India Meteorological Department, Pune.

Table 3: Air Temperature Station Kota (A) (1981-2010)

			Mean			Extremes		
Month	**Daily Max (0C)**	**Daily Min (0C)**	**Highest in The month (0C)**	**Lowest in the month (0C)**	**Highest (0C)**	**Year**	**Lowest (0C)**	**Year**
Jan.	23.5	11.5	28.8	7.9	33.4	1966	1.8	1967
Feb.	26.8	14.3	32.8	10.2	37	1973	4.5	1971
Mar	33.2	19.9	39.2	14.6	42.7	2003	8.6	1979
Apr	39.1	25.7	43.8	19.8	48.5	1984	14	1976
May	42.3	29.9	45.6	24	48.4	2010	20	1971
June	40.3	29.6	44.7	24.1	47.3	1979	18.8	1979
July	34.4	27	39.3	23.5	44.9	1995	17.1	2004
Aug	32.4	25.8	35.8	23.5	41	1987	18.4	2006
Sep	34.2	25.7	37.6	23	41	2009	16.4	1966
Oct	34.4	22.5	37.5	18.6	46.8	2003	14.3	1964
Nov	29.9	17.1	33.8	13.1	38	2001	7.1	1970
Dec	25.4	12.6	29.7	9.2	33.2	1963	3.8	1964
Annual Total or Mean	33	21.8	46.1	7.7	48.5		1.8	
No. of Years	30	30	30	30	50		50	

***Source*:** Climatologically Normal's (1981-2010)

7. Results and Discussion

The mean, standard deviation (SD), and coefficient of variation (CV) of rainfall, minimum, and maximum temperature were calculated using both monthly and annual data. For each station, the month-by-month basic statistical properties of selected variables are shown in the subsequence tables. The region received little to no rain at all. During the monsoon season, the cities of Kota, Jhalawar, and Bakani each received more than 150 millimetres of rain, whereas Antah only received 93 millimetres and 62.2 millimetres of rain, respectively, in the months of July and August. Further data mining revealed that August 1973 saw the greatest mean rainfall in Jhalawar district, with 424.1 mm. In 2001, the city of Kota received 675.8 millimetres of rain. Jhalawar received 630.0 mm of rain in July 1973, 256.1 mm in 1978, and 956.3 mm in 1981, all in the same month.

8. Conclusion

Office of the Additional Director General of Meteorology (Research) India Meteorological Department, Pune The temperature at the Kota (A) station has risen, according to Tables 2 and 3. This year's average maximum temperature was 32.8oC in 1961-1990 compared to 33.3oC in 1981-2010 and 21.8oC in 1961-1990. Months with temperatures of 44.8° C or above had an average monthly low of 6.6° C from 1961 to 1990. In 1981-2010, they likewise rose by a total of 46.1oC and 7.7oC.

References

1. Sharma H. S. (2018). Climate change and natural resources: A case study of Indian desert.
2. Bhalla L. R. (2020). Geography of Rajasthan.
3. Gupta K. R. (2010). Climate change: Meeting the change.
4. Annamalai S, Mani N. (2014). Climate change crisis challenges and options.
5. www.mausam.imd.gov.in