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Regression model developed using climatic parameters in green chilli (*Capsicum annuum* L.) crop in Marathwada region

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ABSTRACT

A study was conducted at the Department of Agricultural Meteorology, College of Agriculture Parbhani, Vasantao Naik Marathwada Krishi Vidyapeeth, Parbhani, on “Regression model developed using climatic parameters in green chilli (*Capsicum annuum* L.) crop in Marathwada region” was undertaken to quantify major climatic parameters influencing green chilli production and to assess their relationships with crop area, production and productivity through correlation and regression analyses. Data for the period 2015 to 2024 were analysed for Parbhani, Nanded and Chh. Sambhajinagar districts of the Marathwada region during the average growing period of the crop. Correlation analysis revealed district-specific associations between climatic variables (i.e. Rainfall, Maximum and Minimum temperature, Morning and afternoon Relative humidity) and crop parameters (i.e. area, production and productivity). In Parbhani district, maximum temperature showed significant positive correlations with area (0.70*) and production (0.73*). In Nanded rainfall and RH-II showed significantly negative correlations with area and production. In Chh. Sambhajinagar, minimum temperature was positively correlated with area (0.71*) and production (0.66*) but significantly negative correlated with productivity (-0.63*). RH-I and RH-II was significantly negative correlated with productivity (-0.69*) and (-0.73*) in Chh. Sambhajinagar. Regression analysis indicated that Nanded district exhibited the highest R^2 value for area (0.99**) and for production (0.98**), both significant at the 1% level. Among the selected districts, the highest R^2 value for productivity (0.82**) was observed in Chh. Sambhajinagar.

Keywords: Weather parameters, Area, Production, Productivity, Correlation, Regression, Green chilli etc.

Introduction

Chilli (*Capsicum annuum* L.) is a significant vegetable and spice crop recognized for its high commercial, nutritional and medicinal value. It is cultivated year round and has adapted well to diverse climatic conditions. Green chillies hold significant global value, with annual production of 36.29 million tonnes. Globally, India is the largest producer, consumer and exporter of chillies. India is the world leader in chilli production followed by China, Thailand, Ethiopia and Indonesia. In 2023-24, India produced 4.67 million tonnes of green chillies with productivity 10.66 tonnes per hectare (Prasad *et al.*, 2026) [3]. Indian chilli is considered to the world famous for two important commercial qualities of colour and pungency level. Among the major chilli-producing states, Andhra Pradesh leads in production, accounting for approximately 30% of the total area under chilli cultivation. It is followed by Telangana (25%), Madhya Pradesh (12%) and Karnataka (11%) with the remaining states collectively contributing about 22% to the overall cultivated area. (Singh *et al.*, 2025) [6]. According to the Government of India's Ministry of Agriculture & Farmers welfare, Dept. of Agriculture & Farmers welfare-Horticulture Statistics Division, Maharashtra's green chilli production in 2023-24 was approximately 4.38 lakh tonnes. In Maharashtra, the districts of Nagpur, Palghar, Jalgaon, Chh. Sambhajinagar and Dharashiv are among the major producers of chilli. Capsaicin, the active component responsible for chilli's pungency, has notable physiological effects and is incorporated into various medicinal products such as cold balms, throat relief ointments and decongestants.

Chilli crop require specific temperature ranges for optimal growth and fruit development. Ideal temperatures for growth of chilli is 21-32 °C. However, when temperatures rise above 33 °C, fruit setting and colour development are negatively affected. A relative humidity between 65-85% is the optimum for the growth, development and production of chilli. An annual rainfall between 600 to 1250 mm fulfil the water requirement of the chilli crop. Chilli is sensitive to excess moisture and heavy rains during crop period may damage the crop. In view of these considerations, an experiment was carried to study the “Regression model developed using climatic parameters in green chilli (*Capsicum annuum* L.) crop in Marathwada region.”

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Materials and Methods

The methodologies and techniques used in the study are described in this chapter under appropriate headings.

Study of area description

The present study was carried out in the Parbhani, Nanded and Chh. Sambhajinagar districts of the Marathwada region, which constitutes a major part of Maharashtra State.

Collection of data

In methodology it is consisted that the collection of historical weather/climatic and annual crop data of Parbhani, Nanded and Chh. Sambhajinagar district of Marathwada region. The weather data for the period from 2015 to 2024 were compiled from various reliable and authorized sources, including the State Department of Agriculture, Statistical Department, relevant agricultural databases and websites, Department of Agricultural Meteorology, Vasantao Naik Marathwada Krishi Vidyapeeth (VNMKV), Parbhani and the India Meteorological Department (IMD), Pune. These sources were used to obtain the meteorological information required for the present study. Agricultural crop data on the area, production and productivity of green chilli were collected from reliable official sources, including the Department of Agriculture and Statistical Department of the Government of Maharashtra, relevant research stations of Vasantao Naik Marathwada Krishi Vidyapeeth (VNMKV), Parbhani and the National Horticulture Board (NHB), Pune.

Correlation and regression studies

The relationship between climatic parameters and the production and yield of green chilli was assessed using correlation analysis. The meteorological observations recorded during the period from 2015 to 2024, along with the corresponding crop data, were subjected to statistical analysis. The correlation coefficients were calculated using the following formula:

$$r = \frac{\sum xy - (\sum x \cdot \sum y) / N}{\sqrt{(\sum x^2 - (\sum x)^2 / N) \cdot (\sum y^2 - (\sum y)^2 / N)}}$$

Whereas

r = Correlation coefficient

N = Number of observations on x and y variables.

X = Weather parameters

y = Yield

Development of regression model with climatic parameters, area, production and productivity of green chilli crop in Marathwada region

A regression model was developed using crop data covering a ten-year period from 2015 to 2024. The analysis was conducted to assess the combined effect of all independent variables in explaining the

$$Y = -4808.34 + 115.73X_1 + 27.30X_2 + 11.80X_3 - 12.14X_4 + 0.12X_5 \text{ and } R^2 = 0.65$$

While, Table 2(a) revealed that the combined weather parameters explained 68% of the variation in green chilli production. However,

$$Y = -34192.76 + 842.18X_1 + 169.70X_2 + 78.77X_3 - 69.97X_4 + 0.81X_5 \text{ and } R^2 = 0.68$$

Moreover, Table 2(a) revealed that the combined influence of the selected weather parameters explained 41% of the variation in green chilli productivity. However, none of the individual weather parameters

variation in the dependent variable. Accordingly, the influence of the independent variables was estimated using the following regression equation:

$$Y = a + b_1x_1 + b_2x_2 + \dots + b_nx_n$$

Whereas,

Y = Dependent variable

X₁ = Independent variable

b₁ = Partial regression coefficient

a = Constant

n = Total number of variables

Result and Discussion

Correlation and regression model of weather parameters with area, production and productivity of green chilli in Parbhani district (2015 to 2024)

The relationship between the year wise weather parameters and the area, production and productivity of green chilli is presented in Table 1 revealed that the T max. exhibited a significant positive correlation with area (0.70*) and production (0.73*), whereas its correlation with productivity was negative (-0.50). T min showed positive correlations with both area (0.42) and production (0.43). (RH-I) and (RH-II) were positively associated with productivity, with correlation coefficients of (0.19) and (0.32), respectively. Rainfall also showed a positive relationship with productivity (0.22). The findings are broadly consistent with the observations reported by Widowati *et al.* (2023) [8] and Jambhale *et al.* (2016) [2].

The observed relationships indicate that variations in temperature, humidity and rainfall may influence the area, production and productivity of green chilli in the study region. The findings indicate that temperature is an important climatic factor influencing green chilli cultivation and production. The negative association between maximum temperature and productivity suggests that temperatures beyond the favourable range may reduce yield through heat stress. The observed variation in green chilli area, production and productivity may therefore be associated with changes in cultivated area as well as year to year fluctuations in weather conditions.

Table 2. (a) revealed that the combined effect of the selected weather parameters explained 65% of the variation in the area under green chilli cultivation. However, none of the individual weather variables showed a statistically significant influence on the green chilli cultivated area.

The resultant multiple regression model was derived and expressed as

none of the individual weather variables exhibited a statistically significant effect on green chilli production during the study period.

The resultant multiple regression model was derived and expressed as

ters showed a statistically significant effect on crop productivity during the study period.

The resultant multiple regression model was derived and expressed as

$$Y = 124.48 - 2.53X_1 - 0.70X_2 - 0.38X_3 + 0.43X_4 - 0.003X_5 \text{ and } R^2 = 0.41$$

Correlation and regression model of weather parameters with area, production and productivity of green chilli in Nanded district (2015 to 2024)

The relationship between the selected weather parameters and green chilli area, production and productivity is presented in Table 1 revealed that the T max. showed positive correlations with area (0.29), production (0.31) and productivity (0.60). T min was also positively correlated with area (0.48), production (0.50) and productivity (0.59). RH-I exhibited a positive correlation with productivity (0.39), while RH-II showed a positive correlation with productivity (0.21). In contrast, RH-II had a significant negative correlation with area (-0.73*) and production (-0.71*). Rainfall also showed a significant negative correlation with area (-0.63*) and production (-0.64*). The similar results are in accordance with the findings reported by Sarada *et al.* (2015) [5] and Bhattacharya *et al.* (2021) [1].

$$Y = -307.14 - 17.87X_1 + 246.81X_2 - 34.93X_3 - 1.70X_4 - 1.02X_5 \text{ and } R^2 = 0.99$$

The *R* (Jambhale *et al.*, 2016) [2] value is (0.99**) which is highly significant at 1% level of significant.

Table 2. (b) indicated that the combined weather variables explained 98% of the variation in green chilli production. Among the variables studied, minimum temperature, morning relative humidity (RH-I) and rainfall had significant effects on production. Minimum temperature

$$Y = -12198.38 - 2.91X_1 + 2996.11X_2 - 423.60X_3 + 1.39X_4 - 12.77X_5 \text{ and } R^2 = 0.98$$

The *R* (Jambhale *et al.*, 2016) [2] value is (0.98**) which is highly significant at 1% level of significant.

Table 2. (b) shows that the selected weather parameters collectively explained 58% of the variation in green chilli productivity. However,

$$Y = -29.14 + 1.04X_1 + 0.21X_2 + 0.01X_3 + 0.02X_4 - 0.0008X_5 \text{ and } R^2 = 0.58$$

Correlation and regression model of weather parameters with area, production and productivity of green chilli in Chh. Sambhajinagar district (2015 to 2024)

The relationship between the selected weather parameters and the area, production and productivity of green chilli is presented in Table 1 resulted that T max. showed a positive correlation with productivity (0.29). T min exhibited significant positive correlations with area (0.71*) and production (0.66*), whereas it showed a significant negative correlation with productivity (-0.63*). RH-I was positively associated with area (0.40) and production (0.34), but showed a significant negative correlation with productivity (-0.69*). Similarly, RH-II was positively correlated with area (0.46) and production (0.41), while its relationship with productivity was significantly negative (-0.73*). Rainfall showed a positive correlation with area and production (0.14). These findings are similar to the observations reported by Bhattacharyya *et al.* (2021) [1], Vijayan *et al.* (2013) [7] and Sarada *et al.* (2015) [5].

$$Y = -1372.43 - 2033.32X_1 + 3681.34X_2 - 82.26X_3 + 37.92X_4 + 3.56X_5 \text{ and } R^2 = 0.68$$

Table 2. (c) indicated that the combined effect of the selected meteorological variables explained 62% of the variation in green chilli production. However, none of the individual weather parameters exerted

$$Y = 26975.56 - 16301X_1 + 28617.62X_2 - 870.44X_3 + 317.15X_4 + 31.17X_5 \text{ and } R^2 = 0.62$$

Table 2. (c) revealed that the combined contribution of the selected weather parameters explained 82% of the variation in green chilli productivity. However, none of the individual meteorological variables

The results indicate that higher afternoon relative humidity and rainfall were associated with reductions in green chilli area and production during the study period. Green chilli is sensitive to excess moisture, particularly during periods of heavy rainfall. Excess water can reduce oxygen availability in the root zone, adversely affecting root activity and overall plant growth.

Table 2. (b) shows that the combined effect of the selected weather parameters explained 99% of the variation in the area under green chilli cultivation. Among the meteorological variables, minimum temperature, morning relative humidity (RH-I) and rainfall had a statistically significant influence on cultivated area. Minimum temperature had a positive effect, whereas morning relative humidity and rainfall had negative effects. These findings are consistent with those reported by Bhattacharyya *et al.* (2021) [1].

The resultant multiple regression equation was derived and expressed as

had a positive effect, whereas morning relative humidity and rainfall had negative effects. These findings are consistent with those reported by Sali (2016) [4].

The resultant multiple regression equation was derived and expressed as

none of the individual weather variables exhibited a statistically significant effect on crop productivity.

The resultant multiple regression model was derived and expressed as

The result indicates that a rise of 1 °C in minimum temperature can enhance chilli production up to an optimum temperature of approximately 20 °C beyond this level, further increases in minimum temperature may reduce the rate of production and consequently lower yield. Green chilli is sensitive to moisture conditions and the present study showed a negative association between relative humidity and productivity. Higher relative humidity may create a favorable environment for the development and spread of diseases, which can adversely affect crop performance and yield. Therefore, minimum temperature, morning relative humidity (RH-I) and afternoon relative humidity (RH-II) can be considered important weather-related factors influencing the productivity of green chilli.

It is evident from the Table 2(c) indicated that the combined effect of the weather variables accounted for 68% of the variation in the area under green chilli cultivation. Despite this, the individual weather variables did not exhibit any statistically significant effect on the area under green chilli cultivation.

The resultant multiple regression model was derived and expressed as

a statistically significant influence on green chilli production during the study period.

The resultant multiple regression model was derived and expressed as

exhibited a statistically significant effect on the productivity of green chilli.

The resultant multiple regression model was derived and expressed as

$$Y = -68.33 + 5.29X_1 - 3.92X_2 - 0.07X_3 - 0.15X_4 - 0.0003X_5 \text{ and } R^2 = 0.82$$

The *R* (Jambhale *et al.*, 2016) [2] value is (0.82**) which is highly significant at 1% level of significant.

Table 1. Correlation of Climatic parameters with Area, Production and Productivity of green chilli in selected district of Marathwada region (2015 to 2024)

Weather Parameter	Parbhani district		
	Green chilli		
	Area (ha)	Production (t)	Productivity (t ha ⁻¹)
T max. (°C)	0.70*	0.73*	-0.50
T min. (°C)	0.42	0.43	-0.37
RH-I (%)	-0.37	-0.39	0.19
RH-II (%)	-0.44	-0.44	0.32
Rainfall (mm)	-0.23	-0.22	0.22
Nanded district (Green chilli)			
T max. (°C)	0.29	0.31	0.60
T min. (°C)	0.48	0.50	0.59
RH-I (%)	-0.44	-0.41	0.39
RH-II (%)	-0.73*	-0.71*	0.21
Rainfall (mm)	-0.63*	-0.64*	-0.20
Chh. Sambhajinagar district (Green chilli)			
T max. (°C)	-0.11	-10.5	0.29
T min. (°C)	0.71*	0.66*	-0.63*
RH-I (%)	0.40	0.34	-0.69*
RH-II (%)	0.46	0.41	-0.73*
Rainfall (mm)	0.14	0.14	-0.12

*= Significant at 5% level **= Significant at 1% level

Table 2. (a): Multiple Regression model of Climatic parameters with Area, Production and Productivity of Green chilli in Parbhani district of Marathwada region (2015 to 2024)

Sr. No.	Parameters	Parbhani district (Area ha)			
		Regression coefficient B (i)	SE	"t" value	"P" value
1	T max. (°C)	115.73	100.76	1.14	0.31
2	T min. (°C)	27.30	70.80	0.38	0.71
3	RH-I (%)	11.80	16.03	0.73	0.50
4	RH-II (%)	-12.14	25.01	-0.48	0.65
5	Rainfall (mm)	0.12	0.25	0.49	0.64
$B_0 = -4808.34$, F value = 1.48, $R^2 = 0.65$, $SEY = 57.67$					
Production (t)					
1	T max. (°C)	842.18	649.67	1.30	0.26
2	T min. (°C)	169.70	456.54	0.37	0.72
3	RH-I (%)	78.77	103.36	0.76	0.49
4	RH-II (%)	-69.97	161.27	-0.43	0.69
5	Rainfall (mm)	0.81	1.62	0.50	0.63
$B_0 = -34192.76$, F value = 1.74, $R^2 = 0.68$, $SEY = 371.83$					
Productivity (t ha⁻¹)					
1	T max. (°C)	-2.53	3.64	-0.69	0.52
2	T min. (°C)	-0.70	2.56	-0.27	0.80
3	RH-I (%)	-0.38	0.57	-0.65	0.55
4	RH-II (%)	0.43	0.90	0.47	0.66
5	Rainfall (mm)	-0.003	0.009	-0.40	0.71
$B_0 = 124.48$, F value = 0.57, $R^2 = 0.41$, $SEY = 2.08$					

*= Significant at 5% level **= Significant at 1% level

(continued on next page)

Table 2. (b): Multiple Regression model of Climatic parameters with Area, Production and Productivity of green chilli in Nanded district of Marathwada region (2015 to 2024)

Sr. No.	Parameters	Nanded district (Area ha)			
		Regression coefficient B (i)	SE	“t” value	“P” value
1	T max. (°C)	-17.87	43.14	-0.41	0.70
2	T min. (°C)	246.81**	29.63	8.33	0.001
3	RH-I (%)	-34.93**	5.29	-6.60	0.002
4	RH-II (%)	-1.70	4.77	-0.36	0.74
5	Rainfall (mm)	-1.02**	0.18	-5.53	0.005
$B_0 = -307.14$, F value = 88.82, $R^2 = 0.99$, SEY = 58.29					
Production (t)					
1	T max. (°C)	-2.91	578.92	-0.005	0.99
2	T min. (°C)	2996.11**	397.60	7.53	0.001
3	RH-I (%)	-423.60**	70.99	-5.96	0.003
4	RH-II (%)	1.39	63.96	0.02	0.98
5	Rainfall (mm)	-12.77**	2.49	-5.11	0.006
$B_0 = -12198.38$, F value = 69.89, $R^2 = 0.98$, SEY = 782.28					
Productivity (t ha⁻¹)					
1	T max. (°C)	1.04	0.76	1.36	0.24
2	T min. (°C)	0.21	0.52	0.40	0.71
3	RH-I (%)	0.01	0.09	0.12	0.90
4	RH-II (%)	0.02	0.08	0.25	0.81
5	Rainfall (mm)	-0.0008	0.003	-0.25	0.81
$B_0 = -29.14$, F value = 1.11, $R^2 = 0.58$, SEY = 1.027					
* = Significant at 5% level ** = Significant at 1% level					

Table 2. (c): Multiple Regression model of Climatic parameters with Area, Production and Productivity of green chilli in Chh. Sambhajinagar district of Marathwada region (2015 to 2024)

Sr. No.	Parameters	Chh. Sambhajinagar district (Area ha)			
		Regression coefficient B (i)	SE	“t” value	“P” value
1	T max. (°C)	-2033.3	2338.06	-0.87	0.43
2	T min. (°C)	3681.34	1578.43	2.33	0.08
3	RH-I (%)	-82.26	163.24	-0.50	0.64
4	RH-II (%)	37.92	83.40	0.45	0.67
5	Rainfall (mm)	3.56	3.27	1.09	0.33
$B_0 = -1372.43$, F value = 1.67, $R^2 = 0.68$, SEY = 1637.24					
Production (t)					
1	T max. (°C)	-16301	19920.6	-0.8183	0.46
2	T min. (°C)	28617.6	13448.5	2.13	0.10
3	RH-I (%)	-870.44	1390.83	-0.62	0.56
4	RH-II (%)	317.15	710.56	0.45	0.68
5	Rainfall (mm)	31.17	27.88	1.11	0.33
$B_0 = 26975.56$, F value = 1.30, $R^2 = 0.62$, SEY = 13949.47					
Productivity (t ha⁻¹)					
1	T max. (°C)	5.29	3.37	1.57	0.19
2	T min. (°C)	-3.92	2.27	-1.72	0.16
3	RH-I (%)	-0.07	0.23	-0.32	0.76
4	RH-II (%)	-0.15	0.12	-1.30	0.26
5	Rainfall (mm)	-0.0003	0.004	-0.07	0.94
$B_0 = -68.33$, F value = 3.75, $R^2 = 0.82$, SEY = 2.360					
* = Significant at 5% level ** = Significant at 1% level					

Conclusions

Among all districts, Nanded district exhibited the highest model fit R (Jambhale *et al.*, 2016) [2] value (0.99**) for area and (0.98**) for production while Chh. Sambhajinagar recorded the highest productiv-

ity model fit (R (Jambhale *et al.*, 2016) [2] = 0.82**) which is highly significant at the 1% level of significance. In Chh. Sambhajinagar district, the regression analysis based on weather parameters revealed that T min. had significant positive correlation with green chilli area (0.71*) and production (0.66*).

References

1. Bhattacharyya B, Biswas R, Sujatha K, Chiphang DY. Linear regression model to study the effects of weather variables on crop yield in Manipur State. *International Journal of Agricultural and Statistical Sciences*. 2021;17(1):317–322.
2. Jambhale AV, Khobragade AM, Karhale MB. Influence of weather parameter on Tomato vegetable crop under Parbhani District of Marathwada region. *International Journal Society for Scientific Development*. 2016;11:2297-2300.
3. Prasad I, Tiwari CP, Karkute SG, Kumar R, Chauhan VB, Ram CN, Jha A, Kumar R. Insight of high temperature stress in chilli (*Capsicum annuum* L.). *Discover Plants*. 2026;3:275.
4. Sali A. Development of database management system for selected commercial crops M.Sc. (Agri.) Thesis. University of Agricultural Sciences, College of Agriculture, Dharwad, Karnataka, India; 2016.
5. Sarada C, Ratnam M, Naram Naidu L, Venkata Ramana C, Rajani A, Vijayalakshmi T. Chilli production and productivity in relation to Seasonal weather conditions in Guntur District of Andhra Pradesh. *Int. J. Pure App. Bio. Sci*. 2015;3(1):207-213.
6. Singh J, Kumar S. Climate change impacts and mitigation on chilli production: Adaptive agronomic and genetic strategies. *Plant Archives*. 2025;25(2):2089-2098.
7. Vijayan L, Al Talhi FA, Noor EFED. Significance of meteorological parameters in the implementation of agriculture engineering practices in and around Tabuk Region, KSA. *International Journal of Applied Science and Technology*. 2013;3(5):53–60.
8. Widowati A, Dhamira A, Anggrasari H, Seleky RN. Climatic factors and its effect on chilli production: One step forward combating climate change. *BIO Web of Conferences*. 2023;69:04001.

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