Nanaji Deshmukh Krushi Sanjeevani Prakalp

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

Prepared by

Agricultural Technology Management Agency(ATMA), Washim

and

Project Management Unit

Nanaji Deshmukh Krushi Sanjeevani Prakalp, Mumbai

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.

INDEX

Chapter 1: General Profile of the District

1.1 Geographical area and location of the district

Washim district includes six tehsils and 789 villages. The total geographical area is 5,13,124 Ha. Tehsils are Washim, Malegaon, Risod, Karanja, Mangrulpir and Manora. Washim district lies between 19.61 to 21.16 N latitude and 76.07 to 77.14 E longitudes. The total population of Washim district is 11,97,160. Amongst them, the number of Male is 6,20,302 and females are 5,76,858 respectively. The annual average rainfall of the district is 799 mm per year. The maximum rainfall in the district is 911 mm. and minimum 750 mm. The tehsil name Mangrulpir, Manora receives high rainfall and tehsil like Risod and Malegaon receives low rainfall. The climate of the district is extremely dry with temperatures ranging from more than 45 degree Celsius and less than 10 Celsius in winter. The Tehsil Karanja has low temperature whereas the Tehsil Washim has high temperature.

The Penganga is the Main River which flows through Tehsil Risod and the boundaries of Washim. The rivers Arunavati and Katepurna flow through Mangrulpir, Manora and Malegaon tehsil.

1.2 Irrigation Potential of the District.

Sr. No.	District	Irrigated area (Source wise)									Lift irrigation		
		Major project			Medium project			Minor project					
		%	P	A	%	P	A	%	P	A	%	P	A
1	Washim	**0**	**0**	**0**	**109**	**5585**	**3132**	**316**	**33372**	**16853**	**764**	**3481**	**3250**

(Table No. 2)

Sr. No.	District	Wells/Bore wells			Tank			Pond			Others		
		%	P	A	%	P	A	%	P	A	%	P	A
1	Washim	**75**	**12068**	**2089**	**310.32**	**38957**	**14646**	**81**	**2253**	**1343**	**0**	**612**	**0**

(Source for table no. 1 and 2: - Executive engineer, minor irrigation division Washim)

%: Share of the total area under irrigation
P: - Potential area of the project
A: - Actual area of the irrigated

1.7 Soil formation in the district and type of soil

In Washim district, availability of soil is mainly 70% medium depth soil (25 to 100 cm). And 17% shallow depth soil (less than 25 cm) and 13% very deep soil more than (100 cm)

1.8 Different zones according to prevailing agro-ecological situations

AES: 1. Medium to deep soil (25 to 100 cm), moderate groundwater potential, double cropping with a seasonal horticulture crop that covers the maximum area of the district.

AES: 2. Shallow soil (less than 25 cm), hilly area, poor groundwater potential, and kharif crop prevalent.

AES: 3. Very deep soil (more than 100 cm), good water potential, double cropping with perennial horticulture crops.

Spread Agro-climatic Zone (ACZ) in Washim district.

Sr. No.	Name of ACZ	Block/Taluka	Area (Ha.)	% of Geogr. Area of the district
1	ACZ -7 (Assured rainfall)	Risod	87390	17.03
		Karanja	83193	16.21
ACZ – 7 Total			**170583**	**33.24**
2	ACZ – 8 (moderate rainfall)	Washim	94150	11.35
		Malegaon	91598	17.85
		Manora	78224	15.31
		Mangrulpir	78569	15.24
ACZ – 8 Total			**342541**	**66.75**

(Source of above Table no. 3:- https://www.icar-crida.res.in/CP 2012/state wise plans/Maharashtra%28 Pdf%29/PDKV, %20 Akola/Washim.pdf)

Description of Agro-climatic Zone & major agro ecological situations (based on soil and topography)

Sr. No	Agro-climatic Zone	Characteristics
1	Agro-climatic sub–Zone No.3 of the Agro climatic Zone No. 9 as per NARP classification	Washim district is divided into two agro climatic zones ACZ-7 and ACZ-8 having assured rainfall of 828mm with hilly area with light to medium soil, medium soil with single crop, and medium soil with double crop rainfed and medium soil with double crop irrigation in agro-ecological situation. I, II, III and IVth respectively.

Soil types

S. No	Soil type	Characteristics	Area in ha
1	Shallow/light soil (55%)	Well drained	2.37 lakh ha
2	Medium black soil (30%)	Medium day well drained soil	1.29 lakh ha

1. Agro-climatic zones

Washim district is divided into two agro climatic zones ACZ-7 and ACZ- 8 having the assured rainfall of 828 mm with hilly area with light to medium soil with single crop, medium soil with single crop and medium soil with double crop. Western plateau hills region – Plateau Zone North, climate hot and dry with light variation in summer and winter and soil type deep black, medium black shallow red and deep red.

2. Agro-ecosystems.

Based upon soil type, cropping system, irrigation and rain fed conditions; Washim District has been divided into four major agro-ecological situations. The details characteristic of the agro ecosystem is described below.

AES – I: Hilly Area with Light to Medium Soil (Somthana).

This situation is prevailing in Malegaon & Manora blocks of the District Comprising 20.40% cultivable area. The crops grown in this situation are moong, Urid, Jowar, Tur, Soybean, and Cotton. Horticultural crops like orange, vegetables are grown in well irrigated areas.

AES-II. Medium soil with single crop (Chambhai)

This situation is prevalent over part of Mangrulpir and Karanja blocks of the District And comprising 31.35% of District. The soil in these situations is predominantly black cotton soil. Major crops grown are vegetables that are grown on well irrigation.

AES- III Medium Soil with Double Crop.

This situation is observed in Malegaon, Risod and Partly Washim block of the district. This situation has got a very large area about 47% of the total cultivated area of the district. The crops grown in the situation are soybean, Tur, Gram, Safflower, Wheat and Fruit crops like orange, and Aonla.

AES- IV Medium Soil with Double Crop Irrigated.

This situation is observed in part of Washim and a few parts of Mangrulpir blocks covering the cultivated area of District The crops grown in this area are Soybean, Tur Jowar, Moong, Udid, Gram, Wheat, Safflower. Under canal irrigation summer groundnuts are also grown.

Agro Ecological Situations in Respective Villages of Washim District.

AES	Description	Block/Talukas	Representative Villages
AES I	Hilly area with light to medium soil	Manora	Somthana
AES II	Medium soil with single crop	Mangrulpir, Karanja	Chambhai
AES III	Medium soil with double crop rain fed	Malegaon, Risod	Ekamba
AES IV	Medium soil with double crop Irrigated	Washim, Mangrulpir	Vilegaon

Chapter: 2: Agriculture Profile of the District

2.1 Land use classification of the district given in table below

Sr. No.	Information
District	Washim
Geographical Area (Ha.)	513124 Ha.
Cultivable area (Ha.)	429173 Ha.
Cultivable waste (Ha.)	429173 Ha.
Current fallow (Ha.)	429173 Ha.
Forest open (Ha.)	429173 Ha.
Land put to Non agri. use (Ha.)	429173 Ha.
Barren and waste land (Ha.)	429173 Ha.

2.2 The agricultural land holdings of Washim district are as below.

Sr. No.	Land Holding (Ha.)	No. of land holders
1	Below 1 (Ha.)	59067
2	1 to 2 (Ha.)	78579
3	2 to 4 (Ha.)	54518
4	4 to 10 (Ha.)	5200
5	10 (Ha.) & Above	0
Total		197364

(Source for table no 4 and 5: - DSAO office and SREP Data, Washim District)

Irrigation facilities / water resources are available through medium, minor and K.T. ware projects, namely Ek Bhurji, Sonal and Adol. The project's current area is 21,328 Ha.c

2.3 Types of Crops grown, cropping pattern, cropping intensity and farming system

In Washim district, the Kharif season, Soybean, tur, cotton, mug and udid crops are sown. In the Rabi season, gram, wheat etc. crops are sown by farmers. In the cropping pattern, soya, mug / udid are followed by gram and wheat respectively. If irrigation facilities are available in some areas, groundnut crops are sown in summer. Soybean and gram have more crop intensity, found in both seasons respectively. The farming system – small and marginal farmers having less sown land holding so with co-agri. Business done by these farmers like goat rearing, dairy farm, organic farming, farm lab, poultry, processing unit etc., done to increase household income.

A. Year wise Area, Production and Productivity of Major Crops from last 5 Year:

{A- Area in Hector, Y- Yield (Production) in Quintal, P – Productivity Kg / ha}

Sr. No.	Name of crops	2018-19			2019-20			2020-21			2021-22			2022-23		
		A (Ha.)	Y (q)	P (kg)	A (Ha.)	Y (q)	P (kg)	A (Ha.)	Y (q)	P (kg)	A (Ha.)	Y (q)	P (kg)	A (Ha.)	Y (q)	P (kg)
1	Soybean	275271	3783820	1375	275271	2988893	1086	292942	5158943	1761	302607	4966991	1641	305987	4228557	1382
2	Tur	52080	294335	565	52050	317755	610	50721	436647	861	63050	340810	541	63137	389322	617
3	Jowar	11642	64316	552	11641	46959	403	1110	122	11	766	88	12	230	28	12
4	Cotton	29701	99528	335	29701	81078	273	28147	169301	601	21354	111989	524	22534	90981	404
5	Mung	14791	87560	592	14791	71019	480	6643	45219	681	2430	18389	757	2189	10152	464
6	Udid	14925	96154	644	14925	77149	517	544	4524	832	3150	26292	835	2729	15354	563
7	Wheat	28545	384038	1380	39753	525260	1321	37810	510511	1350	28817	400672	1390	38008	532530	1401
8	Gram	49003	385330	786	10151	79827	786	60069	1036767	1726	65385	872458	1334	82035	1011656	1233
9	Safflower	24	--	--	15	63	420	--	--	--	45		--	25		--

(Source: District Statistics Department, DSAO, Washim)

2.4 Other facilities:

Agricultural Service Centre (ASCs) - In Washim district, a total of 850 ASCs are available for farmers to provide input (Seed, Fertilizers/Fungicides, etc.)

KVK - Krushi Vigyan Kendra, Karda Tq. Risod is available for a farmer, which provides various extension facilities like demonstrations, FFS (Farm Field School) training, Workshop etc.

Agri-Clinic, Agri-Business training Centers (ACABC) - In Washim district 4, ACABC is available, which provides seed production and nurseries for fruit crops.

Vanoja (Tq. Risod) - has an 8 Ha. area for seed production, a capacity of 180 quintals per year for the Agricultural department.

Malegaon has a 15.72 ha area for nurseries, capacity 40,000 of which provides fruit crops, seedlings/Grafts of Agri. Department.

Wadha farm tq. Mangrulpir has a 22.40 ha area for seed production capacity of 200 quintals and nursery capacity of 36000, which provides seedlings/ grafts of agri. Department.

Vitholi tq. Manora - has 16.08-Hectare areas for seed production capacity 170 quintals of Agricultural department.

Cold Storages and Warehouses

In Washim two cold storage stores are available at Balkhed tq. Risod by name Balnath Farmer Producer Company LTD has a capacity of 30 Mt. of Guava and Custard Apple pulp. Second is in Washim city for Mango and Banana fruits with a capacity of 0.50 Mt.

Warehouse: Storage Godowns are available in Washim district government / private sector as per below-mentioned.

(Table no. 6)

Sr. No.	Govt./Pvt.	No. of Godowns	Capacity (Mt)
1	MSWC	16	24810
2	APMC	61	18075
3	Pvt. Godown	94	72311
4	PACS (Co-op.)	35	4830
5	Pvt. APMC	02	870
Total		**208**	**120896**

(Source: - SREP and MSWC, Washim 2019)

Soil/Fertilizers/Water testing Lab:

In Washim district, two labs available are one by the government and the other one is a KvK lab for soil testing, each having a capacity of 7500 samples testing and 10,000 samples testing respectively.

Automatic Weather Station:

In Washim district there are a total of 28 government weather stations which share weather data from time to time.

Nurseries: (Pvt. And Govt.): In Washim district there are two govt. nurseries having a capacity of 76000 seedlings/grafts and in private there are six nurseries having a capacity of 10000 seedlings/grafts each. Tamshi, Washim, Gogari, Jamb, Mangrulpir, Dhangarkhed and Shahadatpur.

Farmer Producers Companies / SHGs and their business:

In Washim district, a total of 1379 SHG organizations are registered with the ATMA office. In which 60 FPO's are registered amongst themselves, 49 applied for Custom Hiring Centers (CHC), Drying yard, Construction of Godowns, Neem Oil and Cleaning and Grading Unit etc. The total till now, 237 FPC's and SHG's have given benefits from the above-listed activities, such as subsidies of Rs. 2340.88 lac. From Nanaji Deshmukh Krushi Sanjivani Prakalp (PoCRA).

Agriculture credit flow and related institutions:

List of credit institutes in operation for the agricultural and allied sector in Washim district**.**

Regional Rural Bank			**Private Banks**			**Others**			**Total**			**All the Banks**	
No. of Branches	No. of Creditors	Amount (Crore)	No. of Branches	No. of Creditors	Amount (Crore)	No. of Branches	No. of Creditors	Amount (Crore)	No. of Branches	No. of Creditors	Amount (Crore)	No. of Farmers covered	No. of Farmers not covered
17	**11602**	**112**	**3**	**442**	**32**	**43**	**21112**	**402**	**63**	**33156**	**546**	**33156**	**546**

(Source: - DDR Office, Washim)

Agriculture Education Institutions

There are a total of two agricultural institutes in Washim district.

1. College of Agriculture, Krushi Vigyan Kendra, Karda Tq. Risod, District Washim.
2. Karmayogi Bhauraoji Jogdand Agriculture College, Amkheda Tq. Malegaon, District Washim.

(Above details shown in the Washim district Map below.)

Chapter 3: Weather trend of district

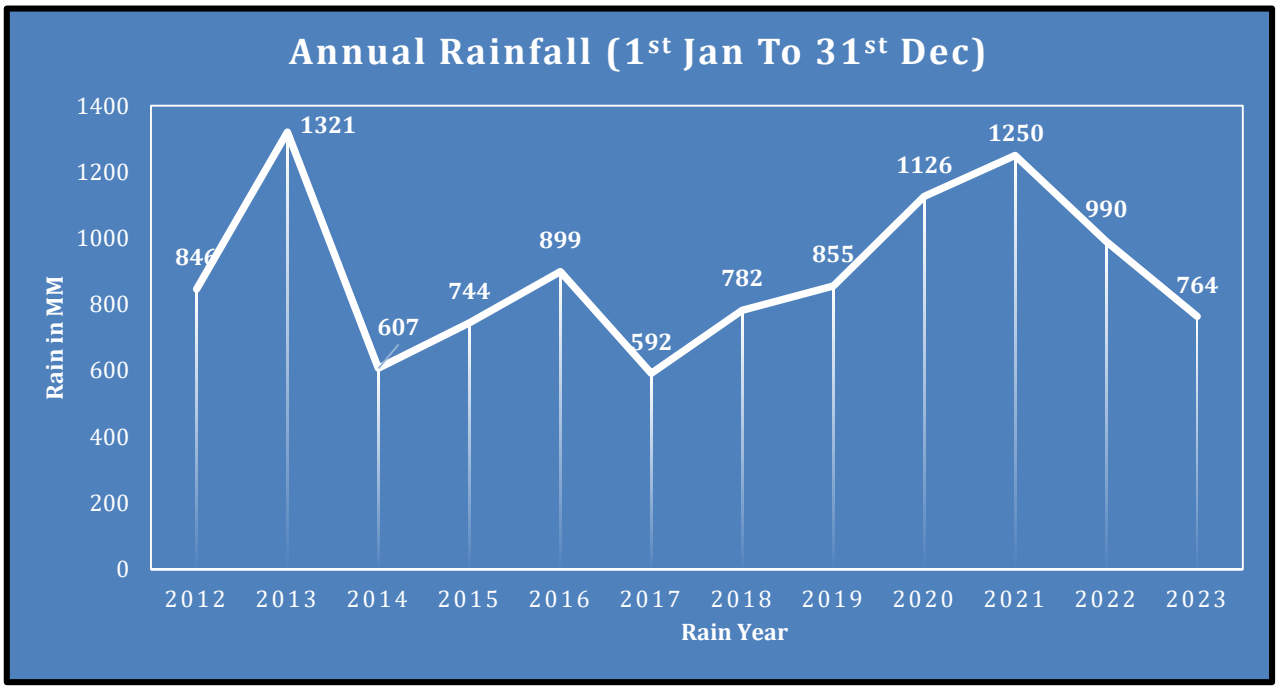
Introduction

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

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

3.1 Annual average rainfall of last twelve years

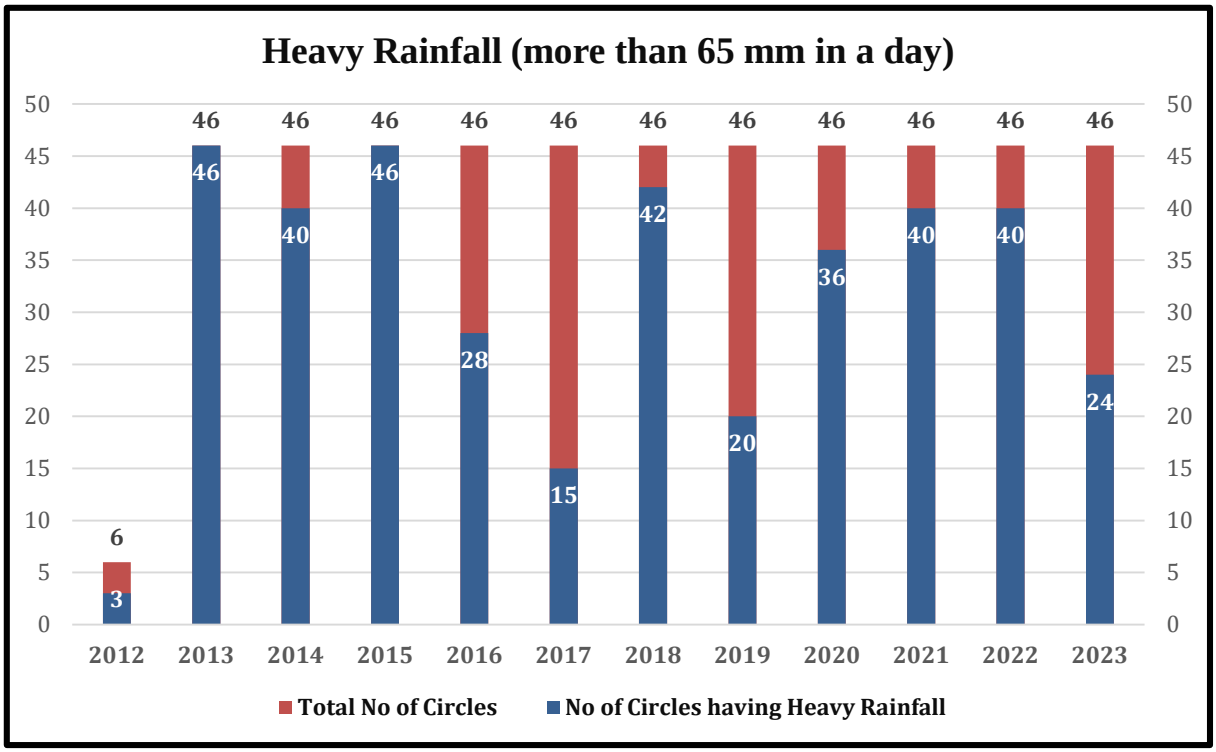
Normal or average rainfall is the amount of precipitation that we expect per year (in a given area). It is obtained and set by calculating the average (mean) of precipitation recorded in an area. Annual rainfall or precipitation is the sum of daily rainfall in a year.



The graph 3.1 presents annual rainfall data of Washim district from 2012 to 2023, highlighting fluctuations in precipitation. Notably, the lowest recorded rainfall was in year 2017 at 592 mm, while the highest occurred in year 2013 with a total of 1321 mm annual average rainfall.

3.2 Heavy rainfall

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



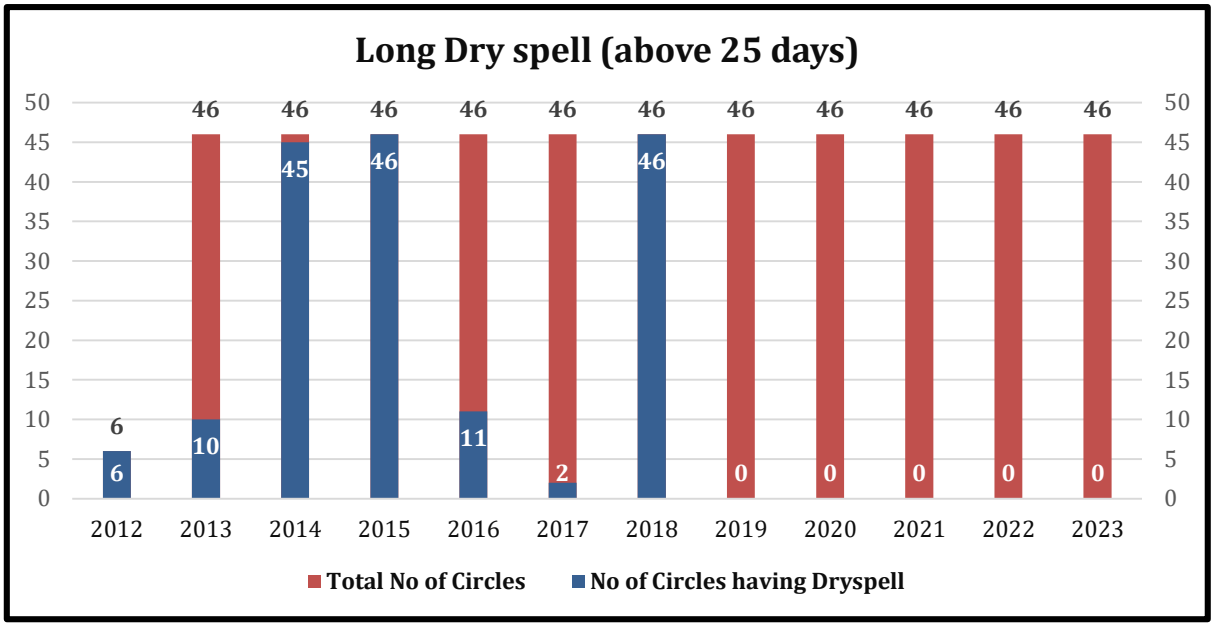
The provided graph 3.2 illustrates occurrences of heavy rainfall in circles within the Washim district from year 2012 to 2023. Notably, in year 2013 and 2015, heavy rainfall affected the all 46 circles. Conversely, the year 2017 recorded a lower incidence of heavy rainfall, with only 15 circles out of the 46 circles being affected in Washim District.

3.3 Dry spells

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

3.3.1 Long Dry spell

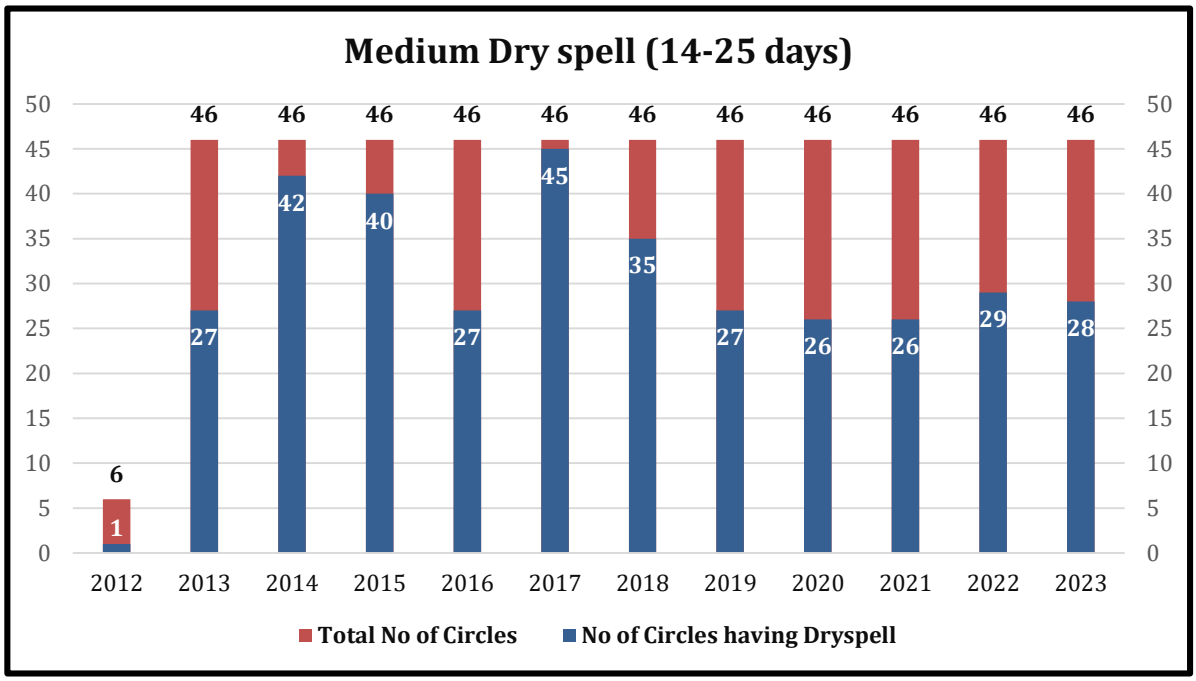
Long Dry spell is a prolonged period above 25 days of dry days in monsoon period



A graph (Graph 3.3.1) that shows the trend of long dry spells observed in a Washim district. The data covers the total number of circles and the circles that affected long dry spell (more than 25 days) from the year 2012 to 2023. The graph shows that in year 2015 and 2018, all circles in the district experienced long dry spells. Conversely, in year 2019 to 2023, there was no long dry spell, across all 46 circles in the district.

3.3.2 Medium Dry spell

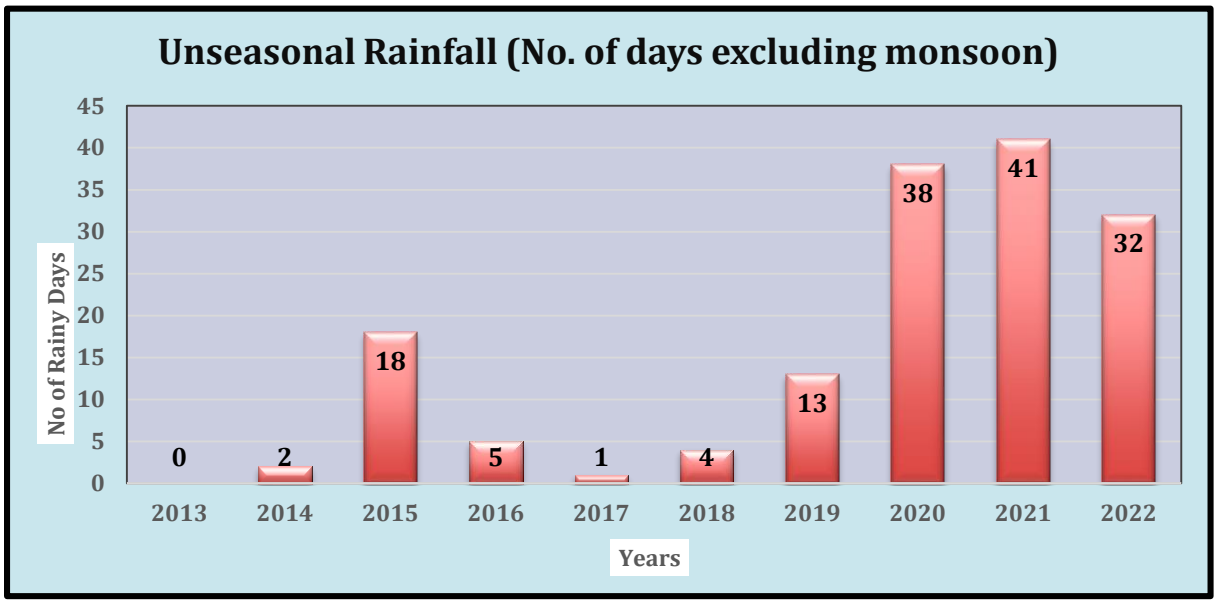
Medium Dry spell a period of 14-25 days of dry weather.



A graph (Graph 3.3.2) that shows the trend of medium dry spells observed in a Washim district. The data covers the total number of circles and the circles that affected medium dry spell (14 to 25 days) in Washim district from the year 2012 to 2023. The graph shows that in year 2017, 45 circles out of 46 circles in the district experienced medium dry spells. Conversely, in year 2020 and 2021 there was 26 circles out of 46 circles experienced medium dry spell in the district.

3.4 Unseasonal rainfall.

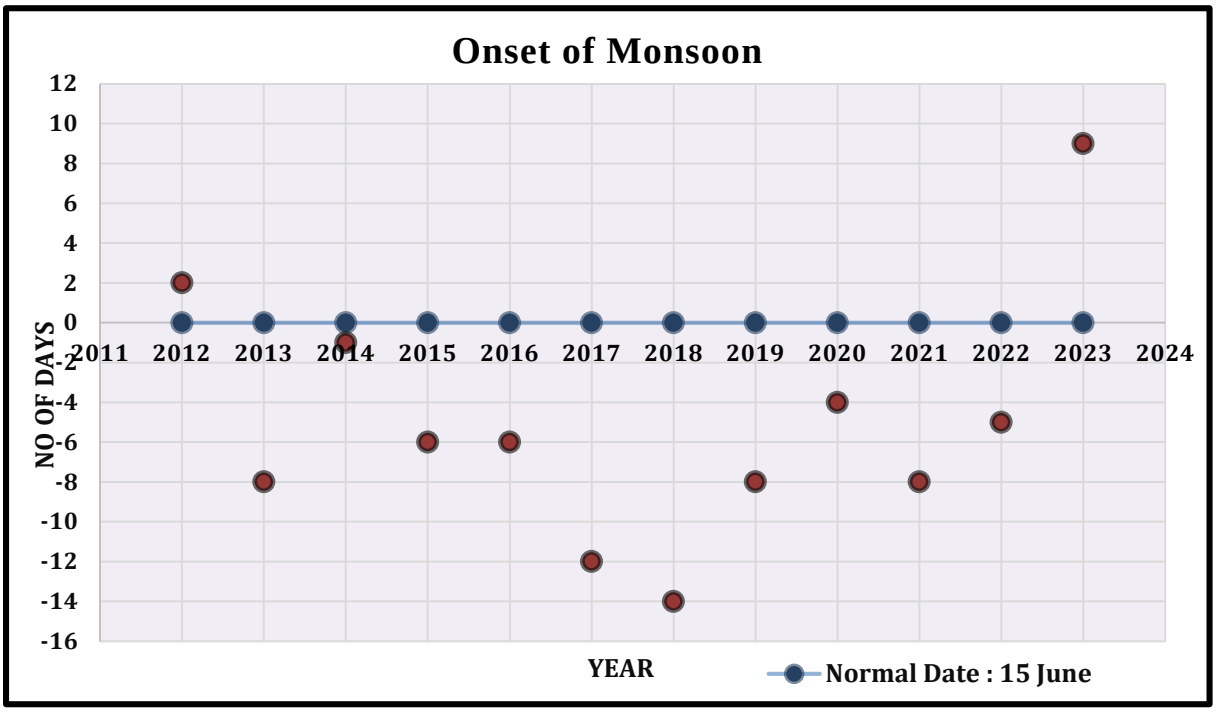
Rainfall received during non mosoon days is treated as unseasonal rainfall. Unseasonal rains-when there is a sudden change in atmospheric pressure, it can result in precipitation, even during non-monsoon seasons.



The graph 3.4 illustrates the annual occurrences of unseasonal rainfall in the Washim district from year 2013 to 2022. The data reveals a variation ranging from 0 days to 41 days of unseasonal rainfall.

3.5 Monsoon onset delay

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

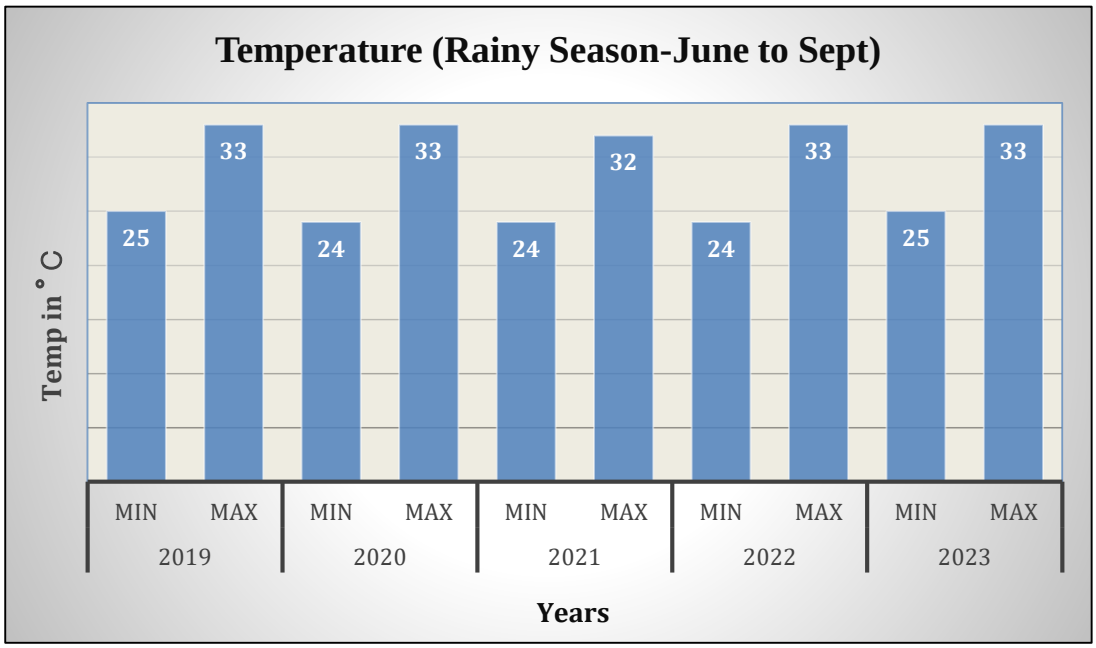


The graph 3.5 depicts the annual onset of the monsoon. The blue line represents the normal day of onset of monsoon. The onset days show variations ranging from -14 to 9 days. Notably, in year 2014, 2016 and 2023 the monsoon arrived delayed than the normal onset date. However, in remaining years the monsoon was notably arrived earlier.

3.6 Temperature.

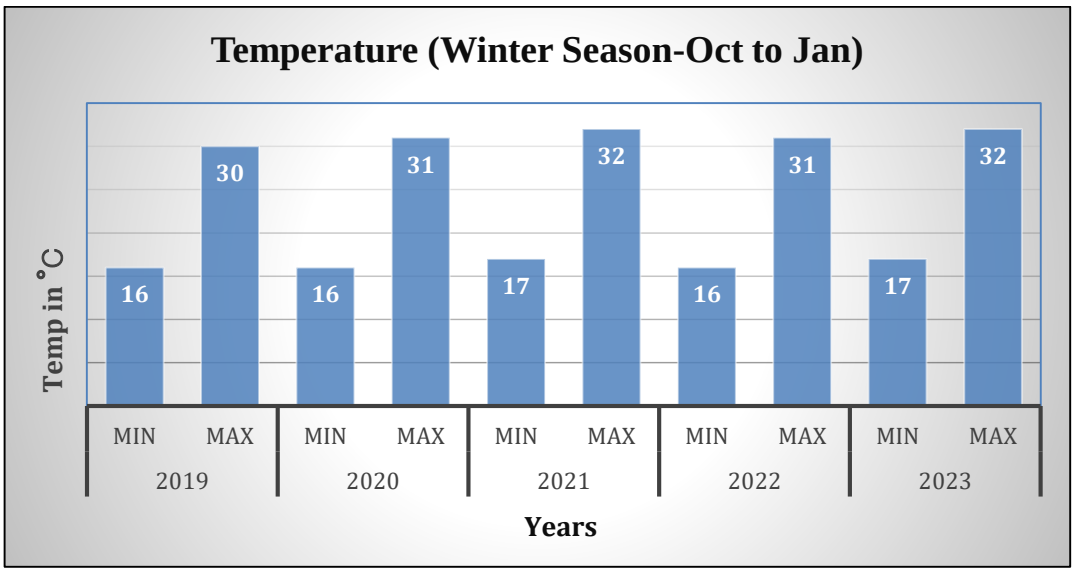
Temperature is a physical quantity that quantitatively expresses the attribute of hotness or coldness. The average temperature is 27.5 °C, with a minimum of 17° and a maximum of 38°C. On the coldest nights, the temperature usually drops to around 16°C. On the warmest days, the temperature usually reaches around 40°C.

3.6.1 Temperature (Rainy Season-June to Sept)



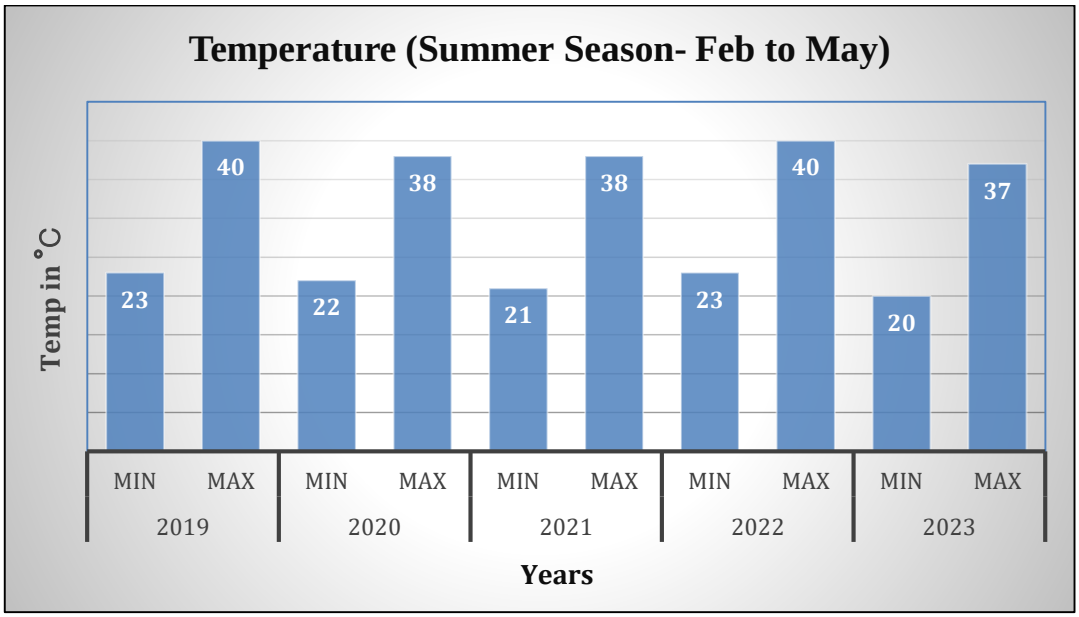
The graph 3.6.1 presents the temperature in the Washim district during the rainy season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 24-25 °C and maximum temperatures ranging from 32-33 °C.

3.6.2 Temperature (Winter Season-Oct to Jan)



The graph 3.6.2 presents the temperature in the Washim district during the winter season from year 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 16-17 °C and maximum temperatures ranging from 30-32 °C.

3.6.3 Temperature (Summer Season- Feb to May)

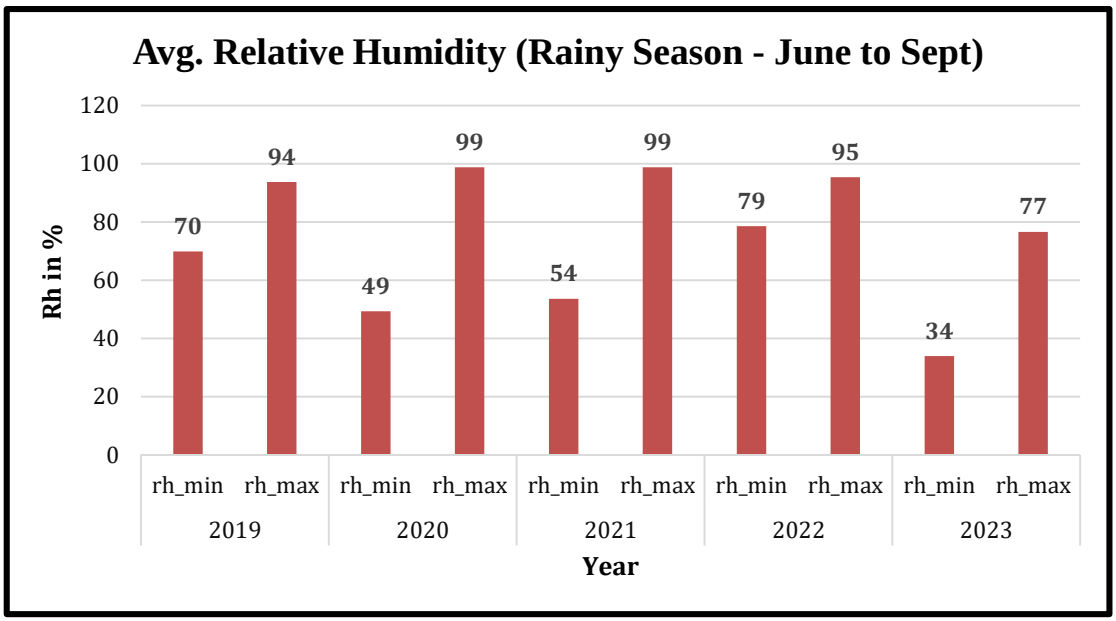


The graph 3.6.3 presents the temperature in the Washim district during the summer season from 2019 to 2023 exhibited a consistent range, with minimum temperatures fluctuating between 19-23°C and maximum temperatures ranging from 38-40 °C.

3.7 Relative Humidity

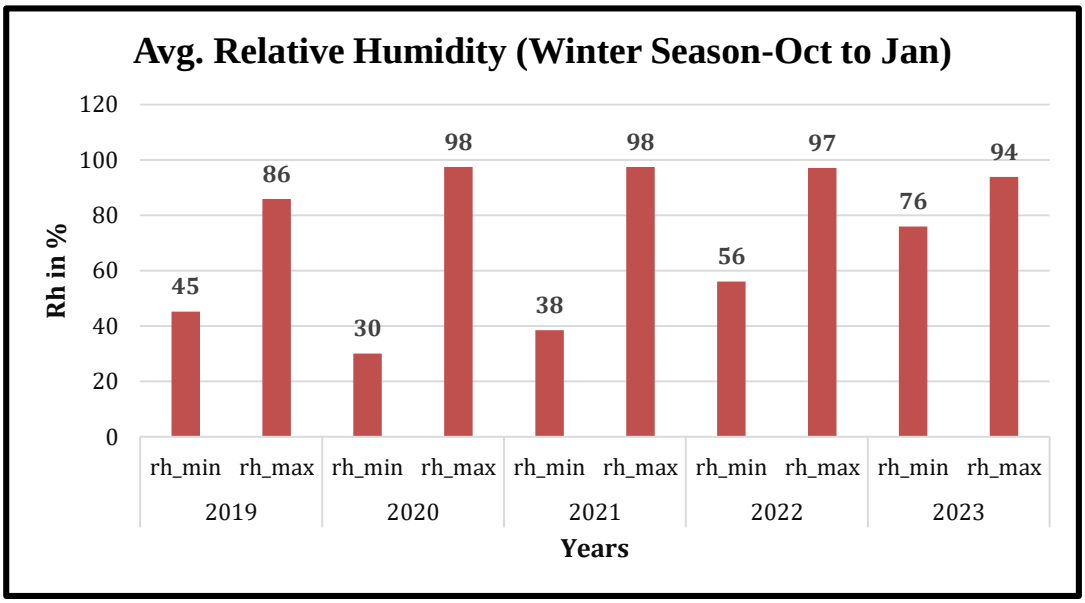
Relative Humidity is the ratio of the actual quantity of moisture at a certain temperature and pressure to the maximum it can hold at the same temperature and pressure. It is usually multiplied by 100 and expressed in percent.

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



The graph 3.7.1 illustrates humidity levels during the rainy season in the Washim district, revealing a variation in minimum humidity from 34% to 79% and maximum humidity ranging between 77% and 99%.

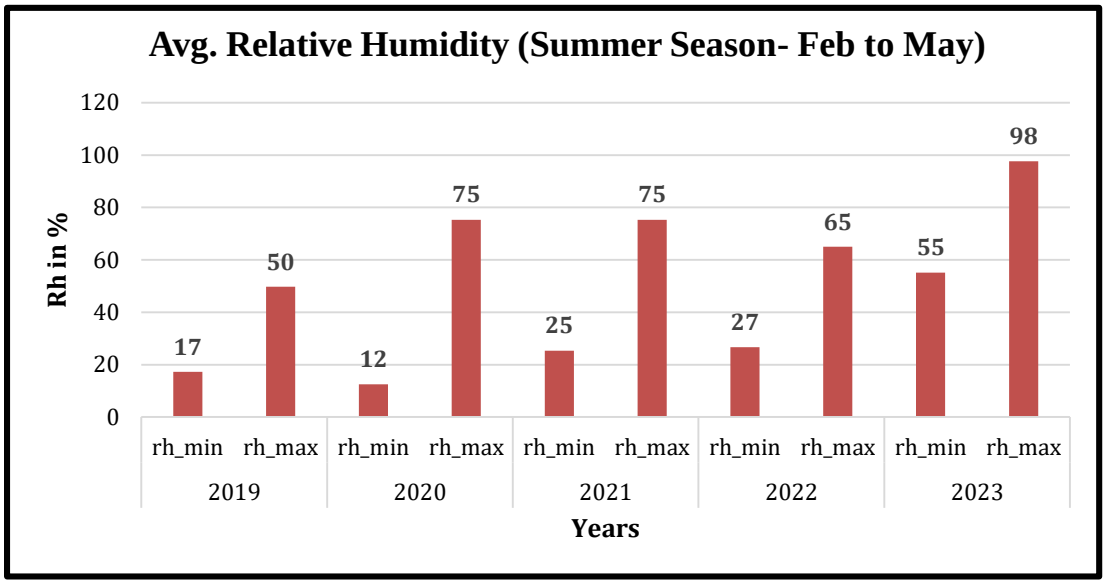
3.7.2 Avg. Relative Humidity (Winter Season-Oct to Jan)



The graph 3.7.2 illustrates humidity levels during the winter season in the Washim district, revealing a variation in minimum humidity from 30% to 76% and maximum humidity ranging between 86% and 98%.

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

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



The graph 3.7.3 illustrates humidity levels during the summer season in the Washim district, revealing a variation in minimum humidity from 12% to 55% and maximum humidity ranging between 50% and 98%.

Chapter4: Impact of Climate variability on Agriculture Production

Sr. No	Climate Variability	Kharif			Rabi	
4.1	**Impact of Temperature**	**Cotton**	**Soybean**	**Pigeon pea**	**Gram**	**Wheat**
4.1.1	Crop Growth and Yield	1) Stunted Growth Normal temp. For cotton crop is 27-32°C. minimum temp. Required for growth. If temp. Below than is 16 °C it affects germination of seed. Vegetative growth 21-27°C is needed. Fiber development affect if the temp<15°C and also affect the crop production temp>43°C it causes flower and bud dropping. 2) Low/high temp. Impact found on Shedding of square of crop. 3) High temp. Decrease soil moisture and its effects on uptake of nutrients. 4) Impact of high / low temp. yield losses up to 5-10%.	1) Average temperature needed is 26-30° for crop growth. 2) Lower temp.-delay the vegetative growth, flowering and pod formation. 3) Higher temp impacts seen on dropping of flower, increased evaporation rates from soil surface, also leads to increase the transpiration rate, Stunted Growth and pod cracking ratio increases. 4) Decrease in soil moisture affect uptake of nutrients is reduced 5) All over impact of temp. Found on yield Losses up to 15 - 20%.	1) This crop is sown as inter crop with soybean, cotton needed temp. 26-30°C. 2) Impact of high temp. Seen flower dropping and Poor Pod Formation. So, yield losses found up to 20 -25%	2) Low temp. and cold- causes disfavor to germination and flowering Germination Problem 3) Effect on Vegetative Growth Disturb 4)Decrease in soil moisture so uptake of nutrients is reduced 5) Yield Losses up to 10-15%.	1) 16-22°C Normal temp-wheat required cool temp. Optimum temp. for germination is 20-22°C growth and tillering. 2) If temp high-affect the growth 3) >25°C it reduces grain weight 4) High temp. decrease soil moisture so uptake of nutrients is reduced 5)Yield Losses up to 10%

4.1.2	Water Availability	1) Cotton plants undergo transpiration, where water is taken up by the roots and released into the atmosphere through small pores in the leaves (stomata). 2) Higher temperatures often lead to increased transpiration rates, contributing to the overall water demand of the crop. Elevated temperatures, coupled with insufficient water availability, can result in water stress for cotton crops. 3) Water stress during critical growth stages, such as flowering and boll development, can negatively impact yield and fiber quality.	1) Higher temperatures generally lead to increased evaporation rates from the soil surface. 2) Higher temperatures often lead to increased transpiration rates. If temperatures are high and there is insufficient water in the soil to meet the demands of evaporation, transpiration, and plant growth, soybean plants can experience drought stress. Drought stress negatively impacts plant development and can lead to yield losses.	1) Excess of water availability in field found. 2) Wilting of crop 3) Affect physiological growth	1) Excess of water availability in field found. 2) Wilting of crop 3) Affect physiological growth	1)Evaporation 2) Wilting of Crop 3) Stress on Crop 4) Crop Lodging
4.1.3	Pest and Diseases Infestation	Pest: thrips, Whitefly	Pest: In vegetative growth semilooper found after 45 to 60 days after sowing of crop girdle beetle found in field.	Pest: - leaf roller found in vegetative growth and helicoverpa *Armigera* found in pod formation stage.	Pest: helicoverpa found in pod set to harvest stage.	Pest: termites infestation found.
		Diseases: Lalya, Alternaria leaf spot, Angular leaf spot, etc.	Diseases: collar rot	Diseases: wilting, leaf blight.	Diseases: - wilting, stem rot	Diseases: rust, leaf blight

Sr. No	Climate Variability	Kharif			Rabi	
		Cotton	**Soybean**	**Pigeon pea**	**Gram**	**Wheat**
4.2	**Impact of Rainfall on**					
4.2.1	Crop Growth and Yield	1) Delay onset of Monsoon delay Sowing season 2)Due to dry spell yield losses 3)Adverse effect on crop health and growth 4)Excessive rainfall causes crop rot	1) Delay onset of Monsoon delay Sowing season 2)Due to dry spell yield losses 3)Adverse effect on crop health and growth 4)Excessive rainfall causes root rot and wilt	1) The delay in arrival of monsoon resulted in delay in sowing and terminal moisture stress and finally low productivity in pigeon pea 2)Excessive rainfall causes Flower drop	1) Damage of Flowering and Pod Formation 2) Vegetative Growth stunted 3) Yield Losses	1) Damage of tillers 2) Crop lodging 3) Vegetative Growth stunted 4) Yield Losses 5- Excessive rainfall causes root rot and wilt 6- affect the pollination
4.2.2	Irrigation Supply	1)Water level Decrease 2) Soil Cracking 3) Wilting of Crop 4) Stress on Crop	1) irrigation frequency diminishes 2) Soil pan Cracking 3) Compact of soil 4) Stem and root rot	1)Affects irrigation demand, water availability and the greenhouse gas intensity of irrigation energy 2) Wilting of Crop	1)Water level Decrease 2) Soil Cracking 3) Wilting of Crop 4) Stress on Crop	1) irrigation frequency diminishes 2) soil pan Cracking 3) compact of soil 4) Stem and root rot
	1. Drought	1) Water Stress 2)Stunted Growth 3)Wilting of Crop 4) Soil Cracking 5)low Germination 6) Increasing in pest population	1) Water Stress 2)Stunted Growth 3)Wilting of Crop 4) Soil Cracking 5)low Germination 6) Yellowing of leaves	1)Frequent droughts have threatened the crop yields and livelihoods 2)Affects Germination 3)Low Yield	1) Water Stress 2)Stunted Growth 3)Wilting of Crop 4) Soil Cracking 5)low Germination	1)Water Stress 2)Stunted Growth 3)Wilting of Crop 4) Soil Cracking 5)Low Germination 6) Yellowing of leaves

	2. Flood	1)Heavy Loss of Standing Crop 2) seedling mortality 3) drain of soil nutrient 4) soil erosion take place 5) affect root respiration	1) Heavy Loss of Standing Crop 2) seedling mortality 3) drain of soil nutrient 4)soil erosion take place 5) affect root respiration	1)Flood disasters physically cause damage to farms and crops, 3)Crops get rotten on farms under wet conditions and Starts Wilting 3)flooded soils has shown that the oxygen concentration approaches zero after 24 hours 4)wet soils are most conducive to disease development	1)Heavy Loss of Standing Crop 2) seedling mortality 3) drain of soil nutrient 4) soil erosion take place 5) affect root respiration	1)Heavy Loss of Standing Crop 2) seedling mortality 3) drain of soil nutrient 4) soil erosion take place 5) affect root respiration
4.2.3	Pest and Disease infestation and its management	Outbreak of disease and Pest	These delays keep seedlings from out-growing damage by soil-borne diseases that attack seeds and seedlings. 2)Outbreak of disease and Pest	Increase in soil-borne diseases that attack seeds and seedlings.	Increase in Loss of Grain Quality and Quantity	Increase in Rust Disease and Loose Smut
4.2.4	Soil erosion and nutrient loss	1) Fertile soil and Nutrient losses due to flood and leaching	Fertilize soil and Nutrient losses due to flood and leaching	In Pigeon pea crop climate affects soil erosion and the chemical and biological deterioration of the soil. The state of the soil (texture, structure and chemical and biological properties) is a major factor,	Crop Rotations	Crop Rotations

4.2.5	Harvest & Storage	deterioration of lint quality, affect boll bursting	deterioration of grain quality	1)minimize qualitative and quantitative losses of food crop dietary nutrients 2)Increase in Store grain pest	1) Pod size Decrease	Heavy loss of Quality and quantity of crop
4.3	**Impact of Other Calamities (Cyclones and hail storms etc.)**					
	Crop Damage and Loss	1) Yield losses up to 40% 2) Cyclone associated flood water also brings sand and silt along with it to the crop fields and thereby resulting in change in soil physical condition	Yield losses occur up to 40%	Cyclone associated flood water also brings sand and silt along with it to the crop fields and thereby resulting in change in soil physical condition 2)One of the main reasons for poor productivity in agriculture is uncertain weather and its associated natural disasters	Yield losses up to 30 to 35%	1) The crops get affected both in terms of establishment and productivity 2) Yield losses up to 40%

(Source – KVK, Washim)

Example: Shri. Devidas Sakharam Warkad, Village: Kharola, Tq. Dist. Washim has land holding in survey no. 36,222 total area 2.38 Ha. in which affected area 2.00 Ha. Due to heavy rains, tentative 40 quintals of soybean yield have been damaged. Near about 70 to 80 thousand rupees financial loss is faced by farmers.

.

First Photo

In the first photo*: This photo shows how heavy rain has destroyed the soybean crop in the farm and the waterlogged in the farm.*

Second photo

In the second photo: *Due to heavy rains the standing crop of soybean has bent down which further led to loss of the crop in the farm*

Chapter: 5: Measures to Cope with Climate Variability

Recommendation of Universities

Sr. No	Climate Variability	Kharif			Rabbi	
5.1	**Rain Fall**	**Cotton**	**Soybean**	**Pigeon pea**	**Gram**	**Wheat**
1	Heavy Rainfall	1) Excess water should be drained out 2) Spraying of 2 % DAP 3) For wilt 1.5 kg N + 1.5 kg P in 100-liter water 4)Drenching of Carbendazim + Mancozeb. 5) Drenching of Trichoderma Viridi 6) In case of continuous cloudy days in August, Agronomy Measures to prevent bud and boll shedding spray Naphthalic acetic acid (NAA) @ 20 ppm	1) Used resistant / tolerant variety 2) Contingency crop planning helps in providing better resilience in post cyclone and flood period resulting in lesser extent of crop damage. 3) In medium and lowlands under high rainfall region and cyclone and flood prone areas, land modification such as raised and sunken bed technique would be highly effective 4) Sowing by BBF method	1)Drenching of Carbendazim + Mancozeb 2) Drenching of Trichoderma Viridi 3)land modification such as raised and sunken bed technique would be highly effective 4) Sowing by BBF method	1)Used resistant / tolerant variety 2) Contingency crop planning helps in providing better resilience in post cyclone and flood period resulting in lesser extent f crop damage. 3) Drenching of Trichoderma Viridi	1) Short Duration Variety
2	Low Rainfall	1) Spraying of 2 % DAP 2) Protective Irrigation	1) Spray 13:00:45 Raise crop on raised beds with drip irrigation	Raise crop on raised beds with drip irrigation	1) Nipping of apical bud Raise crop on raised beds with drip irrigation	1) Selection of Short Duration Variety 2) Increasing Irrigation

3	Dry Spells / water stress	1)In case of dry spell of >15 days with appearance of cracks of pencil thickness, provide a life-saving irrigation through sprinklers, perforated pipes, drip or alternate furrow wherever possible 2) Mulching 3) Reflector-Kaolin 4) Hoeing	In Water Stress condition, Foliar application of Sulphur 85% WP @ 1.5-2.0 g/liter for quick recovery during active vegetative growth stage. 2) In Dry Spell condition foliar application of water soluble NPK fertilizer (for example 5g/liter 19:19:19 NPK) may be given for quick recovery.	Foliar application of Sulphur 85% WP @ 1.5-2.0 g/liter for quick recovery during active vegetative growth stage.	1)Protective Irrigation	Foliar application of micronutrient mixture containing Zn, Mn, Fe, Cu, B at 30, 45 and 60 DAT for better crop stand (5 ml/l).
4	Terminal Drought	1) Raise seedlings on a raised bed with drip or micro-sprinkler irrigation system to use available irrigation water judiciously. In case, drip irrigation facility is not available, apply irrigation water through water sprinkler cans. 2)) Application Micro Nutrient	1) Raise seedlings on a raised bed with drip or micro-sprinkler irrigation system to use available irrigation water judiciously. In case, drip irrigation facility is not available, apply irrigation water through water sprinkler cans. Apply stubble mulch (paddy straw/wheat straw etc.) until seed germination to avoid evaporation. In case of poor seedling growth, foliar application of water soluble NPK fertilizer (for example 5g/liter 19:19:19 NPK) may be given for quick recovery.	Apply stubble mulch (paddy straw/wheat straw etc.) until seed germination to avoid evaporation.	1)Spraying Potassium Phosphate & Mulching 2) Application of Micro Nutrient	1)Spraying Potassium Phosphate & Mulching 2) Application of Micro Nutrient

5	Late onset of monsoon	1)Selection of late duration Variety 2)Use of Drip Irrigation	late duration Variety should be sown	Late duration Variety should be sown	late duration Variety should be sown	late duration Variety should be sown
5.2	Temperature Condition	Used resistant, tolerant variety	Used resistant, tolerant variety	Used resistant, tolerant variety	Used resistant, tolerant variety	Used resistant, tolerant variety
1	High Temperature	1) Crop Shifting 2) Inter Cropping	Intercropping	Intercropping	1)Spraying Potassium Phosphate & Mulching 2) Application of Micro Nutrient	1)Spraying Potassium Phosphate & Mulching 2) Application of Micro Nutrient
2	Cold waves/low temperature	Light irrigation could be equally effective to protect the crop 1)Vermicompost, FYM, Crop rotation	1) Light irrigation could be equally effective to protect the crop 2) Intercropping 3) To burn the crop residue/straw in the direction of northern side at evening time. Smoke also protects to crops from cold injury. 4)Impact Based Forecast-Warning for Cold Wave	1) To burn the crop residue/straw in the direction of northern side at evening time. Smoke also protects to crops from cold injury. 2)Impact Based Forecast-Warning for Cold Wave 3)Intercropping	1)Light irrigation could be equally effective to protect the crop 2Spray with Thiourea, Liquid Sulfur etc. 3Spray of dilute Sulphuric Acid @ 0.1% 4)Vermicompost, FYM, Crop rotation 5 To burn the crop residue/straw in the direction of northern side at evening time	1)Light irrigation could be equally effective to protect the crop 2Spray with Thiourea, Liquid Sulfur 3Spray of dilute Sulphuric Acid @ 0.1% 4)Vermicompost, FYM, Crop rotation To burn the crop residue/straw in the direction of northern side at evening time. Smoke also protects to crops from cold injury.

5.3	Soil degradation	1) Tillage operation and sowing across the slope 2) Dead Farrow, Short Duration Variety 3) Nala Bunding	1) Soil conservation measures, such as contour ploughing, bunding, use of strips and terraces, can decrease erosion and slow runoff water. 2)Crop Rotations 3)Water Harvesting, Terracing The broad bed and furrow system decreased soil loss	1) Soil conservation measures, such as contour ploughing, bunding, use of strips and terraces, can decrease erosion and slow runoff water. 2)Crop Rotations 3)Water Harvesting, Terracing The broad bed and furrow system decreased soil loss	1)Horizontal sowing on a slope 2) Dead Farrow, Short Duration Variety 3) Nala Bunding The broad bed and furrow system decreased soil loss	1)Horizontal sowing on a slope 2) Dead Farrow, Short Duration Variety 3) Nala Bunding 3)Water Harvesting, Terracing

Source: (KVK, Washim))

Practices Developed by Farmers in the Districts

Farmers in Washim district have adopted various technology related to climate resilience. Most of the awareness created by farmers for good quality of seed selection in the Kharif season – crop soybean – KDS-720, KDS-753, MAUS-158, MAUS-612 and AMS-1001. These varieties are selected-which are high-yielding varieties and climate-resilient varieties. Also, resistant to Girdle Beetle, Mosaic and Rust.

BBF, Dibbling and ridges & Furrows methods are used for sowing the seeds. These technologies are useful for low seed rate per acre, which is 22 kg to 25 kg per acre.

Before seed is sown, the seed treatment process is adopted by farmers. And also, 100 percent awareness created in the farmer farmers. For seed treatment, Trico drama, PSB/Rhizobium etc. culture is used for seed treatment. It is useful for fixation of nitrogen and phosphorus from soil and air. In NDKSP project seed drum, bio fertilizers provide FPO/SHG. Also, SRT (Zero tillage practice)

1) Vanrai Bandhara Activity

In Washim district VANRAI BANDHARA done by Shri. Ramesh Namdev Dhage and Shaikh Bashid gat no. 131/42. Village Wara Jahagir taluka and district Washim. Vanrai Bandara was constructed by the above farmers in Nala with the help of an empty cement bag filled with sandstone as per local conditions. It helps in protective irrigation for tur crop. Maximum two times irrigation should be given up to one Ha. of tur crop. So, it helps to increase 3 to 4 quintals of production of the tur crop, so net profit will be up to Rs. 32000 per season (4 qty* Rs. 8000 per quintal).

In the year **2022-23, there are 624** Vanrai Bandharas completed in Washim district with the help of farmers' Voluntary participation and in the current year till today, **438 Vanrai Bandharas** were completed. The most popular activity is helpful for protective irrigation for tur and gram crops.

Hon. Arif Shah DSAO, Washim and Hon. Anisa Mahble PD ATMA, Washim visited to Bori (BK) Taluka Washim

In this village 11 Vanrai Bandhare constructed through Voluntary contribution by farmer.

2) BBF Technology Activity

Shri Bhagwat Deshmukh village, Vanoja taluka Risod sowed Soybean crop with the help of BBF technology. He used 22 kg of seeds per acre. Saving as per below.

He saved seed, fertilizer and cultivation operations etc. Rs. 2488 per acre using this technology, and production increased up to 3 quintals (3 quintals* Rs.4500 per quintal = Rs. 13500). Net profit has been Rs.15988 per acre.

3) Seed Treatment Activity

During Rabi season 2023-2024, seed treatment is done to the gram by Shri. Ramesh Ramchandra Chaware with the help of a seed drum using Trichoderma and Rhizobium prevents wilting of gram and fixation of N (nitrogen) from soil/air.

It helps in an increase in production of about 1 to 2 quintals and net profit would be Rs. 9000.

4.Shade Net Activity:

Shri. Kishore Gulabrao Pacharne village, Asola gat no. 113 taluka Risod district, Washim, took shade net activity in area 0.20 Ha. subsidy Rs. 10.60 lac. From our project. In Shade Net he did a seed production programme for vegetable crops like chilli, brinjal etc. From Mahyco company, in less duration he has received net profit Rs. 3 lacs.

5. Horticulture Plantation Activity:

Shri. Narayan Shamrao Chaudhari village, Kajlamba gat no. 86 taluka and the district Washim area under plantation is 1 Ha. crop guava no. of plants in 1 Ha. is 1666. He has taken a yield of guava 500 quintals in the year 2022 net profit from this activity is Rs. 6 lack.

IPM:

IPM plays a role in preventing infestation of pests and diseases. As listed, activities below like.
Neem extract, bio fertilizer (production of micoryza bacteria), Dashparni Ark, Jeevamrut and Vermiwash.
FFS (Farmer Field School) is also implemented by the project in Washim 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 furrows (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	All crops

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

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

FFS (Farmers' Field School) sessions have been implemented in the project village since 2018, focusing on soybean, cotton, pigeon pea and gram crops in the Washim 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	1200	1175	-	-	-	-	-	-
2020	1531	1312	1535	1311	916	775	1505	1312
2021	1636	1471	1550	1301	849	691	1683	1477
2022	1630	1490	1633	1443	779	662	1603	1481
Average	**1499.25**	**1362.00**	**1572.67**	**1351.67**	**848.00**	**709.33**	**1597.00**	**1423.33**

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 10.08% 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 16.35% 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 19.55% 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 12.20% compared to the control plot.

CRTs Interventions

Climate Resilient Technology plays the main role in growth in various conditions of crop stages. In our district, the Soybean/Gram major crop is sown in both seasons, so from selection of variety up to harvesting. The stage of various cultivation practices depends upon the climate. As like optimum moisture is essential for a sown crop. After germination in the vegetative stage, rainfall is necessary in the kharif season for the growth of crops, flowering, pod formation and needed moisture, so CRT technology is necessary to grow and increase yield.

1) Farm Lab

Jai kisan Shetkari gat, yeranda Tq. Malegaon, Washim

This SHG started a farm lab in the year 2019 with the objective of reducing the cost of production and providing bio-fertilizers, insecticides and fungicides and also gives training to farmers. On the farm, they have started production of Trichoderma, granule fertilizers (bio) from waste of Soybean, cow dung and cow urine. They have also started training centers through the Manav Vikas scheme. This farm lab has the capacity to produce bio production of about 100 to 200 liters per month.

Till now, they have trained 3000 to 4000 farmers and SHG members and guided them to 20 SHG to produce these bio-fertilizers in various villages of the district. Also, this lab provides a culture of bio-fertilizers. For production of 1 liter of bio fertilizers, it costs Rs. 350 per liter and they sell it for Rs. 400 per liter only.

6.3 Impact of CRT on Crop Yield Based on Broad Bed Furrow (BBF)

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

6.4 Impact of zero tillage on yield crops.

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

Shri Kalyan Shivajirao Khadse Village Shelu Khadse Tq. Risod Dist. Washim adopted zero tillage activity (SRT) for the last two years. He applied this technology to 1 acre, and he saved the cost of cultivation by about Rs. 4400 /- and this increased the production of the gram crop up to 1.5 qtl. Rs. 7500/- per acre, so total net profit has gained Rs. 11000/-

6.5 Impact of Neem based extracts on yield of crops

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

Shri. Sanjay Ramrao Jadhav village Pimparkhed tq. Risod dist. Washim crop soya + tur adopted technology neem extract from the last five years in his field. As per our recommendation in IPM, the first spraying of neem extract saved an amount of Rs. 1100/-. of farmers.

6.6 Impact of a farm biofertilizers production on crop yield.

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

Shri. Dipak Bhimrao Ghuge village Eranda tq. Malegaon dist. Washim has used microraza, trichoderma, PSB/ rhizobium used in his field as biofertilizers, 100 ml per acre. He also used dashparni, jeva-amrut and vermiwash. Due to the use of the mentioned bio fertilizers, the organic carbon ratio in soil increased. This saved the extra expenditure on chemical fertilizers and pesticides Rs. 2675 /- per acre and

increased the crop production (Soybean) to about 1.65 Qtl. Per acre benefited at Rs. 7424/-. So, the total net profit farmer gained is Rs. 10100 /-

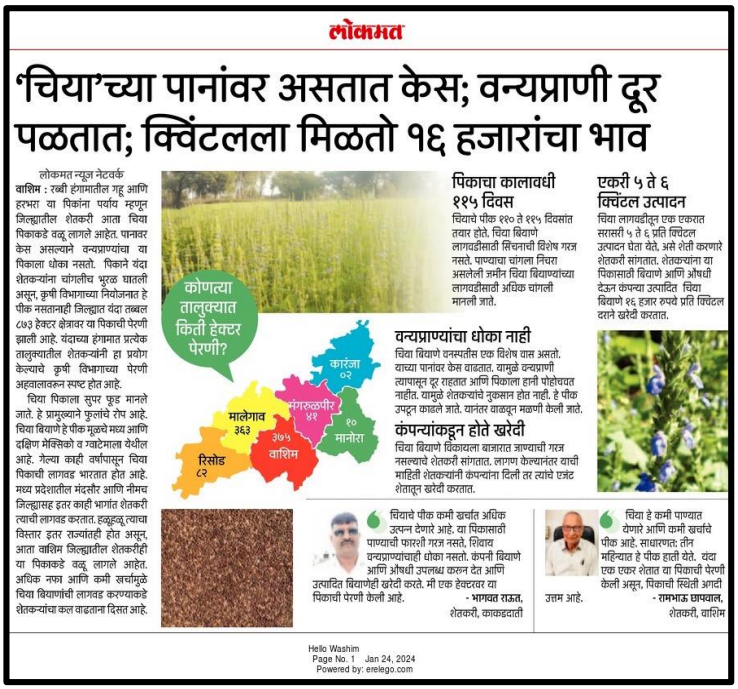
6.7 CRA impact on yield of fruit crops.

In Washim district, citrus fruit crops (like orange, lemon), guava, custard apples are the majority in the area. Water requirements for these fruit crops are required in specific period like flowering stage and fruit setting, so in projects, drip irrigation activity has been compulsory in horticulture plantations. Farmers used drip to provide a nutrient supply and irrigate the fruit crop. Due to drip irrigation, 60 to 70 % of the water is saved from the majority of the area under irrigated.

Farmer name: Gajanan Vishwasrao Ghuge; Village: - Udi Tq: Malegaon, Dist: Washim Fruit crop: Guava plantation and Drip irrigation; Area: 1.00 ha, No. of plants: 1600, Net profit: Rs. 3.25 lacs

Chia Crop (Adoption of New crop)

In Washim district in Rabi season chia crop was planted in 873 Ha. This is an innovative crop introduced in our district which helps farmers to increase net profit in a short duration.



लोकमत

'चिया'च्या पानांवर असतात केस; वन्यप्राणी दूर पळतात; क्विंटलला मिळतो १६ हजारांचा भाव

लोकमत न्यूज नेटवर्क

वाशिम : रब्बी हंगामातील गहू आणि हरभरा या पिकांना पर्याय म्हणून जिल्ह्यातील शेतकरी आता चिया पिकाकडे वळू लागले आहेत. पानावर केस असल्याने वन्यप्राण्यांचा या पिकाला धोका नसतो. पिकाने यंदा शेतकऱ्यांना चांगलीच भूरळ घातली असून, कृषी विभागाच्या नियोजनात हे पीक नसतानाही जिल्ह्यात यंदा तब्बल ८७३ हेक्टर क्षेत्रावर या पिकाची पेरणी झाली आहे. यंदाच्या हंगामात प्रत्येक तालुक्यातील शेतकऱ्यांनी हा प्रयोग केल्याचे कृषी विभागाच्या पेरणी अहवालावरून स्पष्ट होत आहे.

चिया पिकाला सुपर फूड मानले जाते. हे प्रामुख्याने फुलांचे रोप आहे. चिया बियाणे हे पीक मूळचे मध्य आणि दक्षिण मेक्सिको व ग्वाटेमाला येथील आहे. गेल्या काही वर्षांपासून चिया पिकाची लागवड भारतात होत आहे. मध्य प्रदेशातील मंदसौर आणि नीमच जिल्ह्यासह इतर काही भागांत शेतकरी त्याची लागवड करतात. हळूहळू त्याचा विस्तार इतर राज्यांतही होत असून, आता वाशिम जिल्ह्यातील शेतकरीही या पिकाकडे वळू लागले आहेत. अधिक नफा आणि कमी खर्चामुळे चिया बियाणांची लागवड करण्याकडे शेतकऱ्यांचा कल वाढताना दिसत आहे.

कोणत्या तालुक्यात किती हेक्टर पेरणी?

पिकाचा कालावधी ११५ दिवस

चियाचे पीक १२० ते १२५ दिवसांत तयार होते. चिया बियाणे लागवडीसाठी सिंचनाची विशेष गरज नसते. पाण्याचा चांगला निचरा असलेली जमीन चिया बियाण्यांच्या लागवडीसाठी अधिक चांगली मानली जाते.

एकरी ५ ते ६ क्विंटल उत्पादन

चिया लागवडीतून एक एकरात सरासरी ५ ते ६ प्रति क्विंटल उत्पादन घेता येते, असे शेती करणारे शेतकरी सांगतात. शेतकऱ्यांना या पिकासाठी बियाणे आणि औषधी देऊन कंपन्या उत्पादित चिया बियाणे १६ हजार रुपये प्रति क्विंटल दराने खरेदी करतात.

वन्यप्राण्यांचा धोका नाही

चिया बियाणे वनस्पतीस एक विशेष वास असतो. याच्या पानांवर केस वाढतात. यामुळे वन्यप्राणी त्यापासून दूर राहतात आणि पिकाला हानी पोहोचवत नाहीत. यामुळे शेतकऱ्यांचे नुकसान होत नाही. हे पीक उपट्न काढले जाते. यानंतर वाढवून मळणी केली जाते.

कंपन्यांकडून होते खरेदी

चिया बियाणे विकायला बाजारात जाण्याची गरज नसल्याचे शेतकरी सांगतात. लागण केल्यानंतर याची माहिती शेतकऱ्यांनी कंपन्यांना दिली तर त्यांचे एजंट शेतातून खरेदी करतात.

चियाचे पीक कमी खर्चात अधिक उत्पन्न देणारे आहे. या पिकासाठी पाण्याची फारशी गरज नसते, शिवाय वन्यप्राण्यांचाही धोका नसतो, कंपनी बियाणे आणि औषधी उपलब्ध करून देत आणि उत्पादित बियाणेही खरेदी करते. मी एक हेक्टरवर या पिकाची पेरणी केली आहे.

- भागवत राऊत, शेतकरी, काकडदाती

चिया हे कमी पाण्यात येणारे आणि कमी खर्चाचे पीक आहे. साधारणत: तीन महिन्यात हे पीक हाती येते. यंदा एक एकर शेतात या पिकाची पेरणी केली असून, पिकाची स्थिती अगदी उत्तम आहे.

- रामभाऊ छापवाल, शेतकरी, वाशिम

Hello Washim
Page No. 1 Jan 24, 2024
Powered by: erelego.com

Hon. Buneshwari S. District Collector, Washim, Hon. Arif Shah DSAO Washim, Hon. Anisa Mahable PD ATMA, Washim Visited Chia plot of farmer Shri. Ganeshrao Sakharam Garade at Gobhani tq. Risod Dist. Washim.

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

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

7.1 Drought

7.1.1 Rainfed situation

7.1.1.1. Early season drought (delayed onset)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop /Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks 25th June-1st July	Deep & Medium deep black soils	Bt. Cotton	Soybean (JS-335, JS-93 -05) Pigeon pea (AKT- 8811, Vipula, PKV- Tara, BSMR-736)	Normal recommended Package of Practices by Dr. PDKV, Akola (Test GP% Use seed rate @ 75-80kg/ha Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+Carbendazim 1gm+*Trichoderma* 4 gm/Kg of seed Intercrop one row of pigeon pea after every 4 or 6 rowsof soybean as per convenience Open furrow after six /Three rows of soybean)	Linkage with Dr. PDKV / MSSC NSC
		Cotton+ Tur Intercropping	No change	Normal recommended Package of Practices by Dr. PDKV, Akola (Cotton + Pigeon pea 6:2 & Cotton+ Green gram/ Black gram 1:1 intercropping system.)	
		Soybean	No change	Normal recommended Package of Practices by Dr. PDKV, Akola (Test GP% Use seed rate @ 75-80kg/ha Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+Carbendazim1gm+*Trichoderma* 4 gm/Kg of seed Intercrop one row of pigeon pea after every 4 or 6 rowsof soybean as per convenience Open furrow after six /Three rows of soybean)	
		Pigeon pea	No change	Normal recommended Package of Practices by Dr.PDKV, Akola Intercrop Soybean+ Pigeon pea (4:2 / 6:2)Cotton + Pigeon pea	

				(8:1 / 6:2)	
		Sorghum (Kh. Jowar)	No Change	Normal recommended Package of Practices by Dr.PDKV, Akola Seed Treatment of Imidacloprid 70 WS 7g/Kg Seed Sulphur 4g/Kg Seed	
	Shallow blacksoils	Soybean	No change	Normal recommended Package of Practices by Dr. PDKV, Akola (Test GP% Use seed rate @ 75-80kg/ha Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+ Carbendazim 1gm+*Trichoderma* 4 gm/Kg of seed	
		Green gram	No Change	Normal recommended Package of Practices by Dr. PDKV, Akola Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+ Carbendazim 1 gm + *Trichoderma* 4 gm/Kg of seed	
		Black gram			

Condition			**Suggested Contingency measures**		
Early season drought (Delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4weeks 28th wk 9-15th July	Deep to medium deep black soils	Bt. Cotton	Soybean, (JS-335, JS-93 -05) Pigeon pea (AKT- 8811, Vipula, PKV- Tara, BSMR-736)	Normal recommended Package of Practices by Dr. PDKV, Akola(Test GP% Use seed rate @ 75-80kg/ha Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+Carbendazim 1gm+*Trichoderma* 4 gm/Kg of seed Intercrop one row of pigeon pea after every 4 or 6 rows ofsoybean as per convenience Open furrow after six /Three rows of soybean)	Linkage with PDKV / MSSC NSC

		Cotton +Tur Intercropping	Use early varieties of American /Desi cottonvarieties No change in varieties for Pigeon pea	Use 20-25% more than recommended seed rate and reducefertilizer dose by 25% for Cotton. Replace the hybrids with improved varieties in cotton.(American Cotton:- AKH-8828,PKV Rajat,AKH-081, Deshi Cotton:- AKA-5, AKA-7, AKA-8 Avoid sowing of Green gram and Black gram. To reduce the risk of late sowing follow cotton: sorghum:Pigeon pea: Sorghum (6:1:2:1) intercropping system.	
		Soybean	No Change	Follow Normal Recommended Package of Practices	
		Pigeon pea	Change in variety AKT 8811,Vipula, PKV-Tara, BSMR-736	Use spacing 90 x 20 cm instead of 90 X 30 cm.	
		Sorghum (Kh. Jowar)	Replace sorghum by soybean Varieties JS-335, JS-93 -05 or Pigeon pea variety AKT 8811, Vipula, PKV- Tara, BSMR-736	Follow Normal Recommended Package of Practices	
	Shallow black soils	Soybean	No change in var.	Normal recommended Package of Practices by Dr. PDKV, Akola (Test GP% Use seed rate @ 75-80kg/ha Seed Treatment with *Rhizobium* + PSB (250gm each /10Kg seed + Thiram 3 gm+ Carbendazim 1gm+*Trichoderma* 4 gm/Kg of seed	
		Green gram	Replace Green gram & Black gram by SoybeanVarieties JS-335, JS-93 -05	Follow Normal Recommended Package of Practices Seed Treatment with *Rhizobium*+ PSB (250gm each /10Kg seed + Thiram 3 gm+ Carbendazim 1 gm + *Trichoderma* 4 gm/Kg of seed	
		Black gram	-	-	

Condition			**Suggested Contingency measures**		
Early season drought (delayedonset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping systemincluding variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 23-29 July 30th MW	Deep to Medium deep black soils	Bt. Cotton	Sole Pigeon pea AKT-8811, Vipula, PKVTara, BSMR-736. Sunflower (hybrids) / Sesame AKT64/ castorAKC-1, GCH-4, 5, 6 & DCH-117, 32 / pearl millet. PKV Raj Shradha, Saburi Pearl millet + pigeon pea inter-cropping(2:1,.4:2)	Adopt closer spacing(60x30 cm)forPigeon pea Follow *insitu* moisture conservationmeasures	
		Cotton +Tur Intercropping	Sole Pigeon pea AKT-8811, Vipula, PKVTara, BSMR-736. Sunflower (hybrids) /Pearl millet. PKV RajShradha, Saburi / Sesame AKT64/ Castor GCH-4,5,6& DCH-117, Pearl millet + Pigeon pea inter-cropping (2:1, 4:2).		For Seed Source and Technology contact Dr. PDKV / KVK/MSSC/ NSC.
		Soybean	-do-		
		Pigeon pea	Pigeon pea AKT-8811, Vipula, PKV Tara,BSMR-736.		
		Sorghum	Sole Pigeon pea AKT-8811, Vipula, PKVTara, BSMR-736. Sunflower (hybrids) / Sesame AKT64/ CastorAKC-1, GCH-4,5,6& DCH-117, 32/pearl millet. PKV Raj Shradha, Saburi Pearl millet + Pigeon pea inter- cropping (2:1, 4:2).		
	Shallow blacksoils	Soybean		Adopt closer spacing(45x20 cm)forPigeon pea Follow *insitu* moisture conservation measures	
		Green gram			
	Shallow blacksoils	Black gram			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8weeks 6-12 August, 32nd MW	Deep to Medium deep black soils	Bt. Cotton	Sole Pigeon pea AKT-8811, Vipula, Sunflower (hybrids)/ Sesame AKT64/ CastorAKC-1, GCH-4, 5, 6 & DCH-117, 32/ pearl millet. PKV Raj Shradha, Saburi	Adopt closer spacing(60x30 cm)forPigeon pea Follow *insitu* moisture conservation measures	
		Cotton +Tur Intercropping			
		Soybean			
		Pigeon pea	Pigeon pea Varieties PKV Tara, BSMR-736,		
		Sorghum (Kh. Jowar) Varieties	Sole Pigeon pea AKT-8811, Vipula, Sunflower (hybrids)/ Sesame AKT64/CastorAKC-1, GCH-4,5,6& DCH-117, 32/pearl millet. PKV Raj Shradha, Saburi		
	Shallow blacksoils	Soybean	Sunflower (hybrids) / Sesame AKT64/pearl millet. PKV Raj Shradha, Saburi	Follow *insitu* moisture conservation measures	
		Green gram			
		Black gram			

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop	Deep to Medium deep black soils	Bt. Cotton			
		Cotton +Tur Intercropping	Give protective irrigation wherever possible. Raise cotton seedlings in nursery & transplant at sufficient soil moisture or Gap filling to be done by potwatering 7-10 days after sowing when crop stand is less than 80%	Avoid applying fertilizer till sufficient moisture in soil.	Sowing on BBF

stand etc.		Soybean	Give protective irrigation wherever possible. Gap filling with maize and Sesame. If germination is less than 50% resowing immediately after receipt of rains.	One hoeing	Rain water harvesting &recycling to be strengthened
		Pigeon pea	Gap filling either by Sesame or maize. Provide protective irrigation, wherever ispossible	-do-	-do-
		Sorghum (Kh. Jowar)	Follow thinning to maintain optimumplant population.	One hoeing. Fertilizer application at sufficient moisture	Rain water harvesting &recycling to be strengthened
	Shallow blacksoils	Green gram	Protective irrigation if possible.	One hoeing is to be done for conservation of soil moisture.	
		Black gram			

Condition			**Suggested Contingency measures**		
Mid-season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Deep to Medium deep black soils	Bt. Cotton	weeding Intercultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	Avoid applying fertilizer till there is sufficient moisture in thesoil. Opening of alternatefurrows.	With limited water availability prefer micro irrigation system Inter cultivation implements/ machineries to be popularized thro Govt. schemes.
		Cotton +Tur Intercropping			
		Soybean			
		Pigeon pea	-do-	-do-	

		Sorghum (Kh. Jowar)	-do-	Avoid applying fertilizer till there is sufficient moisture in the soil. Opening of alternate furrows.	
	Shallow black soils	Soybean	-do-	Opening of alternate furrows. Spraying of 2 % urea or DAP.	
		Green gram	-do-	Spraying of 2 % urea orDAP.	
		Black gram	Intercultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	-do-	

Condition			Suggested Contingency measures		
Mid-season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Deep to Medium deep black soils	Bt. Cotton	Protective irrigation if possible.	Spraying of 2 % urea or DAP.	
		Cotton + Pigeon pea Intercropping.			
		Soybean			
		Pigeon pea			
		Sorghum (Kh. Jowar)			
	Shallow black soils	Soybean	-do-	-do-	
		Green gram	Protective irrigation if possible.	-do-	
		Black gram	-do-	-do-	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/croppingsystem	Crop management	Rabbi Crop planning	Remarks on Implementation
	Deep to Medium deep black soils	Bt. Cotton	Giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable yield.	-	-
		Cotton + Pigeon pea Intercropping		-	-
		Soybean		Plan for *Rabbi* season	-
		Pigeon pea			-
		Sorghum (Kh. Jowar)		Plan for *Rabbi* season	-
	Shallow black soil	Soybean			-
		Green gram	Giving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable yield	Prepare for *Rabbi* sowing Provided irrigation is available	-

7.1.2 Irrigated situation:

Condition	**Major Farming situation**	**Normal Crop/cropping system**	**Suggested Contingency measures**		
			Change in crop/croppingsystem	**Agronomic measures**	**Remarks on Implementation**
Delayed release ofwater in canals due to low rainfall	Deep to Medium deep black soils	Wheat & Chickpea	Wheat to be replaced by Chickpea/Safflower/Mustard	Follow alternate rov irrigation/irrigate at critica stages/ Stream cutoff	Tapping of other sources of irrigation. Sprinkler Irrigation
	Shallow blacksoils	Chickpea	Safflower/Mustard		
Limited release of water in canals due to low rainfall	Deep to Medium deep black soils	Wheat & Chickpea	Wheat to be replaced by Chickpea/Safflower/Mustard/Linseed/Sesamum		
	Shallow blacksoils	Chickpea	Safflower/Mustard		
Insufficient groundwater recharge due to low rainfall	Open well irrigated-Rabbi cropping	Wheat, Chickpea, Safflower	Chickpea, Safflower	Sprinkler Irrigation	-

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Cotton Soybean Green gram Black gram	Opening of field channels to remove surface ponding, Foliar spray of 2% Urea Interculture at optimum soil moisture to improve soil aeration	Opening of field channels to remove surface ponding, Nutrient spray to arrest flower drop	Opening of field channels to remove surface ponding,	-
Pigeon pea				Shifting to safer place for drying
Horticulture				
Acid Lime and orange	Opening of field channels to remove surface ponding,	Mrig bahar not affected For Ambia bahar Opening of field channels to remove surface ponding, Nutrient spray of NAA 10 ppm+ 1% urea to prevent flowers drop	Timely harvest to avoid losses	Fungal removal Followed by Washing & waxing
Heavy rainfall with high speed winds in a short span				
Cotton	Opening of field channels to remove surface ponding. Improved drainage and drenching with copper oxy chloride to avoid wilting incidence.	Opening of field channels to remove surface ponding, Improved drainage and drenching with copper oxy chloride by opening of the nozzle of spray pump to avoid wilting incidence. Occurrence of grey mildew-control by Sulphur spray @ 25 g/10 lit.	Occurrence of grey mildew-control by Sulphur spray @ 25g/10 lit.	Shifting to safer place for drying
Soybean Green gram Black gram	Opening of field channels to remove surface ponding	Opening of field channels to remove surface ponding		Shifting to safer place for drying
Pigeon pea				
Horticulture				

Nagpur Mandarin Acid lime and sweet orange	Support by bamboo if < 3 years plants.	Support by bamboo if < 3 yearsplants. Opening of field channels to remove surface ponding	Opening of field channels to remove surface ponding	Fungal removal followed by Washing & waxing
Outbreak of pests and diseases due to unseasonablerains				
Cotton	To control Jassids and Thrips spray with Acetamiprid 20 SP @ 1.5 g/ 10 lit.		-	-
Soybean	To control semi-looper spray NSKE 5% orquinalphos 25 EC 20 ml/10 lit.		-	-
Green gram	To control Powdery mildew penconazole 5 ml or dinocap 10 ml or triadomorph 5 ml or Sulphur spray @ 30 g/10 lit. of water.		-	-
Black gram	-do-		-	-
Pigeon pea	-do-		-	-
Horticulture				
Mandarine Orange	To control Citrus *psylla* Malathion 50EC 10mlOr Quinolphos 25EC 10ml Or Cypermethrin 25EC 4 ml/10 lit		Immediate harvesting	
Sweet Orange	-do-		-do-	

Note: Field bunds on slopy area to be strengthened

7.3Extreme events: Heat wave / Cold wave/Hailstorm

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Horticulture	Increase the frequency of irrigation, Use of temporary shed net., Spraying of antitranspirant, Mulching, Pruning of damaged parts	Increase the frequency of irrigation, Spraying of antitranspirant. Mulching. Punning of damaged parts, Application of Bourdeux paste	Increase the frequency of irrigation, Spraying of antitranspirant. Mulching., Pruning of damaged parts	Immediate harvesting of fruits Increase the frequency of irrigation, Spraying of antitranspirant Mulching. , Pruning of damaged parts, Application of Bourdeux paste

Cold wave				
Horticulture	Covering with poly tunnel, floodirrigation at evening	Smogging, Flood irrigation at evening, Basin Mulching, Supplementary dose of fertilizer	Smogging, Flood irrigation at evening, Basin Mulching, Foliar application of potash fertilizers	Immediate harvesting, smogging, Flood irrigation, Basin Mulching, Foliarapplication of potash fertilizers
Hailstorm				
Horticulture	Remove damaged parts, fungicidal spray	Remove damaged parts,fungicidal spray	Remove damaged parts, fungicidal spray, Spraying of NAA 20 ppm + 1 % urea.	Harvesting and grading

Chapter 8: Agro meteorological Advisory

8.1 Agro-Meteorogical advisory

8.1.1 Importance/ Need of Agromet advisory

Agromet advisory is a service that delivers location-specific and timely meteorological information to farmers, assisting them in making optimal decisions related to agricultural activities. These advisories integrate weather and climate forecasts with agricultural knowledge, providing guidance on crop selection, planting and harvesting times, irrigation, and other practices. The goal is to enhance agricultural productivity, reduce risks, and promote sustainable farming practices

NDKSP Project is based specifically on climate resilient agriculture, so agro-meteorological advisory plays an important role in kharif/rabi crops. So, agro advisory is needed in various stages of crops, which helps in an increase in production and ultimately an increase in net profit of farmers. Crop growth and various paste/disease infestations need management, so agro-meteorology advisory is an important part of the farming occupation.

8.1.2 Forecasts or advisories generated at district level

KVK Risod, RMD and PMU generate and provide weekly agromet advisory and forecast. So we communicate with farmers via the What's Up group, test messages, Campaigning, Radio and Newspaper and FFS etc.

8.1.3 DAMU information

District agro-meteorological unit situated at KVK Karda Tq. Risod in Washim district. It also generates agromet advisory for farmers for crop management. Below detailed information about DAMU is given pointwise.

District Agro-met Unit (DAMU):

DAMUs are established by the Indian Meteorological Department to provide agro-meteorological services at the district level. These units aim to deliver location-specific weather and climate-related information to farmers for better decision-making in agriculture.

Objectives of DAMU at KVK:

DAMUs at KVKs likely focus on providing tailored agro-meteorological information to farmers in the respective districts where the KVK is located. This information may include weather forecasts, crop-specific advisories, and guidance on agricultural practices based on weather conditions.

Farmers' Utilization:

Farmers can utilize the information provided by DAMU to make informed decisions regarding crop planning, irrigation, and pest management, considering the prevailing and forecasted weather conditions.

Government Initiatives:

The establishment of DAMUs at KVKs aligns with broader government initiatives to enhance agricultural resilience and productivity by integrating meteorological insights into farming practices.

8.1.4 Other sources of Agro-met advisory

In other sources, like state agri. Department/central govt. department and ARC (Agri. Research Centers) also gives agromet advisory at district level.

8.1.5 Different apps/dashboard/channels/stations/means used to disseminate The information

Project on Climate Resilient Agriculture project dashboard, IMD (Indian Meteorological Department) website, DDMA (District Disaster Management Authority), Washim website etc. also generate advisory.

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

Farmers face various climatic conditions and challenges such as low rainfall, high rainfall, drought, flood, high temperatures and sometimes pest attack on crops etc. So, therefore, agro-met advisory is needed to tackle the above-mentioned conditions and to do proper crop management to minimize the loss of yield. Therefore, from time to time, advisory is very important for proper growth of crops at various stages. Following are the points discussed in detail about the benefits of agromet advisory to farmers.

1. **Increased Awareness:** Agromet advisories help farmers stay informed about changing climate conditions, including temperature variations, precipitation patterns, and extreme weather events.

2. **Crop Planning:** Farmers use agromet advisories to plan their cropping calendars, optimizing planting and harvesting times to align with favorable weather conditions.

3. **Risk Mitigation:** By receiving timely weather forecasts, farmers can take preventive measures to protect crops from adverse weather, reducing the risk of crop failure due to unexpected climatic events.

4. **Water Management:** Agromet advisories aid in efficient water management, allowing farmers to plan irrigation schedules based on predicted weather conditions, minimizing water wastage.

5. **Pest and Disease Control:** Farmers utilize advisories to anticipate and combat potential outbreaks of pests and diseases, adjusting their pest management strategies accordingly.

For Example: In Kharif, 2023 in village Kajlamba tq. Washim there was a soybean crop sown in about 650 Ha. out of which 160 Ha. to 170 Ha. The crop got affected by the pest “Spodoptera litura” ; this affected area was above ETL level in the pod formation stage. So the SDAO office Washim has released crop advisory to farmers to manage pests through IPM technology. It was suggested to usa ferroman trap, Bird Stops and Nim ark spray. In the end this helps farmers to tackle pest attack and reduces the loss of crop in the initial stage.

8.2 Advisory Base on Pest Surveillances Agriculture activity

8.2.1 Implementation Status of CROPSAP:

CROPSAP activity is implemented by the agricultural department by field staff Agri. Assistants select two villages for which they select two fixed plots each. And they take compulsory four readings weekly of fixed plots in two different selected villages. Agri. Super, CAO and TAO randomly take weekly readings in CROPSAP.

Reading is taken in various crop stages, such as seedling, vegetative growth, and pod formation and after maturity.

CROPSAP Activity: - In CROPSAP, crop wise observations in kharif and rabi seasons are taken by field staff to identify pest/disease infestation and its control measures.

1. Agricultural Assistant: - Select the two plots (random and fixed) in two different villages. The crops selected in the two villages are different.

2. Crop reading / observations: - It is taken in one square meter during various stages like seedling, vegetative, flowering and maturity. Afterwards, weekly observations are taken on Monday and Thursday. If any pest / disease infestation is identified above, then ETL, SDAO office monitors these observations or reading in subdivision. As the SDAO office is monitoring the subdivision immediately, crop advisory advisories are taken from KVK, Agricultural University for Management of infestation.

3. Crop Advisory: - Crop advisory is given to infested areas/villages through farmers' training, field visits, FFS by field staff to the farmers for management of pest/disease infestation.

4. Monitor: - CROPSAP has been monitored by agricultural supervisors, CAO, TAO, SDAO and DSAO. Through random crop observations /reading.

8.2.2 Impact on Crop pests and diseases management

During the observations in CROPSAP, if field staff find any attack or infestation of pests above the ETL level on crops, then Agro-advisory is given to farmers by staff through the agri. Department.

Example: In Rabbi season, 2022 in village Pimpal-shenda Tq. Malegaon Dist. Washim's total cultivable area is 78 Ha. sown crop gram, out this area 25 Ha. affected by gram pod borer (*Heliothis armigera*) which was above then ETL level so SDAO office Washim gave crop advisory through CROPSAP so to manage pest IPM technology advised. It was suggested to use pheromone trap, Bird Stops and Nim ark spray. In the end this helps farmers to manage pest attack and reduces the loss of crop in the initial stage.

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

9.1 Existing marketing scenario in the district

- Kharif season: - majority soybean, tur, udid and Mug. This crop, after the post-harvest seed production programme, is also carried out by Mahabeej and a certain FPC in Washim district. They collect raw seeds from a registered grower for certified seed.
- Soybean is purchased by soya mills to extract oil, cake etc., so farmers get a better price as compared to APMC and other markets.
- In the rabi season, the majority of crop grams and wheat after the post-harvest seed production programme is also carried out by Mahabeej and certain FPC in Washim district. They collect raw seeds from a registered grower for certified seed.
- In tur, grams are purchased from the market by the dal mill owner for making dal. It helps in the value addition of these crops for which the farmer gets a good price.

A.1 Year wise Marketable Surplus of Major Crops:

Sr. No.	Name of the crops	Year				
		2018-19	2019-20	2020-21	2021-22	2022-23
		yield in Qtl.	yield in Qtl.	yield in Qtl.	yield in Qtl.	yield in Qtl.
1	Soybean	3783820	2988893	5158943	4966991	4228557
2	Tur	294335	317755	436647	340810	389322
3	Jowar	64316	46959	122	88	28
4	Cotton	99528	81078	169301	111989	90981
5	Mung	87560	71019	45219	18389	10152
6	Udid	96154	77149	4524	26292	15354
7	Wheat	384038	525260	510511	400672	532530
8	Gram	385330	79827	1036767	872458	1011656

(Source: - District Statistic Dept.)

A. Variation of price on future yield and farmers financials.

1. **Profit Margins and Investment Decisions:**
   Fluctuations in crop prices directly influence farmers' profit margins. Price variations can impact decisions related to agricultural investments, such as the choice of crops to cultivate and the level of inputs to be used.
2. **Income Stability and Financial Planning:**

Unpredictable price variations make it challenging for farmers to predict and stabilize their incomes. Farmers often face difficulties in long-term financial planning due to uncertainties in crop prices.

3. **Risk Management:**

Price volatility increases the overall risk for farmers, especially those who heavily rely on a single crop. Farmers may adopt risk mitigation strategies, such as diversifying crops or exploring alternative income sources.

4. **Access to Credit and Loans:**

Farmers' ability to secure credit and loans is influenced by the perceived risk associated with crop price fluctuations. Lenders may be hesitant to provide loans in uncertain market conditions, affecting farmers' access to essential resources.

5. **Technological Adoption:**

Price variations impact farmers' decisions to adopt new technologies and practices. During periods of lower prices, farmers may hesitate to invest in expensive technologies, potentially affecting long-term productivity.

6. **Market Dynamics and Selling Strategies:**

Farmers' selling strategies are influenced by price fluctuations. They may choose to sell immediately after harvest if prices are high or store crops if they anticipate better prices in the future, impacting market dynamics.

7. **Government Policies and Interventions:**

Price variations often lead to government interventions and policies aimed at stabilizing agricultural markets. Support programs may include price support mechanisms and subsidies to mitigate the adverse effects on farmers.

8. **Livelihood Impact:**

For many farmers, agriculture is not just a business but a way of life. Price variations can directly impact their livelihoods and overall well-being. In conclusion, the impact of price variation on future crop yields and farmers' financial conditions underscores the need for effective risk management strategies, market-oriented policies, and support mechanisms to ensure the resilience and sustainability of agricultural practices.

9.1.2 Year Wise Price Variation of Major Crops

Crops	Year														
	2018			2019			2020			2021			2022		
	Price (Rs. /Qtl.)														
	Max.	Min.	Vari.	Max.	Min.	Vari.	Max.	Min.	Vari.	Max.	Min.	Vari.	Max.	Min.	Vari.
Soybean	3298	3113	185	3733	3456	277	4161	3602	559	6910	5651	1259	6396	5620	776
Tur	4105	3806	299	5481	5135	346	5918	5233	685	6408	5679	729	6753	5967	786
Udid	3784	3445	339	4863	4398	465	5872	4854	1018	5864	4755	1109	5631	4580	1051
Gram	3866	3545	321	4275	3945	330	4450	3953	497	4774	4119	655	4575	3986	589
Wheat	1962	1578	384	2129	1807	322	1896	1605	291	1856	1512	344	2299	1695	604

(Source: e-Market)

9.1.3 Markets available in the district with commodities handled (e-Nam, e-MARKETS, APMC/Kharedi Vikri Sangh)

In Washim district majorly Soybean is traded at APMC and private markets. Whereas, Tur, Gram and other commodities are traded at APMC, NAFED at government level and also at private markets.

Regulated markets: In Washim district in each taluka there is a regulated market as follows.

Sr.no.	Taluka	APMC	Periodicity	Important Crop	Quantity (In Quintal)
1	Washim	Washim	Daily	Soybean	997097
				Tur	144598
				Green/Black Gram	5497
				Chick Pea (Gram)/Channa	254573
				Cotton	3708
				Wheat/Jowar	7018
2	Risod	Risod	Daily	Soybean	467481
				Tur	32134
				Green/Black Gram	1335
				Chick Pea (Gram)/Channa	62255
				Cotton	0
				Wheat/Jowar	2783
3	Manora	Manora	Daily	Soybean	206454
				Tur	55022
				Green/Black Gram	65
				Chick Pea (Gram)/Channa	22315
				Cotton	2650
				Wheat/Jowar	3152
4	Mangrulpir	Mangrulpir	Daily	Soybean	740603
				Tur	40832
				Green/Black Gram	21050
				Chick Pea (Gram)/Channa	99787
				Cotton	30036
				Wheat/Jowar	47520
5	Karanja	Karanja	Daily	Soybean	979798
				Tur	272735
				Green/Black Gram	19323
				Chick Pea (Gram)/Channa	135319
				Cotton	27290
				Wheat/Jowar	50014

(Source: - e-Nam Market)

9.2 Constraints in existing value chain

Following are the constraints in the existing value chain at different levels.

1. Farmers:

- Limited access to modern agricultural practices and technology.
- Dependence on weather conditions, which can lead to crop failure.
- Lack of knowledge about sustainable and efficient farming techniques.

2. APMC (Agricultural Produce Market Committee):

- Limited infrastructure and facilities at many APMC markets.
- Middlemen may exploit farmers by offering low prices.
- Complex and bureaucratic procedures for selling produce.

3. Big Traders:

- May engage in speculative trading, which can lead to price volatility.
- May have disproportionate bargaining power, disadvantaged smaller farmers.
- Limited transparency in pricing and transactions.

4. Brokers:

- Potential for conflicts of interest if brokers represent both buyers and sellers.
- May not always act in the best interests of farmers.
- Lack of standardization in brokerage practices.

5. Processors:

- Dependent on the quality and quantity of raw materials from farmers.
- Vulnerable to price fluctuations in the international market.
- Need significant capital investment in processing facilities.

6. National and International Markets:

- Vulnerability to international trade policies and tariffs.
- Price fluctuations due to global supply and demand dynamics.
- Limited access to international markets for small-scale players.
- Geopolitical factors can affect trade relationships and market access.

9.3 Potential for strengthening of commodity wise value chains

1. Farmers:

- Training and Extension Services: Provide farmers with access to training and extension services to improve agricultural practices, crop rotation, and pest management.
- Access to Finance: Facilitate access to credit, microloans, and insurance to help farmers invest in better seeds, fertilizers, and machinery.

2. APMC (Agricultural Produce Market Committee):

- Infrastructure Development: Upgrade market infrastructure to include storage, grading, and packaging facilities, making it easier for farmers to sell their produce.
- Digital Platforms: Implement digital platforms for price transparency and real-time market information.

3. Big Traders:

- Regulation and Transparency: Implement regulations to prevent speculative trading and ensure transparency in pricing.
- Farmer Cooperatives: Encourage the formation of farmer cooperatives to give them more bargaining power when dealing with big traders.

4. Processors:

- Quality Control: Invest in quality control measures to ensure consistent product quality.
- Diversification: Explore opportunities for value addition, such as soybean oil and meal processing, which can increase profitability.

5. National and International Markets:

- Market Diversification: Encourage the exploration of new markets and the development of value-added products to reduce dependence on a single market.
- Trade Agreements: Advocate for trade agreements that facilitate exports and imports while protecting domestic interests.

6. Government and Policy Support:

- Agricultural Policies: Develop and implement policies that support the soybean industry, including subsidies, incentives, and risk mitigation programs.
- Infrastructure Investment: Invest in transportation infrastructure to reduce post-harvest losses and facilitate distribution.

7. Value Chain Integration:

- Vertical Integration: Encourage integration between different stages of the value chain to reduce inefficiencies and improve coordination.
- Partnerships: Promote partnerships between public and private sectors to strengthen the value chain.
- Strengthening the soybean value chain is a complex process that requires collaboration among various stakeholders, including government, farmers, traders, processors, and consumers. By addressing the limitations and improving each step in the value chain, the industry can become more resilient, sustainable, and competitive.

9.4 FPCs' contribution in value chain development

9.4.1 Status of FPCs in the district

In the District, a total 49 number of FPC's registered on the portal. They applied for various types of activities like CHC, Drying Yard, Godown Construction etc. in our project. Till now we have disbursed 45 FPC's of amounts Rs.504.18 lac.

9.4.2 Assessment of FPCs in the district

9.4.2.1. Objectives of Evaluation

- The study is an attempt to assess the Farmer Producer Companies of project area and find whether these companies are performing and earning sufficient returns to sustain business. The report has also proposed a rating method to measure the performance of FPCs considering different 8 parameters. The reports analysed 50 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. 9.2.2.1.a. **Criteria for Evaluation of FPCs**

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

Scoring Method of Evaluation

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

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

9.4.2.2 Output of evaluation.

All the major parameter noted above can be classified on the basis of percentage and frequency. The total obtained percent score was use for categorization of the parameter. The parameter was categories into three categories i.e. below 50% marks, 50- 75% marks, and above 75% marks. And all the FPCs were categories in three categories which help to 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.

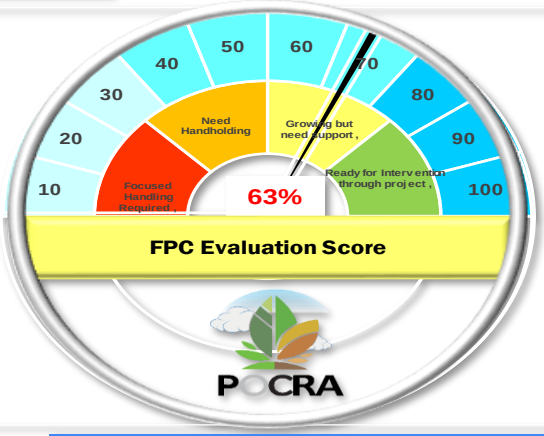
Customized Evaluation Report

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

Nardas Farmer Producer Company

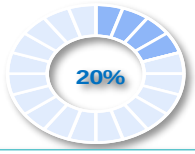
Address

Chndai ,Risod, Dist-Washim , Pincode-444105

Score Report

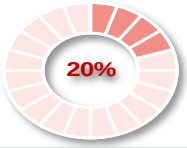
Criteria	Max. Score	Score Obtained
Organization & Adminstration (Core Foundation Strength)	21	17
Governance (Control Systems in Place)	11	10
Management (Decision making processes)	8	7
Infrastructure (Assets and resources)	5	1
Finance (Financial base and health)	25	12
Business & Market Linkages (Resource quality)	21	14
Capacity Building (Resource quality)	5	1
Climate Resilience (Adaptability to climate risk)	4	1
Final Score	100	63

What could improve your FPC?



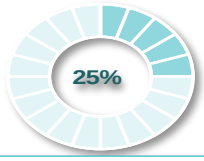
Capacity Building

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.



Infrastructure

Better Financial Management can help in improving available infrastructure



Climate Resilience

The FPC should promote various climate resilient agricultural technologies.

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

9.4.3 Information about FPC's supported by SMART/NDKSP/MAGNET

Sr.no	Activity	Numbers	Disbursement in Lac.
1	Custom Hiring Center	17	187.38
2	Drying Yard	8	75.33
3	Construction of Godown	8	101.53
4	Goat Breeding Center	1	11.46
5	Cleaning and Grading Center	3	38.44
6	Other Agribusiness	8	90.05
Total		**45**	**504.19**

Sr.no	Project name	No. of FPC's	Disbursed amount (Rs. In lakh)
1	SMART	03	245.81
2	NDKSP	45	504.18
3	MAGNET	-	-

(Source: District Superintendent of Agriculture Office)

9.4.4 Details of Commodity transacted by the FPC

In the district, the majority of Soybean and Gram commodities have been processed (Cleaning and Grading) by FPC's. Foundation/Certified Seeds is provided for farmers on a subsidy basis by this project.

Name Of FPC /SHG	Taluka	Activity/Commodities	Business
Gorekshan Shetkari Bachat Gat	Risod	Vermi Compost Unit.	Provides Vermicompost
Krushimauli Farmer Producer Company	Mangrulpir	Neem Extract Unit.	Provides Neem Oil, Neem Powder Etc.
Jai Bholenath Shetkari Bachat Gat	Risod	Vermi Compost Unit.	Provides Vermicompost
Bhagwanbaba Shetkari Sheti Swavalamban Bachat Gat	Karanja	Seed Processing Shade/ Drying Yard.	Provides Drying Facilities

9.4.5 Details of Services provided by FPC's

The majority of FPC's provide services to farmers, like CHC, Drying Yard, Godown Construction etc. They have also increased their income source by giving on a hiring basis.

FPC's main role is creating awareness in farmers about adapting to new developed technology which leads to increasing their income.

Name Of FPC /SHG	Taluka	Activity/Commodities	Business
Sairam Shetkari Bachat Gat	Washim	Goat Breeding Center.	Provides Good Quality Breeds Of Goat
Krushideep Agricultural Producer Company Limited	Malegaon	Seed Processing Unit.	Provides Cleaning, Grading Facilities.
Yogiraj Agro Swayam Sahayyta Shetkari Bachat Gat	Karanja	Construction Of Godown/ Small Warehouse.	Provides Storage Facilities
Rajchandra Farmer Producer Company	Manora	Establishment Of Custom Hiring Centers.	Provides Farm Equipment.
Jaydatta Shetkari Swyamsahayta Bachat Gat	Washim	Goat Breeding Center.	Provides Good Quality Breeds Of Goat
Swa.Gopinath Munde Shetkari Bachat Gat	Malegaon	Seed Processing Shade/ Drying Yard	Provides Drying Facilities
Krushi Mauli Farmer Producer Company	Mangrulpir	Seed Processing Shade/ Drying Yard	Provides Drying Facilities
Jai Mahakali Shetkari Bachat Gat	Mangrulpir	Establishment Of Custom Hiring Centers.	Provides Farm Equipment.

Chapter 10: Extension strategies for adaptation to climate change

I) Preparation of Village Adaptation Plan

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

❖ **Planning for water security**

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

❖ **Planning for soil health**

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

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

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

❖ **Planning for Carbon sequestration**

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

❖ **Planning for reduction of production cost**

a. Reducing cost on labour intensive operations (by mechanization)
b. Reducing use of chemical fertilizers (by enhancing use of bio/ organic fertilizers)
c. Reducing use of chemical pesticides (by enhancing use of bio/ natural pesticides)
d. Reducing tillage operations (by conservation agriculture)
e. Reducing excessive water usage (by micro-irrigation)

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

a. Identification of CRV.

b. Production programme for Truthful/ Certified/ Foundation seeds- status
c. Conservation of indigenous seed having climate resilient characters- details of such seeds with location and characteristics

❖ **Adoption of climate resilient technologies**

a. Identification of CRT useful to the village and creating awareness
b. Plan of demonstration of CRT (FFS, Method/ Result Demonstrations)
c. Most prominently adopted technologies and their impact
d. Innovative technologies adopted
e. Validation of technologies developed by Progressive farmers

❖ **Integrated Pest Management Plan**

a. Identification of common pests on major crops based on *CROPSAP*
b. Plan of IPM technologies to be adopted
c. On-farm production of bio-pesticides, natural pesticides etc.
d. Skill training to reduce pesticide hazard

❖ **Integrated farming systems**

a. Potential for crop based and other livelihood activities
b. Households to be engaged in IFS
c. Plan for market linkage for IFS produce

❖ **Preparation of contingency plan**

a. Village level weather forecast mechanism
b. Preparedness for contingencies
c. Crop insurance promotion and status
d. Monitoring of contingencies
e. Assessment of losses due to natural calamities if any

❖ **Strengthening of commodity value chains**

a. Assessing existing commodity value chains
b. Identification of gaps in existing value chains
c. Assessing volume of commodity to be marketed
d. Assessing warehouse availability and available capacity
e. Assessing transportation facilities
f. Plan for infrastructure
g. Plan for market linkage of major commodities
h. Role of Women Self Help Groups, Farmer Groups, FPCs

II. Convergence of Govt. Programs with Extension Plan

Convergence of government programs with extension plans is essential for ensuring the effective and coordinated delivery of services, particularly in the agricultural sector. Extension plans typically aim to transfer knowledge, skills, and technologies to farmers and rural communities.

A. ATMA (Agricultural Technology Management Agency):

In the year 2023-24, 1200 farmer trainings have been completed under the Atma in the district, including 00 trainings outside the state regarding silk industry and dairy business management, 75 trainings within the state regarding goat rearing and grain processing unit and 1125 trainings within the district regarding fruit processing unit and hygiene, goat rearing and dairy business are completed. Farmers' trips outside

state and within state each 2 groups of farmers which consist 1180 farmers have completed their farmer trips. 06 agricultural schools have been completed. 1023 crop demonstrations have been completed under Atma Yojana.

B. Ranbhaji Mahotsav:

District Level Ranbhaji Mahotsav was organized during 09 to 15 August 2023 on behalf of Maharashtra State, Department of Agriculture on 09/08/2022 Project Director ATMA, Washim was organized. Which was inaugurated by Hon. District Magistrate . According to the suggestion of the Commissioner of Agriculture, according to the natural availability of wild vegetables at district level and taluka level. 2537 farmers participated in the vegetable festival organized at district and tehsil level. At this time 85 wild vegetables were available for sale.

C. Agriculture Sanjeevani week:

from 23st June to 1st July 2023, meetings were organized in 750 villages with the participation of 23400 farmers and guidance was given regarding preparation of Kharif season, importance of seed germination, seed treatment, soil testing, various schemes of agriculture department, precautions to be taken while handling/spraying chemical pesticides.

D. Vikel Te Pikel:

In the year 2023-24, a total of 65 farmer groups / farmer producer companies are selling agricultural produce to bulk buyers / sellers / processors. In this, 50 farmer groups 160 M. Tons of their produce have been sold, 15 farmers producing companies, 7500 M. Tons of agricultural produce has been sold.

E. SMART:

16 applications have been received under the project for various activities and all the applications have received pre-sanction and the construction work, procurement process is in progress.

G. NDKSP:

Till date 35448 farmers of the district have been registered on the online portal DBT PoCRA and a total of 75902 individual benefit applications have been registered. Out of which till date 17792 farmers have been given subsidy amounting to Rs.5168.1 lakh.

Also, under the agribusiness component till date 257 farmer groups and farmer producer companies in the district have distributed subsidy amounting to Rs.4852.5 lakh.

III. Monitoring mechanism for village adaptation progress

- Monthly review of Taluka Agriculture Officers and Circle Agriculture Officers.
  Monthly meetings with field functionaries of all agriculture schemes.
- Through the field farm school to give the proper guidance for farmers regarding climate resilient technologies to create sustainable livelihood opportunities.
- 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.

- To identify the needs and problems of farmers for effective implementation of various agriculture schemes.
- To train extension workers, government officials, and agricultural experts to provide guidance and support to farmers in adopting mechanization.
- Provide easy access to information about the latest trends in mechanization and government support programs through online platforms and local agricultural extension offices.
- Encourage the formation of farmer cooperatives to jointly invest in and share machinery. This can help small farmer's access modern equipment.
- Promote the use of mechanization methods that are environmentally sustainable, such as precision agriculture and reduced chemical usage.
- 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:

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

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

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

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

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

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

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

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

Annexure I Sample Village Level Micro-Plan

VDP: Village Vitholi, Taluka Manora, Dist. Washim

गाव विकास आराखडा प्रपत्र

महाराष्ट्र शासन - कृषि विभाग
नानाजी देशमुख कृषि संजीवनी प्रकल्प

गाव विकास आराखडा

गाव समुहाचा क्रमांक- 502_pgaa-3_02

गावाचे नाव-	विठोळी	सेन्सस कोड-	531082
महसुल मंडळ-	Manora	तालुका-	मनोरा
उपविभाग-	वाशिम	जिल्हा-	वाशिम

गावसमुहातील इतर समाविष्ठ गावे

अ. क्र	गावाचे नाव	सेन्सस कोड	अ. क्र	गावाचे नाव	सेन्सस कोड
1	भुळी	531091	2	गळमगाव	531089
3	गव्हा	531081	4	चाकुर	531090
5	अमदरी	531137	6	उज्वल नगर	531144
7	कारखेडा	531083	8	कारपा	531129
9	हतोळी	531138	10	असोळा खु.	531080

सुक्ष्मनियोजन प्रक्रिया कालावधी - 14-10-2021 ते 21-10-2021
गाव विकास आराखडा तयार करणा-या कृषि सहाय्यकाचे नाव - Priti Chore
गाव विकास आराखडयाची तांत्रिक तपासणी करणारे कार्यालय - उपविभागीय कृषि अधिकारी,वाशिम
ग्राम कृषि संजीवनी समिती मंजूरी ठराव क्रमांक व दिनांक - ठराव क्रमांक 4 दि. 21-10-2010
ग्रामसभा मंजूरी ठराव क्र व दिनांक - ठराव क्रमांक दि. --
जिल्हास्तरीय समन्वय समितीकडील मंजूरीचा दिनांक - _____

जिल्हा अधिक्षक कृषि अधिकारी,वाशिम कार्यालय

अनुक्रमणिका

Annexure II Sample Village Profile

नानाजी देशमुख कृषि संजीवनी प्रकल्प — सत्यमेव जयते — कृषी विभाग महाराष्ट्र शासन

अहवाल क्रमांक : **नादेकृसप्र/गामाप्र/531082/2024/35** दिनांक : 04/02/202

ग्राम कृषी संजीवनी विकास दर्शिका

गावाचे नाव : विठोळी	गावाचा सांकेतांक : 531082	ग्रामपंचायत: Vitholi
गावाचा (प्रकल्प) टप्पा : 3	गाव खारपान मध्ये येते का ?: नाही	समूह कोड: 502_pgaa-3_02
तालुका : मनोरा	उपविभाग : वाशिम	जिल्हा : वाशिम

प्रकल्प कर्मचारी/अधिकारी

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
उपविभागीय कृषी अधिकारी	Chatarmal Sanjay	7588582777
तालुका कृषी अधिकारी	Rathod Umesh	9604837591
कृषी सहाय्यक	Chore Priti	9420361288
समूह सहाय्यक	Matre Shubham Pundlikrav	8007791790
शेतीशाळा प्रशिक्षक	Deshmukh Shrinath	8605776818
कृषीमित्र	Thakarey Vishal Banduji	9130247428
कृषीताई	Tale Ratnmala Vasant	8262921173

ग्राम कृषी संजीवनी समिती

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
सरपंच	Patil Jaymala Ganesh	7057424203
उपसरपंच	Walale Gajanan Rangrao	9673838991
ग्रामपंचायत सदस्य	Rathod Asha Uttam	7350971093
ग्रामपंचायत सदस्य	Patil Venudhar Narendra	8605764599
प्रगतिशील शेतकरी	Patil Pramila Tukaram	9011667751
प्रगतिशील शेतकरी	Patil Nitin Niranjan	9420705055
महिला शेतकरी	Walale Kautukbai Anna	9284234291
महिला शेतकरी	Rathod Devkabai Dayaram	7575367244
महिला शेतकरी	Patil Annpurna Mahadeo	8806373937
शेतकरी उत्पादक कंपनी प्रतिनिधी	Patil Ankush Niranjan	9765106054
बचत गट महिला प्रतिनिधी	Patil Sonali Venudhar	8975928200
कृषि पूरक व्यावसायिक शेतकरी	Thakare Shakuntala Vishnu	8275551881
कृषि पूरक व्यावसायिक शेतकरी	Patil Baban Anna	8459328770

भौगोलिक तपशील

माहिती उपलब्ध नाही

हवामान अंदाज व पीक सल्ला

माहिती उपलब्ध नाही

वैयक्तिक लाभार्थी तपशील

नोंदणी केलेले शेतकरी - 546	अर्जांची एकूण संख्या - 681
पूर्वसंमती दिलेले अर्ज - 200	लाभ दिलेले अर्ज- 208
लाभार्थी संख्या - 153	लाभार्थी महिला शेतकरी - 34
अनुसूचित जाती लाभार्थी - 9	अनुसूचित जमाती लाभार्थी - 1
वितरीत अनुदान रक्कम - 7949893	बँकेसोबत आधार संलग्न नसलेले शेतकरी - 72

घटकनिहाय वितरित अनुदान

घटक/बाब	एकूण अर्ज	पूर्व समंती प्राप्त अर्ज	नाकारलेल्या अर्जांची संख्या	लाभार्थी शेतकरी	वितरीत केलेला निधी (रू)
Apiculture	2	0	2	0	0
Backyard Poultry	1	0	1	0	0
Compost (Vermicompost / NADEP / Organic input production unit)	5	0	5	0	0
Drip Irrigation	96	23	68	18	1787863
Farm Mechanization	77	9	67	8	567639
Farm Pond (Individual)	3	0	3	0	0
FFS host farmer assistance / Promotion of BBF technology/ Zero Tillage Technology etc.	8	2	6	2	5600
Horticulture Plantation / Agroforestry	190	77	113	70	3271950
Pipes	6	0	6	0	0
Recharge of open dug wells	12	0	12	0	0
Saline and Sodic lands (Farm ponds/ Sprinklers / Water pump/ FFS)	6	0	6	0	0

Seed Production	1	0	1	0	0
Sericulture	11	0	8	0	0
Shadenet House	9	1	7	0	0
Sprinkler Irrigation	184	85	96	82	1566841
Water Pumps	5	0	5	0	0
Well	65	3	52	3	750000
Total	681	200	458	183	7949893

कृषी व्यवसाय घटकाचा तपशील

नोंदणी केलेल्या FPC/SHG/Farmer Group ची संख्या - 1	एकूण अर्जांची संख्या - 1
पूर्वसंमती दिलेल्या अर्जांची संख्या - 1	कार्यारंभ आदेश दिलेल्या अर्जांची संख्या - 1
लाभ दिलेल्या FPC/SHG/Farmer Group ची संख्या - 1	अनुदान वितरीत रक्कम, रु. - 1180560

कृषी व्यवसाय घटकांतर्गत घटक/ बाबनिहाय वितरीत अनुदान

घटक/बाब	एकूण अर्ज	पूर्व समंती प्राप्तअर्ज	कार्यारंभ आदेश प्राप्त अर्ज	अनुदान वितरीत FPC/SHG/Farmer Group	वितरीत केलेले अनुदान रक्कम, (रू)
Establishment of Custom Hiring Centers	1	1	1	1	1180560

मृद व जलसंधारण तपशील

पावसाचे प्रमाण (मिमी) - 960.25	उपलब्ध अपधाव (TCM) - 1030.08
अडवलेला अपधाव (TCM) - 60.87	शिल्लक अपधाव (TCM) - 969.21
प्रस्तावित क्षेत्र उपचार (हे.) - 1087.34	प्रस्तावित नाला उपचार संख्या - 15
कामांची एकूण रक्कम - 168.2	तयार अंदाज पत्रकांची संख्या - 16
एकूण तांत्रिक मंजुरींची संख्या - 16	पूर्ण झालेल्या ई निविदा संख्या - 16
सुरु झालेल्या कामांची संख्या - 16	पूर्ण झालेल्या कामांची संख्या - 12
निधी वितरण केलेल्या कामांची संख्या - 12	खर्च झालेली एकूण रक्कम (रू) - 4096453

कामानुसार झालेला खर्च

उपचार प्रकार	एकूण तांत्रिक मान्यता	एकूण कार्यारंभ आदेश	एकूण पूर्ण झालेलीकामे	निधी अदा केलेल्या कामांची संख्या	एकूण अदायगी (रू)
Compartment /graded bunding	16	16	12	12	4096453
Total	16	16	12	12	4096453

पिक पद्धतींचा तपशील

माहिती उपलब्ध नाही

भूमी उपयोगिता वर्गीकरण

गावाचे एकूण भौगोलिक क्षेत्र 1253.33 हे असून निव्वळ पिकाखाली त्यापैकी 0% क्षेत्र आहे. गावाचे भूरूप ढोबळमानाने उंचसखल/ डोंगराळ/ सपाट प्रकारचे आहे. गावातील निव्वळ पिकाखालील क्षेत्रापैकी 0% क्षेत्राकरिता सिंचनसुविधा उपलब्ध आहे.

अ.क्र.	तपशील		क्षेत्र (हेक्टर)
1	एकूण भौगोलिक क्षेत्र (Total Geographical Area)		1253.33
2	पिकाखालील निव्वळ क्षेत्र (Net Cropped Area)		NA
3	दुबार पिकाखालील क्षेत्र (Double Cropped Area)		NA
4	एकूण लागवडीखालील क्षेत्र (Gross cropped Area)		NA
5	एकुण सिंचित क्षेत्र (Irrigaterd Area)	हंगामी बागायत	NA
		बारमाही बागायत	NA
6	एकूण वन क्षेत्र (Total Forest Area)		NA
7	कायम पड क्षेत्र (Permanent Fallow Area)		NA
8	चालू पड क्षेत्र (Current Fallow Area)		NA
9	गवत पड व चराऊ कुरणे (Pasture Land)		NA
10	इतर पड क्षेत्र (Other Fallow Area)		NA
11	बिगर कृषि क्षेत्र (Area put to non-Agricultural use)		NA

पिकनिहाय क्षेत्र (क्षेत्र हेक्टर)

अ.क्र.	पिकाचा वर्ग	पिकाखालील क्षेत्र
1	तृणधान्य	0
2	कडधान्य	0
3	गळितधान्य	600
4	नगदी पिके (कापूस,ऊस)	0
5	भाजीपाला पिके	0
6	फळपिके	0
7	चारा पिके	0
8	इतर	0

एकूण	600

निरीक्षण विहिरींची पाण्याची पातळी

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

माहिती उपलब्ध नाही

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
9440	1438	30/11/2023
गोदाम नाव	ईमेल	दूरध्वनी
DHARWA	darwha.wh@mswc.in	-

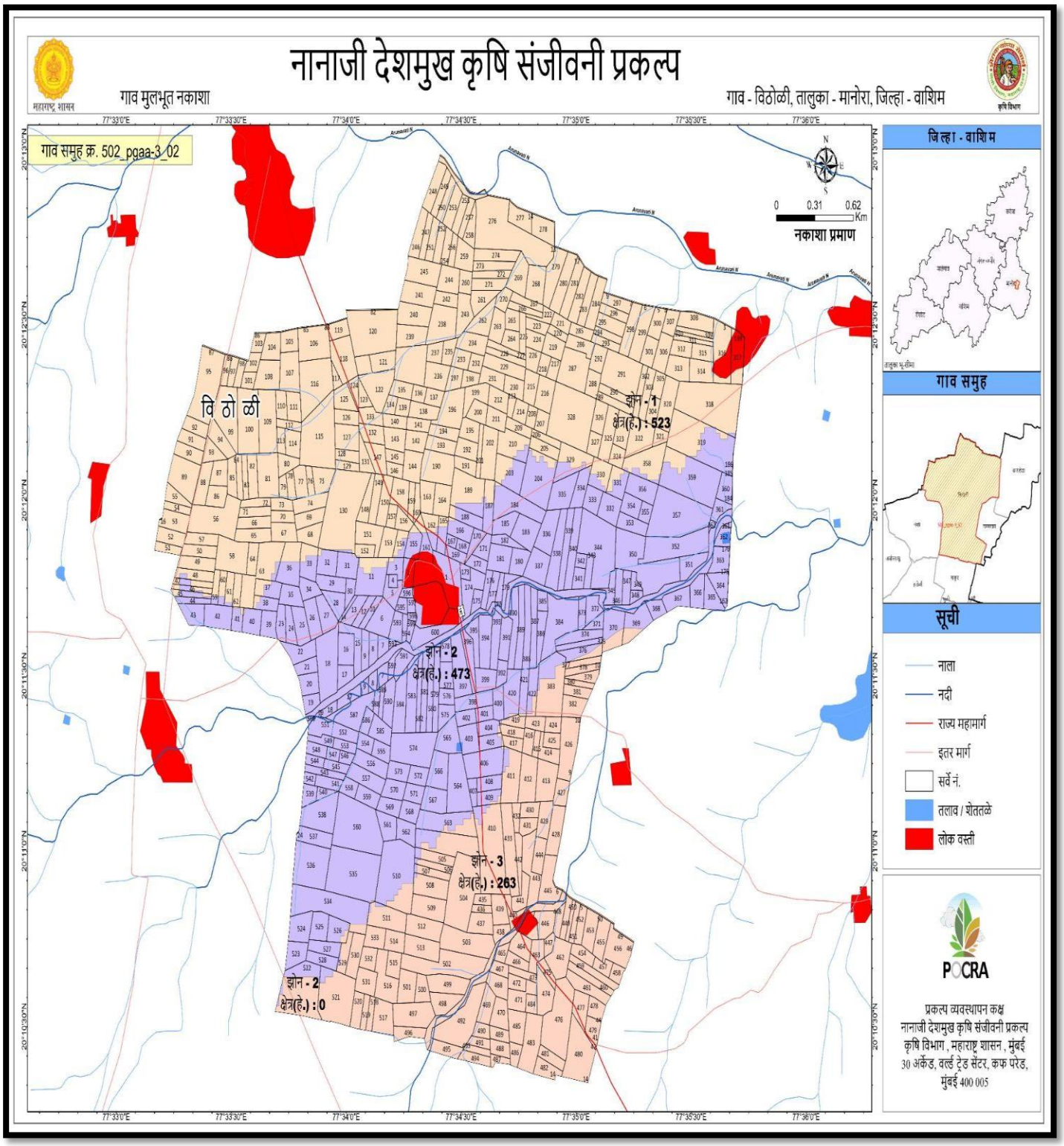
गोदामाचा पत्ता -MSWC, ARNI ROAD, DARWHA - 445202
गावापासून अंतर(कि.मी.) - 22.24

Sources of Information:

1. General Census 2011
2. Agriculture Census 2010
3. PoCRA DBT Portal
4. PoCRA MLP Application
5. PoCRA FFS Application
6. PoCRA Training Application
7. PoCRA SSO system

Annexure III Sample Village Map (गावाचा मुलभूत नकाशा)

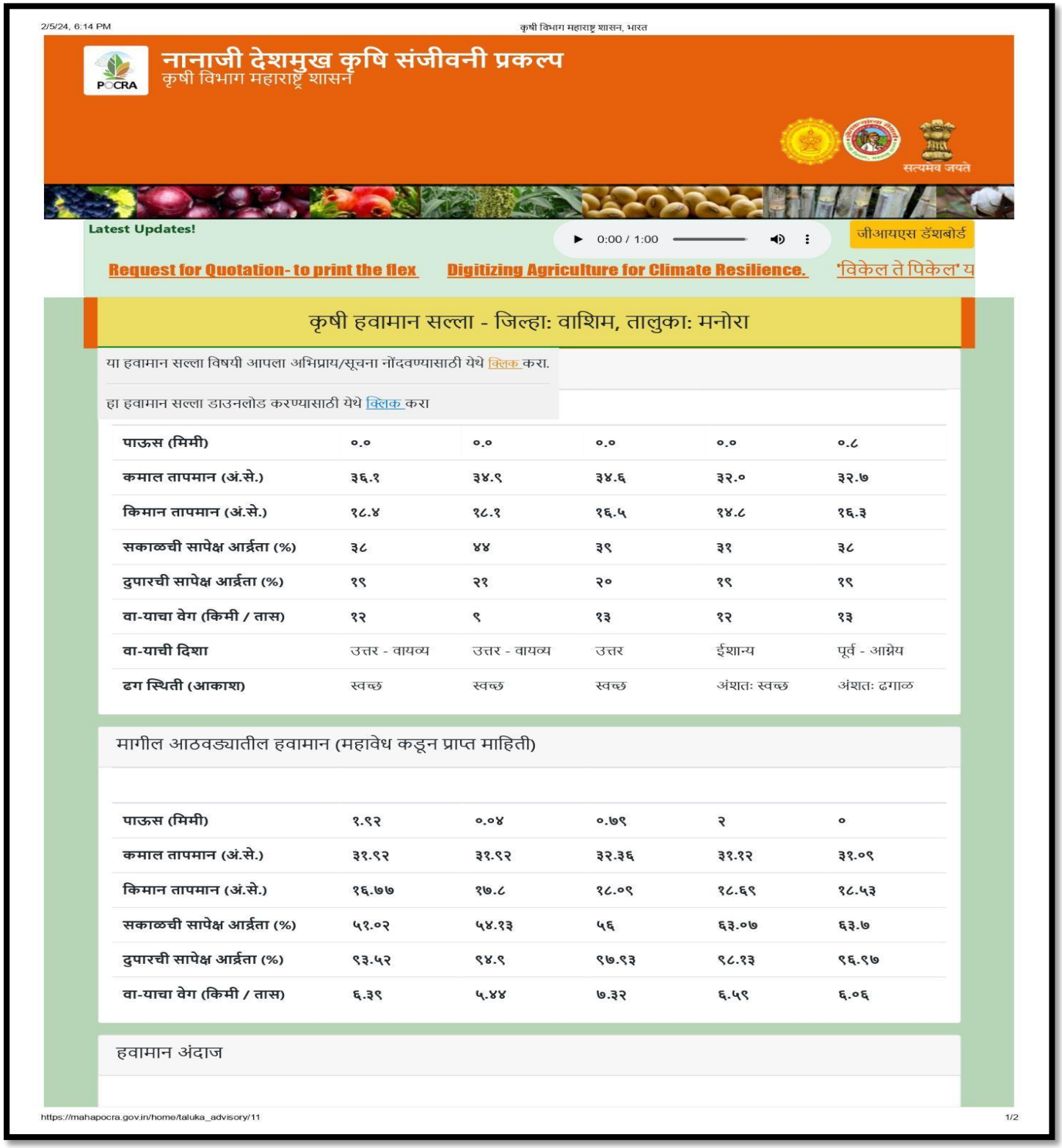
Village Vitholi, Taluka Manora, Dist. Washim



Annexure IV Sample Agro-met Advisory

(तालुका निहाय हवामान अंदाज व कृषी सल्ला)

Village Vitholi, Taluka Manora, Dist. Washim



2/5/24, 6:14 PM कृषी विभाग महाराष्ट्र शासन, भारत

नानाजी देशमुख कृषि संजीवनी प्रकल्प
कृषी विभाग महाराष्ट्र शासन

सत्यमेव जयते

Latest Updates!

0:00 / 1:00

जीआयएस डॅशबोर्ड

Request for Quotation- to print the flex Digitizing Agriculture for Climate Resilience. 'विकेल ते पिकेल' य

कृषी हवामान सल्ला - जिल्हा: वाशिम, तालुका: मनोरा

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

हा हवामान सल्ला डाउनलोड करण्यासाठी येथे क्लिक करा

पाऊस (मिमी)	०.०	०.०	०.०	०.०	०.८
कमाल तापमान (अं.से.)	३६.१	३४.९	३४.६	३२.०	३२.७
किमान तापमान (अं.से.)	१८.४	१८.१	१६.५	१४.८	१६.३
सकाळची सापेक्ष आर्द्रता (%)	३८	४४	३९	३१	३८
दुपारची सापेक्ष आर्द्रता (%)	१९	२१	२०	१९	१९
वा-याचा वेग (किमी / तास)	१२	९	१३	१२	१३
वा-याची दिशा	उत्तर - वायव्य	उत्तर - वायव्य	उत्तर	ईशान्य	पूर्व - आग्नेय
ढग स्थिती (आकाश)	स्वच्छ	स्वच्छ	स्वच्छ	अंशतः स्वच्छ	अंशतः ढगाळ

मागील आठवड्यातील हवामान (महावेध कडून प्राप्त माहिती)

पाऊस (मिमी)	१.९२	०.०४	०.७९	२	०
कमाल तापमान (अं.से.)	३१.९२	३१.९२	३२.३६	३१.१२	३१.०९
किमान तापमान (अं.से.)	१६.७७	१७.८	१८.०९	१८.६९	१८.५३
सकाळची सापेक्ष आर्द्रता (%)	५१.०२	५४.१३	५६	६३.०७	६३.७
दुपारची सापेक्ष आर्द्रता (%)	९३.५२	९४.९	९७.९३	९८.१३	९६.९७
वा-याचा वेग (किमी / तास)	६.३९	५.४४	७.३२	६.५९	६.०६

हवामान अंदाज

https://mahapocra.gov.in/home/taluka_advisory/11 1/2

हलक्या स्वरुपात पाऊस पडण्याची शक्यता. आकाश अंशतः स्वच्छ ते अंशतः ढगाळ राहण्याची शक्यता. हळुवार वारा असण्याची शक्यता. तापमान १४.८ ते ३६.१ अंश से. दरम्यान असण्याची शक्यता.

पीक सल्ला

गाव	पीक	पीक सल्ला
	हरभरा	हेलिकोव्हर्पावर लक्ष ठेवावे.हेलिकोव्हर्पाची आर्थिक नुकसान पातळी ओलांडताच क्लोरँट्रेनिलिप्रॉल २० ससीए@३ मिली। १०लिटर पाण्यात मिसळून फवारावे. - 2024-02-01

टीप:

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

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

हा हवामान सल्ला डाउनलोड करण्यासाठी येथे क्लिक करा

Contact Us

कृषी विभाग
महाराष्ट्र शासन

नानाजी देशमुख कृषि संजीवनी प्रकल्प (PoCRA),
30 अ/ब, आर्केड, वर्ल्ड ट्रेड सेंटर,
कफपरेड,
मुंबई 400005.

Phone: 022-22163351
Email: pmu@mahapocra.gov.in
हेल्पलाईन क्रमांक- 9355056066