

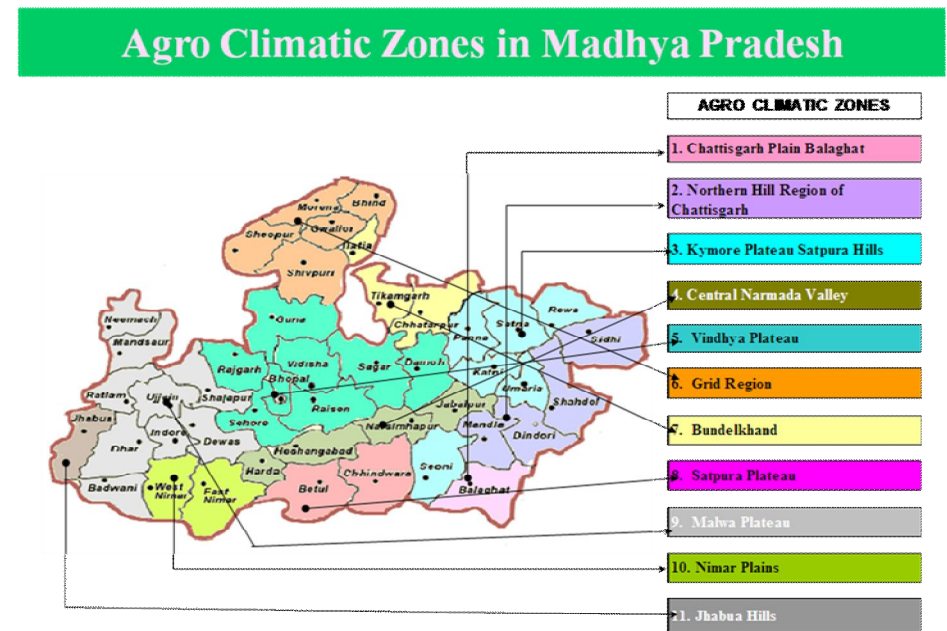
Chapter – II

2.0 AGRO-CLIMATIC ZONES

The state has a typically tropical climate with 3 distinct seasons (winter, summer and monsoons). The average rainfall for the state is 1200 mm. District in the western and northwestern parts of the state are considered to be susceptible to desertification. These regions also do not have a thick forest cover in comparison with the central and eastern parts of the state.

The state has broadly been divided into 11 Agro-climatic Zones (ACZ). Agriculturally, Malwa and Central Narmada Valley (CNV) are advanced ACZ. The cropping pattern shows a significant presence of cash crops and horticultural crops in Malwa and CNV ACZ. The average productivity of land in these regions is also higher than that the state average. CNV ACZ has the higher percentage of irrigated land to net sown area while Malwa is third in the list. Bundelkhand ACZ due to large parts of the region under traditional tanks/ponds occupies the second position in the state. NHC ACZ has the lowest percentage of irrigated area to net sown area. It also shows the lowest productivity percentages of both kharif and rabi crops.

The zones have special cropping patterns, soil types and varying degrees of rainfall as shown in the **Table SPSP – 2** given below :-



SPSP – 2 : Agro-climatic Zones in State

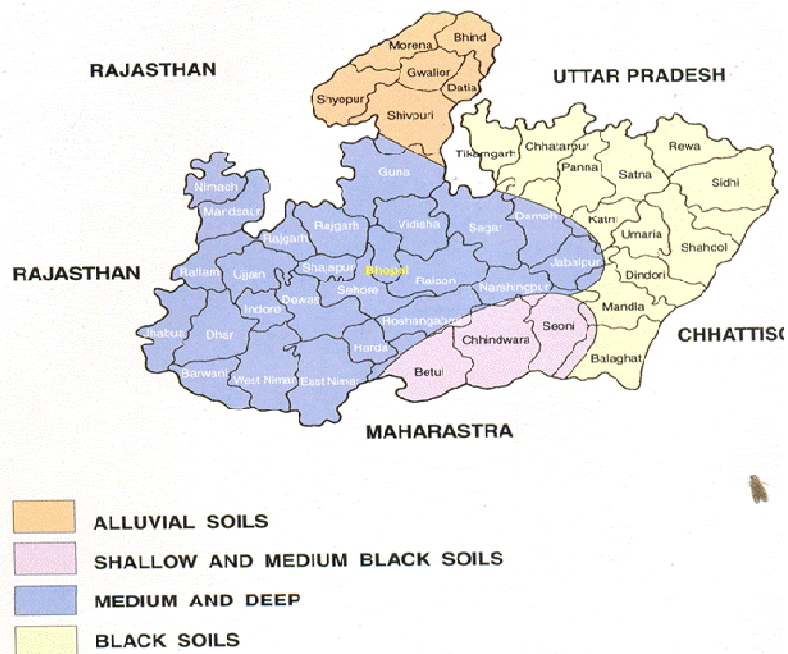
S.No	Name of the Agro-	Area in	Names of	Major soil types	Average	Major crops
------	-------------------	---------	----------	------------------	---------	-------------

	climatic zone	Sq Km	the districts	a) Type	b) Area in Ha.	rainfall in mm (preceding 5 years average)	Name	Area in 000 Ha.
1	Chhattisgarh Plains	17987	Balaghat	Red and Yellow	922900	1623	Paddy, Wheat, Linseed	277
			Seoni	Mixed Red and Black	875800	1170	Paddy, Kodokutki, Soybean, Wheat, Gram	379.1
2	Northern hill Region of Chhattisgarh	33748	Sidhi,	Red and yellow	1052600	1287	Paddy, Maize, Kodokutki,Tur, Sesamum, Wheat, Barley, Gram, Linseed	417.3
			Shahdol	Red and yellow Medium Black	995200	1326	Paddy, Kodokutki,Wheat	152.1
			Dindhori	Red and yellow	747000	1241	Paddy, Maize,Kodokutki,Niger, Wheat, Mustard, Lentil	242.2
			Anuppur	Red and yellow Medium Black			Paddy, Maize,Kodokutki, Niger, Wheat	144.7
			Mandla	Red and yellow Medium Black	580000	1370	Paddy, Maize,Kodokutki, Wheat, Peas, Mustard, Lentil	248.8
3	Kymore Plateau & Satpura Hills	29979	Panna	Mixed Red and black, Deep Black	713500	1213	Paddy, Wheat, Gram,Lentil	238.9
			Satna	Mixed Red and Black	750200	896.3	Paddy,Kodokuti, Soybean, Wheat, Gram,Lentil	431.7
			Rewa	Medium and Black	631400	1035	Paddy, Jowar, Tur, Soybean, Wheat, Gram,Lentil, Linseed	473.6
			Katni	Mixed Red and black, Deep Black	495000	1027	paddy, wheat, gram, lentil	205.3
			Umaria	Red and yellow Medium Black	407800	1326	paddy, maize, kodokutki, wheat	99.6
4	Central Narmada Valley	20381	Harda	Deep Black	333000	1417	Soybean, Wheat, Gram	292.2
			Hosangabad	Deep Black	670700	1294	Soybean, Wheat, Gram	451.2
			Narsingpur	Deep Black	513300	1105.2	Tur, Urd, Soybean, Wheat, Gram, Lentil,Sugarcane	413.3
			Jabalpur	Deep Black	521100	1161.9	Paddy, Urd, Wheat, Gram,Peas, Lentil	306.9

S.No	Name of the Agro-climatic zone	Area in Sq Km	Names of the districts	Major soil types		Average rainfall in mm (preceding 5 years average)	Major crops	
				a) Type	b) Area in Ha.		Name	Area in 000 Ha.
5	Vindhyan Plateau	59966	Guna	Medium and Deep Black		1052.8	Jowar, Maize, Soybean, Wheat, Gram, Mustard	349.8
			Rajgarh	Medium Black	615400	1134	Jowar, Maize, Soybean, Wheat, Gram	497.3
			Vidisha	Medium and Deep Black	737100	1133	Urd, Soybean, Wheat, Gram, Lentil	645.1
			Bhopal	Medium Black	277200	1079	Soybean, Wheat, Gram	194.3
			Sagar	Medium and Deep Black	1025200	1125	Urd, Soybean, Wheat, Gram, Lentil	660.9
			Raisen	Medium and Deep Black	846800	1330	Tur, Soybean, Wheat, Gram, Lentil	455.6
			Sehore	Medium and Deep Black	657800	1262	Maize, Soybean, Wheat, Gram	537.4
			Damoh	Medium and Deep Black	730600	1224	Paddy, Urd, Soybean, Wheat, Gram, Lentil	380.2
6	Gird Region	30892	Morena	Alluvium	498900	709	Bajra, Wheat, Mustard	298.7
			Bhind	Alluvium	445900	668	Bajra, Wheat, Mustard	284.2
			Sheopur	Alluvium	660600	723.7	Bajra, Soybean, Sesamum, Wheat, Mustard	167.4
			Shivpuri	Alluvium	1027800	871	Maize, Soybean, Groundnut, Wheat, Gram, Mustard	414.3
			Gwalior	Alluvium	456000	858.1	Wheat, Gram, Mustard	165.9
			Ashoknagar	Alluvium			Urd, Soybean, Wheat, Gram, Lentil	333.6
7	Bundelkhand	16426	Datia	Mixed Red and Black	269100	742.6	Sesamum, Wheat, Gram, Peas	161.1
			Tikamgarh	Mixed Red and Black	504800	1101	Urd, Soybean, Sesamum, Wheat, Gram, Mustard	236.1
			Chhatarpur	Mixed Red and Black	868700	1075	Urd, Sesamum, Wheat, Gram, Peas	311.1
8	Satpura Plateau	21858	Betul	Shallow Black	1004300	1084	paddy, Jowar, Maize, Tur, Soybean, Wheat, Gram, Sugarcane	476.3
			Chhindwara	Shallow Black	1181500	1053.7	Paddy, Jowar, Maize, Tur, Soybean, Groundnut, Cotton, Wheat, Gram, Sugarcane	532.2
9	Malwa Plateau	51432	Neemach	Medium Black	425600	823	Maize, Soybean, Wheat, Gram, Mustard	221.4
			Mandsaur	Medium Black	553500	1012	Maize, Urd, Soybean, Wheat, Gram, Mustard	419.3
			Ratlam	Medium Black	486100	895	Maize, Soybean, Wheat, Gram	361.2
			Ujjain	Medium Black	609100	935	Soybean, Wheat, Gram	666.2
			Shajapur	Medium Black	619600	977	Jowar, Maize, Soybean, Wheat, Gram	574.3
			Indore	Medium Black	389800	980	Soybean, Wheat, Gram	363
			Dewas	Medium Black	7072000	1067	Soybean, Wheat, Gram	470.8
			Dhar	Medium Black	815300	875	Maize, Soybean, Cotton, Wheat, Gram,	617.7
	Badwani	Medium Black	542200	844	Jowar, Maize, Soybean, Cotton, Wheat	332.5		
10	Nimar Plains	18809	Khandwa	Medium Black	1077900	880	Jowar, Soybean, Wheat, Gram, Cotton	320.6
			Burhanpur	Medium Black			Jowar, Soybean, Wheat, Cotton, Sugarcane	95.5
			Khargone	Medium Black	803000	830	Jowar, Maize, Soybean, Cotton, Wheat	388.3

The state of Madhya Pradesh has a variety of soils ranging from rich clayey to gravelly. The major groups of soils found in the state can be divided into 4 categories namely; alluvial, medium and deep black, shallow and medium black, mixed red and black. The district wise detail are given in **Table- 8**:-

Table- 8



Type of soils Area and (%)	No. of Districts	Name of Districts
Shallow & medium Black soil Area 3.06 m ha. (6.91%)	3	Betul, Chhindwara and Seoni
Deep medium Black soil Area 16.21 m. ha. (36.53%)	33	Narsinghpur, Hoshangabad, Harda, Shahdol, Damoh, Vidisha, Raisen, Bhopal, Sehore, Rajgarh, Ujjain, Dewas, Shajapur, Mandsaur, Neemuch, Ratlam, Jhabua, Dhar, Indore, Khargone, Barwani, Khandwa, Guna (partly), Shivpuri (partly), Datia (partly) and Sidhi (partly), Anuppur, Ashoknagar, Burhanpur
Alluvial soil Area 3.35 m. ha. (7.57%)	4	Gwalior, Morena, Sheopurkala, Bhind & Shivpuri (partly)
Mixed Red & Black soil Area 8.11 m. ha. (18.30%)	8	Mandla, Dindori, Balaghat,, Rewa, Satna, Panna, Chhatarpur, Tikamgarh, Shivpuri (partly), Guna (partly), Datia (partly) and Sidhi (partly)

2.1 RAINFALL

- a) Annual rainfall in the state varies from 600 to 1600 mm. The average rainfall for the state is 1200 mm. There is one distinct rainy season when the state receives rains through the southwest monsoon, in the months of June to October and the average numbers of rainy days are 54. The district-wise details of average rainfall recorded at the district head quarter are given in **Table – SPSP-3** :-

SPSP – 3 Details of average rainfall

1	2	3
S.No.	Name of the District	Average rainfall in mm (preceding 5 years average)
1	Betul	1084.00
2	Balaghat	1623.20
3	Barwani	844.00
4	Bhind	668.00
5	Bhopal	1079.00
6	Chhatarpur	1075.00
7	Chhindwara	1053.70
8	Damoh	1224.00
9	Datia	742.60
10	Dewas	1067.00
11	Dhar	875.00
12	Dindori	1241.00
13	Guna	1052.80
14	Gwalior	858.10
15	Harda	1417.00
16	Hosangabad	1294.00
17	Indore	980.00
18	Jabalpur	1161.90
19	Jhabua	580.00
20	Katni	1027.00
21	Khandwa	880.00
22	Khargone	830.00
23	Madsaur	1012.00
24	Mandla	1370.00
25	Morena	709.20

26	Narsinghpur	1105.20
27	Neemach	823.00
28	Panna	1213.00
29	Raisen	1330.40
30	Rajgarh	1134.00
31	Ratlam	895.00
32	Rewa	1035.00
33	Sagar	1125.00
34	Satna	895.30
35	Sehore	1262.16
36	Seoni	1170.00
37	Shahdol	1326.00
38	Shajapur	977.00
39	Sheopur	723.70
40	Shivpuri	871.00
41	Sidhi	1248.00
42	Tikamgarh	1101.00
43	Ujjain	935.00
44	Umaria	1326.00
45	Vidisha	1133.80
	Total	

b) **Brief Of Droughts and Flood in the State :**

Almost every year, one or other part of the state is generally hit by drought in last 10 years causing damage to crops and shortage of drinking water. The year wise details are as given below:-

Year	No. of Districts	Name of Districts	Type of Calamity
1991-92	23	Rewa, Sidhi, Satna, Shahdol, Jabalpur, Balaghat, Chhindwara, Mandla, Seoni, Rajgarh, Betul, Dhar, Jhabua, Khandwa, Sagar, Damoh, Panna, Tikamgarh, Chhatarpur, Gwalior, Guna, Data, Ratlam	Drought
1992-93	4	Mandla, Khandwa, Chhindwara, Balaghat	Drought
1994-95	4	Rajgarh, Tikamgarh, Balaghat, Khandwa	Drought
1995-96	8	Panna, Tikamgarh, Chhatarpur, Rajgarh, Ratlam, Khandwa, Jhabua, Chhindwara	Drought
1996-97	5	Balaghat, Jabalpur, Seoni	Drought
1997-98	35	Indore, Khargone, Khandwa, Ujjain, Dewas, Shajapur, Mandsaur, Ratlam, Gwalior, Shivpuri, Guna, Bhind, Rewa, Shahdol, Satna, Sagar, Damoh, Panna, Chhatarpur, Tikamarh, Bhopal, Betul, Raisen, Rajgarh, Sehore, Vidisha, Hoshangabad, Jabalpur, Balaghat, Chhindwara, Seoni, Mandla, Narsinghpur	Excessive Rains &Hail Storms
1998-99	23	Vidisha, Dhar, Neemuch, Ujjain, Bhopal, Ratlam, Betul, Shajapur, Sagar, Guna, Chhindwara, Damoh, Dindori, Dewas, Khandwa, Khargone, Indore, Mandsaur, Gwalior, Sehore, Mandla, Jabalpur, Rajgarh	Hail Storms
1999-2000	4	Dhar, Jhabua, Khargone, Badwani	Drought
	6	Hoshangabad, Harda, Raisen, Sehore, Narsinghpur, Dewas	Flood
2000-01	32	Ratlam, Rajgarh, Panna, Seoni, Jhabua, Ujjain, Khargone, Badwani, Balaghat, Khandwa, Dhar, Neemuch, Katni, Bhind, Mandsaur, Chhindwara, Mandla, Jabalpur, Damoh, Chhatarpur, Narsinghpur, Tikamgarh, Shahdol, Indore, Sheopur, Satna, Betul, Sidhi, Dindori	Drought
2001-02	6	Ujjain, Shajapur, Ratlam, Rajgarh, Seoni & Chhindwara	Drought

2002-03	33	Ratlam, Rajgarh, Panna, Seoni, Ujjain, Morena, Gwalior, Balaghat, Neemuch, Katni, Shivpuri, Guna, Datia, Bhind, Mandsaur, Chhindwara, Mandla, Jabalpur, Damoh, Chhatarpur, Tikamgarh, Shahdol, Shajapur, Barwani, Sheopur, Satna, Sidhi, Dindori, Raisen, Sagar, Rewa, Umaria and Vidisha	Drought
2004-05	21	Sheopur, Datia, Tikamgarh, Balaghat, Panna, Chhatarpur, Rewa, Shahdol, Sidhi, Chhindwara, Harda, Hoshangabad, Seoni, Betul, Dewas, Khargone, Barwani, Ratlam, Umaria, Sehore, Ujjain	Drought
2005-06	9	Tikamgarh, Ratlam, Mandsaur, Shajapur, Chhatarpur, Khargone, Rajgarh, Chhindwara, Panna	Drought
	3	Chhindwara (Chindwara)	Drought
		Shajapur (Agar), Panna (Gunnor & Pawai)	Drought
2006-07	9	Panna, Tikamgarh, Chhatarpur, Satna, Gwalior, Shivpuri, Rewa, Katni, Ratlam	Drought
	4	Datia, Gwalior, Morena, Anuppur	Cluster