Nanaji Deshmukh Krushi Sanjeevani Prakalp

Strategic Research & Extension Plan (SREP)
Climate Resilient Agriculture Supplement
of
District Latur

Prepared by

Agricultural Technology Management Agency(ATMA), Latur

and

Project Management Unit

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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 objectives (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 Kendras. 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 Kendras (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.

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Chapter 1: General Profile of the District

1.1 Geographical area and location of the district

The area of Latur district is 7,157 sq.km. Latur district is in the south eastern part of the Maharashtra state and falls within the central plateau zone. Latur town is situated between 17°52' North to 18°50' North and 76°18' East to 79°12' East in the Deccan plateau. The district is situated on the Maharashtra and Karnataka boundary. On the eastern side of the Latur is Bidar district of Karnataka, whereas Nanded is on the northeast, Parbhani on the northern side, Beed on the Northwest and Osmanabad on the western and southern side.

The crop cultivated in three seasons viz Kharif, Rabbi, Summer growing cereals, pulses, oilseed, cotton and sugarcane, totaling 5, 59162 Ha. area under different crops. The district is all under "Assured Rainfall Zone" and moderate to scarce zone. The distribution and the characteristic features of agro-climatic zone in district are shown

1. **Assured rainfall zone:** The assured rainfall zone comprises part of Ahmedpur, Chakur, Jalkot, and Udgir taluka with assured rainfall and light to heavy soil. A hilly track comes under these zones. The annual precipitation varies from 881 to 903 mm.

2. Moderate rainfall zones: Some parts of Latur, Renapur, Ausa, Nilanga, Sirur Anantpal, and Deoni Taluka are under moderate rainfall zones, receiving annual rainfall 700 to 800 mm with command area and heavy soils.

1.2 Tehsils details

One of the central zone districts comprising ten tehsils viz. Latur, Ausa Nilanga, Shirur Anantpal, Renapur, Udgir, Jalkot, Deoni, Ahamadpur, and Chakur, these 10 tehsils have 948 villages. The entire district of Latur is situated on the Balaghat plateau, 540 to 638 mt. from the mean sea level.

Total villages of Latur District

Sr. No	Block Name	Total Villages (No)	Sr. No	Block Name	Total Villages (No)
1	Latur	122	6	Udgir	98
2	Ausa	130	7	Jalkot	47
3	Nilanga	162	8	Deoni	54
4	Renapur	79	9	Ahamadpur	123
5	Shirur Anantpal	48	10	Chakur	85
Total			948		

(Source: SREP, 2022 of ATMA, Latur)

1.3 Demographic Information

According to the Census of population of 2011, Latur district has a total population of 24.54 lakhs; out of this total population 4.80 lakh is of SC category, 0.57 lakh is of ST category and 19.15 lakh is of General Category persons of which 12.73 lakhs are males while 11.81 lakh are females. The sex ratio is 928 females per thousand males.

Sr. No.	Name of the Block	Total Population (As per 2011 census)	% of Literacy	Male (No.)	Female (No.)	Workers (No.).				Categories (No.)		
						Agri.		Non. -Agri				
						Male	Female	Male	Female	SC	ST	Gen
1	Latur	683666	82.14	355784	327882	65695	41565	24793	73877	130749	12021	540896
2	Ausa	309571	76.77	160771	148800	66881	44907	20451	11057	52236	4092	253243
3	Nilanga	325255	76.64	167903	157352	68648	44539	22721	12779	58562	12913	253780
4	Udgir	311066	81.18	161568	149496	42710	27829	38515	15090	74641	7362	229063
5	Ahmedpur	236168	78.73	122717	113451	42551	31113	61825	9517	43274	5729	187165
6	Jalkot	87201	75.86	45058	42143	17295	10965	6162	3173	21601	1890	63710
7	Chakur	177956	77.84	92262	85694	39484	28328	10737	5625	35922	4456	137578
8	Shirur Ananlpal	83528	77.76	42904	40624	1849	1092	956	266	18772	3053	61703
9	Deoni	97598	76.37	50150	47448	21828	14756	5819	4240	19799	4263	73536
10	Renapur	142187	76.27	74023	68164	32409	22005	8228	3793	25357	1709	115121
Total		**2454196**	**77.26**	**1273140**	**1181054**	**399350**	**267099**	**200207**	**139417**	**480913**	**57488**	**1915795**

(Source: SREP, 2022 of ATMA, Latur)

1.4 Annual Average rainfall of the district

The district's climate is generally dry and subject to extremes. The district receives rainfall from south-west monsoon during the month of June to October. The average rainfall of the district is 800 mm. of this 90 % of the rainfall is from the southwest monsoon. In the monsoon season of the year 2022-23 has received highest rainfall in Chakur tehsil (765 mm) and lowest in Ausa tehsil (613 mm) of Latur district shows in following table.
(Source: District Agricultural Department office)

1.5 Maximum and Minimum temperature of the district

Annual temperature in Latur district range from 13°C to 40 °C (55 to 106 °F), with the most comfortable time to visit is in the winter, which is October to February. The highest temperature ever recorded was 45.8 °C (114.4 °F). The lowest recorded temperature was 6.9 °C (44.4 °F) in the cold season. The district is sometimes affected by cold waves in association with the eastward passage of western disturbances across north India. Mean temperature in summer is 30.9°C, in winter 22.4 °C and in the rainy season 25.7 °C.

1.6 River Network in the district

Manjra river, a tributary of river Godavari flows through the district. It originated at Balaghat range of hills in the Beed district of Maharashtra. It flows through Osmanabad and Latur district and enters into Karnataka state. There are small rivers Terna, Rena, Tawarja, Manyad, Tiru, and Lendi which form the part of Manjra River basin. *(Source: SREP 2022)*

1.7 Irrigation Potential of the district

The existing irrigation source in Latur District consists of surface irrigation source, Ground water draft and water harvesting structure. The Canal based irrigation projects in the district are nearly 175 other surface sources are village community ponds, farm ponds and Govt. reservoirs/ dams viz. percolation tank, KT Weirs, barrages, storage tanks etc. with 8142 in numbers the water harvesting structure like earthen bunds & cement check dams are about 7597. Ground water draft is from open wells & bore wells numbering about 50153 and 78205 respectively.

Latur district is benefited by two major projects namely Manjra (dam) situated in Beed district towards western part of Latur, another Lower Terna project situated in Osmanabad district towards southern part of Latur district with 4168 Ha. Irrigation potential. The completed medium irrigation project in the district is 8 viz., Gharni, Tavarja, Vhati, Sakol, Masalga, Devarjan, and Giraknal with 16858 Ha. Irrigation potential. The completed minor irrigation projects are 132 with 62737 Ha. Irrigation potential.

Apart from this one Uppar Manyad lift irrigation scheme is partially completed with present irrigation potential of 2000 Ha. Also 14 barrages KT weirs on Manjra River are incomplete with irrigation potential of 15836 Ha.

The barrages/KT weirs with 2788 Ha. Irrigation potential is in progress. The irrigation potential of about 3000 Ha. is created by the local sector (Water conservation) and Zilla parishad minor irrigation.

The gross irrigated area is 1,77,025 Ha. and net irrigated area is 1,31,797 Ha. The highest irrigated area is in Latur, second Nilanga, and third is Ahamadpur taluka. S. Anantpal, Jalkot, Deoni is at par with nearly 5500 Ha. net irrigated area

Irrigation based classification

Sr. No.	Name of the block	Total			
		Irrigated area (ha)		Rainfed area (ha)	
		Gross Irrigated area	Net irrigated area	Partially irrigated / Protective irrigation	Un-irrigated
1	Latur	32191	28392	0	3799
2	Renapur	18250	15276	0	2974
3	Nilanga	29129	22021	0	7108
4	Ausa	15349	11547	0	3802
5	Sirur Anantpal	8886	5638	0	3248
6	JaIkot	7840	5555	0	2285
7	Deoni	7651	5326	0	2325
8	Chakur	11303	6636	0	4667
9	Ahmadpur	30415	20317	0	10098
10	Udgir	16011	11089	0	4922
TOTAL		**177025**	**131797**	**0**	**45228**

(Source: DIP, Latur)

1.7 Soil formation in the district and type of soil

The district can be divided into the two zones based on soil characteristics i.e., the first zone which occurs in the eastern part of the district comprising Ahmedpur, Udgir and parts of Latur and Ausa tehsils. It consists of light and light medium soil of inferior type. They are not retentive of moisture and are therefore suitable for the cultivation of Kharif crops only. The soil in some parts of Nilanga taluka is of Lateritic type and the second zone which occurs in western part of the district comprising parts of Latur and Ausa tehsils. They are heavy deep black cotton soils. Owing to the peculiarity of the soil, both Kharif and Rabbi crops are cultivated in this zone

(Source: DIP Latur)

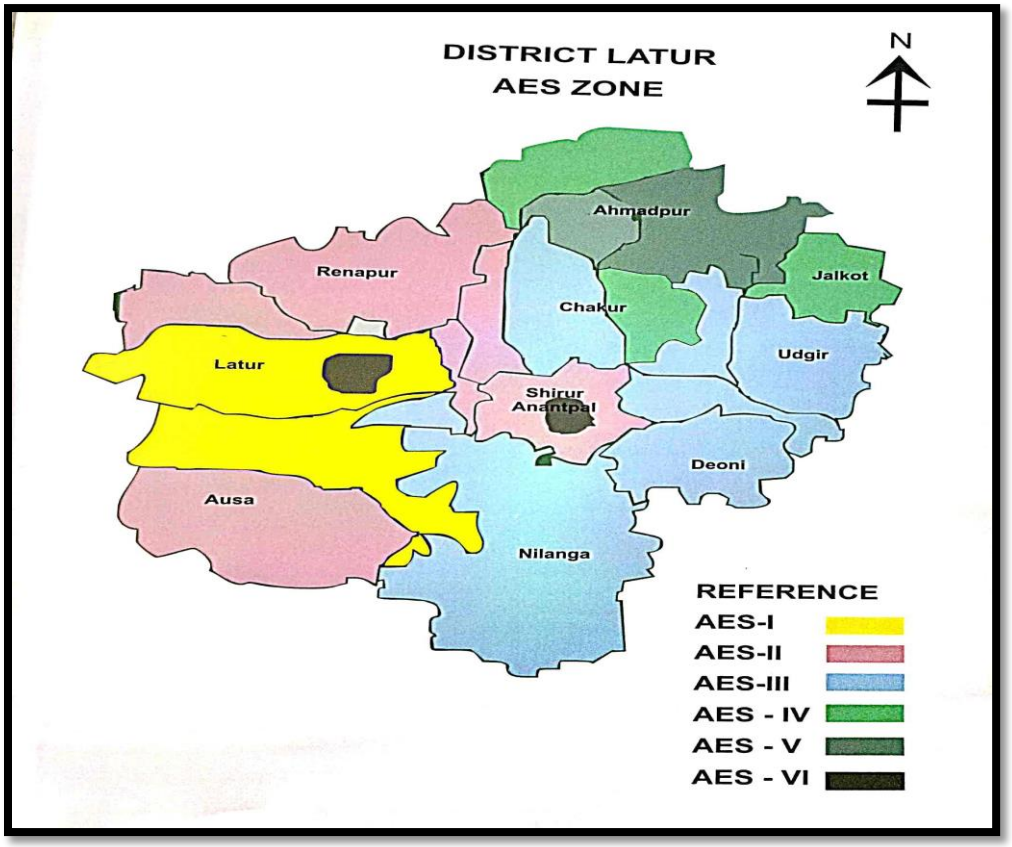
1.9 Different Zones according to revealing agro-ecological situations

According to the agro- climatic conditions, soils, ground water potential and rainfall pattern, the district was divided into four Agro Ecological Situations (AES) for the preparation of situation specific and farmer need based SREP. AES wise secondary data pertaining to affected factors taken for delineation of different AES was not available. However, on the basis of the Remote Sensing Maps provided by MRSAC and visual observations and general consensus among district core team members and scientists, the following AES were identified. In Latur district 6 major-Ecological Situations (AES) were identified based upon rainfall, soil type, topography, irrigation potential.

(Source: SREP, 2022 of ATMA, Latur)

Agro Ecological Situation	Soil Depth	Irrigation / rainfall	Special Features	Representative blocks	Crops
I	Light to medium soil	Low rainfall	Plain area	Western part of Latur and central part of Ausa	Jowar, wheat, red gram, soybean
II	Medium to heavy soil	Low rainfall	Flat area	Renapur, northern part of Shirur Anantpal And East of Latur.	Jowar, wheat, red gram, soybean
III	Medium to heavy soil	Moderate rainfall	Flat area	Nilanga, western part of Udgir, east of Chakur and Deoni	Jowar, wheat, black gram, green gram, soybean
IV	Light to Medium soil	Moderate rainfall	Hilly area	Jalkot and western part of Ahmedpur north east of Chakur	Jowar, wheat, black gram, green gram, soybean
V	Light to medium soil	Moderate rainfall	Flat area	Ahmedpur	Jowar, wheat, black gram, green gram, soybean
VI	Medium to heavy soil		Command Area	Western part of Latur and Central Part of Shirur Anantpal	Jowar, wheat, black gram, green gram, soybean

Map of AES of Latur district…



Chapter 2: Agriculture Profile of District

2.1 Land use classification of the district

No. of tehsils		10
No. of villages		949
Total Geographical Area (Ha.)		715700
Forest Area (Ha.)		3558
Land not available for Cultivation	Non-Agricultural Land (Ha.)	19127
	Barren Uncultivable Land (Ha.)	10856
	Total (Ha.)	29983
Uncultivable Land Other Than Barren Land (Ha.)		20730
Fallow Land	Current Fallows (Ha.)	41470
	Other Fallows (Ha.)	18581
	Total Fallows (Ha.)	60051
Net Area Sown (Ha.)		610844
Area Sown More Than Once (Ha.)		111633
Gross Cropped Area (Ha.)		722477
Cultivable Area (Ha.)		710405

(Source: District Social and Economic Review 2022, District Statistical Analysis Latur)

2.2 Agriculture land holdings

Distribution according to sizes.

Sr. No.	Land Holding	No. of Farmers	Total Area (Ha.)
1	Below 1.00 Ha. (Marginal farmers)	190447	99772.86
2	1.00ha to 2.00 Ha. (Small farmers)	148729	200475.01
3	2.00 to 4.00 Ha. (Semi medium farmers)	83406	238286.61
4	4.00 to 10 Ha. (Medium farmers)	11115	72178.07
5	More than 10 Ha. (Large farmers)	1042	15698.62
Total		**434739**	**626411.17**

(Source: District Social and Economic Review 2022, Latur)

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

Information on rainfed and irrigated area in the district Latur

Sr. No.	Name of the Block	Rainfed area (ha)	%	Irrigated area (Source wise)								
				Major			Medium			Minor		
				%	P	A	%	P	A	%	P	A
1	**Latur**	163818	86	69.59	10025	6977	98.3	4107	4040	99.80	5774	5763
2	**Ausa**	150663	88	74.68	3370	2517	100	1664	1664	90.5	7676	6949
3	**Nilanga**	134656	85	74.65	8420	6286	0	0	0	84.6	11237	9513
4	**Udgir**	15759	54	0	0	0	72.6	5824	0	64.78	12127	7856
5	**Ahmedpur**	83951	87	0	0	0	0	0	0	100	21886	21886
6	**Jalkot**	6712	37	0	0	0	0	0	0	72.64	9289	6748
7	**Chakur**	62623	82	0	0	0	0	0	0	94.88	10024	9511
8	**Shirur Ananlpal**	14332	54	0	0	0	74.47	6577	4898	86.3	825	712
9	**Deoni**	7398	17	0	0	0	0	0	0	100	7513	7513
10	**Renapur**	69257	80	69.59	8480	5902	74.5	5639	4205	75071	6242	4726

(Source: SREP, 2022 of ATMA, Latur)

% - Share of the total area under irrigate (%)

P - Potential area of the project (Ha.)

A – Actual area irrigated (Ha.)

Different types of Irrigation facilities/water resources available in the district.

Sr. No.	Name of the block	Rainfed area (ha)	%	Lift			Wells / Bore wells			Tank			Pond			Others		
				%	P	A	%	P	A	%	P	A	%	P	A	%	P	A
1	Latur	163818	86	8	13105	11000	12	13105	12000	4	6553	5900	2	3276	3200	1	1638	1400
2	Ausa	150663	88	9	13560	11400	15	13560	12400	5	7533	7500	3	4520	3800	1	1507	1500
3	Nilanga	134656	85	7	9426	8700	12	9426	9400	8	10772	9800	4	5386	4000	1	1347	1200
4	Udgir	15759	54	7	1103	700	4	1103	900	6	946	800	2	315	300	1	158	150
5	Ahmedpur	83951	87	8	6716	4700	15	6716	6500	7	5877	5400	3	2519	2500	1	840	700
6	Jalkot	6712	37	9	604	600	11	604	590	7	470	430	4	268	230	1	67	50
7	Chakur	62623	82	10	6262	6000	12	6262	6230	7	4384	4100	4	2505	2400	1	626	540
8	Shirur Anantpal	14332	54	11	1577	1470	17	1577	1470	6	860	800	3	430	400	1	143	140
9	Deoni	7398	17	7	518	400	13	518	510	6	444	420	4	296	240	2	148	145
10	Renapur	69257	80	8	5541	5400	14	5541	5200	7	4848	4800	3	2078	1400	2	1385	1200
Total		**709169**	**80**	**8.4**	**58412**	**50370**	**12.5**	**58412**	**55200**	**6.3**	**42687**	**39950**	**3.2**	**21593**	**18470**	**1.2**	**7859**	**7025**

(Source: SREP, 2022 of ATMA, Latur)

% -Share of the total area under irrigated (%)
P - Potential area of the project (ha)
A – Actual area irrigated (ha)

2.4 Types of crops grown, cropping Pattern, cropping intensity and farming system

The total net sown area in the district is 6,10,844 hectares of which about 1,11,633 hectares is sown more than once. More than 85% of the area exclusively comes under rained cropping. The total area under Kharif crop is 5,11,000 hectare which include Soybean, Tur and cotton while 1,59,000 hectare is under rabbi crops which include Gram, Sorghum, Safflower and Wheat. The area under summer crop is 2700 hectares. The area under Rabi season is a double cropped area that is sown more than once. Therefore, the cropping intensity of the district is 118 %.

The climate of Latur District is suitable for fruit crops. Latur, Chakur, Udgir, Ausa, Nilanga and Renapur have fruits like Mango, Grapes and pomegranates. The fruits like Guava, Chikoo, and Sweet Lime are taken in Latur, Ausa, Jalkot, Udgir and Ahmadpur. The area under fruits crops in the district is 20226 Ha which is 3.38% of the total cultivated area.

The Vegetables are mostly grown under a well irrigated area in Latur district. During Kharif Farmers mostly grow Chilli, Brinjal, Capsicum, Beams, Tomato and Onion along with vegetables that fall under the Cucurbitaccac family. During winter cauliflower, cabbage, carrot and radish are grown. The vegetables like Lady finger and Tomatoes are grown on a large scale in the summer season.

(Source: SREP Latur, district social and economic review, DSA, Latur)

2.5 Year wise area, production and productivity of major crops of last 5 years

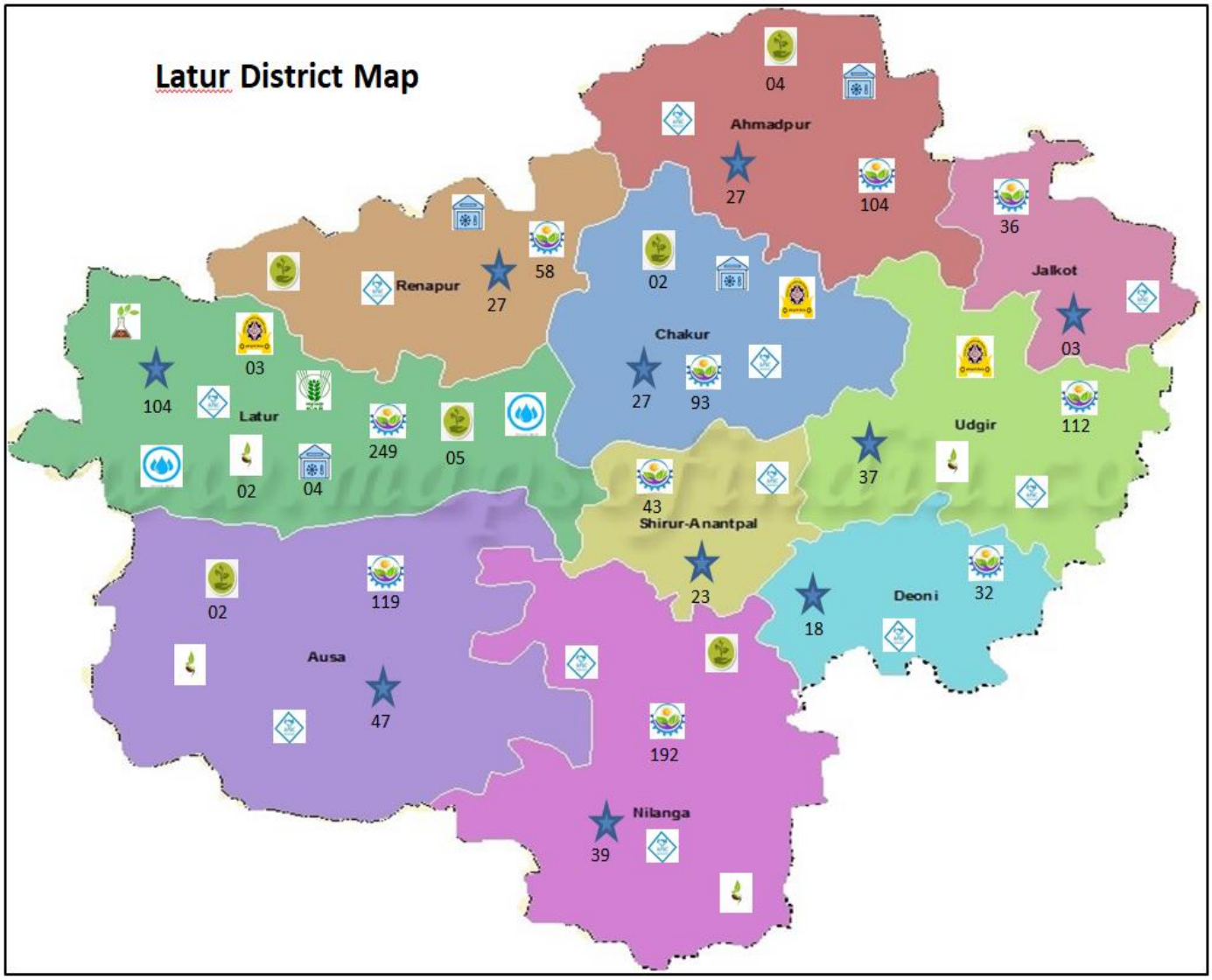
(Area in "00" Ha., Production in "00" tonnes, Productivity in Kg/ha)

Crop	2022-23			2021-22			2020-21		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
Soybean	4897.5	5397.6	1102.1	4753.8	5837.2	1227.9	4424	7742	1750
Red Gram	688.89	255.23	370.5	1154.6	739.16	640.2	1113.3	1645	1478
Black Gram	40.19	24.22	602.66	67.03	45.65	681	74.83	69	924
Rabi Jowar	315.5	393.91	1248.5	407.9	497.8	1220.4	377.64	507.28	1343
Gram	3120.1	2680.4	859.07	2331.1	2352.7	1009.3	2124.3	2165.8	1020
Cotton	61.91	173.69	476.93	79.03	126.19	271.46	79	198	427
Green gram	60.76	34.71	571.28	120.87	82.68	684.1	112.76	81	722
Sugarcane	631.58	55858	88.44	712.18	63049	88.53	301	22757	76
Wheat	131.2	158.22	1205.9	147.49	179.4	1216.3	119.92	188.26	1570

Crop	2019-20			2018-19		
	Area units	Production	Productivity	Area	Production	Productivity
Soybean	4555.6	1103	1103	4359.7	4454.8	1021.8
Red Gram	1066.4	1328.2	1222.6	1140.9	544.2	477
Black Gram	75.38	42.87	568.68	106.32	53.26	500.97
Rabi Jowar	336.93	320.16	950.22	238	162	678.9
Gram	1813.1	2038.8	1124.4	1425.8	776	544
Cotton	62.69	95.57	259.14	58.61	49.63	143.94
Green gram	113.85	51.08	448.61	162.27	71.17	438.62
Sugarcane	297.62	20327	68.3	623	37741	60.58
Wheat	90.33	58.34	645.88	87.2	33	38010

(Source: DSAO statistics department)

Different facilities available in Latur district:



1	Krushi Vigyan Kendra (1)		6	Cold Storages and Warehouse (7)	
2	Soil Testing Lab (1)		7	Farmer Producer Company (350)	
3	Nurseries (10)		8	Agricultural Produce Market Committee (APMC) (11)	
4	Seed Processing Center (5)		9	Automatic~~Autotmatic~~ Weather Station (02)	
5	College of Agriculture (5)		10	Farmer Producer Companies (356)	

2.6 Facilities available in Latur district:

Sr. No.	Taluka	Farmer Producer Companies (FPC)	Agriculture Service Centers (ASC)	Agriculture Education Institute	Cold Storages and Warehouse	Agricultural Produce Market Committee (APMC)	Nurseries of Fruit Crops
1	Latur	104	249	3	4	1	5
2	Ausa	47	119	0	0	1	2
3	Nilanga	39	192	0	0	2	1
4	Renapur	27	58	0	1	1	1
5	Shirur Anantpal	23	43	0	0	1	0
6	Udgir	37	112	1	0	1	0
7	Ahmadpur	31	104	0	1	1	4
8	Deoni	18	32	0	0	1	0
9	Jalkot	3	36	0	0	1	0
10	Chakur	27	93	1	1	1	2
Total FPC		**356**	**1038**	**5**	**7**	**11**	**15**

(Source: DSAO statistics department)

Chapter 3: Weather trend of district

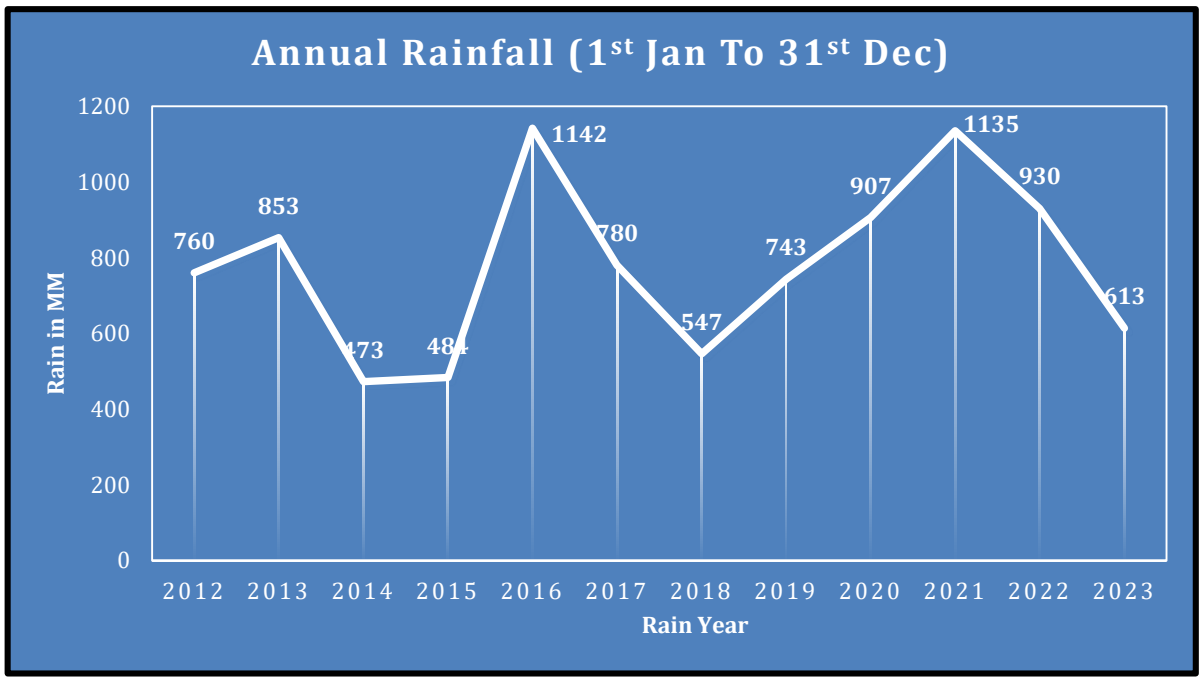
Introduction

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.

3.1Annual average rainfall of last twelve years

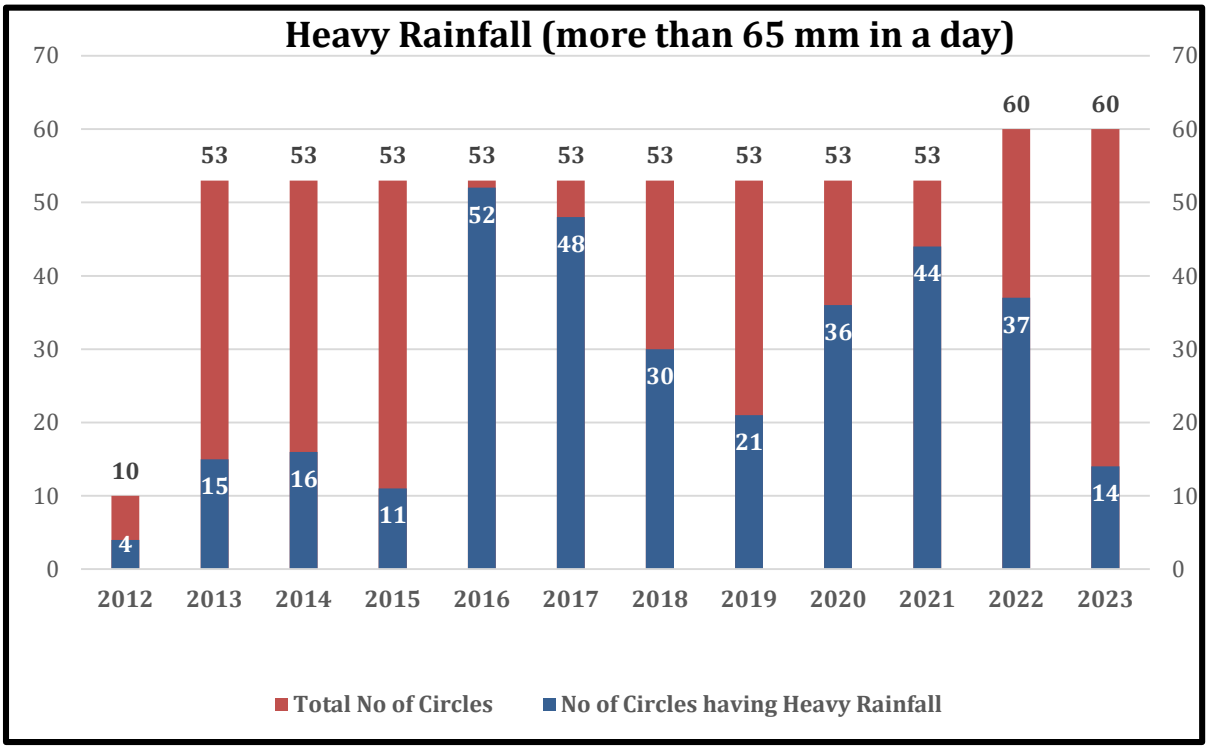
Normal or average rainfall is the amount of precipitation that we expect per year (in a given area). It is obtained and set by calculating the average (mean) of precipitation recorded in an area. Annual rainfall or precipitation is the sum of daily rainfall in a year.



The graph 3.1 presents annual rainfall data of Latur district from 2012 to 2023, highlighting fluctuations in precipitation. Notably, the lowest recorded rainfall was in year 2014 at 473 mm, while the highest occurred in year 2016 with a total of 1142 mm annual average rainfall.

3.2Heavy rainfall

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



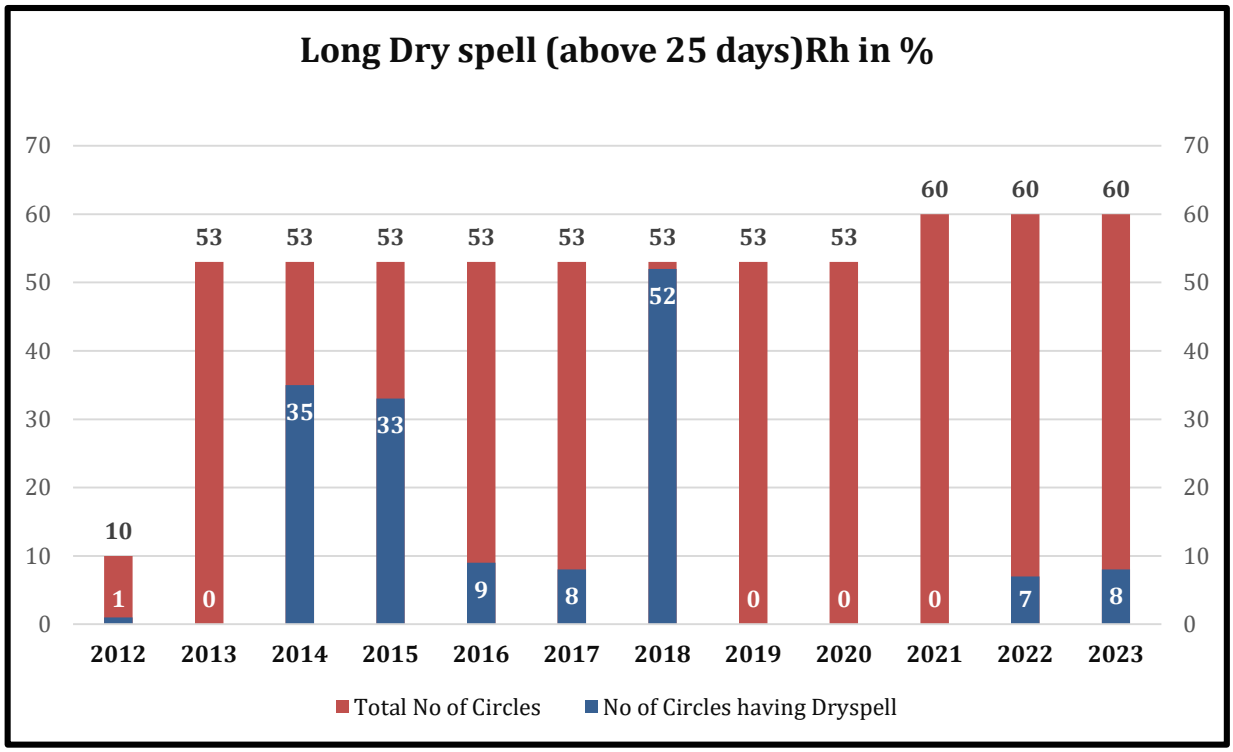
The provided graph 3.2 illustrates occurrences of heavy rainfall in circles within the Latur district from year 2012 to 2023. Notably, in year 2021, heavy rainfall affected the maximum number of circles, with 52 circles out of the 53 circles experiencing such conditions. Conversely, the year 2015 recorded a lower incidence of heavy rainfall, with only 11 circles out of the 53 circles being affected in Latur District.

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

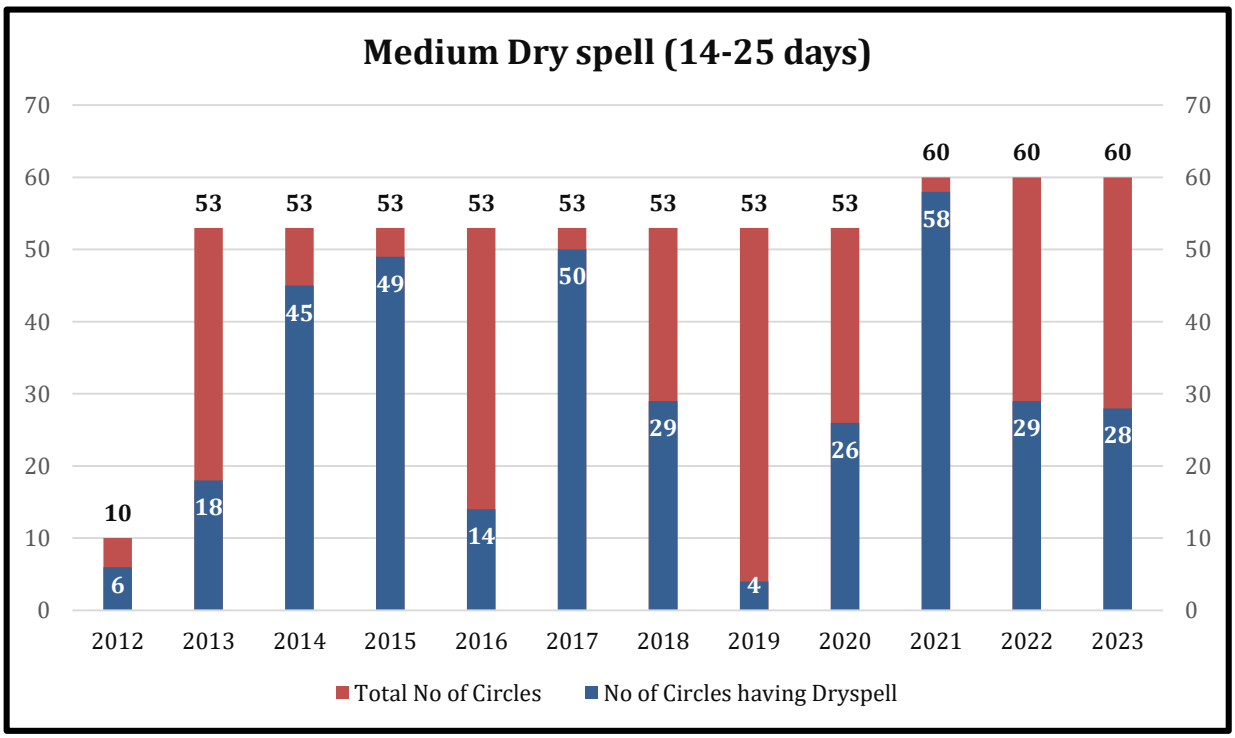
Long Dry spell is a prolonged period above 25 days of dry days in monsoon period



A graph (Graph 3.3.1) that shows the trend of long dry spells observed in a Latur 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 2018, 52 circles out of 53 circles in the district experienced long dry spells. Conversely, in year 2013, 2019, 2020 and 2021, there was no long dry spell, across all circles in the district.

3.3.1 Medium Dry spell

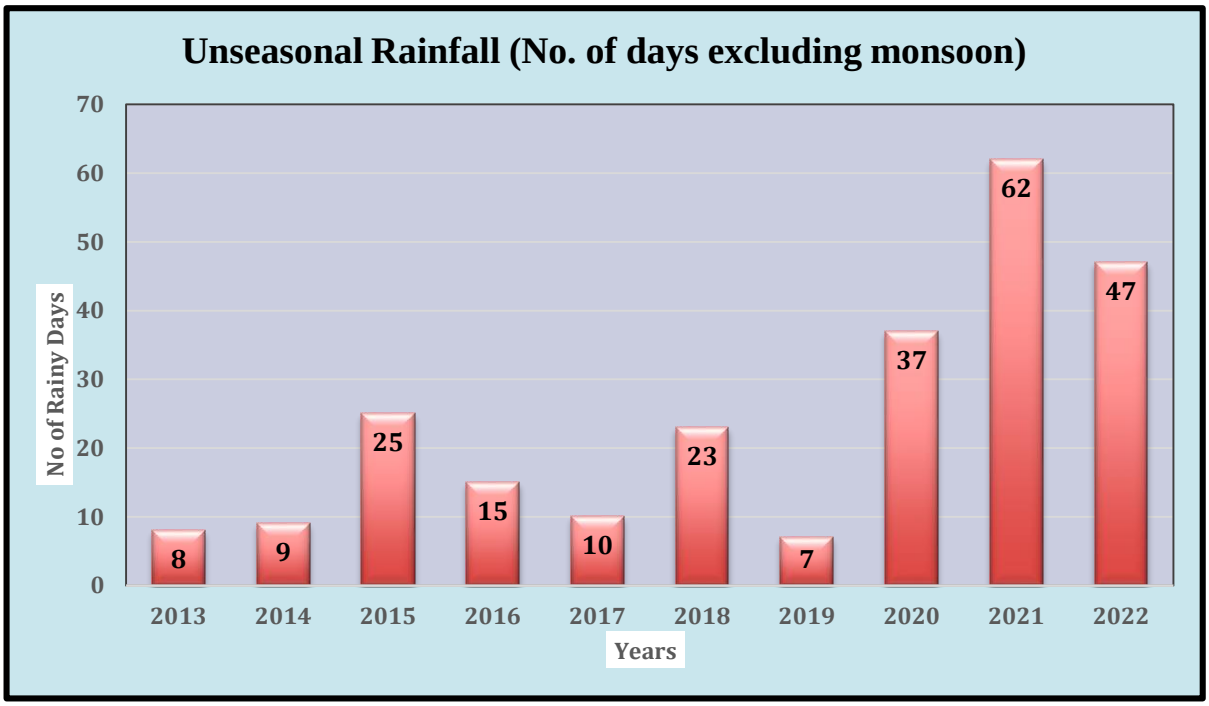
Medium Dry spell a period of 14-25 days of dry weather.



A graph (Graph 3.3.2) that shows the trend of medium dry spells observed in a Latur district. The data covers the total number of circles and the circles that affected medium dry spell (14 to 25 days) in Latur district from the year 2012 to 2023. The graph shows that in year 2021, 58 circles out of 60 circles in the district experienced medium dry spells. Conversely, in year 2019, there was only 4 circles out of 53 circles experienced medium dry spell in the district.

3.3Unseasonal rainfall.

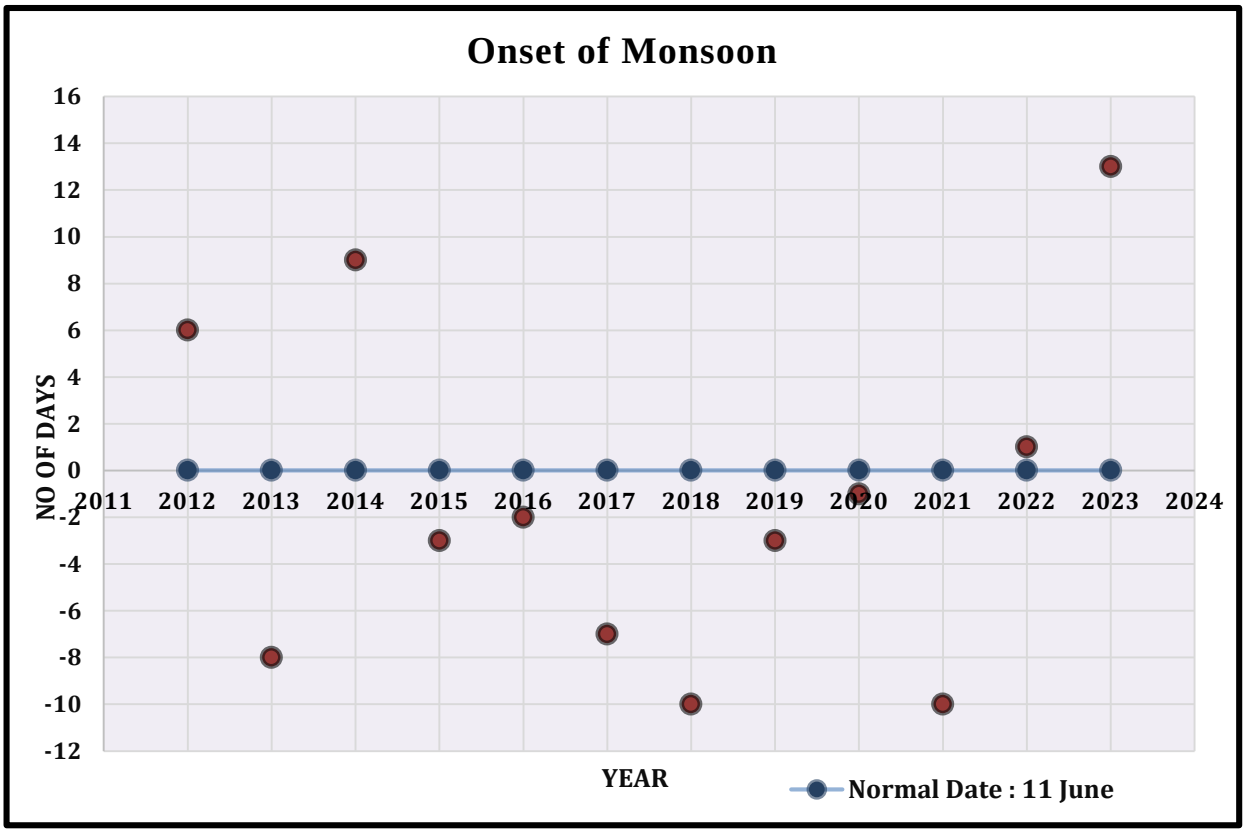
Rainfall received during non mosoon days is treated as unseasonal rainfall. Unseasonal rains- when there is a sudden change in atmospheric pressure, it can result in precipitation, even during non-monsoon seasons.



The graph 3.4 illustrates the annual occurrences of unseasonal rainfall in the Latur district from year 2013 to 2022. The data reveals a variation ranging from 7 days to 62 days of unseasonal rainfall.

3.4Monsoon 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 11th June in Latur district.

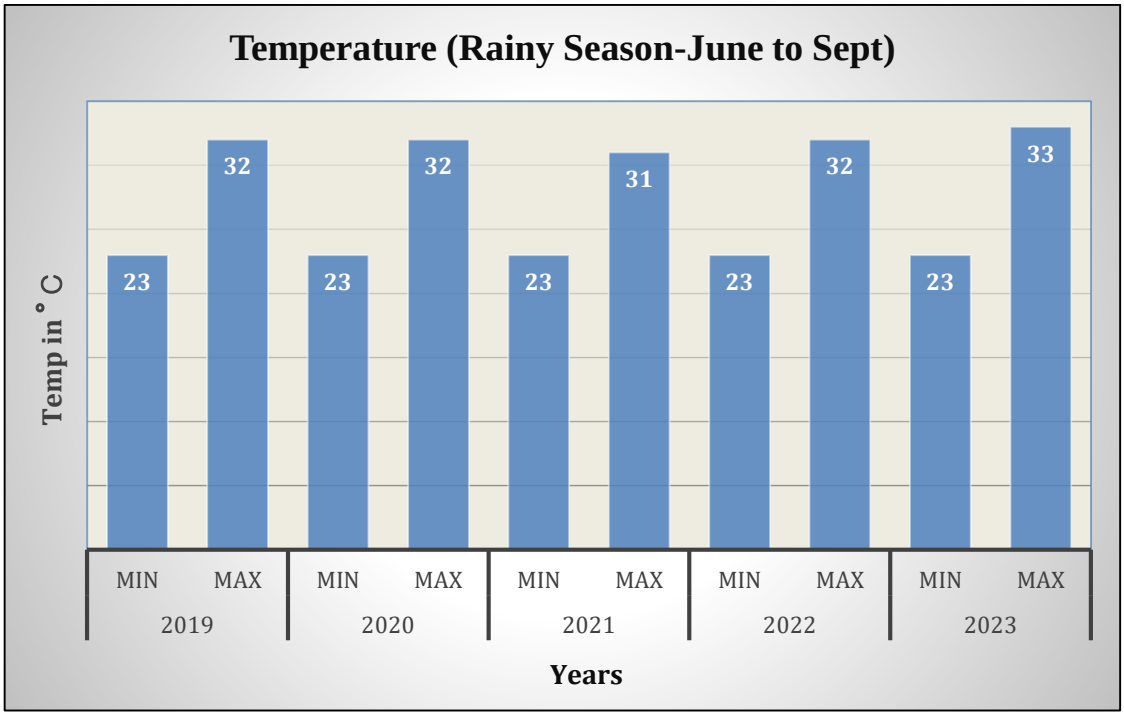


The graph 3.5 depicts the annual onset of the monsoon. The blue line represents the normal day of onset of monsoon. The onset days show variations ranging from -13 to 10 days. Notably, in year 2012, 2014, 2022 and 2023 the monsoon arrived delayed than the normal onset date. However, in remaining years the monsoon was notably arrived earlier.

3.5Temperature.

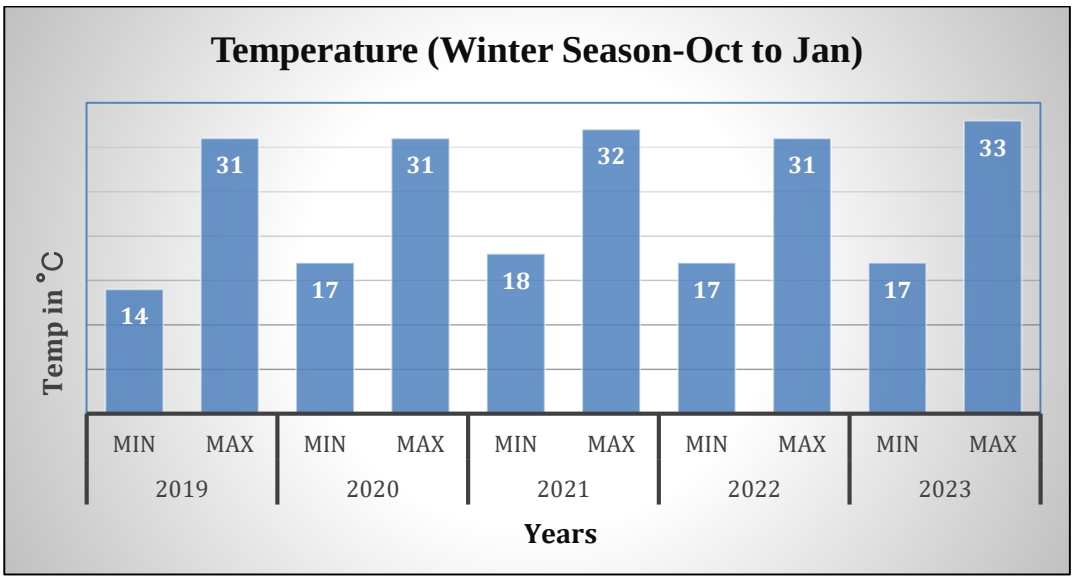
Annual temperature in Latur district range from 13°C to 40 °C (55 to 106 °F), with the most comfortable time to visit is in the winter, which is October to February. The highest temperature ever recorded was 45.8 °C (114.4 °F). The lowest recorded temperature was 6.9 °C (44.4 °F) in the cold season. The district is sometimes affected by cold waves in association with the eastward passage of western disturbances across north India. Mean temperature in summer is 30.9°C, in winter 22.4 °C and in the rainy season 25.7 °C.

3.6.1 Temperature (Rainy Season-June to Sept)



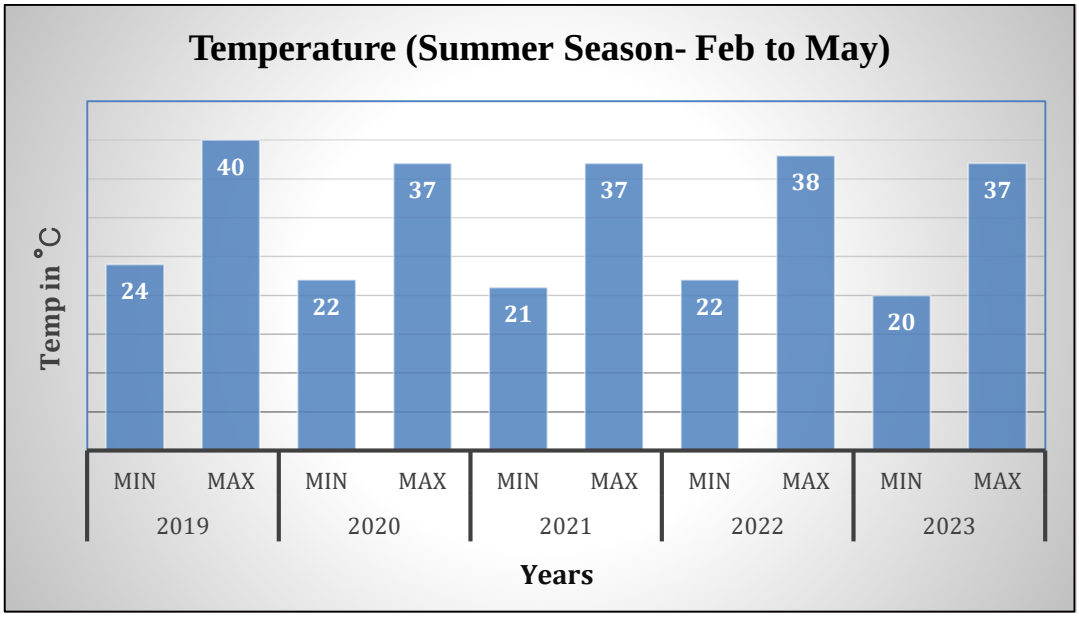
The graph 3.6.1 presents the temperature in the Latur district during the rainy season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures 23 °C and maximum temperatures ranging from 31-33 °C.

3.6.2 Temperature (Winter Season-Oct to Jan)



The graph 3.6.2 presents the temperature in the Latur district during the winter season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 14-18 °C and maximum temperatures ranging from 31-33 °C.

3.6.3 Temperature (Summer Season- Feb to May)

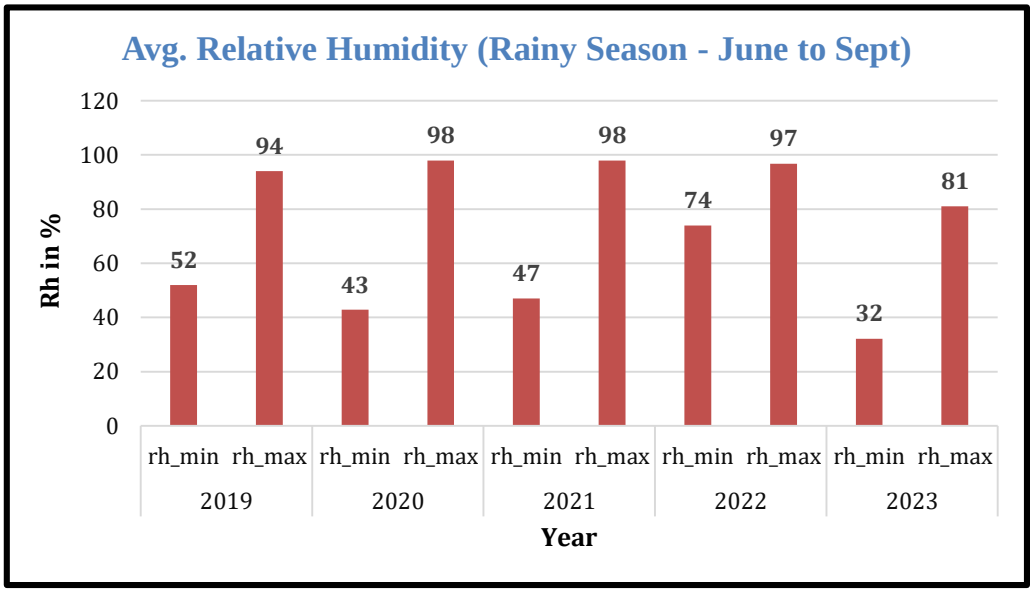


The graph 3.6.3 presents the temperature in the Latur district during the summer season from 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 20-24 °C and maximum temperatures ranging from 37-40 °C.

3.6 Relative Humidity

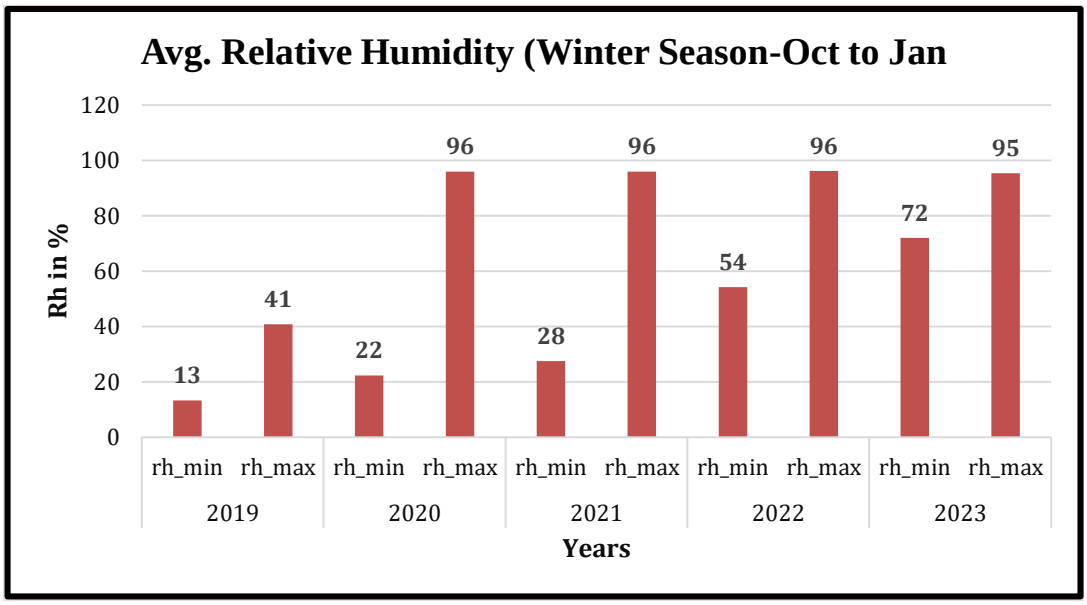
Relative Humidity is the ratio of the actual quantity of moisture at a certain temperature and pressure to the maximum it can hold at the same temperature and pressure. It is usually multiplied by100 and expressed in percent.

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



The graph 3.7.1 illustrates humidity levels during the rainy season in the Latur district, revealing a variation in minimum humidity from 32% to 74% and maximum humidity ranging between 81% and 98%.

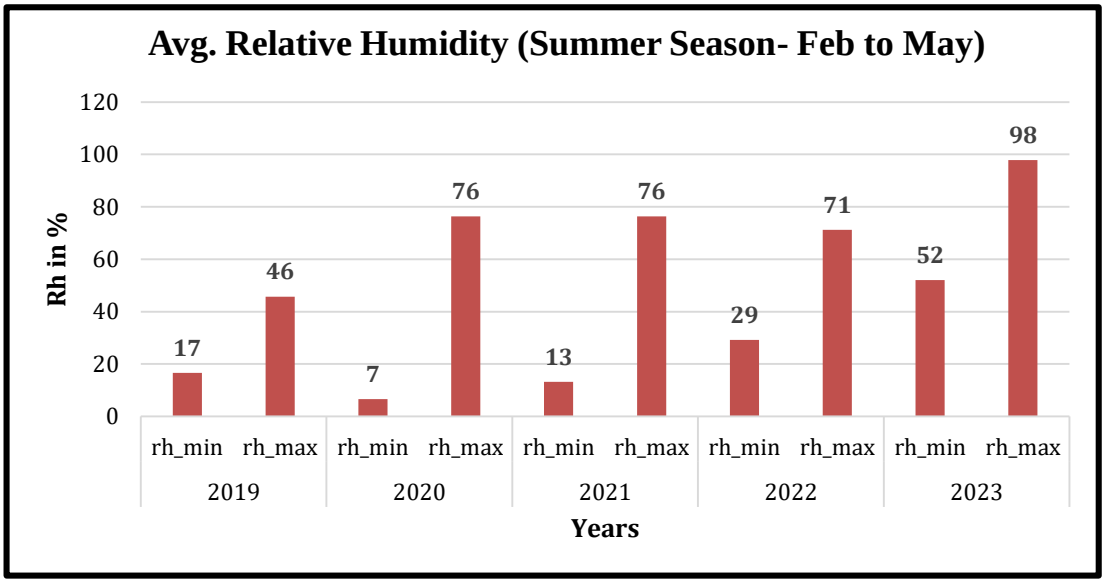
3.7.2 Avg. Relative Humidity (Winter Season-Oct to Jan)



The graph 3.7.2 illustrates humidity levels during the winter season in the Latur district, revealing a variation in minimum humidity from 13% to 72% and maximum humidity ranging between 41% and 96%.

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 the Latur district, revealing a variation in minimum humidity from 7% to 52% and maximum humidity ranging between 46% and 98%.

Chapter 4: Impact of Climate Variability on agriculture production

Sr. No	Climate Variability	Kharif			Rabbi	
	Crop	**Soybean**	**Tur**	**Cotton**	**Gram**	**Wheat**
A	**Impact of Temperature**					
1	Crop Growth and Yield	1)Stunted vegetative growth due to rising temperature and rainfall variability during season.	1)Stunted vegetative growth due to rising temperature and rainfall variability during season.	1) Stunted vegetative growth due to rising temperature and rainfall variability during season.	1) Crop performs better in **26-32**°C temperature but below and above affects the germination of crop.	1) Ideal Temperature requires to crop for germination **10-15** °C **but** High temperature during sowing causes less germination.
		2) Heat Stress decreases No. of branches and number of flowers during growth of crop.	2) Low temperature followed by instant heat stress results to Flower dropping in Tur which **reduces 15-20%** yield.	2) Reddening of Leaves observed in cotton crop due to high temperature effects during vegetative growth of crop.	2) Due to change in Climate like temperature, precipitation, long dry spell and drought situation Stunted vegetative growth of crop.	2) High temperature causes vegetative growth and grain development due to unavailability of moisture during vegetative stage of crop.

		3) The optimum soil temperature for germination and early seedling growth of soybean is **25 to 30°C.** With temperatures of **35°C** and above considered inhibitory to production.	3) Pigeon pea can be grown with a temperature ranging from **26°C to 30°C** in the rainy season and **17°C to 22°C** in the post rainy. With temperature of below and above results to flower drop and small grain size.	3) Cotton requires uniformly high temperature between **21-30°C.** High temperature, especially more than 30°C, reduces the boll retention, Dropping of square and thus final yield	3) Soil temperature of 30°C or above adversely affects the nitrogen fixation process by the rhizobia which Effect on flower setting and pod formation. Gram also experiences drought stress at various growth stages; terminal drought, along with heat stress at flowering and seed filling can reduce yields by **40–45%**	3) Projected increases in temperatures, changes in precipitation patterns, changes in extreme weather events, and reductions in water availability may all result in reduced wheat productivity. Low soil moisture, high temperature and higher bright sun shine hours hasten maturity and shorten the reproductive period from flowering to maturity time.
		4) Climate change would lead to a 20% decline in soybean yields	4)The regression of yield on weather variables shows that increase in maximum temperature is harmful for the crop whereas the minimum temperature and rainfall show Yield Losses up to **20%**	4)Higher temperatures will eventually reduce yields and increase the prevalence of pests and diseases. Changes in precipitation are likely to lead to crop failures and production declines. Cotton being a **C3 plant** and a heat-sensitive plant, the	4) Gram also experiences drought stress at various growth stages; terminal drought, along with heat stress at flowering and seed filling can reduce yields by 40–45%	4) High temperature causes a high rate of transpiration, which causes drought that ultimately leads to low productivity. Yield losses up to **20% to 40%**

				yield of cotton is affected by **10–17%**		
2	Water Availability	1)Water level Decrease	1)Water level Decrease	1)Water level Decrease	1)Water level Decrease	1)Water level Decrease
		2) Soil cracking	2) Soil cracking	2) Soil cracking	2) Soil cracking	2) Soil cracking
		3)Wilting of Crop	3) Wilting Of Crop	3) Wilting of Crop	3)Wilting of Crop	3)Wilting of Crop
		4) Stress on Crop	4) Stress on Crop	4) Stress on Crop	4) Stress on Crop	4) Stress on Crop
3	Pest and diseases infestation	1) Increase incidence of sucking pest	1) Shedding of flower	1) Increase incidence of thrips and white fly	1) Shedding of flower	1) Increase infestation of stem borer & smut diseases
		2) Infestation of stem fly increase	2) Increase incidence of leaf roller.	2) Infestation sucking pest increase	2) Incidence of pod borer increase	2). Increase incidence of sucking pest
		3) Increase incidence of white fly attack & curling of leaves	-	-	-	

Sr. No	Climate Variability	Kharif			Rabbi	
		Crop	**Soybean**	**Tur**	**Cotton**	**Gram**
B	**Impact of rainfall on**					
1	**Crop growth and yield**	Low Rainfall: Stunted growth, Yield loses. High Rainfall: waterlogging, stunted growth, yield losses, Shedding of flowers. It varies by crop growth stages.	Low Rainfall: Stunted growth. High Rainfall: wilting, shedding of flowers.	Low Rainfall: Stunted growth, Yield loses. High Rainfall: Yellowing of crops, waterlogging. Shedding of flowers.	Low Rainfall: Stunted growth, Yield loses. High Rainfall: Yellowing of crops, waterlogging. Shedding of flowers.	Low Rainfall: Insufficient rainfall can lead to water stress, affecting wheat growth, tillering, and grain development, potentially resulting in lower yields. High Rainfall: High humidity associated with abundant rainfall can increase the risk of fungal diseases, such as rusts and blights, affecting wheat crops.
2.	**Irrigation supply**	1) Soil cracking	1) Soil cracking	1) Soil cracking	1) Soil cracking	1) Soil cracking
		2)Water level decrease	2) Water level decrease	2) Water level decrease	2) Water level decrease	2) Water level decrease
		3) Stress on crop	3) Stress on crop	3) Stress on crop	3) Stress on crop	3) Stress on crop
		4) Wilting of crop	4) Wilting of crop	4) Wilting of crop	4) Wilting of crop	4) Wilting of crop
	a) Drought	In Latur district the year of 2014-15 and 2015-16 drought prone years having crop losses around 60 to 75 %				
	b) Flood	1) Yield losses up to 40%	1) Yield losses up to 30%	1) Yield losses up to 50%	1) Yield losses up to 40%	1) Yield losses up to 50%

3	**Pest and disease infestation and its management**	1) The infestation of sucking pest such as whiteflies, Jassids and mite has increased tremendously, so expenditure on management of insect-pests which were found in increasing order. 2) The viral diseases infections such as YMV and mosaic are tremendously due to increase in insect vector populations, which is major cause in yield reduction particularly cultivars such as KDS-726.	1) The Pod borer and pod fly incidences in pigeon pea were positively increases with increase in temperature 2) The wilt disease incidence initiated with the flowering of Pigeon pea in the last of October and gradually increased with the sudden increase in temperature. The sudden increase in temperature and relative humidity and heavy rainfall plays an important role in increase infection of Phytophthora. The Phytophthora blight appeared in the last week of July after heavy rains where maximum temperature was 32.5 and relative humidity was 78.5 per cent.	1)The major pests that occur in cotton are aphids, jassids, whitefly, thrips, pink bollworm, American bollworm etc. 2) The major diseases on cotton are bacterial blight, Alternaria leaf spot, fusarium wilt etc.	1) The major pest occurring on gram is pod borer, semilooper, cutworm. etc. 2) The major disease on gram are Alternaria blight, collar rot, fusarium wilt, dry root rot etc	1) The major pests that occur on wheat are termites and armyworms etc. 2) The major diseases on wheat crops are crown and root rot, leaf rust etc.
4	Soil erosion	1) Fertile soil and nutrient losses due to flood and leaching	1)Fertile soil and nutrient losses due to flood and leaching	1)Fertile soil and nutrient losses due to flood and leaching	1)Fertile soil and nutrient losses due to flood and leaching	1)Fertile soil and nutrient losses due to flood and leaching
5	Harvest & Storage	1)Pod size decrease	1)Pod size decrease	1) Boll rot	1)Pod size decrease	1)Yield losses up to 50%
C. Impact of Other Calamities (Cyclones and hail storms etc.)						
	Crop Damage and Loss	1) Yield losses up to 40%	1) Yield losses up to 40%	1) Yield losses up to 40%	1) Yield losses up to 40%	1) Yield losses up to 40%

(Source: KVK, Latur)

Chapter 5: Measures to cope with climatic variability

5.1 Recommendation of Universities

Sr. No.	Climate Variability	Kharif			Rabbi	
	Crop	Soybean	Tur	Cotton	Gram	Wheat
1	**Heavy Rainfall**	1) Excess water should be drained out 2) Use BBF technology yield increases 10 to 15% 3) Use of Precision Tool Planter (Token Yantra) yield increases up to 20%. 4)Fungicide spraying	1) Excess water should be drained out 2) Trichoderma drenching 3) Use BBF technology yield increases 10 to 15% 4) Short duration variety	1) Excess water should be drained out 2) Seed treatment 2) Application of fertilizer 4) Use BBF technology	1) Excess water should be drained out 2) Use BBF technology yield increases 10 to 15% 3)Use of Precision Tool Planter (Token Yantra) yield increases up to 20%.	1) Excess water should be drained out 2) Short duration variety
2	**Low rainfall**	1) Across sowing on a slope 2) Dead furrow 3) Short duration variety 4) Use BBF technology 5) Use of Precision Tool Planter (Token Yantr a)yield increases up to 20%.	1) Nipping of apical bud 2) Across sowing on a slope 3) Dead furrow, short duration variety 4) Use BBF technology	1) Across sowing on a slope 2) Dead furrow 3) Short duration variety 4) Use BBF technology	1) Nipping apical bud 2) Use BBF technology	1) Selection of short duration variety
3	**Dry spells / water stress**	1) Protective irrigation 2) Farm pond 3) Foliar spray of nitrogen fertilizers and micronutrients	1) Protective irrigation 2) Farm pond 3) Foliar spray of nitrogen fertilizers and micronutrients	1)Protective irrigation 2)Application of ammonium nitrate potassium phosphate 3) Application of fertilizer 4) Mulching	1) Protective irrigation during critical crop stage	1) Protective irrigation during critical crop stage

				5) Irrigation through Micro Irrigation Systems		
4	**Terminal Drought**	Spraying potassium phosphate & drenching. Application of micro nutrient	1) Spraying potassium phosphate &drenching 2) Application of micro nutrient	1) Spraying potassium phosphate drenching 2) Application of micro nutrient	Spraying potassium phosphate &drenching. Application of micro nutrient	1) Spraying potassium phosphate &drenching 2) Application of micro nutrient
5	**Late onset of monsoon**	1) Selection of short duration variety 2)Intercropping soybean + tur	1) Selection of short duration variety 2) Intercropping soybean + tur	1) Selection of short duration variety	1) Selection of short duration variety	1) Selection of short duration variety
B	**Temperature condition**					
1	**High Temperature**	1) Spraying potassium phosphate & drenching 2) Application of micro nutrient	1) Spraying potassium phosphate & drenching 2) Application of micro nutrient	1) Application of micro nutrient	1) Spraying potassium phosphate & drenching 2) Application of micro nutrient	1) Spraying potassium phosphate & drenching 2) Application of micro nutrient
2	**Cold waves/low temperature**	1) Irrigation in night 2) Application of vermicompost and FYM	1) Irrigation in night 2) Application of vermicompost and FYM	1) Irrigation in night 2) Application of vermicompost and FYM	1) Irrigation in night 2) Application of vermicompost and FYM	1) Irrigation in night 2) Application of vermicompost and FYM
C	**Hailstorms**	1) Use of hail net 2) Use dwarf variety	1) Use of hail net 2) Use dwarf variety	1) Use of hail net 2) Use dwarf variety	1) Use of hail net	1) Use of hail net 2) Use dwarf variety
D	**Soil degradation**	1) Horizontal sowing on a slope 2) Opening dead furrow 3) Nala Bunding	1)Horizontal sowing on a slope 2) Opening dead furrow 3) Nala Bunding	1)Horizontal sowing on a slope 2) Opening dead furrow 3)Nala Bunding	1)Horizontal sowing on a slope 2) Opening dead furrow 3)Nala Bunding	1)Horizontal sowing on a slope 2) Opening dead furrow 3)Nala Bunding

(Source: KVK, Latur)

5.2 Best practices developed by farmers in the district

- **Use of BBF method for soybean cultivation**: In 376 villages of Latur district 32532 farmers have been cultivating soybean crop on area of 21360 Ha. by adopting BBF technology in kharif season 2022-23.

BBF Plot - Deepak MohanKumar Patil at. Sakol, Taluka Shirur-Anantpal, Latur

- **Use of dibbling method in soybean cultivation**: In 203 villages of Latur district 11910 farmers have been cultivating soybean crop on an area of 9060 Ha. by adopting BBF technology in kharif season 2022-23.

- **Improved Seed Varieties**: Farmers have adopted modern and climate-resilient seed varieties that are better suited to the local environment. This includes drought-tolerant and pest-resistant varieties. *Total 8569 farmers have benefited of Rs. 869.98 Lacks under Nanaji Deshmukh Krushi Sanjivani Project in Latur district.*

- **Organic Farming Practices**: Organic farming methods have gained popularity among some farmers in Latur. They use natural fertilizers, compost, and bio-pesticides to reduce chemical inputs and promote soil health. Total 1488 farmers have benefited of Rs. 66.58 Lacks under Nanaji Deshmukh Krushi Sanjivani Project in Latur district

- **Drip and Sprinkler Irrigation**: Farmers have adopted drip and sprinkler irrigation and other water efficient techniques to maximize water use in crop production. This approach helps in conserving water resources and improving crop yields. Total 5735 farmers has been benefited of Rs.4180.28 Lakhs for drip irrigation and Total 22695 farmers has been benefited of Rs.4332.54 Lakhs for sprinkler irrigation under Nanaji Deshmukh Krushi Sanjivani Project in Latur district

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

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 Latur 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	1437	1251	1325	1000	968	868	778	682
2020	1572	1346	1354	1154	820	690	1589	1362
2021	1431	1156	664	569	684	444	1663	1288
2022	1793	1250	-	-	1230	883	1815	1403
Average	**1558.25**	**1250.75**	**1114.33**	**907.67**	**925.50**	**721.25**	**1461.25**	**1183.75**

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 24.59% 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 22.77% 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 28.32% 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 23.44% compared to the control plot.

6.3 Impact of BBF on crops yield

1. The BBF method improves soil and water conservation of the field.
2. The BBF method works well in dry and wet spells. In dry spell it increases the period of wilting of crops by making available conserved moisture and in wet spell it protects crops by draining excess water through furrows to maintain proper soil water ratio.
3. It enhances fast root growth as crops are being planted on beds, increasing the number of pods which ultimately results in increased crop production.
4. It improves crop aeration and sunlight results reduce insect pest attack on crops.
5. Inter-row cultivators have an added advantage of mechanized intercultural operation, thus reducing time of operation cost and labor.
6. Reduces labor cost of thinning and gap filling.
7. Open furrow can be well utilized for installation of a sprinkler set.

Soybean cultivation on BBF Technology Dibbling Method

Sowing of soybean Crop by BBF and Dibbling Method in Latur District

Taluka	BBF Technology			Dibbling Method		
	No Of Village	No Of Farmers	Area (Ha.)	No Of Village	No Of Farmers	Area (Ha.)
Latur	45	4720	2740	22	1580	1240
Ausa	52	5300	4210	25	1950	1570
Nilanga	63	4832	2620	34	1440	1020
Renapur	25	2710	2100	12	1020	810
Shirur Anantpal	20	1580	1210	15	650	450
Udgir	42	3820	2800	24	1620	1310
Jalkot	21	2150	910	11	540	350
Deoni	22	1740	840	10	410	280
Ahmadpur	45	3120	2280	26	1670	1310
Chakur	41	2560	1650	24	1030	720
Total	**376**	**32532**	**21360**	**203**	**11910**	**9060**

(Source: DSAO Statistics Department)

BBF Technology impact on yield of Crops:

Sr. No.	Season	Crop Name	Crop Average Yield (KG/Acre)		Increase Yield (KG/Acre)	Increase Yield in %
			Control Plot	BBF Plot		
1	Kharif	Soybean	875	1125	250	28.57
		Tur (Intercrop)	650	850	200	30.77
2	Rabbi	Gram	650	810	160	24.62
		safflower	510	630	120	23.52

6.4 Impact of Zero Tillage on crops yield:

- Reduce soil erosion from wind and water. (because the mulch cover of previous crops covers the soil)
- Less soil compaction.
- More fertile and resilient soils.
- Reduce moisture evaporation.
- Lower fuel and labor cost.
- Zero tillage saves farmers money by reducing the cost of intensive cultivation.
- It improved soil water infiltration capacity.
- It reduces soil erosion in high-risk areas.
- This practice is more prevalent in humid areas where wind and water erosion are more likely.
- It improved the soil's organic matter retention capacity.
- It makes the soil more biologically resilient and fertile.
- It increases efficiency by reducing the time required to sow seeds in crop cultivation.

SRT Plot - Sudhir Ramdas Mekle At. Gharni Taluka Chakur, District - Latur

6.5 Impact of Neem based extracts on yield of crops

- Neem-based extracts, derived from the neem tree (Azadirachta indica), have been used in agriculture as a natural and eco-friendly approach to pest and disease management. These extracts can have a positive impact on crop yield.
- **Pest Control**: Neem-based extracts contain compounds like azadirachtin that have insecticidal properties. When used as a natural pesticide, neem extracts can help control a wide range of crop-damaging pests, such as aphids, whiteflies, and leafhoppers. By reducing pest infestations, crop damage is minimized, leading to higher yields.
- **Disease Management**: Neem extracts also have antifungal properties, which can be effective in managing fungal diseases like powdery mildew and rust. Preventing or reducing the incidence of these diseases can result in healthier plants and higher crop yields.
- **Nematode Suppression**: Neem-based products can help suppress plant-parasitic nematodes, which are a common problem in many crops. Nematode damage to plant roots can be reduced, allowing crops to access nutrients more efficiently and ultimately leading to increased yields.
- **Plant Growth Promotion**: Neem extracts can have plant growth-promoting effects. They may enhance root development, nutrient uptake, and overall plant health. Stronger and healthier plants are more productive and can yield higher quantities of quality crops.
- **Reduction in Chemical Pesticide Use**: By using neem-based extracts as an alternative to synthetic chemical pesticides, farmers can reduce the negative impacts of chemical residues on the environment and beneficial non-target organisms. This can create a more balanced ecosystem, allowing natural predators to thrive and help control pests, which can indirectly lead to increased crop yields.

- **Economic Benefits**: Neem-based extracts are often more cost-effective than synthetic pesticides. Using them can reduce the cost of pest and disease management, leading to greater profitability for farmers.
- **Marketability**: Crops grown using neem-based extracts are often perceived as more environmentally friendly and may command premium prices in the market due to their reduced chemical residue content.
- **Residual Activity**: Neem-based extracts may have longer residual activity than some chemical pesticides, providing prolonged protection against pests and diseases, which can lead to better yield protection

Cost saving of Neem ark spraying on crops

Sr. No.	Season	Crop Name	Spraying of Neem ark on crops		
			Cost of insecticide on control plot (Rs./ acre)	Cost of Neem ark on FFS plot (Rs./ acre)	Saving of Cost on insecticide spraying (Rs./ acre)
1	Kharif	Soybean	1850	30	1820
		Tur (Intercrop)	1750	30	1720
2	Rabbi	Gram	1250	30	1220
		Jowar	1285	30	1255

FFS Facilitator giving information about neem ark extract in FFS class…

6.6 Impact of on form bio fertilizer production on crop yield

- The effectiveness of on-farm bio-fertilizer production depends on various factors, including the choice of bio-fertilizer strains, soil conditions, crop varieties, and proper application techniques.

Farmers should conduct soil tests, monitor crop response, and adjust their bio-fertilizer production and application practices accordingly to maximize the

Rhizobium seed treatment on Soybean seeds

- positive impact on crop yield. Additionally, bio-fertilizers may work best when used in conjunction with other sustainable farming practices and integrated pest management strategies.
- **Improved Nutrient Availability**: Bio-fertilizers can fix atmospheric nitrogen and solubilize phosphorus and other essential nutrients, making them available to plants. This enhances nutrient uptake and utilization by crops, leading to increased yield.
- **Enhanced Soil Health**: The use of bio-fertilizers contributes to improved soil health and microbial diversity. Healthy soils with a diverse microbial community promote better nutrient cycling and nutrient retention, which is conducive to higher crop yields.
- **Increased Crop Quality**: In addition to higher yields, bio-fertilizers can contribute to better crop quality, such as improved taste, nutritional value, and disease resistance, which can be valuable in the market.
- **Cost Savings**: Producing bio-fertilizers on-farm can reduce the need to purchase commercial fertilizers, resulting in cost savings for farmers, which can be reinvested in other aspects of farming.

Useful bacteria for organic farming and their uses

- Rhizobium: These bacteria live in nodules on the roots of dicotyledonous pulses, oilseeds and provide nitrogen (N) from the air to the crops.
- PSB (Phosphate Solubilizing Bacteria): These bacteria dissolve phosphorus in the soil (P) Speeds up the process of making crops available.
- KSB (Potassium Solubilizing Bacteria): These bacteria speed up the process of making potassium (K) in the soil available to the crops.
- Waste Decomposer: These bacteria accelerate the decomposition process, Uses- Compost Manure, Decompose Mulch.

Demonstration of Rhizobium seed treatment on Soybean seeds (Kharif season 2022-23)

Taluka	Biofertilizer seed treatment	
	Demonstration	Farmer
Latur	15	350
Udgir	32	620
Ahmadpur	49	790
Jalkot	14	231
Devni	10	161
Shirur Anantpal	26	318
Ausa	52	870
Nilanga	50	580
Renapur	67	405
chakur	64	256
Total	**379**	**4581**

Chapter 7: Plan to cope with weather related contingencies of Beed 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	**Major Farming situation**	**Normal Crop/Cropping system**	**Suggested Contingency measures**		
Early season drought (delayed onset)			**Change in Crop/Cropping system**	**Agronomicmeasures**	**Remarks on Implementation**
Delay by 2 week (Specify month) * **June 4th week**	Medium deep to deep black soils	Soybean	No Change	No Change	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Sorghum	No Change	No Change	
		Pigeon pea	No Change	No Change	
		Black gram	No Change	No Change	
		Green gram	No Change	No Change	
	Shallow black soils	Soybean	No Change	No Change	
		Sorghum	No Change	No Change	
		Pigeon pea	No Change	No Change	
		Black gram	No Change	No Change	
Delay by 4 week (Specify month) **July 2nd week**	Medium deep to deep black soils	Soybean	No change / Soybean+ pigeon pea 4:2 row proportion (MAUS 71,81) +(BSMR 736, 853, BDN 708, 711)	Normal package of practicesrecommended by MAU, Parbhani Open furrow every after 2 to 4 rows of soybean with Balram plough.	• Linkage with MAU, MSSC, NSC, NFSM and Village seed productionprogramme for seed. • Linkage with MAIDC, ZILLA PARISHAD for implements.
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP-92901) + (BSMR 736, 853, BDN 708, 711)	Normal package of practicesrecommended by MAU, Parbhani	

		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335, MAUS-71,81) + (BSMR 736, 853, BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani Open furrow every after 2 to 4 rows of soybean with Balramplough.	• Linkage with MAU, KVK for agro techniques
		Black gram	Soybean + Pigeon pea 4 : 2 (JS-335,MAUS-71,81) + (BSMR 736, 853, BDN 708, 711)		
		Green gram	Soybean + Pigeon pea 4 : 2 (JS-335,MAUS-71,81) + (BSMR 736, 853, BDN 708, 711)		
	Shallow black soils	Soybean	No change / Soybean+ pigeon pea 4:2 row proportion (MAUS 71,81) +(BDN 708, 711)	Normal package of practicesrecommended by MAU, Parbhani Prefer early maturing varieties. Open furrow every after 2 to 4 rows of soybean with Balramplough.	
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP-92901) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani	
		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335, MAUS-71,81) + (BDN 708, 711)	Normal package of practicesrecommended by MAU, Parbhani Open furrow every after 2 to 4rows of soybean with Balram plough.	
		Black gram	Soybean + Pigeon pea 4 : 2 (JS-335, MAUS-71,81) + (BDN 708, 711)	-------**do**--------	

Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
Early season drought (Delayed Onset)			**Change in Crop/Cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 week (Specify month) **July 4th week**	Medium deep to deep black soils	Soybean	No change / Soybean+ pigeon pea4:2 row proportion (MAUS 71,81) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani Open furrow every after 2to 4 rows of soybean with Balram plough.	• Linkage with MAU, MSSC NSC, NFSM andVillage seed production programme for seed. • Linkage with MAIDC, ZILLA PARISHAD for implements. • Linkage with MAU, KVK foragro techniques
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP-92901) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani.	
		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335,MAUS-71,81) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani Open furrow every after 2 to 4 rows of soybean with Balram plough.	
		Black gram	Soybean + Pigeon pea 4 : 2 (JS- 335, MAUS-71,81) + (BSMR 736, 853, BDN 708, 711) or Sunflower (Morden, EC-68414, SS-56, LSH- 35)		
		Green gram	Soybean + Pigeon pea 4 : 2 (JS-335, MAUS-71,81) + (BSMR 736, 853, BDN 708, 711) or Sunflower (Morden, EC-68414, SS-56, LSH-35)		

	Shallow black soils	Soybean	No change / Soybean+ pigeon pea4:2 row proportion (MAUS 71,81) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani Prefer early maturingvarieties. Open furrow every after 2to 4 rows of soybean with Balram plough.	
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP- 92901) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani	
		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335, MAUS-71,81) + (BDN 708, 711)	Normal package of practices recommended by MAU, Parbhani Open furrow every after 2 to 4 rows of soybean with Balram plough.	
		Black gram	Soybean + Pigeon pea 4 : 2 (JS- 335, MAUS-71,81) + (BDN 708,711) or Sunflower (Morden, EC- 68414, SS-56, LSH-35)		

Condition	**Major Farming situation**	**Normal Crop/Cropping system**	**Suggested Contingency measures**		
Early season drought (delayed onset)			**Change in Crop/Cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 week (Specify month) **August 2nd week**	Medium deep todeep black soils	Soybean	No change / Soybean+ pigeon pea 4:2 row proportion (MAUS 71,81) + (BDN 708, 711)	Normal package of practicesrecommended by MAU, Parbhani Open furrow every after 2 to 4 rows of soybean withBalram plough.	• Linkage with MAU, MSSC NSC, NFSM and Village seed production programme forseed. • Linkage with MAIDC, ZILLA PARISHAD for implements.
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP- 92901) + (BDN 708, 711)	Open furrow every after 2 to4 rows of soybean with Balram plough.	

		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335,MAUS-71,81) + (BDN 708, 711)	**-------do--------**	• Linkage with MAU, KVK for agro techniques
		Black gram	Soybean + Pigeon pea 4 : 2 (JS-335, MAUS-71,81) + (BSMR 736, 853, BDN 708, 711) or Sunflower (Morden, EC-68414, SS-56, LSH-35)	**-------do--------**	
		Green gram	Soybean + Pigeon pea 4 : 2 (JS-335,MAUS-71,81) + (BSMR 736, 853,BDN 708,711) or Sunflower(Morden, EC-68414, SS-56, LSH- 35) or Sesamum (GLT-7, 26)	**-------do--------**	
	Shallow black soils	Soybean	No change / Soybean+ pigeon pea 4:2 row proportion (MAUS 71,81) + (BDN 708, 711)	Prefer early maturingvarieties. Open furrow every after 2 to 4 rows of soybean with Balram plough.	
		Sorghum	Pearl millet + Pigeon pea 4 : 2 (Shradha, Saburi, Shanti, AIMP-92901) + (BDN 708, 711)	Open furrow every after 2 to 4 rows of soybean with Balram plough.	
		Pigeon pea	No change / Soybean + Pigeon pea 4:2 (JS-335,MAUS-71,81) + (BDN 708, 711)	**-------do--------**	
		Black gram	Soybean + Pigeon pea 4 : 2 (JS-335,MAUS-71,81) + (BDN 708, 711) or Sunflower (Morden, EC-68414, SS-56, LSH-35) or Niger (NS-6)	**-------do--------**	

7.1.1.2. Early season drought (Normal onset)

Condition	Major Farming situation	Normal Crop/ Cropping system	Suggested Contingency measures		
Early season drought (Normal onset)			**Crop management**	**Soil nutrient& moisture Conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell aftersowing leading to poor germination / crop stand etc.	Medium deep to deep black soils	Soybean	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population **or** if the plant population is less than 50% re sow the crop	Making of conservation furrowsfor moisture conservation	• Linkage withMAU, MSSCand NSC for seed. • Linkage with MAIDC for implements. • Linkage with DSAO for farm ponds and micro irrigation system through RKVY Linkage with MAU, KVK for agro techniques
		Sorghum	Gap filling with Pigeon pea	When the crop is 2 weeks old take up Interculture with hoe	
		Pigeon pea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	When the crop is 2 weeks oldtake up Interculture with hoe	
		Black gram	If the plant population is less than 75% of optimum, go for re-sowingof the alternate crops like sunflower/ Pigeon pea. If possible give protective irrigationwith sprinkler.		
		Green gram	If the plant population is less than 75% of optimum, go for re-sowingof the alternate crops like sunflower / Pigeon pea. If possible give protective irrigationwith sprinkler.		
	Shallow black soils	Soybean	Gap filling within the rows with same or short duration cultivar tomaintain at least 75% plant population	Interculture with hoe	
		Sorghum	Gap filling with Pigeon pea		
		Pigeon pea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population		
		Black gram	If the plant population is less than 75% of optimum, go for re-sowing of the alternate crops like sunflower / Pigeon pea. If possible give protective irrigation with sprinkler.		

7.1.1.3 Mid-season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)

Condition	Major Farming situation	Normal Crop/Croppingsystem	Suggested Contingency measures		
Mid-season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)			**Crop management**	**Soil nutrient & moistureConservation measures**	**Remarks on Implementation**
At vegetative stage	Medium deep to deepand black soils	Soybean	Interculture for weeding and tocreate soil mulch. Give protective irrigation wherever possible.	Opening of alternate furrowswith Balaram plough. Spraying of 2% urea or DAP	• Linkage withMAIDC for implements. • Linkage with DSAO for farm ponds and micro irrigation systemthrough RKVY • Linkage with MAU, KVK for agro techniques
		Sorghum	Avoid top dressing of fertilizers till sufficient soil moisture isavailable. Intra row thinning. Protective irrigation if possible.	Opening of alternate furrowswith Balaram plough. Interculture for weeding	
		Pigeon pea	Protective irrigation if possible		
		Black gram	Inter culture for weeding Protective irrigation if possible	Spraying of 2% urea or DAP	
		Green gram	Inter culture for weeding Protective irrigation if possible	Spraying of 2% urea or DAP	
	Shallow black soils	Soybean	Give protective irrigation wherever possible	Opening of alternate furrowswith Balaram plough. Spraying of 2% urea or DAP	
		Sorghum	Avoid top dressing of fertilizerstill sufficient soil moisture is available. Intra row thinning. Protective irrigation if possible.	Opening of alternate furrowswith Balaram plough. Interculture for weeding	
		Pigeon pea	Protective irrigation if possible		
		Black gram	Inter culture for weeding Protective irrigation if possible	Spraying of 2% urea or DAP	

Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
Mid-season drought (long dry spell)			**Crop management**	**Soil nutrient & moisture Conservationmeasures**	**Remarks on Implementation**
At flowering / fruitingstage	Medium deep to deep black soils	Soybean	Give protective irrigation whereverpossible	Opening of alternate furrowswith Balaram plough. Spraying of 2% urea or DAP	Linkage withMAIDC for implements. • Linkage with DSAO for farm ponds and micro irrigation system through RKVY • Linkage with MAU, KVK for agro techniques
		Sorghum	Give protective irrigation. If feasible spray antitranspirant 6%kaolin	-	
		Pigeon pea	Protective irrigation if possible	Foliar spray of 2% KNO_3, urea and DAP	
		Black gram	Protective irrigation if possible	-	
		Green gram	Protective irrigation if possible	-	
	Shallow blacksoils	Soybean	Give protective irrigation whereverpossible	Opening of alternate furrowswith Balaram plough. Spraying of 2% urea or DAP	
		Sorghum	Give protective irrigation. If feasible spray antitranspirant 6% kaolin	-	
		Pigeon pea	Protective irrigation if possible	Foliar spray of 2% KNO_3, urea and DAP	
		Black gram	Protective irrigation if possible	-	

Condition	Major Farming situation	Crop/Cropping system	Suggested Contingency measures		
Terminal drought			**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Medium deep to deep black soils	Soybean	Give life saving irrigation **or** harvest at physiological maturity	Sowing of rabbi crops like sorghum, chickpea, safflower immediately after harvest of soybean with minimum tillage	• Linkage with MAU, MSSCand NSC for seed. • Linkage with MAIDC / DSAOfor harvesting implements (thresher, harvester). • Linkage with DSAO for farm ponds and microirrigation systemthrough RKVY • Linkage with MAU, KVK for agro techniques
		Sorghum	Life saving irrigation **or** harvest at physiological maturity	Plan for rabbi crops like chickpea and safflower	
		Pigeon pea	Life saving irrigation Foliar spray of 2% KNO_3, urea andDAP	---	
		Black gram	Harvest at physiological maturity **or** in case of severe drought use asfodder/ green manuring	Plan for rabbi crops chickpea / safflower / rabbi sorghum /sunflower	
		Green gram	Harvest at physiological maturity **or** in case of severe drought use as fodder/ green manuring	Plan for rabbi crops chickpea /safflower / rabbi sorghum / sunflower	
	Shallow black soils	Soybean	Give protection irrigation	Plan for rabbi crops chickpea / safflower / sorghum	
		Sorghum	Give protection irrigation In case of severe stress harvest as green fodder	Plan for rabbi crops chickpea / safflower	
		Pigeon pea	Give protection irrigation	Foliar spray of 2% KNO_3, urea and DAP	
		Black gram	Harvest at physiological maturity **or** in case of severe drought use asfodder/ green manuring	Plan for rabbi crops chickpea / safflower / rabbi sorghum /sunflower	

7.1.2 Irrigated situation

Condition	Major Farming situation	Crop/Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Delayed / limited release of water in canals due to low rainfall	Medium deep to deep blacksoil with assured and high rainfall	Sugarcane Turmeric	No change or prefer Cotton (Irrigated) Wheat	Limited irrigation	Supply of seed through MSSC, MAU, Village seedproduction programme
	Shallow soil with assuredand high rainfall	Sweet orange ,Ginger, Vegetable crops	Maize Cotton	Alternate furrow irrigation Drip irrigation	
Non release of waterin canals under delayed onset of monsoon in catchment	Medium deep to deep blacksoil with assured and high rainfall	Irrigated Cotton	Rainfed Cotton	Recommended spacing (120 x 45 cm) and 80:40:40 NPK Kg/ha	Release of water at critical growth stages by Irrigation Department
	Shallow soil with assuredand high rainfall	Ginger / Turmeric	Cotton and Maize		
Lack of inflows into tanks due to insufficient / delayedonset of monsoon	Medium deep to deep blacksoil with assured and high rainfall	Irrigated Cotton	Rainfed Cotton	Recommended spacing (120 x 45 cm) and 80:40:40 NPK Kg/ha	Release of water at critical growth stages by Irrigation Department
	Shallow soil with assured and high rainfall	Ginger / Turmeric	Cotton and Maize		
Insufficient ground water recharge due to low rainfall	Medium deep to deep blacksoil with assured and high rainfall	Irrigated Cotton	Rainfed Cotton	Limited irrigation	Supply of seed through MSSC, NFSM, MAU, Village seed production programme
	Shallow soil with assuredand high rainfall	Ginger / Turmeric	Cotton and Maize	Alternate furrow irrigation Drip irrigation	

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

Condition	Suggested contingency measure			
Continuous high rainfallin a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity Stage**	**Post-harvest**
Cotton, Sorghum	• Drain excess water • Interculture at soil optimummoisture • Apply 25KgN/Ha to cotton	Drain excess water	Drain out excess waterTimely harvest	Protect picked cotton fromdrenching and soiling Dry wet cotton and market
Soybean, Pigeon pea and short duration pulses	Drain out excess water	-do-	-do-	Shift to safer place Dry the produce
Horticulture				
Mango	Opening of field channels to drain outexcess water and avoid surface ponding, Interculture at optimum soil moisture	Opening of field channels to drain out excess water and avoid surface ponding, Interculture at optimum soil moisture	Collect fallen fruits, grade and market if feasible	Grading, cleaning and marketing of fruits
Grape	-do-	-do-	-do-	-do-
Heavy rainfall with high speed winds in a short span				
Cotton, Sorghum	• Drain excess water • Interculture at soil optimummoisture • Apply 25KgN/Ha to cotton	Drain excess water	Drain out excess waterTimely harvest	Protect picked cotton fromdrenching and soiling Dry wet cotton and marketing
Soybean, Pigeon pea and short duration pulses	Drain out excess water	-do-	-do-	Shift to safer place Dry the produce
Horticulture				
Mango	-	Provide support to preventlodging and uprooting in young orchards	Apply multi nutrient andhormonal spray to promote flowering	Shift produce to safer place

Grape	-do-	-do-	-do-	-do-
Outbreak of pests and diseases due to unseasonal rains				
Cotton	Apply soil drench of carbendazim 0.1% or COC @ 3g/litre at base of plants to prevent wilt in low lying patches	Apply foliar spray of streptocycline sulphate @ 6g/60 litre + COC @ 25g/10 litre to prevent bacterial leaf blight Apply Sulphur 25g/10 litre (300 mesh) to prevent grey mildew Apply MgSO4 25 kg/ha soil application or 1% MgSO4 foliar spray to prevent leaf reddening	Foliar spray of carbendazim 0.1% or Ditane M45 0.2% to prevent boll rot	
Sorghum	-	-	Apply Dithane M 45 0.2%on ear heads immediately after cessation of rains	-
Soybean	Manually remove infested plants or plantparts from below the girdles Protect against semilooper when densityreaches >4 larvae per meter row with foliar spray of NSKE 5% or dimethoate30 EC 1 ml/litre	-	-	-
Horticulture				
Mango	Spray imidacloprid 0.3 ml or dimethoate1 ml/liter to control hopper Drench the seedlings with COC 0.25%against root rot	Protect against hopper	Spray Dithane M 45 3g/litre or carbendazim 1g/liter against anthracnose Spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening or fruits
Grape	Soil drenching with COC 3g/litre toavoid rhizome rot	Spray Dithane M 45 3g/literor propiconazole 1 ml/liter 2-3 times against Cercosporaleaf spot	-	-

Chapter 8: Agro meteorological Advisory

8.1 Agro-Meteorogical advisory

8.1.1 Importance/ Need of Agromet advisory

Agro-meteorological advisory services play a crucial role in supporting agriculture by providing farmers with timely and accurate information about weather and climate conditions. These advisories are tailored to the specific needs of the agricultural community and aim to enhance agricultural productivity, minimize risks, and promote sustainable farming practices. Here are some key aspects highlighting the importance of agro-meteorological advisories:

1. **Enhanced Productivity:** Agromet advisories help farmers optimize their agricultural practices by aligning them with weather patterns. This leads to better crop yields and increased overall productivity.
2. **Risk Reduction:** Early warnings about extreme weather events, such as storms, frosts, or droughts, enable farmers to take preventive measures to protect their crops and livestock. This helps in minimizing losses and risks associated with unpredictable weather conditions.
3. **Resource Optimization:** Farmers can efficiently allocate resources such as water, fertilizers, and pesticides based on agromet advisories, leading to improved resource use efficiency and cost-effectiveness.
4. **Timely Decision-Making:** Agromet advisories provide timely and accurate information, allowing farmers to make informed decisions regarding planting, irrigation, harvesting, and other critical activities. This contributes to better farm management.
5. **Improved Crop Planning:** Farmers can plan their cropping calendars more effectively with the help of agromet advisories, ensuring that crops are sown and harvested at optimal times for maximum yield.
6. **Pest and Disease Management:** Agromet advisories offer insights into the likelihood of pest and disease outbreaks based on weather conditions. This information helps farmers implement timely and targeted pest management strategies, reducing the need for excessive pesticide use.
7. **Water Management:** Information on precipitation patterns and water availability assists farmers in planning irrigation schedules, conserving water, and adopting sustainable water management practices.
8. **Livestock Health Management:** Agromet advisories provide information on weather conditions that can affect livestock. Farmers can take measures to protect the health and well-being of their animals, reducing the risk of diseases and stress.
9. **Climate Change Adaptation:** With climate change impacting traditional agricultural practices, agromet advisories help farmers adapt to changing conditions by providing insights into long-term climate trends and suggesting resilient farming practices.
10. **Market Access and Profitability:** Farmers can use agromet advisories to make informed decisions about when to bring their produce to the market. This helps in optimizing market access and potentially improving the profitability of agricultural enterprises.
11. **Technology Integration:** Agromet advisories can be delivered through various technological platforms, such as mobile apps and SMS services, making it easier for farmers to access timely information and updates.

12. **Community Empowerment:** By enhancing the knowledge and capacity of farmers, agromet advisories empower local communities to adapt to changing weather patterns and build resilience against climate-related challenges.

8.1.2. Forecasts or advisories generated at district level

Advisory follows in Latur District as per below

- Crop Pest Surveillance System and advisory project (CROPSAP)
- Divisional Agriculture Extension Education Center, Latur
- Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani (VNMKV)
- Metrological Department of Maharashtra, Pune
- Regional weather station, Mumbai
- Akashwani Osmanabad (Radio station)

8.1.3 Other Source of Agromet Advisory

- Nanaji Deshmukh Krushi Sanjivani Prakalp (NDKSP) Portal. https://mahapocra.gov.in/home/taluka-advisories
- Krushi Vigyan Kendra for Block level Agromet Advisory at Manjra krushi vigyan kendra, Latur.

8.1.4 Different apps / dashboard / channels / stations / means used to disseminate the information

In the era of information technology farmers refer the mobile apps to get easy access to agro met advisory like

- **Meghdoot:** Meghdoot is an Agromet app that provides farmers with weather forecasts and advisories. It helps farmers make informed decisions about their agricultural activities, considering the prevailing weather conditions.
- **Damini:** Damini is associated with services or applications that support women in agriculture. It could offer information, resources, or tools tailored to the specific needs and contributions of women in the farming community.
- **Mausam:** Mausam, meaning "weather" in Hindi, likely refers to an app or service that delivers weather-related information. Farmers can use it to access forecasts, climate data, and other weather-related insights crucial for agriculture.
- **Agri Central:** Agri Central is a platform or app designed to centralize agricultural information and services. It may provide a one-stop solution for farmers, offering a range of resources, advisory services, and tools.
- **Kisan Suvidha:** Kisan Suvidha, translating to "Farmer Convenience," suggests an app focused on providing farmers with convenient access to a variety of agricultural information, services, and resources.
- **APEDA Farmer Connect:** APEDA Farmer Connect is likely an initiative by the Agricultural and Processed Food Products Export Development Authority. It aims to establish a connection between farmers and agricultural export processes, facilitating export-related information and opportunities.
- Krushik farmer refers to other farmers' opinions using this kind of advisory or forecast.

8.1.5 Utilization of Agro-met advisory by farmers in changing climatic condition:

- At the beginning of the season farmers select crops according to the weather forecast based on whether this year is drought prone on a heavy rainfall basis.
- Use advanced and climate resilient technologies to prevent losses in heavy rainfall or drought conditions such as BBF, SRT, mulching etc.
- Use disease and pest resistant varieties also use high yielding varieties according to the suggestion of KVK and Agriculture Universities.
- Farmers use above mentioned agro advisories for seed treatment purpose to reduce initial losses.
- According to advisories farmers use trichoderma, and other biofertilizers to increase production.
- Farmers make a proper schedule according to the weather forecast for integrated nutrient and pest management.
- Management of intercultural operations is the main thing that farmers do with the help of weather forecasts.
- Farmers use trap crops to prevent losses for main crops for the attraction of insects.
- Farmers install bird perches, pheromone trap and yellow sticky trap to minimize losses and reduce cost of cultivation.
- At the time of harvesting farmers schedule their harvesting date and or create alternatives to save crops from losses.

8.2 Advisory based on Pest surveillance activity

8.2.1 Implementation Status of CROPSAP:In Latur district all CROPSAP adversaries circulate at time of crop management for each and every crop.

- CROPSAP readings of Soybean, Cotton, Tur and Gram are collected by the Agriculture Assistant, Agriculture Supervisor, Circle Agriculture Officer, Taluka Agriculture Officer, Sub Divisional Agriculture Officer, DSAO at fixed plot and random plot on a weekly basis.
- Pink / American Bollworm, White Fly, Jassids, Steam, Borer, Thrips these are the major pests and disease like Alternaria, leaf spot, fusarium wilt, leaf curl, bacterial blight of cotton, Yellow Vein Mosaic, Root Rot, Charcoal Rot etc.
- Provide SMS to farmers through M-kisan, KVK, NDKSP according to Crop Condition and season of crop. With the help of FFS, identification of diseases and pests is shown to farmers that may help them to manage pests and diseases with natural and chemical pesticides.
- Use of Trap Crop, Sticky trap, Pheromone Trap for effective control of pests by natural measures. Use of Dashparni ark, Nimboli Ark, Trichocards as natural pesticides that may reduce cost of cultivation and use for survival of natural insects such as ladybird beetle, Syrphid Fly and chrysopa etc.

8.2.2 Impact on Crop pests and diseases management:

- Reduction in cost of Cultivation happens with the help of accurate timing of spraying, Use of Bio Pesticides and other control measures such as Installation of Bird perches, Yellow Sticky Trap, Pheromone Trap etc.Conservation of Natural Insects occurs due to Integrated Disease and Pest Management.

Cropsap- Crop Protection Advisory Report							
Date	**Division**	**Agricultural University**	**District**	**Taluka**	**Crop**	**Brief Advice**	**Detailed Advice**
21-09-23	Latur	Vasantrao Naik Marathwada Krushi Vidyapith, Parbhani	Latur	Latur	Soybean	For the survey of tobacco leaf-eaters and Ghate Alaya, 5 *kamagand safle* per hectare and 8 to 10 bird traps per acre should be set.	10 yellow sticky traps per acre for whitefly. Emamectin benzoate 1.90 EC 8.5 ml or @ 16.5 ml for leaf-eating caterpillars or tetraniliprole 18.98 SC @ 5 ml or Chlorantraniliprole 18.5 SC 3 ml per 10 liters Mix with water and spray.
18-09-23	Latur	Vasantrao Naik Marathwada Krushi Vidyapith, Parbhani	Latur	Latur	Soybean	For the survey of tobacco leaf-eaters and Ghate Alaya, 5 traps per hectare should be set and 8 to 10 bird traps should be set per acre.	For whitefly, 10 yellow sticky traps should be planted per acre. Emamectin benzoate 1.90 EC 8.5 ml or @ 16.5 ml for leaf-eating caterpillars or Ethion 50 EC 30 ml for camel larvae, weevils and weevils or Chlorantraniliprole 18.5 SC 3 ml per 10 l. Mix with water and spray.
16-09-23	Latur	Vasantrao Naik Marathwada Krushi Vidyapith, Parbhani	Latur	Latur	Soybean	For whitefly, 10 yellow sticky traps per acre should be laid and sprayed with Acetamiprid 25% + Bifenthrin 25% w 0.5 g per liter of water.	Novaluron 5.25% + indoxacary 4.50% SC for leaf-eating caterpillars or @ 96.5 ml or Chlorantraniliprole 98.5 SC 3ml for camelids, weevils and weevils or Ethyl 50 EC 30ml or Tetranilipol 18.18 SC @ 5ml per 10 Ltd. Mix with water and spray.

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

9.1 Existing marketing scenario in the district

The relationship between agricultural development and investment in infrastructure is long recognized as complementary to each other. Market infrastructure is important not only for the performance of various marketing functions and expansion of the size of the market but also for transfer of appropriate price signals leading to improved marketing efficiency. Infrastructure facilitates vertical and horizontal integration, thereby bringing economies of scale and cost efficiencies in the supply chain. Infrastructure facilities lead to reduction in marketing costs, which is crucial for increasing the realization of growers and reducing the costs to the consumer. Infrastructure also contributes to the human welfare, poverty reduction and overall growth of the economy. The changing trade environment in the wake of liberalization, privatization and globalization and increased agricultural production and marketable surplus, further emphasizes the pivotal role to be played by the infrastructure in agricultural development.

Major food grains produced in Latur are Bengal gram, red gram, jowar, and black gram while the major oilseed grown is soybean.

Agriculture Produce Market Committees (APMCs)

Latur district is divided into 11 APMCs, one in each taluka, with *12 sub market yards. The 11 APMCs cover 1002 villages.*

Sr. No.	Block	Name of the APMC	Commodity handled	Total Villages covered
1	Latur	Latur	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	118
2	Udgir	Udgir	Jowar, wheat, red gram, Soybean, Gram	90
3	Ahmedpur	Ahmedpur	Jowar, wheat, red gram, Soybean, Gram	123
4	Ausa	Ausa	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	131
5	Renapur	Renapur	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	76
6	Jalkot	Jalkot	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	47
7	Aurad Shahajani	Aurad Shahajani	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	58
8	Chakur	Chakur	Jowar, wheat, red gram, Soybean, Gram	85
9	Nilanga	Shirur Anantpal	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	53
10	Nilanga	Nilanga	Jowar, wheat, red gram, Soybean, Gram, Black gram, Green Gram	164
11	Deoni	Deoni	Jowar, wheat, red gram, Soybean, Gram	57

(Source: Maharashtra agricultural competitiveness project, Market strategies supplements Latur.)

Latur and Udgir APMCs represent around 95% of arrivals and average annual value for the 6 APMCs for which we have data. Latur alone represents around 57% of arrivals and value for these APMCs. Major commodities marketed through the APMCs are jowar, wheat, red gram, Bengal gram and soybean.

Rural haats (RH):

Apart from the regulated APMCs there are 50 rural haats in the district, which are unregulated markets. Annexure 3 gives the comprehensive list of rural haats in the district. The 7 rural haats considered under MACP are listed below:

Sr. No	Block	Number of rural haats	RH Selected under MACP
1	Ausa	9	Ashiv, Ujani
2	Shirur Anantpal	5	Sakol
3	Chakur	8	Chakur, Nalegaon
4	Udgir	3	Handrguli
5	Nilanga	7	Kasar Shirshi
6	Latur	6	-
7	Deoni	2	-
8	Jalkot	2	-
9	Ahmadpur	3	-
10	Renapur	5	-
	Total	50	7

9.1.1 Marketable surplus of major crops:

Soybean

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	2022	5397.61	107.95	5289.66
2	2021	5837.2	116.74	5720.46
3	2020	7742	154.84	7587.16
4	2019	1103.03	22.06	1080.97
5	2018	4454.8	89.10	4365.70

Rabbi Jowar

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	2022	393.91	78.78	315.13
2	2021	497.8	99.56	398.24
3	2020	507.28	101.46	405.82
4	2019	320.16	64.03	256.13
5	2018	162	32.40	129.60

Bengal Gram

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	2022	2680.4	321.65	2358.75
2	2021	2352.71	282.33	2070.38
3	2020	2165.75	259.89	1905.86
4	2019	2038.75	244.65	1794.10
5	2018	776	93.12	682.88

Black Gram

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	**2022**	**24.22**	**7.27**	**16.95**
2	**2021**	**45.65**	**13.70**	**31.96**
3	**2020**	**69**	**20.70**	**48.30**
4	**2019**	**42.87**	**12.86**	**30.01**
5	**2018**	**53.26**	**15.98**	**37.28**

Green Gram

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	**2022**	**34.71**	**10.41**	**24.30**
2	**2021**	**82.68**	**24.80**	**57.88**
3	**2020**	**81**	**24.30**	**56.70**
4	**2019**	**51.08**	**15.32**	**35.76**
5	**2018**	**71.17**	**21.35**	**49.82**

Red Gram

Sr. No	Year	Av. Annual Production on (00 M Ton)	Consumption on (00M Ton)	Marketable Surplus (00 M Ton)
1	**2022**	**255.23**	**40.84**	**214.39**
2	**2021**	**739.16**	**118.27**	**620.89**
3	**2020**	**1645**	**263.20**	**1381.80**
4	**2019**	**1328.24**	**212.52**	**1115.72**
5	**2018**	**544.2**	**87.07**	**457.13**

(Source: MACP, Market strategies supplements Latur.)

9.1.2 Year wise price variation of major crops. (Avg. Price / Qtl):

Based on the analysis generated using pivot tables comprising of market arrival data for the emerging crops, the following analysis has been generated.

Year	Soybean unit	Rabi Jowar	Gram	Red Gram	Black Gram
2018	3100	2100	4030	3310	4200
2019	3550	2100	4260	5150	5890
2020	3700	2100	5450	5590	7900
2021	6150	2100	4450	6100	7000
2022	5000	2300	4400	7500	7012

(Source: Maharashtra State Agriculture Marketing Board, Pune)

9.1.3 Markets available in the district with commodities handled

Latur is highly integrated, with several marketing channels available to farmers. The existence of FPOs, public and private warehouses, institutional buyers such as solvent processing units, and large exporters.

National Agriculture Market (e-NAM)

National Agriculture Market (e-NAM) is a Pan-India electronic trading (e-trading) portal which seeks to network the existing physical APMCs through a virtual platform to create a unified national market for agricultural commodities.

NAM is a "virtual" market but it has a physical market (Mandi) at the back end. The NAM Portal provides a single window service for all APMC related information and services. This includes commodity arrivals, quality & prices buy & sell offers, provision to respond to trade offers and electronic payment settlement directly into farmers' accounts, among other services. e-NAM is an online market which aims at reducing transaction costs, bridging information asymmetry and helping in expanding the market access for farmers.

Details of e-NAM MANDIS IN Latur District:

Sr. No	Mandi	Mandi Postal Address	Commodity Group	Commodity Name
1	Ausa	Nearby Nilanga vase Market yard Ausa Pin-413520	Cereals	Jowar, Maize, Paddy, Wheat
			oil seed	Soybean, Sunflower
			Pulses	Gram, Green gram, Black Gram
2	Latur	The Secretary Agriculture market Committee (APMC), Market yard, Latur. Pin 413512	Cereals	Bajra, Jowar, Maize
			oil seed	Soybean
			Pulses	Red gram, Gram
3	Udgir	Nava Mondha Road, Ramchandra Nagar, Pin-413517	Forest Products	Tamarind
			oil seed	Soybean
			Pulses	Gram

(Source: e-NAM Mandis website)

9.2 Constraints in existing value chain

SWOT Analysis

Sr. No	APMC	Strengths	Weaknesses	Opportunities	Threats
1	Latur	Connected by 4 lane road to Pune, Aurangabad and Nanded, Good rail connectivity, Adequate storage facilities	No cold storage facilities, mechanized cleaning and grading. Poor solid waste management	Trade linkages with far away districts given good road and rail connectivity	Competition from ADM Agro's operations in Latur district
2	Udgir	Irrigated catchment area, APMC has a farmer guest house, godowns and electronic weighing machines	Inadequate basic and productive infrastructure, Under developed cattle market. No facilities for grading	Trade in pulses and food grains can be increased to adjacent districts	Produce from the catchment area is often taken to Latur APMC
3	Ahmedpur	Good road and rail connectivity APMC has a godown	Inadequate basic and productive infrastructure, No facilities for storage, packing and grading	Trade in pulses and food grains can be increased to adjacent districts	Developing center at Latur
4	Nilanga	APMC owns 8 acres of land, Well connected to Bidar in Karnataka	No facilities for storage, cleaning and grading of vegetables	Developing basic infrastructure which is presently lacking	Developing center at Latur
5	Ausa	Catchment area is one of the dominant producers of wheat, soybean, guava, pomegranate and grapes	Inadequate basic and productive infrastructure, Under developed cattle market	To develop markets for fruits, vegetables and flowers, Developing basic infrastructure which is presently lacking	Produce being marketed directly to Latur
6	Aurad Shahjani	Good productive infrastructure, Catchment area is one of the dominant producer of red gram, Bengal gram, Soybean, wheat and jowar	Inadequate basic infrastructure	Developing basic infrastructure which is presently lacking	Produce from the catchment area is often taken to Nilanga APMC
7	Ranapur	Catchment area is one of the dominant producer of cotton and Soybean	Inadequate basic and productive infrastructure	To develop a market for cotton	Developing center at Latur
8	Jalkot	APMC owns 5 acres of land and a 1000 MT capacity godown	Inadequate basic and productive infrastructure	Trade linkages with far away districts given good road and rail connectivity	Developing center at Latur
9	Chakur	APMC owns land	Vegetables and fruits are not marketed in the APMC due to lack of facilities	To develop a fruit and vegetable market especially to service nearby Aurangabad city.	Lack of cold storage facilities
10	Deoni	Catchment area is one of the dominant producer of wheat, Bengal gram and Soybean	Inadequate basic and productive infrastructure	Developing basic infrastructure which is presently lacking and markets	Lack of cold storage facilities
11	Shirur Anantpal				

(Source: APMC, Latur)

9.3 Potential for strengthening of commodity wise value chains

1. **Soybean:**
   1) Soybean refinery oil
   2) Soya bean food product-based technology viz.
   - Tofu
   - Soya milk
   - Soy nuts
   - Soy chakli
   - Soy snacks
   - Seed production speciality food grade soybean
2. **Tur/red gram**: storage facility, cleaning grading unit, dal mill for quality package tur daal. Organic tur dal has high demand in the market.
3. **Bengal gram/gram:** dal mill for chana daal, chana flour, chana snacks, chana sattu, polished chana daal, chana dry fruit barfi, chana jor snacks, chana jaggery laddu, have good opportunities for such business. Cleaning-grading unit, packaging also have potential for development
4. Sugarcane: Direct Marketing sugarcane to Manjra and vikas Sugar factory and other sugar factories.

9.4 FPC's contribution in value chain development:

9.4.1 Status of FPCs in the district:

There are 356 FPCs at Latur district out of 97 FPCs (NDKSP) are working on topic like, Dall Mill, Cleaning & Grading, Tool Bank, Processing Units, Godown, Seed processing Units, oil mill, etc. and 24 FPC granted by SMART.

Sr. No	Taluka	No. of FPC's
1	Latur	104
2	Ausa	47
3	Nilanga	39
4	Renapur	27
5	Shirur Anantpal	23
6	Udgir	37
7	Ahmadpur	31
8	Deoni	18
9	Jalkot	3
10	Chakur	27
Total FPC		**356**

(Source: MAC, Market Strategies Supplements, Latur.)

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 analyzed 203 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:

$$\textbf{Score}=\frac{\boldsymbol{Maximum\ Obtained\ Score}}{\boldsymbol{Maximum\ Obtainable\ Score}}\times\mathbf{100}$$

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 analyzed 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.

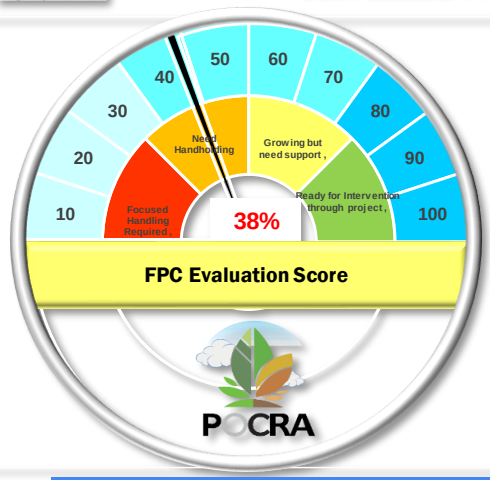
Customized Evaluation Report

Nanaji Deshmukh Krush Sanjivani Praklap

Maharashtra Project on Climate Resilient Agriculture

(Project of government of Maharashtra in partnership with World Bank)

CUSTOMIZED FPC EVALUATION REPORT



Name of FPC

Gavhane Krushi Mitra Producer Company Limited

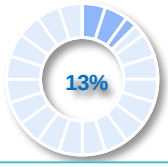
Address

At Post Shirala ,Tq Latur, Dist-Latur , Pincode- 413512

Score Report

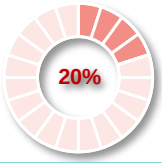
Criteria	Max. Score	Score Obtained
Organization & Adminstration (Core Foundation Strength)	21	13
Governance (Control Systems in Place)	11	3
Management (Decision making processes)	8	1
Infrastructure (Assets and resources)	5	2
Finance (Financial base and health)	25	9
Business & Market Linkages (Resource quality)	21	8
Capacity Building (Resource quality)	5	1
Climate Resilience (Adaptability to climate risk)	4	1
Final Score	100	38

What could improve your FPC?



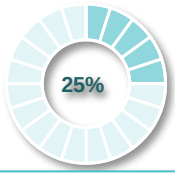
Management

Responsibilities should be divided among the BODs, this will help in defining tasks and achieving the objectives. Efforts needed to increase the number of shareholders



Capacity Building

Training is required on various climate resilient crop production practices and other new technologies. BOD trainings required for business management and legal compliances. Awareness on climate change is required so that the FPC can adapt CR practices.



Climate Resilience

The FPC should promote various climate resilient agricultural technologies.

For more Information contact us at Project Director, ATMA, Latur

9.4.3 Information about FPCs supported by SMART/ NDKSP/MAGNET:

Information about FPCs supported by NDKSP

Taluka	Village	Sr.No.	Name of FPC's	Services Provided By FPC's	Commodity Transected by the FPC's
Ahmadpur	Bhakarwadi	1	Samruddha Shetkari Agro Producer Company Limited	Establishment of Custom Hiring Centers	
				Turmeric Processing Unit	Turmeric
	Kalegaon	2	Alzirat Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Kingaon	3	Av 28 Foods Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Vegetable/ Fruits Processing Unit	Vegetable and Fruits
	Nalegaon	4	Shirur Nalegaon Farmer Producer Company Limited	Medicinal/Aromatic Plants Processing Unit	Geranium
	Nandura	5	Sant Kondiba Maharaj Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Prachanda	6	Vikasratna Shetkari Utpadak Parchanda Producer Company Limited	Establishment of Custom Hiring Centers	
	Patoda	7	Shree Sant Madhav Baba Farmers Producer Company Limited	Establishment of Custom Hiring Centers	
	Rokda Sawargaon	8	Lokkalyan Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
Ausa	Ashiv	9	Kanishq Farmer Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Seed Processing Unit	
		10	Mane Farmer Producer Company Limited	Complete Seed Processing Unit (Equipment, Godown/ Shade)	Soybean, Gram, Red Gram
	Ekambi	11	Tridhara Agro Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	hasala	12	s p krushi mitra producer company ltd	Construction of Godown/ Small Warehouse. Pulse Mill (Dal Mill)	Soybean, Gram, Red Gram

	Hasalgan	13	Sant Savata Mali Agro Producer Company Limited	Grain Processing Unit (Cleaning/Sorting/Grading Unit)	Soybean, Gram, Red Gram
	Hasegao	14	Ketaki Sangam Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Kalmatha	15	Dp Mohite Patil Agro Farmer Producer Company Limited	Medicinal/Aromatic Plants Processing Unit	Geranium
	Karajgaon	16	Prayagbai Jadhav Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Lamjana	17	Pandurang Rukmini Agro Producer Company Limited	Seed Processing Unit	All Agri Commodity
	Limbala Dau	18	Kedareshwar Agrotech Producer Company Limited	Establishment of Custom Hiring Centers	
	Lodga	19	Dattasai Farmer Producer Company Limited	Construction of Godown/ Small Warehouse	All Agri Commodity
		20	Kalamkrushi Farmers Producer Company Limited	Other Agribusiness Activity Bamboo Furniture Manufacturing Unit	Bamboo wood
	Selu	21	Pawar Krushi Mitra Producer Company Limited	Establishment of Custom Hiring Centers	
	Shivni	22	Shivneri Agro Producer Company Limited	Other Agribusiness Activity Dal Mill Colour Sorter	Pulse Crops
Chakur		23	Krushi Mangal Agro Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
	Atola	24	Atola Farmer Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
	Gharola	25	Cropking Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
		26	Om Sai Adhunik Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
				Grain Processing Unit (Cleaning/Sorting/Grading Unit)	All Grains Crops
				Seed Storage/ Godown	All Agri Commodity
		27	Vatsidha Nagnath Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Jagdalpur	28	Latur Kisan Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram

				Establishment of Custom Hiring Centers	
				Grain Processing Unit (Cleaning/Sorting/Grading Unit)	All Grains Crops
	Rohina	29	Shree Sant Bhagwan Baba Farmers Producer Company Limited	Establishment of Custom Hiring Centers	
	Shelgaon	30	Malleshwar Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Wadwal Nagnath	31	Jangave Agro Producer Company Limited	Establishment of Custom Hiring Centers	
		32	Wadwal Nagnath Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
Deoni	Deoni	33	Rasika Agro Processing Farmer Producer Company Ltd	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Establishment of Custom Hiring Centers	
		34	Anshika agro processing farmer producer company Ltd	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
Jalkot	Hokarna	35	Hokarna Agro Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
	Lali Bk.	36	Baliraja Shetkari Gat	Establishment of Custom Hiring Centers	
Latur	Akharwai	37	Svr Krushimitra Producer Company Limited	Establishment of Custom Hiring Centers	
	Babhalgaon	38	Rokdeshwar Beej Utpadak Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Establishment of Custom Hiring Centers	
	Bhadgaon	39	Krushi Ugam Farmers Producer Co. Ltd	Grain Processing Unit (Cleaning/Sorting/Grading Unit)	All Grains Crops
		40	Shrikar Agro Producer Company Limited	Complete Seed Processing Unit (Equipment, Godown/ Shade)	All Agri Commodity
	Chikalthana	41	Sundar Agro Farmer Producer Co Ltd	Establishment of Custom Hiring Centers	

	Gangapur	42	Rediantgram Farmer Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Turmeric Processing Unit Milk Processing Unit	Turmeric
	Harangul Kh	43	Vishwa Siddhi Agro Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Establishment of Custom Hiring Centers	
	Katpur	44	Satsatak Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Khandapur	45	Agrotech Agro Producer Company Limited	Seed Storage/ Godown	All Agri Commodity
	Latur	46	Bhanudas Agro Producer Company Limited	Seed Processing Unit	All Agri Commodity
		47	Pgbcrop Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Murud Akola	48	Alok Sanjivani Farmers Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
				Grain Processing Unit (Cleaning/Sorting/Grading Unit)	All Grains Crops
	Murud Bk.	49	Murudeshwar Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Murud Nilkanth	50	Dagdu Anna Autade Agro Producer Company Limited	Construction of Godown/ Small Warehouse	
	Nivali	51	Nivalicha Shetkari Agro Business Producer Company Limited	Establishment of Custom Hiring Centers	
	Sonwati	52	Samarth Sonwati Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Wanjarkheda	53	Sunandan Agro Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
Nilanga	Gaur	54	Gaur Agro Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Nanand	55	Nisarg Krushi Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Nitur	56	Sadnath Agro Producer Company Limited	Complete Seed Processing Unit (Equipment, Godown/ Shade)	All Agri Commodity

	Umarga [Hadga]	57	Swarajya Kranti Farmer Producer Company Ltd	Establishment of Custom Hiring Centers	
	Zari	58	Daneshwari Farmer Producer Company Limited	Seed Storage/ Godown	All Agri Commodity
Renapur	Bhandarwadi	59	Shri Narhari Agro Producer Company Limited	Construction of Godown/ Small Warehouse Establishment of Custom Hiring Centers	Soybean, Gram, Red Gram
	Gutti	60	Gutti Agro Farmer Producer Company Limited	Establishment of Custom Hiring Centers	
	Pangaon	61	Yuvakisan Agro Producer Company Limited	Establishment of Custom Hiring Centers	
	Wanjarwadi	62	Swargiya Pandit Anna Munde Farmers Producer Company Limited	Establishment of Custom Hiring Centers	
	(blank)	63	Ravini Agro Producer Company Limited	Grain Processing Unit (Cleaning/Sorting/Grading Unit)	All Grains Crops
Shirur	Aari	64	Anantpal Krushi Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
	Hanmantwadi	65	Shilpa Agro Farmer Producer Company Limited	Establishment of Custom Hiring Centers Medicinal/Aromatic Plants Processing Unit	Geranium
		66	Renukai Sheti Prakriya Producer Company Limited	Construction of Godown/ Small Warehouse	Soybean, Gram, Red Gram
		67	Sakol Farmers Agro Producer Company Limited	Establishment of Custom Hiring Centers	
		68	Shrianantpal Agro Producer Company Limited	Establishment of Custom Hiring Centers	

Information about FPC's supported by MAGNET

Sr.No.	Name of the Facility	Location	Commodity Handled
1	Export facility Centre, Latur	Maharashtra Industrial Development Corporation, Latur	Kesar Mangoes Pomegranates, Sweet limes and Apples.

(Source- MAGNET, Pune)

Information about FPCs supported by SMART

Sr. No.	Name of FPC's	Project Name
1	Krushi Mitra Producer Company Limited	Collection, Processing, Storing, Sale To Buyer
2	Shrikar Agro Producer Company Limited	Productive Partnership Between Shrikar Agro Producer Company Ltd. And Processors
3	Vikas Agro Producer Company Limited	Productive Partnership Between Adm Agro Industries Latur & Vizag Pvt. Ltd. And 6 Soybean FPCs
4	Katpur Agro Producer Company Limited	Productive Partnership Between Adm Agro Industries Latur & Vizag Pvt. Ltd. And 6 Soybean FPCs
5	Aroma Organic Agro Producer Company Limited	Productive Partnership Between Adm Agro Industries Latur & Vizag Pvt. Ltd. And 6 Soybean FPCs
6	Farmrich Producer Company Limited	Farmrich Warehousing With Cleaning ,Grading & Sortex Facility And Agriculture Equipment Bank
7	Bhageshwar Agro Producer Company Limited	Cleaning Grading & Dal Mill (Pp)
8	Arjunrao Sukne Farmer Producer Company Limited	Godown And Agri Commodities Cleaning & Grading.
9	Gutti Agro Farmer Producer Company Limited	Productive Partnership Sub Project

10	Rasika Agro Processing Farmer Producer Company Limited	Warehouse & Cleaning, Grading Unit
11	Reformers Farmers Producer Company Limited	Warehouse & Cleaning, Grading Unit
12	Raghukul Agro Producer Company Limited	Cleaning Grading, Custom Hiring, Warehouse & Agri Input.
13	Usturi Agro Producer Company Limited	Usturi Warehousing Cleaning Grading And Agriculture Equipment Bank
15	Samarth Sonwati Farmer Producer Company Limited	Warehouse, Besan Plant, Clearing Grading, Custom Hiring
16	Ansarwada Organic Farmer Producer Company Limited	Cleaning Grading , Warehouse & Custom Hiring
17	Pgb Crop Agro Producer Company Limited	Pgb Crop Agro Producer Seeds Processing Unit
18	Malleshwar Agro Producer Company Limited	
19	Shivmalhar Agro Producer Company Limited	Shivmalhar Cleaning, Grading, Warehousing And Agriculture Equipment Bank
20	Aakka Agro Producer Company Limited	Aakka Agro Producer Company Limited
21	Patharwadi Agro Farmer Producer Company Limited	Patharwadi Agro Farmer Producer Company Limited
23	Mauli Agri Farmer Producer Company Limited	Mauli Agri Farmer Producer Company Limited
24	Anantpal Krushi Producer Company Limited	Anantpal Krushi Producer Company Limited

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 labor 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

Krishi Sanjivani Saptah –

- *Krushi sanjivani saptah* was organized from 25th June to 1st July 2023 in Latur district.
- In that week meetings were organized in 949 villages with the participation of 23700 farmers.
- During *krushi sanjivani saptah* field officials guided 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.

Krushi Sanjivani Saptah At. Andhori Taluka – Aehmadpur

District Agricultural Festivals: (District Krishi Mahotsav)

- District Agricultural Festivals were conducted in **Siddheshwar Mandir premises** during 25th February to 01st March 2023.
- A total of 175 stalls participated.
- Visited 24000 farmers.
- Rs.20 lakhs of agricultural produce and processed food of women self-help groups, farmers were sold.

Agricultural Extension Planning

- Meetings / Training / Demonstrations at least three times before sowing in each village
- Attendance / participation of senior officials in village meetings
- Dissemination of technologies used by successful farmers through short videos
- Contact every farmer through What's App
- Dissemination of technology by field staff themselves by making technology dissemination videos
- Dissemination of technology of winning farmers in crop competitions in the district

Ranbhaji Mahotsav:

- District Level Ranbhaji Mahotsav was organized on behalf of Maharashtra State, Department of Agriculture at Kalpataru function hall, near Datta temple, Ausa road, latur
- Ranbhaji Mahotsav was inaugurated by Hon. District collector, Latur. According to the suggestion of the Commissioner of Agriculture, according to the natural availability of wild vegetables at district level and taluka level.
- Ranbhaji Mahotsav was organized on 13/08/2022 In this, 1750 farmers participated in the vegetable festival organized at district level. At this time 64 wild vegetables were available for sale and there was a turnover of Rs.3 lakhs.

Ranbhaji Mahotsav: Agriculture Technology Management Agency, (ATMA) Latur

Integrated control of snails

- Snail integrated through gram sabhas, farmer meetings in every village of the district, enlightenment through Demonstration
- Distribution of medicines/fertilizers on 50% subsidy through District Planning Committee.
- Through Akashvani, Durdarshan, Private Channels, Videos, Newspapers, Murals to promote and disseminate information about eradication special attention in last year affected villages.

Pradhan Mantri Pik Bima Yojana

- In the kharif season 8,29,770 farmers will cover 5,66,025 Ha. area for kharif season 2022 by Rs.2917.84 Cr.
- In rabbi season 130862 farmers will be covered 94985 Ha. area for rabbi season 2022 by Rs.314.37 Cr.
- In a weather based fruit crop insurance scheme 533 farmers will be covered 370 Ha. area for Ambia bahar season 2022 by Rs.5.24 Cr.

Balasaheb Thackeray Agricultural Business and Rural Transformation Project (SMART)

- Total 46 proposals have been received in the district and submitted to the Commissionerate for preliminary approval and out of 38 proposals have received preliminary approval.
- 34 detailed project reports of the proposal have been submitted.
- 23 proposal is Processed at Commissionerate level for approval

Pradhan Mantri Formalisation of Micro food processing Enterprises (PMF ME)

- In this scheme, 35 percent subsidy is available for individual and group projects with an upper limit of Rs. 10 lakhs.
- Accordingly, 969 projects have been submitted to the bank out of which 181 proposals have been approved and 478 proposals have been rejected. 150 proposals are pending with the Bank level.

- To conduct meetings, training, workshops and study tours of Village Climate Resilient Agriculture Management Committee (VCRMC), farmers, Krishi Tai, project officials and field functionaries for effective implementation.
- To conduct field farm schools to adapt climate resilient agriculture technologies.
- Under the project a total amount of Rs.12602.38 lakhs has been disbursed to 43720 farmers for individual components.
- A total of 80 FPO/FPC has been benefited of Rs.1129.82 lakhs for community components.
- A total 101 of soil and water conservation works worth Rs.171.95 lakh have been done under the community component.

III. Monitoring mechanism for village adaptation progress

Monitoring Mechanization for village adaptation progress:

1) Monthly review of Taluka Agriculture Officers and Circle Agriculture Officers.
2) Monthly meetings with field functionaries of all agriculture schemes.
3) Through the field farm school to give the proper guidance for farmers regarding climate resilient technologies to create sustainable livelihood opportunities.
4) To inspire the farmer by effective communication to plan adaptation of new technology and schemes and to focus on adaptive climate resilient agriculture technologies for sustain.
5) To identify the needs and problems of farmers for effective implementation of various agriculture schemes.
6) To train extension workers, government officials, and agricultural experts to provide guidance and support to farmers in adopting mechanization.
7) Provide easy access to information about the latest trends in mechanization and government support programs through online platforms and local agricultural extension offices.
8) Encourage the formation of farmer cooperatives to jointly invest in and share machinery. This can help small farmers access modern equipment.
9) Promote the use of mechanization methods that are environmentally sustainable, such as precision agriculture and reduced chemical usage.
10) Monitor the adoption of modern agricultural technologies and machinery, such as tractors, harvesters, irrigation systems, and precision agriculture tools.

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:

1. **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.

2. **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.
3. **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.
4. **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.
5. **Resource Management**: Evaluate the sustainable management of natural resources, including water, soil, and forests. Consider strategies for resource conservation and sustainable practices.
6. **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.
7. **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.
8. **Community Participation**: Involve local communities in the planning and decision-making process. Encourage community-led initiatives and self-help groups.
9. **Communication and Awareness**: Communicate the revised plan to all stakeholders, ensuring transparency and understanding. Raise awareness among the villagers about the plan and its objectives.
10. **Periodic Review**: Set regular intervals for revisiting and updating the plan, such as every two to three years, to stay current with evolving needs.
11. Revisiting a village adaptation plan is a **dynamic process** that requires collaboration, adaptability, and a focus on sustainable development. It should be a participatory and iterative process that takes into account the unique needs of each village.

Annexure I Sample Village Level Micro-Plan

https://mlpv2.mahapocra.gov.in/vdp.php?census_code=560569

गाव विकास आराखडा प्रपत्र

महाराष्ट्र शासन - कृषि विभाग
नानाजी देशमुख कृषि संजीवनी प्रकल्प

POCRA

गाव विकास आराखडा

गाव समुहाचा क्रमांक- 524_mr-33_02

गावाचे नाव-	गणेशवाडी	सेन्सस कोड-	560569
महसुल मंडळ-	Hisamabad	तालुका-	शिरूर
उपविभाग-	लातूर	जिल्हा-	लातूर

गावसमुहातील इतर समाविष्ठ गावे

अ. क्र	गावाचे नाव	सेन्सस कोड	अ. क्र	गावाचे नाव	सेन्सस कोड
1	दगडवाडी	560206	2	सुगाव	560543
3	वंजारखेडा	560576	4	देवंग्यावाडी	560541
5	मुशिराबाद	560204	6	बींदगीहळ	560209
7	बोकनगाव	560208	8	अष्टा	560518
9	फक्रानपूर	560575	10	सळगरा खु.	560205
11	देवंग्या	560540	12	हिप्पळगाव	560546
13	मोहदळ	560519	14	सावरगाव	560545
15	सळगरा बु.	560207			

सुक्ष्मनियोजन प्रक्रिया कालावधी - 04-02-2021 ते 06-02-2021
गाव विकास आराखडा तयार करणा-या कृषि सहाय्यकाचे नाव - T KAMBLE
गाव विकास आराखडयाची तांत्रिक तपासणी करणारे कार्यालय - उपविभागीय कृषि अधिकारी,लातूर
ग्राम कृषि संजीवनी समिती मंजूरी ठराव क्रमांक व दिनांक - ठराव क्रमांक 1 दि. 21-06-2002
ग्रामसभा मंजूरी ठराव क्र व दिनांक - ठराव क्रमांक 1 दि. 19-07-2021
जिल्हास्तरीय समन्वय समितीकडील मंजूरीचा दिनांक - _____

जिल्हा अधिक्षक कृषि अधिकारी,लातूर कार्यालय

अनुक्रमणिका

2) गावाचा विकास आराखडा तयार करण्यासाठी राबविलेला कार्यक्रमाचा तपशील

2.1 सुक्ष्मनियोजन प्रक्रिया कालावधी

नानाजी देशमुख कृषि संजीवनी प्रकल्पांतर्गत गाव विकास आराखडा तयार करण्यासाठी लोकसहभागी पद्धतीने सुक्ष्मनियोजन प्रक्रिया दि. 4-2-2021 पासून दि. 6-2-2021 पर्यंत राबविण्यात आली. त्याचा तपशील पुढीलप्रमाणे आहे.

सुक्ष्मनियोजन दिवस	तारीख	कार्यक्रम (सुक्ष्मनियोजन तंत्र / उपक्रम)	उपस्थिती	
			महिला	पुरुष
1	4-2-2021	प्रभात फ़ेरी	9	16
		संसाधन नकाशा	8	21
		संकलित सामाजिक व आर्थिक माहितीवर चर्चा	5	22
		गावातील शेती व निगडीत बाबीसंबंधी ऋतूचक्र, समयरेषा आणि परिस्थिती विश्लेषण विषयी चर्चा	7	24
		-शिवार फ़ेरी व विहीर निरिक्षण		
		-संसाधन नकाशा व अहवाल व त्यावर चर्चा	8	25
2	5-2-2021	-शिवार फ़ेरी व विहीर निरिक्षण		
		लक्ष्य गट चर्चा - शेती मुल्यसाखळी, शेती परिस्थिती विश्लेषण, नैसर्गिक संसाधने व शेतीचे नियोजन ;	2	22
		शेतकरी गट/ कृषि आधारीत उद्योग/ प्रगतीशील शेतकरी माहिती	8	22
		- प्रस्तावित कामांचा मसुदा App द्वारे/ प्रिटद्वारे वाचून दाखविणे	12	28
		महिला सभा	12	--
3	6-2-2021	- पाण्याचा ताळेबंद नुसार जलसंधारण कामे व पिक नियोजन आराखडा अंतिम करणे	10	24
		प्रस्तावित कामांचा मसुदा अंतिम करणे	10	24
		सामाजिक व पर्यावरणीय सुची	10	24
		ग्राम कृषि संजीवनी समिती सभा	10	24
4	6-2-2021	- ग्रामसभा	00	00
		प्रस्तावित कामांच्या मसुद्यास व गाव विकास आराखड्यास मंजूरी देणे	00	00

१) प्रस्तावना व पार्श्वभूमी, प्रकल्पाची गरज

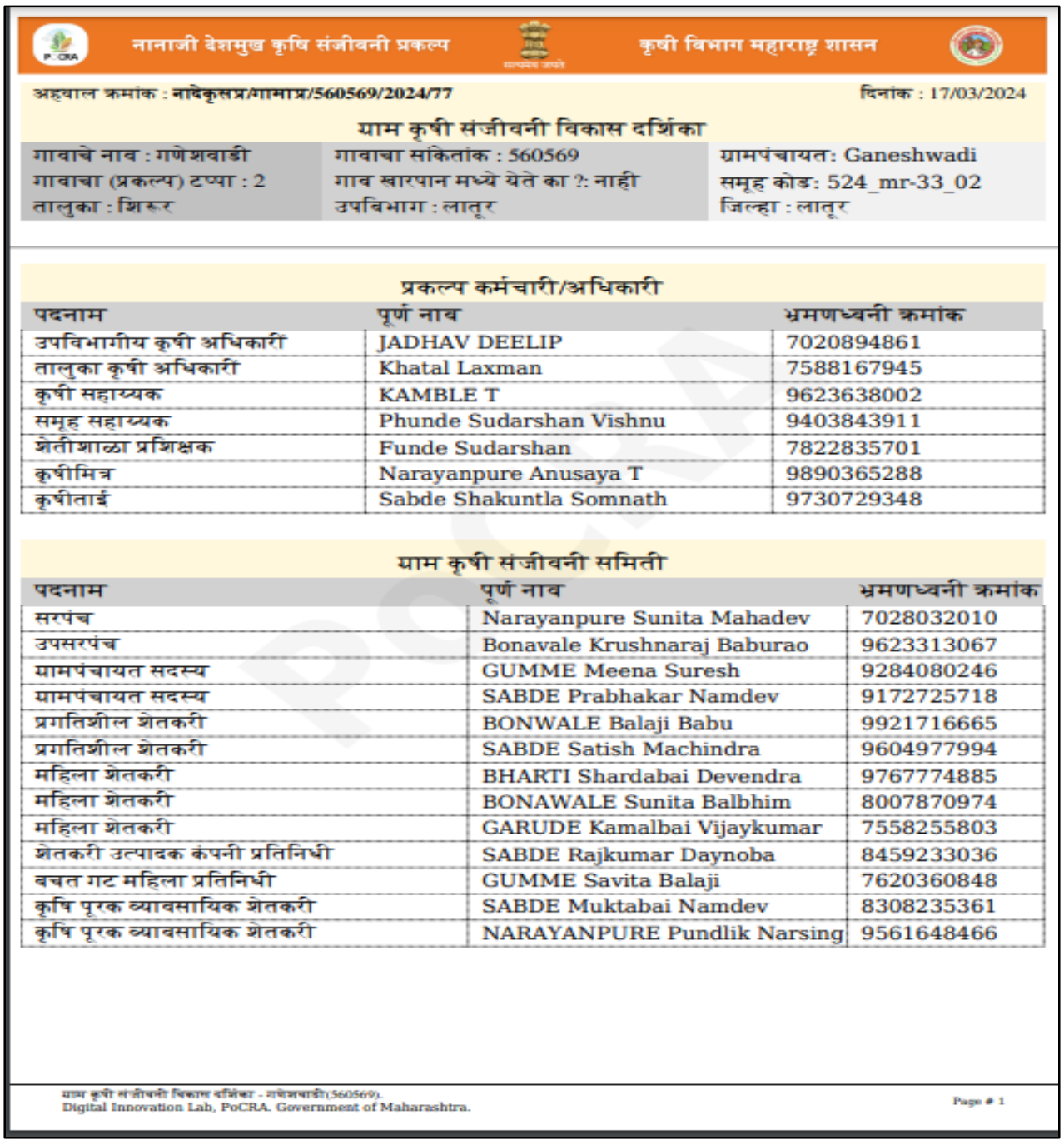
नानाजी देशमुख कृषि संजीवनी प्रकल्पांतर्गत दि.**18.1.2018** च्या शासन निर्णयानुसार मौजे **गणेशवाडी** ता. **शिरूर** जि. **लातूर** गावाची निवड झालेली आहे. मौजे **गणेशवाडी** हे गाव जिल्हा ठिकाणापासून **26** किमी अंतरावर **पूर्व** दिशेला वसलेले आहे. गावाचे प्रक्षेत्र **पाण्याचे दुर्भिक्ष्य** असलेल्या भागात येते. गावाचे भौगोलिक क्षेत्रफ़ळ **494** हेक्टर आहे. गावाची सध्याची लोकसंख्या **1268** असून साक्षरतेचे प्रमाण **85** आहे. हे गाव रीठ गाव **नाही** .

मौजे **गणेशवाडी** गावाचा प्रमुख व्यवसाय शेती यावर आधारीत आहे. गावात पिकाखालील क्षेत्र **484** हे आहे. खरीप हंगामामध्ये **soyabean, tur,** ही पिके प्रामुख्याने घेण्यात येतात. रबी हंगामामध्ये **gram, jowar,** ही पिके घेतली जातात. त्याव्यतिरिक्त ही फ़ळपिके आहेत. तर प्रामुख्याने भाजीपाला घेतला जातो. गावामध्ये उत्पादीत शेतीमालावर आधारीत **0** प्रक्रिया उद्योग आहेत. गावातील शेतीमाल विक्रीकरिता येथे बाजारपेठ उपलब्ध आहे. गावात शेती बरोबरच **अन्नधान्य** हे शेतीपुरक व्यवसाय आहेत. सद्यस्थितीत गावाच्या पाण्याच्या ताळेबंदानुसार **37 (कोटी लिटर)** इतका अपधाव शिल्लक आहे. गावात **बोरवेल, पाझर तलाव, शेततळे - इनलेट व आउटलेट्सह (३० x ३० x ३ मी. पर्यंत), वैयक्तिक विहिरी** ही मृद व जलसंधारणाची कामे अस्तित्वात आहेत. गावात मृद व जलसंधारणाची कामे हाती घेण्यास वाव **--**. गावात मृद व जलसंधारणाची कामे **--** या कारणामुळे हाती घेता येणार नाहीत. गावाचे पर्जन्यमान सरासरी **664.6** मि मी आहे. पडणारा पाऊस **खरीप** पिकांकरिता पुरेसा असतो. सर्वसाधारणपणे पावसातील **खंड** घटकांमुळे शेतीचे नुकसान होते. भूजलाचे कमी प्रमाण व पाण्याची साठवण देखील कमी असल्यामुळे गावातील शेतीसाठी पाण्याचे नियोजन करणे क्रमप्राप्त आहे. लहान व मध्येम शेतक-यांची तसेच अनु. जाती/ जमातीतील आणि महिला शेतक-यांचे उत्पन्न वाढविण्याच्या उद्देशाने तसेच बदलत्या हवामानास तोंड देण्यासाठी शेतीमध्ये **jalsandharan, mrudsandharan,** इ. बाबींना वाव आहे.

गावाच्या **pazar talav** या वैशिष्ट्यामुळे गावातील **sinchan** शेती/ शेती पुरक व्यवसाय/ शेती आधारित व्यवसाय वृद्धींगत करता येणे शक्य आहे. गावामध्ये नानाजी देशमुख कृषि संजीवनी प्रकल्पातील **drip and sprinkler** बाबींचा लाभ शेतक-यांनी घेतलेला आहे.

Annexure II Sample Village Profile

https://ffsauditlogs.blob.core.windows.net/mahapocra/scripts/pdf/pocra-village-profile-560569-2024-77.pdf



नानाजी देशमुख कृषि संजीवनी प्रकल्प — कृषी विभाग महाराष्ट्र शासन

अहवाल क्रमांक : **नादेकृसप्र/गामाप्र/560569/2024/77** — दिनांक : 17/03/2024

ग्राम कृषी संजीवनी विकास दर्शिका

गावाचे नाव : गणेशवाडी	गावाचा सांकेतांक : 560569	ग्रामपंचायत: Ganeshwadi
गावाचा (प्रकल्प) टप्पा : 2	गाव खारपान मध्ये येते का ?: नाही	समूह कोड: 524_mr-33_02
तालुका : शिरूर	उपविभाग : लातूर	जिल्हा : लातूर

प्रकल्प कर्मचारी/अधिकारी

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
उपविभागीय कृषी अधिकारी	JADHAV DEELIP	7020894861
तालुका कृषी अधिकारी	Khatal Laxman	7588167945
कृषी सहाय्यक	KAMBLE T	9623638002
समूह सहाय्यक	Phunde Sudarshan Vishnu	9403843911
शेतीशाळा प्रशिक्षक	Funde Sudarshan	7822835701
कृषीमित्र	Narayanpure Anusaya T	9890365288
कृषीताई	Sabde Shakuntla Somnath	9730729348

ग्राम कृषी संजीवनी समिती

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
सरपंच	Narayanpure Sunita Mahadev	7028032010
उपसरपंच	Bonavale Krushnaraj Baburao	9623313067
ग्रामपंचायत सदस्य	GUMME Meena Suresh	9284080246
ग्रामपंचायत सदस्य	SABDE Prabhakar Namdev	9172725718
प्रगतिशील शेतकरी	BONWALE Balaji Babu	9921716665
प्रगतिशील शेतकरी	SABDE Satish Machindra	9604977994
महिला शेतकरी	BHARTI Shardabai Devendra	9767774885
महिला शेतकरी	BONAWALE Sunita Balbhim	8007870974
महिला शेतकरी	GARUDE Kamalbai Vijaykumar	7558255803
शेतकरी उत्पादक कंपनी प्रतिनिधी	SABDE Rajkumar Daynoba	8459233036
बचत गट महिला प्रतिनिधी	GUMME Savita Balaji	7620360848
कृषि पूरक व्यावसायिक शेतकरी	SABDE Muktabai Namdev	8308235361
कृषि पूरक व्यावसायिक शेतकरी	NARAYANPURE Pundlik Narsing	9561648466

ग्राम कृषी संजीवनी विकास दर्शिका - गणेशवाडी(560569).
Digital Innovation Lab, PoCRA. Government of Maharashtra.
Page # 1

एकूण	NA

निरीक्षण विहिरींची पाण्याची पातळी

सूक्ष्म नियोजन आराखडयानुसार गावतील सरासरी भुजल पातळी 8 (खोली मी मध्ये) निरीक्षण साठी निवडलेल्या विहिरीचा तपशील

अ.क्र.	पाणलोट क्रमांक	शेतकरी संख्या	भुजल पातळी स्थिती (मी)	दिनांक
1	524_mr-33_02	227	14	5-2-2021

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
17830	1697	30/11/2023
गोदाम नाव	**ईमेल**	**दूरध्वनी**
SHIRUR ANANTPAL	shiruranantpal.wh@mswc.in	9158299765

गोदामाचा पत्ता -MSWC, A.P.M.C. MARKET YARD, SAMTANAGAR, UDGIR ROAD, SHIRUR ANANATPAL - 413544
गावापासून अंतर(कि.मी.) - 8.99

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

पिक पद्धतींचा तपशील

माहिती उपलब्ध नाही

भूमी उपयोगिता वर्गीकरण

गावाचे एकूण भौगोलिक क्षेत्र 494.27 हे असून निव्वळ पिकाखाली त्यापैकी 99.14% क्षेत्र आहे. गावाचे भूरूप ढोबळमानाने उंचसखल/ डोंगराळ/ सपाट प्रकारचे आहे. गावातील निव्वळ पिकाखालील क्षेत्रापैकी 43.67% क्षेत्राकरिता सिंचनसुविधा उपलब्ध आहे.

अ.क्र.	तपशील		क्षेत्र (हेक्टर)
1	एकूण भौगोलिक क्षेत्र (Total Geographical Area)		494.27
2	पिकाखालील निव्वळ क्षेत्र (Net Cropped Area)		490
3	दुबार पिकाखालील क्षेत्र (Double Cropped Area)		221
4	एकूण लागवडीखालील क्षेत्र (Gross cropped Area)		490
5	एकूण सिंचित क्षेत्र (Irrigaterd Area)	हंगामी बागायत	187
		बारमाही बागायत	27
6	एकूण वन क्षेत्र (Total Forest Area)		0
7	कायम पड क्षेत्र (Permanent Fallow Area)		8
8	चालू पड क्षेत्र (Current Fallow Area)		0
9	गवत पड व चराऊ कुरणे (Pasture Land)		0
10	इतर पड क्षेत्र (Other Fallow Area)		8
11	बिगर कृषि क्षेत्र (Area put to non-Agricultural use)		0

पिकनिहाय क्षेत्र (क्षेत्र हेक्टर)

अ.क्र.	पिकाचा वर्ग	पिकाखालील क्षेत्र
1	तृणधान्य	NA
2	कडधान्य	NA
3	गळितधान्य	NA
4	नगदी पिके (कापूस,ऊस)	NA
5	भाजीपाला पिके	NA
6	फळपिके	NA
7	चारा पिके	NA
8	इतर	NA

Saline and Sodic lands (Farm ponds/ Sprinklers / Water pump/ FFS)	9	0	9	0	0
Seed Production	64	53	11	35	560427
Sericulture	7	0	7	0	0
Shadenet House	1	0	1	0	0
Small ruminants	1	0	1	0	0
Sprinkler Irrigation	149	92	36	92	1654777
Water Pumps	17	1	16	1	15000
Well	2	1	1	1	250000
Total	363	162	166	143	3381011

कृषी व्यवसाय घटकाचा तपशील

नोंदणी केलेल्या FPC/SHG/Farmer Group ची संख्या - 0
एकूण अर्जांची संख्या - 0
पूर्वसंमती दिलेल्या अर्जांची संख्या - 0
कार्यारंभ आदेश दिलेल्या अर्जांची संख्या - 0
लाभ दिलेल्या FPC/SHG/Farmer Group ची संख्या - 0
अनुदान वितरीत रक्कम, रु. - 0

मृद व जलसंधारण तपशील

पावसाचे प्रमाण (मिमी) - 835
उपलब्ध अपधाव (TCM) - 0
अडवलेला अपधाव (TCM) - 0
शिल्लक अपधाव (TCM) - 0
प्रस्तावित क्षेत्र उपचार (हे.) - 484
प्रस्तावित नाला उपचार संख्या - 9
कामांची एकूण रक्कम - 48.06
तयार अंदाज पत्रकांची संख्या - 0
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

भौगोलिक तपशील

माहिती उपलब्ध नाही

हवामान अंदाज व पीक सल्ला

माहिती उपलब्ध नाही

वैयक्तिक लाभार्थी तपशील

नोंदणी केलेले शेतकरी - 157	अर्जांची एकूण संख्या - 363
पूर्वसंमती दिलेले अर्ज - 162	लाभ दिलेले अर्ज- 162
लाभार्थी संख्या - 108	लाभार्थी महिला शेतकरी - 37
अनुसूचित जाती लाभार्थी - 0	अनुसूचित जमाती लाभार्थी - 1
वितरीत अनुदान रक्कम - 3381011	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	1	0	1	0	0
Compost (Vermicompost / NADEP / Organic input production unit)	5	0	4	0	0
Drip Irrigation	42	10	24	10	822073
Farm Mechanization	5	0	5	0	0
Farm Pond (Individual)	17	1	13	1	50000
Farm Pond Lining	1	0	0	0	0
FFS host farmer assistance / Promotion of BBF technology/ Zero Tillage Technology etc.	4	3	1	2	8400
Horticulture Plantation / Agroforestry	14	1	13	1	20334
Pipes	21	0	21	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	1	0	0	0	0

नानाजी देशमुख कृषि संजीवनी प्रकल्प — कृषी विभाग महाराष्ट्र शासन

अहवाल क्रमांक : **नादेकृसप्र/गामाप्र/560569/2024/77** दिनांक : 17/03/2024

ग्राम कृषी संजीवनी विकास दर्शिका

गावाचे नाव : गणेशवाडी	गावाचा सांकेतांक : 560569	ग्रामपंचायत: Ganeshwadi
गावाचा (प्रकल्प) टप्पा : 2	गाव खारपान मध्ये येते का ?: नाही	समूह कोड: 524_mr-33_02
तालुका : शिरूर	उपविभाग : लातूर	जिल्हा : लातूर

प्रकल्प कर्मचारी/अधिकारी

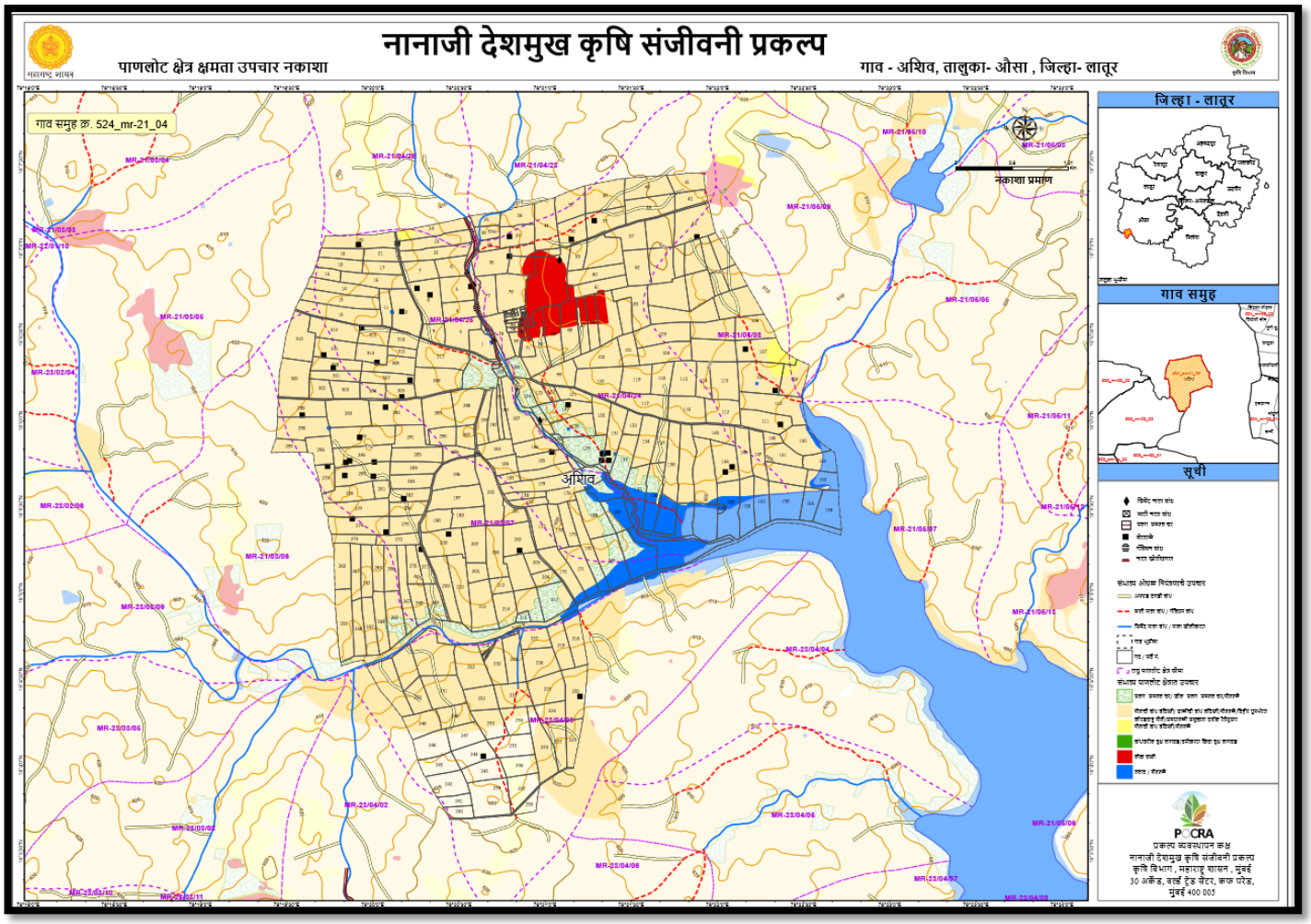
पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
उपविभागीय कृषी अधिकारी	JADHAV DEELIP	7020894861
तालुका कृषी अधिकारी	Khatal Laxman	7588167945
कृषी सहाय्यक	KAMBLE T	9623638002
समूह सहाय्यक	Phunde Sudarshan Vishnu	9403843911
शेतीशाळा प्रशिक्षक	Funde Sudarshan	7822835701
कृषीमित्र	Narayanpure Anusaya T	9890365288
कृषीताई	Sabde Shakuntla Somnath	9730729348

ग्राम कृषी संजीवनी समिती

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
सरपंच	Narayanpure Sunita Mahadev	7028032010
उपसरपंच	Bonavale Krushnaraj Baburao	9623313067
ग्रामपंचायत सदस्य	GUMME Meena Suresh	9284080246
ग्रामपंचायत सदस्य	SABDE Prabhakar Namdev	9172725718
प्रगतिशील शेतकरी	BONWALE Balaji Babu	9921716665
प्रगतिशील शेतकरी	SABDE Satish Machindra	9604977994
महिला शेतकरी	BHARTI Shardabai Devendra	9767774885
महिला शेतकरी	BONAWALE Sunita Balbhim	8007870974
महिला शेतकरी	GARUDE Kamalbai Vijaykumar	7558255803
शेतकरी उत्पादक कंपनी प्रतिनिधी	SABDE Rajkumar Daynoba	8459233036
बचत गट महिला प्रतिनिधी	GUMME Savita Balaji	7620360848
कृषि पूरक व्यावसायिक शेतकरी	SABDE Muktabai Namdev	8308235361
कृषि पूरक व्यावसायिक शेतकरी	NARAYANPURE Pundlik Narsing	9561648466

Annexure III Sample Village Map (गावाचा मुलभूत नकाशा)

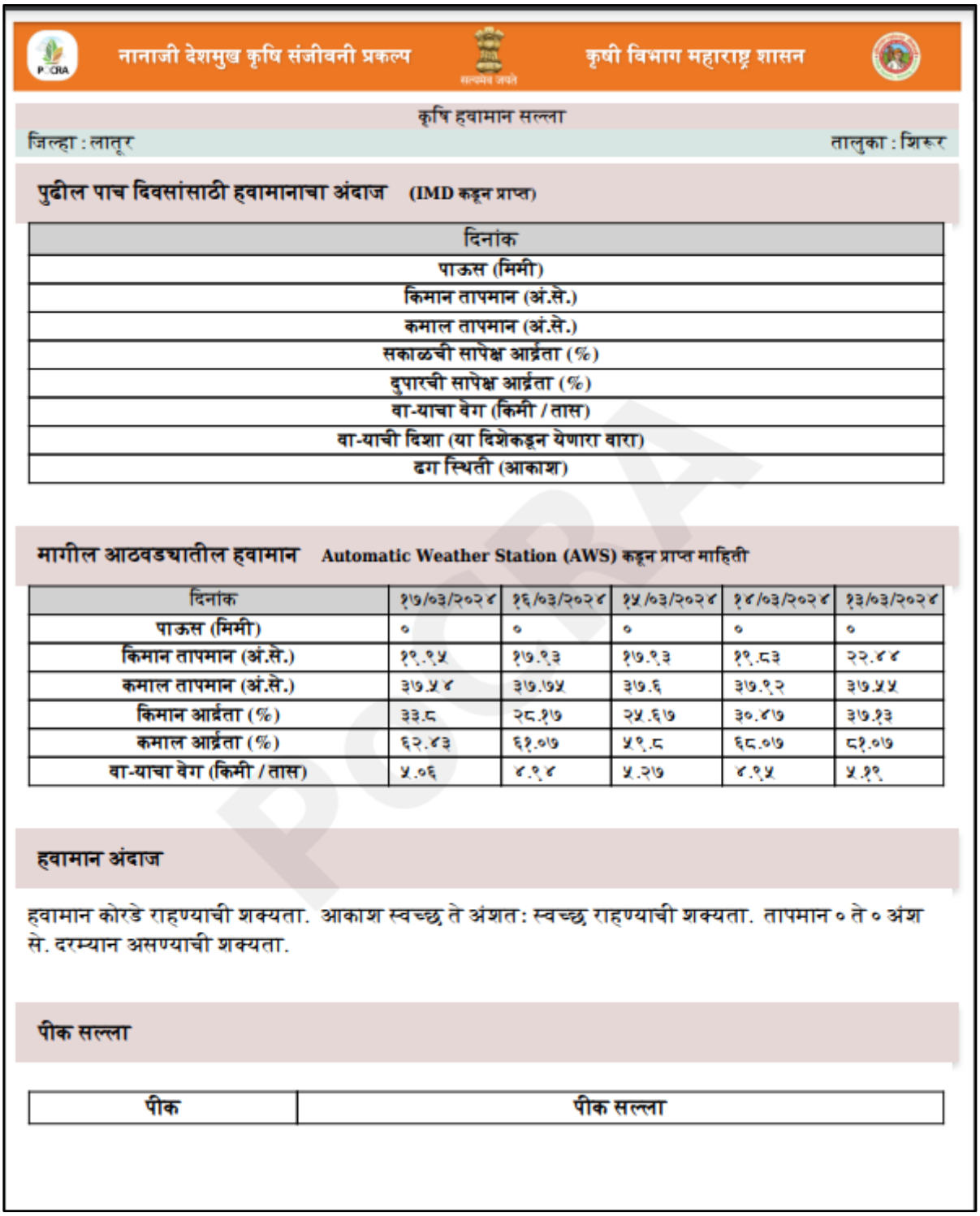
https://mahapocra.gov.in/maps/BaseMap/560694.pdf



Annexure IV Sample Agro-met Advisory

(तालुका निहाय हवामान अंदाज व कृषी सल्ला)

https://mahapocra.gov.in/home/taluka-advisories



नानाजी देशमुख कृषि संजीवनी प्रकल्प — कृषी विभाग महाराष्ट्र शासन

कृषि हवामान सल्ला

जिल्हा : लातूर — तालुका : शिरूर

पुढील पाच दिवसांसाठी हवामानाचा अंदाज (IMD कडून प्राप्त)

दिनांक
पाऊस (मिमी)
किमान तापमान (अं.से.)
कमाल तापमान (अं.से.)
सकाळची सापेक्ष आर्द्रता (%)
दुपारची सापेक्ष आर्द्रता (%)
वा-याचा वेग (किमी / तास)
वा-याची दिशा (या दिशेकडून येणारा वारा)
ढग स्थिती (आकाश)

मागील आठवड्यातील हवामान Automatic Weather Station (AWS) कडून प्राप्त माहिती

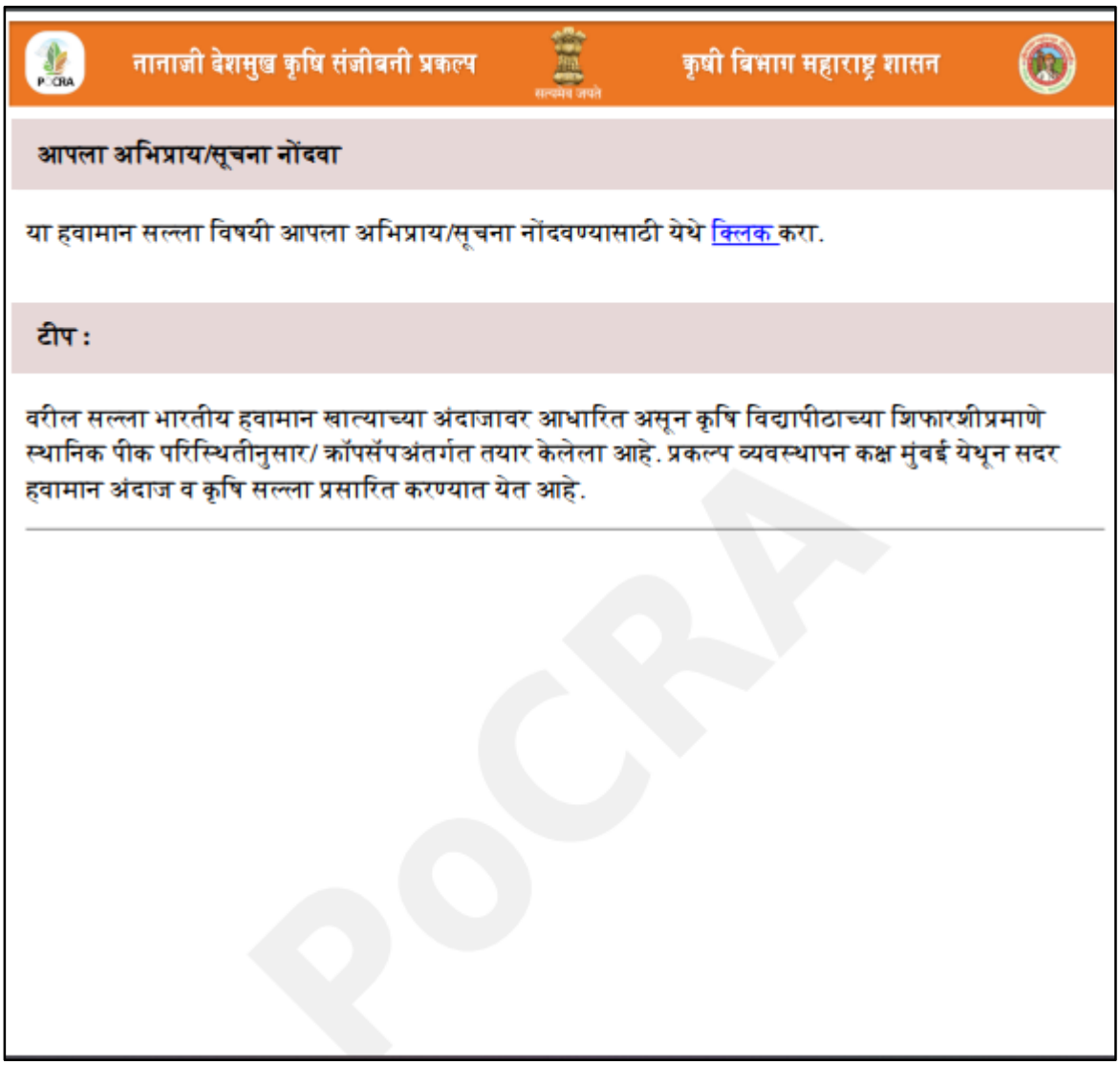
दिनांक	१७/०३/२०२४	१६/०३/२०२४	१५/०३/२०२४	१४/०३/२०२४	१३/०३/२०२४
पाऊस (मिमी)	०	०	०	०	०
किमान तापमान (अं.से.)	१९.९५	१७.९३	१७.९३	१९.८३	२२.४४
कमाल तापमान (अं.से.)	३७.५४	३७.७५	३७.६	३७.९२	३७.५५
किमान आर्द्रता (%)	३३.८	२८.१७	२५.६७	३०.४७	३७.१३
कमाल आर्द्रता (%)	६२.४३	६१.०७	५९.८	६८.०७	८१.०७
वा-याचा वेग (किमी / तास)	५.०६	४.९४	५.२७	४.९५	५.११

हवामान अंदाज

हवामान कोरडे राहण्याची शक्यता. आकाश स्वच्छ ते अंशत: स्वच्छ राहण्याची शक्यता. तापमान ० ते ० अंश से. दरम्यान असण्याची शक्यता.

पीक सल्ला

पीक	पीक सल्ला


नानाजी देशमुख कृषि संजीवनी प्रकल्प
कृषी विभाग महाराष्ट्र शासन
आपला अभिप्राय/सूचना नोंदवा
या हवामान सल्ला विषयी आपला अभिप्राय/सूचना नोंदवण्यासाठी येथे क्लिक करा.
टीप :
वरील सल्ला भारतीय हवामान खात्याच्या अंदाजावर आधारित असून कृषि विद्यापीठाच्या शिफारशीप्रमाणे स्थानिक पीक परिस्थितीनुसार/ क्रॉपसॅपअंतर्गत तयार केलेला आहे. प्रकल्प व्यवस्थापन कक्ष मुंबई येथून सदर हवामान अंदाज व कृषि सल्ला प्रसारित करण्यात येत आहे.
POCRA