Nanaji Deshmukh Krushi Sanjeevani Prakalp
Strategic Research & Extension Plan (SREP)
Climate Resilient Agriculture Supplement
of
District Chhatrapati Sambhaji Nagar

Prepared by

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and

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INTRODUCTION

The Project on Climate Resilient Agriculture in Maharashtra (PoCRA) is a project of Government of Maharashtra with Partnership of World Bank and the project is implemented in 5220 vulnerable villages in 16 districts of Marathwada, Vidarbha and North Maharashtra. The project development objective (PDO) is 'to enhance climate resilience and profitability of smallholder farming system in selected districts of Maharashtra'. On the backdrop of frequent droughts affecting the agriculture in the state, the project is focused on enhancing climate resilience at farm level. Climate Resilient Agriculture involves sustainable agricultural practices that enhance productivity, mitigate risks, and reduce greenhouse gas emissions. The farmers can ensure food security in the face of extreme weather events and climate change by adopting climate-resilient agriculture practices. The extension functionary of the Department of Agriculture is mandated to disseminate knowledge and skills about resilient technologies to the farming community. The district-level authority of the Department of Agriculture prepares the strategy for need-based extension with the help of the Agriculture Universities and Krushi Vidnyan Kendra's. In order to facilitate this process, the Government of India has directed the states to prepare a Strategic Research and Extension Plan (SREP) at the district level as an integral part of extension reforms under the Agriculture Technology Management Agency (ATMA) initiative.

SREPs are multi-year strategy documents for the dissemination of innovations and the coordinated interaction in the field between State Agricultural Universities (SAU), Regional Research Stations (KVK), district-level agricultural extension services (ATMA) and the farming community. SREPs are developed under the leadership of the Project Director (ATMA), whose responsibility is to bring together researchers, extensionists, farmers and other stakeholders to make, based on joint diagnostic studies, district extension plan and recommendations for expanded adaptive research to introduce innovations in technology dissemination to cater to local needs and situations. The project had taken a conscious decision to review and update the current SREPs to mainstream climate vulnerability and its impact on farming in project districts as well as to explore the potential for strengthening existing value chains with up-to-date market intelligence. This task is accomplished with preparation of climate resilient agriculture supplement as a supportive document to the current SREP of each project district. As per the project agreement between the Government of Maharashtra and the World Bank, the updation of SREPs is considered as one of the project assessment indicators. The document is prepared by the Project Director (ATMA) in consultation with the field functionary of the Department of Agriculture, State Agriculture Universities (SAUs), Krushi Vigyan Kendra's (KVKs), Farmers, Farmer Producer Organizations from the district. The SREP supplement contains an account of weather analysis, information about cropping pattern, impact of climate change on crop yields, coping mechanisms adopted by the farmers, adoption level of climate resilient technologies, constraints in marketing of agriculture produce and scope for value chain development. The SREP supplement ends with comprehensive template for Village Adaptation Plan which will act as guide for the Agriculture Assistants who are the cutting-edge extension workers. It will be helpful to extension workers while carrying out extension of 'climate resilience technologies.

INDEX

Chapter 1: General Profile of the District

1.1 Geographical area and location of the district

Chhatrapati Sambhajinagar district comprising nine tehsils and 1368 Villages, total geographical area of the district is 10,181 sq. kms. The district lies between 19° to 20°N Latitude and 74° to 76° E longitude in the Deccan *Plateau Zone (NBSS&LUP).*

1.2 Tehsils details

The tehsils are Chhatrapati Sambhajinagar, Khultabad, Gangapur, Kannad, Sillod, Soygaon, Paithan, Phulambri, and Vaijapur.

1.3 Demographic Information

As per 2011 census total population was 37.1 lakhs. The share of rural population is 18.09 lakhs.

1.4 Annual Average rainfall & Temperature

Agriculture is dependent on Monsoon rainfall. The average normal precipitation of the district is 718 mm. Khultabad recorded the highest rainfall of 981 mm whereas Paithan taluka registered lowest precipitation of 544 mm.

The highest temperature goes up to 42° C in summer whereas minimum temperature is observed up to 8° C in winter season.

1.5 River Network in the District

The Godavari is the main river flowing west to east and Purna, Shivana, Khelna, Kham, Dudhana, Girija *etc*. are the sub-rivers following in the district.

1.6 Irrigation Potential of the district

At present the irrigation potential by using all sources is 16.57 percent. The cultivable Lands come to be 8,53,000 Ha.

1.7 Soil formation in the district and type of soil

The soils are mostly formed from igneous rocks and black, medium black, shallow and calcareous types having different depths and profiles.

1.8 Different zones according to prevailing agro ecological situations

The district falls within the two agro-climatic zones, six tehsils and their major parts comes under the Central Maharashtra plateau zone comprising Chhatrapati Sambhaji Nagar, Khultabad, Kannad, Sillod and Soygaon tehsils. Three tehsils *viz,* Paithan, Gangapur and Vaijapur belong to Western Maharashtra dry or scarcity zone. The crops are taken in three seasons in a year kharif, rabbi and summer. Cotton (19.72%) Cereals (28.11%), Pulses (7.62%) and Oil Seed (3.32%), Sugarcane (1.10%) and dry land fruit crops are growing in the district. There is much scope for agro-forestry and agro-horticulture in the district.

Agro-Ecological Situations in Chhatrapati Sambhajinagar district:

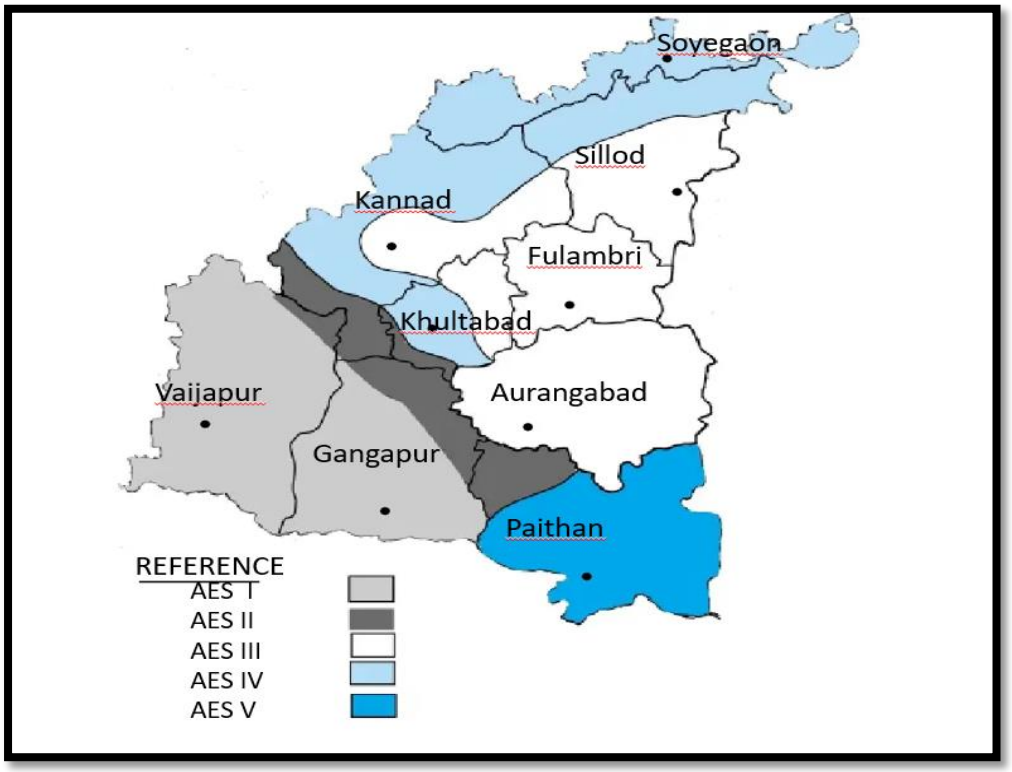
Chhatrapati Sambhajinagar district is divided into five zones according to Agro – Ecological Situations prevailing in different parts of the district. These situations are based on rainfall, topography, soil type, etc., the situation wise survey helped in understanding the situation specific research and extension priorities and needs for strategic planning of the district.

Agro-Ecological Situation including their characteristics and coverage:

Sr. No.	Agro-ecological situations	Characteristics of the zone	Blocks covered
1	Scarcity zone I	Low rainfall, light to medium soils	Western part of Vaijapur and Gangapur
2	Central plateau of Maharashtra II	Low rainfall, light to heavy soils, non-CADA area	Some part of Gangapur, Paithan, Chhatrapati Sambhajinagar and Vaijapur taluka
3	Central plateau of Maharashtra III	Assured rainfall medium to heavy soils	Part of Phulambri, Sillod, Khultabad taluka
4	Central plateau of Maharashtra IV	Assured rainfall hilly terrain	Some part of Kannad,Khultabad, Sillod and Soygaon Taluka
5	Central plateau of Maharashtra V	Command area heavy soils	Some part of Paithan and Gangapur Taluka

(Source: SREP, Chhatrapati Sambhaji Nagar, 2021)

Map of Agro-Ecological Situations in Chhatrapati Sambhajinagar district



Chapter 2: Agriculture Profile of District

2.1 Land use classification of the district

Land use classification of the district (Area in Ha.)

Sr. No.	Name of Land use	Area (Ha.)
1	Forest land	81,415
2	Barren and uncultivable land	106692
3	Current fallow	27400
4	Other fallows	7813
5	Gross cropped area	784400
	Total Geographical area of the district.	10,07,817

(Source: https://mahades.maharashtra.gov.in/publication)

Land Utilization Statistics (Preceding 3 Years Average) (Area in Ha.)

Sr. No.	Taluka	Geographical Area	Forest Area	Land under Non Agril. Use	Cultivable Waste	Total (5+6)	Land under miscellaneous tree crops and groves
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Aurangabad	94777	22463	10020	0	10020	205
2	Phulambri	66269	4425	3747	85	3832	2132
3	Paithan	142812	1554	25485	728	26213	8635
4	Vaijapur	159403	3057	9618	2237	11855	3112
5	Gangapur	130846	2219	15136	1286	16422	8390
6	Khultabad	51846	2047	3095	205	3300	6922
7	Sillod	151723	2827	20011	2100	22111	16462
8	Kannad	155547	30312	10004	2540	12544	5682
9	Soygaon	54497	12511	3576	470	4046	0
	Total	1007720	81415	100692	9651	110943	51540

(Source: district socio-economic survey, 2021)

Land Utilization Statistics (Preceding 3 Years Average) (Area in Ha.)

Sr. No.	Taluka	Current Fallows	Other Fallows	Total Fallow (9+10)	Total Net area sown	Area sown more than once	Total area under cultivation (12 + 13)	Cultivable area (8+11+12)
(1)	(2)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	Aurangabad	98	40	138	61796	37642	99438	62139
2	Phulambri	962	340	1302	54578	24700	79278	58012
3	Paithan	3210	1353	4563	101830	33698	135528	115028
4	Vaijapur	790	167	957	140366	26186	166552	144435
5	Gangapur	4435	1535	5970	97837	30345	128182	112197
6	Khultabad	3220	3230	6450	33110	14549	47659	46482
7	Sillod	13567	740	14307	95913	60981	156894	126682
8	Kannad	1310	451	1761	105080	39877	144957	112523
9	Soygaon	0	0	0	37931	10012	47943	37931
	Total	27592	7856	35448	728441	277990	1006431	815429

(Source: district socio-economic survey, 2021)

2.2 Agriculture land holdings

Land Holdings (Chhatrapati Sambhaji Nagar) 2011 (Holdings in numbers and area in hectares)

Sr. No.	Category of Farmer (Ha.)	Number of land holders	Area operated (Ha.)	% of land holders	% of land operated	State Level %	
						No. cultivator	Land operated
1	0 – 1.0	264373	142753.81	49.00	20.6	48.97	16.12
2	1.0 – 2.0	175839	247299.88	33.18	35.8	29.58	29.03
3	2.0 – 4.0	71404	186571.57	13.47	27.0	15.76	29.17
4	4.0 - 10.0	16897	93376.81	3.18	13.5	5.19	20.2
5	10.0 - Above	1348	21782.9	0.25	3.1	0.5	5.48
	Total District	529861	691704.97	100	100	100	100
	Average land holding = 1.30 ha						1.66 ha

(Source: dept. of agriculture, govt. of Maharashtra)

Land holdings Tehsil wise (Agriculture Census 2011)

Sr. No.	Tehsil	Marginal Farmers		Small Farmers		Semi-Med Farmers		Medium Farmers		Large Farmers		Total	
		No.	Area (Ha.)	No.	Area (Ha.)	No.	Area (Ha.)	No.	Area (Ha.)	No.	Area (Ha.)	No.	Area (Ha.)
1	Aurangabad	27642	14927	19381	27133	9235	24103	1808	10028	192	3103	58258	79294
2	Phulambri	18749	9937	13111	18355	7132	18615	1612	9561	92	1486	40696	57954
3	Paithan	43412	23008	28788	40303	10098	26356	1832	10036	212	3424	84342	103127
4	Vaijapur	45018	23860	28135	39389	9468	24711	1848	11096	182	3162	84651	102218
5	Gangapur	32766	17694	22778	31889	9690	25291	3041	16490	192	2934	68467	94298
6	Khultabad	9082	4813	5772	8081	3583	9352	1469	9221	56	904	19962	32371
7	Sillod	29209	15773	18818	26345	7219	18841	1578	8471	105	1684	56929	71114
8	Kannad	49994	27973	32958	46141	11356	29847	1896	10596	228	3648	96432	118205
9	Soygaon	8832	4769	6098	9664	3623	9456	1813	7878	89	1437	20455	33204
Total		264704	142754	175839	247300	71404	186572	16897	93377	1348	21782	530192	691785

(Source: Agriculture Census, govt of Maharashtra, 2011

Information of Soils (Area in ha)

Sr. No.	Name of the block	Class II (Heavy)		Class III (Medium)		Class IV (Light)		Class V (Not Suitable for cultivation		Class VI (Steep slopes shallow soils)		Class VIII (Steep slopes eroded soils)	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
1	Sillod	39394	25.96	15202	10.02	83616	55.11	0	0.00	13511	8.91	0	0.00
2	Kannad	44988	28.92	27400	17.62	49254	31.67	2741	1.76	2211	1.42	28953	18.61
3	Soygaon	6600	12.11	14473	26.56	19424	35.64	3000	5.50	6000	11.01	5000	9.17
4	Aurangabad	24491	25.84	23983	25.30	16550	17.46	0	0.00	13992	14.76	15761	16.63
5	Phulambri	8715	13.15	19750	29.80	25400	38.32	2778	4.19	4192	6.32	5444	8.21
6	Paithan	51600	36.13	31569	22.11	36400	25.49	18883	13.22	3100	2.17	1260	0.88
7	Vaijapur	61750	38.74	54050	33.91	38025	23.85	0	0.00	5578	3.50	0	0.00
8	Gangapur	63324	48.40	45905	35.08	20586	15.73	0	0.00	1031	0.79	0	0.00
9	Khultabad	16354	31.54	6791	13.10	17710	34.16	0	0.00	10991	21.20	0	0.00
Total		**317216**	**28.98**	**239123**	**23.72**	**306965**	**30.83**	**27402**	**2.74**	**60606**	**7.79**	**56418**	**5.95**

(Source: Agriculture Census, govt. of Maharashtra, 2011)

General features of the district Chhatrapati Sambhaji Nagar

Sr. No	Name of the block / Taluka	Geographical Area (In ha)	No. of Gram Panchayats	No. of Revenue Villages
1	Chhatrapati Sambhajinagar	94777	123	190
2	Paithan	66269	101	191
3	Phulambri	142812	70	92
4	Vaijapur	159403	135	167
5	Gangapur	130846	93	226
6	Khultabad	51846	42	77
7	Sillod	151723	103	131
8	Kannad	155547	144	212
9	Soygaon	54497	47	85
	Total	**1007720**	**858**	**1371**

(*Source: DSAO, Chhatrapati Sambhaji Nagar, MRSAC, District Collector and District Statistic Office, Chhtrapati Sambhajinagar)*

2.3 Different types of irrigation facilities/water resources available in the district

Different types of Irrigation facilities/water resources available in the district (In numbers)

Sr. No.	Taluka	Majar Project	Medium Project	Minor Project		percolation tank	KT Weir	storage tank	wells	Spraying Pump	
				State	Local sector					diesel pump	electric pump
1	Kannad	0	4	22	262	363	135	83	14913	992	31604
2	Soygaon	0	1	24	105	143	93	41	6308	482	9452
3	Sillod	0	2	8	234	324	253	101	12035	1105	39300
4	Phulambri	0	1	9	279	287	124	53	9829	390	18732
5	Ch. Sambhajinagar	0	2	12	402	445	139	124	11228	695	30660
6	Khultabad	0	1	5	246	260	62	39	11715	328	11063
7	Vaijapur	1	4	8	270	395	122	94	15280	869	34833
8	Gangapur	0	1	7	145	160	81	96	10260	771	28101
9	Paithan	3	0	11	125	148	97	137	13885	1325	29718
	Total	**4**	**16**	**106**	**2068**	**2525**	**1106**	**768**	**105453**	**6957**	**233463**

(Source: Irrigation department data year 2021, Chhatrapati Sambhaji Nagar.)

2.4 Types of crops grown, cropping pattern

The main crops in the district are Maize, soybean, cotton, tur, wheat, and gram. Cash crops like Sugarcane, Cotton, and Fruit crops such as Sweet Orange are grown in the district. The major cropping season in the district is Kharif and followed by rabbi)

In recent years, the area under crops such as Maize, soybean, Bt. cotton, has increased. This change is attributed to comparatively better prices to these crops and increase in area under irrigation. The activities allied to agriculture are playing an important role in providing gainful employment and income to rural masses.

Details On Crops, Area, Production and Productivity of the District

Sr. No.	Name of Crops	Ch. Sambhaji Nagar			Paithan			Phulambri		
		Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1	Bajara	6600	7610.70	1154	5311	4049.03	708	1395	1401	919
2	Maize	9952	19209.5	1962	1900	2253.5	1112	21581	51776	2405
3	Tur	6507	4791.73	735	11517	6653.4	572	1501	805	497
4	Mug	1422	591.21	413	1270	305	269	812	350	424
5	Udid	511	219.34	432	141	20.17	183	388	181	483
6	Ground net	128	157.64	1343	88	16.3	159	512	502	1022
7	Soybean	1792	1544.84	684	2166	1296.80	578	387	356	954
8	Cotton	40688	12048.38	295	58790	12471	210	25316	7248	283

Sr. No.	Name of Crops	Vaijapur			Gangapur			Khultabad		
		Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1	Bajari	5267	5391	1011	2931	2008	614	944	1038	1018
2	Maize	35584	64083	1836	116444	26038	1607	11783	28965	2471
3	Tur	1960	1172	598	5129	2912	531	1234	825	686
4	Mug	2717	1161	428	1142	305	269	559	221	406
5	Udid	100	17	212	0	0	0	0	0	0
6	Ground net	2981	2051	633	1255	817	640	313	226	680
7	Soybean	2225	1978	961	1634	1176	707	1573	1184	794
8	Cotton	70258	13317	188	61577	13518	219	14586	3233	219

Sr. No.	Name of Crops	Sillod			Soygaon			Kannad		
		Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1	Bajara	698	782	814	2277	2438	964	667	415	596
2	Maize	39113	91597	2339	35581	77274	2156	3898	4921	1223
3	Tur	1975	1669	881	3018	1741	596	1315	679	535
4	Mug	2103	1056	497	1339	467	362	858	346	396
5	Udid	1772	842	502	958	341	359	690	271	370
6	Ground net	466	336	728	589	358	607	292	120	408
7	Soybean	4470	4165	1169	1717	1569	964	2984	1537	517
8	Cotton	40412	15494	385	47589	14679	306	29868	4245	144

(Source: DSAO, Chhatrapati Sambhaji Nagar)

2.6 Other facilities

Sr No.	Type of Infrastructure	No.	Present status
1	Agriculture Service Centers Fertilizer (Nos.) - 2034 Seed (Nos.) - 1894 Insecticide (Nos.) – 1222	5150	Working
2	Fertilizer Testing Lab	1	Working

Sr No.	Type of Infrastructure	No.	Present status
3	Soil Testing Lab	7	Working
4	Leaf Testing Lab	2	Working
5	Water Testing Lab	6	Working
6	Pesticide Testing Lab.	1	Working
7	Govt. / Private Fruits crop Nurseries	91	Working
8	Automatic Weather Stations	82	Working
9	Self Help Groups	3940	Working
10	Krishi Vigyan Kendra	2	Working
11	Farmer Producer Companies	471	Working
12	Seed Processing centers	3	Working
13	Bio Control Lab.	1	Working
14	Cold storage Unit	2	Working
15	Primary Agriculture Credit Society	692	Working
16	Agriculture Produce Market Committees	12	Working
17	Agriculture Education Institutes (Under Graduation)	23	Working.
18	Agriculture Education Institutes (Diploma)	9	Working
19	Agri clinic Agri Business Training Centers	1	Working

Chapter 3: Weather trend of district

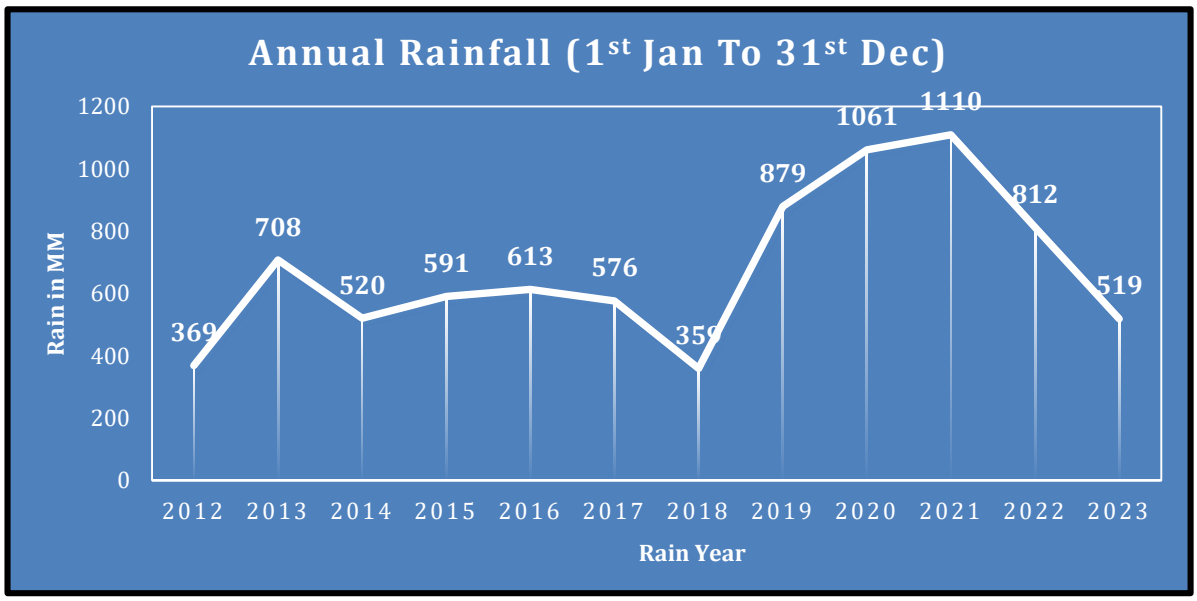
Introduction

Mahavedh project is operationalized by the Government of Maharashtra (GoM) through Public Private Partnership with M/S Skymet Weather Services pvt.ltd. At present 2127 Automatic Weather Stations (AWS) have been installed at circle level in Maharashtra. Weather data fetched from these Automatic Weather Stations (AWS) is useful for implementation of Public Welfare and Development schemes, Research and Development, Disaster management and Allied services.

PoCRA seamlessly combines forecast data from IMD and historical weather data from Mahavedh through APIs, integrating and storing the information in a database. This consolidated data is utilized to generate tailored weather-based advisories for farmers. Leveraging AICRPAM's crop calendars, PoCRA's automated systems craft pest and disease advisories to enhance agricultural decision-making.

3.1 Annual average rainfall of last twelve years

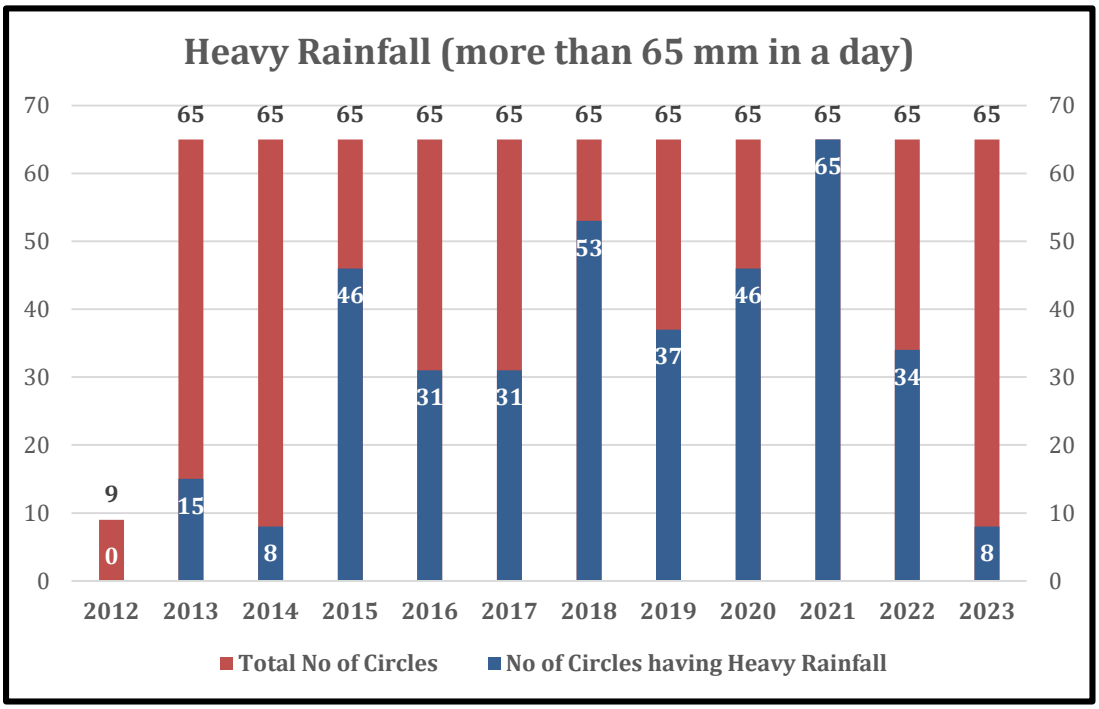
Normal or average rainfall is the amount of precipitation that we expect per year (in a given area). It is obtained and set by calculating the average (mean) of precipitation recorded in an area. Annual rainfall or precipitation is the sum of daily rainfall in a year.



The graph 3.1 presents annual rainfall data of Chhatrapati Sambhajinagar district from 2012 to 2023, highlighting fluctuations in precipitation. Notably, the lowest recorded rainfall was in year 2018 at 359 mm, while the highest occurred in year 2021 with a total of 1110 mm annual average rainfall.

3.2 Heavy rainfall.

Heavy rainfall is defined as rainfall that exceeds 65 mm in 24 hours.



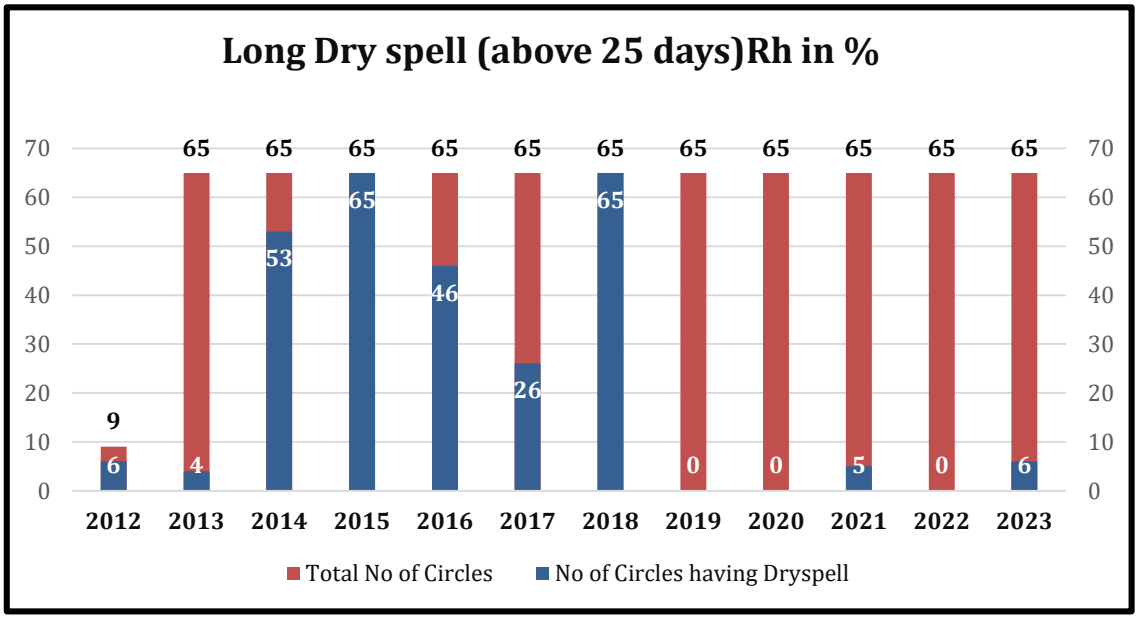
The provided graph 3.2 illustrates occurrences of heavy rainfall in circles within the Chhatrapati Sambhajinagar district from year 2012 to 2023. Notably, in year 2021, heavy rainfall affected all circles out of the 63 circles. Conversely, the year 2014 and 2023 recorded a lower incidence of heavy rainfall, with only 8 circles out of the 65 circles being affected in Chhatrapati Sambhajinagar district. In year 2012, there was no heavy rainfall in all 9 circles in district.

3.3 Dry spells

A dry day is when rainfall is below 2.5 mm, and consecutive dry days form a dry spell in monsoon period. Longer dry spells impact crop growth. Categories include very short (up to 7 days), short (7-14 days), medium (14-25 days), and long (more than 25 days) dry spells, each influencing crop development differently.

3.3.1 Long Dry spell

Long Dry spell is a prolonged period above 25 days of dry days in monsoon period

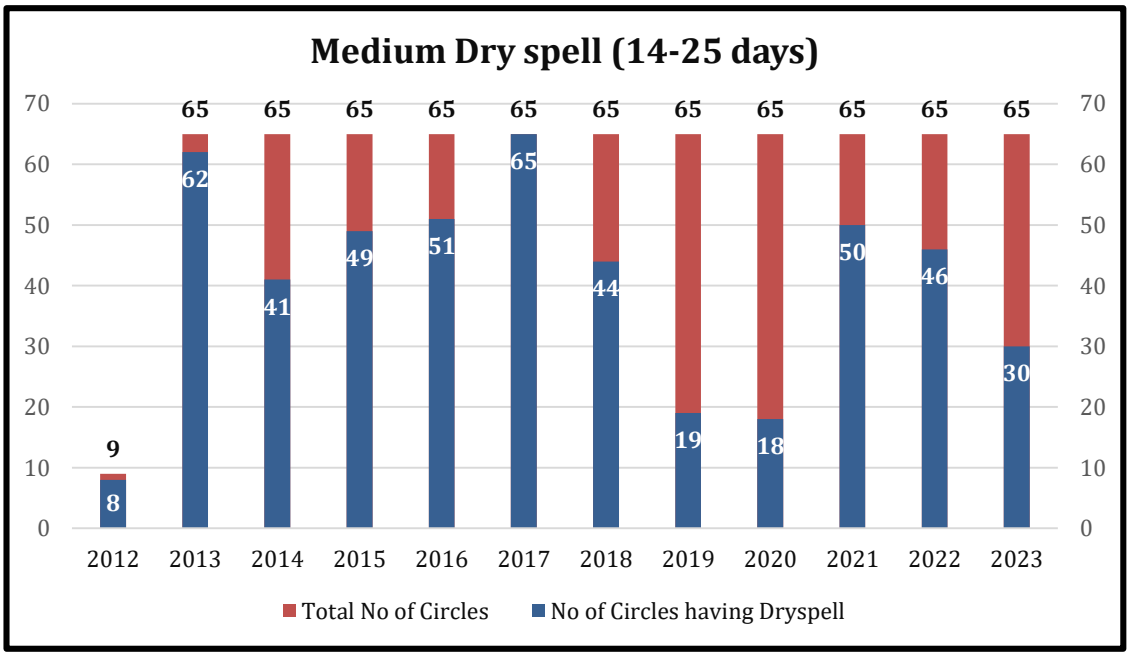


A

Graph (Graph 3.1.1) that shows the trend of long dry spells observed in Chhatrapati Sambhajinagar district. The data covers the total number of circles and the circles that affected long dry spell (more than 25 days) from the year 2012 to 2023. The graph shows that in year 2015 and 2018, all circles in the district experienced long dry spells. Conversely, in year 2019, 2020 to 2022 there was no long dry spell, across all 65 circles in the district.

3.3.2 Medium Dry spell

Medium Dry spell a period of 14-25 days of dry weather.

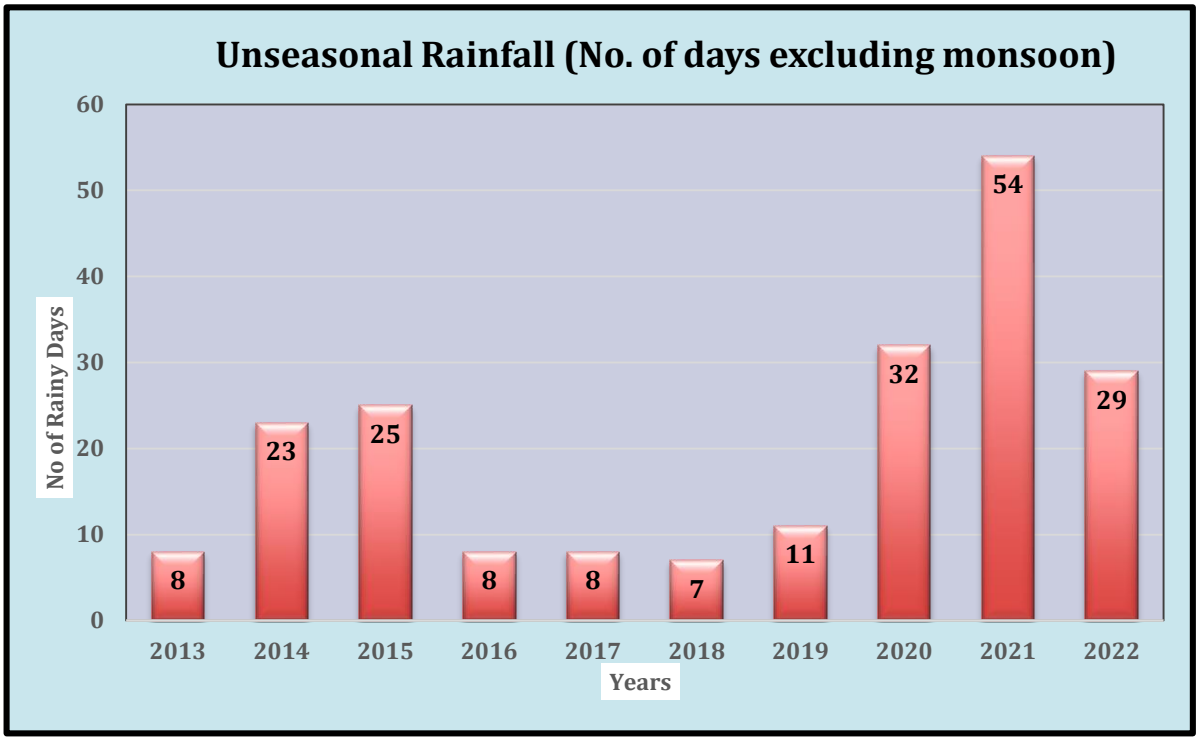


A graph (Graph 3.3.2) that shows the trend of medium dry spells observed in Chhatrapati Sambhajinagar district. The data covers the total number of circles

and the circles that affected medium dry spell (14 to 25 days) in Chhatrapati Sambhajinagar district from the year 2012 to 2023. The graph shows that in year 2017 all 65 circles in the district experienced medium dry spells. Conversely, in year 2020, there was 18 circles out of 65 circles experienced medium dry spell in the district.

3.4 Unseasonal rainfall.

Rainfall received during non mosoon days is treated as unseasonal rainfall. Unseasonal rains-when there is a sudden change in atmospheric pressure, it can result in precipitation, even during non-monsoon seasons.

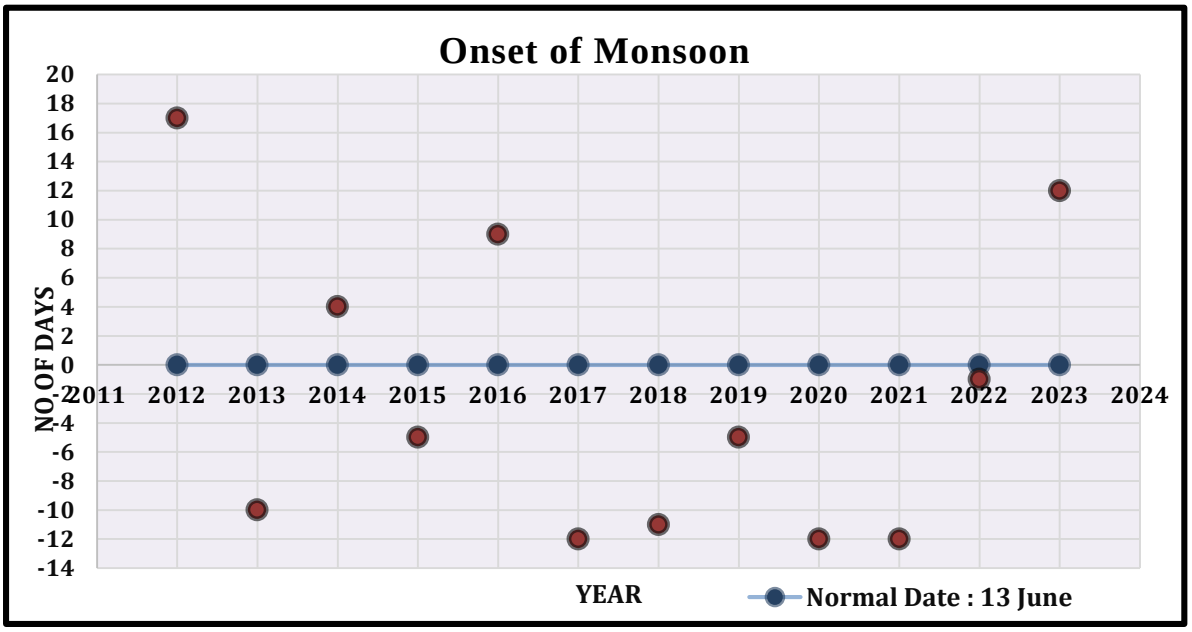


The graph 3.4 illustrates the annual occurrences of unseasonal rainfall in the Chhatrapati Sambhajinagar district from year 2013 to 2022. The data reveals a variation ranging from 7 days to 54 days of unseasonal rainfall.

3.5 Monsoon onset delay

The onset of the southwest monsoon refers to the time when the southwest monsoon winds begin to establish over a region, bringing widespread rainfall. The onset of the monsoon in Maharashtra typically occurs around early June. However, the exact timing can vary slightly from year to year. According to the document published by IMD dated 15th May, 2020 (CRS research report), Normal

monsoon onset date is 13th June in Chhatrapati Sambhajinagar district.

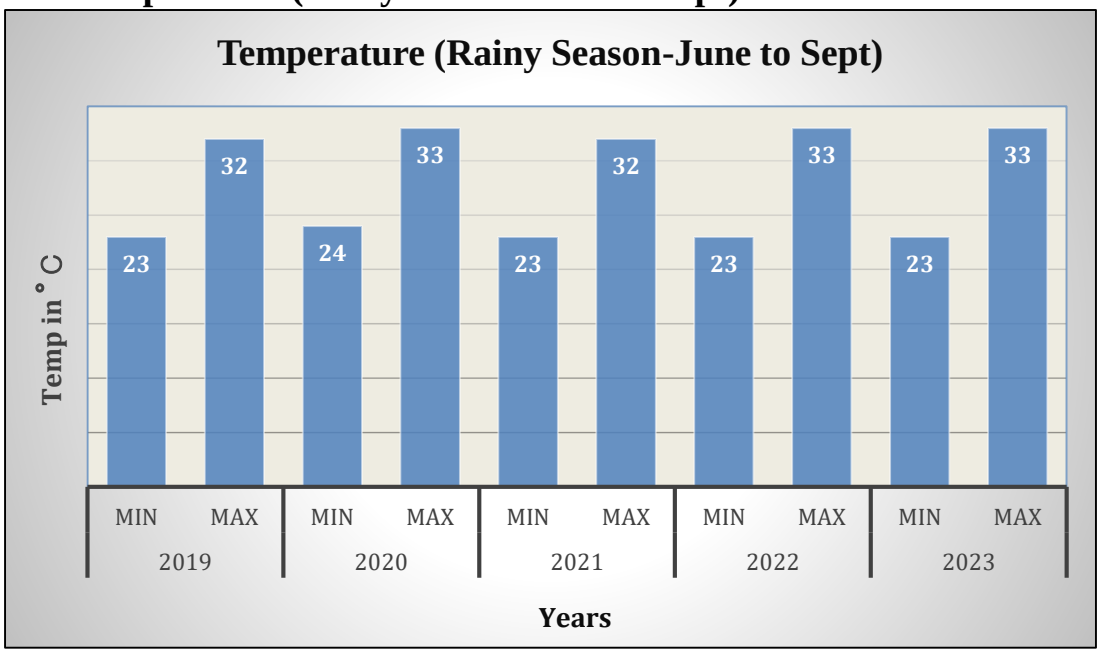


The graph 3.5 presents the annual onset of the monsoon, with a blue line representing the normal onset. The onset days show variations ranging from -12 to 17 days. Notably, in year 2012, 2014, 2016 and 2023 the monsoon arrived delayed than the normal onset date. However, in remaining years the monsoon was notably arrived earlier.

3.6 Temperature.

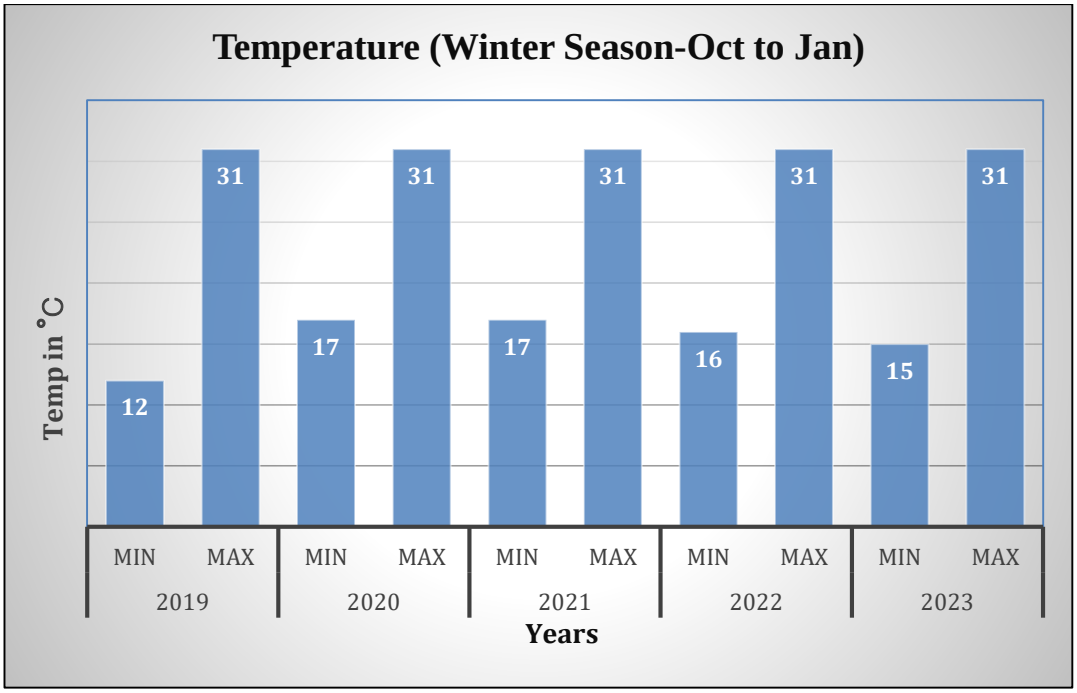
Temperature is a physical quantity that quantitatively expresses the attribute of hotness or coldness. The average temperature is 29 °C, with a minimum of 19°C and a maximum of 39°C. On the coldest nights, the temperature usually drops to around 8°C. On the warmest days, the temperature usually reaches around 42°C.

3.4.1 Temperature (Rainy Season-June to Sept)



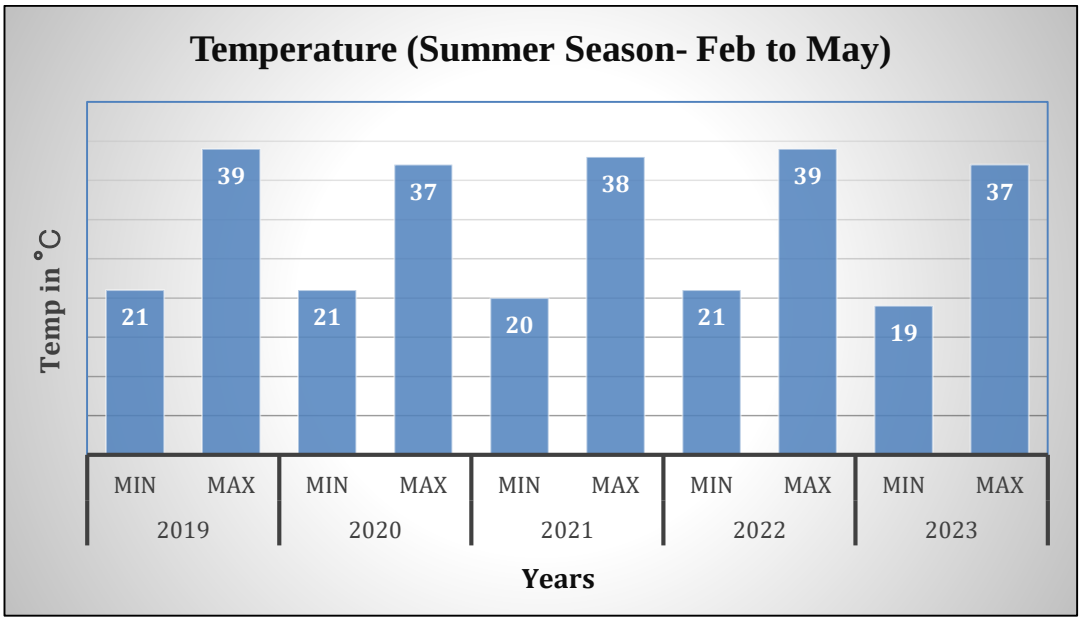
The graph 3.6.1 presents the temperature in Chhatrapati Sambhajinagar district during the rainy season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 23-24 °C and maximum temperatures ranging from 32-33 °C.

3.4.2 Temperature (Winter Season-Oct to Jan)



The graph 3.6.2 presents the temperature in Chhatrapati Sambhajinagar district during the winter season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 12-17 °C and maximum temperatures 31°C.

3.4.3 Temperature (Summer Season- Feb to May)



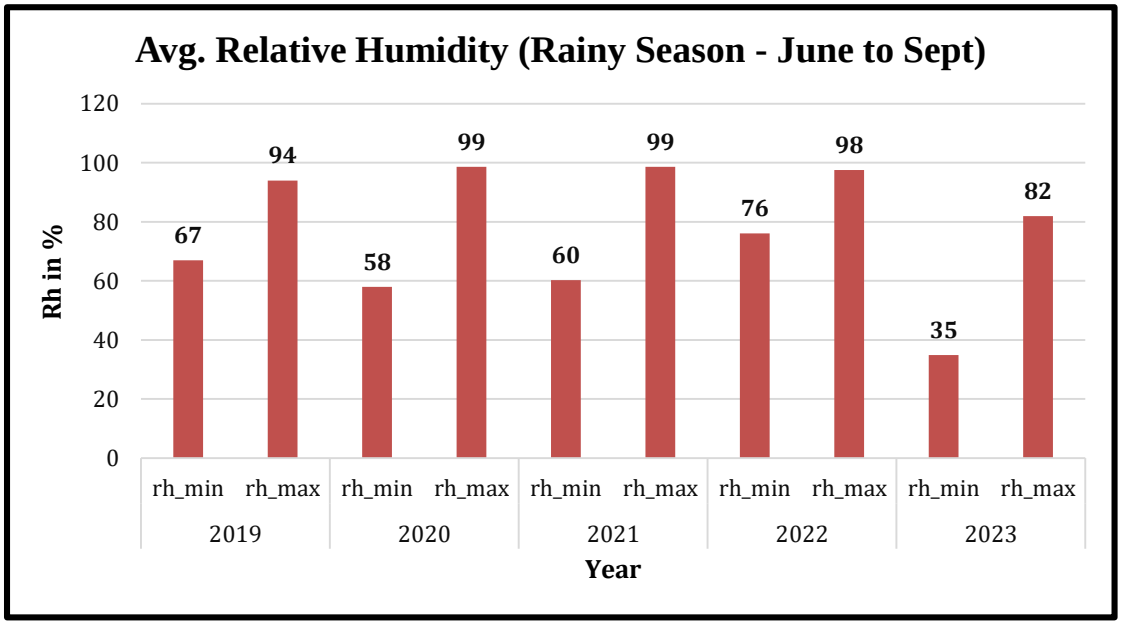
The graph 3.6.3 presents the temperature in Chhatrapati Sambhajinagar district during the summer season from 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 19-21 °C and maximum temperatures ranging from 37-39 °C.

3.7 Relative Humidity

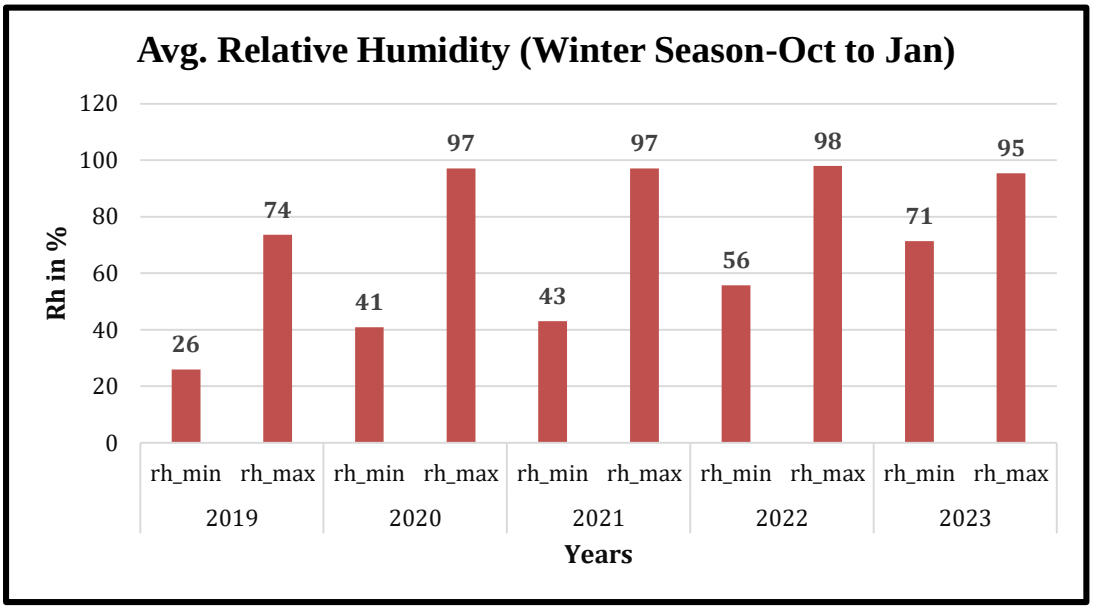
Relative Humidity is the ratio of the actual quantity of moisture at a certain temperature and pressure to the maximum it can hold at the same temperature and pressure. It is usually multiplied by 100 and expressed in percent.

3.7.1 Avg. Relative Humidity (Rainy Season - June to Sept)

The graph 3.7.1 illustrates humidity levels during the rainy season in Chhatrapati Sambhajinagar district, revealing a variation in minimum humidity from 35% to 76% and maximum humidity ranging between 82% and 99%.



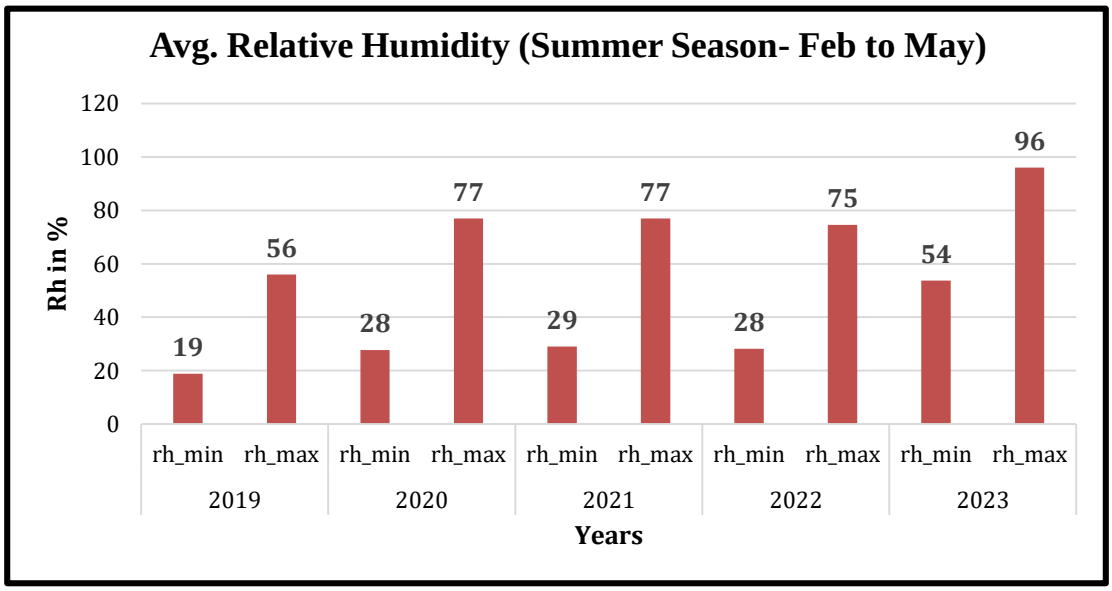
3.7.2 Avg. Relative Humidity (Winter Season-Oct to Jan)



The graph 3.7.2 illustrates humidity levels during the winter season in Chhatrapati Sambhajinagar district, revealing a variation in minimum humidity from 26% to 71% and maximum humidity ranging between 74% and 98%.

3.7.3 Avg. Relative Humidity (Summer Season- Feb to May)

The relative humidity during the summer season, typically averaged from Feb to May.



The graph 3.7.3 illustrates humidity levels during the summer season in Chhatrapati Sambhajinagar district, revealing a variation in minimum humidity from 19% to 54% and maximum humidity ranging between 37% and 96%.

Chapter 4: Impact of climate variability on agriculture production

4.1 Impact of Temperature on crop growth and yield

Sr.no	Crop	Crop Growth	Water Availability	Pests and Diseases Infestation
1	Soybean	1. Optimum temperature for soybean growth 20-30^{0}C. For every 1^0 Centigrade increases, soybean yield decreases by an average of 17%. In Kharif there is an increase in temperature in august and September soybean crop yield is hamper. 2. Stunted vegetative growth. 3. Flower dropping 4. Small size grains 5. Approximate 20 to 25 % yield losses.	1. Temperature variation affects the agro-ecological cycle in so many ways. In Kharif 2023, with long dry spells there is only 82% precipitation of the average rainfall & hence soybean average decreases by 17 2. Increase evaporation and transpiration rate. 3. Decrease in soil moisture resulting in stress in the crop.	1. Due to the occurrence of dry spell period in August & September, infestation of whitefly on soybean acts as virus vector and results in spread of yellow vein mosaic virus leading to decrease in crop yield. 2. Increase incidence of sucking pests 3. Increase infestation of stem fly due increase in temperature.
2	Cotton	1. Temperature for ideal functioning of metabolism and associated enzyme activity, should be 23.5 to 30^{0}C. Exposure to high temperatures >32^0 C limits the growth and development of the cotton crop. High temperature affects fiber quality and strength. 2. Stunted vegetative growth. 3. Dropping of square 4.Reddening of leaves 5.Less number of boll formation resulting approximate 15 to 25 % yield losses	1. Availability of water plays an important role in various growth stages of crop, but in Chhatrapati Sambhaji Nagar district, in the kharif 2023 season occurrence of total 82% precipitation of the average and these long and uneven dry spells affects growth and yield of cotton crop. 2. Depletes groundwater level 3. Increase evaporation and transpiration rate	1. Typical effect of elevated temperature is an increase in consumption rate and therefore decrease the time of pupation making them less apparent to natural enemies and in some cases increasing the potential number of generations. It happened in 2023 kharif in Chhatrapati Sambhaji Nagar district about increase in sucking pest complexes. 2. Increase Dahiya disease. 3.Increase Incidence of Thrips and White fly

			4. Decrease in soil moisture resulting stress in the crop	
3	Tur	1. Required temperature is 26 ^{0}C to 30 ^{0}C in the rainy season and 17 ^{0}C to 22^{0}C in the post rainy season. Tur crop is extremely Susceptible to low radiation at the time of pod development. 2. Due to High Temperature the rate of evapotranspiration is increased resulting in stunted the vegetative growth of pigeon pea crop. 3. Crop at flowering stage at high temp. affect flower dropping. 4. Due to high temp. and insufficient moisture availability in soil resulting in small grain size. 5. Approximate 20 to 25 % yield losses.	1. Water availability during flowering and pod formation increases yield. Post Monsoon rains are beneficial to increase the yield of tur crops. 2. Depletes groundwater level 3. Increase evaporation and transpiration rate 4. Decrease in soil moisture resulting in stress in the crop.	1. Cloudy weather in October, November caused an infestation of leaf mining insects, heliothis and tur plume moth. 2. Increase Incidence of leaf roller.
4	Wheat	1. High temperature, even for a short period, affects crop growth especially in temperature crops like wheat. In wheat, temperatures higher than 27° C caused under-development of anthers and loss of viability of pollen. 2. High temperature. Cause less germination. 3. High temperature cause vegetative growth and grain development	1. For wheat crop to reach physiological maturity and its potential yield, it needs on average 350-600 ml of water through irrigations. Due to high temperature, there is evapo - transpiration and soil moisture losses occur at a high rate which affects the frequency of scheduling irrigation which	1. Increase incidence of sucking pest 2. increase infestation of stem borer & smut diseases

		4. Approximate 20 to 40 % yield losses.	ultimately affects wheat crop growth and production. 2. Depletes groundwater level 3. Decrees soil moisture resulting in stress in the crop.	
5	Gram	1. Both High & Low temperature at or exceeding 35 ◦c affects male reproductive tissue function on pod setting. 2. Hot (>30 ◦c and dry atmospheric conditions lead to more loss of flower buds and open flowers in gram. 3. High temperature (>35◦c) during reproductive development reduces grain yield. . Due to High Temperature the rate of evapotranspiration is increased resulting in stunted the vegetative growth of crop. 6. High temp. affected the setting of flowers. 7. High temp during grain feeling stage resulting small grain size. 8. Approximate 10 to 25 % yield losses.	1. Gram crop normally requires 25 cm of water. It is important to give adequate water i.e. 7 to 8 cm through every irrigation. High temperatures during both periods require more water and frequency of irrigation. 2. Depletes groundwater level 3. Increase evaporation and transpiration rate 4. Decrease in soil moisture resulting in stress in the crop.	High temperature leads to Increase incidence of pod borer during high temperature days.
6	Maize	1. Due to High Temperature the rate of evapotranspiration is increased resulting in stunted the vegetative growth	1. Insufficient Water Availability 2. Evaporation 3. Wilting of Crop 4. Stress on Crop	1. Diseases and Pest Increase

		2. Stunted Growth 4. yield losses		
7	Rabi Sorghum	1. Low tillering 2. Germination Problem 3. Yield Losses 4. Vegetative Growth	1. Insufficient Water Availability 2. Evaporation 3. Wilting of Crop 4. Stress on Crop 5. Crop Lodging	Blight and Wilt
8	Ginger	High temperature leads to- 1. Stunted vegetative growth. 2. Less uptake of nutrient 3. Small size of rhizomes. 4. Approximate 30 to 40 % yield losses.	High temperature leads to- 1. Depletes groundwater level 2. Increase evaporation and transpiration rate 3. Decrease in soil moisture resulting stress in the crop	High temperature leads to- 1. Increase incidence of sucking pest & blight disease. 2. Increase infestation of Rhizome rot
9	Tomato, Chili.	High temperature leads to- 1. less germination 2. stunted growth 3.flower dropping 4. Increase infestation of pests and diseases. 5. Approximate 30 to 50 % yield losses	High temperature leads to- 1. Depletes groundwater level 2. Increase evaporation and transpiration rate 3. Decrease in soil moisture resulting in stress in the crop.	High temperature leads to- 1. Increase incidence of sucking pest 2. Increase infestation of fruit borer

(Source: KVK, Chhatrapati Sambhajinagar and National Agriculture Research project (NARP, VNMKV))

4.2 Impact of Rainfall:

4.2.1 Impact of rainfall on crop growth and yield:

- Rainfall is essential to crop health, as it provides the water and nutrients needed for the growth and development of plants. When rain is plentiful, crops can absorb the water and nutrients they need, and the soil around them remains moist and fertile. This allows the plants to grow and produce large, healthy yields.
- However, too much rain can be detrimental to crop health. Excessive rainfall can lead to flooding, which can wash away soil nutrients and damage crops. Additionally, too much water can cause crops to become waterlogged, leading to root rot and disease.
- Inadequate rainfall can also be harmful to crop health. Without enough water, crops may suffer from drought-related stress, which can reduce yields and lead to poor crop health. To ensure optimal crop health, farmers should monitor rainfall levels and adjust their irrigation systems accordingly.
- In addition, farmers should practice crop rotation and use good soil management techniques to help retain moisture, reduce erosion, and improve soil fertility. Adequate rainfall can lead to a good harvest, while too much or too little rain can harm crop yields.

Effects of Less Rainfall on Farming:

Insufficient rainfall can lead to drought conditions and negatively impact crop growth and yields. Therefore, an optimal amount of rainfall is necessary for optimal crop growth and yields. Drought conditions can lead to moisture stress, causing plants to wilt, and reducing crop yields. Thus, the right amount of rainfall at appropriate times is crucial for optimal crop growth and production.

Effects of Excessive Rainfall on Agriculture:

- Rainfall is important for the growth and development of crops as it provides the necessary water for plant growth and reproduction. Too much rainfall, however, can be harmful and lead to waterlogging and soil erosion, reducing crop yields.
- Rainfall has a significant impact on crops as it provides the necessary moisture for plant growth and development. Excessive rainfall can cause soil erosion, and waterlogging,

and increase the risk of plant diseases. The areas with lack of rainfall have a great importance of the methods such as drip irrigation in agriculture

4.2.2 Impact of rainfall on irrigation supply, drought and floods:

"Rainfall plays a crucial role in irrigation, drought, and floods. Farmers rely on rainfall for natural water sources. When it's scarce, they use wells or reservoirs for irrigation. Long dry periods, or droughts, hurt crops, reduce yields, and cause water shortages for people and industries. Overflowing water submerges dry land, damaging property and posing risks to life. Rainfall helps prevent droughts by refilling water sources. Yet, heavy rain can cause floods. Changing climates may bring extreme rain or more droughts, impacting irrigation, droughts, and floods.

Adaptation Measures:
Improving water storage, developing drought-resistant crops, and better flood control can reduce these risks.

4.2.3 Impact of rainfall on pest and disease infestation and their management

Sequential extremes can affect yields and diseases. Droughts, followed by intense rains, for example, can reduce soil water absorption and increase the potential for flooding, thereby creating conditions favoring fungal infestations of leaf, root and tuber crops in runoff areas. Prolonged anomalous periods – such as the five years of El Niño conditions can have destabilizing effects on agriculture. Sequential extremes, along with altered timing of seasons, can decouple long-evolved relationships among species (e.g., predator/prey) essential for controlling pests, pathogens, and populations of plant pollinators.

Impact of extremities due to rainfall variability may lead to

- Extension of geographical range of insect-pests and pathogens
- Changes in population growth rates of pathogens and insect-pests
- Changes in relative abundance and effectiveness of biocontrol agents
- Changes in pathogen/insect-pest × host × environment interactions, and loss of resistance in
- cultivars containing temperature-sensitive genes
- Emergence of new diseases/pest problems and increased risk of invasion by migrant diseases and pests
- Reduced efficacy of different components of disease and insect-pest management

4.2.4 Impact of rainfall on soil erosion and nutrient loss:

- Reduced quantity and quality of organic matter content, which is already quite low in Indian soil.
- crop residues have a higher C:N ratio, which may reduce their rate of decomposition and nutrient supply.
- Change in rainfall volume and frequency and wind intensity may alter the severity, frequency and extent of soil erosion.
- Rainfall has a great effect on soil fertility, especially in the top layer of soil, because typically nutrients and soil erosion are concentrated in the top few centimeters of soil. Soil properties can also be altered over time by rainfall and soil erosion, inducing spatial variability of soil fertility along the slope and possibly modifies the soil profile.
- Soil erosion during rainfall is strongly affected by runoff and slope steepness. Soluble nutrients like nitrate and potassium can be lost in runoff and drainage water, whereas less soluble nutrients like phosphorus are more likely to be lost with sediments moving in eroding soil and runoff water.

Sr. No.	Crop	Crop Growth	Irrigation Supply	Pests and Diseases Infestation	Soil Erosion and Nutrient loss	Harvest and Storage
	Soybean	1. Insufficient rainfall can lead to drought conditions and negatively impact crop growth and yields. Drought conditions can lead to moisture stress, causing plants to wilt, and reducing crop yields about 17%. This condition occurred in Kharif 2023. 2. Inadequate rainfall can also be harmful to crop health. Rainfall has a significant impact on crops as it provides the necessary moisture for plant growth and development. Excessive rainfall can cause soil erosion, and waterlogging, and increase the risk of plant diseases.	1. Drought is also an extreme situation, which happens due to insufficiency of precipitation over a longer period causing damages to crops. 2. Heavy rainfall mainly causes flooding in an area when the natural watercourse fails to channelize the excess water. Places without a proper drainage system also get flooded during heavy rainfall.	1. Unpredictable rains might disrupt the parasitoids' ability to track their caterpillar hosts. 2. Too much water will be devastating for some pests, especially soil dwelling insects. 3. Rain drops can physically dislodge insects from their host plants and behavior patterns can be disrupted in small insects such as thrips. 4. Some pest species are suppressed by periods of rainfall by outbreak of fungal diseases. 5. Sudden outbreak of disease and Pest	1. Rainfall intensity and slope gradient affect runoff and sediment, ultimately leading to soil nutrient loss. It shows a positive correlation between rainfall intensity and nutrient loss. 2. There are two main ways in which soil nutrients are lost. At low rainfall intensities, soluble nutrients migrate with runoff, while at high rainfall intensities, soil nutrients migrate with runoff in sediment form. 3. Soil nutrient loss rises with the increase in the slope gradient, but when the slope gradient reaches the threshold value, nutrient loss declines with the rise of the slope gradient, indicating that there is a critical slope gradient for nutrient loss.	1. Farm output is affected when crops that are ready to be harvested or about to ripen, get soaked in excessive rainfall. 2. Untimely rain can make it difficult or impossible to harvest the crops, and can also cause damage to the crops that have already been harvested. The moisture from the rain can cause the crops to become wet and heavy, making them more difficult to handle and transport.

Sr. No.	Crop	Crop Growth	Irrigation Supply	Pests and Diseases Infestation	Soil Erosion and Nutrient loss	Harvest and Storage
2	**Cotton**	1. High rainfall results in over saturation and water logging which has an adverse effect on cotton growth and development. Large intra seasonal variability of rainfall and day to day variation of rainfall like this year, affects crop production. 2. Delay onset of Manson delay Sowing season 3. Due to dry spell yield losses 4. Adverse effect on crop health and growth 5. Excessive rainfall causes crop rot.	1. Heavy rainfall causes water logging resulting into wilting of cotton 2. Low rainfall leads to Water level Decrease 3. soil Cracking 4. Wilting of Crop 5. Stress on Crop	1 Unpredictable rain might disrupt the parasitoids' ability to track their caterpillar hosts. 2. Too much water will be devastating for some pests, especially soil dwelling insects. 3. Rain drops can physically dislodge insects from their host plants and behavior patterns can be disrupted in small insects such as thrips. 4. Some pest species are suppressed by periods of rainfall by outbreak of fungal diseases.	1. Rainfall intensity and slope gradient affect runoff and sediment, ultimately leading to soil nutrient loss. It shows a positive correlation between rainfall intensity and nutrient loss. 2. There are two main ways in which soil nutrients are lost. At low rainfall intensities, soluble nutrients migrate with runoff, while at high rainfall intensities, soil nutrients migrate with runoff in sediment form. 3. Soil nutrient loss rises with the increase in the slope gradient, but when the slope gradient reaches the threshold value, nutrient loss declines with the rise of the slope gradient, indicating that there is a critical slope gradient for nutrient loss. 5. Fertile soil and Nutrient losses due to flood and leaching	1. Farm output is affected when crops that are ready to be harvested or about to ripen, get soaked in excessive rainfall. 2. Untimely rain can make it difficult or impossible to harvest the crops, and can also cause damage to the crops that have already been harvested. The moisture from the rain can cause the crops to become wet and heavy, making them more difficult to handle and transport. 3.Heavy loss of Quality and quantity of crop

3	Tur	1. Rainfall in November damaged standing tur crop which is likely to reduce yield by 20%	Irrigation supply during initiation of flower bud, flowering and pod formation will result in higher yield and vice versa.	1.Unpredictable rains might disrupt the parasitoids' ability to track their caterpillar hosts. 2. Too much water will be devastating for some pests, especially soil dwelling insects. 3. Rain drops can physically dislodge insects from their host plants and behavior patterns can be disrupted in small insects such as thrips. 4. Some pest species are suppressed by periods of rainfall by outbreak of fungal diseases.	1. Rainfall intensity and slope gradient affect runoff and sediment, ultimately leading to soil nutrient loss. It shows a positive correlation between rainfall intensity and nutrient loss. 2. There are two main ways in which soil nutrients are lost. At low rainfall intensities, soluble nutrients migrate with runoff, while at high rainfall intensities, soil nutrients migrate with runoff in sediment form. 3. Soil nutrient loss rises with the increase in the slope gradient, but when the slope gradient reaches the threshold value, nutrient loss declines with the rise of the slope gradient, indicating that there is a critical slope gradient for nutrient loss.	1. Farm output is affected when crops that are ready to be harvested or about to ripen, get soaked in excessive rainfall. 2. Untimely rain can make it difficult or impossible to harvest the crops, and can also cause damage to the crops that have already been harvested. The moisture from the rain can cause the crops to become wet and heavy, making them more difficult to handle and transport.

4	**Wheat**	1. Rainfall in the harvesting stage of wheat deteriorates the quality of produce.	1. Irrigation during periods of high wheat demand has significant effects on wheat growth, grain yield. 2. The soil water status and different growth stages have different effects on photosynthetic physiological characteristics and grain yield.	1. Unpredictable rains might disrupt the parasitoids' ability to track their caterpillar hosts. 2. Too much water will be devastating for some pests, especially soil dwelling insects. 3. Rain drops can physically dislodge insects from their host plants and behavior patterns can be disrupted in small insects such as thrips. 4. Some pest species are suppressed by periods of rainfall by outbreak of fungal diseases.	1. Rainfall intensity and slope gradient affect runoff and sediment, ultimately leading to soil nutrient loss. It shows a positive correlation between rainfall intensity and nutrient loss. 2. There are two main ways in which soil nutrients are lost. At low rainfall intensities, soluble nutrients migrate with runoff, while at high rainfall intensities, soil nutrients migrate with runoff in sediment form. 3. Soil nutrient loss rises with the increase in the slope gradient, but when the slope gradient reaches the threshold value, nutrient loss declines with the rise of the slope gradient, indicating that there is a critical slope gradient for nutrient loss.	1. Farm output is affected when crops that are ready to be harvested or about to ripen, get soaked in excessive rainfall. 2. Untimely rain can make it difficult or impossible to harvest the crops, and can also cause damage to the crops that have already been harvested. The moisture from the rain can cause the crops to become wet and heavy, making them more difficult to handle and transport.

5	**Gram**	Being a crop in determinate growth habit, drought conditions will hasten maturity in gram by stopping growth, while late season rains will be helpful for pod development.	Irrigation effect on Parameter like number of primary and secondary branches for plant height, No of nodules biomass per plant, days to maturity and yield component increases in gram.	1. Unpredictable rains might disrupt the parasitoids' ability to track their caterpillar hosts. 2. Too much water will be devastating for some pests, especially soil dwelling insects. 3. Rain drops can physically dislodge insects from their host plants and behavior patterns can be disrupted in small insects such as thrips. 4. Some pest species are suppressed by periods of rainfall by outbreak of fungal diseases.	1. Rainfall intensity and slope gradient affect runoff and sediment, ultimately leading to soil nutrient loss. It shows a positive correlation between rainfall intensity and nutrient loss. 2. There are two main ways in which soil nutrients are lost. At low rainfall intensities, soluble nutrients migrate with runoff, while at high rainfall intensities, soil nutrients migrate with runoff in sediment form. 3. Soil nutrient loss rises with the increase in the slope gradient, but when the slope gradient reaches the threshold value, nutrient loss declines with the rise of the slope gradient, indicating that there is a critical slope gradient for nutrient loss.	1. Farm output is affected when crops that are ready to be harvested or about to ripen, get soaked in excessive rainfall. 2. Untimely rain can make it difficult or impossible to harvest the crops, and can also cause damage to the crops that have already been harvested. The moisture from the rain can cause the crops to become wet and heavy, making them more difficult to handle and transport.

Sr. No.	Crop	Crop Growth	Irrigation Supply	Pests and Diseases Infestation	Soil Erosion and Nutrient loss	Harvest and Storage
6.	**Maize**	1. Delay onset of Manson delay Sowing season 2.Due to dry spell yield losses 3.Adverse effect on crop health and growth 4. Excessive rainfall causes crop rot.	1.Water level Decrease 2. soil Cracking 3. Wilting of Crop 4. Stress on Crop	Sudden outbreak of disease and Pest	Fertilize soil and Nutrient losses due to flood and leaching	Heavy loss of Quality and quantity of crop
7.	**Rabi Sorghum**	1. Damage of tillers 2. Crop lodging 3. Vegetative Growth Disturb 4) Yield Losses	1. Water level Decrease 2.Soil Cracking 3. Wilting of Crop 4. Stress on Crop	Blight and Wilt	----------	Blight and Wilt

4.3 Impact of other calamities:

Hailstorms

Hailstorm is a localized natural calamity that does a great deal of damage to crops and the associated losses run into hundreds of millions of dollars annually. While hailstones have been found weighing as much as 0.75 kilograms, even much smaller hail can destroy crops, slicing corn and other plants to ribbons in a matter of minutes. Precipitation of condensed atmospheric moisture in the form of small bolls or pieces of ice having diameter more than 5 mm is termed as hail. The ice pieces may be of different polygonal shapes i.e. trigonal, pentagonal, hexagonal etc. The size of hail is sometimes very large i.e. 50 mm or more, depending upon the upthrust within the cloud in which hail formation takes place. Cumulonimbus clouds are mainly associated with hailstorms. Hail is the most destructive form of precipitation. Hail structure resembles that of onion. It consists of concentric layers of ice with a layer of snow in between. The damage itself is often produced not only by the impact of falling hailstones, but also by the high winds and torrential rains associated with hailstorm.

Cyclones:

Cyclones caused by atmospheric disturbances around a low-pressure are distinguished by swift and often destructive air circulation. They are usually accompanied by violent storms and bad weather. The air circulates inward in an anticlockwise direction in the northern hemisphere and clockwise in the southern hemisphere. Tropical revolving storms (TRS) form in the vast expanses of the warm tropical oceans. They are violent whirls spiraling upward from the ocean surface to great heights, sometimes up to the tropopause and moving across the ocean, generally from east to west. They are characterized by a huge pressure deficit at the center, cyclonic circulation, violent winds and severe weather.

(Source- KVK Chhatrapati Sambhajinagar and National Agriculture Research project (NARP, VNMKV))

Chapter 5: Measures to cope with climatic variability

5.1. Recommendations:

Rainfall condition	1. Heavy rainfall	• Removal of excess water during plant growth by better draining the water retained in the soil. In cotton by Creating or digging drains • Organic matter applications improve soil structure and avoid soil compaction in Cotton & Soybean. • Sub soiling can break possible hard pans and improve soil aeration and drainage with water retention. • Raised or Broad Bed furrow method of cultivation, In Soybean it is proved to be beneficial and effective in Chhatrapati Sambhajinagar District. • Green manure increases organic matter content, nitrogen content and soil water retention, is applicable for all Kharif Crops • Soil conservation and water conservation structures may reduce water runoff and helps to control soil erosion by graded bunding & drain.
	2. Low rainfall-	• Weeding and defoliation reduce soil water losses from plant transpiration in side branches by defoliating branches having without boll • Cover crops reduce soil erosion by increasing soil organic matter, water, air, and nutrient availability. • Harrowing (breaking the soil into small fragments) can prevent the loss of land moisture by evaporation. • Covering the soil with crop residues (mulching) in combination with no-tillage reduces the exposure of crops to heat-stress conditions. It also increases soil moisture by reducing direct soil evaporation in Horticulture crops like Citrus etc. • Use of micro–irrigation (drip/ sprinkler) system and construction of a farm pond for protective / life saving irrigations. • Use of Short Duration variety. • Recharge of farm ponds and wells with water recharge shafts. • Use of foliar application of fertilizers through spraying.
	3.Dry Spells/Water Stress-	• Drought tolerant crops with low water requirements reduce evapotranspiration losses during photosynthesis by rapidly closing their stomata and maintaining leaf water potential and photosynthetic rate. • Promote micro irrigation and water budgeting for each crop.

		• Increase water availability to counteract the impacts of drought shocks through small water reservoirs (Farm ponds) • Foliar spray of nitrogen fertilizers and micronutrients during the dry spell protects and improves the endurance of crops in drought conditions.
	4.Terminal Drought-	• Diversification of crops • Promote short cycle varieties • Through carbon sequestration, agroforestry has the potential to offset greenhouse gas (GHG) emissions from the agricultural sector. • Undertake rainwater harvesting. Water harvesting practices like farm ponds, community tanks, watersheds and pools can prove a life saver
	5. Late onset of monsoon	• Sowing is done only after 70 to 100 mm rainfall. • Promote intercropping • Prepare a contingency plan in case of late onset of monsoon / dry spells during the season with appropriate cropping patterns. • Crops with short duration and requiring relatively little water need to be encouraged in drought-prone areas; arrange availability of seeds with short duration varieties.
Temperature conditions	1.High Temperature-	• Soil covering with plastic and organic mulching and or other materials increases the soil surface temperature. • Wind breaks redistribute sensible heat that is already present in the air. • Row covers increase downward long-wave radiation at night and reduce heat losses by convection and advection. • Promote protected cultivation.
	2. Cold waves / Low Temperature.	• Hail protection nets reduce crop damage and loss by buffering the impact of hail on crops. • Slight irrigation may reduce the effect of low temperature. • It consists of generating heat through burning the crop residues that prevent the cooling of the air at the crop level. It is not the most recommended method due to environmental pollution and other ecological aspects.
Hailstorms		• Promote Protected cultivation • Hail protection nets reduce crop damage and loss by buffering the impact of hail on crops.
Soil degradation		• Soil Erosion Control by-changing agricultural practices and engineering practices. (Agricultural practices- Crop rotation, Strip cropping, Contour farming, Terrace farming, Mulching) (Engineering practices- Excavation

	of ditches, Terraces construction, Check dams, Windbreaks) ● Water Harvesting (Watershed Approach), Terracing and Other ● Engineering Structure like, Contour plowing, terracing, wind barrier etc. ● Landslide and Mine-spoil Rehabilitation ● River Bank Erosion Control Intercropping and crop divarication ● Integrated Nutrient Management and Organic Manuring Reclamation of Acid and Salt Affected Soils and Drainage (Desalinization) ● Water Management and Pollution Control ● Vegetative Barriers and Using Natural Geotextiles, Mulching and Diversified cropping ● Agro forestry and Conservation diversified agriculture practices

(Source- KVK and National Agriculture Research Project (NARP, VNMKV), Chhatrapati Sambhajinagar)

5.2. Best practices developed/ followed by farmers in Chhatrapati Sambhajinagar district.

In Chhatrapati Sambhaji Nagar district farmers have developed some practices and they are using on their farm on wide growing area i.e. zero tillage technology (SRT), Broad bed furrow (BBF), use of plastic mulching for vegetables crops (Chili crop in open conditions).

1. **SRT (Saguna Regenerative Technology) - Zero tillage Technology.**

Sr. No.	Farmer Name and address	Crop Name	Technology	Production under rainfed condition (Q/Ha.)	Production under irrigated condition (Q/Ha.)
1	Ganesh Baburao Gavhane, Bodwad, Tq. Sillod 8329105851	Cotton (in light type of soil)	SRT Demo Plot (Zero tillage Technology)	34	44
			Control plot (Normal Condition)	29	41
2	Vikas Suslade, Ruikheda, Tq.Kannad 9765708039	Cotton (in heavy type of soil)	SRT Demo Plot (Zero tillage Technology)	37.5	-
			Control plot (Normal Condition)	32	-

3	Vikas Suslade, Ruikheda, Tq.Kannad 9765708039	Soybean	SRT Demo Plot (Zero tillage Technology)	30	38
			Control plot (Normal Condition)	27	34
4	Ganesh Gavhane, Bodwad, Tq.Sillod 8329105851	Soybean	SRT Demo Plot (Zero tillage Technology)	35	38
			Control plot (Normal Condition)	32	34
5	Bhivsan Vaman Rathod, Malegaon Thokal, Tq. Kannad	Soybean	SRT Demo Plot (Zero tillage Technology)	39	-
			Control plot (Normal Condition)	32	-
6	Raosaheb Mohite, Tapargaon, Tq. Kannad 9049023729	Bajra	SRT Demo Plot (Zero tillage Technology)	-	46
			Control plot (Normal Condition)	-	38
7	Sampat Ingale, Panas Tq.Sillod 9970148657	Gram (Kabuli)	SRT Demo Plot (Zero tillage Technology)	-	24.5
			Control plot (Normal Condition)	-	21
8	Kailas Bhavar, Athvi, Tq.Sillod 9765181770	Cotton + Tur Intercropping	SRT Demo Plot (Zero tillage Technology)	Cotton-37 Tur-5	-
			Control plot (Normal Condition)	Cotton-32 Tur-4	-
9	Dinesh Nagurao Lagad, Pimpalgaon Dev,	Maize	Broad bed furrow (BBF)	76	-

	Tq.Phulambri 9545415109		Control plot (Normal Condition)	64	-
10	Kadubai Dhondiba Khandagale, janefal, Tq.Phulambri 9890569280	Maize	Broad bed furrow (BBF)	-	95
			Control plot (Normal Condition)	-	82

2. BBF (Broad Bed Furrow) System for soybean crop.
3. Use of mulching paper for vegetables like chilly, flower crops, and field crops like cotton.
4. Inter cropping system Ginger + maize on raised bed system with use of drip irrigation.
5. protective cultivation of vegetables and flower crops in shade net houses and polyhouses for market vegetables & for commercial seed production.

Chapter 6: Climate Resilient Technology (CRT) Interventions and its impact on yield of crops

6.1 CRTs Interventions

Climate Resilient Technologies promoted under PoCRA			
Technology	**Resilience Feature**	**Benefits**	**Suitable Crops**
1. Cultivation by broad bed furrow (BBF) method	Resilience to moisture stress, poor soil drainage, nutrient (fertilizer) loss	Ensures optimum moisture and aeration at root level, helps drain out water in excess rainy condition, saves seed, ensures proper fertilizer placement in root zone, helps develop optimum microclimate under crop canopy, helps in proper intercultural operations, reduces cost of cultivation.	All field crops both in Kharif and Rabi season
2. Intercropping	Resilience to risk due to crop failure, moisture stress, pest incidence	Ensures optimum use of soil moisture & nutrients, overcomes risk due to aberrant climatic variabilities, helps in effective pest management, and reduces financial risk in farming.	Cotton, soybean, pulses, sorghum & pearl millet
3. Use of climate resilient seed varieties	Resilience to moisture stress due to dry spell & drought, pest epidemic, infestation by wilt & soil borne pathogens	Higher yields than existing varieties, helps escape drought condition due to shorter durations, tolerance to moisture stress, resistance to pest & disease infestation fetches good price due to better consumer preference.	All crops
4. Seed treatment	Resilience to biotic stress	Protection from soil born pathogen and pests, enhances good root development.	All field crops
5. Integrated Nutrient Management	Resilience to abiotic stresses including soil salinity, nutrient deficiencies, susceptibility to pest & disease	Enhances crop health, higher yields, enhances quality of produce, resistance to biotic & abiotic stresses, enhances quality of produce, enhances consumer preference, helps to fetch better market price.	All crops
6. Integrated Pest Management	Resilience to pest & disease epidemic, environmental hazards	Protection from pest & disease attack, reduction in use of chemical pesticide, helps in production of residue free agriculture commodities, reduces environmental hazards, enhances quality of produce, enhances consumer preference in domestic and export market, helps to fetch better market price.	All crops
7. Furrow opening	Resilience to moisture stress,	Helps in conservation of moisture around root zone of crops during dry spell.	Cotton, soybean, pulses,

			sorghum & pearl millet
8. Foliar spray of 2% Urea at flowering and 2% DAP at boll development	resilience to poor nutrition & moisture stress		Cotton
9. Protective irrigation through farm pond	resilience to moisture stress during dry spell & drought condition	Overcomes moisture stress during critical stages, improves nutrient uptake, and enhances increase in yield.	All crops
10. Conservation tillage	Resilience to moisture stress, soil & nutrient loss	Enhances level of soil carbon, soil fertility & water holding capacity, better crop health and higher yields, enhances quality of produce, resistance to biotic & abiotic stresses, and enhances quality of produce.	All crops
11. Incorporation of biomass	Resilience to soil organic carbon (SOC) loss	Enhances level of soil carbon and soil fertility, enhances water holding capacity of soil, leading to better crop health and higher yields, tolerance to moisture stresses.	All crops
12. Canopy management in fruit crops	Resilience to stress management	Enhances fruit bearing capacity, enhances quality of fruits, and reduces cost of harvesting.	Mango, Pomegranate & Guava
13. Cultivation of citrus crops on broad ridges	Resilience to poor soil drainage & soil borne diseases	Enhances proper microclimate around root zone, helps in retaining optimum soil moisture, avoids contact of water with stem collar, and prevents infection by phytophthora & other soil borne pathogens.	Mandarin orange, Sweet orange and Kagzi Lime

6.2 Impact of CRT on crop yield based on FFS data.

FFS (Farmers' Field School) sessions have been implemented in the project village since 2018, focusing on soybean, cotton, pigeon pea and gram crops in the Chhatrapati Sambhajinagar district. FFS aims to promote sustainable and efficient farming. It does this by introducing effective practices for selected crops, improving farmers' knowledge with concepts like IPM and INM, empowering them to make informed decisions and working towards reducing cultivation costs, restoring soil fertility and increasing productivity. In essence, the FFS focuses on sustainable farming and empowering farmers as decision-makers. The adoption of climate resilient technology (CRT) was promoted on the FFS plot during these sessions. A comparison of the crop yields between the FFS plot and the control plot is detailed below, as per the data captured in the FFS app.

Year wise crop yield (Kg/ha)

Year	Soybean		Cotton		Pigeon Pea		Gram	
	FFS Plot	Control Plot	FFS Plot	Control Plot	FFS Plot	Control Plot	FFS Plot	Control Plot
2019	-	-	464	407	813	603	1574	1433
2020	1184	922	1445	1213	976	739	1441	1173
2021	1356	1185	1344	1185	898	779	1524	1294
2022	-	-	-	-	-	-	1949	1494
Average	**1270.00**	**1053.50**	**1084.33**	**935.00**	**895.67**	**707.00**	**1622.00**	**1348.50**

The FFS plot for soybean crops benefited from various CRT interventions, including seed treatment with fungicide and biofertilizer, sowing using the BBF method, intercropping, protective irrigation during dry spells and foliar spray of Neem seed kernel extract (NSKE). As a result, the yield of the FFS plot increased by 20.55% compared to the control plot.

The FFS plot for cotton crops benefited from various CRT interventions, including seed treatment with biofertilizer, intercropping, protective irrigation during dry spells, foliar spray of Neem seed kernel extract (NSKE), nipping of bud and use of traps (pheromone traps, sticky traps). As a result, the yield of the FFS plot increased by 15.97% compared to the control plot.

The FFS plot for Pigeon pea crops benefited from various CRT interventions, including as Seed treatment with fungicide and biofertilizer, protective irrigation in dry spell, foliar spray of Neem seed kernel extract (NSKE), topping. As a result, the yield of the FFS plot increased by 26.69% compared to the control plot.

The FFS plot for Gram crops benefited from various CRT interventions, including as Seed treatment with fungicide and biofertilizer, sowing by BBF method, protective irrigation, NSKE, and use of pheromone traps. As a result, the yield of the FFS plot increased by 20.28% compared to the control plot.

6.2 Impact of BBF on yield crops

BBF/Dibbling of seed technology is promoted through a project for sowing of soybean crop 22 to 25 kg/Acre seed rate is required as compared to regularly sown, so they saved waste of money on seed impacts on germination also as BBF/Dribbling sown up to 4 inch soil/bed and plant ti plant row to row ratio maintained by this method. Aeration, nutrient/fertilizer nutrients are supplied as per necessity of the crop, so it helps in the vegetative, flowering and pod formation stages. These activities increase in yield up to 4 to 5 Qt. on average.

6.4 Impact of zero tillage on yield crops.

In project Zero, tillage is an innovative activity adapted by farmers in our district, especially in Kharif, followed by Rabbi Soybean / Gram respectively. Due to zero tillage, there is no need for cultivation practices like ploughing, harrowing and inter-cultivation operations. As seed is sown by dibbling on a raised bed, the plant population is maintained as per requirement. Also, plant to plant and row to row, optimum distance is maintained and after germination, the crop has to spray weedicide, so there will be no growth of yield. A main purpose of zero tillage is to increase organic carbon in soil. So it helps in the productivity of crops and humus also developed in soil.

SRT (Saguna Regenerative Technology) - Zero tillage Technology:

No. farmers adopting SRT in the district:

Sr. No.	Particulars	Year 2022-23 (Kharif)	Year 2023-24 (Kharif)
1.	No. of villages	29	85
2.	No. of farmers	302	908
3.	Area (Ha.)	444	719.50
4.	Increase in area in 2023-24 as comparative to 2022-23	--	62 %

Examples of successful farmers adopting SRT on their farm:

Sr.No.	Farmer Name and address	Crop Name	Technology	Production under rainfed condition (Q/Ha.)	Production under irrigated condition (Q/Ha.)
1	Ganesh Baburao Gavhane, Bodwad, Tq. Sillod 8329105851	Cotton (in light type of soil)	SRT Demo Plot (Zero tillage Technology)	34	44
			Control plot (Normal Condition)	29	41
2	Vikas Suslade, Ruikheda, Tq.Kannad 9765708039	Cotton (in heavy type of soil)	SRT Demo Plot (Zero tillage Technology)	37.5	-
			Control plot (Normal Condition)	32	-
3	Vikas Suslade, Ruikheda, Tq.Kannad 9765708039	Soybean	SRT Demo Plot (Zero tillage Technology)	30	38
			Control plot (Normal Condition)	27	34
4	Ganesh Gavhane, Bodwad,	Soybean	SRT Demo Plot (Zero tillage Technology)	35	38

	Tq.Sillod 8329105851		Control plot (Normal Condition)	32	34
5	Bhivsan Vaman Rathod, Malegaon Thokal, Tq. Kannad	Soybean	SRT Demo Plot (Zero tillage Technology)	39	-
			Control plot (Normal Condition)	32	-
6	Raosaheb Mohite, Tapargaon, Tq. Kannad 9049023729	Bajra	SRT Demo Plot (Zero tillage Technology)	-	46
			Control plot (Normal Condition)	-	38
7	Sampat Ingale, Panas Tq.Sillod 9970148657	Gram (Kabuli)	SRT Demo Plot (Zero tillage Technology)	-	24.5
			Control plot (Normal Condition)	-	21
8	Kailas Bhavar, Athvi, Tq.Sillod 9765181770	Cotton + Tur Intercropping	SRT Demo Plot (Zero tillage Technology)	Cotton-37 Tur-5	-
			Control plot (Normal Condition)	Cotton-32 Tur-4	-
9	Dinesh Nagurao Lagad, Pimpalgaon Dev, Tq. Phulambri 9545415109	Maize	Broad bed furrow (BBF)	76	-
			Control plot (Normal Condition)	64	-
10	Kadubai Dhondiba Khandagale, janefal, Tq.Phulambri 9890569280	Maize	Broad bed furrow (BBF)	-	95
			Control plot (Normal Condition)	-	82

SRT plot and non SRT plot soil testing comparison

(After 3 years onwards starting of SRT)

Farmer Name and address	Particulars	Before SRT	3 Years after SRT
Raosaheb Mohite, Tapargaon, Tq. Kannad, Dist. Chatrapati Sambhaji Nagar 9049023729	Soil pH	7.87	7.83
	Soil E.C.	0.50	0.25
	Soil O.C.	0.68	0.71
	Soil Deficiency of Zn and Fe	Deficiency of Zn and Fe Traced	Deficiency of Zn and Fe not Traced
	Soil Microbial activity count	10^6 to 10^9	10^{16}
	Maize crop leaf brix reading taken during dry spell by *Kheti-buddy* Agritech, Pune	Brix reading 12 (non SRT plot)	Brix reading 15 (SRT plot)

Benefits/ achievement found in last 3 years from cultivation under SRT

- Useful for heavy black, low land, saline and sodic soil under irrigated as well as rainfed condition
- Saving of cost of cultivation up to 50-60%
- Negligible use of tractor and bullocks operated machinery and equipment except land preparation of 1st year crops,
- Solving labor problems as very few labors required for each crop cultivation on the same beds without disturbing it.
- Naturally increase in the number of earthworms in the soil eventually year by year.
- Naturally increase in the organic carbon content in the soil eventually year by year.
- Naturally increase in the microbial count in the soil eventually year by year.
- Naturally improvement of physical and chemical properties of the soil leads to proper availability of the nutrients for the crops.
- Improved water holding capacity of soil leads to optimum availability of water for the crops during dry spell.
- Removal of excess water during high rainfall conditions.
- low erosion of the soil
- More number of crops cultivated in a year on the same land due to avoidance of land preparation for each crop.
- SRT is suitable for high temperature, heavy rainfall, low rainfall, and dry spell conditions.
- The cost benefit ratio for the maize crop is 1:3.09 for the farmers of the district.
- SRT is successful for cultivation of Cotton, Maize, marigold, Tur, wheat & gram crops in the district.
- From different 19 districts of Maharashtra 2040 farmers were visited to SRT plots in the district.

Zero Tillage Technology (SRT)

first crop cotton (2020)
production 8 Quintal/ Acre ,
expenditure Rs. 17000/-

Second crop Maize (2020)
production 20 Quintal/ Acre ,
expenditure Rs. 7600/-

Third crop cotton (2021)
production 9.6 Quintal/ Acre ,
expenditure Rs. 10150/-

fourth crop maize (2021)
production 30 Quintal/ Acre ,
expenditure Rs. 8650/-

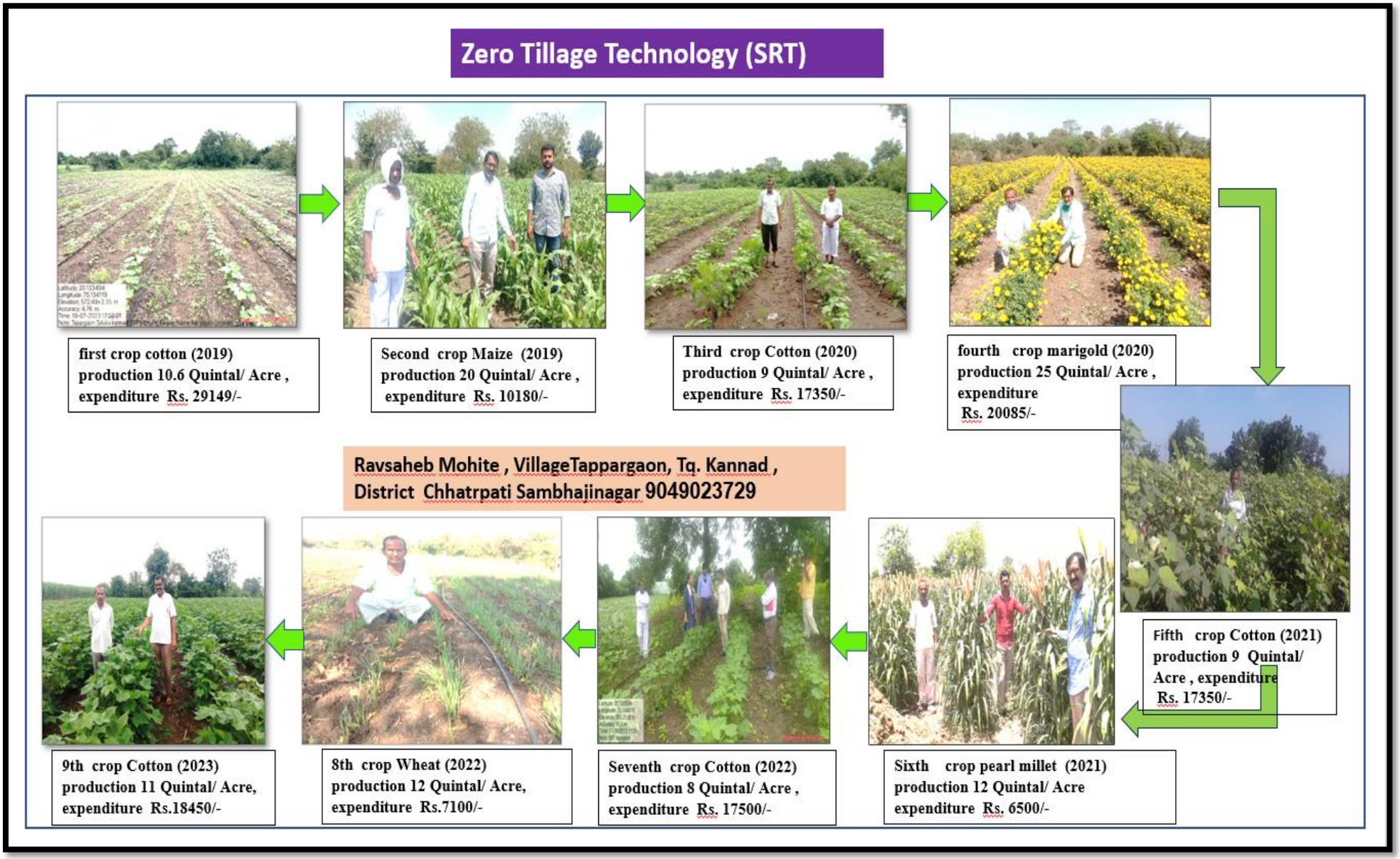
Bhausaheb Sonavane, Village Khamgaon, Tq. Phulambri, District - Chhatrpati Sambhajinagar - 9145553816

8th crop Gram (Current 2023)

Seventh crop Maize (2023)
production 8 Quintal/ Acre ,
expenditure Rs. 17500/-

Sixth crop Maize (2022)
production 12 Quintal/ Acre
expenditure Rs. 7100/-

Fifth crop Cotton (2022)
production 13.40 Quintal/ Acre ,
expenditure Rs. 19366/-



(Source: Technical coordinator, NDKSP, chh. Sambhajinagar)

6.5. Impact of Neem based extracts on yield of crops.

Neem extracts are the main part of IPM, especially in paste management. In soybean after 30 days of sowing, the first spray is needed for paste management of the Girdle beetle, eggs of leaf eating caterpillars etc.5 % Neem extracts spray work as insecticides.

6.6. Impact of on farm biofertilizers production on crop yield.

To prevent extra use of chemical fertilizers, farmers adopted biofertilizers, PSB /Rhizobium used in seed treatments, which helps in fixation of N (Nitrogen). Farmers also use jeevamrut, Dashparni ark, Vermicompost /Vermiwash, so these activities help to increase production.

Chapter 7: Plan to cope with weather related contingencies of Aurangabad District

(*Source- http://www.icar-crida.res.in/*)

7.1 Drought

7.1.1 Rainfed situation

7.1.1.1. Early season drought (delayed onset)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **4th week of June**	Medium deep to deep black soils withassured rainfall	Cotton	No Change	Normal package of practices recommended by MAU, Parbhani	• Linkage with MAU, MSSC andNSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK foragro techniques.
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeon pea	-do-	-do-	
		Soybean	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram / Black gram -Chickpea / Rabbi Sorghum / Safflower	-do-	-do-	
	Shallow black soils with assured rainfall	Cotton	-do-	-do-	
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeon pea	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram /Black gram – Gram / Rabbi Sorghum / Safflower	-do-	-do-	
	Medium deep to deep	Cotton, Pearl millet	-do-	-do-	
		Maize, Pigeon pea	-do-	-do-	

	black soils with low rainfall (Vaijapur and Gangapur tehsils)*	Green gram /Black gram -Chickpea / Rabbi Sorghum / Safflower	-do-	-do-	
	Shallow black soilswith low rainfall (Vaijapur and Gangapur tehsils)	Cotton	-do-	-do-	
		Pearl millet / Pearl millet + Pigeon pea	-do-	-do-	
		Maize	-do-	-do-	
		Pigeon pea	-do-	-do-	

Condition					
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop /Croppingsystem**	**Change in Crop/Cropping systemincluding variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4weeks **2nd week ofJuly**	Medium deep to deep black soils with assured rainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change, prefer varieties BSMR 736, 853 BDN 708, 711	-do-	
		Soybean	No change or intercropping with Pigeon pea in 4:2 or 6:3 rowproportion	-do-	
		Sorghum	Cotton / Maize/ Pigeon pea (BSMR736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	

		Green gram / Black gram -Chickpea / Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BSMR736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with assured rainfall	Cotton	No change or short duration varieties / hybrids or Cotton + Pigeon pea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani oradopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change**.** Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-	
		Sorghum	Cotton / Maize/ Pigeon pea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)		
		Green gram / Black gram -Chickpea / Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BSMR736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani oradopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	

	tehsils)	Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-	
		Green gram / Black gram -Chickpea / Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi,AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with low rainfall (Vaijapurand Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani oradopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet / Pearl millet + Pigeon pea	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/Cropping system**	**Change in Crop / Cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 4th week of July	Medium deep to deep black soilswith assured rainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% moreseed rate than recommended and reduce fertilizer dose by 25 per cent.	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	
		Soybean	No change. Prefer intercroppingwith pigeon pea in 4:2 or 6:3 row proportion	-do-	
		Sorghum	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
		Green gram / Black gram - Chickpea /Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden,SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with assuredrainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeon pea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani (or) adopt 20-25%more seed rate than recommended and reduce fertilizer dose by 25 %	
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	

		Sorghum	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani (or) adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + Pigeon pea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet / Pearl millet + Pigeon pea	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in Crop/Cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks 2nd week of August	Medium deep to deep black soils with assured rainfall	Cotton	Pearl millet (Shradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or Pearl millet + Pigeon pea in 3:3 or 4:2 row proportion or keep fallow and plan for rabbi season	Follow *in situ* soil moisture conservation measures like alternate furrow opening with Balaram plough.	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	Pearl millet + Pigeon pea in 3:3 or 4:2 row proportion	Open conservation furrow after every 6-8 rows with Balaram plough.	
		Maize	No change. Alternatively go for castor (VI-9, Aruna , DCS-9 (Jyothi), GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Pigeon pea	Pearl millet + Pigeon pea in 3:3 or 4:2 row proportion. Prefer early maturing varities like BDN-708 / 711	-do-	
		Soybean	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow or plan for rabbi crops	• Open conservation furrow after every 6-8 rows with Balaram plough • Prepare land for early sowing of rabbi crops like chickpea, safflower, sunflower and sorghum	
	Shallow black soils with assured rainfall	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1 or Pearl millet + Pigeon pea in 2:1 row proportion) or keep fallow and plan for rabbi season	Prepare land for early sowing of rabbi crops like chickpea, safflower sunflower and sorghum	
		Pearl millet	No change. Prefer intercropping with Pigeon pea	Open conservation furrow after every 6-8 rows with Balaram plough	
		Maize	No change /fodder maize	-do-	

		Pigeon pea Sorghum	Castor (VI-9, Aruna, GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Keep fallow and prepare land for rabbi crops.	• Open conservation furrow after every 6-8 rows with Balaram plough • Prepare land for early sowing of rabbi crops like chickpea, safflower sunflower and sorghum	
	Medium deep to deep black soilswith low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow (plan forrabbi) or Pearl millet + Pigeon pea in 2:1 row proportion	Follow *in situ* soil moisture conservation measures like alternate furrow opening withBalaram plough	
		Pearl millet	No change. Prefer intercropping with Pigeon peain 3:3 or 4:2 row proportion	-do-	
		Maize	No change /fodder maize (African Tall)	-do-	
		Pigeon pea	Castor (VI-9, Aruna, GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	-do- Prepare land for rabbi crop	• Open conservation furrow after every 6-8 rows with Balaram plough. • Prepare land for early sowing of rabbi crops like chickpea, safflower sunflower and sorghum	
	Shallow black soils with lowrainfall (Vaijapur and Gangapur tehsils)	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow (plan forrabbi) or Pearl millet + Pigeon pea in 2:1 row proportion	Follow *in situ* soil moisture conservation measures like alternate furrow opening withBalaram plough	
		Pearl millet / Pearl millet + Pigeon pea	No change. Prefer intercropping with Pigeon pea	-do-	
		Maize	No change /fodder maize	-do-	
		Pigeon pea	Castor (VI-9, Aruna, DCS-9 (Jyothi), GCH-4, 5, 6 and DCH-117 / 32)	-do-	

7.1.1.2. Early season drought (Normal onset)

Condition			Suggested Contingency measures		
Early season drought (Normalonset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spellafter sowing leading to poor germination / crop stand etc.	Medium deep to deep black soils with assured rainfall	Cotton	• Gap filling within the rows with same cultivar or Pigeon pea to maintain at least 75% plant population. • Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. • Give protective irrigation wherever possible	Avoid applying fertilizers till sufficient soil moisture is available, Interculture with harrows	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	Gap filling or transplanting of seedlings either from the samefield or from nursery or gap filling with Pigeon pea	Interculture with hoe.	
		Maize	Gap filling within the rows withsame or short duration cultivar to maintain at least 75% plant population	-do-	
		Pigeon pea			
		Soybean	-do- or if the plant population is less than 50% go for re sowingof the crop	-do-	
		Sorghum	Gap filling with pearl millet / Pigeon pea	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	• If the plant population is less than 75% of optimum, go for re sowing of the alternate crops like pearl millet / sunflower / Pigeon pea • If possible give protective irrigation with sprinkler	-do-	
	Shallow black soils with assuredrainfall	Cotton	• Gap filling within the rows with same cultivar or Pigeon pea to maintain at least 75% plant population. • Raise cotton seedlings in	Avoid applying fertilizers till sufficient soil moisture is available, Interculture with harrows	

			polythene bags and • transplant when sufficient soil moisture is available. • Give protective irrigation wherever possible		
		Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with Pigeon pea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivarto maintain at least 75% plant population	-do-	
		Pigeon pea	-do-	-do-	
		Sorghum	Gap filling with Pigeon pea	-do-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	• If the plant population is • less than 75% of ptimum, go for re sowing of the alternate crops like pearl millet / sunflower / Pigeon pea • If possible give protective irrigation with sprinkler.	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	• Gap filling within the rows • With same cultivar or Pigeon pea to maintain at least 75% plant population. • Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. • Give protective irrigation wherever possible	• Avoid applying fertilizers till sufficient soil. moisture is available • Making of conservation furrows formoisture conservation • Interculture with harrows	
		Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gapfilling with Pigeon pea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivarto maintain at least 75% plant population	-do-	

		Pigeon pea	- do-	-do-	
		Green gram / Black gram - Chickpea / RabbiSorghum / Safflower	• If the plant population is less than 75% of optimum, go for re sowing of the alternate crops like pearl millet / sunflower / pigeon pea. • If possible give protective irrigation with sprinkler	-do-	
	Shallow black soils with low rainfall (Vaijapurand Gangapur tehsils)	Cotton	• Gap filling within the rows with same cultivar or Pigeon pea to maintain at least 75% plant population. • Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. • Give protective irrigation wherever possible	• Avoid applying fertilizers till sufficient soil. moisture is available • Making of conservation furrows for moisture conservation • Interculture with harrows	
		Pearl millet / Pearl millet + Pigeon pea	Gap filling or transplanting of seedlings either from the samefield or from nursery or gap filling with Pigeon pea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivarto maintain at least 75% plant population	-do-	
		Pigeon pea	- do-	-do-	

7.1.1.3. Mid-season drought(long dry spell)

Condition			Suggested Contingency measures		
Mid season drought(long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservationmeasures**	**Remarks on Implementation**
At vegetative stage	Medium deep to deep black soils withassured rainfall	Cotton	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation if possible	• Mulching with crop residue @ 3-5 t / ha • Foliar spray of 2% KNO_3, urea, DAP,$MgSo_4$, Zinc, Boron • Mulching with crop residue @ 3-5 t / ha	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	-do-	Opening of alternate furrows with Balaram plough.	
		Maize	-do-	• Opening of alternate furrows with Balaram plough • Mulching with crop residue @ 3-5 t / ha	
		Pigeon pea	-do-	Spraying of 2% urea or DAP	
		Soybean	Interculture for weeding and to create soil mulch.		
		Sorghum	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Give protective irrigation wherever possible • Intra row thinning	• Opening of alternate furrows with • Balaram plough. • Mulching with crop residue @ 3-5 t / ha	

		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	• Interculture for weeding and to create soil mulch. • If possible give protective irrigation with sprinkler	• Spraying of 2% urea or DAP • Interculture with hoe	
	Shallow black soils with assured rainfall	Cotton	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation wherever possible	• Opening of alternate furrows with • Balaram plough. • Mulching with crop residues @ 3-5 t / ha within the rows	
		Pearl millet	-do-		
		Maize	-do-		
		Pigeon pea	Interculture for weeding and to create soil mulch	• Spraying of 2% urea or DAP • Opening of alternate furrows with Balaram plough.	
		Sorghum	• Avoid top dressing of Fertilizers till sufficient soil moisture is available. • Give protective irrigation wherever possible	• Interculture for weeding and to create soil mulch to conserve moisture. • Opening of alternate furrows	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	• Interculture for weeding and to create soil mulch. • If possible give protective irrigation • with sprinkler	Spraying of 2% urea or DAP	

	Medium deep to deep black soils withlow rainfall (Vaijapur and Gangapur tehsils)	Cotton	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation wherever possible	• Opening of alternate furrows with Balaram plough. • Mulching with crop residue • Spraying of 2% urea or DAP	
		Pearl millet			
		Maize			
		Pigeon pea		• Spraying of 2% urea or DAP • Opening of alternate furrows with Balaram plough.	
		Green gram /Black gram - Chickpea / Rabbi Sorghum / Safflower	• Interculture for weeding and to create soil mulch. • If possible give protective irrigation with sprinkler	Spraying of 2% urea or DAP	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation whereverpossible	• Opening of alternate furrows with • Balaram plough. • Mulching with crop residue @ 3-5 t / ha • Spraying of 2% urea or DAP	
		Pearl millet / Pearl millet + Pigeon pea			
		Maize			
		Pigeon pea	-do-	• Spraying of 2% urea or DAP • Opening of alternate furrows withBalaram plough.	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering /fruiting stage	Medium deep todeep black soils with assured rainfall	Cotton	Give protective irrigation withdrip	• Foliar spray of 2% KNO_3, urea, DAP,$MgSo_4$, Zinc, Boron. • Mulching with crop residue @ 3-5 t / Ha.	• Linkage with MAIDC / DSAO for intercultural implements (Harrow, hoe). • Linkage withRKVY for farm ponds and micro irrigation system.
		Pearl millet	- do-	Mulching with crop residue @ 3-5 t / ha	
		Maize	- do-	• Mulching with crop residue @ 3-5 t / ha • If feasible spray anti-transparent 6% kaolin	
		Pigeon pea	Give protective irrigation with sprinkler	Foliar spray of 2% KNO_3, urea and DAP	
		Soybean	- do-	-do-	
		Sorghum	- do-	• Mulching with crop residue @ 3-5 t / ha • If feasible spray anti-transparent 6% kaolin	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Give protective irrigation withsprinkler	• Spraying of 2% urea and DAP	
	Shallow black soils with assuredrainfall	Cotton	Give protective irrigation	• Foliar spray of 2% KNO3, urea and DAP. • Mulching with crop residue @ 3-5 t / Ha.	
		Pearl millet	- do-	Mulching with crop residue @ 3-5 t / ha	
		Maize	• Give protection irrigation • In case of severe stressharvest as green fodder	• -do- • If feasible spray anti-transparent 6% kaolin.	

		Pigeon pea	Give protective irrigation	• Foliar spray of 2% KNO3, urea and DAP	
		Sorghum	• Give protection irrigation • In case of severe stressharvest as green fodder	If feasible spray anti-transparent 6% kaolin	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	• Give protection irrigation with sprinkler • In case of severe stress harvest as green fodder /green manuring	Spraying of 2% urea and DAP	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Give protective irrigation with drip	• Foliar spray of 2% KNO3, urea and DAP, • MgSo4, Zinc, Boron. • Mulching with crop residue @ 3-5 t / Ha.	
		Pearl millet	Give protective irrigation	Mulching with crop residue @ 3-5 t / ha	
		Maize	- do-	-do-	
		Pigeon pea	- do-	Foliar spray of 2% KNO_3, urea and DAP	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	- do-	Spraying of 2% urea and DAP	
	Shallow black soils with low rainfall (Vaijapurand Gangapur tehsils)	Cotton	Give protective irrigation with drip	• Foliar spray of 2% KNO_3, urea and DAP • Mulching with crop residue @ 3-5 t / ha	
		Pearl millet / Pearl millet + Pigeon pea	Give protection irrigation	-	
		Maize	• Give protection irrigation • In case of severe stressharvest as green fodder	• Mulching with crop residue @ 3-5 t / ha within the rows • If feasible spray anti-transparent 6%kaolin.	
		Pigeon pea	Give protection irrigation	Foliar spray of 2% KNO_3, urea and DAP	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Crop management	**Rabbi Crop planning**	**Remarks on Implementation**
Terminal drought (Early withdrawalof monsoon)	Medium deep to deep black soils with assured rainfall	Cotton	• Life saving irrigation with drip • Picking	If possible, adopt relay cropping of chickpea,safflower, rabbi sorghum	• Linkage with MAIDC / DSAO for intercultural implements (Harrow, hoe). • Linkage with RKVY for farm ponds and micro irrigation system.
		Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabbi crops chickpea / safflower	
		Maize			
		Pigeon pea	Life saving irrigation	Plan for rabbi crops chickpea / safflower	
		Soybean			
		Sorghum	Life saving irrigation or harvest at physiological maturity		
		Green gram / Black gram - Chickpea / RabbiSorghum / Safflower	Harvest at physiological maturity	Plan for rabbi crops chickpea / safflower / rabbi sorghum / sunflower	
	Shallow black soils with assured rainfall	Cotton	• Life saving irrigation • Picking	If possible, adopt relay cropping of chickpea, safflower, rabbi sorghum	
		Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabbi crops chickpea / safflower	
		Maize	• Life saving irrigation • In case of severe stress harvestas green fodder	do	
		Pigeon pea	Life saving irrigation	Foliar spray of 2% KNO_3, urea and DAP	
		Sorghum	• Life saving irrigation • In case of severe stress harvestas green fodder	Plan for rabbi crops chickpea / safflower	
		Green gram / Black gram - Chickpea / RabbiSorghum / Safflower	Harvest at physiological maturity	Plan for rabbi crops chickpea / safflower / rabbi sorghum / sunflower	
	Medium deep to deep black soils	Cotton	• Life saving irrigation with drip • Picking	If possible, adopt relay cropping of chickpea, safflower, rabbi sorghum	

	with low rainfall (Vaijapur and Gangapur tehsils)	Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabbi crops chickpea / safflower	
		Maize	-do-	-do-	
		Pigeon pea	Life saving irrigation	-	
		Green gram / Black gram - Chickpea / Rabbi Sorghum / Safflower	Harvest at physiological maturity	Plan for rabbi crops chickpea / safflower / rabbi sorghum / sunflower	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	• Life saving irrigation with drip • Picking	If possible, adopt relay cropping of chickpea, safflower, rabbi sorghum	
		Pearl millet / Pearl millet + Pigeon pea	Life saving irrigation or harvest at physiological maturity	Plan for rabbi crops chickpea / safflower after harvest of sole pearl millet	
		Maize	• Life saving irrigation • In case of severe stress harvestas green fodder	Plan for rabbi crops chickpea / safflower	
		Pigeon pea	Life saving irrigation	Foliar spray of 2% KNO_3, urea and DAP	

7.1.2. Irrigated situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due tolow rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or prefer irrigated cotton	• Raising of nurseries with single budded setts to save the time andwater for pre-seasonal planting • Drip system for enhancing the water productivity • Mulching with sugarcane trash between rows and frequent interculture to conserve moisture	• Linkage with VSI and Sugarcane Research Station, Padegeon for supply of foundation planting material of improved varieties Co-

		Wheat	No change. Depending upon time of release of water go for timely (HD- 2496, HD-2189, Triambak) / late sown(HD-2189, Kailash) wheat varieties	Give irrigation at critical stages of cropgrowth	86012, Co- 0265, Co- 94012 • Linkage with MAU, Parbhani, MSSC, NSCand NFSM for supply ofseed • Linkage with DSAOfor micro irrigation system through RKVY and NHM.
		Chickpea	Use early maturing varieties ICCV-2	Use drip irrigation / give irrigation at critical crop growth stages (branching andpod formation)	
		Safflower	Use improved varieties PBNS-12 / 40	Use drip irrigation / give irrigation at critical crop growth stages (branching and capsule formation)	
		Ginger	No change	Use drip irrigation	
		Turmeric			
		Chilli			
		Rabbi onion			
	Shallow black soilswith assured rainfall	Ginger / turmeric	Rabbi onion / summer pearl millet	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Irrigated cotton / wheat	Give irrigation at critical stages of crop growth	
		Wheat	No change. Depending upon time of release of water go for timely sown	Give irrigation at critical stages of crop growth	
			(HD-2496, HD-2189,Triambak)/ late sown (HD-2189, Kailash) wheat varieties		
		Chickpea	Use early maturing varieties i.e. ICCV-2	Use drip irrigation / give irrigation at critical crop growth stages (branching andpod formation)	
		Safflower	Use improved varieties i.e. PBNS-12 / 40	Use drip irrigation / give irrigation at critical crop growth stages (branching andcapsule formation)	
		Ginger	No change	Use drip irrigation	
		Turmeric	No change	-do-	
		Chilli	No change	-do-	
		Rabbi onion	No change	-do-	

	Shallow black soils with low rainfall(Vaijapur and Gangapur tehsils)	Wheat	Chickpea / safflower / summer pearl millet / fodder maize	Use drip irrigation and give irrigation at critical growth stages	

Condition	Major Farmingsituation	Normal Crop/Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or prefer irrigated cotton /wheat / safflower / chickpea / rabbi onion	• Water saving measures suchas alternate furrow • Give irrigation at critical cropgrowth stages	Linkage with Irrigation Department for release of water at critical growthstages
		Wheat	Use low water requiring varieties Lok-1, PBN-1, Kailash	Give irrigation at critical cropgrowth stages	
		Chickpea	No change		
		Safflower	No change		
		Ginger	Wheat		
		Turmeric	Wheat		
		Chilli	Rabbi onion		
		Rabbi onion	No change		
	Shallow black soils with assured rainfall	Wheat	Chickpea / fodder maize / safflower		
		Safflower	No change		
		Ginger	Chickpea / safflower		
	Medium deep to deepblack soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Irrigated cotton / wheat / rabbi onion		
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sunflower	No change or prefer fodder maize		

Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Non release ofwater in canals under delayed onset of monsoon in catchment	Medium deep to deepblack soils with assured rainfall	Sugarcane	Cotton / soybean / Pigeon pea /maize	• Interculture operations and mulching to conserve soil moisture. • Basal application of all therecommended fertilizers.	Liasion with Irrigation Department for release of water at critical growthstages
		Ginger	Chickpea / safflower / sunflower / rabbi sorghum		
		Turmeric	-do-		
		Chilli	-do-		
	Shallow black soils with assured rainfall	Chickpea / safflower	No change		
	Medium deep to deepblack soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Cotton / soybean / Pigeon pea / maize		
		Ginger	Chickpea / safflower / sunflower / maize		
		Turmeric	-do-		
		Chilli	-do-		
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils) Gangapur tehsils)	Chickpea / safflower / Maize fodder	No change		

Condition	Major Farming situation	Normal Crop /Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwaterrecharge dueto low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change. Prefer alternate crops likecotton, soybean, maize / wheat / cowpea / sunflower	Limited irrigation / Drip / Alternate furrowirrigation or harvest for fodder purpose	Supply of seed through MSSC,NFSM, MAU, Village seed production programme
		Wheat	Rabbi sorghum	-do-	
		Chickpea	No change or prefer varieties like BDN-9-3, Akash, Vijay, Vikas	-do-	
		Safflower	No change or prefer varieties like PBNS-12/40, Sharada, Naari-6	-do-	
		Ginger	Sorghum (M-35-1, Parbhani Moti) / chickpea (BDN-9-3, Akash, Vijay) / safflower (PBNS-12/40, Sharada,Naari-6)	-do-	
		Turmeric	-do-	-do-	
		Chilli	-do-	-do-	
		Rabbi onion	-do-	-do-	
	Shallow black soils with assured rainfall	Not applicable			
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Prefer alternate crops like cotton, soybean, maize and Pigeon pea	-do-	
		Wheat	Rabbi sorghum	-do-	
		Chickpea	No change or prefer varieties like BDN-9-3, Akash, Vijay, Vikas	-do-	
		Safflower	No change or prefer varieties like PBNS-12/40, Sharada, Naari-6	-do-	
		Ginger	Sorghum (M-35-1, Parbhani Moti) / chickpea (BDN-9-3, Akash, Vijay) / safflower (PBNS-12/40, Sharada, Naari-6)	-do-	
		Turmeric		-do-	
		Chilli		-do-	
		Rabbi onion		-do-	

7.2 Unusual rains (untimely, unseasonal etc.) (For both rainfed and irrigated situations)

Condition- Continuous high rainfall in a short span leading to water logging				
Crop	**Suggested contingency measure**			
	Vegetative stage	**Flowering stage**	**Crop maturity Stage**	**Post-harvest**
Cotton	• Open field channels to drain excesswater and avoid surface ponding. • Apply 2% urea foliar spray after cessation of rains. • Interculture at optimum soil moistureto improve soil aeration.	• Open field channels to drain excess water and avoid surface ponding. • Apply multi-nutrient or hormonal spray topromote flowering	• Open field channels to drain excess water and avoid surface ponding. • Timely picking of cotton	• Protect picked cotton in storage from drenching and soiling • Drying of wet cotton and marketing
Pearl millet	• Drain excess water as early as possible • Intercultivation with hoe • Apply 20 kg additional N / ha afterdraining of excess water	• Drain excess water as early as possible • Intercultivation with hoe • Apply 20 kg additional N / ha after draining of • excess water	• Drain excess water as early aspossible • Harvest at physiological maturity	Dry the grain to optimum moisture content before storage
Maize	• Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / ha afterdraining of excess water	• Drain excess water as early as possible • Intercultivation with hoe • Apply 20 kg additional N / ha after draining of excess water	• Drain excess water as early as possible • Harvest green cobs from dislodged plants for immediatemarketing	• Harvest the cobs after they are dried up properly • Dry the grain to optimum moisture content before storage
Pigeon pea	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	• Drain excess water as early aspossible • Allow the crop to dry completelybefore harvesting	• Spread the bundles drenched in the rain on field bunds / drying floors to quicken drying • Thresh bundles after they are dried properly • Dry the grain to proper moisture content before bagging and storing

Soybean	Provide drainage to drain excess water	Provide drainage to drain excess water	Timely harvest of produce at maturity stage	Shifting to safer place and drying the produce
Sorghum	• Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / ha afterdraining of excess water	• Drain excess water as early as possible • Intercultivation withhoe Apply 25kg additional N/ha after draining of excess water	• Drain excess water as early as possible • Harvest the earheads after they are dried up properly or use ear head drier	Dry the grain to optimum moisture content before storage
Green gram /Black gram –Chickpea	Drain excess water as early as possible	Drain excess water as early as possible	• Drain excess water as early as possible • Allow the crop to dry completelybefore harvesting	Quick drying followed by threshing
Horticulture – Fruits				
Sweet orange (Mosambi) Mango Sapota Custard apple Pomegranate	• Drain excess water from the field • Keep the field clean and do earthing up	• Drain excess water from the field • Keep the field clean and do earthing up • Spray micro nutrients	• Spray fungicides like Bavistin @ 1 gm./1lt water after rain stop as a preventive measure to control disease • Harvest mature produce on clear sunny day • Fallen fruit may be collected, graded and marketed if feasible	• Store fruits in well ventilated temporary structures before marketing • Market the fruits as soon as possible
Condition-Heavy rainfall with high speed winds in a short span				
Cotton	• Open field channels to drain excess water and avoid surface ponding. • Apply 2% urea foliar spray after cessation of rains. • Interculture at optimum soil moisture to improve soil aeration and to provide anchorage	• Open field channels to drain excess water and avoid surface ponding. • Apply multi-nutrient or hormonal spray to promote flowering • Provide soil support	• Open field channels to drain excess water and avoid surface Ponding. • Timely picking of cotton • Keep the fallen and soiled bolls and lint separately for drying	• Protect picked cotton in storage from drenching and soiling • Drying of wet cotton and marketing • Keep the fallen andsoiled bolls and lint separately for drying and marketing
Pearl millet	• Drain excess water as early as possible • Intercultivation with hoe	• Drain excess water as early as possible	• Drain excess water as early as possible	Dry the grain to optimum moisture content beforestorage

	• Apply 20 kg additional N / ha after draining of excess water	• Intercultivation with hoe • Apply 20 kg additional N / haafter draining of excess water • Tie fallen group of plants withleaves to prevent crop loss	• Tie fallen group of plants with leaves to prevent crop loss • Harvest at physiological maturity	
Maize	• Drain excess water as early as possible • Interculture • Apply 25 kg additional N / ha afterdraining of excess water	• Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / haafter draining of excess water • Tie fallen group of plants withleaves to prevent crop loss	• Drain excess water as early as possible • Tie fallen group of plantswith leaves to prevent croploss • Harvest green cobs from dislodged plants for immediate marketing	• Harvest the cobs after they are dried up properly • Dry the grain tooptimum moisture content before storage
Pigeon pea	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	• Open field channels to drain excess water and avoid surface Ponding and interculture at optimum soil moisture to improve aeration • Tie fallen group of plants to prevent crop loss	• Drain excess water as early as possible • Allow the crop to dry completely before harvesting • Tie fallen group of plants to prevent crop loss	• Spread the bundles drenched in the rain on field bunds / drying floors to quick endrying • Thresh bundles after they are dried properly • Dry the grain to proper moisture content before bagging and storing
Sorghum	• Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / ha	• Drain excess water as early as possible • Intercultivation with	• Drain excess water as early as possible • Tie fallen group of plants to prevent crop loss	• Dry the grain to Optimum moisture content before storage

	afterdraining of excess water	hoe • Apply 25 kg additional N / haafter draining of excess water • Tie fallen group of plants toprevent crop loss	• Harvest the ear heads afterthey are dried up properly or use ear head drier	
Green gram / Black gram -Gram	Drain excess water as early as possible	Drain excess water as early as possible	• Drain excess water as early as possible • Allow the crop to dry completely before harvesting	Quick drying of pods followed by threshing
Horticulture				
Sweet Orange (Mosambi)	• Drain excess water from the field • Keep the field clean and do earthingup	• Drain excess water from the field • Keep the field clean and doearthing up	• Spray fungicides like Bavistin @ 1 gm./1lt ofwater of after rain stop as a preventive measure to control disease	• Store fruits in well Ventilated temporary structures before marketing
Mango Sapota Custard apple Pomegranate	• Go for staking if needed	• Spray micro nutrients • Go for staking if needed	• Go for staking if needed • Harvest mature produce onclear sunny day • Fallen fruit may becollected, graded and marketed if feasible	• Market the fruits as soon as possible
Condition-Outbreak of pests and diseases due to unseasonal rains				
Cotton	Protect against incidence of wilt and root rot. Drenching of Copper oxy chloride (COC) 0.3% or carbendazim 0.1%	• When marginal yellowing of leaves due to jassid injury is seen, spray neem oil 0.3% with sticker or imidacloprid 0.6 ml / lit or acetamiprid 0.1-0.2 ml /lit • Protect against Bacterial leaf blight (BLB) with foliar application of streptocycline sulphate 6 gm. + 30 gm. COC for	To control grey mildew and boll rot, apply carbendazim 1 gm./ lit ormancozeb 3 gm. / lit	Proper storage of seed cotton to prevent wettingand incidence of molds

		every 10 lit of water		
Maize		Foliar application of Mancozeb 0.25 to 0.4% at 8-10 days interval tocontrol Turcicum leaf blight	*Trichoderma* mixed with FYM 10 gm. / kg at 10 days prior to its usein the field can be applied to control stalk rot which is likelyduring post flowering	-do-
Pearl millet	-	-	-	-do-
Pigeon pea	Soil application of *Trichoderma harzianum* along with FYM as side dressing to prevent *Fusarium* wilt	Drenching of carbendazim 0.1% atplant base to control wilt Foliar application of acephate 1.5 gm. /lit or Miticide to prevent sterility mosaic virus	Drench with carbendazim 0.1% atplant base to control wilt	Quick drying to preventmolds
Sorghum	Shoot fly	Midge,	Earhead bug, web worm, grain mold	-do-
Horticulture-Fruits				
Sweet orange (Mosambi)	Protect against citrus *psylla* with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml /10 lit	Protect against citrus psylla with foliar spray of malathion 50 EC 10 mlor quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml /10 lit	-	-
Mango	• Spray imidacloprid 0.3ml or dimethoate 1 ml / lit to control leafhopper • Drench the seedlings with COC 0.3 %against root rot	Spray imidacloprid 0.3ml or dimethoate 1 ml / lit to control leafhopper	Spray Dithane M-45 3 gm. / lit or carbendazim 1 gm. / lit againstanthracnose Spray sulphur 0.5% to controlpowdery mildew	Maintain aeration in storage to prevent fungal infection and blackening of fruits

Chapter 8: Agro meteorological Advisory

8.1 Agro-Meteorogical advisory

8.1.1 Importance/ Need of Agromet advisory

Agro meteorological Advisory Services (AAS) are being rendered by India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) under Gramin Krishi Mausam Sewa (GKMS). Under this scheme weather information-based, crop/livestock management strategies and operations are dedicated to enhancing crop production and food security.

Among the various factors affecting the agricultural production, weather is the most important one. Weather is one of the most important factors determining the success or failure of agricultural production. Every phase of growth and development in plants is affected by weather. Among the weather parameters, rainfall and its distribution fluctuate greatly than other parameters. Extreme weather events like heavy rains, cyclones, heat waves, cold waves, drought etc. cause considerable loss in crop production every year. Any variability in the rainfall during the crop season, such as delay in onset of monsoon, excessive rains and prolonged dry spells would affect the crop growth and finally the quality and quantity of the produce. Adoption of real time contingencies in crop management based on weather forecasts can minimize crop losses. Weather forecast and weather based agromet advisories help in increasing the economic benefit to the farmers with appropriate management practices.

Agro advisory service provides timely and accurate weather forecasts and miscellaneous agricultural operations to be carried out for better crop growth. It helps the farmers to take weather sensitive decisions like sowing/transplanting of crops, pesticide and fertilizer application, scheduling irrigation, timely harvesting of the crops. To provide advice on how to safeguard agriculture products from damage while in storage and transit. Weather-based advisory services can provide real time information about weather patterns, crop health and appropriate measures to the farmers enabling them to make informed decisions about various crop management practices leading to higher yields and increased income.

8.1.2 Forecasts or advisories generated at district level

1. Advisory by District Agromet Units (DAMU), Krishi Vigyan Kendra (KVK), Chhatrapati Sambhajinagar.
2. Crop Pest Surveillance System and Advisory Project (CROPSAP)
3. Akashwani Chhatrapati Sambhajinagar (Radio station).
4. Advisory by Vasantrao Naik Marathwada Krishi Vidyapeeth (VNMKV), Parbhani.
5. Department of Agriculture (Sub-Divisional Agriculture offices).
6. Regional News Papers.

कृषि सल्ला दि. ११/१२/२०२३ तालुका-वैजापुर,गंगापुर,खुलताबाद

कापूस- रसशोषक किडिंसाठी पायरीप्रॉक्सीफेन ०५% + डायफेंथियुरॉन २५% एसई @ २० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी. बोंडअळयासाठी थायमिथोक्झाम १२.६ + लॅमडा साहॅलोथ्रीन ९.५ झेडसी ४ किंवा पायरीप्रोक्सिफेन ५ टक्के अधिक फेनप्रोपाथ्रिन १५ टक्के ईसी @ १० मिली प्रति १० लि. पाण्यात मिसळून फवारणी करावी.
हरभरा- घाटेअळीसाठी प्रति हे. ५ कामगंध सापळे लावावेत. पक्षीथांबे प्रति हे. ५० उभारावेत. मर रोग निंयत्रणासाठी कार्बेडेझीम ५० डब्ल्यू पी १० ग्रॅ १० लि. पाण्यात मिसळून आळवणी करावी.
तूर- शेंगा पोखरणा-या अळयासाठी अॅझाडिरॅक्टीन ३०० पीपीएम ५० मिली किंवा एच.ए.एन.पी.व्ही. विषाणूची ५ मि.ली. किंवा पाने फुले गुंडाळनाया अळया व पिसारी पतंग साठी इंडोक्झाकार्ब १४.५ एससी @ ७ मिली प्रति १० लिटर पाण्यात मिसळून फवारावे.
र.मका- ट्रायकोग्रामा प्रिटीओसम ५०,००० अंडी किंवा टेलेनोमस रिमस ४००० अंडी प्रती एकर प्रमाणे परोपजीवि किटकाचे एक आठवड्याच्या अंतराने प्रसारण करावे. ५ टक्के निंबोळी अर्काची किंवा अॅझाडिरॅक्टीन १५०० पीपीएम ५० मिली १० लिटर पाण्यातुन फवारणी करावी. मेटा-हायझीयम अॅनिसोप्ली ५० ग्रॅम किंवा नोमुरीया रिलाई ५० ग्रॅम प्रति १० लि. पाण्यात मिसळून फवारावे. क्लोरॅनट्रानिलीप्रोल १८.५ एससी ४ मिली प्रति १० लि. पाण्यात मिसळून फवारणी करावी.
र.ज्वारी- ५ टक्के निंबोळी अर्काची किंवा अॅझाडिरॅक्टीन १५०० पीपीएम ५० मिली १० लिटर पाण्यातुन फवारणी करावी. मेटा-हायझीयम अॅनिसोप्ली ५० ग्रॅम किंवा नोमुरीया रिलाई ५० ग्रॅम प्रति १० लि. पाण्यात मिसळून फवारावे. क्लोरॅनट्रानिलीप्रोल १८.५ एससी ४ मिली प्रति १० लि. पाण्यात मिसळून फवारणी करावी.
उपविभागीय कृषि अधिकारी,वैजापुर

कृषि सल्ला दि. 01/12/2023. तालुका -औरंगाबाद / फुलांब्री/पैठण

कापूस रसशोषक किडिंसाठी पायरीप्रॉक्सीफेन ०५% + डायफेंथियुरॉन २५% एसई @ २० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी. तूर शेंगा पोखरणा-या अळया हाताने वेचून नष्ट कराव्यात. इमामेक्टींन बेंन्झोएट ५ एस जी ४ ग्रॅम प्रती १० लिटर पाण्यातून फवारणी करावी. हरभरा पक्षीथांबे प्रति हे. ५० उभारावेत. ५ टक्के निंबोळी अर्काची फवारणी करावी. मर रोग निंयत्रणासाठी कार्बेडेझीम ५० डब्ल्यू पी १० ग्रॅ १० लि. पाण्यात मिसळून आळवणी करावी.	बोंडअळयासाठी थायमिथोक्झाम १२.६ + लॅमडा साहॅलोथ्रीन ९.५ झेडसी ४ किंवा पायरीप्रोक्सिफेन ५ टक्के अधिक फेनप्रोपाथ्रिन १५ टक्के ईसी @ १० मिली प्रति १० लि. पाण्यात मिसळून फवारणी करावी. मर रोगाच्या नियंत्रणासाठी कार्बेन्डाझिम @ १.५ ग्रॅम किंवा प्रोपिकोनेझोल @ १ मिली तसेच ट्रायकोडर्मा या जैविक बुरशीनाशकाची ५ ग्रॅम प्रति लिटर पाण्यात मिसळून आळवणी करावी. पक्षीथांबे प्रति हे. ५० उभारावेत. ५ टक्के निंबोळी अर्काची फवारणी करावी. मर रोग निंयत्रणासाठी कार्बेडेझीम ५० डब्ल्यू पी १० ग्रॅ १० लि. पाण्यात मिसळून आळवणी करावी. उप विभागीय कृषि अधिकारी, औरंगाबाद.

कृषि सल्ला दि. 30/11/2023 तालुका -औरंगाबाद/ पैठण

Sweet Orange

		सायलाच्या व्यवस्थापनासाठी बागेमधील पर्याइ खाद्य वनस्पती (कढीपत्ता) असु नये. ढालकिडा, सिरफिड माशी इ. मित्र किटकांचे संवर्धन करावे. प्रादुर्भाव जास्त दिसल्यास थायमिथॉक्झाम 25 डब्लुजी @ 1ग्रॅम/10 लिटर पाण्यामध्ये मिसळुन फवारणी करावी. पाने खाणारी अळी व्यवस्थापनासाठी अंडी, अळी, कोष अवस्था गोळा करुन नष्ट करावीत. पर्याइ तणे (बाउची) नष्ट करावीत. बीटी पावडरची 2 ग्रॅम/लिटर पाण्यातुन फवारणी करावी.	सायलाच्या व्यवस्थापनासाठी बागेमधील पर्याइ खाद्य वनस्पती (कढीपत्ता) असु नये. ढालकिडा, सिरफिड माशी इ. मित्र किटकांचे संवर्धन करावे. प्रादुर्भाव जास्त दिसल्यास थायमिथॉक्झाम 25 डब्लुजी @ 1ग्रॅम/10 लिटर पाण्यामध्ये मिसळुन फवारणी करावी. पाने खाणारी अळी व्यवस्थापनासाठी अंडी, अळी, कोष अवस्था गोळा करुन नष्ट करावीत. पर्याइ तणे (बाउची) नष्ट करावीत. बीटी पावडरची 2 ग्रॅम/लिटर पाण्यातुन फवारणी करावी.
		Tomato टोमॅटोवरील फळे पोखरणाऱ्या अळीचे व्यवस्थापन नुकसानीचाप्रकार :अळी सुरवातीला कोवळी पाने खाते तसेच कोवळया वाढणा-या फांद्या कुर्तुडून खाते. फळे लागल्यानंतर अळी फळाना छिद्र पाडून आत डोके खुपसुन आतील भाग खाते.	टोमॅटोवरील फळे पोखरणाऱ्या अळीचे व्यवस्थापन नुकसानीचाप्रकार :अळी सुरवातीला कोवळी पाने खाते तसेच कोवळया वाढणा-या फांद्या कुर्तुडून खाते. फळे लागल्यानंतर अळी फळाना छिद्र पाडून आत डोके खुपसुन आतील भाग खाते. एकअळीही२ते८फळांचेनुकसानकरूशकते. जवळपासहीकीडपिकाचे ७०-८०टक्केनुकसानकरू शकते. एकात्मिकनियंत्रण : सर्वेक्षणासाठी शेतात हेक्टरी ५ कामगंध सापळे लावावेतघाटेअळी लहान अवस्थेत असताना एच.ए.एन.पी.व्ही. ५०० एल.ई. विषाणूची प्रति हे. फवारणी करावी म्हणजेच ५०० एल.ई. विषाणू (५०० मि.ली.) ५०० लिटर पाण्यात

		एकअळीही२ते८फळांचेनुकसानकरूशकते. जवळपासहीकीडपिकाचे ७०-८०टक्केनुकसानकरू शकते. एकात्मिकनियंत्रण : सर्वेक्षणासाठी शेतात हेक्टरी ५ कामगंध सापळे लावावेतघाटेअळी लहान अवस्थेत असताना एच.ए.एन.पी.व्ही. ५०० एल.ई. विषाणूची प्रति हे. फवारणी करावी म्हणजेच ५०० एल.ई. विषाणू (५०० मि.ली.) ५०० लिटर पाण्यात मिसळून त्यामध्ये ५०० मि.ली. चिकट द्रव (स्टिकर) आणि राणीपाल (नीळ) २०० ग्रॅम टाकावा, ५टक्केनिंबोळीअर्ककिंवाकडूनिंबआधारित ॲझाडिरेक्टीन (३०००पीपीएम) २मि.लिप्रति लिटर प्रमाणेफवारणीकरावी, बिव्हेरिया बॅसियाना 1 टक्के विद्राव्य पावडर 6 ग्रॅम प्रति लिटर पाण्यातून फवारणी करावी, किडीने आर्थिकनुकसानपातळी ओलांडल्यासक्विनालफॉस २५ईसी२मिली किंवाक्लोरॅनट्रानिलीप्रोल१८.५एससी०.३मिली स्यानाट्रानीलीप्रोल १०.२६ ओडी १.८ मिली किंवा इंडोक्झाकार्ब१४.५एससी०.८मिली प्रति लिटरपाणी रासायनिककीटकनाशकाचीफवारणी करावी. Pomegranate जर बागेला जिवाणूजन्य रोगाचा प्रादुर्भाव असेल तर फक्त स्ट्रेप्टोसायक्लिनची फवारणी (स्ट्रेप्टोमायसिन सल्फेट 90% + टेट्रासाइक्लिन हायड्रोक्लोराईड 10%) @ 0.5 g/L दर महिन्यातून एकदा आणि ब्रोनोपॉल7-10 दिवसांच्या अंतराने फवारणी करा.कृपया लक्षात घ्या की ब्लाइट पॅथोजेनने स्ट्रेप्टोमायसिन सल्फेटला 0.5 ग्रॅम/लि पेक्षा कमी डोसमध्ये प्रतिकार विकसित केला आहे आणि शिफारस	मिसळून त्यामध्ये ५०० मि.ली. चिकट द्रव (स्टिकर) आणि राणीपाल (नीळ) २०० ग्रॅम टाकावा, ५टक्केनिंबोळीअर्ककिंवाकडूनिंबआधारितॲझाडिरेक्टीन (३०००पीपीएम) २मि.लिप्रति लिटर प्रमाणेफवारणीकरावी, बिव्हेरिया बॅसियाना 1 टक्के विद्राव्य पावडर 6 ग्रॅम प्रति लिटर पाण्यातून फवारणी करावी, किडीने आर्थिकनुकसानपातळी ओलांडल्यासक्विनालफॉस २५ईसी२मिली किंवाक्लोरॅनट्रानिलीप्रोल१८.५एससी०.३मिली स्यानाट्रानीलीप्रोल १०.२६ ओडी १.८ मिली किंवा इंडोक्झाकार्ब१४.५एससी०.८मिली प्रति लिटरपाणी रासायनिक कीटक नाशकाची फवारणी करावी. जर बागेला जिवाणूजन्य रोगाचा प्रादुर्भाव असेल तर फक्त स्ट्रेप्टोसायक्लिनची फवारणी (स्ट्रेप्टोमायसिन सल्फेट 90% + टेट्रासाइक्लिन हायड्रोक्लोराईड 10%) @ 0.5 g/L दर महिन्यातून एकदा आणि ब्रोनोपॉल7-10 दिवसांच्या अंतराने फवारणी करा.कृपया लक्षात घ्या की ब्लाइट पॅथोजेनने स्ट्रेप्टोमायसिन सल्फेटला 0.5 ग्रॅम/लि पेक्षा कमी डोसमध्ये प्रतिकार विकसित केला आहे आणि शिफारस केलेल्या डोसपेक्षा कमी घेतल्यास ते नियंत्रित केले जाणार नाही. फळधारणा करणाऱ्या फळबागांमध्ये केवळ वाढीच्या अवस्थेत जिवाणूजन्य रोगाचा प्रादुर्भाव रोखण्यासाठी, 10-25% फळांचा संसर्ग आढळल्यास 4 दिवसांच्या अंतराने 2 आपत्कालीन फवारण्या केल्या जाऊ शकतात. या फवारण्या अनिष्टाचा पुढील प्रसार थांबवू शकतात.

		केलेल्या डोसपेक्षा कमी घेतल्यास ते नियंत्रित केले जाणार नाही. फळधारणा करणाऱ्या फळबागांमध्ये केवळ वाढीच्या अवस्थेत जिवाणूजन्य रोगाचा प्रादुर्भाव रोखण्यासाठी, 10-25% फळांचा संसर्ग आढळल्यास 4 दिवसांच्या अंतराने 2 आपत्कालीन फवारण्या केल्या जाऊ शकतात. या फवारण्या अनिष्टाचा पुढील प्रसार थांबवू शकतात.	

उप विभागीय कृषि अधिकारी,औरंगाबाद

Regional Newspaper eg. Lokmat and Agrowon

हलक्या ते मध्यम पावसाची शक्यता

वेध हवामानाचा

डॉ. रामचंद्र साबळे

आठवड्याचे सुरवातीस राज्याच्या उत्तर भागावर १००६ तर दक्षिण भागावर १००८ हेप्टापास्कल इतका हवेचा दाब बुधवार (ता. ६) पर्यंत राहील. ही स्थिती गुरुवार (ता.७) पर्यंत कायम राहील. या संपूर्ण कालावधीत पूर्व विदर्भात मध्यम, तर उर्वरित महाराष्ट्रात अल्प स्वरूपात पावसाची शक्यता राहील. शुक्रवारी (ता.८) हवेच्या दाबात बदल होण्यास सुरुवात होऊन उत्तर महाराष्ट्रावर १००४ तर दक्षिण महाराष्ट्रावर १००६ हेप्टापास्कल इतका कमी हवेचा दाब राहील. ईशान्येकडील भागावर १००२ हेप्टापास्कल आणि बंगालचे उपसागराच्या उत्तर भागावर १००० हेप्टापास्कल इतका हवेचा दाब राहील. त्यावेळी ईशान्य मॉन्सूनच्या पावसास अनुकूल हवामान स्थिती होण्यास सुरुवात होईल.

जून ते ऑगस्ट या कालावधीत गोंदिया, धाराशीव, परभणी, बुलडाणा, धुळे, नंदुरबार या जिल्ह्यांत सरासरीपेक्षा २२ ते २८ टक्के तर सोलापूर, बीड, सातारा, नगर, छत्रपती संभाजीनगर, अकोला, अमरावती व हिंगोली या जिल्ह्यांत ३२ ते ३८ टक्के इतका कमी पाऊस सरासरीच्या तुलनेत झाला आहे. सांगली जिल्ह्यात ४६ टक्के व जालना जिल्ह्यात ४९ टक्के इतका सरासरीपेक्षा कमी पाऊस झाला आहे.

प्रशांत महासागराचे पाण्याचे पृष्ठभागाचे तापमान वाढ ३१.१ अंश सेल्सिअसपर्यंत वाढले आहे. मात्र अरबी समुद्राचे व बंगालचे उपसागराच्या पाण्याचे पृष्ठभागाचे तापमान ३०.५ अंश सेल्सिअस व हिंदी महासागराचे पाण्याचे पृष्ठभागाचे तापमान ३० अंश सेल्सिअस इतके कमी राहण्यामुळे एल निनोचा प्रभाव सुरू आहे.

कोकण

आज (ता.३) व उद्या (ता.४) सिंधुदुर्ग, रत्नागिरी, रायगड, ठाणे व पालघर जिल्ह्यांत १ ते १.५ मिमी इतका कमी पाऊस होईल. त्यामुळे नैर्ऋत्य मॉन्सूनचा प्रभाव संपुष्टात आल्याचे दिसून येईल. वाऱ्याची दिशा नैर्ऋत्येकडून राहील. वाऱ्याचा ताशी वेग ७ ते ८ किमी राहील. कमाल तापमान सिंधुदुर्ग जिल्ह्यात ३१.५ अंश सेल्सिअस तर रत्नागिरी, रायगड व ठाणे जिल्ह्यांत ३० ते ३१ अंश सेल्सिअस आणि पालघर जिल्ह्यात ३२ अंश सेल्सिअस राहील.

उत्तर महाराष्ट्र

आज (ता.३) व उद्या (ता.४) नाशिक, नंदुरबार व जळगाव जिल्ह्यांत ०.२ ते ०.४ मिमी इतक्या अल्पशा पावसाची शक्यता आहे. धुळे जिल्ह्यात पावसात उघडीप राहील. चारही जिल्ह्यांत वाऱ्याचा ताशी वेग १५ ते १८ किमी राहील. वाऱ्याची दिशा नाशिक व नंदुरबार जिल्ह्यांत नैर्ऋत्येकडून तर धुळे व जळगाव जिल्ह्यांत वायव्येकडून राहील. कमाल तापमान सर्वच जिल्ह्यांत ३२ ते ३३ अंश सेल्सिअस राहील. किमान तापमान नाशिक जिल्ह्यात २२ अंश सेल्सिअस, धुळे व नंदुरबार जिल्ह्यांत २३ अंश सेल्सिअस आणि जळगाव जिल्ह्यात २४ अंश सेल्सिअस राहील.

मराठवाडा

आज (ता.३) व उद्या (ता.४) लातूर जिल्ह्यात २२ मिमी पावसाची शक्यता आहे. आज (ता.३) नांदेड जिल्ह्यात ४ मिमी तर उद्या (ता.४) ३१ मिमी पावसाची शक्यता आहे. हिंगोली जिल्ह्यात आज (ता.३) १५ मिमी पावसाची शक्यता आहे. आज (ता.३) व उद्या (ता.४) धाराशीव जिल्ह्यात ७ मिमी पावसाची शक्यता आहे. परभणी जिल्ह्यात आज (ता.३) २ मिमी व उद्या (ता.४) ११ मिमी पावसाची शक्यता आहे. बीड जिल्ह्यात आज (ता.३) ९ मिमी तर उद्या (ता.४) ५ मिमी पावसाची शक्यता आहे. जालना व छत्रपती संभाजीनगर जिल्ह्यात आज (ता.३) २ ते ३.५ मिमी व उद्या (ता.४) २ मिमी पावसाची शक्यता आहे. वाऱ्याची दिशा वायव्येकडून राहील. कमाल तापमान धाराशीव, छत्रपती संभाजीनगर व बीड जिल्ह्यांत ३४ अंश सेल्सिअस तर नांदेड व जालना जिल्ह्यांत ३३ अंश सेल्सिअस राहील. लातूर, परभणी व हिंगोली जिल्ह्यात कमाल तापमान ३१ अंश सेल्सिअस राहील. किमान तापमान सर्वच जिल्ह्यात २३ ते २४ अंश सेल्सिअस राहील.

पश्चिम विदर्भ

अमरावती जिल्ह्यात आज (ता.३) ५ मिमी व उद्या (ता.४) ६ मिमी पावसाची शक्यता आहे. आज (ता.३) बुलडाणा जिल्ह्यात ३ मिमी पावसाची शक्यता आहे. उद्या (ता.४) वाशीम जिल्ह्यात १२ मिमी, अकोला व बुलडाणा जिल्ह्यात ३ ते ४ मिमी पावसाची शक्यता राहील. वाऱ्याची दिशा वायव्येकडून राहील. कमाल तापमान अकोला जिल्ह्यात ३५ अंश सेल्सिअस, अमरावती जिल्ह्यात ३४ अंश सेल्सिअस, तर बुलडाणा व वाशीम जिल्ह्यांत ३३ अंश सेल्सिअस राहील. किमान तापमान सर्वच जिल्ह्यांत २४ ते २५ अंश सेल्सिअस राहील.

मध्य विदर्भ

आज (ता.३) यवतमाळ जिल्ह्यात २३ मिमी, नागपूर जिल्ह्यात १४ मिमी व वर्धा जिल्ह्यात ९ मिमी तर नागपूर जिल्ह्यात ९ मिमी, वर्धा व यवतमाळ जिल्ह्यांत ०.६ ते १.५ मिमी शक्यता आहे. वाऱ्याची दिशा वायव्येकडून राहील. वाऱ्याचा ताशी वेग १० ते ११ मिमी राहील. कमाल तापमान ३३ अंश सेल्सिअस, तर किमान तापमान २५ अंश सेल्सिअस राहील.

पूर्व विदर्भ

आज (ता.३) चंद्रपूर जिल्ह्यात ९.५ मिमी, गडचिरोली जिल्ह्यात १६ मिमी, भंडारा जिल्ह्यात ६ मिमी व गोंदिया जिल्ह्यात ११ मिमी पावसाची शक्यता आहे. उद्या (ता.४) चंद्रपूर जिल्ह्यात ११ मिमी, गडचिरोली जिल्ह्यात १७ मिमी, भंडारा जिल्ह्यात ८.६ मिमी व गोंदिया जिल्ह्यात १२.५ मिमी पावसाची शक्यता आहे. वाऱ्याची दिशा वायव्येकडून आणि ताशी वेग ६ ते ८ किमी राहील. कमाल तापमान चंद्रपूर व गोंदिया जिल्ह्यांत ३२ अंश सेल्सिअस, तर गडचिरोली व भंडारा जिल्ह्यांत ३३ अंश सेल्सिअस राहील. किमान तापमान सर्वच जिल्ह्यांत २५ अंश सेल्सिअस राहील.

पश्चिम महाराष्ट्र

आज (ता.३) व उद्या (ता.४) कोल्हापूर, सांगली, सातारा, सोलापूर, पुणे व नगर जिल्ह्यांत १ ते १.७ मिमी पावसाची शक्यता आहे. वाऱ्याची दिशा कोल्हापूर, सांगली व सातारा जिल्ह्यात नैर्ऋत्येकडून तर सोलापूर, पुणे व नगर जिल्ह्यांत वायव्येकडून राहील. वाऱ्याचा ताशी वेग सांगली व सोलापूर जिल्ह्यांत २० किमी तर पुणे व नगर जिल्ह्यात १५ ते १७ किमी राहील. कमाल तापमान कोल्हापूर, सांगली, सातारा व पुणे जिल्ह्यांत ३१ अंश सेल्सिअस तर नगर व सोलापूर जिल्ह्यांत ३३ ते ३४ अंश सेल्सिअस राहील. किमान तापमान सर्वच जिल्ह्यांत २१ ते २२ अंश सेल्सिअस राहील.

(ज्येष्ठ कृषी हवामान तज्ज्ञ, सदस्य, ॲग्रिकल्चर मेटरॉलॉजी फोरम फॉर साउथ आशिया)

पावसाचे पाणी जमिनीत मुरण्यासाठी बंदिस्त वाफे तयार करावेत.

कृषी सल्ला

- पावसामध्ये मोठा खंड पडला आहे. त्यामुळे खरीप पिकांना संरक्षित पाणी द्यावे.
- वाढीच्या अवस्थेतील पिकांमध्ये तण नियंत्रण करावे.
- करडई, रब्बी ज्वारी पेरणीसाठी जमिनीची पूर्वमशागत करावी.
- ज्वारी व करडईसाठी बंदिस्त वाफे तयार करावेत. त्यामुळे पावसाचे पाणी जमिनीत मुरण्यास मदत होईल.

8.1.3. DAMU Information:

Units are being established in KVKs under ICAR network in a phased manner for rendering block level Agromet Advisory Services. District Agro-met Unit (DAMU), a project of Indian Meteorological Department is operational in 200 KVKs All over India. They provide block level AAB Based on medium range weather forecast, block-wise Agromet advisory bulletins are transmitted weekly twice to farmers, state department, IMD, NGOs and mass media. District Agromet Units (DAMU) is the flagship programme of Govt. of India for weather-related services to the farmers aiding in decision making on day-to-day agricultural operations. The scheme is downscaled at block level with great concern to address weather needs of farmers at micro level. This is a joint effort of IMD and ICAR with multi-organizational collaboration to implement various components. While the scheme is in existence since long, following service requirements from the District Agromet Units (DAMUs) located in the Krishi Vigyan Kendra's (KVKs) are deciphered to implement block level Agromet Advisory Service (AAS) under grant-in-aid programme of IMD. SMS (Agromet) has the pivotal role in association with the Nodal Officer and other experts in the KVK to implement the service.

वसंतराव नाईक मराठवाडा कृषि विद्यापीठ, परभणी
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छत्रपती संभाजीनगर जिल्हा कृषि हवामान सल्ला पत्रक क्रमांक –७५/२०२३-२४ मंगळवार दिनांक १९.१२.२०२३

छत्रपती संभाजीनगर जिल्ह्याकरिता दिनांक २० ते २४ डिसेंबर २०२३ साठी हवामान अंदाज					
हवामान घटक	२०/१२	२१/१२	२२/१२	२३/१२	२४/१२
पाऊस (मिमी)	०.०	०.०	०.०	०.०	०.०
कमाल तापमान (अं.से.)	२६.०	२७.०	२८.०	३०.०	३०.०
किमान तापमान (अं.से.)	१४.०	१३.०	१४.०	१६.०	१६.०
ढग स्थिती (आकाश)	ढगाळ	ढगाळ	ढगाळ	अंशत:ढगाळ	अंशत:ढगाळ
सकाळची सापेक्ष आर्द्रता (%)	६१	६२	६०	६२	६१
दुपारची सापेक्ष आर्द्रता (%)	४१	२९	२९	३४	३७
वा-याचा वेग (किमी/तास)	१२	१०	८	७	९
वाऱ्याची दिशा	पुर्व	आग्नेय	आग्नेय	आग्नेय	पुर्व

प्रादेशिक हवामान केंद्र, मुंबई येथून प्राप्त झालेल्या अंदाजानूसार छत्रपती संभाजीनगर जिल्हयात पुढील पाच दिवसात आकाश अंशत:ढगाळ ते ढगाळ राहील. तसेच कमाल तापमान २६.० व ३०.० अंश सेल्सिअस आणि किमान तापमान १३.० ते १६.० अंश सेल्सिअस दरम्यान राहील व सापेक्ष आर्द्रता २९ ते ६२ टक्के राहील तर वाऱ्याचा वेग ०७ ते १२ किमी/तास राहण्याची शक्यता आहे.

विस्तारित अंदाजानुसार (ईआरएफएस) छत्रपती संभाजीनगर जिल्हयात दि. २४ ते ३० डिसेंबर २०२३ दरम्यान आकाश स्वच्छ ते अंशत:ढगाळ राहून पर्जन्यमान सरासरीपेक्षा जास्त तर कमाल तापमान सरासरी पेक्षा कमी व किमान तापमान सरासरी ऐवढे राहण्याची शक्यता आहे.

पिकाचे नाव	अवस्था	कृषी हवामान सल्ला
आद्रक	कंद वाढीची अवस्था	मागील आठवड्यातील ढगाळ वातावरणामुळे आद्रक पिकामध्ये करपा रोगाचा प्रादूर्भाव वाढण्याची शक्यता असुन याच्या व्यवस्थापनासाठी अझॉक्सीस्ट्रॉबीन १८.२ टक्के + डायफेनकोनॅझोल ११.४ टक्के एससी १० मिली प्रति १० लीटर पाण्यात मिसळून फवारणी करावी.
हळद	कंद वाढीची अवस्था	मागील आठवड्यातील ढगाळ वातावरणामुळे हळद पिकामध्ये करपा रोगाचा प्रादूर्भाव वाढण्याची शक्यता असुन याच्या व्यवस्थापनासाठी अझॉक्सीस्ट्रॉबीन १८.२ टक्के + डायफेनकोनॅझोल ११.४ टक्के एससी १० मिली प्रति १० लीटर पाण्यात मिसळून फवारणी करावी.
हरभरा	वाढीची ते फांदया धरणे	मागील आठवड्यातील ढगाळ व दमट वातावरणामुळे हरभरा पीकामध्ये रोप कुरतडणाऱ्या अळीच्या प्रादुर्भाव दिसून येत असून याच्या व्यवस्थापनासाठी क्लोरोपायरीफॉस २० टक्के ईसी २० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी. पीक एक महिन्याचे झाल्यावर पिकापेक्षा एक ते दिड फूट उंचीचे T अक्षराच्या आकाराचे ५० पक्षी थांबे प्रति हेक्टरी लावावेत. तसेच घाटेअळीच्या सर्वेक्षणासाठी ५ कामगंध सापळे प्रति हेक्टरी जमिनीपासून एक मीटर उंचीवर लावावेत.
जवस	वाढीची अवस्था	मागील आठवडयातील ढगाळ वातावरणामुळे जवस पिकामध्ये भुरी रोगाचा प्रादुर्भाव दिसून येत असुन, याच्या व्यवस्थापनासाठी मॅन्कोझेब २५ ग्रॅम प्रती १० लिटर पाण्यात मिसळून फवारणी करावी.

पुढील पानावर....

बटाटा	वाढीची अवस्था	मागील आठवड्यातील ढगाळ व दमट वातावरणामुळे बटाटा पिकामध्ये लवकर येणारा करपा रोगाचा प्रादुर्भाव दिसून येत असुन, याच्या व्यवस्थापनासाठी मॅन्कोझेब ७५ टक्के डब्ल्यूपी २५ ते ३० ग्रॅम किंवा कॉपर ऑक्झीक्लोराईड ३० ग्रॅम किंवा प्रोपीनेब ७० टक्के डब्ल्यूपी ३० ग्रॅम प्रती १० लिटर पाण्यात मिसळून फवारणी करावी. तसेच बटाटा पीकामध्ये रस शोषन करणा-या किडींच्या व्यवस्थापनासाठी निळे व पिवळे चिकट सापळे प्रत्येकी २५ याप्रमाने प्रतिएकरी लावावेत.
मोसंबी	आंबिया बहार व्यवस्थापन	**आंबिया बहार** : आंबिया बहारासाठी झाडांना ५ डिसेंबर ते १५ जानेवारी या कालावधीत ताण दयावा. फळ काढणीनंतर वाळलेल्या फांदया तसेच बागेतील खाली पडलेली फळे जमा करुन नष्ट करावीत व बाग स्वच्छ करावी आणि त्यानंतर १ टक्का कार्बेन्डाझीम या बुरशीनाशकाची फवारणी घ्यावी.
डाळिंब	वाढीची अवस्था	**आंबिया बहार** : डाळिंब बागेमध्ये आंबिया बहाराच्या नियोजनासाठी जमिनीच्या प्रकारानुसार तीन ते सहा आठवडे बागेस ताण द्यावा. मागील आठवड्यातील ढगाळ व दमट वातावरणामुळे डाळींब फळबागेमध्ये साल पोखरणा-या अळीचा प्रादूर्भाव दिसून येत असल्यास प्रादूर्भावग्रस्त खोड किंवा फांदीवरील छिद्रामध्ये क्लोरिपायरीफॉस २० टक्के ईसी ३० मीली प्रति १० लिटर पाण्यात मिसळून इंजेक्शनच्या सहाय्याने सोडावे व नंतर छिद्रे चिखलाने बंद करावीत.
भाजीपाला	फुल ते फळ धारणा अवस्था	मागील आठवड्यातील ढगाळ व दमट वातावरणामुळे टोमॅटो पीकामध्ये करपा रोगाचा प्रादूर्भाव दिसून येत असल्यास याच्या व्यवस्थापनासाठी मॅन्कोझेब ७५ टक्के किंवा क्लोरोथॅलोनील ७५ टक्के २५ ग्रॅम प्रती १० लिटर पाण्यात मिसळून फवारणी करावी. तसेच मिरची पिकावरील रस शोषण करणा-या (फुलकीडे, मावा) किडीच्या व्यवस्थापनासाठी फिप्रोनिल ५ टक्के एससी २० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी.
तुती रेशीम	------	रेशीम किटकांचे थंडीपासुन संरक्षण करण्याकरीता संगोपनगृहात कोळशाची शेगडी किंवा इलेक्ट्रीक शेगडीचा वापर करावा. संगोपनगृहात कोळश्याचा धुर होणार नाही याची काळजी घ्यावी व तापमान २२ ते २८ अंश से. व आर्द्रता ८० ते ८५ टक्के राहील याची काळजी घ्यावी. कच्चा संगोपनगृहात थंडी किंवा उष्णता मर्यादित ठेवणे कठीण होते. म्हणून हळूहळू पक्के सिमेंट कॉक्रिटच्या संगोपनगृह बांधकाम करुन घ्यावे. त्यामुळे रेशीम किटक रोगास बळी पडत नाहीत. धुळीचा त्रास कमी होतो आणि कोषाच्या उत्पादनात वाढ होते. सीएआर व टीआय, म्हैसूर यांच्या शिफारशीनुसार संगोपनगृहाचा आकार असावा. खालच्या व वरील बाजूस झरोके व मधील बाजूस खिडक्या असाव्यात म्हणजे हवा खेळती राहण्यास मदत होईल.
पशुसंवर्धन	------	सद्यस्थितीत तापमानात घट होत असल्याने शेतक-यांना जनावरांची अतिरिक्त उर्जेची गरज पुर्ण करण्याकरीता जनावरांच्या आहारात जास्त उर्जा देणा-या तसेच खनिज मिश्रणांच्या खाद्याचा समावेश करावा.
इतर	------	सद्यस्थितीत ज्वारीचे पीक वाढीच्या अवस्थेत असुन पशुपालकांनी जनावरांना ज्वारीची कोळळी धाटे (पोंगे) खाण्यास देवू नये. जेणेकरुन पोंग्याव्दारे किराळ लागून होणा-या विषबाधेपासून जनावरांचा बचाव होईल.

सदर कृषि सल्ला पत्रिका जिल्हा कृषि हवामान केंद्र (DAMU) कृषि विज्ञान केंद्र, छत्रपती संभाजीनगर-१ येथील तज्ञ समितीच्या शिफारशीवरून तयार करून प्रसारित करण्यात आलेली आहे.

कार्यक्रम समन्वयक तथा नोडल ऑफिसर
जिल्हा कृषि हवामान केंद्र (DAMU)
कृषि विज्ञान केंद्र, छत्रपती संभाजीनगर-१

8.1.4. Other source/ Sources of Agro-met advisory and Different apps/dashboards/ channels/stations/means used to dissemination the information

Krushik, Plantix, and VNMKV apps and PoCRA website (mahapocra.gov.in) are used by farmers to get agriculture related information. Chhatrapati Sambhajinagar Radio Akashwani and Agrowon Newspaper also used by farmers.

Meghdoot: Meghdoot, a joint initiative of India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM) and Indian Council OF Agricultural Research (ICAR) aims to deliver critical information to farmers through a simple and easy to use mobile application. The mobile application was developed by the Digital Agriculture research theme at International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad in collaboration with IITM, Pune and IMD, Delhi. The app seamlessly aggregates contextualized district and crop wise advisories issued by Agro Met Field Units (AMFU) & District Agromet Unit (DAMU) every Tuesday and Friday with the forecast and historic weather information to the fingertips of the farmers. The advisories are also issued in vernacular wherever available.
https://play.google.com/store/apps/details?id=com.aas.meghdoot

VNMKV, Parbhani : AAB (Agromet Advisory Bulletin) is also available on Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani website

https://university.vnmkv.ac.in/WeatherBulletinpdf/_AAB_Parbhani.pdf

VNMKV, Parbhani : AAB is also available on Blogger

https://www.blogger.com/blog/posts/5278960244914681835?bpli=1&pli=1

YouTube Channel of VNMKV, Parbhani

YouTube Channel of Agriculture Dept Govt Maharashtra “"हवामानाचा अंदाज आणि कृषि तज्ञांचा सल्ला 2023"”

Damini : Lightning Alert : Damini Lightning apps is developed by IITM-Pune and ESSO.The apps is monitoring all lightning activity which are happening specifically for all india. if lightning is happening near you by GPS notification. under 20 KM and 40 KM. Details description of instruction, precautions is provided in apps while in a lightning prone area.
https://play.google.com/store/apps/details?id=com.lightening.live.damini

Dissemination of AAB through Whatsapp groups
Dissemination of AAB through All India Radio
AAB ON IMD WEBSITE :
https://www.imdagrimet.gov.in/AGDistrictBulletin

8.1.5. Utilization of agro-met advisory by farmers in changing climatic conditions:

Farmers in Chhatrapati Sambhajinagar District use agro met advisory weekly given by District Agromet Units (DAMU) at Krishi Vigyan Kendra (KVK), Chhatrapati Sambhajinagar and Vasantrao Naik Marathwada Krishi Vidyapeeth (VNMKV) Parbhani. These advisories are again disseminated by sub divisional agriculture offices Aurangabad, Sillod and Vaijapur. These advisories also disseminated through Akashwani Chhatrapati Sambhajinagar, regional newspapers and through SMS by M-KISAN portal. It helps farmers to manage timely sowing, fertilizer application, irrigation, intercultural operations, spraying, harvesting and storage of crops and also for their livestock management. Integrated Agro met Advisory Services will make it possible for the farmer to be informed of current and expected weather as well as advice to the farmer on the best course of action to reduce losses caused by unfavorable weather conditions and increase the output of agricultural systems.

• Adjusting sowing times to cope with later/more variable monsoon onset dates,

• Irrigation management – to avoid either unnecessary irrigation (or therefore irrigation costs) prior to rainfall or damaging a crop with excess moisture if irrigation is followed by heavy rain.

• Timing of pest control measures, using humidity and wind speed and direction information to decide bio-pesticide application e.g. applying chili spray to mustard with an east wind.

• Timing of frost damage control using irrigation and smoke to mitigate forecast frost episodes

• Compost/fertilizer application timed to maximize effects on crop growth and yield e.g. avoiding application prior to heavy rainfall to mitigate fertility loss through soil erosion.

• Vegetable nursery development based on temperature forecasts, for Chilies, Onions & seasonal leaf vegetables.

• Timing the harvest so as to increase the likelihood of grain being stored at optimal moisture content.

• Agro advisory helps in protection of crop harvest and its storage avoiding rain damage at harvest/storage stage thus reducing the economic losses.

• Timely advisory bulletin with forecast of extreme weather like dry spell, heat wave, hail storm and advised management options thereof helps to protect crops. Such timely advisories alerts and benefit the farmers.

8.2 Advisory based on Pest surveillance activity.

8.2.1. Implementation status of CROPSAP

CROPSAP activity is implemented by the agricultural department by giving training from master trainers to all field staff. Agriculture Assistants select two villages of jurisdiction for which they select two fixed plots each and they take compulsory four readings weekly of fixed plots in two different selected villages. Agriculture Supervisors, circle agriculture officers (CAOs) and Taluka agriculture officers (TAOs) randomly take weekly readings in CROPSAP.

Reading is taken in various crop stages, such as seedling, vegetative growth, and pod formation and after maturity. On the basis of observation advisory preparer as given below

Status of CROPSAP:

CROPSAP Target Achievement data from July 2023 to 21 December 2023, District Chhatrapati Sambhajinagar					
Sr.No.	**Designation**	**Agriculture field staff No.**	**Target no. of field Observations**	**Achieved (Based on Data Upload)**	**% of work done**
1	Agriculture Assistants	246	24600	25444	103.43
2	Agriculture Supervisors	56	5600	5937	106.02
3	Circle Agriculture Officers	24	2400	2407	100.29
4	Taluka Agriculture Officers	9	900	908	100.89
5	Sub Divisional Agriculture Officers	3	294	301	102.38
Total		338	33794	34997	103.56

(source- KVK Chhatrapati Sambhajinagar DSAO office Chhatrapati Sambhajinagar)

8.2.2. Impact on crop pests and diseases management:

With the help of CROPSAP advisory as above, farmers get known proper pest management treatment to keep the pest populations below economic threshold levels (ETL). As farmers get information about upcoming pests early, it helps to control pests before damage of crops and save spraying expenditure of farmers. The pest affected areas across soybean, cotton, pigeon pea and chickpea are implemented with scientifically based pest management practices across Chhatrapati Sambhajinagar district.

(Source: KVK Chhatrapati Sambhajinagar and DSAO, Chhatrapati Sambhajinagar)

वसंतराव नाईक मराठवाडा कृषि विद्यापीठ, परभणी
कृषि विज्ञान केंद्र, छत्रपती संभाजीनगर – १ (४३१०१०) म.रा.
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छत्रपती संभाजीनगर जिल्हा कृषि हवामान सल्ला पत्रक क्रमांक –७९/२०२३-२४ मंगळवार दिनांक ०२.०१.२०२४

छत्रपती संभाजीनगर जिल्ह्याकरिता दिनांक ०३ ते ०७ जानेवारी २०२४ साठी हवामान अंदाज					
हवामान घटक	०३/०१	०४/०१	०५/०१	०६/०१	०७/०१
पाऊस (मिमी)	०.०	०.०	०.०	०.०	०.०
कमाल तापमान (अं.से.)	३०.०	२९.०	२९.०	२८.०	२८.०
किमान तापमान (अं.से.)	१४.०	१५.०	१५.०	१५.०	१६.०
ढग स्थिती (आकाश)	अंशत:ढगाळ	अंशत:ढगाळ	ढगाळ	अंशत:ढगाळ	अंशत:ढगाळ
सकाळची सापेक्ष आर्द्रता (%)	७५	७६	८०	८९	९७
दुपारची सापेक्ष आर्द्रता (%)	४२	४६	४७	४६	४४
वा-याचा वेग (किमी/तास)	१०	१३	१३	१४	१५
वाऱ्याची दिशा	दक्षिण	दक्षिण	दक्षिण	आग्नेय	आग्नेय

प्रादेशिक हवामान केंद्र, मुंबई येथून प्राप्त झालेल्या अंदाजानूसार छत्रपती संभाजीनगर जिल्ह्यात पुढील पाच दिवसात हवामान कोरडे राहून आकाश अंशत:ढगाळ ते ढगाळ राहील. तसेच कमाल तापमान २८.० व ३०.० अंश सेल्सिअस आणि किमान तापमान १४.० ते १६.० अंश सेल्सिअस दरम्यान राहील व सापेक्ष आर्द्रता ४२ ते ९७ टक्के राहील तर वाऱ्याचा वेग १० ते १५ किमी/तास राहण्याची शक्यता आहे.

विस्तारित अंदाजानूसार (ईआरएफएस) छत्रपती संभाजीनगर जिल्ह्यात दि. ०७ ते १३ जानेवारी दरम्यान आकाश स्वच्छ ते अंशत:ढगाळ राहून पर्जन्यमान सरासरीपेक्षा जास्त तर कमाल तापमान मध्यम प्रमाणात सरासरी पेक्षा कमी व किमान तापमान सरासरी ऐवढे राहण्याची शक्यता आहे.

पिकाचे नाव	अवस्था	कृषी हवामान सल्ला
आद्रक	परिपक्वता ते काढणी	काढणीस तयार असलेल्या आद्रक पिकास काढणीपूर्वी १५ दिवस पाणी देणे बंद करावे.
हळद	परिपक्वता ते काढणी	काढणीस तयार असलेल्या हळद पिकास काढणीपूर्वी १५ दिवस पाणी देणे बंद करावे.
हरभरा	वाढीची ते फांदया धरणे	मागील आठवड्यातील तापमानातील चढउतारामुळे हरभरा पीकामध्ये पिकावर करपा या रोगाचा प्रादूर्भाव दिसून येत असुन याच्या व्यवस्थापनासाठी मॅन्कोझेब २५ ग्रॅम प्रति १० लिटर पाण्यात मिसळून फवारणी करावी. तसेच हरभरा पिकामध्ये घाटे अळीच्या व्यवस्थापनासाठी शेतामध्ये प्रती हेक्टरी ५० T आकाराचे पक्षीथांबे उभारावेत. प्रादूर्भाव दिसून येत असल्यास इमामेक्टीन बेन्झोएट ५ एसजी ४ ग्रॅम प्रति १० लीटर पाण्यात मिसळून फवारणी करावी. पावर पंपाने फवारणी करायची असल्यास कीटकनाशकांचे प्रमाण तिप्पट करावे.
जवस	फुलोरा ते बोंड धरणे अवस्था	जवस पीकावरील गादमाशी अथवा पिलीचा प्रादूर्भाव ओळखण्यासाठी निरिक्षण करावे. प्रादूर्भाव दिसून येत असल्यास याच्या व्यवस्थापनासाठी डायमेथोएट ३० टक्के १० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी.
बटाटा	कंद लागणे ते कंद वाढीची अवस्था	बटाटा पिकातील तणनियंत्रण करुन वरंब्यास मातीची भर दयावी तसेच पिकास गरजेनुसार पाणी व्यवस्थापन करावे. तसेच मागील आठवड्यातील तापमानातील चढउतारामुळे बटाटा पिकावर रसशोषण करणाऱ्या किडींच्या व्यवस्थापनासाठी डायमिथोएट (३० टक्के) १५ मिली किंवा ॲसिटामीप्रीड २-३ ग्रॅम प्रति १० लिटर पाण्यात मिसळून फवारणी करावी. तसेच पिवळया व निळया रंगाचे चिकट सापळे (छोट्या आकाराची) प्रत्येक ४-५ ओळींनंतर एकरी २५ ते ३० या प्रमाणात लावावेत.

पुढील पानावर.....

मोसंबी	आंबिया बहार व्यवस्थापन	मोसंबी बागेतील ४० टक्के पानगळ होणे, पाने गोलाकार होणे ही व्यवस्थित ताण बसण्याची लक्षणे असुन, ताण तोडतांना शेतक-यानी झाडांच्या वयानुसार हळूहळू बागेस पाणी देण्यास सुरवात करावी व १ ग्रॅम जिब्रॅलीक आम्ल + १ किलो युरिया प्रति १०० लिटर पाण्यात मिसळून स्वच्छ वातावरणात फवारणी करावी यामुळे बहार चांगला येण्यास मदत होते. ताण तोडतांना हलक्या ओलिता अगोदर बागेस शिफारशीत खत मात्रा द्यावी. (५ ते ७ वर्षे वयोगटातील झाडांना ३५० ग्रॅम नत्र, १५० ग्रॅम स्फुरद, १५० ग्रॅम पालाश, ८ ते १० वयोगटातील झाडांना ४०० ग्रॅम नत्र, २०० गॅम स्फुरद, २०० ग्रॅम पालाश तर १० ते पुढील वयोगटातील झाडांना ५०० ग्रॅम नत्र, २५० स्फुरद, २५० पालाश याप्रमाणे खतमात्रा दयावी.)
डाळिंब	बहार व्यवस्थापन	डाळिंब बागेस योग्य ताण बसल्यास ताण तोडताना शिफारशीत ३०० ग्रॅम नत्र, २५० ग्रॅम स्फुरद, २५० ग्रॅम पालाश प्रती झाड खत मात्रा देऊन बागेस हलके पाणी दयावे.
भाजीपाला	फुल ते फळ धारणा अवस्था	मागील आठवड्यातील ढगाळ वातावरणामुळे टोमॅटो पीकामध्ये करपा रोगाचा प्रादूर्भाव दिसून येत असल्यास याच्या व्यवस्थापनासाठी मॅन्कोझेब ७५ टक्के किंवा क्लोरोथॅलोनील ७५ टक्के २५ ग्रॅम प्रती १० लिटर पाण्यात मिसळून फवारणी करावी. तसेच मिरची पिकावरील रस शोषण करणा-या (फुलकीडे, मावा) किडीच्या व्यवस्थापनासाठी फिप्रोनिल ५ टक्के एससी २० मिली प्रति १० लिटर पाण्यात मिसळून फवारणी करावी.
तुती रेशीम	------	रेशीम कोषाच्या प्रत्येक पीकामध्ये १५ ते २० टक्के पर्यंत कोष उत्पादनात कीटकावरील येणाऱ्या रोगामुळे घट येऊ शकते. रोगकारक जीवाणू, विषाणू किंवा बुरशीचा संगोपनगृहातून पूर्णपणे नायनाट होणे आणि संगोपन गृहातील साहित्याचे निर्जंतुकीकरण होणे गरजेचे असते. त्यामूळे भींती किंवा शेडनेटवर २०० मिली प्रती चौरस मीटर या प्रमाणात ब्लिचिंग पावडर ०२ टक्के आणि ०.३ टक्के विरी गेलेला चूणा द्रावणासोबत फवारणी करावी व नंतर २४ तासांनी अस्त्र निर्जंतुक पावडर ५० ग्रॅम प्रति १०० लिटर पाण्यात मिसळून फवारणी करावी. फवारल्यानंतर उर्वरित पाणी रोगकारका सोबत संगोपनगृहाबाहेर जाणे गरजेचे आहे. त्यामूळे चहूबाजूने २२.५ सें.मी. X १५ सेंमी. आकाराची नाली असणे आवश्यक आहे.
पशुसंवर्धन	------	शेळया व मेंढयांमध्ये जानेवारी ते एप्रिल या कालावधीत देवी या साथीच्या आजाराचा प्रादूर्भाव मोठ्या प्रमाणात दिसून येतो. सदर आजार हा पॉक्स विषाणूपासून होणारा संसर्गजन्य साथीचा आजार असुन त्यासाठी शेतक-यांनी तीन महिने वयाच्या वरील सर्व शेळया-मेंढयांना जानेवारी महिण्यामध्ये न चूकता पशूवैदयकांच्या सल्ल्याने लसीकरण करावे.
इतर	------	शेतक-यांनी हरभरा पिकास तुषार सिंचन पध्दतीच्या साहाय्याने गरजेनुसार पाणी व्यवस्थापन करावे. तसेच पाणी व्यवस्थापन करतांना पीकामध्ये अतिरिक्त पाणी साचणार याची दक्षता घ्यावी.
सदर कृषि सल्ला पत्रिका जिल्हा कृषि हवामान केंद्र (DAMU) कृषि विज्ञान केंद्र, छत्रपती संभाजीनगर-१ येथील तज्ञ समितीच्या शिफारशीवरून तयार करून प्रसारित करण्यात आलेली आहे.		

कार्यक्रम समन्वयक तथा नोडल ऑफिसर
जिल्हा कृषि हवामान केंद्र (DAMU)
कृषि विज्ञान केंद्र, छत्रपती संभाजीनगर-१

Chapter 9: Commodity wise status of climate Resilient Agriculture value chain

9.1 Existing marketing scenario in the district

9.1.1 Year wise marketable surplus of major crops. (With arrival & price variation)

Crop	Bajra	Wheat (Husked)	Sorgum (Jawar)	Maize	Gram	Green Gram (Mug)	Pigeon Pea (Tur)	Black Gram (Udid)	Soybean	Sun Flower	Potato	Onion	Tomato
Year	2015-2016												
Arrivals in Qtl	40739	65581	73285	535932	19903	14445	30986	335	12934	91	155297	718855	38271
Min Price Rs. / Qtl	1461	1595	1566	1352	4777	5689	7470	7166	3457	3100	1011	284	1043
Max Price Rs. / Qtl	1692	1876	1855	1446	5191	5973	7956	7523	3611	3180	1281	1163	1808
Modal Price Rs. / Qtl	1579	1734	1694	1402	5049	5853	7783	7386	3553	3130	1147	758	1422
Year	2016-2017												
Arrivals in Qtl	76207	119919	78828	932620	42553	18144	181585	1239	22001	5	176837	860383	37798
Min Price Rs. / Qtl	1267	1623	1738	1233	5112	4298	3559	4498	2498	2557	573	262	846
Max Price Rs. / Qtl	1461	1874	2000	1343	5739	4853	3981	4863	2685	2557	767	953	1572
Modal Price Rs. / Qtl	1358	1749	1863	1289	5406	4693	3781	4736	2619	2557	670	633	1207
Year	2017-2018												
Arrivals in Qtl	37939	160195	81105	413383	51454	7498	106633	403	12832	11	179882	715653	46781
Min Price Rs. / Qtl	1148	1642	1462	1092	3228	3984	3489	2966	2726	2904	883	485	586
Max Price Rs. / Qtl	1366	1845	1770	1185	3651	4822	3879	3233	2947	2904	1152	1638	1227
Modal Price Rs. / Qtl	1252	1734	1611	1147	3491	4531	3759	3103	2871	2904	1018	1150	904
Year	2018-2019												
Arrivals in Qtl	21974	43351	30942	282220	16763	13533	25730	182	9330	0	209889	781323	53788
Min Price Rs. / Qtl	1815	2008	2389	1665	3584	4588	4532	3859	3247	0	756	393	612
Max Price Rs. / Qtl	2141	2256	2857	1762	4056	5297	5001	4148	3420	0	1073	1302	1589
Modal Price Rs. / Qtl	1992	2142	2639	1722	3902	5098	4806	4017	3303	0	915	921	1098
Year	2019-2020												
Arrivals in Qtl	102816	99909	84839	533424	26190	12132	73958	396	8710	0	146322	966480	33884

Min Price Rs. / Qtl	1367	1807	2178	1251	3550	4137	4384	4295	3318	0	1375	537	599
Max Price Rs. / Qtl	1762	2082	2905	1474	3940	5972	4848	4953	3712	0	1817	2192	1432
Modal Price Rs. / Qtl	1532	1937	2581	1367	3787	5300	4647	4648	3581	0	1597	1455	1018
Year	2020-2021												
Arrivals in Qtl	102690	284454	106371	262856	32560	19682	104328	485	13789	44	101130	1611156	35903
Min Price Rs. / Qtl	1260	1609	1417	1272	4098	4201	5334	4706	4439	5193	1179	632	536
Max Price Rs. / Qtl	1451	1811	2063	1442	4661	5684	5910	5242	4832	5455	1636	2346	1226
Modal Price Rs. / Qtl	1351	1700	1704	1362	4406	5108	5661	4975	4674	5382	1404	1704	883
Year	2021-2022												
Arrivals in Qtl	90555	239054	72143	356062	29249	9179	116569	311	56196	1056	198967	2352470	26078
Min Price Rs. / Qtl	1861	1984	1704	1780	3919	5253	5382	4414	5471	5578	1031	445	1238
Max Price Rs. / Qtl	2227	2290	2169	1972	4335	6114	5981	4752	6013	5877	1533	1756	2566
Modal Price Rs. / Qtl	2044	2117	1891	1884	4149	5772	5708	4574	5815	5760	1280	1204	1900
Year	2022-2023												
Arrivals in Qtl	86772	170391	50740	364111	18619	8062	103875	3358	53992	3057	266333	3906122	29871
Min Price Rs. / Qtl	2173	2306	2753	1815	4348	7724	6988	5200	4647	3975	974	357	1683
Max Price Rs. / Qtl	2520	2698	3542	2015	4753	8649	7841	5478	4958	4224	1520	1498	2854
Modal Price Rs. / Qtl	2368	2481	3131	1913	4565	8302	7495	5340	4847	4146	1221	1034	2259

*(Source: APMC, Chh. Sambhajinagar.) *

9.2 Constraints in existing value chain

1. At the time of sowing, the seeds are not available on time and are sold by the Krishi Seva Kendra at a higher price
2. Due to lack of automated farming implementation and lack of skilled labour,

Sowing is not done on time.

3. While farmer selling their agriculture produce, farmer bear transporting cost, agent commission in APMC and also village level agent purchase at low cost
4. Due to lack of infrastructure i.e. warehouses at village level farmers have to sell their produce because of insufficient storage capacity.
5. Low economic condition of farmer, losses occurring due to processing mills not available nearby places

SWOT Analysis

An analysis of the strengths, weaknesses, opportunities and threats for all the 12 APMCs in the district has been done. It helped realize the essential factors that APMCs can leverage on and those which it can improve on. Every APMC has a different need based on the requirements of the farmers, the arrivals, the sale, its connectivity by rail and road and the proximity of processing factories.

APMC	Strength	Weakness	Opportunities	Threats
Chh. Sambhaji nagar	Storage facility is good, Open auction & competitions, High no of traders, Farmers Rest house & all basic infrastructure, Railway Connectivity	Lack of Resources, Low efficiency of Staff, No F & V marketing, No Pack house & Shade No cold storage	Development of Infrastructure, Formation of groups, Grading & packing facility, Providing range & graders More pro producer activities Establishment of cold storage units SMS services for farmers for disseminating price, arrivals Variety wise price declaration More Processing plants	Evolution of Private market

Karmad	Electronic weighbridge Auction Hall, Godown (Storage Room / Hall) available Water Facility available Electricity, Farmer Rest House available Traders Shop, Canteen Facility, Animal Dispensary , Availability of pledge loan facility	No Cold Storage, No F & V Pack house, No Grading & Packing Unit, No Transport Facility	F & V Pack house Basic Infrastructure availability, More pro producer activities Establishment of cold storage units SMS services for farmers for disseminating price, arrivals Variety wise price declaration More Processing plants	Private Market, Changes in Farmers Habit to sell directly to traders Lack of competency
Paithan	Open auction System, Open auction Hall, Electronic Weigh instrument available, Water Cooler available, Overhead Water Tank, Rate Board present, Shop For Traders & Atayas, Canteen , Pledge Loan Facilities available, Farmers guest house available	Bad Road conditions & Lighting, Electronic Weigh bridge not available No Storage Facilities No E. Trading, No Projection TV, No Digital Board, No Hamal Bhavan, No Advance Grading equipment, No Toilet Block, Orange Market not developed Existing warehouses (APMC & MSWC) are in poor condition. No cold storages & pack house for fruits	Development of Road & Lighting facilities Electronic Weigh bridge, Storage Facilities are not available, More pro producer activities Establishment of cold storage units SMS services for farmers for disseminating price, arrivals Variety wise price declaration More Processing plants	Private Market, Changes in Farmers Habit to sell directly to traders

Phulambri	Auction Hall, Godown (Storage Room / Hall) are available Water Facility, electricity available, Farmer Rest House available Availability of pledge loan facility, Compound Wall	Bad Road conditions & Lighting, Existing warehouses (APMC & MSWC) are in poor condition. No cold storages & pack house for fruits No Grading & Packing Unit No Transport Facility Low Office Staff,	Development of Road & Lighting facilities Establishment of F & V Pack house, Grading & packing Unit Transport Facility, More pro producer activities Establishment of cold storage units SMS services for farmers for disseminating price, arrivals Variety wise price declaration More Processing plants	Private Market divert purchasing fruits
Sillod	Open auction System and auction hall , Electronic Weigh instrument available, Electronic Weigh bridge available Water Cooler , Overhead Water Tank available, Rate Board , Shop for Traders &Adtayas, Canteen present E. Trading, Digital Board available Well-Constructed Internal Roads, Shetkari Nivas, Toilet Block	No Storage facilities, No Projection TV, No Hamal Bhavan, No Advance Grading equipment.	Development of Roads and Storage Facilities	Private Marketing, Lack of Advance Technology & Lack of research & Competitiveness

Bharadi	Electronic weighing bridge available Auction Hall , shaded Platform available Availability of Farmers Rest House , Marketing Cell, Electronic Display Board, Street light , Drinking Water Facility, Parking Facility, Train Connection	Lack of Labour rest house , Electronic weighing Machine, Banking Services, Traders, Pack house for F & V	Farmers Groups can produce bulk production with quality, Infrastructure Development will help to invite farmer in APMC, Diversification of Farmer to Fruits & Vegetable Crops	Private Marketing , Lack of Advance Technology & Lack of research & Competitiveness
Kannad	Adequate certified electronic weighing, Auction Hall ,shaded platform available Good Road condition, Availability of Open Auction system, Middle Man Shops , Godown - 2, Supervisor Room, Farmers House	No Cold Storage, TV, Digital Board, Pack House.	Soybean Grading packing unit setup, F& V market development , Banana Market Development	Private Market, Increase in Direct Selling Lack of competency by the management
Soygaon	Auction Hall available, Good Farmers Network , Good Infrastructure and Well Trained Staff	Lack of banking facility, No Grading & packing Few traders come to Daryapur APMC	Development of banking facilities Grading and packing units	Private Market, Increase in Direct Selling
Vaijapur	Open Auction Hall present, Electronic Weigh instrument and bridge available, Overhead Water Tank, Rate Board , Shop For Traders &Adtayas, Canting are available	Lack of banking facility, Storage Facilities No E. Trading , Projection TV , Digital Board, No Shetkari Nivas, Hamal Bhavan , Advance Grading equipment not present, No Toilet Block , CCTV Camera	More pro producer activities Establishment of cold storage units SMS services for farmers for disseminating price, arrivals Variety wise price declaration· More Processing plants	Private Market, Increase in Direct Selling

Gangapur	Open auction System, Open auction Hall, Overhead Water Tank, Rate Board, Toilet Block available	No Storage to farmers Produce, water cooler, Compound wall, cement concrete road, No Electrification, Grain & pulses cleaning unit, No Godown, Weighbridge, solid waste management, No Shop for Traders & adtayas, Canteen , No Electronic Weight instrument	Development of all basic & productive infrastructure	Private Market, Increase in Direct Selling
Lasur Station	Open Auction System , Auction hall available, Godown, water Facilities available Shetkari Nivas , Cotton Yard, Weighbridge available	No compound wall Some basic Infrastructure missing,	To develop the all basic and productive infrastructure	Private Market, Increase in Direct Selling
Khultabad	Open auction System, Open auction Hall.	No Storage to farmers Produce, No Drinking water cooler, Compound wall, cement concrete road, No Electrification, Grain & pulses cleaning unit, Godown, Weighbridge, No solid waste management, Shop for Traders & adtayas, Canting , No Electronic Weighing instrument	To develop the all basic and productive infrastructure	Private Market, Increase in Direct Selling

(Source – Market strategy supplement of MACP, Ch. Sambhajinagar)

9.3 Potential for strengthening of commodity wise value chains

Strengthening is going on using SMART NDKSP AND MAGNET. These projects will focus on strengthening the traditional agricultural system to make it more market-oriented and broadening the participation of the private sector in the value chain. The project has the following three major components.

1. Strengthening of institutional arrangements for agribusiness reforms

Under this component, strengthening of agriculture and marketing department, capacity building (training) of employees/officers in this department, establishment of crop value chain development interest promotion councils, establishment of technical room for policy changes etc. Items included.

2. Setting up a risk mitigation system

Warehouse based Sub Projects are risk mitigation. These sub-projects will provide godown and grain storage facilities for farmers at village level in a decentralized manner. These projects were mainly implemented through SHG/ FPC level.

3. Maize Supply Chain Management:

Under this component clean and graded maize grains are procured by SHG / FPC at their level, then all maize are send to the purchaser level e.g. CFC Gangapur, Saguna Agro Baramati, Deogiri poultry feed Chh. Sambhajinagar.

4 Cotton Value Chain: -

Under this component clean and homogenous cotton is produced and cotton bales are sold under the brand name 'Smart Cotton' through electronics platform and also developing the cotton value chain. It will be implemented through the Department of Agriculture and Maharashtra State Co-op. and Cotton Growers Marketing Federation Ltd. Smart Cotton project is implemented in the Paithan (10 villages), Phulambri(10 villages), Gangapur(12 villages) and Sillod (10 villages) tehsils.

9.4 FPCs' Contribution in value chain development

9.4.1. No. of registered FPCs in the district

There are 471 registered FPCs in the district.

9.4.2 Assessment of FPCs in the district

9.4.2.1. Objectives of Evaluation

- The study is an attempt to assess the Farmer Producer Companies of project area and find whether these companies are performing and earning sufficient returns to sustain business. The report has also proposed a rating method to measure the performance of FPCs considering different 8 parameters. The reports analysed 144 Farmer Producer Companies with the help of parameters. The parameters were further assigned performance scores on the basis of efficiency and effectiveness with the help of Automatic Rating Meter.

- On the basis of assessment report, suggesting the measures for strengthening of FPCs e.g. capacity building, climate resilience adaptation.

Table no. 9.4.2.1.a. Criteria for Evaluation of FPCs

Criteria	Max. Score
Organization and Administration (Core foundation strength)	21
Governance (Control System in Place)	11
Management (Decision making processes)	8
Infrastructure (Assets and resources)	5
Finance(Financial Base and health)	25
Business and Market Linkages (Resource quality)	21
Capacity Building (Resource quality)	5
Climate Resilience (Adaptability to climate risk)	4
Final Score	100

Scoring Method of Evaluation

- The maximum score for the above mention parameter was 100. The FPC rating report was generated by calculating the obtained score for a FPC. From these scores the result boxes were generated in the report indicating areas where this particular FPC needs to be improved. Selected questions were grouped under every parameter and weightage was accorded to each question under each parameter. The final score was calculated by using formula:

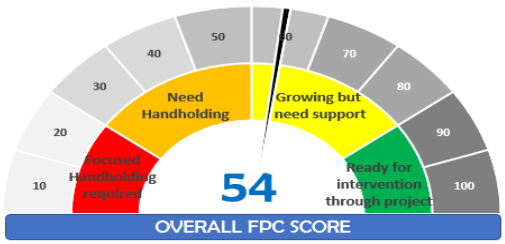
$$\text{Score}=\frac{\textit{Maximum Obtained Score}}{\textit{Maximum Obtainable Score}}\times 100$$

9.4.2.2 Output of evaluation.

All the major parameter noted above can be classified on the basis of percentage and frequency. The total obtained percent score was use for categorization of the parameter. The parameter was categories into three categories i.e. below 50% marks, 50- 75% marks, and above 75% marks. And all the FPCs were categories in three categories which help to analysed the present situation of the FPCs present in the project area and will also help to given suggestion to them. This analysis can be useful for the project also for developed different strategies plan for the project area.

The main findings from the survey and the observations from the detailed interactions with the member or directors of the FPCs created insights in terms of how the FPCs operate today, where the members want it to go in the future, how the Directors perceive the plan of action for the future and in which focus areas the gaps between reality and expectation lie.

Customized FPC Evaluation Report



Krushi Kranti Hitech Agro Producer Company Ltd.

Address - Gat No. 149 At. Sonwadi Post. Nagad, Tq. Kannad, Aurangabad – 431103.

Score Report Summary		
Criteria	**Max. Score**	**Score Obtained**
Establishment (Core Foundation Strength)	15	14.92
Governance (Control Systems in Place)	12	6.89
Management (Decision making processes)	10	3.44
Infrastructure (Assets and resources)	10	4.59
Finance (Financial base and health)	12	9.18
Business (Core business strength)	18	10.33
Capacity Building (Resource quality)	17	2.30
Climate Resilience (Adaptability to climate risk)	6	2.30
Final Score	**100.00**	**53.93** **54 (rounded off)**

The FPC should promote climate resilient varieties and more than one crop in a year will reduce the risk of crop failure

9.4.3 Information about FPCs supported by SMART/ NDKSP/ MAGNET

Beneficiary FPC/SHGs under NDKSP

Sr. No.	Taluka	Village	Name of Farmer Group	Activity name	Commodity wise value chain
1	Khultabad	Palaswadi	Ghrushneshwar Shetkari Agro Farmers Producer co. ltd.	Procurement of grains	Maize
2	Khultabad	Palaswadi	Ghrushneshwar Shetkari Agro Farmers Producer co. ltd.	Cleaning & grading unit	All grains
3	Khultabad	Sultanpur	Malojiraje Krushi Producer Company Limited	Silege Unit	All grains
4	Khultabad	Sultanpur	Swaroop Shetkari Producer Co. Ltd.	Oil Extraction Unit	Geranium
5	Khultabad	Devlana Kh.	Shribhadra Agro Producer Company Limited	Onion Storage Unit	Onion
6	Sillod	Bharadi	Jai Siddheshwar Krushi Producer Company Ltd.	Cleaning & grading unit	All grains
7	Sillod	Bharadi	Jai Siddheshwar Krushi Producer Company Ltd.	Procurement of grains	Maize
8	Sillod	Bharadi	Jai Siddheshwar Krushi Producer Company Ltd.	Flower mill	Wheat, Maize
9	Sillod	Bharadi	Bharadi Vision Farmer Producer Company Ltd.	Construction of Small Godown	Maize
10	Sillod	Bharadi	Laxmidev Farmer Producer Company Limited	Construction of Small Godown	Maize
11	Sillod	Sillod	Aakash Agro Farmer Producer Co Ltd	Cleaning & Grading Unit	Maize, Wheat, Seed
12	Kannad	Wakad	Wakeshwar Producer Co. Ltd.	Cleaning & grading unit	All grains
13	Kannad	Wakad	Wakeshwar Producer Co. Ltd.	Ripening Chamber	Banana
14	Kannad	Shelgaon	Purna Mahila Producer Co. Ltd.	Turmeric processing unit	Turmeric
15	Kannad	Shelgaon	Purna Mahila Producer Co. Ltd.	Ripening Chamber	Banana
16	Kannad	Mundwadi	Ankurmay Farmers Producer Company Ltd.	Sweetcorn Frozen Unit and Cold Storage	Sweetcorn
17	Kannad	Wadod	Choundeshwar Agritech Producer Company Limited	Construction of Small Godown	Maize
18	Phulambri	Waregaon	Shantai Farmers Producers Company Ltd.	Grain Processing Unit (Cleaning/Sorting/Grading)	Maize
19	Vaijapur	Varegaon	Narangi Vally Farmers Producer Company Limited	Milk Processing Unit	Millk
20	Kannad	Kannad	Godavari valley Aurangabad Farmer Producer Company Limited	Oil Extraction Unit.	Geranium
21	Paithan	Nilajgaon	Hood Patil Farmer Producer Company	Onion Storage Unit	Onion
22	Sillod	Pirola	Kale Pirola Farmer Producer Company Limited	Pulse Mill	Dal mill
23	Phulambri	Janephal	Kanhoba Agro Producer Co. Ltd	Neem Extract Unit	Neem
24	Ch. Sambhaji nagar	Pachod	Asramata Shetkari Gat	Milk Processing Unit	Millk

Chapter 10: Extension strategies for adaptation to climate change

I) Preparation of Village Adaptation Plan

- Need for participatory micro-planning and pre-season meetings
- Process for micro-planning and seasonal meetings- agenda, stakeholders, duration, material required, information needed etc.
- Role of Village Agriculture Development Committee of Gram panchayat
- Components of Village Adaptation Plan to be prepared for each village

❖ **Planning for water security**

a. Computation of water budget
b. Water conservation structures
c. Groundwater recharge structures (including recharge of wells)
d. Water harvesting structures
e. Micro-irrigation plan

❖ **Planning for soil health**

a. Soil health Card status of the village
b. Status of Organic Carbon content
c. Soil health based advisory- crop suitability
d. On-farm production of biofertilizers
e. Production of organic inputs
f. Regenerative agriculture plan
g. Soil erosion/ degradation arresting measures

❖ **Crop planning based on water budget and market demand**

a. Current cropping pattern
b. Available water balance (post monsoon)
c. Last year prices of crops
d. Crop diversification
e. Proposed cropping pattern (season and crops)

❖ **Planning for Carbon sequestration**

a. Agro-forestry plantation
b. Horticulture plantation
c. Forage/ Cover crop cultivation
d. Bamboo plantation
e. Live fencing plan

❖ **Planning for reduction of production cost**

a. Reducing cost on labour intensive operations (by mechanization)
b. Reducing use of chemical fertilizers (by enhancing use of bio/ organic fertilizers)

c. Reducing use of chemical pesticides (by enhancing use of bio/ natural pesticides)

d. Reducing tillage operations (by conservation agriculture)

e. Reducing excessive water usage (by micro-irrigation)

❖ **Planning for conservation and production of climate resilient variety seed**

a. Identification of CRV.

b. Production programme for Truthful/ Certified/ Foundation seeds- status

c. Conservation of indigenous seed having climate resilient characters- details of such seeds with location and characteristics

❖ **Adoption of climate resilient technologies**

a. Identification of CRT useful to the village and creating awareness

b. Plan of demonstration of CRT (FFS, Method/ Result Demonstrations)

c. Most prominently adopted technologies and their impact

d. Innovative technologies adopted

e. Validation of technologies developed by Progressive farmers

❖ **Integrated Pest Management Plan**

a. Identification of common pests on major crops based on *CROPSAP*

b. Plan of IPM technologies to be adopted

c. On-farm production of bio-pesticides, natural pesticides etc.

d. Skill training to reduce pesticide hazard

❖ **Integrated farming systems**

a. Potential for crop based and other livelihood activities

b. Households to be engaged in IFS

c. Plan for market linkage for IFS produce

❖ **Preparation of contingency plan**

a. Village level weather forecast mechanism

b. Preparedness for contingencies

c. Crop insurance promotion and status

d. Monitoring of contingencies

e. Assessment of losses due to natural calamities if any

❖ **Strengthening of commodity value chains**

a. Assessing existing commodity value chains

b. Identification of gaps in existing value chains

c. Assessing volume of commodity to be marketed

d. Assessing warehouse availability and available capacity

e. Assessing transportation facilities

f. Plan for infrastructure

g. Plan for market linkage of major commodities

h. Role of Women Self Help Groups, Farmer Groups, FPCs

II. Convergence of Govt. Programs with Extension Plan

Nanaji Deshmukh Krishi Sanjivani Project (NDKSP): In the Chhatrapati Sambhajinagar district total 405 villages (299 Gram Panchayat) are included under the project and are working till now. In the district from 2018-19 till date a total number of 129874 individual farmers have been registered on the DBT portal and a total 468293 applications have been done by the farmers for different activities. Till date 135111 farmers applications are successfully benefitted with an subsidy amount of rupees 951.04 crores. Also on community basis, different farmers groups, Self Help Groups, Farmers Producer Companies have been registered with numbers of 1608 and applications received are 2643 and a total number of successful disbursement applications are 1714 with subsidy benefit of Rs. 171.50 crores.

Bhausaheb Fundkar Falbag Lagwad yojna (BFFLY): Under this scheme, farmers are promoted to increase area under fruit crop plantation with the help of government subsidy. Now the scheme is running online through the Maha-DBT portal with direct benefits to the farmers. In the year 2022-23 a total of 71 farmers get benefit on 51 hectares land with a total subsidy amount of Rs. 18.52 lakhs. In the district till date 31/01/2024, in the year 2023-24 a total of 160 farmers get benefit on 112 hectares land with a total subsidy amount of Rs. 47.45 lakhs.

MIDH (Mission on Integrated Development of Horticulture): The scheme is sponsored by the central government, is running online through the Maha-DBT portal with direct benefits to the farmers. The major components under the scheme are community farm ponds, individual farm ponds, plastic lining for farm ponds, protected cultivation (shade net house, polyhouse, plastic mulching), pack house, low-cost onion storage structures, field extension programme for implementation of newly adopted crops like dragon fruits etc. In the district till date 31/01/2024, in the year 2023-24 a total of 2184 farmers get benefitted with a total subsidy amount of Rs. 10.55 crores.

RKVY *(Rastriya Krishi Vikas Yojna):* The scheme is sponsored by the central government, is running online through the Maha-DBT portal with direct benefits to the farmers. Components under the scheme are plastic lining for farm ponds, protected cultivation (shade net house, polyhouse, plastic mulching), pack house, low-cost onion storage structures etc. In the district till date 31/01/2024, in the year 2023-24 a total of 224 farmers gets benefited with a total subsidy amount of Rs. 1.99 crores.

Chief minister sustainable irrigation scheme (for individual farm ponds): The scheme is sponsored by the state government, is running online through the Maha DBT portal with direct benefits to the farmers. Components under the scheme are individual farm ponds (excavation) and plastic lining for individual farm ponds. Purpose of the schemes is to create protective irrigation sources. In the district till date 31/01/2024, in the year 2023-24 a total of 212 farmers get benefited with a total subsidy amount of Rs. 1.83 crores.

Chief minister sustainable agriculture irrigation scheme (Micro Irrigation): The scheme is sponsored by the State government, is running online through the Maha-DBT portal with direct benefits to the farmers. Components under the scheme are drip irrigation set and sprinkler irrigation set. In the year 2023-24 a total of 19753 farmers benefited with a total subsidy amount of Rs. 34.14 crores.

Pradhan mantri krishi sinchayi yojana/RKVY (per drop more crop): The scheme is sponsored by the Central government, is running online through the MahaDBT portal with direct benefits to the farmers. Components under the scheme are drip irrigation set and sprinkler irrigation set. In the year 2023-24 a total of 6994 farmers benefited with a total subsidy amount of Rs.32.64 crores.

Rainfed area development programme (RAD) under sustainable agriculture development: In year 2023-24 project is implementation is going on in six tehsils namely chatrpati Sambhajinagar, paithan, Vaijapur, Gangapur, Kannad, Soyagaon having one village each. Major components to be implemented are livestock based dairy farming, vermicompost, post-harvest management components, silage unit, horticulture based farming system, etc. Funds to be available for the scheme is Rs. 1.08 crore.

Weather based Fruitcrop insurance scheme for plantations: Out of total nine fruit crops, eight fruit crops namely sweet orange, mango, pomegranate, custard apple, guava, sapota, grapes and banana are covered under the insurance for adverse conditions. Under 'Mrig Bahar' 2022-23 season 11617 farmers applied for insurance with 8100 hectares area. Out of these 5072 farmers get an insurance compensation benefit of Rs. 8.02 crores. Under 'Ambia Bahar' 2022-23 season 6738 farmers applied for insurance with 4755 Ha. area. Out of these 2196 farmers get an insurance compensation benefit of Rs. 7.60 crores.

Prime Minister Fasal Bima Yojana: Purpose of the Scheme is to protect the field crops under insurance cover. Insurance premium amount for per Farmers applications is only one rupee and remaining total premium amount is paid and subsidized by the Government. In Kharif 2023-24 a total of 11.52 lakh applications received under the crop insurance cover, out of which, under mid-season adversity condition 219414 farmers got benefited with insurance compensation benefits of Rs. 84.67 crores.

CROPSAP: With the help of cropsap advisory farmers get know proper pest management to keep the pest populations below economic threshold levels (ETL) for field crops.

HORTSAP: With the help of cropsap advisory farmers get know proper pest management to keep the pest populations below economic threshold levels (ETL) for fruit and vegetable crops.

Agriculture Sanjeevani week : From 23st June to 1st July 2023, meetings were organized in 1396 villages with the participation of 33504 farmers and guidance was given regarding preparation of Kharif season, importance of seed germination, seed treatment, soil testing, various schemes of agriculture department, precautions to be taken while handling/spraying chemical pesticides.

State level Agricultural Exhibition Festivals (District Krishi Mahotsav) : State level Agricultural Festivals was conducted at Sillod, Dist Chhatrapati Sambhaji Nagar during 1st January to 5th January 2023. This was a very vast extension tool composed of modern technology and innovations by every organized stall. A total number of more than 600 stalls participated. The number of farmers visited was 24000 from all over state of Maharashtra and nearly Rs.20 lakhs of agricultural produce and processed food by women self-help groups, farmers were sold.

SMART Project: Project is implemented by the P.D. ATMA (Agriculture technology management agency) at district level. Since the start of the project in the district, 91 applications have been received under the project for various activities and among these, 31 applications have received pre-sanction and 19 applications have received final sanctions, 16 are under construction work, procurement process is in progress.

III. Monitoring mechanism for village adaptation progress

Monthly review meetings: In Chh. Sambhajinagar district regular monthly review meetings of SDAO, TAO, CAO will be conducted by DSAO Chh. Sambhajinagar, number of applications of different activities, their progress and desk wise pendency will be monitored by DSAO. Technical sessions are also conducted by DSAO Chh. Sambhajinagar.

Engagement with field Functionaries: Monthly meetings of Cluster Assistant (CA) , Agriculture Assistant (AA), Agriculture Supervisor (AS), Circle Agriculture Officer (CAO) , & Taluka Agriculture Officer(TAO) will be regularly conducted by SDAO Chh. Sambhajinagar, Sillod and Vaijapur. The progress and proper direction will be regularly delivered by DSAO, SDAO & TAO to all field staff.

Training for Extension workers and officials: In FFS farmers are trained to identify the insect pest and disease. Harmful insects and beneficial insects, their role in crop growth, regular observation of pests for Crop Economic Threshold level (ETL), Integrated Pest Management (IPM), Eco friendly farming, all these activities are conducted regarding climate resilient technology to create sustainable livelihood. The farmers are regularly visited by krishi tai, krishi Mitra, Cluster Assistants (CA) and Agriculture Assistants (AA) and made aware about new technology and schemes conducted by NDKSP. They help the farmer to select proper schemes and Technology which is suitable for them for their sustainable livelihood.

All the officials and extension workers related to NDKSP Chh. Sambhajinagar are regularly trained by different kinds of training sessions conducted at district level, KVK, PMU, seminars and various training institutes in Maharashtra and outside the state. So the result is 135111 individual farmers, 1714 SHG & FPC are benefited by NDKSP.

Effective Communication: Krushi tai, CA, AA by identifying the needs and problems of farmers for effective implementation of various agricultural schemes & Proper guidance is given to the farmers to implement various schemes and practices on field.

In Chh. Sambhajinagar district all CA, AA, AS, CAO, TAO, SDAO, DPIU team, PD ATMA, DSAO are connected to each other through different WhatsApp groups. So information about the latest trend and in mechanization and Government support Programmes will be easily disseminated from top to bottom level.

Community participation: In Chh. Sambhajinagar district farming the joint investment like construction of Godown and warehouse, custom hiring center, Processing Unit, Onion Storage Structure, Milk Processing , Spice unit, Cleaning and Grading Unit, Oil Extraction Unit, are come to exist on the cooperatively basis through NDKSP.

Monitoring Adoption of Agricultural Technologies: Regularly monitor the adoption of modern agricultural technologies and machinery, including tractors, harvesters, irrigation

systems, and precision agriculture tools. This ongoing assessment helps the effectiveness of interventions and identifies areas for improvement.

IV. Strategy for revisiting the village adaptation plan

Revisiting a village adaptation plan is essential to ensure that it remains effective and relevant to the changing needs and circumstances of the communities it serves. Here's a strategy for revisiting and updating a village adaptation plan:

Stakeholder Engagement: Identify and engage with key stakeholders, including local government officials, community leaders, farmers, NGOs, and agricultural experts. Conduct meetings and workshops to gather input and feedback on the existing plan and to understand the evolving needs and challenges of the villages.

Assessment of Changing Climate Patterns: Consider the impact of changing climate patterns on agriculture and rural communities. Assess the need for climate-resilient strategies and adaptations.

Technology and Mechanization: Review the adoption of modern agricultural technologies and machinery in the villages. Evaluate the effectiveness of any support or subsidies provided for technology adoption.

Market and Value Chain Analysis: Analyze the local and regional markets for agricultural produce. Identify opportunities to strengthen value chains, improve market access, and increase farmers' income.

Resource Management: Evaluate the sustainable management of natural resources, including water, soil, and forests. Consider strategies for resource conservation and sustainable practices.

Climate-Smart Agriculture: Incorporate climate-smart agricultural practices and technologies to help farmers adapt to changing weather patterns. Promote techniques such as crop diversification and water management.

Capacity Building and Training: Review the effectiveness of training and capacity-building programs for farmers. Ensure that farmers have access to knowledge and skills needed for modern and sustainable farming practices.

Community Participation: Involve local communities in the planning and decision-making process to encourage community-led initiatives and self-help groups.

Annexure I Sample Village Level Micro-Plan

गाव विकास आराखडा प्रपत्र

महाराष्ट्र शासन - कृषि विभाग
नानाजी देशमुख कृषि संजीवनी प्रकल्प

POCRA

गाव विकास आराखडा

गाव समुहाचा क्रमांक- 515_gv-41_03

गावाचे नाव-	तांदुळवाडी	सेन्सस कोड-	549303
महसुल मंडळ-	Shendurwada	तालुका-	गंगापूर
उपविभाग-	वैजापूर	जिल्हा-	छत्रपती संभाजीनगर

गावसमुहातील इतर समाविष्ठ गावे

अ. क्र	गावाचे नाव	सेन्सस कोड	अ. क्र	गावाचे नाव	सेन्सस कोड
1	दैगाव	549190	2	बुट्टे वडगाव	549210
3	सुलतानाबाद	549203	4	सिरेगाव	549204
5	वाजनापूर	549291	6	सिल्लेगाव	549209
7	शेक्ता	549292	8	महमदपूर	549208
9	कोळघर	549305	10	मंजारपूर	549206
11	देवळी	549207	12	बोळठाण	549301
13	डोनगाव	549185	14	पाचपिरवाडी	549184
15	सिद्धनाथ वडगाव	549298	16	सावंगी	549189
17	धामोरी खु.	549191			

सुक्ष्मनियोजन प्रक्रिया कालावधी - ते

गाव विकास आराखडा तयार करणा-या कृषि सहाय्यकाचे नाव - R N PANDHURE

गाव विकास आराखड्याची तांत्रिक तपासणी करणारे कार्यालय - उपविभागीय कृषि अधिकारी,वैजापूर

ग्राम कृषि संजीवनी समिती मंजूरी ठराव क्रमांक व दिनांक - ठराव क्रमांक दि. --

ग्रामसभा मंजूरी ठराव क्र व दिनांक - ठराव क्रमांक दि. --

जिल्हास्तरीय समन्वय समितीकडील मंजूरीचा दिनांक - _____

जिल्हा अधिक्षक कृषि अधिकारी,छत्रपती संभाजीनगर कार्यालय

अनुक्रमणिका

Annexure II Sample Village Profile

नानाजी देशमुख कृषि संजीवनी प्रकल्प — कृषी विभाग महाराष्ट्र शासन

अहवाल क्रमांक : **नादेकृसप्र/गामाप्र/549303/2024/35** दिनांक : 04/02/2024

ग्राम कृषी संजीवनी विकास दर्शिका

गावाचे नाव : तांदुळवाडी	गावाचा सांकेतांक : 549303	ग्रामपंचायत: Tandulwadi
गावाचा (प्रकल्प) टप्पा : 3	गाव खारपान मध्ये येते का ?: नाही	समूह कोड: 515_gv-41_03
तालुका : गंगापूर	उपविभाग : वैजापूर	जिल्हा : औरंगाबाद

प्रकल्प कर्मचारी/अधिकारी

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
उपविभागीय कृषी अधिकारी	Aadhav Ashok yadavrao	9850269555
तालुका कृषी अधिकारी	Jaybhay Bapurao	9404811666
कृषी सहाय्यक	PANDHURE R N	9403229788
समूह सहाय्यक	Umbare Atul Prabhkar	8087908616
शेतीशाळा प्रशिक्षक	Korhale Shivshant	8766426965
कृषीमित्र	NA	NA
कृषीताई	Mahske Anita Raju	9881857734

ग्राम कृषी संजीवनी समिती

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
सरपंच	Rajgire Sushilabai Bhausaheb	9921330003
उपसरपंच	Rashinkar Dattu Babasaheb	9921416664
ग्रामपंचायत सदस्य	Pathan Karima Harun	8329059155
ग्रामपंचायत सदस्य	NA	NA
प्रगतिशील शेतकरी	Pandit Gayabai Tatyaba	9022040693
प्रगतिशील शेतकरी	Mahske Shesrao Bhaurav	8788644200
महिला शेतकरी	Rashinkar Mangal Nanasaheb	9767271166
महिला शेतकरी	Thorat Rukhamanbai Chandrabhan	9623244863
महिला शेतकरी	Khandagale Tarabai Vishwanath	8329457475
शेतकरी उत्पादक कंपनी प्रतिनिधी	Korhale Ashok Uttam	9552012001
बचत गट महिला प्रतिनिधी	Raut Archana Babasaheb	9637120001
कृषि पूरक व्यावसायिक शेतकरी	Rajgire Anil Bhausaheb	8788351133
कृषि पूरक व्यावसायिक शेतकरी	Mhaske Navnath Santaram	9503865081

भौगोलिक तपशील

माहिती उपलब्ध नाही

हवामान अंदाज व पीक सल्ला

माहिती उपलब्ध नाही

वैयक्तिक लाभार्थी तपशील

नोंदणी केलेले शेतकरी - 175	अर्जांची एकूण संख्या - 438
पूर्वसंमंती दिलेले अर्ज - 149	लाभ दिलेले अर्ज- 150
लाभार्थी संख्या - 100	लाभार्थी महिला शेतकरी - 33
अनुसूचित जाती लाभार्थी - 0	अनुसूचित जमाती लाभार्थी - 1
वितरीत अनुदान रक्कम - 7045986	बँकेसोबत आधार संलग्न नसलेले शेतकरी - 1

घटकनिहाय वितरित अनुदान

घटक/बाब	एकूण अर्ज	पूर्व समंती प्राप्त अर्ज	नाकारलेल्या अर्जांची संख्या	लाभार्थी शेतकरी	वितरीत केलेला निधी (रू)
Apiculture	3	0	2	0	0
Backyard Poultry	1	0	0	0	0
Drip Irrigation	154	59	89	53	3578205
Farm Mechanization	29	3	25	3	114000
Farm Pond (Individual)	21	4	16	4	325246
Farm Pond Lining	1	0	1	0	0
FFS host farmer assistance / Promotion of BBF technology/ Zero Tillage Technology etc.	1	1	0	1	2800
Horticulture Plantation / Agroforestry	55	10	43	10	238959
Inland Fisheries	2	0	2	0	0
Pipes	2	0	2	0	0
Planting material in Polyhouse / Shadenet house	1	0	1	0	0
Polyhouse/ Poly tunnels	1	0	1	0	0
Recharge of open dug wells	2	0	2	0	0

Saline and Sodic lands (Farm ponds/ Sprinklers / Water pump/ FFS)	3	1	2	1	17520
Seed Production	1	0	1	0	0
Sericulture	3	0	3	0	0
Shadenet House	13	1	10	1	1476955
Sprinkler Irrigation	144	70	68	70	1292301
Water Pumps	1	0	1	0	0
Total	438	149	269	143	7045986

कृषी व्यवसाय घटकाचा तपशील

नोंदणी केलेल्या FPC/SHG/Farmer Group ची संख्या - 1	एकूण अर्जांची संख्या - 1
पूर्वसंमती दिलेल्या अर्जांची संख्या - 1	कार्यारंभ आदेश दिलेल्या अर्जांची संख्या - 1
लाभ दिलेल्या FPC/SHG/Farmer Group ची संख्या - 1	अनुदान वितरीत रक्कम, रु. - 897600

कृषी व्यवसाय घटकांतर्गत घटक/ बाबनिहाय वितरीत अनुदान

घटक/बाब	एकूण अर्ज	पूर्व समंती प्राप्तअर्ज	कार्यारंभ आदेश प्राप्त अर्ज	अनुदान वितरीत FPC/SHG/Farmer Group	वितरीत केलेले अनुदान रक्कम, (रू)
Establishment of Custom Hiring Centers	1	1	1	1	897600

मृद व जलसंधारण तपशील

पावसाचे प्रमाण (मिमी) - 819.5	उपलब्ध अपधाव (TCM) - 0
अडवलेला अपधाव (TCM) - 80	शिल्लक अपधाव (TCM) - 0
प्रस्तावित क्षेत्र उपचार (हे.) - 450	प्रस्तावित नाला उपचार संख्या - 9
कामांची एकूण रक्कम - 98.5	तयार अंदाज पत्रकांची संख्या - 7
एकूण तांत्रिक मंजुरींची संख्या - 0	पूर्ण झालेल्या ई निविदा संख्या - 0
सुरु झालेल्या कामांची संख्या - 0	पूर्ण झालेल्या कामांची संख्या - 0
निधी वितरण केलेल्या कामांची संख्या - 0	खर्च झालेली एकूण रक्कम (रू) - 0

कामानुसार झालेला खर्च

उपचार प्रकार	एकूण तांत्रिक मान्यता	एकूण कार्यारंभ आदेश	एकूण पूर्ण झालेली कामे	निधी अदा केलेल्या कामांची संख्या	एकूण अदायगी (रू)

Compartment /graded bunding	0	0	0	0	0
Total	0	0	0	0	0

पिक पद्धतींचा तपशील

माहिती उपलब्ध नाही

भूमी उपयोगिता वर्गीकरण

गावाचे एकूण भौगोलिक क्षेत्र 638.07 हे असून निव्वळ पिकाखाली त्यापैकी 81.97% क्षेत्र आहे. गावाचे भूरूप ढोबळमानाने उंचसखल/ डोंगराळ/ सपाट प्रकारचे आहे. गावातील निव्वळ पिकाखालील क्षेत्रापैकी 14.72% क्षेत्राकरिता सिंचनसुविधा उपलब्ध आहे.

अ.क्र.	तपशील		क्षेत्र (हेक्टर)
1	एकूण भौगोलिक क्षेत्र (Total Geographical Area)		638.07
2	पिकाखालील निव्वळ क्षेत्र (Net Cropped Area)		523
3	दुबार पिकाखालील क्षेत्र (Double Cropped Area)		260
4	एकूण लागवडीखालील क्षेत्र (Gross cropped Area)		523
5	एकुण सिंचित क्षेत्र (Irrigaterd Area)	हंगामी बागायत	62
		बारमाही बागायत	15
6	एकूण वन क्षेत्र (Total Forest Area)		0
7	कायम पड क्षेत्र (Permanent Fallow Area)		60
8	चालू पड क्षेत्र (Current Fallow Area)		45
9	गवत पड व चराऊ कुरणे (Pasture Land)		8
10	इतर पड क्षेत्र (Other Fallow Area)		19
11	बिगर कृषि क्षेत्र (Area put to non-Agricultural use)		4

पिकनिहाय क्षेत्र (क्षेत्र हेक्टर)

अ.क्र.	पिकाचा वर्ग	पिकाखालील क्षेत्र
1	तृणधान्य	208
2	कडधान्य	98
3	गळितधान्य	0

4	नगदी पिके (कापूस,ऊस)	330
5	भाजीपाला पिके	0
6	फळपिके	0
7	चारा पिके	0
8	इतर	0
एकूण		636

निरीक्षण विहिरींची पाण्याची पातळी

सूक्ष्म नियोजन आराखड्यानुसार गावतील सरासरी भुजल पातळी 22 (खोली मी मध्ये) निरीक्षण साठी निवडलेल्या विहिरीचा तपशील

अ.क्र.	पाणलोट क्रमांक	शेतकरी संख्या	भुजल पातळी स्थिती (मी)	दिनांक
1	515_gv-41_03	86	8	--

शेतमाल निहाय घाऊक बाजारातील आवक व बाजार भाव बाबत माहीती

माहिती उपलब्ध नाही

नजिकचे गोदाम / वखारकेंद्रा बाबत माहीती

एकूण क्षमता (MT)	उपलब्ध क्षमता (MT)	तारीख
4180	311	30/11/2023
गोदाम नाव	**ईमेल**	**दूरध्वनी**
LASUR	lasur.wh@mswc.in	02433-241257

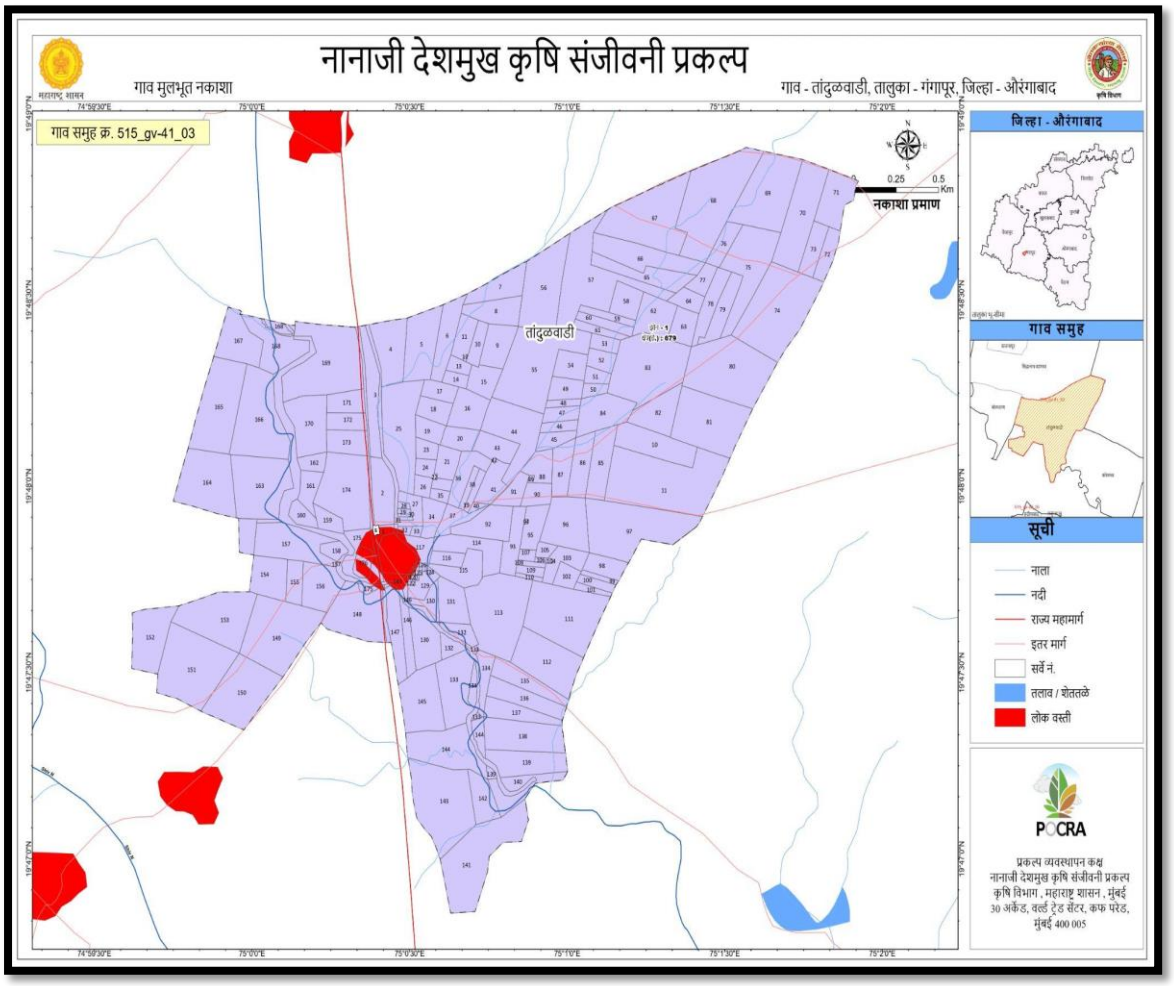
गोदामाचा पत्ता -KRUSHI UTPANNA BAZAR SAMITI ,MARKET YARD - 423702
गावापासून अंतर(कि.मी.) - 11.87

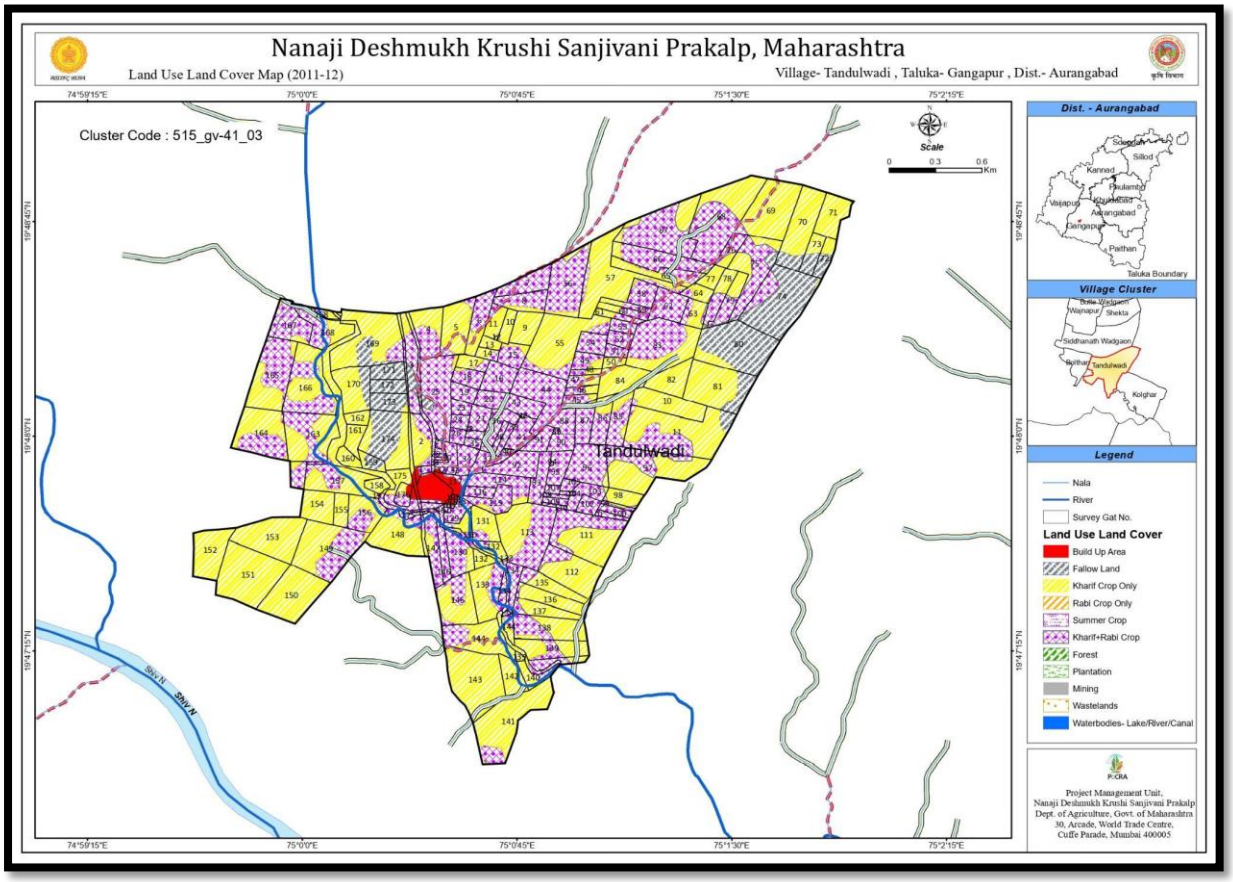
Sources of Information:

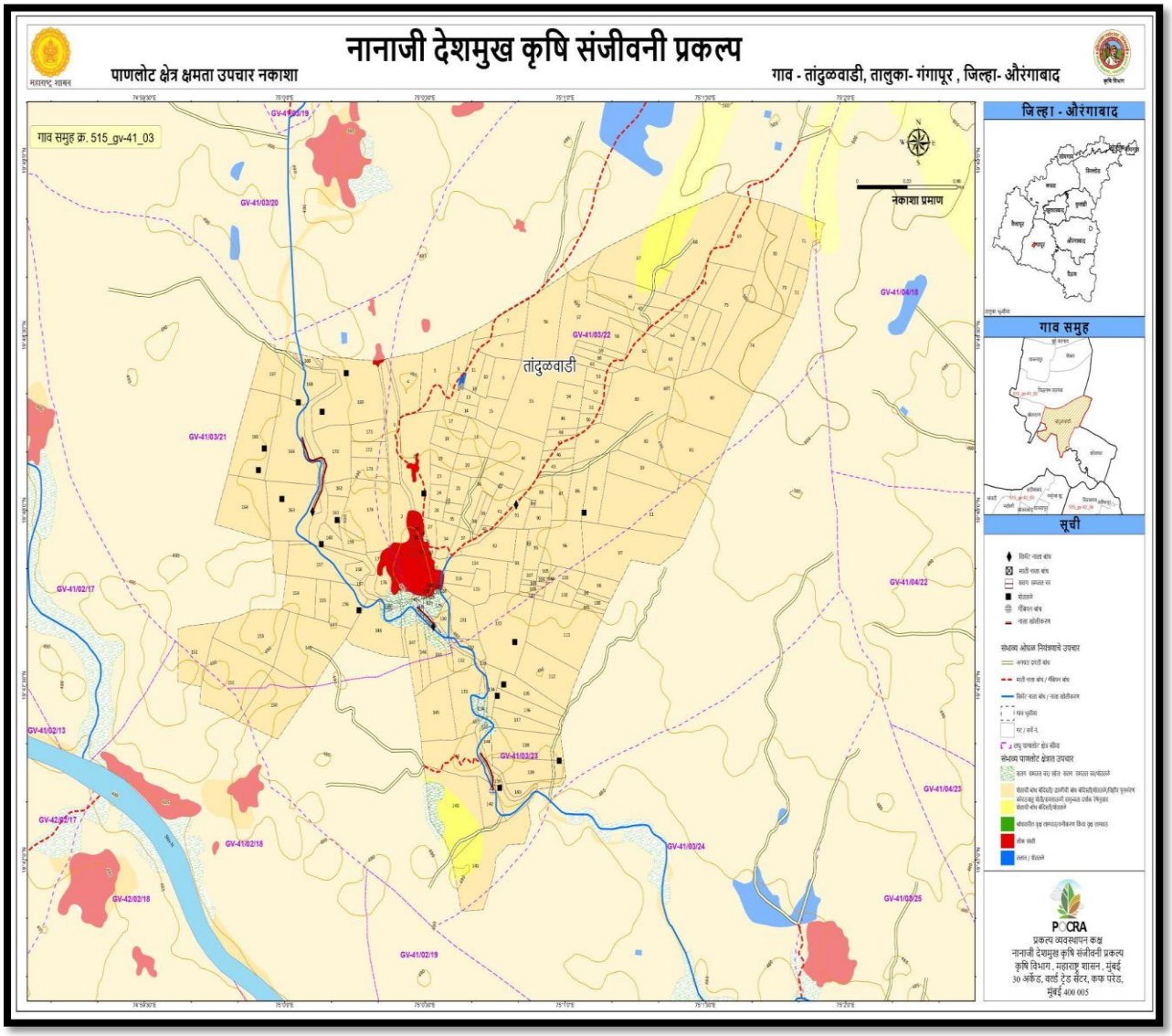
1. General Census 2011
2. Agriculture Census 2010
3. PoCRA DBT Portal

4. PoCRA MLP Application
5. PoCRA FFS Application
6. PoCRA Training Application
7. PoCRA SSO system

Annexure III Sample Village Map (गावाचा मुलभूत नकाशा)




Nanaji Deshmukh Krushi Sanjivani Prakalp, Maharashtra
Land Use Land Cover Map (2011-12)
Village- Tandulwadi , Taluka- Gangapur , Dist.- Aurangabad
Cluster Code : 515_gv-41_03
Tandulwadi
Scale
0 0.3 0.6 Km
Dist. - Aurangabad
Taluka Boundary
Village Cluster
Legend
Nala
River
Survey Gat No.
Land Use Land Cover
Build Up Area
Fallow Land
Kharif Crop Only
Rabi Crop Only
Summer Crop
Kharif+Rabi Crop
Forest
Plantation
Mining
Wastelands
Waterbodies- Lake/River/Canal
Project Management Unit,
Nanaji Deshmukh Krushi Sanjivani Prakalp
Dept. of Agriculture, Govt. of Maharashtra
30, Arcade, World Trade Centre,
Cuffe Parade, Mumbai 400005


नानाजी देशमुख कृषि संजीवनी प्रकल्प
पाणलोट क्षेत्र क्षमता उपचार नकाशा
गाव - तांदुळवाडी, तालुका- गंगापूर , जिल्हा- औरंगाबाद
गाव समुह क्र. 515_gv-41_03
तांदुळवाडी
नकाशा प्रमाण
जिल्हा - औरंगाबाद
गाव समुह
सूची
PoCRA
प्रकल्प व्यवस्थापन कक्ष
नानाजी देशमुख कृषि संजीवनी प्रकल्प
कृषि विभाग, महाराष्ट्र शासन, मुंबई
30 अर्केड, वर्ल्ड ट्रेड सेंटर, कफ परेड,
मुंबई 400 005

Annexure IV *Sample Agro-met Advisory*

(तालुका निहाय हवामान अंदाज व कृषी सल्ला)

2/5/24, 12:54 PM कृषी विभाग महाराष्ट्र शासन, भारत

नानाजी देशमुख कृषि संजीवनी प्रकल्प
कृषी विभाग महाराष्ट्र शासन

Latest Updates! 0:00 / 1:00 जीआयएस डॅशबोर्ड

टकांबाबत अधिक माहितीसाठी **9355056066** या हेल्पलाईन क्रमांकावर संपर्क साधा. **Request for Quotation- to print**

कृषी हवामान सल्ला - जिल्हा: छत्रपती संभाजीनगर, तालुका: गंगापूर

या हवामान सल्ला विषयी आपला अभिप्राय/सूचना नोंदवण्यासाठी येथे क्लिक करा.

हा हवामान सल्ला डाउनलोड करण्यासाठी येथे क्लिक करा

			०८/०२/२०२४	०९/०२/२०२४	१०/०२/२०२४
पाऊस (मिमी)	०.०	०.०	०.०	०.०	०.०
कमाल तापमान (अं.से.)	३३.३	३२.१	३१.९	३०.४	३१.७
किमान तापमान (अं.से.)	१७.२	१७.६	१६.४	१५.३	१७.९
सकाळची सापेक्ष आर्द्रता (%)	४४	३८	३८	३३	४५
दुपारची सापेक्ष आर्द्रता (%)	१७	१९	१७	१९	१९
वा-याचा वेग (किमी / तास)	१२	९	११	११	११
वा-याची दिशा	वायव्य	उत्तर	उत्तर - ईशान्य	पूर्व - ईशान्य	पूर्व - आग्नेय
ढग स्थिती (आकाश)	स्वच्छ	स्वच्छ	स्वच्छ	अंशतः स्वच्छ	अंशतः स्वच्छ

मागील आठवड्यातील हवामान (महावेध कडून प्राप्त माहिती)

दिनांक	०४/०२/२०२४	०३/०२/२०२४	०२/०२/२०२४	०१/०२/२०२४	३१/०१/२०२४
पाऊस (मिमी)	०	०	०	०	०
कमाल तापमान (अं.से.)	३१.१७	३१.८१	३२.५२	३१.५२	३२.०४
किमान तापमान (अं.से.)	१२.६	१४.१६	१२.५६	१२.९८	१३.१६
सकाळची सापेक्ष आर्द्रता (%)	४६.७४	४५.५८	३८.५२	४४.७	४३.०७
दुपारची सापेक्ष आर्द्रता (%)	९३.३१	९३.८६	९३.०४	९४.२३	९२.५३
वा-याचा वेग (किमी / तास)	६.९८	५.५८	६.०३	५.९६	४.९४

हवामान अंदाज

https://mahapocra.gov.in/home/taluka_advisory/47 1/2

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हवामान कोरडे राहण्याची शक्यता आहे. आकाश अंशतः स्वच्छ ते अंशतः ढगाळ राहण्याची शक्यता. हळुवार वारा असण्याची शक्यता. तापमान १५.३ ते ३३.३ अंश से. दरम्यान असण्याची शक्यता.

पीक सल्ला

गाव	पीक	पीक सल्ला
	हरभरा	क्लोरॅनट्रानिलीप्रोल १८.५ एससी २.५ मिली किंवा फ्लुबेन्डामाईड ३९.३५ एससी २ मिली प्रती १० लिटर पाण्यातून फवारणी करावी. - 2024-02-01

टीप:

पीठाच्या शिफारशीप्रमाणे स्थानिक पीक परिस्थितीनुसार/ हवामान अंदाज व कृषि सल्ला प्रसारित करण्यात येत आहे.

या हवामान सल्ला विषयी आपला अभिप्राय/सूचना नोंदवण्यासाठी येथे क्लिक करा.

हा हवामान सल्ला डाउनलोड करण्यासाठी येथे क्लिक करा

Contact Us
कृषी विभाग
महाराष्ट्र शासन

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