

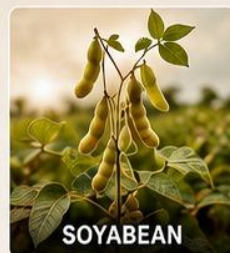


DISTRICT WISE CONTINGENCY PLAN TO DEAL WITH **EL NIÑO**

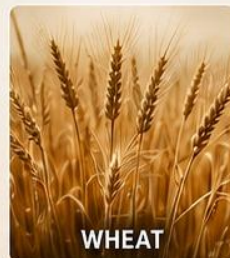
PREPAREDNESS | RESPONSE | RESILIENCE



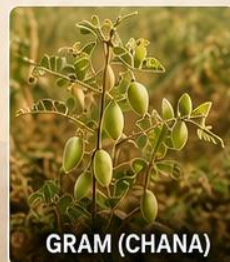
BUILDING A
DROUGHT RESILIENT
MADHYA PRADESH



SOYABEAN



WHEAT



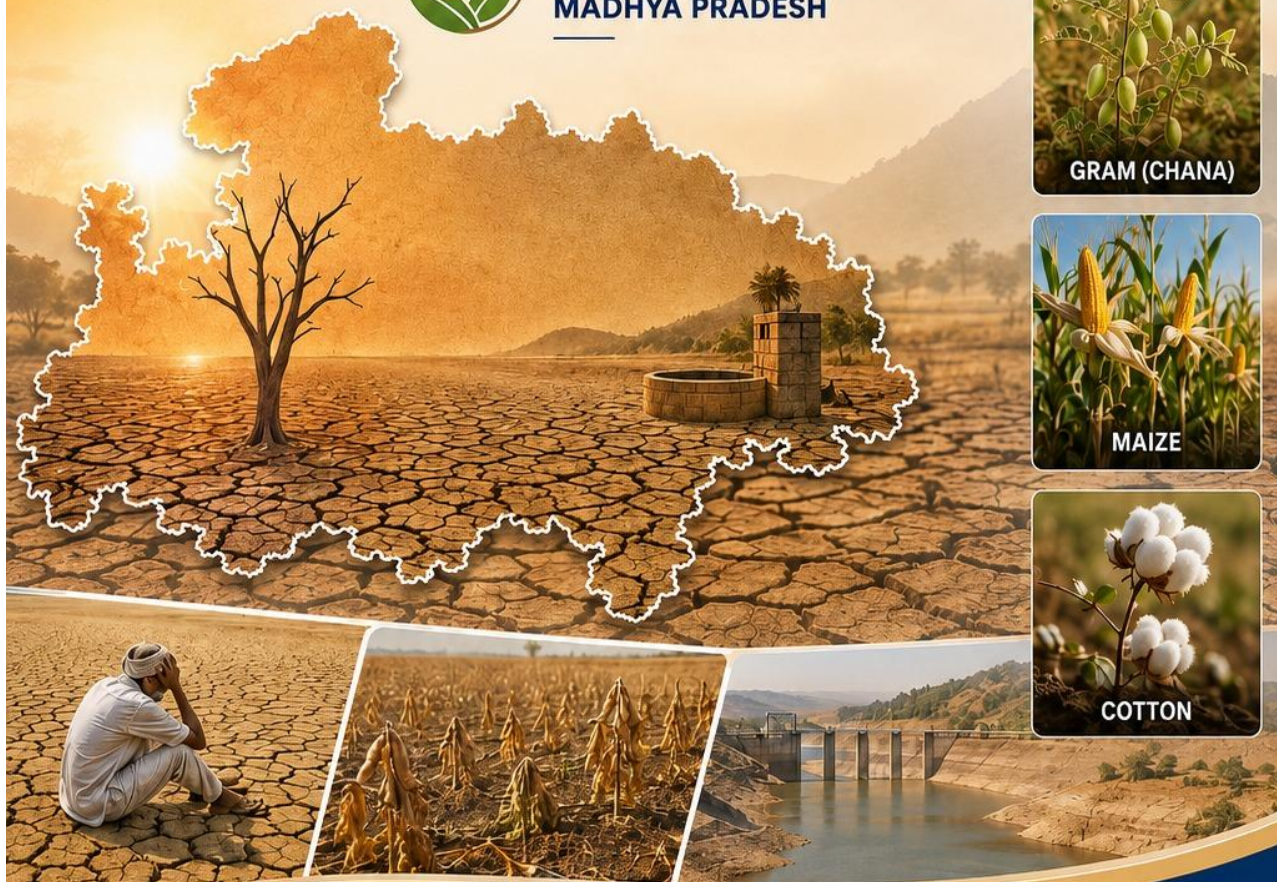
GRAM (CHANA)



MAIZE



COTTON



EARLY WARNING
& MONITORING



WATER
MANAGEMENT



SUSTAINABLE
AGRICULTURE



COMMUNITY
PARTICIPATION

TOGETHER, LET'S BUILD A RESILIENT MADHYA PRADESH

PREPARE TODAY • PROTECT TOMORROW • PROSPER TOGETHER

Madhya Pradesh

Madhya Pradesh, often referred to as the "Heart of India," is one of the largest agricultural states in the country. Agriculture plays a vital role in the state's economy, contributing significantly to employment, rural livelihoods, and food security. More than half of the state's population depends directly or indirectly on agriculture and allied activities. The state possesses diverse agro-climatic zones, fertile soils, and a wide range of cropping systems. Agriculture in Madhya Pradesh not only contributes substantially to the state's Gross State Domestic Product (GSDP) but also supports allied sectors such as livestock, horticulture, fisheries, and agro-processing industries.

Madhya Pradesh is recognized as the "Soybean State of India" because it accounts for a major share of the country's soybean production. Other important Kharif crops grown in the state include paddy, maize, sorghum, pearl millet, pigeon pea, black gram, green gram, cotton, groundnut, and sesame. During the Rabi season, wheat, chickpea, lentil, mustard, and barley are the major crops. The state is also a leading producer of pulses and oilseeds, contributing significantly to national food and nutritional security. The state receives an average annual rainfall of approximately 900–1200 mm, with nearly 85–90 percent of the rainfall occurring during the southwest monsoon season (June to September). Therefore, agricultural production in Madhya Pradesh is highly dependent on the timely onset, distribution, and quantity of monsoon rainfall.

Historical impact of El Nino to Madhya Pradesh

Madhya Pradesh is highly vulnerable to El Nino-induced monsoon variability because nearly half of its cultivated area remains rainfed. During El Nino years, the state often experiences delayed monsoon onset, prolonged dry spells, and below-normal rainfall. Reduced rainfall adversely affects the sowing and growth of major Kharif crops such as soybean, paddy, maize, and pulses. Moisture stress during critical crop growth stages leads to lower yields and reduced farm incomes.

Effects on Major Crops

- **Soybean:** Reduced germination, flower shedding, poor pod formation, and lower yields.
- **Paddy:** Delayed transplanting, reduced tillering, and lower grain production.
- **Maize:** Poor cob development and reduced grain filling.
- **Pulses (Pigeon pea, Black gram, green gram):** Flower drop, reduced pod setting, and lower productivity.
- **Groundnut:** Poor peg formation and kernel development.
- **Cotton:** Reduced boll formation and increased moisture stress.

- **Millet and Sorghum:** Better drought tolerance but yield reductions under severe drought conditions.

Contingency plans for major crops grown in Madhya Pradesh

Crop	El Nino Situation	Recommended Contingency Measures	Suitable Varieties
Soybean	Delayed monsoon up to July	Use short-duration varieties, seed treatment, line sowing, moisture conservation	JS 20-29, JS 20-34, JS 95-60, RVS 2001-4
	Severe rainfall deficit	Shift to pigeonpea, sesame, blackgram, greengram, bajra	-
Paddy (Rice)	Delayed transplanting	Use short-duration varieties, direct seeded rice (DSR), community nursery	JR-201, IR-36, Ananda, Danteshwari
	Water scarcity	Alternate wetting and drying, life-saving irrigation	-
Maize	Delayed sowing	Adopt short-duration hybrids and drought-tolerant varieties	JM-216, JM-218, HQPM-1
	Mid-season drought	Earthing up, mulching, foliar spray of 2% KCl	-
Pigeon pea (Tur)	Delayed monsoon	Use short-duration cultivars and intercropping systems	TJT-501, Asha (ICPL-88039), Pusa-992
	Moisture stress	Mulching and protective irrigation	-
Blackgram (Urdbean)	Delayed sowing	Shift to short-duration varieties	T-9, PU-31, JU-2
	Dry spells	Foliar nutrition and moisture conservation	-
Greengram (Moongbean)	Late Kharif sowing	Use early maturing varieties	PDM-139, SML-668, HUM-16
	Drought conditions	Foliar spray of 2% urea	-
Sesame (Til)	Failure of soybean sowing	Use as contingency crop in low-rainfall situations	TKG-22, TKG-306, JTS-8
Pearl Millet (Bajra)	Delayed monsoon or crop failure	Suitable drought-resilient substitute crop	HHB-67 Improved, ICTP-8203, ICMV-221

Sorghum (Jowar)	Rainfall deficit	Adopt drought-tolerant varieties; use as fodder and grain crop	CSV-15, CSV-17, CSV-23
Groundnut	Delayed onset of monsoon	Use short-durati	

Agriculture remains the backbone of Madhya Pradesh's economy and rural development. However, the sector is highly dependent on monsoon rainfall and is therefore vulnerable to climatic disturbances such as El Nino. Reduced rainfall, delayed monsoon onset, prolonged dry spells, and increased temperatures during El Nino years can significantly affect Kharif crop production, farm incomes, and food security. Strengthening district-level contingency plans, promoting climate-resilient technologies, and improving water resource management are essential strategies for safeguarding agricultural productivity and ensuring sustainable development in Madhya Pradesh.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	AGAR MALWA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	899.3	More than 19%	Less than 728.433
June	110.8		
July	307		
August	295.3		
September	186.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	180152	Gross irrigated area:	182052
Net Rainfed area	6749	Gross rainfed area	198066

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	3129	3183
Wells	65386	65464
Tanks	6768	7358
Other sources	104869	106047

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	0	0	
2	Jowar	91	30	61
3	Maize	818		818
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	115	115	0
2	Groundnut	100		100

3	Sesamum	12		12
4	SOyabean	184044		184044
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		0
4	Other Fodder crops	1072	1072	0

Crop Plan- Beginning of the season

Rainfed situation:

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
1	2	3	4	5	6
Delay by 4 weeks 3 rd week of July	Deep soil	Soybean-Chickpea	Early maturity crop/ varieties of blackgram, greengram and arhar	Increase seed rate upto 20% Supplemental irrigation if possible Proper manuring	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations, RKVY, NFSM, ISOPAM for supply of seed and with RKVY for seed drills
	Shallow soils	Soybean – gram			

Contingency measures- Mid season

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
1	2	3	4	5
6Mid season drought (long	Deep soil	Soybean –chickpea	Gap filling with improved varieties when the plant	

dry spell, consecutive 2 weeks rainless (>2.5 mm) period At vegetative stage	Shallow soils	Soybean – gram	population is less ,around 70% than optimum Timely management of weeds	Use of dora / Kolpa for moisture conservation Use of organic mulch / plastic mulching to conserve moisture Life saving irrigation
Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
1	2	3	4	5
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At flowering/ fruiting stage	Deep soil	Soybean –Chickpea	Timely management of weeds Spray 2% of urea or MOP during the dry spell Timely management of weeds	Use of dora / Kolpa for moisture conservation Use of organic mulch / plastic mulching to conserve moisture Life saving irrigation
	Shallow soils	Soybean – Gram		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop / Cropping system	Crop management	Rabi Crop Planning
1	2	3	4	5
	Deep soil	Soybean –chickpea	Spray 2% urea solution or MOP during the dry spell life saving irrigation	If the damage is very severe, Plan for land preparation of <i>rabi</i> crops like mustard, taramira, safflower and linseed etc
	Shallow soils	Soybean – gram		

RealTimeContingencyPlan

Weatheraberration	Crop	Stage of crop	Realtimecontingencymeasureimplemented
Delayed onset of monsoon	Soybean	-	Short duration varieties (80-90 days) like JS 95-60 and JS 93-05 were planted
	Maize	-	Short duration varieties (70-80 days) likePatidar-999wereplanted
	Pigeonpea	-	Medium duration varieties (160-180 days) like JA-4, JKM-189 and JS 93-05 Rising of seedling
			Thinning and intercultivation Transplanting and opening of conservation furrow Weeding Desilting of farm pond and channels Utilizing farm pond water efficiently Shift from water intensive crops to millets, pulses and oil seeds Instead of single mono crop go for intercropping systems

Midseason drought	Soybean	Vegetative, flowering	1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets Inter-cultural operation-Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding. 2- Spraying of VAM-C@375ml/ha Thio urea @ 250 g/ha
	Maize	Vegetative, flowering	Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation
	Pigeonpea	Vegetative	Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation
			Supplemental Irrigation at crop critical stages
Terminal drought			Foliar spray Supplemental Irrigation and mulching Harvesting of crops for vegetables and fodder

Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/ cropping system	Change in crop/cropping system	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Delayed/ limited release of water in canals due to low rainfall	Deep black soil	Soybean-wheat/gram	Late sown var. wheat GW 173, GW-190 and chickpea JG-130	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation	Management of seed under RKVY, NFSM, ISOPAM etc. Training of farmers through KVK
		Soybean-potato-onion	Soybean-wheat /onion / chickpea		
	Shallow soil	Soybean-wheat/gram	Late sown var. wheat GW 173, GW-190 and chickpea JG-130		
		Soybean-potato-onion	Soybean-wheat /onion / chickpea		
Non release of water in canals under delayed onset of monsoon in catchment	Deep soil	Soybean-wheat/ gram	Chickpea / mustard/ safflower / linseed /taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation	Management of seed under RKVY, NFSM, ISOPAM etc Training of farmers through KVK
		Soybean-potato-onion			
	Shallow soil	Soybean-wheat/ gram			
		Soybean-potato-onion			

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep soil	Soybean-wheat/gram	Chickpea / mustard/ safflower / linseed / taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation	Management of seed under RKVY, NFSM, ISOPAM etc Training of farmers through KVK
		Soybean-potato-onion			
	Shallow soils	Soybean-wheat/gram			
		Soybean-potato-onion			
Insufficient groundwater recharge due to low rainfall	Deep soil	Soybean-wheat/gram	Chickpea / mustard/ safflower / linseed /taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Mulching in crop rows Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation	Management of seed under RKVY, NFSM, ISOPAM etc Training of farmers through KVK
		Soybean-potato-onion			
	Shallow soils	Soybean-wheat/gram			
		Soybean-potato-onion			

Resource management technologies

- **Preparedness:**
 - Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
 - Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
 - Energy management: Compartmental bunding
 - Nutrient management: Intercropping with RDF

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	ALIRAJPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	871.8	More than 19%	Less than 706.158
June	124.3		
July	276		
August	274.7		
September	196.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	66114	Gross irrigated area:	75366
Net Rainfed area	102232	Gross rainfed area	170212

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	3518	3518
Wells	32894	38094
Tanks	9054	9154
Other sources	20648	24600

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	4903	0	
2	Jowar	3088	-	
3	Maize	47560	16499	31061
4	Bajra	8001	2003	5998
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	3090		3090
2	Groundnut	16119	2078	14041
3	Sesamum	71	39	32
4	SOyabean	57294		57294
5	Sunflower	-		
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	23399		23399
2	Jute	-		
3	Mesta	-		
4	Sunhemp	4		4

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		16
4	Other Fodder crops	212	196	16

Crop Plan- Beginning of the season

Rainfed situation:

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
1	2	3	4	5	6
Delay by 4 weeks 3rd week of July	Shallow Soils	Maize	No change (JVM 421, JM 12)	Ridge and furrow sowing Intercultural operation (Daura)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	No change (T 9, JU 86)	Intercultural operation (Daura)	
		Soybean	Black gram- T 9, JU 86	-do-	
	Moderate deep soil	Maize	JVM 421, JM 12	Ridge and furrow sowing Intercultural operation (Daura)	
		Cotton	Black gram- T 9, JU 86	Intercultural operation (Daura)	
		Soybean	Black gram - T 9, JU 86	-do-	

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At vegetative stage	Shallow Soils	Maize	Maize + Urd intercropping	1% N Spraying, use dora and life saving irrigation in furrow irrigation ridge bed system (FIRBs) if available	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Black gram	1% N Spraying, use dora and life saving irrigation in FIRBs, if available	
		Soybean	Soybean	1% N Spraying, use dora and life saving irrigation	
	Moderate deep soil	Maize	Maize + Urd intercropping	1% N Spraying, use dora/ desiplaugh for intercultural operation and life saving irrigation.	
		Cotton	Cotton + Soybean intercropping	1% N Spraying, use dora and life saving irrigation, mulching of Polythine sheet , use micro irrigation system	
		Soybean	Soybean + maize	1% N Spraying, use dora and life saving irrigation	
Mid season drought (long dry spell)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
1	2	3	4	5	6
At reproductive stage	Shallow Soils	Maize	Maize	1% N Spraying, and life saving irrigation, intercultural operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Black gram	-do-	
		Soybean	Soybean	-do-	
	Moderate deep soil	Maize	Maize	-do-	
		Cotton	Cotton + Soybean / Maize	1% N Spraying and life saving irrigation, mulching , micro irrigation system intercultural operations	
		Soybean	Soybean	1% N Spraying and life saving irrigation intercultural operations	

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
1	2	3	4	5	6
	Shallow Soils	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and
		Black gram	Black gram	Mature pods are picking and vegetative parts use as fodder.	
		Soybean	Soybean	Harvest at physiological maturity	

	Moderate deep soil	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.	with RKVY for seed drills
		Cotton	Cotton + Soybean / maize	Intercultural operation, mulching, life saving irrigation through micro irrigation system	
		Soybean		Harvest at physiological maturity	

RealTimeContingencyPlan

Weatheraberration	Crop	Stage of crop	Realtimecontingencymeasureimplemented
Delayed onset of monsoon	Soybean	-	Short duration varieties (80-90 days) like JS 95-60 and JS 93-05 were planted
	Maize	-	Short duration varieties (70-80 days) like Patidar-999 were planted
	Pigeonpea	-	Medium duration varieties (160-180 days) like JA-4, JKM-189 and JS 93-05 Rising of seedling
			Thinning and intercultivation Transplanting and opening of conservation furrow Weeding Desilting of farm pond and channels Utilizing farm pond water efficiently Shift from water intensive crops to millets, pulses and oil seeds Instead of single mono crop go for intercropping systems
Midseason drought	Soybean	Vegetative, flowering	1- <i>In-situ</i> moisture conservation measures viz, Mulching with polythene sheets Inter-cultural operation-Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding. 2- Spraying of VAM-C@375ml/ha Thio urea @ 250 g/ha
	Maize	Vegetative, flowering	Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation
	Pigeonpea	Vegetative	Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation
			Supplemental Irrigation at crop critical stages
Terminal drought			Foliar spray Supplemental Irrigation and mulching Harvesting of crops for vegetables and fodder

Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/ cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Delayed/ limited release of water in canals due to low rainfall	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers’ societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	Adopt improved production technologies	
		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties	
		Vegetables	Tomato, Brinjal	- Used of improved varieties - Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean- Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/ Cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	Adopt improved production technologies	
		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties	
		Vegetables	Tomato, Brinjal	Used of improved varieties	

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/ Cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
				Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
Soybean - Chickpea					
Soybean- Wheat					

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/ cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	• Adopt improved production technologies	
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties	
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean- Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Insufficient groundwater recharge due to low rainfall	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	Adopt improved production technologies	

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Crop/cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties	
		Vegetables	Tomato, Brinjal	- Used of improved varieties - Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean- Wheat			

Resource management technologies

- Preparedness:**

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	ANUPPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	997.5	More than 19%	Less than 807.975
June	156.8		
July	320.7		
August	295.3		
September	224.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	13114	Gross irrigated area:	13138
Net Rainfed area	145612	Gross rainfed area	215578

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1316	1316
Wells	7745	7760
Tanks	103	103
Other sources	3950	3959

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	137924	38	137886
2	Jowar	205	-	
3	Maize	5476		5476
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	2419		2419
2	Groundnut	66		66
3	Sesamum	146		146
4	SOyabean	3622		3622
5	Sunflower	-		
6	Castor	2		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	35		35

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	18		18
2	Tobacco	-		
3	Guar seed	-		60
4	Other Fodder crops	60		60

Crop Plan- Beginning of the season

Rainfed situation

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
Delay by 4 weeks 3 rd week July	Deep soils	Soybean	Soybean (JS – 93-05, JS 95-60)	- Ridge & Furrow sowing - Seed treatment with Thirum + Corbidizim mixture @3gm/kg of seed - Frequent intercultivation to control weeds and to conserve moisture
		Maize	Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	
	Shallow red soils	Soybean	Early Soybean(JS 93-05 – NRC-7) Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	
		Blackgram	Blackgram(JU- 2, JU-3, JU-86)	
		Greengram	Greengram (TM- 37, K-851)	

Irrigated Situation

Condition			Suggested Contingency measures	
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures

1	2	3	4	5
	Deep soils	Wheat Gram Lentil Mustard	Wheat (MP-4010, GW-173) Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	

Contingency measures- Mid season

Rainfed situation

Condition				Suggested Contingency measures
Major Farming situation	Major farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At flowering/ fruiting stage)	Deep soils	Soybean	20% defoliation in soybean - Insecticidal spray for control of green semi looper in soybean - Spray of anti transparent like VAM-C , Boost etc	- Dust mulching through frequent interculture - Green leaf mulch in between crop rows - Supplemental irrigation through farm pond water/other sources
		Maize		
	Shallow red soils	Soybean		
		Blackgram		
		Greengram		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil management	Remarks on Implementation
At flowering/ fruiting stage	Low land bunded, deep and medium deep black soils	Rice-Wheat/ Linseed/Lentil	Life saving irrigation (Preferably with sprinkler method) Intercultural operations	Green leaf mulching or dust Mulching; supplemental irrigation if available Mulching;	
		Rice-Chickpea / lentil			
		Soybean			
	Upland unbunded shallow black soils	Rice			
		Maize-Mustard			
		Kodo millets			
		Niger			
		Soybean			
		Blackgram			

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil management	Remarks on Implementation
		Rice-Wheat/			Seed source: SAU

	Low land bunded, deep and medium deep black soils	Linseed/Lentil	Harvest the crop at physiological maturity. Apply light irrigation; Soil moisture conservation by repeat tillage operations	Sowing of mustard, batri, linseed and gram in october month	
		Rice-Chickpea / lentil			
		Soybean			
	Upland unbunded shallow black soils	Rice			
		Maize-Mustard			
		Kodo millets			
		Niger			
		Soybean			
		Blackgram			

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Deep to medium deep soils	Rice-Wheat	Medium duration variety of Rice (JRH-4,5,8, MTU 1010, IR-64, PS-3,5,, MTU-1081	Micro irrigation (Drip, sprinkler, Sub surface irrigation), Mulching,	Seed arrangement under RKVY, NFSM, ISOPAM .
		Rice- Chickpea	Medium duration variety of Rice (JRH-4,5,8, MTU 1010, IR-64, PS-3,5,, MTU-1081	Micro irrigation (Drip, sprinkler, Sub surface irrigation), Mulching,	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measure	Remarks on Implementatio
Limited release of water in canals due to low rainfall	Deep to medium deep soils	Rice-Wheat	Soybean- Pigeon pea Sesame in Directed Seeded Rice	Micro irrigation (Drip, sprinkler, Sub surface irrigation), Mulching,	-
		Rice- Chickpea	Pigeonpea- Minor millets Sesame in Directed Seeded Rice		
		Maize-Wheat	Pigeonpea – Kodo millet		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchments	Deep to medium deep soils	Rice-Wheat	Maize, Blackgram, Sesame; short duration rice	Micro irrigation	-
		Rice- Chickpea	Pigeonpea- kodo millet	Micro irrigation	
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep to medium deep soils	Rice-Wheat	Maize-Pigeonpea	Farm bunding, deep ploughing; mulching	
		Rice- Chickpea	Pigeonpea- kodo millet	Farm bunding	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Deep to medium deep soils	Rice-Wheat	Maize-Pigeonpea Sesame, Blackgram	Farm bunding; Ridge & furrow irrigation, Broad bed furrow irrigation, Micro irrigation	
		Rice- Chickpea	Pigeonpea- kodo millet Sesame, Blackgram		

Resource management technologies

1. Watershed Management Technologies

- Check dams and stop dams
- Farm ponds
- Percolation tanks
- Recharge shafts
- Gully plugs
- Contour bunding and field bunding
- Stone bunds and loose boulder structures

These structures reduce runoff, increase groundwater recharge, and improve water availability for agriculture.

2. Soil and Moisture Conservation

- Contour farming
- Conservation tillage
- Mulching
- Vegetative barriers
- Terracing on sloping lands
- Soil fertility management through compost and vermicompost

Such measures reduce erosion and improve moisture retention.

3. Water Resource Development

To address water scarcity and irrigation constraints:

- Rainwater harvesting systems
- Village ponds
- Groundwater recharge structures
- Micro-irrigation (drip and sprinkler systems)
- Water user group–managed irrigation systems

These technologies increase irrigation reliability and drought resilience.

4. Biomass and Vegetation Development

To restore degraded lands:

- Agroforestry
- Horticulture plantations
- Pasture development
- Bund plantations
- Community forestry and afforestation

These practices improve biodiversity, fodder availability, and carbon sequestration.

5. Sustainable Agriculture Technologies

- Integrated Nutrient Management (INM)
- Integrated Pest Management (IPM)
- Crop diversification
- Drought-tolerant crop varieties
- Farmer Field Schools
- Integrated Farming Systems

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	ASHOKNAGAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	856.2	More than 19%	Less than 693.522
June	106.3		
July	299.9		
August	267.9		
September	182.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	306483	Gross irrigated area:	336464
Net Rainfed area	585	Gross rainfed area	276502

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	15280	15359
Wells	213773	241822
Tanks	20459	20967
Other sources	56971	58316

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	29777	29777	0
2	Jowar	59	-	
3	Maize	12497	1	12496
4	Bajra	1		1
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	-		
2	Groundnut	6105		6105
3	Sesamum	77		77
4	SOyabean	230509		230509
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	1		1

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	101	101	0
2	Tobacco	-		
3	Guar seed	-		34
4	Other Fodder crops	85	51	34

Crop Plan- Beginning of the season

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
Delay by 4 weeks 3 rd week July	Deep soils	Soybean	Soybean (JS – 93-05, JS 95-60)	- Ridge & Furrow sowing - Seed treatment with Thirum + Corbidizim mixture @3gm/kg of seed - Frequent intercultivation to control weeds and to conserve moisture
		Maize	Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	
	Shallow red soils	Soybean	Early Soybean(JS 93-05 – NRC-7) Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	
		Blackgram	Blackgram(JU- 2, JU-3, JU-86)	
		Greengram	Greengram (TM- 37, K-851)	

Contingency measures- Mid season

Condition			Suggested contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Deep soils	Soybean	- Intercultural operation for control of weeds and soil mulch - Life saving irrigation (if available) - Spraying of Anti-transperant	- Hand weeding - Breaking of upper earth crust. - Mulching in crop rows
		Maize		
	Shallow red soils	Soybean		
		Blackgram		
		Greengram		

Contingency measures- End of the season

Condition				
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop / Cropping system	Crop management	Rabi Crop Planning
	Deep soils	Soybean	- Life saving irrigation with farm pond water/other sources if feasible - Harvest at physiological maturity	- Utilize the available moisture for rabi sowing - Seeds of wheat, gram be soaked in water for 12-15 hours before sowing
		Maize		
	Shallow red soils	Soybean		
		Blackgram		
		Greengram		

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
	Deep soils	Wheat Gram Lentil Mustard	Wheat (MP-4010, GW-173) Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method	Awareness needed; Trainings in ATMA,FTC
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)		

Condition			Suggested Contingency measures		
Limited release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6

	Deep soils	Wheat Gram Lentil Mustard	Wheat (MP-4010, GW-173) Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method	Awareness needed ; Trainings in ATMA,FTC
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)		

Condition			Suggested Contingency measures		
Non release of water in canals under delayed onset of monsoon in catchment	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
	Deep soils	Wheat Gram Lentil Mustard	Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method - Give irrigation using own source of available water plus tank water (conjunctive use)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)		

Condition			Suggested Contingency measures		
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
	Deep soils	Wheat Gram Lentil Mustard	Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method - Give irrigation using own source of available water plus tank water (conjunctive use)	Awareness needed ; Trainings in ATMA,FTC
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)		

Condition			Suggested Contingency measures		
Insufficient groundwater recharge due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
	Deep soils	Wheat Gram Lentil Mustard	Gram (JG-16, JG-130) Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method Give irrigation using own source of available water plus tank water (conjunctive use)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
	Shallow red soils	Lentil Mustard	Lentil (JL-1 & 3) Mustard (JM-1 & 4, Pusa Bold)		

Resource management technologies

1. Watershed Management Technologies

These are among the most important NRM approaches for Ashoknagar.

Technologies used:

- Ridge-to-valley watershed treatment
- Contour bunding
- Field bunding
- Gully plugging
- Nala bunds
- Check dams
- Percolation tanks
- Farm ponds

These structures reduce runoff, prevent soil erosion, increase soil moisture, and improve groundwater recharge. Watershed-based planning has been widely promoted in Madhya Pradesh for drought-proofing and sustainable resource management.

2. Groundwater Recharge Technologies

Groundwater is a critical resource in Ashoknagar.

Suitable technologies include:

- Recharge shafts
- Recharge wells
- Percolation tanks
- Recharge trenches
- Injection wells
- Revival of traditional wells and baolis
- Check dams on seasonal streams

The Ashoknagar Aquifer Management Plan specifically recommends recharge shafts, percolation tanks, nala bunds, check dams, and gully plugs to augment groundwater resources.

3. GIS and Remote Sensing-Based Resource Management

Modern NRM increasingly uses geospatial technology.

Ashoknagar GIS Platform

The district has a GIS-based system that integrates:

- Land-use mapping
- Water infrastructure mapping
- Resource planning
- Development monitoring
- Spatial decision support

GIS helps identify suitable sites for water harvesting, recharge structures, irrigation projects, and land restoration.

4. Aquifer Mapping and Groundwater Management

A key technology now used across India is aquifer mapping.

5. Soil and Moisture Conservation Technologies

These improve agricultural productivity while conserving resources.

Technologies include:

- Contour farming
- Conservation tillage
- Mulching
- Vegetative barriers
- Terracing on slopes
- In-situ moisture conservation
- Cover crops

Such measures reduce soil loss and improve water retention in agricultural fields.

6. Agroforestry and Farm Forestry

These technologies combine trees with agriculture.

- Boundary plantations
- Silvi-pasture systems
- Agroforestry models
- Farm forestry on marginal lands

Benefits include:

- Carbon sequestration
- Reduced soil erosion
- Improved soil fertility
- Additional income from timber, fruits, and fodder

These approaches are recommended in watershed regions of Madhya Pradesh with moderate to poor groundwater potential.

7. Dryland Agriculture Technologies

Since much of Ashoknagar is rain-fed, these technologies are important:

- Drought-tolerant crop varieties
- Micro-irrigation (drip and sprinkler systems)
- Rainwater harvesting
- Crop diversification
- Climate-smart agriculture
- Precision nutrient management

These reduce water demand while maintaining productivity.

8. Rainwater Harvesting Technologies

Common options include:

- Rooftop rainwater harvesting
- Farm ponds
- Village tanks
- Percolation ponds
- Recharge pits

These increase local water availability and reduce dependence on groundwater extraction.

9. Community-Based NRM Technologies

Effective NRM in Ashoknagar also depends on institutional mechanisms:

- Water User Associations (WUAs)
- Village Watershed Committees
- Participatory groundwater management
- Community monitoring systems

Community participation improves maintenance and long-term sustainability of NRM investments.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	BARWANI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	669.4	More than 19%	Less than 542.214
June	108		
July	201.1		
August	195.5		
September	164.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	213323	Gross irrigated area:	264874
Net Rainfed area	15929	Gross rainfed area	148175

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	31960	36754
Wells	130345	143391
Tanks	2208	3005
Other sources	48810	81724

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	77	0	
2	Jowar	14863	14	14849
3	Maize	84730	20684	64046
4	Bajra	5628	189	5439
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	1475	129	1346
2	Groundnut	6057	1764	4293
3	Sesamum	18		18
4	SOyabean	31793	422	31371
5	Sunflower	2	2	0
6	Castor	264		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	95894	85601	10293
2	Jute	-		
3	Mesta	-		
4	Sunhemp	2		2

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	4291	4291	0
2	Tobacco	-		
3	Guar seed	-		32
4	Other Fodder crops	103	71	32

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures
1	2	3	4	5
Delay by 4 weeks 31MW July30-Aug5	Deep Soils	Cotton	Black gram JU-86, JU-3, T-9 ,or Green gram : JM-721 K-851	Increasing seed rate
		Maize	Maize early varieties JVM 421	
	Medium deep soils	Maize	Black gram JU-86, JU-3, T-9 ,or Green gram : JM-721 K-851	
		Green gram / Blackgram	-do-	
		Soybean	Soybean JS-95 60, IS 93 05	
		Pigeon pea	JK-189, ICPL-87	
		Cotton	Bt cotton (short duration varieties)	

	Shallow Soils	Sugar cane	Improved varieties
		Ground nut	JGN-3, Junagad-11
		Soybean	Soybean JS-95 60, IS 93 05
		Maize	Maize early varieties JVM 421
		Sorghum	JJ-938, JJ-1022

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
1	2	3	4	5
At reproductive stage	Deep Soils	Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	1% N Spraying and life saving irrigation in FIRBs, if available, mulching of Polythin sheet , drip irrigation system facilities developed
		Cotton	Foliar application of 2% DAP solution	
		Soybean	- 20% defoliation in soybean and use as mulching -Spray of 2% solution of MOP/DAP/ water during the dry spell -Spraying of PMA @3 ppm solution during the dry spell	
	Medium deep soils	Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
		Sugarcane	-do-	
		Ground nut	-do-	
		Green gram / Black gram	-do-	
		Pigeon pea	Life saving irrigation / water spray	
		Soybean	- 20% defoliation in soybean and use as mulching -Spray of 2% solution of MOP/DAP/ water during the dry spell -Spraying of PMA @3 ppm solution during the dry spell	
		Cotton	Foliar application of 2% DAP solution	
	Shallow Soils	Soybean	- 20% defoliation in soybean and use as mulching -Spray of 2% solution of MOP/DAP/ water during the dry spell -Spraying of PMA @3 ppm solution during the dry spell	
		Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
		Sorghum	-do-	

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming	Crop/cropping system	Crop management	Rabi Crop planning

	situation			
1	2	3	4	5
	Deep Soils	Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	1% N Spraying, and life saving irrigation if available, shell green cobs (dough stage) and green fodder for cattle's.
		Cotton	Foliar application of 2% DAP solution	
		Soybean	- 20% defoliation in soybean and use as mulching - Spray of 2% solution of MOP/DAP/ water during the dry spell - Spraying of PMA @3 ppm solution during the dry spell	
	Medium deep soils	Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
		Sugarcane	-do-	
		Ground nut	-do-	
		Green gram / Black gram	-do-	
		Pigeon pea	Life saving irrigation / water spray	
		Soybean	- 20% defoliation in soybean and use as mulching - Spray of 2% solution of MOP/DAP/ water during the dry spell - Spraying of PMA @3 ppm solution during the dry spell	
		Cotton	Foliar application of 2% DAP solution	
	Shallow Soils	Soybean	- 20% defoliation in soybean and use as mulching - Spray of 2% solution of MOP/DAP/ water during the dry spell - Spraying of PMA @3 ppm solution during the dry spell	
		Maize	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
		Sorghum	-do-	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Delayed release of water in canals	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-

due to low rainfall		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implemen tation
1	2	3	4	5	6
Lack of inflows into tank due to insufficient/delayed onset of monsoon	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-

		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
Condition	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Insufficient ground water recharge due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Resource management technologies

Promising resilient technologies for very high risk prone for Bidwani

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Black gram JU-86, JU-3, T-9 ,or Green gram : JM-721 K-851. Maize early varieties JVM 421. Black gram JU-86, JU-3, T-9 ,or Green gram : JM-721 K-851.
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon

- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadakhnath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Bidwani

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
 - Construction of new or renovation of percolation tanks to recharge groundwater level
 - Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
 - Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
 - Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.
- Change in cropping systems or variety Soybean JS-95 60, IS 93 05 JK-189, ICPL-87. Bt cotton (short duration varieties). Improved varieties JGN-3, Junagad-11. Soybean JS-95 60, IS 93 05. Maize early varieties JVM 421.
- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
 - Micro irrigation system for efficient use of harvested water for higher water productivity
 - Vermicompost to enhance the soil fertility and moisture holding capacity
 - Soil health cards for rational application of fertilizers
 - System of rice intensification to overcome dry spells and for enhancing productivity
 - Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
 - Zero till sowing of wheat to conserve soil moisture
 - Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
 - Mineral mixture as feed supplement for enhancing milk productivity from milch animals
 - Improved breeds of backyard poultry for get additional income
 - Improved shelter for livestock.

Promising resilient technologies for low risk prone for Bidwani

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	BETUL
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1038.1	More than 19%	Less than 840.861
June	154.5		
July	336.2		
August	319.6		
September	227.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	211121	Gross irrigated area:	390302
Net Rainfed area	252739	Gross rainfed area	445633

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	242	17080
Wells	47372	155668
Tanks	2648	14261
Other sources	160859	203293

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	35342	19444	15898
2	Jowar	1196	-	
3	Maize	183184	1303	181881
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	8229	135	8094
2	Groundnut	2210	6	2204
3	Sesamum	63	1	62
4	SOyabean	208197	1275	206922
5	Sunflower	-		
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	1431	11	1420
2	Jute	-		
3	Mesta	-		
4	Sunhemp	5		5

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	26051	21869	4182
2	Tobacco	-		
3	Guar seed	-		112
4	Other Fodder crops	136	24	112

Crop Plan- Beginning of the season

Rain fed situation

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed in late sown monsoon 2. Don't sow the soybean, maize sorghum and cotton and sowing of alternate crop like Greengram, Blackgram Sesame 3. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 4. Use of balanced fertilizer and biofertilizer 5. Application of zinc in deficient areas.
Delay by 4 weeks (2 nd week of July)	Shallow (red sandy loam) soils	Soybean-Chickpea	Dont sow Soybean	
		Sorghum	Greengram -Pusa vishal,K851,JM721,Jawahar 99 - 37,Hum-1, Hum-2,Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684,TAU-1, Berkha, PU-30, 35, 19 Sesame - TKG -306, TKG-35, JGS-8, JT-21, JT-22,JT-55, PKTS-11, PKTS12, JT-1 Pigeonpea - Pragti, Jagrati,Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi), JKM-189	
		Rice		
		Pigeonpea		
		Maize-Wheat		
		Niger	No Change	

Deep to medium deep soils	Soybean-Chickpea	Dont sow Soybean	6. Sowing of crops against the slope. 7. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 8. Adoption of plant protection as per requirement as rainfall condition 9. Timely weeding is done and use weed plant as mulch between rows of crops for moisture conservation 10. Application of biofertilizer and potash fertilizer under late sown condition 11. Intercropping in rainfed based area 12. Sowing of sesame and blackgram as intercrop
	Sorghum	Greengram/ Greengram	
	Rice	Rice -Upland field: IR-36, JR-201, JR-503, vandna, porrnima, Ananda, Narendr 97, Govinda and hybrid rice JRH -4, 5 and 8	
	Pigeonpea	Pragati ,Jagrati,Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189	
	Maize-Wheat	Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623,LBG684,TAU-1, Berkha, PU-30,35,19 Greengram - Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1,L.G.450, T.M. 98-50, JM-98-90, PDM 11, 54 and 139 Cotton - JKH-4, JRA5166, JKH2, 8, 10, NNH-44, Maljari, Tapti, Khandwa-2, JMC-1, KWA23 , JK 35, BT cotton JK Hy-1,4	

Irrigated situation

Condition	Suggested Contingency measures			Agronomic measures
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	
Limited release of water in canals due to low rainfall	Scarce rainfall, shallow red sandy loam soils	Soybean-Chickpea \Maize-Wheat	Chickpea, Lentil, Linseed will be preferred instead of wheat	1. Moisture conservation will be followed. 2. Sprinkler irrigation will be preferred. 3. RDF will be as per the availability of irrigation water.

Contingency measures- Mid season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Early season drought (Normal onset)				
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Scarce rainfall, shallow red sandy loam soils	Soybean-Chickpea	Re-sowing with early matured varieties Gap filling. Intercultural operation.	1. Storage of water in lower side of the field and make use for life saving irrigation 2. Practice of Dora/Kulpha/Hand hoe in between rows and use of removed weeds use as mulch for moisture conservation. 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity. 4. Ridges are made after 15-20 lines of crops for the moisture conservation 5. Use of plant protection measures
		Sorghum		
		Rice		
		Pigeonpea		
		Maize-Wheat		
	Deep to medium deep soils	Niger		
		Soybean-Chickpea		
		Sorghum		
		Rice		
		Pigeonpea		
		Maize-Wheat		
At vegetative stage	Scarce rainfall, shallow red sandy loam soils	Soybean-Chickpea /	Intercultural operations; Proper plant population	1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops
		Sorghum		
		Rice		
		Pigeonpea		

	Deep to medium deep soils	Maize-Wheat		2. Practice of Dora/ Kulpha/ Hand hoe ing between rows and use of removed weeds use as mulch for moisture conservation 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Use of plant protection measures 5. Mulching 6. Life saving irrigation through sprinklers
		Niger		
		Soybean-Chickpea		
		Sorghum		
		Rice		
		Pigeonpea		
At flowering/ fruiting stage	Scarce rainfall, shallow red sandy loam soils	Maize-Wheat	Life saving irrigation through sprinklers. Proper plant protection measures.	7. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 8. Practice of Dora/ Kulpha/ Hand hoeing between rows and use of removed weeds use as mulch for moisture conservation. 9. Ridges are made after 15-20 lines of crops for the moisture conservation 10. Use of plant protection measures
		Soybean-Chickpea /		
		Maize-Wheat		
		Sorghum		
		Rice		
		Pigeonpea		
	Deep to medium deep soils	Maize-Wheat		
		Niger		
		Soybean-Chickpea		
		Sorghum		
		Rice		
		Pigeonpea		

Irrigated situation

Condition	Suggested Contingency measures			
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	Scarce rainfall, shallow red sandy loam soils	Soybean-Chickpea , Maize-Wheat	Sowing of oilseed (linseed, mustard, and safflower) and pulse (Chickpea, lentil) crops.	1. Integrated approaches for moisture conservation will be followed. 2. Sprinkler irrigation will be preferred. 3. RDF will be as per the availability of irrigation water 4. Select early maturing crop variety.

Contingency measures- End of the season

Info for different cropping/farming systems (terminal drought) as available in the plan be copied here.

Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
Early withdrawal of monsoon)	Scarce rainfall, shallow red sandy loam soils	Soybean-Chickpea	Protective irrigation. Optimum plant population. Harvest crop at physiological stage	1. Adopt Moisture and weed Management practice, destroy the weed under early withdrawal of monsoon for rabi season 2. Preference will be given on sowing of Lentil, Linseed, Chickpea, irrigated and un irrigated wheat 3. Selection of short duration of varieties 4. Diversification of crops 5. Line sowing of Lentil, Linseed, Chickpea in moisture zone 6. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim
		Sorghum		
		Rice		
		Pigeonpea		
		Maize-Wheat		
		Niger		
	Deep to medium deep soils	Soybean-Chickpea		
		Sorghum		
		Rice		
		Pigeonpea		
		Maize-Wheat		

				(1.5g) /kg seed then after treated with biofertilizers 7. Sowing of small seeded grains mix with FYM and vermicompost
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Resource management technologies

1. Watershed Management Technologies

- Check dams and stop dams
- Farm ponds
- Percolation tanks
- Recharge shafts
- Contour trenches and bunds
- Watershed prioritization using GIS and DEM analysis

2. Water Resource Management Technologies

Given variable rainfall and seasonal water scarcity in some blocks, the following technologies are highly relevant:

- Groundwater recharge structures
- Rainwater harvesting systems
- Spring and stream rejuvenation
- Micro-irrigation (drip and sprinkler)
- Water budgeting and water accounting
- Smart groundwater monitoring systems

3. Soil Conservation Technologies

- Contour farming
- Vegetative barriers
- Mulching
- Terracing on steeper slopes
- Conservation agriculture
- Soil moisture sensors
- Erosion modelling through GIS

4. Climate-Smart and Natural Farming

- Bio-input preparation units
- Composting and vermicomposting
- Integrated farming systems
- Crop diversification
- Drought-tolerant varieties
- Digital advisory services

Resource	Key Technology
Water	Check dams, recharge shafts, farm ponds, drip irrigation
Soil	Contour bunding, mulching, conservation agriculture
Forest	GIS monitoring, agroforestry, community forestry
Agriculture	Natural farming, climate-smart agriculture

Planning	GIS, Remote Sensing, DEM analysis, GPS mapping
Governance	Participatory GIS, digital monitoring platforms

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	BHOPAL
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	956.2	More than 19%	Less than 774.522
June	133.6		
July	321.8		
August	303.1		
September	197.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	147515	Gross irrigated area:	283186
Net Rainfed area	6147	Gross rainfed area	3390

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	14103	14757
Wells	97408	231446
Tanks	4999	5978
Other sources	31005	31005

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	14962	13015	1947
2	Jowar	6	6	0
3	Maize	157	157	0
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	15	15	0
2	Groundnut	72	72	0
3	Sesamum	21	21	0
4	SOyabean	115990	115990	0
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	9	8	1
2	Tobacco	-		
3	Guar seed	-		0
4	Other Fodder crops	57	57	0

Crop Plan- Beginning of the season

Rainfed situation

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
Delay by 4 weeks 2 nd week of July	Deep black soils	Soybean	Sweet corn/ Sunflower(Modern) / Pigeon pea	•Seed dressing with Thiram+carbendazim in equal ratio @3g/kg seed for sunflower
		Maize	Sunflower (Modern)	
			Brinjal , tomato, sponge guard, Kharif onion (Red agri found)/ Maize for cobs-potato	
	Shallow black soils	Soybean	Black gram (JU-86)	
		Maize	Sunflower (Modern)/ Sesame-(TKG 55,TKG 8)	

Contingency measures- Mid season

Condition	Suggested contingency measures			
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering /fruiting stage	Deep black soils	Soybean	Insecticidal spray for control of green semi looper in soybean	Supplemental irrigation through farm pond water/other sources
	Shallow black soils	Maize		

Contingency measures- End of the season

Condition	Suggested contingency measures			
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Deep black soils	Soybean	- Incase of severe drought reduce the plant population by uprooting the plants from alternate row and use as green fodder and sell the green cobs. - Supplemental irrigation if available - Harvest at physiological maturity	- Prepare land for chickpea/safflower - Seed priming of chickpea & safflower (as recommended) before sowing
	Shallow black soils	Maize		

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed/limited release of water in canals due to low rainfall	Deep black soils	Soybean- Chickpea/ Wheat	Chickpea JG 130, JG-16, Jaki-92-18 Wheat HW 2004, Harshita, JW-173	-Dry sowing followed by irrigation -Application of vermi compost @ 3-4 t/ha -Follow ridge/BBF method of sowing in <i>Kharif</i> crops -Seed dressing with Thiram+carbendazim in equal ratio @3g/kg seed -Water harvesting and use collected water as life saving irrigation -Cultivate the field on receiving pre monsoon showers -Provide supplement irrigation by sprinkler method	Management of seed under RKVY, NFSM, ISOPAM etc
	Shallow black soils	Chickpea Wheat Lok-1	Wheat HW 2004, Harshita, JW-173 Chickpea JG 130, JG-16, Jaki-92-18		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed	Deep black soils	Soybean- Chickpea/ Wheat	Fallow-Chickpea/ Linseed/ Lentil	-Seed priming in water for 12-15 hrs -Provide supplement irrigation by sprinkler method -	Awareness needed; Trainings in ATMA,FTC
	Shallow black soils	Chickpea	In case of soybean one pre sowing irrigation and if necessary one irrigation		
		Wheat Lok-1			

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
onset of monsoon in catchment			at critical stage at pod development to be given		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep black soils	Chickpea	Fallow-Chickpea/ safflower Linseed/ Lentil Chickpea JG 130, JG-16, Jaki-92-18 Safflower (JSF-7, JSF-73, JSF-97) Lentil (JL-3 & JL-1)	- Mulching in kharif and rabi crops - Supplemental irrigation by sprinkler and using other sources of water available	Awareness needed; Trainings in ATMA, FTC
		Wheat			
	Shallow black soils	Chickpea			
		Wheat Lok-1			

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater (open wells and borewells) recharge due to low rainfall	Deep black soils	Chickpea	Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.	- Pre sowing irrigation if available - Mulching with crop residue - Supplemental irrigation by sprinkler	Awareness needed; Trainings in ATMA, FTC

Resource management technologies

Promising resilient technologies for very high risk prone for Bhopal

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Sweet corn/ Sunflower(Modern) / Pigeon pea, Sunflower (Modern), Brinjal , tomato, sponge guard, Kharif onion (Red agri found)/ Maize for cobs-potato, Black gram (JU-86), Sunflower (Modern)/ , Sesame-(TKG 55,TKG 8).
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard
- intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production

- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Bhopal

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
- Construction of new or renovation of percolation tanks to recharge groundwater level
- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
- Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall
- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
- Zero till sowing of wheat to conserve soil moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Bhopal

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	BURHANPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	737.3	More than 19%	Less than 597.213
June	141.4		
July	208.8		
August	216.2		
September	170.9		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	85939	Gross irrigated area:	132944
Net Rainfed area	10504	Gross rainfed area	41247

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1019	1019
Wells	82770	128644
Tanks	440	440
Other sources	1710	2841

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	261	0	
2	Jowar	927	-	
3	Maize	27337	13269	14068
4	Bajra	22	15	7
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	4685		4685

2	Groundnut	363	276	87
3	Sesamum	13	4	9
4	SOyabean	13307	2	13305
5	Sunflower	3	3	0
6	Castor	4		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	27451	27451	0
2	Jute	-		
3	Mesta	-		
4	Sunhemp	9	9	0

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	6396	3744	2652
2	Tobacco	-		
3	Guar seed	-		9
4	Other Fodder crops	12	3	9

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures
1	2	3	4	5
Delay by 4 weeks (3 rd week of July)	Shallow soils	Soybean	Maize	Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 421. Making field free of weeds full utilization of water and nutrients by the crops
		Pigeonpea	No change	Sowing of short duration disease resistant variety JKM 189, Making field free of weeds full utilization of water and nutrients by the crops
		Sorghum	No change	Sowing of dual purpose high yielding Sorghum variety JJ-1022,JJ 1041, Making field free of weeds full utilization of water and nutrients by the crops
	Moderate Deep Soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop
		Soybean	Soybean and Maize	Sowing of short duration Varieties(JS 9560). Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 421. Making field free of weeds full utilization of water and nutrients by the crops

Contingency measures- Mid season

Condition	Suggested Contingency measures
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Mid season drought (long dry spell)	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures
1	2	3	4	5
At reproductive stage	Shallow soils	Soybean	20% defoliation in soybean and use as mulching Foliar application of 2% DAP solution	Life saving irrigation, Making field free of weeds full utilization of water and nutrients by the crops
		Pigeonpea	-do-	
		Sorghum	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
	Moderate Deep Soils	Cotton	Foliar application of 2% DAP solution	
		Soybean	-do-	

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures
1	2	3	4	5
	Shallow soils	Soybean	Wherever water resources are available such as pond, wells etc. protective irrigation can be provided to the crop	Repeated interculture operations to keep the field weed free and use of organic mulches <i>Glyricidia</i> leaves, uprooted weeds keeping roots upwards.
		Pigeonpea		
		Sorghum		
	Moderate Deep Soils	Cotton		
		Soybean		

2.1.1 Drought- Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	-

Condition		Suggested Contingency measures
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	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	
		Cotton	No change	Irrigation at critical growth stage	

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Lack of inflows into tank due to	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization	-

insufficient/delayed onset of monsoon		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Irrigation at critical growth stage Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	-

Condition	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Insufficient ground water recharge due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	

Resource management technologies

Promising resilient technologies for very high risk prone for Burhanpur

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers

- Change in cropping systems or variety such Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 42, pigeon pea variety JKM 189, Sorghum variety JJ-1022, JJ 1041.

- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields

- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon

- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production

- Mineral mixture as a feed supplement for milk production from milch animals

- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification

- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Burhanpur

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity

- Construction of new or renovation of percolation tanks to recharge groundwater level

- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season

- Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield

- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.

Change in cropping systems or variety such Varieties(JS 9560). Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 421

- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture

- Micro irrigation system for efficient use of harvested water for higher water productivity

- Vermicompost to enhance the soil fertility and moisture holding capacity

- Soil health cards for rational application of fertilizers

- System of rice intensification to overcome dry spells and for enhancing productivity

- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested

water for enhancing profitability

- Zero till sowing of wheat to conserve soil moisture

- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green

fodder available for milch animals during the lean period

- Mineral mixture as feed supplement for enhancing milk productivity from milch animals

- Improved breeds of backyard poultry for get additional income

- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Burhanpur

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater

- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water

- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture

- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals

during off season

- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals

- Improved backyard poultry to get additional income

- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	CHHATARPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	941.4	More than 19%	Less than 762.534
June	115.6		
July	282.3		
August	323.7		
September	219.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	393260	Gross irrigated area:	397609
Net Rainfed area	72473	Gross rainfed area	458985

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	33209	33209
Wells	340238	343267
Tanks	3695	3695
Other sources	16118	17438

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	1481	126	1355
2	Jowar	4061	-	
3	Maize	124		124
4	Bajra	4		4
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	3652	1	3651
2	Groundnut	94607	806	93801
3	Sesamum	112392	567	111825
4	SOyabean	17400	39	17361
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	40	39	1
2	Tobacco	-		
3	Guar seed	-		792
4	Other Fodder crops	842	50	792

Crop Plan- Beginning of the season

Rainfed situation

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
Delayed 4 weeks 3 rd week of July	Deep black soils	Blackgram	Blackgram varieties : JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19	- Blade harrowing (Bakhar) for moisture conservation - Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers. - Intercultivation - Adopt of recommended package of practices for higher production. - Late maturing varieties recommended for heavy soil
		Greengram	Greengram : Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-	
		Sesame	Sesame : TKG-306, TKG-35, JGS-8, JT-21, JT-22, JT-55,PKTS-11,PKTS-12, JT-1	
		Soybean	Don't sow soybean (Can be sow upto 10 th july) Prefer Blackgram/ Greengram and sesame Sesame: TKG-21,TKG-22,JTS-8,TKG-306	

			Blackgram: LBG-20,Azad-1,Azad-3 Greengram: PDM-139,HUM-1	and Short duration varieties for double crop in light soil.
		Sorghum	Dont sow sorghum after 2nd week of July. Prefer any alternate crops like Niger, Sesame, kodo etc.,	
		Rice	Rice : Pusa-1121,JR-201	
		Pigeonpea	Pigeonpea- Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi), JKM-189	
		Ground nut	Groundnut-JGM-23,TG-37,JGN-3, JG-24	
	Medium deep black soils	Blackgram	Blackgram : JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19	
		Greengram	Greengram : Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-	
		Sesame	Sesame : TKG-306, TKG-35, JGS-8, JT-21, JT-22, JT-55,PKTS-11,PKTS-12, JT-1	
		Soybean	Don't sow soybean (Can be sow upto 10 th july) Prefer Blackgram/Greengram	
		Sorghum	Dont sow sorghum after 2nd week of July. Prefer any alternate crops like Niger, Sesame, kodo etc.,	
		Rice	Rice : Pusa-1121,JR-201	
		Pigeonpea	Pigeonpea- Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi), JKM-189	
		Ground nut	Ground nut : JM-24	
	Shallow sandy loam soils	Blackgram	Blackgram : JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19	
		Greengram	Greengram : Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-	
		Sesame	Sesame : TKG-306, TKG-35, JGS-8, JT-21, JT-22, JT-55,PKTS-11,PKTS-12, JT-1	
		Soybean	Don't sow soybean (Can be sow upto 10 th july) Prefer Blackgram/Greengram	
		Sorghum	Dont sow sorghum after 2nd week of July.	

			Prefer any alternate crops like Niger, Sesame, kodo etc.,	
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Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
At flowering/ fruiting stage	Deep black soils	Blackgram	Weeding and interculture;	Weeding with hand wheel hoe;
		Greengram	Adopt plant protection measures	Interculture for dust mulching Conservation furrows Give life saving/ supplemental irrigation if available Ridges are made after 15-20 lines of crops for the moisture conservation Intercultivation
		Sesame		
		Soybean		
		Sorghum		
		Ground nut		
		Rice		
		Pigeonpea		
	Medium deep black soils	Blackgram		
		Greengram		
		Sesame		
		Soybean		
		Sorghum		
		Ground nut		
		Rice		
		Pigeonpea		
	Shallow sandy loam soils	Blackgram		
		Greengram		
		Sesame		
		Soybean		
		Sorghum		

Contingency measures- End of the season

Condition			Suggested Contingency measures
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Terminal Drought	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Rabi crop planning
	Deep black soils	Blackgram	Give life saving/ supplemental irrigation if available	Plan to sow for rabi crops like wheat if pre sowing irrigation is available (JW-17,HW-2004) Lentil (JL-3,DPL-62,Pea-JM-6) Pea -JM-6 Line sowing of Lentil, Linseed, Chickpea in moisture zone Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers Sowing of small seeded grains mix with FYM and vermicompost
		Greengram		
		Sesame		
		Soybean		
		Sorghum		
		Pigeonpea		
		Ground nut		
		Rice		
	Medium deep black soils	Blackgram	Give life saving/ supplemental irrigation if available	Plan to sow for Rabi mustard (short duration varieties- Pusa Agarani), Linseed (JLS-9)
		Greengram		
		Sesame		
		Soybean		
		Sorghum		
		Pigeonpea		
		Ground nut		
		Rice		
	Shallow sandy loam soils	Blackgram	Give life saving/ supplemental irrigation if available	Plan for wheat, if pre sowing irrigation is available (JW-17,HW-2004) Mustard short duration varieties- Pusa Agarani
		Greengram		
		Sesame		
		Soybean		
		Sorghum		

Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in	Deep black soils	Wheat- Blackgram	Plan to sow for rabi crops like wheat if pre sowing irrigation is available (JW-17,HW-2004)		
		Wheat- sesame			
		Wheat- Soybean			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
canals due to low rainfall			Lentil (JL-3,DPL-62,Pea-JM-6) Pea -JM-6		
	Shallow sandy loam soils	Mustard- Soybean	Plan for wheat, if pre sowing irrigation is available (JW-17,HW-2004) Mustard short duration varieties- Pusa Agarani		
		Mustard- Groundnut			
		Mustard-Sesame			
	Medium deep black soils	Chickpea- Black gram	Plan to sow for Rabi mustard (short duration varieties- Pusa Agarani) ,Linseed (JLS-9,vegetables) Wilt resistant variety of Chickpea JG130 JG 14		
		Chickpea-soybean			
		Chickpea- Sesame			

Resource management technologies

Promising resilient technologies for very high risk prone for Chatarpur

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Blackgram varieties : JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19. Greengram : Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Sesame : TKG-306, TKG-35, JGS-8, JT-21, JT-22, JT-55,PKTS-11,PKTS-12, JT-1.
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Chatarpur

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
- Construction of new or renovation of percolation tanks to recharge groundwater level
- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
- Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.
- Change in cropping systems or variety Blackgram/ Greengram and sesame. Sesame: TKG-21,TKG-22,JTS-8,TKG-306. Blackgram: LBG-20,Azad-1,Azad-3. Greengram: PDM-139,HUM-1
- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
- Zero till sowing of wheat to conserve soil moisture

- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Chatarpur

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.

Change in cropping systems or variety such as Rice : Pusa-1121,JR-201. Pigeonpea- Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi), JKM-189. Groundnut-JGM-23,TG-37,JGN-3, JG-24

- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	CHHINDWARA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1000.8	More than 19%	Less than 810.648
June	160.2		
July	319.3		
August	292.6		
September	228.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	344505	Gross irrigated area:	377837
Net Rainfed area	164047	Gross rainfed area	533675

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	30262	32262
Wells	291186	318542
Tanks	6090	7517
Other sources	16967	19516

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	34675	1303	33372
2	Jowar	919	31	888
3	Maize	361879	2021	359858
4	Bajra	4		4
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	17000	12	16988
2	Groundnut	5406	871	4535
3	Sesamum	86		86
4	SOyabean	15043	162	14881
5	Sunflower	-		
6	Castor	6		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	56280	2294	53986
2	Jute	-		
3	Mesta	-		
4	Sunhemp	97		97

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	6490	6490	0
2	Tobacco	-		
3	Guar seed	-		26
4	Other Fodder crops	107	81	26

Crop Plan- Beginning of the season

Rainfed situation

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
Delay by 4 weeks 2 nd week of July	Rainfed, shallow red sandy loam soils	Soybean-Chickpea	Prefer to sow Pigeonpea, Greengram, Blackgram and Sesame instead of soybean, maize and sorghum	1. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 2. Application of Zinc 25 kg/ha after every 4 crop cycle 3. Application of bioferlizer and potash fertilizer under late sown condition 4. Sowing of Sesame and Blackgram as intercrop 5. Blade harrowing (Bakhar),to remove weeds.
		Maize-Wheat		
		Rice-Wheat		
		Sorghum	Change to late and short duration variety of Redgram (Pragti, Jagrati,Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189)	
		Blackgram		
		Greengram		
	Deep to medium deep soils	Soybean-Chickpea	Blackgram – JU-2,JU-3,JU-86,T-9,JBG	
		Maize-Wheat		
		Rice-Wheat		
		Cotton		

		Sorghum	23, LBG684, TAU-1, Berkha, PU-30,35,19	
		Blackgram		
		Greengram		
			Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum- 2, Tarme-1, L.G.450, T.M. 98-50, JM-98-90, PDM 11, 54 and 139	
			Sesame- TKG -306, TKG- 35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1	

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
Vegetative stage	Deep to shallow soils	Soybean- Chickpea	Life saving irrigation through sprinklers	1. Storage of water in lower side of the field and make use for life saving irrigation 2. Dora/Kulpha/Hand hoeing in between rows and use of removed weeds use as mulch for moisture conservation 3. Apply FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation 5. Mulching
At flowering/ fruiting stage		Maize-Wheat	Interculture	
		Rice-Wheat	Foliar application of 2% urea and MOP	
		Pigeonpea		
		Sorghum		
		Blackgram		
		Greengram		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Deep to shallow soils	Soybean- Chickpea	Protective irrigation	8. Plan for early rabi crop planning with Lentil Linseed, Chickpea, irrigated and un irrigated Wheat 9. Selection of short duration of varieties with increased seed rate up to 25% 10. Line sowing of Lentil, Linseed, Chickpea in moisture zone 11. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed then after treated with biofertilizers. 12. Sowing of small seeded grains mix with FYM and vermicompost
		Maize-Wheat	Harvest crop at physiological stage	
		Rice-Wheat		
		Pigeonpea/ Sorghum/ Blackgram/ Greengram		

				13. Apply light irrigation to <i>Kharif</i> crops for proper grain filling if required, this will helpful in field preparation for <i>Rabi</i> crops
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Resource management technologies

Promising resilient technologies for very high risk prone for Chindwara

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Redgram (Pragti, Jagrati, Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189). Blackgram – JU-2,JU-3,JU-86,T-9,JBG 23, LBG684,TAU-1, Berkha, PU-30,35,19.
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadakhnath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Chindwara

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
 - Construction of new or renovation of percolation tanks to recharge groundwater level
 - Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
 - Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
 - Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.
- Change in cropping systems or variety Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1,L.G.450, T.M. 98-50, JM-98-90, PDM 11, 54 and 139. Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1
- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
 - Micro irrigation system for efficient use of harvested water for higher water productivity
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 - Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
 - Zero till sowing of wheat to conserve soil moisture
 - Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
 - Mineral mixture as feed supplement for enhancing milk productivity from milch animals
 - Improved breeds of backyard poultry for get additional income
 - Improved shelter for livestock.

Promising resilient technologies for low risk prone for Chindwara

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals

during off season

- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	DAMOH
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1088.9	More than 19%	Less than 882.009
June	148.8		
July	339.8		
August	375.4		
September	224.9		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	295008	Gross irrigated area:	295308
Net Rainfed area	25020	Gross rainfed area	334076

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	32165	32165
Wells	173537	173837
Tanks	14944	14944
Other sources	74362	74362

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	91181	2814	88367
2	Jowar	10	-	
3	Maize	6510		6510
4	Bajra	1		1
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	5657	199	5458
2	Groundnut	55		55
3	Sesamum	786		786
4	SOyabean	59478		59478
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	17	12	5
2	Tobacco	-		
3	Guar seed	-		25
4	Other Fodder crops	25		25

Crop Plan- Beginning of the season

Rainfed situation

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

Delay by 4 weeks 2nd week of July	Deep to medium deep black soils	Soybean-wheat /Chickpea/lentil/ linseed Rice-wheat/ Maize-wheat/ Blackgram-Linseed/ Mustard/ Sesame-Chickpea/ Pigeonpea/ Soybean+ Pigeonpea (4:2)	Don't sow soybean, maize and sorghum Prefer to sow Pigeonpea, Greengram, Blackgram, Sesame in place of soybean, maize and sorghum Pigeonpea- Pragati , Jagriti, Asha, Number-148, JKM-7, JA-4, Type-21- Pusa- 855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal,K851,JM721,Jawahar 99 - 37,Hum-1, Hum-2, Tarme- 1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha, Sesame - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1	1. Increase seed rate 25 % under late sowing condition. 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 4.Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 5. Blade harrowing (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon
	Shallow soils	Blackgram/Sorghum/ Maize/ Sesame/ Pigeonpea	Prefer to sow Pigeonpea, Greengram, Blackgram, Sesame Pigeonpea- Pragati , Jagriti, Asha, Number-148, JKM-7, JA-4, Type-21- Pusa- 855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal,K851,JM721,Jawahar 99 - 37,Hum-1, Hum-2, Tarme- 1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha, Sesame - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1	1. Sowing of crops against the slope in ridge and furrow methods 2. Blade harrowing (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Deep to medium deep black soils	Soybean- Chickpea	Defoliation of soybean about 20%..	1.Hand hoeing (Dora/ Kulpha) for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation 2. Mulching 3. Provide life saving irrigation
		Rice – Wheat	Plant protection	
	Shallow soils	Blackgram/Sorghum/ Maize/ Sesame/ Pigeonpea	-	1.Hand hoeing (Dora/ Kulpha) for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation 2. Mulching

Contingency measures- End of the season

Condition			Suggested Contingency measures
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Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Deep to medium deep black soils	Soybean- Chickpea	- Moisture conservation practice adopt and destroy the weed under early withdrawal of monsoon for <i>Rabi</i> season - Plan for early rabi crops Lentil, Linseed, Chickpea, irrigated and un-irrigated wheat - Increase seed rate up to 25% in late sown condition - Line sowing of Lentil, Linseed, Chickpea in moisture zone - Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed thenafter treated with biofertilizers - Sowing of small seeded grains mix with FYM and vermicompost - Apply light irrigation to <i>Kharif</i> crops for proper grain filling if required, this will helpful in field preparation for <i>Rabi</i> crops	
		Rice – Wheat		
		Rice – Wheat		
	Shallow soils	Blackgram/Sorghum/ Maize/ Sesame/ Pigeonpea	Give Life Saving irrigation Line sowing of early crops like Lentil, Linseed in moisture zone	

Irrigated situation

Irrigated situation					
Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed/ Limited release of water in canals due to low rainfall	Deep to medium deep black soils	Soybean- Chickpea Rice – Wheat	Sowing of early duration varieties of oilseeds ex. Linseed – JLS-67, JLS-66, JLS-9, Padmini, NL-97	Reduce the usage of fertilizer (<25%)	
			Mustard – Pusa, Jaikisan, Pusa bold, Varuna	Adopt water saving methods like direct seeded rice, SRI	
			Pulses – Lentil JL-3, Noorie	Cultivation, Aerobic rice	
			Chickpea – JG-11,12,14	Prefer early maturing Cultivars. Irrigate at critical stages	
			Pea – Rachna, JP-885		
		Rice – Wheat			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset	Deep to medium deep black soils	Soybean- Chickpea Rice – Wheat	Use of short duration varieties of Soybean (JS-95-60) or Blackgram, Greengram, sesame etc.	High seed rate (25% more) with seed treatment	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
of monsoon in catchment			Prefer dual purpose sorghum at large scale	Raised bed sowing Less fertilizer (25%) Weed management with weedicides Imazethapyr @ 750 ml/ha in soybean. Use of Pendimethaline @ 1kg/ha as PPI/PRE in Blackgram and greengram. Use of Alachlor @ 1kg/ha as PRE in sesame	
Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep to medium deep black soils	Soybean- Chickpea Rice – Wheat	Black gram-Mustard/ Green gram- Linseed/ Maize-Lentil	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS	
Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater (open wells and borewells) recharge due to low rainfall	Deep to shallow soils	Rice Soybean-Chickpea Maize-Wheat	Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame Plan for relay or utera cropping with any short duration pulse Chickpea should be sown under residual moisture immediately after harvest of soybean or give pre sowing irrigation to chickpea	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt furrow irrigation and use of micro-irrigation system	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.		

Resource management technologies

Promising resilient technologies for very high risk prone for Damoh

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Pigeonpea- Pragati , Jagriti, Asha, Number-148, JKM-7, JA-4, Type-21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189. Greengram- Pusa vishal,K851,JM721,Jawahar 99 -37,Hum-1, Hum-2, Tarme- 1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139. Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,. Sesame - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Damoh

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
 - Construction of new or renovation of percolation tanks to recharge groundwater level
 - Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
 - Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
 - Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.
- Change in cropping systems or variety **Pigeonpea**- Pragati , Jagriti, Asha, Number-148, JKM-7, JA-4, Type-21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189. **Greengram**- Pusa vishal,K851,JM721,Jawahar 99 -37,Hum-1, Hum-2, Tarme- 1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139. **Sesame** - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1

- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
- Zero till sowing of wheat to conserve soil moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Damoh

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	DEWAS
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	904.7	More than 19%	Less than 732.807
June	131		
July	289.5		
August	288		
September	196.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	407241	Gross irrigated area:	407490
Net Rainfed area	10358	Gross rainfed area	427503

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	12022	12022
Wells	364142	364142
Tanks	14193	14193
Other sources	16884	17133

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	143	0	
2	Jowar	239	-	
3	Maize	25252	105	25147
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	471		471
2	Groundnut	192	192	0
3	Sesamum	9		9
4	SOyabean	390162	1907	388255
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	561		561
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	74		74
2	Tobacco	-		
3	Guar seed	-		593
4	Other Fodder crops	1013	420	593

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
1	2	3	4	5
Delay by 4 (4 th week of month)	Shallow black soil	Soybean	JS- 9560, JS- 9305	Use Ridge/BBF sowing of Kharif crops Increasing seed rate up to 25% Select short duration varieties for sowing
		Jowar	JJ1041, JJ1022	
		Maize	Jm-216, JM-421	
		Arhar	ICPL-87, Pusa-33, JA-4, Jkm-7, Asha	
		Cotton	Bt cotton Varieties	
		Jowar	JJ-1041, JJ-1022	
		Maize	JM-216	
		Arhar	Jkm-189, Icpl-87-119	
	Moderate deep black soil	Soybean	Soybean (early) JS 95-60, / Black gram USA16, Safflower JSF 7, JSF73	
		Pigeon Pea	Pigeon Pea (medium) JA-4+ Soybean (early) JS 95-60	

		Pigeon Pea+ Soybean	Sorghum JJ938, JJ1041+early soybean JS 95-60
	Deep black soil	Soybean -Chickpea	Black gram-chick pea/wheat
		Soybean – Wheat	Soybean (early) / Black gram - Potato (Kufari early)
		Soybean - Sugarcane	Soybean - Sugarcane

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation ^a	Normal Crop/ cropping system ^b	Crop management	Soil nutrient & moisture conservation measues ^d
1	2	3	4	5
At flowering/ fruiting stage	Shallow black soil	Soybean	Spray 2% urea on foliage maintain optimum plant population by thinning in alternate row	Use of organic mulch / plastic mulching to conserve moisture Supplementary irrigation if available
		Jowar		
		Maize		
		Arhar		
		Cotton		
		Jowar		
		Maize		
		Arhar		
	Moderate Deep black soil	Soybean		
		Pigeon Pea		
		Pigeon Pea+ Soybean		
	Deep black soil	Soybean -Chickpea		
		Soybean – Wheat		
		Soybean - Sugarcane		

Contingency measures- End of the season

Info for different cropping/farming systems (terminal drought) as available in the plan be copied here.

info for different cropping/farming systems (terminal drought) as available in the plan be copied here.				
Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d
1	2	3	4	5
(Early withdrawal of monsoon)	Shallow black soil	Soybean	Spray 2% urea to the folage Supplementary irrigatin through farm pond water	If the damage is severe, plan for land preparation of rabi crops like Toria, Mustard, Chicpea
		Jowar		
		Maize		
		Arhar		
		Cotton		
		Jowar		
		Maize		
		Arhar		
	Moderate Deep black soil	Soybean	Spray 2% urea to the folage Supplementary irrigatin through farm pond water	
		Pigeon Pea		
		Pigeon Pea+ Soybean		
	Deep black soil	Soybean -Chickpea	Spray 2% urea to the folage Supplementary irrigatin through farm pond water	
		Soybean – Wheat		
		Soybean - Sugarcane		

Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/ cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Shallow black soil	Pea / Safflower	Safflower – JSI -7, JSF-1, JSI-73, JSI-97 Pea like Arkel and Bornville	Proper field preparation Seed priming with water for 6-8 hours before sowing life saving irrigation with drip or sprinkler system Apply bio-fertilizers	Link KVK,ATMA to create awareness and to acquire skills of relevant technologies
	Moderate Deep black soil	Gram / Wheat	Increase Gram area with drought tolerant varieties such as JG-130 ,JG-218, JG-226		
	Deep black soil	Gram / Wheat / Pea	Select less water required varieties like sujata Amar Horshita , Amrata etc.		

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/ cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation
1	2	3	4	5	6
Limited release of water in canal due to low rainfall	Shallow black soil	Pea / Safflower	Safflower – JSI -7, JSF-1, JSI-73, JSI-97 Pea like Arkel and Bornville	Mulching in crop rows Seed priming with water for 6-8 hours before sowing Ridge and furrow system planting Irrigation at critical crop growth stages Alternate furrow irrigation Life saving irrigation with sprinkler/drip if feasible Apply bio-fertilizers	Link KVK,ATMA to create awareness and to acquire skills of relevant technologies among the farmers
	Moderate Deep black soil	Gram / Wheat	Increase Gram area with drought tolerant varieties such as JG-130 ,JG-218, JG-226		
	Deep black soil	Gram / Wheat / Pea	Select less water required varieties like sujata Amar Horshita , Amrata etc.		

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/ cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soil	Pea / Safflower	No change	Safflower – JSI -7, JSF-1, JSI-73, JSI-97 Pea like Arkel and Bornville Seed priming with water for 6-8 hours before sowing Follow moisture conservation practices like ridges and furrows life saving irrigation from rainwater harvesting	Link KVK,ATMA to create awareness and to acquire skills of relevant technologies among the farmers

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/ cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
				Alternate furrow irrigation of rainwater	
	Moderate Deep black soil	Gram / Wheat		Increase Gram area with drought tolerant varieties such as JG-130 ,JG-218, JG- 226 Seed priming with water for 6-8 hours before sowing Follow moisture conservation practices like ridges and furrows life saving irrigation from rainwater harvesting Alternate furrow irrigation of rainwater	
	Deep black soil	Gram / Wheat / Pea	.	Select less water required varieties ike sujata Amar Horshita , Amrata etc Seed priming with water for 6-8 hours before sowing Follow moisture conservation practices like ridges and furrows life saving irrigation from rainwater harvesting Alternate furrow irrigation of rainwater	

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/ cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow soil	Pea / Safflower	Safflower – JSI -7, JSF-1, JSI-73, JSI-97 Pea like Arkel and Bornville	Seed priming with water for 6-8 hours before sowing Ridges and furrows life saving irrigation from rainwater harvesting Alternate furrow irrigation of rainwater Mulching in crop rows	Link KVK,ATMA to create awareness and to acquire skills of relevant technologies among the farmers
	Moderate Deep black soil	Gram / Wheat	Increase Gram area with drought tolerant varieties such as JG-130 ,JG-218, JG- 226	Seed priming with water for 6-8 hours before sowing Follow moisture conservation practices like ridges and furrows life saving irrigation from rainwater harvesting Alternate furrow irrigation of rainwater	
	Deep black soil	Gram / Wheat / Pea	Select less water required varieties ike	-do-	

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			sujata Amar Horshita , Amrata etc.		
Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
1	2	3	4	5	6
Insufficient groundwater recharge due to low rainfall	Shallow soil	Pea / Safflower	Safflower – JSI -7, JSF-1, JSI-73, JSI-97 Pea like Arkel and Bornville	Seed priming with water for 6-8 hours before sowing Follow moisture conservation practices like ridges and furrows life saving irrigation from rainwater harvesting Alternate furrow irrigation of rainwater	Link KVK,ATMA to create awareness and to acquire skills of relevant technologies among the farmers
	Moderate Deep black soil	Gram / Wheat	Increase Gram area with drought tolerant varieties such as JG-130 ,JG-218, JG- 226		
	Deep black soil	Gram / Wheat / Pea	Select less water required varieties ike sujata Amar Horshita , Amrata etc.		

Resource management technologies

Promising resilient technologies for very high risk prone for Dewas

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
 - Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
 - Water harvesting and recycling for supplemental irrigation from sand bag check dam
 - Micro irrigation system for efficient use of harvested water for enhancing water productivity
 - Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
 - Soil health cards for rational application of fertilizers
 - Change in cropping systems or variety such Soybean JS- 9560, JS- 9305, Jowar- JJ1041, JJ1022, Maize- Jm-216,JM-421, Arhar- ICPL- 87, Pusa-33,JA-4, Jkm-7, Asha.
 - Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard
- intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
 - Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income
- production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
 - Improved backyard poultry (Kadakhnath) for enhanced income and livelihood diversification

- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Dewas

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
- Construction of new or renovation of percolation tanks to recharge groundwater level
- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season

· Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield

- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.

Change in cropping systems or variety Soybean (early) JS 95-60, / Black gram- USA16, Safflower JSF 7, JSF73, Pigeon Pea (medium) JA-4, Soybean (early) JS 95-60, Sorghum JJ938, JJ1041+early soybean JS 95-60.

- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested

water for enhancing profitability

- Zero till sowing of wheat to conserve soil moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Dewas

· Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater

· Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.

- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals

during off season

- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	DHAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	818.8	More than 19%	Less than 663.228
June	123.2		
July	256.2		
August	238.4		
September	201		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	448189	Gross irrigated area:	572651
Net Rainfed area	54421	Gross rainfed area	392777

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	48874	48874
Wells	308982	381884
Tanks	31663	36783
Other sources	58670	105110

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	0	0	
2	Jowar	847	-	
3	Maize	44291		44291
4	Bajra	1114		1114
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	678	67	611
2	Groundnut	1004	1004	0
3	Sesamum	27	1	26
4	SOyabean	320240	85	320155
5	Sunflower	-		
6	Castor	27		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	123797	123754	43
2	Jute	-		
3	Mesta	-		
4	Sunhemp	7		7

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	1135	1135	0
2	Tobacco	-		
3	Guar seed	-		85
4	Other Fodder crops	391	306	85

Crop Plan- Beginning of the season

Rainfed situation

Condition	Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Agronomic measures
Delay by 4 weeks (July IIIrd Week)	Shallow soils	Cotton	No change
		Sorghum	Maize JVM 421, Early varieties
		Soybean	JS 9560, NRC-7
		Maize	Maize HPQM 1,
		Pigeonpea	No change
		Groundnut	JGN 3, JGN23, TAG -22
	Deep soils	Cotton	No change

Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop

-Select short duration varieties for sowing
-Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed
- Rhizobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence
-Cultivate the field on receiving pre monsoon showers

Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)

Sowing in ridge and furrow system. Seed treatment with culture & fungicides

Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop

		Soybean	JS 9305, JS 335, NRC-7	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhizobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers - Intercropping of pigeonpea with soybean (2:4)
		Pigeonpea	(medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Maize	Maize HPQM 1, JVM 421, Hybrids	-Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed seed treatment by PSB 5g./kg.

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d
1	2	3	4	5
At reproductive stage	Shallow soil	Cotton	Foliar application of 2% DAP solution	Life saving irrigation Making field free of weeds full utilization of water and nutrients by the crops -Organic mulch/ green leaf mulch
		Soybean	- 20% defoliation in soybean and use as mulching -Spray of 2% solution of MOP/DAP/ water during the dry spell -Spraying of PMA @3 ppm solution during the dry spell	
		Sorghum	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching	
		Maize	-do-	
		Pigeonpea	-do-	
		Groundnut	Life saving irrigation / water spray	
	Deep soils	Cotton	-do-	
		Soybean	-do-	
		Maize	-do-	
		Pigeonpea	-do-	

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation ^a	Crop/ cropping system ^b	Crop management ^c	Rabi Crop planning ^d
1	2	3	4	5
	Shallow soil	Cotton	Wherever water resources are available such as pond, wells etc. protective irrigation can be provided to the crop, Harvest sorghum crop for fodder	Repeated interculture operations to keep the field weed free and use of organic mulches <i>Glyricidia</i> leaves,, uprooted weeds keeping roots upwards.
		Soybean		
		Sorghum		
		Maize		
		Pigeonpea		
		Groundnut		
	Deep soils	Cotton		
		Soybean		
		Maize		
		Pigeonpea		

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Lack of inflows into tank due to insufficient/delayed onset of monsoon	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Insufficient ground water recharge due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	- Preferred pre sowing Irrigation (Palewa) - Balanced fertilization - Irrigation at critical growth stage - Dry sowing Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter-culture operation	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)		-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	- Preferred pre sowing Irrigation (Palewa) - Balanced fertilization - Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Dry sowing - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter-culture operation	-

Resource management technologies

Promising resilient technologies for very high risk prone for Dhar

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as Maize JVM 421, Early varieties, JS 9560, NRC-7, Maize HPQM 1.
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Dhar

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
- Construction of new or renovation of percolation tanks to recharge groundwater level
- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
- Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.

Change in cropping systems or variety **Pigeonpea**- (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows). Maize - HPQM 1, JVM 421, Hybrids

- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture

- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
- Zero till sowing of wheat to conserve soil moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Dhar

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	DINDORI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1183.2	More than 19%	Less than 958.392
June	192.4		
July	368.7		
August	381.1		
September	241		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	16270	Gross irrigated area:	18901
Net Rainfed area	196735	Gross rainfed area	314933

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	8198	9141
Wells	4252	4852
Tanks	98	98
Other sources	3722	4810

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	146465	6989	139476
2	Jowar	8	-	
3	Maize	13695	307	13388
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	2981		2981
2	Groundnut	32	16	16
3	Sesamum	47		47
4	SOyabean	5572	76	5496
5	Sunflower	-		
6	Castor	8		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	2		2

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	29	28	1
2	Tobacco	-		
3	Guar seed	-		6
4	Other Fodder crops	6		6

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2 nd week of July	Upland unbunded shallow soils	Maize	Donot sow maize Prefer alternate crops like Kodo/ kutki Kodo- Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 Kutki - Jawahar Kutki 1, 2, 8, JK 36	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,
		Kodo	Kodo- Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106	
		Kutki	Kutki - Jawahar Kutki 1, 2, 8, JK 36	

		Niger	Niger ---JNC-6, JNC-1, JNC-9, JVN-1
		Soybean	Soybean: JS 335, JS 95-60 (Prefer to sow soybean before 10th July)
		Blackgram	Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19
	Upland banded shallow(gravelly sandu) soils	Paddy	Paddy: JR- 201
		Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.
		Pigeonpea	Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil	Paddy: JR- 201
		Paddy-Wheat/ lentil/Mustard	
		Soybean	Soybean: JS 335, JS 95-60 (Prefer to sow soybean before 10th July)

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At Flowering stage	Upland unbanded shallow soils	Maize	Life saving irrigation if available -	1. Interculture with Dora/Kulpha/Hand hoe in between rows . 2. Use of uprooted weeds use as mulch for moisture conservation. 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures
		Kodo		
		Kutki		
		Niger		
		Soybean		
		Blackgram		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning

(Early withdrawal of monsoon)				
	Upland unbunded shallow soils	Maize	1. Life saving irrigation through sprinkler. 2. Soil moisture conservation by use of mulch. 3. Prefer to sow short duration crop varieties .	1. Prefer to sow Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Sowing of small seeded grains mix with FYM and vermicompos 4. Apply light irrigation to Kharif crops for proper grain filling if required and this will helpful in field preparation of <i>Rabi</i> crops
		Kodo		
		Kutki		
		Niger		
		Soybean		
		Blackgram		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

2.1.2 Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Medium deep to deep soils	Paddy-Wheat/lentil/Mustard Paddy-Chickpea/lentil	Green gram-Mustard/ Black gram-Wheat/ Black gram-Chickpea Fallow-Chickpea	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea. Maintain optimum plant population	--

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early)	Adopt water saving methods like direct seeding seeded rice, SRI Cultivation, Aerobic rice Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	-
		Rice -Chickpea	Black gram/Greengram-Wheat		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Blackgram-Chickpea/ wheat	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages	-

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				Conservation tillage	

Resource management technologies

Promising resilient technologies for very high risk prone for Dindori

- Creation of new water harvesting structures or renovation of existing structures such as farm pond
- Desilting of drainage channels to enhance the storage capacity and groundwater recharge in bore wells and in open wells
- Water harvesting and recycling for supplemental irrigation from sand bag check dam
- Micro irrigation system for efficient use of harvested water for enhancing water productivity
- Vermi composting to enhance the soil fertility and also increase the moisture holding capacity of the soil
- Soil health cards for rational application of fertilizers
- Change in cropping systems or variety such as **Kodo-** Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106. **Kutki** - Jawahar Kutki 1, 2, 8, JK 36. **Niger**---JNC-6, JNC-1, JNC-9, JVN-1. **Soybean:** JS 335, JS 95-60.
- Soybean + maize, maize + cotton, soybean + pigeon pea, wheat + mustard and gram + mustard intercropping systems for cropping intensification and sustainable yields
- Short duration variety of soybean (JS-9560, 9305 and 2034) for delayed onset of monsoon
- Improved varieties of vegetable cultivation from harvested water to obtain more crop yield and income production during lean season and to enhance milk production
- Mineral mixture as a feed supplement for milk production from milch animals
- Improved backyard poultry (Kadaknath) for enhanced income and livelihood diversification
- Improved shelter for livestock for minimizing the impact of heat and cold stress.

Promising resilient technologies for medium risk prone for Dindori

- Desilting/renovated community pond and check dams to enhance the water harvesting capacity
- Construction of new or renovation of percolation tanks to recharge groundwater level
- Desilting of drainage channel for harvesting runoff for supplemental irrigation during dry spells in the cropping season
- Farm bunding for conserving moisture for longer period to minimize moisture stress and to increase crop yield
- Conservation furrow for conserving moisture and to enhance crop yield during variable rainfall.

Change in cropping systems or variety **Pigeonpea**- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi).

- Paddy straw mulching in colocasia to enhance soil fertility and soil moisture
- Micro irrigation system for efficient use of harvested water for higher water productivity
- Vermicompost to enhance the soil fertility and moisture holding capacity
- Soil health cards for rational application of fertilizers
- System of rice intensification to overcome dry spells and for enhancing productivity
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) with harvested water for enhancing profitability
- Zero till sowing of wheat to conserve soil moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder productivity and to make green fodder available for milch animals during the lean period
- Mineral mixture as feed supplement for enhancing milk productivity from milch animals
- Improved breeds of backyard poultry for get additional income
- Improved shelter for livestock.

Promising resilient technologies for low risk prone for Dindori

- Enhancing water availability by way of renovation of existing / creation of new structures and to recharge groundwater
- Crop diversification of brinjal (PBH-5) and tomato (Arka Rakshak and arka Samrat) for maximising profitability with harvested water.
- Zero tillage sowing in wheat for timely ness of sowing and to escape heat stress moisture
- Improved fodder variety of barseem (BL-1) for enhancing green fodder production for milch animals during off season
- Mineral mixture as a feed supplementary nutrient to get higher milk yield from milch animals
- Improved backyard poultry to get additional income
- Improved shelter to minimize the heat stress for livestock

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	EAST NIMAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	789.1	More than 19%	Less than 639.171
June	122.6		
July	255.9		
August	224.1		
September	186.5		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	297285	Gross irrigated area:	351740
Net Rainfed area	18969	Gross rainfed area	272422

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	80778	80778
Wells	185590	229441
Tanks	9667	9667
Other sources	21250	31854

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	523	0	
2	Jowar	35	-	
3	Maize	15888	2049	13839
4	Bajra	3		3
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	992	142	850
2	Groundnut	198	24	174
3	Sesamum	17	5	12
4	SOyabean	247494	2278	245216
5	Sunflower	-		
6	Castor	97		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	46463	39663	6800
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	415	415	0
2	Tobacco	-		
3	Guar seed	-		41
4	Other Fodder crops	63	22	41

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	GUNA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	940.9	More than 19%	Less than 762.129
June	114.7		
July	326.8		
August	317.6		
September	181.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	324900	Gross irrigated area:	324900
Net Rainfed area	12093	Gross rainfed area	328584

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	15584	15584
Wells	273592	273592
Tanks	3099	3099
Other sources	32625	32625

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	16044	0	
2	Jowar	19	-	
3	Maize	129936		129936
4	Bajra	8		8
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	6		6
2	Groundnut	38		38
3	Sesamum	99		99
4	SOyabean	174379		174379
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	29		29
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	24	24	0
2	Tobacco	-		
3	Guar seed	-		326
4	Other Fodder crops	326		326

Crop Plan- Beginning of the season

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
Delay by 4 weeks 3 rd week July	Deep soils	Soybean	Soybean (JS – 93-05, JS 95-60)	- Ridge & Furrow sowing - Seed treatment with Thirum + Corbidizim mixture @3gm/kg of seed - Frequent intercultivation to control weeds and to conserve moisture
		Maize	Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	
	Shallow red soils	Soybean	Early Soybean(JS 93-05 – NRC-7) Maize Hybrid: Ganga-2, Ganga Safedi-2 Composite: Jawahar maize – 8 & 12	

		Blackgram	Blackgram(JU- 2, JU-3, JU-86)	
		Greengram	Greengram (TM- 37, K-851)	

Contingency measures- Mid season

Condition	Major Farming situation		Normal Crop / Cropping system	Suggested contingency measures	
	Major Farming situation		Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At vegetative stage	Deep soils		Soybean	- Intercultural operation for control of weeds and soil mulch - Life saving irrigation (if available) - Spraying of Anti-transperant	- Hand weeding - Breaking of upper earth crust. - Mulching in crop rows
			Maize		
	Shallow red soils		Soybean		
			Blackgram		
			Greengram		
Condition		Suggested Contingency measures			
Major Farming situation	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At flowering/ fruiting stage	Deep soils		Soybean	20% defoliation in soybean - Insecticidal spray for control of green semi looper in soybean - Spray of anti transparent like VAM-C , Boost etc	- Dust mulching through frequent interculture - Green leaf mulch in between crop rows - Supplemental irrigation through farm pond water/other sources
			Maize		
	Shallow red soils		Soybean		
			Blackgram		
			Greengram		

Contingency measures- End of the season

Condition	Major Farming situation		Normal Crop / Cropping system	Suggested contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation		Normal Crop / Cropping system	Crop management	Rabi Crop Planning
	Deep soils		Soybean	- Life saving irrigation with farm pond water/other sources if feasible - Harvest at physiological maturity	- Utilize the available moisture for rabi sowing - Seeds of wheat, gram be soaked in water for 12-15 hours before sowing
			Maize		
	Shallow red soils		Soybean		
			Blackgram		
			Greengram		

Irrigated situation

Condition			Suggested Contingency measures	
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures
1	2	3	4	5
	Deep soils	Wheat Gram Coriander Mustard	Wheat (MP-4010, GW-173) Gram (JG-16, JG-130) Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method
	Shallow red soils	Coriander Mustard	Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)	

Condition			Suggested Contingency measures		
Limited release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
	Deep soils	Wheat Gram Coriander Mustard	Wheat (MP-4010, GW-173) Gram (JG-16, JG-130) Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)	- Mulching in rabi crops - Irrigation only at critical stages by check basin/ Border strip method	Awareness needed ; Trainings in ATMA,FTC
	Shallow red soils	Coriander Mustard	Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)		

Condition			Suggested Contingency measures		
Non release of water in canals under delayed onset of monsoon in catchment	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6

	Deep soils	Wheat Gram Coriander Mustard	Gram (JG-16, JG-130) Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)	Mulching in rabi crops Irrigation only at critical stages by check basin/ Border strip method Give irrigation using own source of available water plus tank water (conjunctive use)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
	Shallow red soils	Coriander Mustard	Coriander (JD-1, Sympo-S33, ACR-1, RCR-436) Mustard (JM-1 & 4, Pusa Bold)		

Resource management technologies

- **In-situ Moisture Conservation** through ridge and furrow, compartmental bunding, broad bed and furrow (BBF)
- Conservation Furrows
- Mulching
- Contour Cultivation and Field Bunding
- Renovation of Existing Tanks and Check Dams

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	JHABUA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	884.2	More than 19%	Less than 716.202
June	121.5		
July	284.5		
August	276.9		
September	201.3		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	119303	Gross irrigated area:	128484
Net Rainfed area	63004	Gross rainfed area	180730

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	21020	21020
Wells	29022	34636
Tanks	34855	34855
Other sources	34406	37973

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	3764	0	
2	Jowar	962	-	
3	Maize	62894	5442	57452
4	Bajra	19		19
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	2216		2216
2	Groundnut	3508		3508
3	Sesamum	16		16
4	SOyabean	86947		86947
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	24039	2161	21878
2	Jute	-		
3	Mesta	-		
4	Sunhemp	2		2

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	4	3	1
2	Tobacco	-		
3	Guar seed	-		891
4	Other Fodder crops	1085	194	891

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
1	2	3	4	5
Delay by 4 weeks 3 rd week of July	Shallow Soils	Maize	No change (JVM 421, JM 12)	Ridge and furrow sowing Intercultural operation (Daura)
		Black gram	No change (T 9, JU 86)	Intercultural operation (Daura)
		Soybean	Black gram- T 9, JU 86	-do-
	Moderate deep soil	Maize	JVM 421, JM 12	Ridge and furrow sowing Intercultural operation (Daura)
		Cotton	Black gram- T 9, JU 86	Intercultural operation (Daura)
		Soybean	Black gram - T 9, JU 86	-do-

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d
1	2	3	4	5
At vegetative stage	Shallow Soils	Maize	Maize + Urd intercropping	1% N Spraying, use dora and life saving irrigation in furrow irrigation ridge bed system (FIRBs) if available
		Black gram	Black gram	1% N Spraying, use dora and life saving irrigation in FIRBs, if available
		Soybean	Soybean	1% N Spraying, use dora and life saving irrigation
	Moderate deep soil	Maize	Maize + Urd intercropping	1% N Spraying, use dora/ desi plough for intercultural operation and life saving irrigation.
		Cotton	Cotton + Soybean intercropping	1% N Spraying, use dora and life saving irrigation, mulching of Polythine sheet , use micro irrigation system
		Soybean	Soybean + maize	1% N Spraying, use dora and life saving irrigation
Condition	Major Farming situation ^a	Crop/cropping system ^b	Suggested Contingency measures	
Mid season drought (long dry spell)			Crop management ^c	Soil nutrient & moisture conservation measures ^d
1	2	3	4	5
At reproductive stage	Shallow Soils	Maize	Maize	1% N Spraying, and life saving irrigation, intercultural operations
		Black gram	Black gram	-do-
		Soybean	Soybean	-do-
	Moderate deep soil	Maize	Maize	-do-
		Cotton	Cotton + Soybean / Maize	1% N Spraying and life saving irrigation, mulching , micro irrigation system intercultural operations
		Soybean	Soybean	1% N Spraying and life saving irrigation intercultural operations

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d
1	2	3	4	5
	Shallow Soils	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.
		Black gram	Black gram	Mature pods are picking and vegetative parts use as fodder.

		Soybean	Soybean	Harvest at physiological maturity
	Moderate deep soil	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.
		Cotton	Cotton + Soybean / maize	Intercultural operation, mulching, life saving irrigation through micro irrigation system
		Soybean		Harvest at physiological maturity

Irrigated situation

Condition	Major Farming situation ^f	Crop/ cropping system ^g	Suggested Contingency measures	
			Change in crop/ cropping System ^h	Agronomic measures ⁱ
1	2	3	4	5
Delayed/ limited release of water in canals due to low rainfall	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages
		Fodder	Berseem, Lucerne	• Adopt improved production technologies
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages
		Soybean -Chickpea		
		Soybean-Wheat		

Condition	Major Farming situation ^f	Crop/ Cropping system ^g	Suggested Contingency measures	
			Change in crop/ cropping System ^h	Agronomic measures ⁱ
1	2	3	4	5

Non release of water in canals under delayed onset of monsoon in catchment	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages
		Fodder	Berseem, Lucerne	Adopt improved production technologies
		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties
		Vegetables	Tomato, Brinjal	- Used of improved varieties - Adopt improved production technologies
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages
		Soybean - Chickpea		
		Soybean-Wheat		

Condition			Suggested Contingency measures	
	Major Farming situation ^f	Crop/ cropping system ^g	Change in crop/ cropping System ^h	Agronomic measures ⁱ
1	2	3	4	5
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages
		Fodder	Berseem, Lucerne	Adopt improved production technologies

		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties
		Vegetables	Tomato, Brinjal	- Used of improved varieties - Adopt improved production technologies
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages
		Soybean - Chickpea		
		Soybean-Wheat		

Condition	Major Farming situation ^f	Crop/cropping system ^g	Suggested Contingency measures	
			Change in crop/ cropping System ^h	Agronomic measures ⁱ
1	2	3	4	5
Insufficient groundwater recharge due to low rainfall	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	- Preferred pre sowing irrigation (Palewa) - Application of IPNM techniques - Irrigation at critical growth stages, branching and seed filling stage - Inter culture operations
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	- Balanced fertilization - Irrigation at critical growth stages
		Fodder	Berseem, Lucerne	Adopt improved production technologies
		Maize	Rabi maize	- Adopt improved production technologies - Used of short duration varieties
		Vegetables	Tomato, Brinjal	- Used of improved varieties - Adopt improved production technologies
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations
		Wheat		-Balanced fertilization

		Soybean -Chickpea	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Irrigation at critical growth stages
		Soybean-Wheat		

Resource management technologies

- Contour bunding, graded bunding and field bund strengthening.
- Compartmental bunding for in-situ moisture conservation.
- Sprinkler irrigation for maize, wheat and fodder crops.
- Application of micronutrients (Zn, B, S) where deficient.
- Use of enriched compost and vermicompost.
- Fodder banks at village level.
- Cultivation of perennial fodder grasses (Napier, Guinea grass).
- Azolla production for livestock feeding.
- Convergence with MGNREGA for water harvesting structures.
- Promotion of Farmer Producer Organizations (FPOs).

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	KATNI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	941.5	More than 19%	Less than 762.615
June	119.5		
July	316.2		
August	310.6		
September	195.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	216494	Gross irrigated area:	413227
Net Rainfed area	20299	Gross rainfed area	27900

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	16089	31076
Wells	148970	284661
Tanks	1133	2208
Other sources	50302	95282

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	213726	198838	14888
2	Jowar	3	-	
3	Maize	627	152	475
4	Bajra	1		1
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	1116	40	1076
2	Groundnut	2		2
3	Sesamum	3753	529	3224
4	SOyabean	9	9	0
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	44	29	15
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	68	68	0
2	Tobacco	-		
3	Guar seed	-		12
4	Other Fodder crops	32	20	12

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agonomic measures
Delay by 4 weeks 2nd week of July	Medium lands deep to medium deep black soils	Rice-Wheat	Rice – IR-36 JR-201, Poornima , JR-503, Vandna Pigeonpea - Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 Greengram - Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 Sesame - TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1	For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old Blade harrowing (Bakhar) for moisture conservation

		Soybean – Chickpea	Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1
	Bunded uplands shallow soils (mixed red & black soils)	Rice-Wheat	Rice – IR-36 JR-201, Poornima , JR-503, Vandna Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1
		Soybean – Chickpea	Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1
	Haveli systems with medium deep soils	Rice-Wheat	No change

Contingency measures- Mid season

Mid season drought (long dry spell,consecutive 2 weeks rainless period)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measure
At vegetative stage	Medium lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Timely weeding and use weeds as mulch between rows.	1. Interculture with Dora/Kulpha/Hand hoe in between rows
		Soybean – Chickpea		

	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat		2. Use uprooted weeds as mulch for moisture conservation. 2. Ridges are made after 15-20 lines of crops for the moisture conservation Adopt plant protection measures
		Soybean – Chickpea		
	Haveli systems with medium deep soils	Rice-Wheat		

MID season drought(long dry spell,consecutive 2 weeks rainless period)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measure
At flowering and fruiting stage	Medium lands deep to medium deep black soils	Rice-Wheat	Life saving light irrigation. Timely weeding Harvesting of crop at physiological maturity.	1. Interculture with Dora/Kulpha/Hand hoe in between rows . 2. Use of uprooted weeds use as mulch for moisture conservation. 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures
		Soybean – Chickpea		
	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat		
		Soybean – Chickpea		
	Haveli systems with medium deep soils	Rice-Wheat		

Contingency measures- End of the season

Condition	Major Farming situation		Suggested Contingency measures	
Terminal drought		Normal Crop/cropping system	Crop management	Rabi Crop planning
(Early withdrawal of monsoon)	Medium lands deep to medium deep black soils	Rice-Wheat	Harvesting of crop at physiological maturity.	1. Adopt moisture conservation practice 2. Intercultivation 3. Preference will be given on sowing of Mustard,,Lentil, Linseed, Chickpea, 4. Line sowing of Lentil, Linseed, Chickpea in moist zone 5. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 6. Sowing of small seeded grains mix with FYM and vermicompost
		Soybean – Chickpea		
	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat		
		Soybean – Chickpea		
	Haveli systems with medium deep soils	Rice-Wheat		

Irrigated situation

Condition		Suggested Contingency measures	
	Major Farming situation	Change in crop/cropping system	Agronomic measures

Delayed release of water in canals due to low rainfall	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	Sowing of Pigeonpea, Blackgram and Sesame. Prefer early maturing Cultivars. Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Irrigate at critical stage
		Pigeonpea--Wheat/Chickpea	
Limited release of water in canals due to low rainfall	Sandy clay to silt clay loam soils	Rice-Wheat/Chickpea	
		Pigeonpea--Wheat/Chickpea	
Non release of water in canals under delayed onset of monsoon in catchment	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Pigeonpea- Prefer early maturing varieties and sow on ridges Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS
		Pigeonpea-Wheat/Chickpea	
Lack of inflow in to tanks due to insufficient/delayed water in canals under delayed onset of monsoon	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	
		Pigeonpea--Wheat/Chickpea	

Condition	Suggested Contingency measures		
	Major Farming situation	Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall.	Sandy clay to silt clay loam soils	Rice-Wheat/Chickpea Or Pigeonpea--Wheat/Chickpea Prefer short duration low water requirement varieties of wheat.	Sowing of Pigeonpea, Blackgram and Sesame. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea. Protective irrigation at CRI stage in wheat. Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system. Adaptation of soil and water conservation practices.
		Pigeonpea--Wheat/Chickpea	

Resource management technologies

- Strengthening of field bunds, compartmental bunding and contour bunding for in-situ moisture conservation.
- Adoption of ridge-furrow planting, Broad Bed and Furrow (BBF) system and dead furrows for efficient rainwater management.
- Blade harrowing (Bakhar), Dora/Kulpha interculture operations and conservation tillage to reduce soil moisture loss.
- Construction of farm ponds, check dams, nala bunds, percolation tanks and recharge pits for rainwater harvesting and groundwater recharge.
- Integrated Pest Management (IPM) through pest surveillance, pheromone traps, biocontrol agents and need-based plant protection measures.
- Promotion of weather-based agro-advisories, community seed banks, custom hiring centres and convergence with PMKSY, RKVY, NFSM, MGNREGA and watershed development programmes for climate-resilient agriculture.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	MANDLA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1197.1	More than 19%	Less than 969.651
June	171.8		
July	398.8		
August	380.9		
September	245.6		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	57154	Gross irrigated area:	89932
Net Rainfed area	171576	Gross rainfed area	299593

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	21790	35827
Wells	24296	39260
Tanks	1778	2955
Other sources	9290	11890

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	197257	39397	157860
2	Jowar	-	-	
3	Maize	11920	24	11896
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	1421		1421
2	Groundnut	1		1
3	Sesamum	155		155
4	SOyabean	13		13
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	73		73

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	367	367	0
2	Tobacco	-		
3	Guar seed	-		12
4	Other Fodder crops	21	9	12

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2 nd week of July	Upland unbunded shallow soils	Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,
		Kodo	Kodo - Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106	
		Kutki	Kutki - Jawahar Kutki 1, 2, 8, JK 36	
		Niger	Niger ---JNC-6, JNC-1, JNC-9, JVN-1	
		Soybean	Soybean : JS 335, JS 95-60	

			Or Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19 Or Greengram: Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
	Upland bunded shallow(gravelly sandu) soils	Paddy	Paddy: JR- 201	
		Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	
		Pigeonpea	Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21- Pusa-855, ICPL-85063 (Laxmi), JKM-189	
	Lowland bunded deep and medium deep soils	Paddy-Chickpea/lentil	Paddy: JR- 201	
		Paddy-Wheat/ lentil/Mustard		
		Soybean	Soybean: JS 335, JS 95-60	

Contingency measures- Mid season

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 & moisture conservation measures
At vegetative stage	Upland unbunded shallow soils	Maize	Life saving irrigation if available Maintain optimum plant population	Provide Supplemental irrigation if available Mulching, Spray of anti-transpirants. Interculture with Dora/Kulpha/Hand hoe in between rows Use uprooted weeds as mulch for moisture conservation. Ridges are made after 15-20 lines of crops for the moisture conservation Adopt plant protection measures
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland bunded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland bunded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At Flowering stage	Upland unbunded shallow soils	Maize		
		Kodo		

		Kutki			
		Niger			
		Soybean			
	Upland unbunded shallow(gravelly sandu) soils	Paddy	Life saving irrigation available		1. Interculture with Dora/Kulpha/Hand hoe in between rows .
		Maize			2. Use of uprooted weeds use as mulch for moisture conservation.
		Pigeonpea			3. Ridges are made after 15-20 lines of crops for the moisture conservation
	Lowland unbunded deep and medium deep soils	Paddy-Chickpea/lentil	-		4. Adopt plant protection measures
		Paddy-Wheat/ lentil/Mustard			
		Soybean			

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Upland unbunded shallow soils	Maize	1. Life saving irrigation through sprinkler.	1. Prefer to sow Lentil, Linseed, Chickpea, irrigated and unirrigated wheat
		Kodo	2. Soil moisture conservation by use of mulch.	2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers
		Kutki	3. Prefer to sow short duration crop varieties .	3. Sowing of small seeded grains mix with FYM and vermicompos
		Niger		4. Apply light irrigation to Kharif crops for proper grain filling if required and this will helpful in field preparation of Rabi crops
		Soybean		
	Upland unbunded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland unbunded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
	Medium deep to deep soils	Paddy-Wheat/ lentil/Mustard	Green gram-Mustard/ Black gram-Wheat/	

Delayed release of water in canals due to low rainfall		Paddy-Chickpea/lentil	Black gram- Chickpea Fallow-Chickpea Medium duration variety of Rice (JRH-4,5,8, MTU 1010, IR-64, PS-3,5,)	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea. Maintain optimum plant population
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Condition	Major Farming situation	Suggested Contingency measures		
		Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Limited release of water in canals due to low rainfall	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram- Wheat(Early) Black gram/ Greengram-Wheat Limited irrigation requirement varieties of Wheat (JW 3020, JW 3173, 3269, HW 2004, Sujata) should be sown Limited irrigation requirement varieties of Chickpea (JG 218, 226, 130, 11, 14)	Adopt water saving methods like direct seeding seeded rice, SRI Cultivation, Aerobic rice Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea
		Rice -Chickpea		

Condition	Major Farming situation	Suggested Contingency measures		
		Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Blackgram-Chickpea/ wheat	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Farm bundin Deep ploughing Mulching
		Rice -Chickpea		

Resource management technologies

- Rooftop rainwater harvesting.
- Sprinkler irrigation.
- Drip irrigation.
- Life-saving irrigation at critical stages.
- Alternate Wetting and Drying (AWD) in rice.
- Direct Seeded Rice (DSR).
- System of Rice Intensification (SRI).
- Aerobic rice cultivation.
- Crop diversification with kodo, kutki, sesame, niger, blackgram, greengram and pigeonpea.
- Short-duration drought-tolerant crop varieties.
- Intercropping systems.
- Integrated Nutrient Management (INM).
- Farm Yard Manure (FYM) application.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	MANDSAUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	825.3	More than 19%	Less than 668.493
June	99.8		
July	272		
August	284.8		
September	168.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	281112	Gross irrigated area:	348273
Net Rainfed area	76031	Gross rainfed area	355126

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	10632	11518
Wells	256789	306990
Tanks	3781	3839
Other sources	9910	25926

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	0	0	
2	Jowar	31	31	0
3	Maize	4563	4563	0
4	Bajra	38	38	0
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	45		45
2	Groundnut	1082	1082	0
3	Sesamum	15	15	0
4	SOyabean	335752	765	334987
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	26	23	3
2	Tobacco	-		
3	Guar seed	-		6
4	Other Fodder crops	518	512	6

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
1	2	3	4	5
Delay by 4 weeks (Specify month) July 4th Week	Moderate Deep soil	Local maize	Early Soybean JS 93-05, JS 95-60	Increase seed rate by 20% Use Rh & PSB culture for Seed treatments
		Early Soybean	Black gram JU 2, JU3, JU86	
		Urd	Green gram JM 721, J 45	
		Medium Maturity maize	Early maize varieties JM 216	
	Deep soil	Soybean	Early Soybean JS 93-05, JS 95-60	
		Hybrid Maize	Composite Maize JM 12, JM 16, NLD	
		Soybean	Medium maturity JS 93-05	

Contingency measures- Mid season

Condition			Suggested Contingency measures	
	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d

1	2	3	4	5
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Moderate Deep soil	Local maize	Gap filling with improved varieties if the plant population is less than 75% Timely weeding to control weeds	Soil mulching With bullock Drawn hoe Spray 2% urea or MOP during the dry spell Mulching with organic materials in crop rows Ridge and furrow planting for moisture conservation Life saving irrigation
		Early soybean		
		Urd		
		Medium maturity maize		
		Soybean		
	Deep soil	Hybrid maize		
		Soybean		

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d
1	2	3	4	5
At reproductive stage	Moderate Deep soil	Local maize	Spray 2% urea or MOP during the dry spell Timely weed control	Life saving irrigation
		Early soybean		
		Urd		
		Medium maturity maize		
		Soybean		
	Deep soil	Hybrid maize		
		Soybean		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d
1	2	3	4	5
	Moderate Deep soil	Local maize	Spray 2% urea Life saving irrigation If possible reduce leaf per plant Use Anti transparent to check transpiration	If the damage is very severe, plan land preparation of Mustard, chandrsur mustard, Gram.
		Early soybean		
		Urd		
		Medium maturity maize		
		Soy bean		
	Deep soil	Hybrid maize		
		Soybean		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Delayed release of water in canals due to low rainfall	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system
		Local maize		
		Green gram		
		Sesamum		
		Soy bean		
		Composite maize		
		Black gram		

		Black gram + maize		
	Deep soil	Soybean		
		Hybrid maize		
		Black gram		
		Soybean + Pigeon pea		Give irrigation at critical crop growth stages

Condition			Suggested Contingency measures	
	Major situation ^f	Farming system ^g Crop/cropping	Change in crop/cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Limited release of water in canals due to low rainfall	Moderate Deep soil	Early soybean Local maize Green gram Sesamum Soy bean Composite maize Black gram Black gram + maize Soybean Hybrid maize Black gram Soybean + Pigeon pea	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages

Condition			Suggested Contingency measures	
	Major situation ^f	Farming system ^g Crop/cropping	Change in crop/cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Non release of water in canals under delayed onset of monsoon in catchment	Moderate Deep soil	Early soybean Local maize Green gram Sesamum Soy bean Composite maize Black gram Black gram + maize	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages
	Deep soil	Soybean Hybrid maize Black gram Soybean + Pigeon pea		

Condition			Suggested Contingency measures	
	Major situation ^f	Farming system ^g Crop/cropping	Change in crop/cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Moderate Deep soil	Early soybean Local maize Green gram Sesamum Soy bean Composite maize Black gram Black gram + maize	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages

	Deep soil	Soybean	
		Hybrid maize	
		Black gram	

Condition			Suggested Contingency measures	
	Major situation ^f	Normal system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Insufficient groundwater recharge due to low rainfall Any other condition (specify)	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages
		Local maize		
		Green gram		
		Sesamum		
		Soy bean		
		Composite maize		
		Black gram		
		Black gram + maize		
	Deep soil	Soybean		
		Hybrid maize		
		Black gram		
		Soybean + Pigeon pea		

Resource management technologies

- Organic mulching
- Dust mulching
- Crop residue retention
- Conservation agriculture
- Deep summer ploughing
- Field bund strengthening
- Vegetative barriers (Vetiver/Cenchrus grasses)

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	NARSIMHAPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1051.8	More than 19%	Less than 851.958
June	138.7		
July	330.8		
August	333.6		
September	248.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	290952	Gross irrigated area:	540892
Net Rainfed area	11472	Gross rainfed area	196383

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	16367	16367
Wells	253832	487271
Tanks	10	10
Other sources	20743	37244

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	90302	71812	18490
2	Jowar	108	-	
3	Maize	70607	76	70531
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	18130	869	17261
2	Groundnut	1170	2	1168
3	Sesamum	249		249
4	SOyabean	50335	1452	48883
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	4		4
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	50173	50173	0
2	Tobacco	-		
3	Guar seed	-		23
4	Other Fodder crops	121	98	23

Crop Plan- Beginning of the season

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
Delay by 4 weeks 2 nd week of July	Deep to Medium deep black Soils	Soybean	Donot prefer soybean Prefer alternate crops like Sesame/ Blackgram/ Greengram	1. Blade harrowing (Bakhar) for moisture conservation 2. Timely weeding 3. Use uprooted weeds as mulch for moisture conservation
		Rice	Rice - JR-201, JR-503, vandna, pornnima, Ananda, Narendr 97, Govinda Dry sowing or Sesame/ Blackgram/ Greengram Sesame - TKG -306, TKG -20, TKG -27, TKG-35, JGS-8, JT-7, JT-21,	

			JT-22, JT-55, PKTS-11, PKTS-12, JT-1, N-32. Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1 Greengram - Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram	
		Pigeonpea	Pigeonpea :Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189	
	Light sandy soil	Pigeonpea	Pigeonpea :Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189	
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram	
		Sorghum	Prefer alternate crops like Blackgram/ Greengram	

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal system	Crop/cropping	Crop management	Soil nutrient & moisture conservation measues
At vegetative stage	Deep to medium deep black soils	Soybean- Wheat/Chickpea/Sugarcane		Thinning out the extra seedlings per hill;	Manual weed control+Intercropping. Interculture operation for moisture conservation;
		Pigeonpea		Incase of severe drought spell and complete crop failure occurs then resow with Sesame + Greengram (2:4) / Niger	
		Maize			
	Light sandy soil (Light Soil)	Pigeonpea			
		Maize			
		Sorghum			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal system	Crop/cropping	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Deep Black Soil	Soybean-Wheat/Chickpea		Folair application with 2% Urea & MOP	Mulching Interculture; Life Saving Supplemental Irrigation
	Medium Black soil				
	Light sandy soil				

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
	Deep Black Soils	Soybean	Preparation of field and preference for sowing of early rabi crops like field pea, linseed, lentil, mustard.	Life Saving Supplemental Irrigation
	Medium Black soils			
	Light sandy soils			

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed/ limited release of water in canals due to low rainfall	Deep Black Soil	Soybean-Wheat/ Chickpea	Prefer alternate crops like semi Rabi sesame/ Chickpea/ Wheat Go for delayed sowing with early maturing varieties In case of severe shortage of water in canals, plan for sowing of soybean with short duration varieties (JS-335, JS-9560)	Mulching, Mechanical weed control Pre sowing irrigation is given for good germination
	Medium Black soil			
	Light sandy soil			

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Deep Black Soils	Soybean/ Pigeonpea/ Blackgram/ Greengram	Fallow-Chickpea/ Linseed/ Lentil Sorghum: Prefer dual purpose varieties/ hybrids	Interculture operation. Provide life saving irrigation at critical stages. Pre sowing irrigation is given for good germination Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS
	Medium Black soil			
	Light sandy soil			

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep black soils	Soybean-Wheat+ Chickpea	Fallow-Chickpea/ Linseed/ Lentil In case of soybean, adopt sowing on ridges and give one pre sowing irrigation and if necessary one irrigation at critical stage i.e., pod development to be given	Interculture operation. Mulching. Provide the irrigation by sprinkler method	Training programs to farmers by ATMA, FTC.
	Medium black soils	Soybean-Wheat+ Chickpea			
	Light sandy soils	Soybean-Wheat+ Chickpea			
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Deep black soils	Soybean-Wheat+ Chickpea	Fallow-Chickpea/ Linseed / Lentil Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	Interculture Irrigate the crop at critical stages and if possible with sprinklers Mulching. Adopt furrow irrigation and use of micro-irrigation system	Training programme to farmers by ATMA, FTC
	Medium black soils	Soybean-Wheat+ Chickpea			
	Light sandy soils	Soybean-Wheat+ Chickpea			
Any other condition (specify)	Restricted use of irrigation, water irrigation of crops only at critical stages and use of micro-irrigation like drip sprinkler.				

Resource management technologies

- Agroforestry and boundary plantation with neem, karanj, bamboo, subabul and other multipurpose tree species.
- Development of fodder resources through perennial grasses, fodder banks and silage/hay making for drought preparedness.
- Integrated Pest Management (IPM) through pest surveillance, pheromone traps, light traps, biological control agents and need-based plant protection measures.
- Weather-based agro-advisories and climate information services for timely farm operations and drought management.
- Community seed banks, custom hiring centres and village-level water management institutions for climate-resilient agriculture

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	PANNA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1086.9	More than 19%	Less than 880.389
June	132.7		
July	348		
August	353.5		
September	252.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	185158	Gross irrigated area:	347766
Net Rainfed area	75629	Gross rainfed area	140302

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	16782	31775
Wells	112843	212368
Tanks	17129	32584
Other sources	38404	71039

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	153758	116984	36774
2	Jowar	2876	61	2815
3	Maize	509	16	493
4	Bajra	3		3
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	6338	152	6186
2	Groundnut	289	97	192
3	Sesamum	17284	620	16664
4	SOyabean	468	33	435
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	118	90	28
2	Tobacco	-		
3	Guar seed	-		1
4	Other Fodder crops	6	5	1

Crop Plan- Beginning of the season

Crop Plan: Beginning of the season				
Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
Early season drought (delayed onset)			Change in crop / cropping system including variety	Agronomic measures
Delay by 4 weeks 2 nd week of July	Deep black soils (800-1000 mm rainfall)	Rice-Wheat	Dont sow soybean Rice(Early cv.) – IR-36 JR-201, Poornima ,JR-503,Vandna Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684,TAU-1, Berkha, PU-30, 35, 19	1. Blade harrowing (Bakhar) for moisture conservation 2. Remove the weeds 3. In direct seeding use 25% higher seed rate. 4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 5.For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Sandy loam (<i>matasi</i>) with 750-900 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Red (<i>padwa</i>) & yellow(<i>dhankar</i>) with 600-800 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Medium deep soils ((<i>Kachari</i>) with 900-1100 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		

		Sesame	
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Contingency measures- Mid season

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
At vegetative stage	Deep black soils (800-1000 mm rainfall)	Rice-Wheat	-Maintain optimum plant stand. -Weed management through intercultural operation.	1. Interculture with Dora/Kulpha/Hand hoe in between rows 2. Use uprooted weeds as mulch for moisture conservation. 2. Ridges are made after 15-20 lines of crops for the moisture conservation. 3. Adopt plant protection measures
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Sandy loam (<i>matasi</i>) with 750-900 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Red (<i>padwa</i>) & yellow(<i>dhankar</i>) with 600-800 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Medium deep soils ((<i>Kachari</i>) with 900-1100 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Deep black soils (800-1000 mm rainfall)	Rice-Wheat	Give supplemental irrigation if available. Harvest crop at physiological maturity.	1. Blade harrowing (Bakhar) for moisture conservation and 2. Remove the weeds. 3. Use of leaf /dust mulch. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Sandy loam (<i>matasi</i>) with 750-900 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Red (<i>padwa</i>) & yellow(<i>dhankar</i>) with 600-800 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Medium deep soils ((<i>Kachari</i>) with 900-1100 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		

Contingency measures- End of the season.

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop / Cropping system	Crop management	Rabi crop planning
	Deep black soils (800-1000 mm rainfall)	Rice-Wheat	Give supplemental irrigation if available. Harvest crop at physiological maturity.	1. Preference will be given on sowing of Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 2. Line sowing of Lentil, Linseed, Chickpea in moist zone . 3. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 4. Sowing of small seeded grains mix with FYM and vermicompost
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Sandy loam (<i>matasi</i>) with 750-900 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Shallow soils (Red (<i>padwa</i>) & yellow(<i>dhankar</i>) with 600-800 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		
	Medium deep soils ((<i>Kachari</i>) with 900-1100 mm rainfall)	Rice-Wheat		
		Blackgram		
		Pigeonpea		
		Sesame		

Irrigation Situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed release of water in canals due to low rainfall	Upland	Rice	Replace upland rice with Soybean, Blackgram, Sesame	-
		Wheat	Prefer short duration low water requirement varieties of wheat.	
	Midland	Rice	Replace rice with maize, sorghum etc. if conditions prevails go SRI method of rice transplanting	Dry sowing with short duration crop varieties.
		Wheat	Prefer short duration low water requirement varieties of wheat.	
	Low land	Rice	Prefer short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice
		Wheat	Prefer short duration low water requirement varieties of wheat.	

Condition			Suggested Contingency measures
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	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Limited release of water in canals due to low rainfall	Upland	Rice	Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame	-Dry sowing with short duration crop varieties. -Use of vermicompost. -Use balanced quantity of fertilizers. -Water harvesting and use of collected water for life saving irrigation. Application of need based irrigation by pressure irrigation method.
	Midland	Rice	Replace rice with maize, sorghum etc. if conditions prevails Adopt SRI method of rice transplanting	
	Low land	Rice	Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.	

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Upland	Rice	Replace upland rice with low water required crops viz., Soybean, Blackgram, Sesame	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt furrow irrigation and use of micro-irrigation system Adaptation of soil and water conservation practices. Weed management in rice
		Wheat	Prefer short duration low water requirement varieties of wheat.	
	Midland	Rice	Replace rice with maize, sorghum etc. Adopt SRI method of rice transplanting	
	Low land	Rice	Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.	

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland	Rice	Replace upland Rice with lesser water required crops viz., Soybean, Blackgram, Sesame	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt furrow irrigation and use of micro-irrigation system
		Wheat	Prefer short duration low water requirement varieties of wheat.	
	Midland	Rice	Replace Rice with maize, sorghum etc. if conditions prevails Adopt SRI method of rice transplanting	

	Low land	Rice	Prefer short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.	Adopt soil and water conservation by use of mulch.
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Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Insufficient groundwater recharge due to low rainfall	Upland	Rice	Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame Sowing of pulses & oilseeds in place of cereals Plan for relay or utera cropping with any short duration pulse	Rice - Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt furrow irrigation and use of micro-irrigation system
		Chickpea	Chickpea should be sown under residual moisture immediately after harvest of soybean or give pre sowing irrigation to chickpea	-
		Wheat	Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.	-
	Midland	Rice	Replace Rice with maize, sorghum etc. if conditions prevails Adopt SRI method of rice transplanting Plan for relay or utera cropping with any short duration pulse	Rice - Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adaptation of soil and water conservation by use of mulch.
		Chickpea	Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	
		Wheat	Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.	
	Low land	Rice	Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc. Plan for relay or utera cropping with any short duration pulse	-
		Chickpea	Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	
		Wheat	Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.	

Resource management technologies

- Compartmental bunding
- Ridge and furrow system
- Broad Bed and Furrow (BBF)
- Conservation furrows
- Dead furrows
- Contour bunding

- Graded bunding
- Field bund strengthening
- Mulching with crop residues
- Leaf mulch and dust mulch
- Weed removal and use as mulch
- Rainwater harvesting
- Farm ponds
- Check dams
- Percolation tanks
- Recharge pits and recharge wells

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	RAISEN
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1084.6	More than 19%	Less than 878.526
June	150.3		
July	348.5		
August	353.3		
September	232.5		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	404058	Gross irrigated area:	683872
Net Rainfed area	22300	Gross rainfed area	139612

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	177563	177563
Wells	196590	406589
Tanks	7105	8226
Other sources	22800	91494

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	325687	280969	44718
2	Jowar	7	-	
3	Maize	5182	696	4486
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	10806	636	10170
2	Groundnut	27		27
3	Sesamum	145	15	130
4	SOyabean	46524	2007	44517
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	2		2
2	Jute	-		
3	Mesta	-		
4	Sunhemp	1		1

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	1237	1228	9
2	Tobacco	-		
3	Guar seed	-		22
4	Other Fodder crops	46	24	22

Crop Plan- Beginning of the season

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
Delay by 4 weeks 2 nd week of July	Deep to medium black soils	Soybean Pigeonpea, Rice, Maize, Blackgram, Greengram	Donot prefer sowing of soybean beyond 10th July, if sown there will be yield reduction For the following crops prefer the varieties Rice-Upland field: IR-36, JR-201, JR-503, vandna, porrnima, Ananda, Narendra 97, Govinda and hybrid rice JRH 4, 5 and 8 Lowland field WGL-32100, MR-219, Mahamaya, IR-36,IR-64, HMT, Swarna, Madhuri, Pusa basmati, Karnal basmati, Pusa sugandha3,4,and5 and Hybrid rice (PRH-10,PA6201,PHB71, Pro Agro 6444) Pigeonpea- Pragati , Jagriti, Asha ,Numberr-148,JKM-7, JA-4, Type-	1. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 2. Application of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc where deficiency is occurred. 3. Sowing of crops against the slope depends on crops.

			21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189 Greengram - Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha Sesame - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,Jange
	Shallow black soils	Soybean, Maize, Pigeonpea, Blackgram	Donot prefer sowing of soybean beyond 10th July, if sown there will be yield reduction Pigeonpea - Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) ,JKM Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha Sesame - TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11,

Contingency measures- Mid season

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
At vegetative stage	Deep to medium black soils	Soybean/ Blackgram/ Greengram (short duration variety) Rice/Pigeonpea	Protective irrigation by sprinkler or Drip method	1. Soil mulching 2. Foliar spray of nutrients in pulses (DAP 2.5%), Non pulses (Urea 2%) 3. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 4. Hand hoeing with dora/kulpha for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation. 5. Application of FYM and vermicompost at the time of sowing for increase of water holding capacity 6. Ridges are made after 15-20 lines of crops for the moisture conservation
	Shallow black soils			

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Deep to medium black soils	Soybean/ Blackgram/	Provide life saving irrigation	1.Foliar spray of nutrients in pulses(DAP 2.5%), Non pulses (Urea 2%)

	Shallow black soils	Greengram (short duration variety) Rice/ Pigeonpea		2. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 3.Ridges are made after 15-20 lines of crops for the moisture conservation
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Contingency measures- End of the season

Condition	Suggested Contingency measures			
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to light black soils	Soybean-Wheat Soybean Chickpea/lentil	Fallow-Chickpea/ Linseed/ Lentil/ Fieldpea Sorghum: Prefer dual purpose varieties/ hybrids	Apply vermicompost. Water harvesting for life saving irrigation. Interculture operation. Provide life saving irrigation at critical stages. Pre sowing irrigation is given for good germination Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS

Irrigated situation

Condition	Suggested Contingency measures			
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed/ limited release of water in canals due to low rainfall	Medium deep to light black soils	Soybean-Wheat Rice-Wheat	Prefer alternate crops like semi Rabi sesame/ Chickpea/ Wheat Go for delayed sowing with early maturing varieties In case of severe shortage of water in canals, plan for sowing of soybean with short duration varieties (JS-335, JS-9560)	Mulching, Mechanical weed control Pre sowing irrigation is given for good germination

Condition	Suggested Contingency measures			
	Condition Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures

Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium deep to light black soils	Soybean/Wheat-Chickpea	Fallow-Chickpea/ Linseed/ Lentil In case of soybean, adopt sowing on ridges and give one pre sowing irrigation and if necessary one irrigation at critical stage i.e., pod development to be given Soybean (JS-95-60) or Blackgram/ Greengram/ sesame etc. Prefer to sow hybrid Jowar	Mulching. Provide supplement irrigation using sprinkler at critical stage of crop High seed rate (25% more) with seed treatment Prefer raised bed sowing Reduce the dosage of fertilizer to 25%. Weed management with weedicide Imazethapyr @ 750 ml/ha in soybean Use of Pendimethaline @ 1kg/ha as PPI/PRE in Blackgram and greengram Use of Alachlor @ 1kg/ha as PRE in sesame
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Resource management technologies

- Conservation tillage and intercultural operations
- Mulching and residue retention under rainfed conditions
- Supplemental irrigation using harvested rainwater
- Integrated soil and water conservation practices
- Efficient canal water management and conjunctive water use
- Climate-resilient crop planning based on rainfall variability
- Adoption of micro-irrigation systems
- Community water harvesting and storage structures
- Farm-level drought proofing through moisture conservation measures.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	RAJGARH
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	893	More than 19%	Less than 723.33
June	111.9		
July	296.9		
August	313.9		
September	170.3		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	379473	Gross irrigated area:	475830
Net Rainfed area	102276	Gross rainfed area	470367

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	7048	7954
Wells	55365	86266
Tanks	12250	13962
Other sources	304810	367648

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	156	0	
2	Jowar	50	-	
3	Maize	37059	1771	35288
4	Bajra	1771		1771
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	97		97
2	Groundnut	374		374
3	Sesamum	44		44
4	SOyabean	433351	5699	427652
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	1	1	0
2	Tobacco	-		
3	Guar seed	-		760
4	Other Fodder crops	905	145	760

Crop Plan- Beginning of the season

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
1	2	3	4	5
Delay by 4 weeks 2nd week July 28MW	Shallow black soils	Sorghum	Black gram (JU86), Sorghum JJ938,JJ1041	-Select short duration crops - Ridge/BBF sowing of Kharif crops -Seed dressing with Thirum+carbodezim in equal ratio @3g/kg seed -increase seed rate by 25% and reduce inter row spacing (30cm) -Cultivate the field on receiving pre monsoon showers
		Sorghum+ black gram	Sorghum JJ938,JJ1041+ black gram inter cropping 2 : 4 row ratio	
		Soybean local (JS-335)	Short duration soybean JS 93-05,JS 95-60	
		Maize + black gram	Maize JM-8, JM-12 + black gram JU-86,TPU-4	
		Arhar	Arhar like ICPL-87, Asha	
	Deep black soils	Soybean	Soybean(early)JS 95-60, JS 93 05, / Black gram JU-3	
		Pigeon pea	Pigeon pea(medium)JA4, JKM-189 + Soybean (early)JS 95-60	

		Pigeon pea + Soybean	Sorghum JJ938,JJ1041/Maize , JM-12 + soybean JS 95-60
		Black gram	Soyabean: JS-335, JS 95-60, JS 93-05, NRC-7, Urd : JU2,JU-3, JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19(Black gram variety)

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
1	2	3	4	5
At vegetative stage	Shallow soils	Sorghum Sorghum+ black gram Soybean local(JS-335) Maize+Black gram Arhar	-Weed management through doura -Spraying of PMA @3 ppm solution -Girdle beetle control by spraying of Quinalphos@2 ml /l water	- Mulching in crop rows -Frequent intercultural operations Spray 2% urea or MOP during the dry spell Life saving irrigation by sprinkler system
	Deep soil	Soybean Pigeonpea Pigeonpea + Soybean Black gram		

Condition				
Mid season drought (long dry spell)	Major Farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
1	2	3	4	5
At flowering /fruiting stage	Shallow soils	Sorghum Sorghum+ black gram Soybean local(JS-335) Maize+Black gram Arhar	-20% defoliation in soybean, and sorghum/maize -Spraying of PMA @3ppm solution -Insecticidal spray for control of green semi looper in soybean and late shoot borer in sorghum	-1 life saving irrigation in Kharif crops. Practice of doura/Kulpha/Hand hoe in between rows. 3. Use of FYM and vermicompost at the time of sowing 4. Ridges are made after 15-20 lines of crops for the moisture conservation. 5. Adaption of plant protection measures
	Deep soils	Soybean Pigeonpea Pigeonpea + Soybean Black gram		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Crop/cropping system	Crop management	Rabi Crop planning
1	2	3	4	5

	Shallow soils	Sorghum Sorghum+ black gram Soybean local(JS-335) Maize+Black gram Arhar	Life saving irrigaion -Reduce the plant population in sorghum by uproot the plants from alternate row Harvest at physiological maturity	If the damage is severe, plan for land preparation of rabi crops like Toria, chickpea, mustard, coriander seed priming i.e Sowing of soaked seed of gram/ Coriander
	Deep soil	Soybean Pigeonpea Pigeonpea + Soybean Black gram		

Irrigated situation

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Delayed release of water in canals due to low rainfall	Shallow soils	Chickpea	Chickpea	Selection of short duration drought tolerant varieties Sowing of crop in ridges and furrows -Dry sowing followed by irrigation Irrigation at critical stages of crop growth stages Use of drip/sprinkler systems for irrigation if feasible -Balanced fertilization -Application of wormi compost @3-4 t/ha .
		Wheat (Lok-1)	Wheat :HW 2004, Harshita	
	Deep soil	Chickpea	Chickpea JG 130	
		Wheat	Wheat HW 2004, Harshita	
		Coriander	Coriander	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Limited release of water in canals due to low rainfall	Shallow soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	- Selection of short duration drought tolerant varieties Sowing of crop in ridges and furrows -Dry sowing followed by irrigation Irrigation at critical stages of crop growth stages Use of drip/sprinkler systems for irrigation if feasible -Balanced fertilization -Application of wormi compost @3-4 t/ha .
		Wheat Lok-1	Lentil (JL-3)	
	Deep soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	
		Wheat	Safflower (JSI-7) (JSF-1) (JSI-73, JSI-99, JSI-97)	
		Coriander	Coriander	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Non release of water in canals under delayed	Shallow soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	Dry sowing followed by irrigation Use of drip/sprinkler systems for irrigation if feasible
		Wheat Lok-1	Lentil (JL-3)	

onset of monsoon in catchment	Deep soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	Give irrigation at critical growth stages of crop -Application of wormi compost@3-4 t/ha Use of organic manures Use of bio-fertilizers
		Wheat	Safflower (JSI-7) (JSF-1) (JSI-73, JSI-99, JSI-97)	
		Coriander	Coriander	

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
1	2	3	4	5
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	-Mulching in kharif and rabi crops -Supplemental irrigation by sprinkler if available Use of organic manures Use of bio-fertilizers
		Wheat Lok-1	Lentil (JL-3)	
	Deep soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	
		Wheat	Safflower (JSI-7) (JSF-1) (JSI-73, JSI-99, JSI-97)	
		Coriander	Coriander	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
1	2	3	4	5	6
Insufficient groundwater recharge due to low rainfall	Shallow soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita	-Mulching in kharif and rabi crops -Supplemental irrigation by sprinkler if available Use of organic manures Use of bio-fertilizers	Proper training and guidance to the farmers by KVK/ATMA
		Wheat Lok-1	Lentil (JL-3)		
	Deep soils	Chickpea	Chickpea JG 412 Wheat :HW 2004, Harshita		
		Wheat	Safflower (JSI-7) (JSF-1) (JSI-73, JSI-99, JSI-97)		
		Coriander	Coriander		

Resource management technologies

- Laser land levelling for efficient water use in irrigated areas.
- Drip irrigation for high-value crops and vegetables.
- Sprinkler irrigation for life-saving irrigation during dry spells.
- Community water harvesting structures through watershed approach.
- Renovation and desiltation of tanks and village ponds.
- Diversification towards drought-tolerant crops and varieties.
- Fodder production on bunds and wastelands for livestock security.
- Weather-based agro-advisories and contingency crop planning.
- Custom hiring of conservation agriculture implements.
- Convergence with watershed programmes, MGNREGS, RKVY and other climate-resilient agriculture schemes.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	RATLAM
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	914.5	More than 19%	Less than 740.745
June	110.4		
July	291.6		
August	327.4		
September	185.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	301122	Gross irrigated area:	324791
Net Rainfed area	39325	Gross rainfed area	340895

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	12328	12328
Wells	211278	234846
Tanks	19066	19066
Other sources	58450	58551

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	21	0	
2	Jowar	4	-	
3	Maize	19988	279	19709
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	158	1	157
2	Groundnut	145		145
3	Sesamum	9	3	6
4	SOyabean	299556		299556
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	14547	731	13816
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	2	1	1
2	Tobacco	-		
3	Guar seed	-		1478
4	Other Fodder crops	2644	1166	1478

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/ cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
1	2	3	4	5
Delay by 4 weeks (2 nd week of Aug)	Deep soils	Soybean	No change. Prefer varieties like JS 335, JS 95 – 60, JS 93-05, PK-472, NRC-12, NRC - 37	• Use of treated Seed by 2 gm. Bavistin/ kg seed • Use of bio fertilizer . • Sowing crop against the slope. • Collect the water from lower portion and use it as a life saving irrigation.
		Maize	HPQM-1, JM 216, JM 421, NavJot Guava- 11, Pissa, Makka-1, Trisulta	
	Shallow soils	Jowar	JJ 1041, JJ 1022, CSh 13,14, JJ 938	
		Cotton	JKHy 1,4,11, Bt Cotton varieties	

Contingency measures- Mid season

Condition	Suggested contingency measures
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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
1	2	3	4	5
At vegetative stage	Deep soils	Soybean	- Weed management through intercultural operation between rows using <i>doura</i> - Gap filling with improved variety if the population is <75% of optimum - Resow the crop if the damage will be severe	- Dust mulching through interculture - Green leaf mulch in between crop rows - Life saving irrigation
		Maize		
	Shallow soils	Jowar		
		Cotton		

Contingency measures- End of the season

Condition	Suggested contingency measures			
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi planning
1	2	3	4	5
(Early withdrawal of monsoon)	Deep soils	Soybean	- Reduction of Nitrogen 25-50% then recommended - Urea spary 2% solution. - Life saving irrigation	- Rabi crops like safflower, LenSesame, Linseed, Rainfed wheat and Gram. - Selection of heat tolerant varieties like in Gram JAKI 9218. - Use of Line sowing only. - Seed priming. - Use of short duration varieties.
		Maize		
	Shallow soils	Jowar		
		Cotton		

Irrigated situation

Condition	Suggested Contingency measures			
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	- Ridge and furrow planting - Mulching in crop rows - Irrigation at critical stages of crop - Use micro irrigation systems like sprinkler/drip • Increase water Use
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226	
		Maize-Jowar	JG-412, Maize –JM 216 JM-8	

	Shallow soils	NA		
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Condition	Suggested Contingency measures			
Limited release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	- Ridge and furrow planting - Mulching in crop rows - Irrigation at critical stages of crop - Use micro irrigation systems like sprinkler/drip - Increase water Use
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226	
		Maize-Jowar	JG-412, Maize –JM 216 JM-8	
	Shallow soils	NA		

Condition	Suggested Contingency measures			
Non release of water in canals under delayed onset of monsoon in catchment	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures
1	2	3	4	5
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	- Ridge and furrow planting - Mulching in crop rows - Irrigation at critical stages of crop from rain water
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226	
		Maize-Jowar	JG-412, Maize –JM 216 JM-8	
	Shallow soils	NA		

Condition	Suggested Contingency measures			
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	- Ridge and furrow planting - Mulching in crop rows - Irrigation at critical stages of crop
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226	

		Maize-Jowar	JG-412, Maize –JM 216 JM-8	• Use micro irrigation systems like sprinkler/drip • Increase water Use
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Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
Insufficient groundwater recharge due to low rainfall				
1	2	3	4	5
	Deep soils	Soybean - Wheat Soybean-gram Maize-Jowar	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4 Poorna, HI 1518, Gram-JG 130, JG 11, JG226 JG-412, Maize –JM 216 JM-8	• Increased seed rate by 20%. • Reducing loss of water by mulching. • Conserve moisture through ridges and furrow system/ BBF. • Use of life saving irrigation through sprinkler/ Alternate furrow system

Resource management technologies

- Percolation tanks for groundwater recharge.
- Recharge pits and recharge shafts near wells.
- Renovation and desiltation of village ponds and tanks.
- Vegetative barriers (Vetiver/Cenchrus grasses) along contours.
- Agroforestry and tree plantation on field bunds.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	REWA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	986.7	More than 19%	Less than 799.227
June	129.8		
July	309.5		
August	300.2		
September	247.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	312843	Gross irrigated area:	424191
Net Rainfed area	64666	Gross rainfed area	243515

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	157277	165254
Wells	133009	236377
Tanks	3063	3063
Other sources	19494	19497

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	235283	143740	91543
2	Jowar	2250	-	
3	Maize	646		646
4	Bajra	124		124
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	12636		12636
2	Groundnut	-		
3	Sesamum	5579		5579
4	SOyabean	1305		1305
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	6		6

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	31	31	0
2	Tobacco	-		
3	Guar seed	-		0
4	Other Fodder crops	19	19	0

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
Early season drought (delayed onset)			Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2 nd week of July	Bunded low lands deep to medium deep black soils	Rice-Wheat Soybean– Chickpea	Rice – IR-36 JR-201, Poornima , JR-503, Vandna Pigeonpea – Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4,Type-21- Pusa-855, ICPL-85063 (Laxmi), JKM-189 Greengram Pusa Vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 4. Sowing of crops against the slope depend on crops. 5. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 6. Adoption of plant protection as per requirement as rainfall condition

			Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684, TAU-1, Berkha,PU-30,35,19	7. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old.
Delay by 4 weeks 2 nd week of July	Unbunded upland shallow soils	Rice –wheat	Selection of short duration Rice – IR-36 JR-201, Poornima , JR-503, Vandna	1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 4. Sowing of crops against the slope depend on crops. 5. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 6. Adoption of plant protection as per requirement as rainfall condition 7. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice under. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old.
		Pigeonpea	Pigeonpea - Pragati, Jagriti, Asha, ,Nmuber-148,JKM-7,JA-4,Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189	
		Blackgram	Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684,TAU-1, Berkha,PU-30,35,19	
		Greengram	Greengram - Pusa Vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
		Sorghum	No change	
		Niger	No change	

Contingency measures- Mid season

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures	
Mid season drought (long			Crop management ^c	Soil nutrient & moisture conservation measues ^d

dry spell, consecutive 2 weeks rainless (>2.5 mm) period)				
At vegetative stage	Bunded low lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Use of hand hoe for weed management.	6. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 7. Practice of Dora/Kulpha/Hand hoe in between rows and use of removed weeds use as mulch for moisture conservation 8. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 9. Ridges are made after 15-20 lines of crops for the moisture conservation
		Soybean – Chickpea		
	Unbunded upland shallow soils	Rice – Wheat		
		Rice – Chickpea		
		Pigeonpea		
		Blackgram		
		Greengram		
		Sorghum		
		Niger		

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
At flowering/ fruiting stage	Bunded low lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Use of hand hoe for weed management.	1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 2. Practice of Dora/Kulpha/Hand hoe in between rows and use of removed weeds use as mulch for moisture conservation 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation
		Soybean – Chickpea		
	Unbunded upland shallow soils	Rice – Wheat		
		Rice – Chickpea		
		Pigeonpea		
		Blackgram		
		Greengram		
		Sorghum		
		Niger		

Contingency measures- End of the season

Condition	Major Farming situation ^a	Normal Crop/cropping system	Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)			Crop management ^c	Rabi Crop planning ^d

	Bunded low lands deep to medium deep black soils	Rice-Wheat	1. Moisture conservation practice adopt and destroy the weed under early withdrawal of monsoon for rabi season 2. Diversification of crops 3. Apply light irrigation to <i>Kharif</i> crops for proper grain filling if required, this will helpful in field preparation for <i>Rabi</i> crops	Preference will be given to sowing of Lentil, Linseed, Chickpea, irrigated and un irrigated wheat
		Soybean – Chickpea		
	Unbunded upland shallow soils	Rice – Wheat		
		Rice – Chickpea		
		Pigeonpea		
		Blackgram		
		Greengram		
		Sorghum		
		Niger		

Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Delayed release of water in canals due to low rainfall	Sandy clay loam soils	Rice-Wheat	Soybean-wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion
		Soybean – Chickpea	Blackgram – Chickpea	
	Shallow soils	Rice-Wheat	Soybean-wheat	
		Rice - Chickpea	Blackgram – Chickpea	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Limited release of water in canals due to low rainfall	Sandy clay loam soils	Rice-Wheat	Soybean-wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion
		Soybean – Chickpea	Blackgram – Chickpea	
	Shallow soils	Rice-Wheat	Soybean-wheat	
		Rice - Chickpea	Blackgram – Chickpea	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system,
		Soybean – Chickpea	Blackgram – Chickpea	
	Shallow soils	Rice-Wheat	Soybean-Wheat	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
monsoon in catchment		Rice -Chickpea	Blackgram – Chickpea	Adaptation of soil and water conservation practices. Control the soil erosion

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system,
		Soybean – Chickpea	Blackgram – Chickpea	
	Shallow soils	Rice-Wheat	Soybean-Wheat	Adaptation of soil and water conservation practices. Control the soil erosion
		Rice -Chickpea	Blackgram – Chickpea	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system,
		Soybean – Chickpea	Blackgram – Chickpea	
	Shallow soils	Rice-Wheat	Soybean-Wheat	Adaptation of soil and water conservation practices. Control the soil erosion
		Rice -Chickpea	Blackgram – Chickpea	

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SAGAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1068.5	More than 19%	Less than 865.485
June	158.3		
July	343.7		
August	350.2		
September	216.3		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	531556	Gross irrigated area:	597849
Net Rainfed area	31597	Gross rainfed area	538135

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	19827	19926
Wells	160960	223066
Tanks	10431	10521
Other sources	340338	344336

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	50088	4631	45457
2	Jowar	207	3	204
3	Maize	56565	2663	53902
4	Bajra	103	1	102
5	Ragi	2		2

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	2806	159	2647
2	Groundnut	494	118	376
3	Sesamum	426	39	387
4	SOyabean	328383	9686	318697
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	4	1	3

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	2	2	0
2	Tobacco	-		
3	Guar seed	-		282
4	Other Fodder crops	290	8	282

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
Early season drought (delayed onset)			Change in crop/cropping system ^c	Agronomic measures
Delay by 4 weeks 2 nd week of July	Deep black soils	Soybean-Wheat/ /Chickpea/Lentil/ Linseed	Pigeonpea - Pragati , Jagriti, Asha ,Nmuber-148,JKM-7, JA-4, Type-21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189 Greengram - Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha Pigeonpea - Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) ,JKM-189	1. Use of blade harrow (Bakhar) for moisture conservation 2. Increase seed rate 25 % under late sowing condition .Sowing of crops against the slope in ridge and furrow methods 3. Selection of higher production potential varieties. 4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 5. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc where deficiency is occurred.
	Medium deep black soils	Soybean		
		Pigeonpea		
		Paddy		
		Blackgram		
		Maize		
	Shallow light black soils	Blackgram		
		Sorghum		
		Sesame		

			Sesame : TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, Jange	6. Sowing of crops against the slope depends on crops. 7. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 8. Application of bio-fertilizer and potash fertilizer under late sown condition
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Contingency measures- Mid season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)				
At vegetative stage	Deep black soils	Soybean-Wheat /Chickpea/Lentil/Linseed	Protective irrigation By sprinkler or Drip system	1. Soil mulching, plant protection measures, foliar spray of nutrients in pulses DAP 2.5%, Non pulses – Urea 2% 2. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 3. <i>In-situ</i> moisture conservation
	Medium deep black soils	Soybean		1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 2. Use of Dora/Kulpha/ Hand hoe for interculture operation in between rows and use of uprooted weeds use as mulch for moisture conservation 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation
		Pigeonpea		
		Paddy		
		Blackgram		
		Maize		
	Shallow light black soils	Blackgram		
		Sorghum		
		Sesame		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell)				
At flowering/ fruiting stage	Deep black soils	Soybean-Wheat /Chickpea/Lentil/Linseed	Life saving Supplemental irrigation. Spray of anti transpirants. Plant protection measures.	1. Soil mulching 2. Plant protection measures, foliar spray of nutrients in pulses DAP 2.5%, Non pulses – Urea 2% 3. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 4. Use of Dora/Kulpha/ Hand hoe for interculture operation in between rows and use of uprooted weeds use as mulch for moisture conservation
		Soybean		

	Medium deep black soils	Pigeonpea		1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 2. Use of Dora/Kulpha/ Hand hoe for interculture operation in between rows and use of uprooted weeds use as mulch for moisture conservation 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation
		Paddy		
		Blackgram		
		Maize		
	Shallow light black soils	Blackgram		
		Sorghum		
		Sesame		

Contingency measures- End of the season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)			Crop management	Rabi Crop planning
	Deep t black soils	Soybean-Wheat /Chickpea/Lentil/Linseed	Life saving Irrigation Harvest at physiological Maturity.	1. Soil mulching
				2. Plant protection measures, foliar spray of nutrients in pulses DAP 2.5%, Non pulses – Urea 2%
	Medium deep black soils	3. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops		
		4. Use of Dora/Kulpha/ Hand hoe for interculture operation in between rows and use of uprooted weeds use as mulch for moisture conservation.		
		5. Field preparation for rabi crops.		
		Shallow light black soils		1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops
				2. Use of Dora/Kulpha/ Hand hoe for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation
	3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity			
	4. Ridges are made after 15-20 lines of crops for the moisture conservation			

Drought- Irrigated situation

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures	
			Change in crop/cropping system ^h	Agronomic measures ⁱ
Delayed release of water in canals due to low rainfall	Deep to medium deep black soils	Soybean- Wheat/Chickpea/Linseed/Lentil	Mustard – Pusa, Jaikisan, Pusa bold, Varuna Lentil JL-3, Noorie Chickpea– JG-11,12,14 Pea – Rachna, JP-885	Reduce the usage of fertilizer to extent of <25%; Seed treatment with fungicide before sowing. Sowing of early duration varieties of oilseeds

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures	
			Change in crop/cropping system ^h	Agronomic measures ⁱ
Limited release of water in canals due to low rainfall	Deep to medium deep black soils	Soybean- Wheat/Chickpea	Oilseeds & pulses in place of cereals crop	Irrigation at the critical stages only through sprinkler; Reduce the usage of fertilizer to extent of <25%; Seed treatment with fungicide before sowing.

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Deep to medium deep black soils	Soybean- Wheat/Chickpea	Use of short duration varieties of soybean (JS-95-60) or blackgram, greengram, sesame etc.	Application of full package and practices
			Sowing of hybrid Jowar at large scale	High seed rate (25% more) with seed treatment
				Raised bed sowing
				Reduce the usage of fertilizer to extent of <25%.
				Weed management with weedicide Imazethapyr @ 750 ml/ha
				Use of Pendimethalin @ 1kg/ha as PPI/PRE in blackgram and greengram
				Use of Alachlor @ 1kg/ha as PRE in Sesame

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep to medium deep black soils	Soybean- Wheat/Chickpea	Use of short duration varieties of soybean (JS-95-60) or blackgram, greengram, sesame etc.	Application of full package and practices
			Sowing of hybrid Jowar at large scale	High seed rate (25% more) with seed treatment

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
				Raised bed sowing Reduce the usage of fertilizer to extent of <25%. Weed management with Imazethapyr @ 750 ml/ha Use of Pendimethalin @ 1kg/ha as PPI/PRE in blackgram and greengram Use of Alachlor @ 1kg/ha as pre in Sesame

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	Deep to medium deep black soils	Soybean- Wheat/Chickpea	Sowing of pulses & oilseeds in place of cereals Prefer short duration low water requirement varieties of wheat.	Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea. Protective irrigation at CRI stage in wheat.

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SEHORE
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1070.3	More than 19%	Less than 866.943
June	139.8		
July	345.4		
August	355.1		
September	230		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	371444	Gross irrigated area:	536088
Net Rainfed area	25143	Gross rainfed area	347796

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	77002	85969
Wells	241165	367811
Tanks	25863	28866
Other sources	27414	53442

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	47424	46863	561
2	Jowar	3	-	
3	Maize	15482	99	15383
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	436		436
2	Groundnut	86		86
3	Sesamum	13		13
4	SOyabean	330590		330590
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	1		1
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	15	15	0
2	Tobacco	-		
3	Guar seed	-		218
4	Other Fodder crops	413	195	218

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
Early season drought (delayed onset)			Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
Delay by 4 weeks 2 nd week of July	Deep soil	Soybean	JS-93-05, JS 95-60	- Seed dressing with Thiram + carbendazim in equal ratio @3g/kg seed - Use biofertilizer (Rhizobium culture) - Planting on ridge and furrow system 25 % higher seed rate
		Maize	Maize (JM-216, JM-8, JM-12)	
		Sorghum	JJ-938, JJ-1041, JJ-1022, CSH-18	
		Pigeon pea	ICPL-87, ICPL87-119,	
	Shallow soil	Soybean	JS-93-05, JS 95-60	
		Maize	Maize (JM-216, JM-8, JM-12)	
		Sorghum	JJ-938, JJ-1041, JJ-1022, CSH-18	
		Pigeon pea	ICPL-87, ICPL87-119,	

Contingency measures- Mid season

Condition			Suggested contingency measures
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	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Deep soil	Soybean	- Weed management through intercultural operation between rows - Spray 2% solution of Murat of potash - Girdle beetle control by spraying of Quinalphos@2 ml / l water in Soybean	- Dust mulching through frequent interculture - Green leaf mulch in between crop rows - Supplemental irrigation through farm pond water/other sources - Top dressing of 10-20 kg N/ha to both the components after relief of dry spell
		Maize		
		Sorghum		
		Pigeon pea		
	Shallow soil	Soybean Maize Sorghum Pigeon pea		

Condition	Major Farming situation	Suggested contingency measures		
		Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At flowering/ fruiting stage	Deep soil	Soybean	20% defoliation in soybean - Insecticidal spray for control of green semi looper in soybean - Spray of anti transparent - Insecticidal spray for control of late shoot borer in sorghum	- Dust mulching through frequent interculture - Green leaf mulch in between crop rows - Supplemental irrigation through farm pond water/other sources
		Maize		
		Sorghum		
		Pigeon pea		
	Shallow soil	Soybean		
		Maize		
		Sorghum		
		Pigeon pea		

Contingency measures- End of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
			Crop management	Rabi Crop Planning
1	2	3	4	5
(Early withdrawal of monsoon)	Deep soil	Soybean	- Reduce the plant population in sorghum by uproot the plants from alternate row - Supplemental irrigation	- Prepare land either for rabi chickpea/safflower - Seed priming i.e Sowing of soaked seed of safflower/Chickpea - If the damage is very severe, plan for short duration crops like horsegram/fodder legumes
		Maize		
		Sorghum		
		Pigeon pea		
	Shallow soil	Soybean		
		Maize		
		Sorghum		
		Pigeon pea		

Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Delayed release of water in canals due to low rainfall	Deep soil	Chickpea	Chickpea JG 130	-Dry sowing followed by irrigation -Balanced fertilization -Application of vermi compost @3-4 t/ha . -Select short duration varieties for sowing -Seed dressing with Thirum+carbodezim in equal ratio @3g/kg seed -Water harvesting and use collected water as life saving irrigation -Cultivate the field on receiving pre monsoon showers -Need based irrigation by sprinkler
		Wheat	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	
	Shallow black soil	Chickpea	Chickpea JG 130	
		Wheat Lok-1	Wheat :HW 2004, Harshita	
		Lentil	Safflower JSF 7,JSF73 Potato(Kufari early)	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Limited release of water in canals due to low rainfall	Deep soils	Chickpea	Chickpea JG 130	Dry sowing followed by irrigation -Balanced fertilization -Application of wormi compost @3-4 t/ha -Select short duration varieties for sowing -Seed dressing with Thirum + carbodezim in equal ratio @3g/kg seed -Water harvesting and use collected water as life saving irrigation -Cultivate the field on receiving pre monsoon showers -Need based irrigation by sprinkler - Give irrigation using own source of available water plus tank water (conjunctive use)
		Wheat	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	
		Chickpea	Potato(Kufari early)	
	Shallow soils	Wheat Lok-1	Chickpea JG 130	
		Lentil	Wheat HW 2004, Harshita Potato(Kufari early)	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures	
			Change in crop/ cropping system	Agronomic measures
1	2	3	4	5
Non release of water in canals under delayed onset of monsoon in catchment	Deep black soils	Chickpea	Chickpea JG 130, JAKI-92-18	-Seed priming in water for 12-15 hrs - Give irrigation using own source of available water plus tank water (conjunctive use)
		Wheat	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	
	Shallow black soils	Chickpea	Chickpea JG 130, JAKI-92-18	
		Wheat Lok-1	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
			Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep black soils	Chickpea	Chickpea JG 130, JAKI-92-18	- Mulching in <i>kharif</i> and <i>rabi</i> crops - Supplemental irrigation by sprinkler
		Wheat	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	
	Shallow black soils	Chickpea	Chickpea JG 130, JAKI-92-18	
		Wheat Lok-1	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
			Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
Insufficient groundwater recharge due to low rainfall	Deep black soils	Chickpea	Chickpea JG 130, JAKI-92-18	- Mulching in <i>kharif</i> and <i>rabi</i> crops - Supplemental irrigation by sprinkler
		Wheat	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	
	Shallow black soils	Chickpea	Chickpea JG 130, JAKI-92-18	
		Wheat Lok-1	Wheat HW 2004, Harshita	
		Lentil	Potato(Kufari early)	

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SEONI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1018.1	More than 19%	Less than 824.661
June	168		
July	349.8		
August	283.1		
September	217.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	298358	Gross irrigated area:	426227
Net Rainfed area	102004	Gross rainfed area	331056

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	138235	197479
Wells	109881	156973
Tanks	15728	22469
Other sources	34514	49306

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	203694	103859	99835
2	Jowar	11	-	
3	Maize	187691	24143	163548
4	Bajra	-		
5	Ragi	1		1

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	812		812
2	Groundnut	665	49	616
3	Sesamum	260	4	256
4	SOyabean	755		755
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	217		217
2	Jute	-		
3	Mesta	-		
4	Sunhemp	31		31

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	453	453	0
2	Tobacco	-		
3	Guar seed	-		1088
4	Other Fodder crops	1100	12	1088

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
Early season drought (delayed onset)			Change in crop / cropping system including variety	Agronomic measures
Delay by 4 weeks 2 nd week of July	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Greengram/ Sesame	8. Blade harrowing (Bakhar) for moisture conservation. 9. Remove the weeds and use the uprooted weeds as mulch between row of crops for moisture conservation 10. Adopt of plant protection as per requirement and rainfall condition 11. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice under.
		Soybean – Wheat/Chickpea (Soybean – JS-9305, JS-335, JS-95 60)	Prefer early maturing varieties or Maize/ Greengram/ Blackgram	
		Maize– Wheat/Chickpea	Greengram/ Blackgram	
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Choose 100-110 days varieties Or Greengram/ Sesame	
		Maize– Wheat/Chickpea	Greengram/ Blackgram	
		Soybean	Prefer early maturing varieties or Greengram/ Blackgram	
	Shallow soils (mixed red & black soil with	Groundnut	Greengram/ Sesame	
		Soybean	Prefer early maturing varieties (JS-95 60) or	

	<1000 mm rainfall)		Greengram/ Blackgram	12.For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old.
		Maize	Greengram	
		Upland Rice	Greengram/ Blackgram/ Sesame	
		Minor millets	No change Or Sesame/ kodo & Kutki	

Contingency measures- Mid season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)			Crop management	Soil nutrient & moisture conservation measures
At vegetative stage	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Weed management with hand hoe	1. Interculture with Dora/Kulpha/Hand hoe in between rows and use of uprooted weeds use as mulch for moisture conservation 2.Application of FYM and vermicompost at the time of resowing. 3. Preparation of ridges at every 15-20 lines of crops for the moisture conservation
		Soybean – Wheat/Chickpea	Spraying of 2% Urea in cereals.	
		Maize– Wheat/Chickpea		
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Intercultural operations	
		Soybean		
		Maize– Wheat/Chickpea		
		Groundnut		
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Protective irrigation	
		Maize		
		Upland Rice		
		Minor millets		

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Weed management with hand hoe	1. Interculture with Dora/Kulpha/Hand hoe in between rows and use of uprooted weeds use as mulch for moisture conservation 1. Preparation of ridges at every 15-20 lines of crops for the moisture conservation
		Soybean – Wheat/Chickpea	Spraying of 2% Urea in cereals.	
		Maize– Wheat/Chickpea		
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Intercultural operations	
		Soybean		
		Maize– Wheat/Chickpea		
		Groundnut		
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Protective irrigation	
		Maize		
		Upland Rice		
Minor millets				

Contingency measures- End of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures	
Terminal drought			Crop management	Rabi Crop planning

(Early withdrawal of monsoon)				
	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Harvest crop at physiological maturity	Plan for early rabi cropping like Lentil, mustard & fieldpea can sow after 15 th September
		Soybean – Wheat/Chickpea		
		Maize– Wheat/Chickpea		
	Medium deep sandy loam soils (1100 mm rainfall)	Rice		In kharif Fallow fields the Rabi crops like Lentil, mustard & Chickpea can sow after 15 th September.
		Soybean		
		Maize– Wheat/Chickpea		
		Groundnut		
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean		
		Maize		
		Upland Rice		
		Minor millets		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed release of water in canals due to low rainfall	Low land medium black soils	Rice	Select 100-110 days maturing rice varieties	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Follow closer spacing in rice; Reduce the area under irrigated Rice Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses Irrigate at critical stages
		Soybean	Medium maturing varieties	Sowing in ridge and furrows Irrigate at critical stages
Limited release of water in canals due to low rainfall	Low land medium black soil	Rice	Reduce the area of Rice as per availability of water	Adopt closer spacing in rice Reduce the area under irrigated Rice Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses
		Soybean	Prefer short duration varieties	-
Non release of water in canals under delayed onset of monsoon in catchment	Low land medium black soil	Rice	Blackgram / Greengram	Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses Sowing of blackgram on ridges & furrows. Prepare furrows with suitable drainage
		Soybean		
Lack of inflows into tanks due to		Rice	70 to 100 days var. of Rice through broadcasting or line	Adopt Rice+Relay cropping/paira or

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
insufficient /delayed onset of monsoon	Low land medium black soil	Soybean	Sowing of short duration crops like Blackgram & sesame.	utera crop with any short duration pulses Adopt closer spacing

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	Upland medium black soils	Soybean	Prefer early maturing var. of soybean & rice in limited area.	Reduce the area under irrigated Rice
		Rice	Alternate crops like Blackgram / Greengram /Sesame.	Directed seeded rice

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SHAHNOL
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	992.8	More than 19%	Less than 804.168
June	130.4		
July	301		
August	330.6		
September	230.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	16229	Gross irrigated area:	99052
Net Rainfed area	193056	Gross rainfed area	197798

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	4835	29274
Wells	6273	31584
Tanks	422	4837
Other sources	4699	33357

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	183771	15872	167899
2	Jowar	55	-	
3	Maize	2258	15	2243
4	Bajra	21		21
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	5896	40	5856
2	Groundnut	9		9
3	Sesamum	2797	10	2787
4	SOyabean	3377	60	3317
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	18	18	0
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2 nd week of July	Upland unbunded shallow soils	Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,
		Kodo	Kodo- Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106	
		Kutki	Kutki - Jawahar Kutki 1, 2, 8, JK 36	
		Niger	Niger --JNC-6, JNC-1, JNC-9, JVN-1	
		Soybean	Soybean: JS 335, JS 95-60 Or Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19 Or Greengram: Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1	

			L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
	Upland banded shallow(gravelly sandu) soils	Paddy	Paddy: JR- 201	
		Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	
		Pigeonpea	Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189	
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil	Paddy: JR- 201	
		Paddy-Wheat/ lentil/Mustard		
		Soybean	Soybean: JS 335, JS 95-60	

Contingency measures- Mid season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil & moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)				
At vegetative stage	Upland unbanded shallow soils	Maize	Life saving irrigation if available Maintain optimum plant population	Provide Supplemental irrigation if available Mulching, Spray of anti-transpirants. Interculture with Dora/Kulpha/Hand hoe in between rows Use uprooted weeds as mulch for moisture conservation. Ridges are made after 15-20 lines of crops for the moisture conservation Adopt plant protection measures
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell)				
At Flowering stage	Upland unbanded shallow soils	Maize	Life saving irrigation if available -	5. Interculture with Dora/Kulpha/Hand hoe in between rows . 6. Use of uprooted weeds use as mulch for moisture conservation.
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		

	Lowland bunded deep and medium deep soils	Paddy-Chickpea/lentil		7. Ridges are made after 15-20 lines of crops for the moisture conservation 8. Adopt plant protection measures
		Paddy-Wheat/lentil/Mustard		
		Soybean		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Upland unbunded shallow soils	Maize	1. Life saving irrigation through sprinkler. 2. Soil moisture conservation by use of mulch. 3. Prefer to sow short duration crop varieties .	5. Prefer to sow Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 6. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 7. Sowing of small seeded grains mix with FYM and vermicompos 8. Apply light irrigation to Kharif crops for proper grain filling if required and this will helpful in field preparation of <i>Rabi</i> crops
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland bunded shallow (gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland bunded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/lentil/Mustard		
		Soybean		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed release of water in canals due to low rainfall	Medium deep to deep soils	Paddy-Wheat/ lentil/Mustard	Green gram-Mustard/ Black gram-Wheat/ Black gram- Chickpea Fallow-Chickpea Medium duration variety of Rice (JRH-4,5,8, MTU 1010, IR-64, PS-3,5,)	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give p re sowing irrigation to chickpea. Maintain optimum plant population
		Paddy-Chickpea/lentil		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Limited release of water in canals due to low rainfall	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Black gram/ Greengram-Wheat Limited irrigation requirement varieties of Wheat (JW 3020, JW 3173, 3269, HW 2004, Sujata) should be sown Limited irrigation requirement varieties of Chickpea (JG 218, 226, 130, 11, 14)	Adopt water saving methods like direct seeding seeded rice, SRI Cultivation, Aerobic rice Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give p re sowing irrigation to chickpea
		Rice -Chickpea		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Change in crop/cropping system	Agronomic measures
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Blackgram-Chickpea/ wheat	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Farm bundin Deep ploughing Mulching
		Rice -Chickpea		

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SHAJAPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	905.9	More than 19%	Less than 733.779
June	115.5		
July	293.7		
August	310.7		
September	186		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	254998	Gross irrigated area:	290943
Net Rainfed area	34404	Gross rainfed area	293040

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	3139	3139
Wells	208425	222766
Tanks	23314	23314
Other sources	20120	41724

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	30	0	
2	Jowar	10	-	
3	Maize	388		388
4	Bajra	1		1
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	92		92
2	Groundnut	191		191
3	Sesamum	5		5
4	SOyabean	286384		286384
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		1204
4	Other Fodder crops	1376	172	1204

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
1	2	3	4	5
Delay by 4 weeks 3rd week of July	Deep soil	Soybean- Chickpea	Early maturity crop/ varieties of Blackgram, Green gram and Arhar	Increase seed rate upto 20% • Supplemental irrigation if possible Proper manuring
	Shallow soils	Soybean – gram		

Contingency measures- Mid season

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
1	2	3	4	5

Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At vegetative stage	Deep soil	Soybean –Chickpea	Gap filling with improved varieties when the plant population is less ,around 70% than optimum Timely management of weeds	Use of dora / Kolpa for moisture conservation Use of organic mulch / plastic mulching to conserve moisture Life saving irrigation
	Shallow soils	Soybean – Gram		

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
1	2	3	4	5
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At flowering/ fruiting stage	Deep soil	Soybean –Chickpea	Timely management of weeds Spray 2% of urea or MOP during the dry spell Timely management of weeds	Use of dora / Kolpa for moisture conservation Use of organic mulch / plastic mulching to conserve moisture Life saving irrigation
	Shallow soils	Soybean – Gram		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop / Cropping system	Crop management	Rabi Crop Planning
1	2	3	4	5
	Deep soil	Soybean –Chickpea	Spray 2% urea solution or MOP during the dry spell life saving irrigation	If the damage is very severe, Plan for land preparation of rabi crops like mustard, taramira, safflower and linseed etc
	Shallow soils	Soybean – Gram		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/ cropping system	Change in crop/cropping system	Agronomic measures ⁱ
1	2	3	4	5
Delayed/ limited release of water in canals due to low rainfall	Deep black soil	Soybean- wheat/gram	Late sown var. wheat GW 173, GW-190 and Chickpea JG-130	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system
		Soybean-potato-onion	Soybean-wheat /Onion / Chickpea	Give irrigation at critical growth stages of crops
	Shallow soil	Soybean- wheat/gram	Late sown var. wheat GW 173, GW-190 and Chickpea JG-130	Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/ cropping system	Change in crop/cropping system	Agronomic measures ⁱ
		Soybean-potato-onion	Soybean-wheat /Onion / Chickpea	
Non release of water in canals under delayed onset of monsoon in catchment	Deep soil	Soybean-wheat/gram	Chickpea / mustard/ safflower / linseed /taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation
		Soybean-potato-onion		
	Shallow soil	Soybean-wheat/gram		
		Soybean-potato-onion		

Condition	Major Farming situation ^f	Crop/cropping system ^g	Suggested Contingency measures	
			Change in crop/ cropping system ^h	Agronomic measures ⁱ
1	2	3	4	5
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep soil	Soybean-wheat/gram	Chickpea / mustard/ safflower / linseed / taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation
		Soybean-potato-onion		
	Shallow soils	Soybean-wheat/gram		
		Soybean-potato-onion		
Insufficient groundwater recharge due to low rainfall	Deep soil	Soybean-wheat/gram	Chickpea / mustard/ safflower / linseed /taramira	Select drought tolerant short duration varieties Sow the crops on ridges and furrow system Mulching in crop rows Give irrigation at critical growth stages of crops Irrigation through micro irrigation systems like sprinkler/drip/ alternate furrow irrigation
		Soybean-potato-onion		
	Shallow soils	Soybean-wheat/gram		
		Soybean-potato-onion		

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SHEOPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	666.4	More than 19%	Less than 539.784
June	77.6		
July	242.1		
August	235.2		
September	111.5		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	168520	Gross irrigated area:	335294
Net Rainfed area	450	Gross rainfed area	18522

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	38000	38161
Wells	117373	275924
Tanks	1147	1231
Other sources	12000	19978

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	84046	84045	1
2	Jowar	169	169	0
3	Maize	2066	2066	0
4	Bajra	36468	36468	0
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	22	22	0
2	Groundnut	1832	1831	1
3	Sesamum	19610	1961	17649
4	SOyabean	7865	7865	0
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	52	52	0
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	8	8	0
2	Tobacco	-		
3	Guar seed	-		79
4	Other Fodder crops	115	36	79

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
Delay by 4 weeks	Shallow soils	Pearlmillet	JBV-2, 3,4 and HHB-67,	Increasing seed rate Fallow field cultivation Practices for control of weeds and moisture conservation
		Soybean	JS 93-05, JS 95-60	
		Green gram	JM-721	
	Deep soils	Pearlmillet	JBV-2, 3,4 and HHB-67,	
		Soybean	JS 93-05, JS 95-60	
		Pigeon pea	ICPL-87-119	

Contingency measures- Mid season

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long)	Shallow soils	Pearlmillet	Transplant per millet seedlings if gaps are more	Intercultural operation for conservation of moisture ,
		Soybean		

dry spell, consecutive 2 weeks rainless (>2.5 mm) period At vegetative stage		Green gram		Mulching , Supplemental irrigation
	Deep soils	Pearlmillet		
		Soybean		
		Pigeon pea		

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient and moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period At flowering/ fruiting stage	Shallow soils	Pearlmillet	-	Mulching
		Soybean		Top dressing of nitrogen of 20-30kg N after relief of dry spell
		Green gram		
	Deep soils	Pearlmillet		
		Soybean		Supplemental irrigation
		Pigeon pea		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop / Cropping system	Crop management	Rabi Crop Planning
	Shallow soils	Pearlmillet	Harvesting of crops at physiological maturity stage.	Supplemental irrigation
		Soybean		
		Green gram		
	Deep soils	Pearlmillet		
		Soybean		
		Pigeon pea		

Drought - Irrigated situation

Condition			Suggested Contingency measures	
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
	Shallow soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	- Organic mulch - Irrigation at critical growth stages - Increase seed rate by (10%).
	Deep soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	

Condition			Suggested Contingency measures	
Limited release of water in canals due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
	Shallow soils	Wheat	MP-4010, JW-173	Organic mulch

		Chick Pea Rape & Mustard	JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	• Irrigation at critical growth stages • Give irrigation using own source of available water plus tank water (conjunctive use)
	Deep soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	
Condition			Suggested Contingency measures	
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
	Shallow soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	• Organic mulch • Irrigation at critical growth stages • (sprinkler if feasible) • Increase seed rate by 50%
	Deep soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	

Condition			Suggested Contingency measures	
Insufficient groundwater recharge due to low rainfall	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures
	Shallow soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	- Mulching - Interculture - Irrigation at critical crop growth stages - Give irrigation using own source of available water plus tank water (conjunctive use)
	Deep soils	Wheat Chick Pea Rape & Mustard	MP-4010, JW-173 JG-412, Jaki-92-18, Vishal JM-1,2,3 and Pusa bold	

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SHIVPURI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	787.3	More than 19%	Less than 637.713
June	94.5		
July	286.2		
August	247.5		
September	159.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	353591	Gross irrigated area:	687617
Net Rainfed area	115598	Gross rainfed area	253679

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	93186	127817
Wells	213392	484838
Tanks	18701	30064
Other sources	28312	44898

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	67126	67126	0
2	Jowar	24	17	7
3	Maize	17126	7086	10040
4	Bajra	6838	3062	3776
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	6	5	1
2	Groundnut	150205	95092	55113
3	Sesamum	2412	583	1829
4	SOyabean	154607	56595	98012
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	2		2

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	343	343	0
2	Tobacco	-		
3	Guar seed	-		213
4	Other Fodder crops	705	492	213

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
Delay by 4 weeks (Specify month) 2 nd week July	1 Medium black soil rained	As above	Short duration soybean JS 95-60, JS 93-05, Sorghum JJ938,JJ1041+ black gram inter cropping and Improved JBV -3	-Select short duration crops - Ridge/BBF sowing of Kharif crops -Select short duration varieties for sowing -Seed dressing with Thirum+carbodezim in equal ratio @3g/kg seed -increase seed rate by 25% and reduce inter row spacing (30cm) -Cultivate the field on receiving pre monsoon showers
	2 Red and Yellow soil irrigated		Groundnut (GG 20, TAG 24)/Green Gram JM 721, K851, J45)-Chickpea (JG 130,	-Cultivate the field on receiving pre monsoon showers

			Pigeonpea (medium) cv.Asha	-Select short duration varieties -Need based irrigation by sprinkler using harvested water
			Pigeonpea (medium)+Black gram(JU2,JU3,JU 86)	
			Brinjal/tomato Kharif onion cv. Red agrifound	

Contingency measures- Mid season

Condition	Major Farming situation ^a	Crop/cropping system ^b	Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)			Crop management ^c	Soil nutrient & moisture conservation measures ^d
At vegetative stage	1 Medium black soil	Soybean Soybean + black gram	-Weed management through intercultural operation between rows -Spray of 2% solution of Muriate of potash -Spraying of PMA @3 ppm solution -Girdle beetle control by spraying of Quinalphos@2 ml/l water	-Frequent intercultural operations -Dust mulching/ green leaf mulch,
	2 Red and Yellow soil	Groundnut - wheat Blackgram + mustard/chickpea	-Weed management through intercultural operation between rows -Spray of 2% solution of Muriate of potash -Spraying of PMA @3 ppm solution -Girdle beetle control by spraying of Quinalphos@2 ml /l water -Life saving irrigation by sprinkler system	

Condition	Major Farming situation ^a	Crop/cropping system ^b	Suggested Contingency measures	
Mid season drought (long dry spell)			Crop management ^c	Soil nutrient & moisture conservation measures ^d
At flowering /fruiting stage	1 Medium black soil rain fed	Soybean Black gram	-20% defoliation in soybean, and sorghum	-
			-Spraying of PMA @3ppm solution	-
			-Insecticidal spray for control of green semi looper in soybean and late shoot borer in sorghum	-
	2 Red and Yellow soil	Soybean-chickpea Soybean-wheat	-20% defoliation in soybean, and sorghum -Supplemental irrigation by sprinkler system -Spraying of PMA @3ppm solution -Insecticidal spray for control of green semi looper in soybean and late shoot borer in sorghum	

Contingency measures- End of the season

Condition			Suggested Contingency measures
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Terminal drought (Early withdrawal of monsoon)	Major Farming situation^a	Crop/cropping system^b	Crop management^c	Rabi Crop planning^d
	1 Medium black soil rained	Soybean Black gram	-Reduce the plant population in sorghum by uproot the plants from alternate row	---
			Water spray	
			Harvest at physiological maturity	
	2 Red and Yellow soil	Groundnut - Fellow Soybean - Chickpea	Reduce the plant population in sorghum by uproot the plants from alternate row	seed priming i.e Sowing of soaked seed of safflower /gram
			Life saving irrigation	
			Harvest at physiological maturity	
			Supplemental irrigation	

Drought - Irrigated situation

Brought - Irrigated situation				
Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Delayed release of water in canals due to low rainfall	Medium black soil	Chickpea	Chickpea	-Dry sowing followed by irrigation -Balanced fertilization -Application of wormicompost @3-4 t/ha.
		Wheat Lok-1	Wheat :MP 3020, HW 2004, Harshita	
	Red and Yellow	Chickpea	Chickpea JG 11, JG130	
Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Limited release of water in canals due to low rainfall	Medium black soil		Chickpea JG 11, JG 130 Wheat :MP 3020, HW 2004, RVS 4106	Dry sowing followed by irrigation -Balanced fertilization -Application of wormi compost @3-4 t/ha
	Red-Yellow soil		Chickpea JG 14, JG 130, Wheat :HW 2004, Harshita	Dry sowing followed by irrigation -Balanced fertilization Application of wormi compost @3-4 t/ha

Condition			Suggested Contingency measures	
	Major Farming situation^f	Normal Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ
Non release of water in canals under delayed onset of monsoon in catchment	Medium black soil	Chick pea	Chickpea JG130, Coriander	Seed priming in water for 12-15 hrs
	Red-yellow soil	Chick pea	Chickpea JG130, Coriander	Seed priming in water for 12-15 hrs

Condition			Suggested Contingency measures	
	Major Farming situation^f	Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ
Insufficient groundwater recharge due to low rainfall	Medium black soil	Soybean Black gram-chick pea Maize fodder	Soybean JS 95 60, Black gram (Pratap 1) Maize/sorghum+black gram	-Mulching in kharif and rabi crops -Supplemental irrigation by sprinkler
	Red - Yellow soil	Groundnut Black gram-chick pea Maize fodder	Early groundnut-chickpea small seeded /safflower	

Condition			Suggested Contingency measures	
	Major Farming situation ^f	Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Any other condition (specify)	-	-	-	-

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	SIDHI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1047.8	More than 19%	Less than 848.718
June	142.6		
July	336.7		
August	286.9		
September	281.6		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	142312	Gross irrigated area:	232089
Net Rainfed area	7812	Gross rainfed area	60505

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	34350	44350
Wells	78422	132138
Tanks	9430	10150
Other sources	20110	45451

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	115212	104228	10984
2	Jowar	1889	77	1812
3	Maize	2241	33	2208
4	Bajra	9		9
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	16554	589	15965
2	Groundnut	-		
3	Sesamum	7279	84	7195
4	SOyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	2		2

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		9
4	Other Fodder crops	19	10	9

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2nd week of July	Bunded low lands deep to medium deep black soils	Rice-Wheat	Rice – IR-36, JR-201, Poornima, JR-503, Vandna	1. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 2. Blade harrowing (Bakhar) for moisture conservation
	Unbunded upland shallow soils	Rice-Wheat Rice - Chickpea	No Change Rice -Upland field: IR-36, JR-201, JR-503, Vandna, Poornima, Ananda, Narendra 97, Govinda and Hybrid rice JRH 4, 5 and 8	
		Pigeonpea	Pigeonpea - Pragati, Jagriti, Asha, Nmuber-148, JKM-7, JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189	

		Blackgram	Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19 Greengram: Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
		Sesame	No change	
		Minor millets	Kodo - Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 Kutki - Jawahar Kutki 1, 2, 8, JK 36	

Contingency measures- Mid season

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Bunded low lands deep to medium deep black soils	Rice-Wheat	4. Line sowing of Lentil, Linseed, Chickpea in moist zone 5. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 6. Sowing of small seeded grains mix with FYM and vermicompost	Prefer the alternate crops like Lentil, Linseed, Chickpea, irrigated and unirrigated wheat -Line sowing of Lentil, Linseed, Chickpea in moist zone
	Unbunded / bunded upland shallow soils	Rice-Wheat		
		Rice - Chickpea		
		Pigeonpea		
		Blackgram		
		Sesame		
		Minor millets		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed release of water in canals due to low rainfall	Rain fed Upland shallow soils	Rice-Wheat/ Maize- Linseed / Rice- Chickpea/ Rice- Lentil/ Pigeon pea / Sorghum-potato-Late wheat (Local & improved var.)	Rice-Linseed/ Maize- Linseed	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Prefer early maturing Cultivars. Irrigate at critical stages
	Irrigated (Mid land & low lands)			
	Medium black & red soils			

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Limited release of water in canals	Rain fed upland shallow soils	Rice- Mustard / Rice-Linseed	Rice-Wheat	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice
			Green gram-Mustard	
		Maize-Linseed	Pigeon pea	

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
due to low rainfall	Irrigated (Mid land & low lands)	Rice-Wheat/ Rice -Chickpea	Rice-Chickpea	Maintain optimum plant population
			Black gram-Wheat	
		Sorghum- Lentil	Green gram	
	Medium black & red soils	Green gram-Wheat (Early)	Green gram-Wheat(Early)	Conservation tillage

Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Non release of water in canals under delayed onset of monsoon in catchment	Rain fed upland shallow soils	Sorghum- Linseed	Maize-Wheat (Early)	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Pigeon pea- Prefer early maturing varieties and sow on ridges Sorghum: Prefer dual purpose varieties/ hybrids Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS
		Maize-Mustard	Black gram-Mustard	
		Green gram-Mustard	No change	
	Irrigated Low and, Mid lands)	Rice-chickpea	Maize-Wheat (Early)	
		Sorghum-field pea	Green gram-Wheat(Early)	
		Pigeon pea	Green gram-Wheat(Early)	
	Medium black & red soils	Green gram-Wheat	No change	

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Rain fed upland shallow soils	Rice-Wheat	Black gram-Mustard	Rice- Adopt water saving methods like direct seeded rice, SRI Pigeon pea- Prefer early maturing varieties and sow on ridges Sorghum: Prefer dual purpose varieties/ hybrids Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS
		Pigeon pea	Maize-Lentil	
		Rice -Chickpea	Green gram- Linseed	
	Irrigated Low and, Mid lands)	Black gram-Wheat	Green gram- Linseed	
		Rice-chickpea	Maize-Wheat (Early)	
		Sorghum-field pea	Green gram-Wheat (Early)	
		Pigeon pea	Green gram-Wheat (Early)	
	Medium black & red soils	Green gram-Wheat	Green gram-Wheat (Early)	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Rain fed	Rice-Wheat	Fallow-Chickpea		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	upland red loamy soils		Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice	RKVY, NFSM, ISOPOM, NREGS
		Rice-Chickpea	Fallow-Lentil		
		Green gram-Wheat	Maize-Linseed		
	Irrigated Low and, Mid lands)	Black gram-Wheat	Black gram	Pigeon pea- Prefer early maturing varieties and sow on ridges Sorghum: Prefer dual purpose varieties/ hybrids Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS	
		Rice-chickpea	Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.		
		Sorghum-Field pea	Green gram-Wheat (Early)		
		Pigeon pea	Green gram-Wheat (Early)		
	Medium black & red soils	Green gram-Wheat	Green gram-Wheat (Early)	Prefer low water requirement cultivars; Weed management	
Chickpea		Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea			

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	TIKAMGARH
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	911.8	More than 19%	Less than 738.558
June	115.8		
July	317.2		
August	295.4		
September	183.4		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	217912	Gross irrigated area:	243589
Net Rainfed area	8336	Gross rainfed area	189299

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	23980	24027
Wells	168769	192761
Tanks	14707	15532
Other sources	10456	11269

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	1397	0	
2	Jowar	119	-	
3	Maize	121		121
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	35		35
2	Groundnut	59597	22109	37488
3	Sesamum	13301		13301
4	SOyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	41	41	0
2	Tobacco	-		
3	Guar seed	-		73
4	Other Fodder crops	115	42	73

Crop Plan- Beginning of the season

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
Delayed 4 weeks 2 nd week of July	Shallow sandy soils (Padua)	Soybean	Avoid Soybean (Can be sow upto 10 th july) Prefer Blackgram/ Greengram	3. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 4. Blade harrowing (Bakhar) for moisture conservation
		Blackgram	LBG-20,Azad-1,Azad-3	
		Greengram	PDM-139,HUM-1	
	Red medium soils (Rakar soils)	Maize	Sesame: TKG-21,TKG-22,JTS-8,TKG-306 Blackgram: LBG-20,Azad-1,Azad-3 Greengram: PDM-139,HUM-1	
		Soybean	Don't sow soybean (Can be sow upto 10 th july) Prefer Blackgram/ Greengram and sesame Sesame: TKG-21,TKG-22,JTS-8,TKG-306 Blackgram: LBG-20,Azad-1,Azad-3	

			Greengram: PDM-139,HUM-1	
		Sesame	TKG-21,TKG-22,JTS-8,TKG-306	
		Groundnut	JM-24	
		Kodo	Vamban-1,GPUK-3	
	Black soils (Kabar and Mar soils)	Rice	Pusa-1121,JR-201	1. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 2. Blade harrowing (Bakhar) for moisture conservation
		Pigeonpea	UPAS-120,JKM-7,JA-4	

Contingency measures- Mid season

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
At vegetative stage	Shallow sandy soils (Padua)	Soybean	Give life saving/ supplemental irrigation if available Maintain optimum plant population Adopt plant protection measures	Weeding With hand wheel hoe; Interculture for dust mulching Conservation furrows Life saving irrigation
		Blackgram		
		Green gram		
	Red medium soils (Rakar soils)	Maize	Weeding and interculture Give life saving/ supplemental irrigation if available Maintain optimum plant population Adopt plant protection measures	Use of uprooted weeds use as mulch for moisture conservation. Ridges are made after 15-20 lines of crops for the moisture conservation
		Soybean		
		Sesame		
		Ground nut		
		Kodo		
		Pigeonpea		
	Black soils (Kabar and Mar soils)	Rice	Weeding and interculture; Give life saving/ supplemental irrigation if available Maintain optimum plant population Adopt plant protection measures	
		Pigeonpea		

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Shallow sandy soils (Padua)	Soybean	Give life saving/ supplemental irrigation if available Adopt plant protection measures	Weeding With hand wheel hoe; Interculture for dust mulching Conservation furrows Life saving irrigation
		Blackgram		
		Green gram		
	Red medium soils (Rakar soils)	Maize	Give life saving/ supplemental irrigation if available Adopt plant protection measures	Ridges are made after 15-20 lines of crops for the moisture conservation
		Soybean		
		Sesame		
		Ground nut		
		Kodo		
		Pigeonpea		

	Black soils (Kabar and Mar soils)	Rice	Give life saving/ supplemental irrigation if available	Inter cultivation
		Pigeon pea	Adopt plant protection measures	

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Shallow sandy soils (Padua)	Soybean	Give life saving/ supplemental irrigation if available	Plan for wheat, if pre sowing irrigation is available (JW-17,HW-2004) Mustard short duration varieties- Pusa Agarani
		Blackgram		
		Green gram		
	Red medium soils (Rakar soils)	Maize	Give life saving/ supplemental irrigation if available	Plan to sow for rabi Mustard (short duration varieties- Pusa Agarani) ,Linseed (JLS-9,vegetables)
		Soybean		
		Sesame		
		Ground nut		
		Kodo		
		Pigeonpea		
	Black soils (Kabar and Mar soils)	Rice	Give life saving/ supplemental irrigation if available	
		Pigeonpea		

Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow to medium soils (Rakar & Padua)soil)	Sorghum (Jowar)	Prefer fodder sorghum (MP Chari,Jawahar Chari-6,Jawahar Chari-69,Pusa chari-23)	Adopt spacing of 45X12 cm, Apply 100:50:40 NPK Kg/ha
		Maize (Makka)	Prabhat, Prabha	Adopt spacing of 60X25 cm, Apply 120:60:40 NPK Kg/ha
		Sesame	JTS-8, TKG-306	Adopt spacing of 30x10 cm, Apply 60:40:20 NPK Kg/ha
	Heavy soils (Kabar and Mar)	Rice	-	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt plant planking to conserve the

Condition			Suggested Contingency measures	
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
				moisture for rabi cropping

Condition			Suggested Contingency measures	
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ
Insufficient groundwater recharge due to low rainfall	Shallow to medium soils (Rakar & Padua)soil)	Black gram	LBG-20, Azad-1, PU-19, PDU-1	Adopt spacing of 30X10 cm, Apply 20:60:20: NPK Kg/ha+Rhizo+PSB@2.5 Kg/ha Follow the seed @15Kg/ha
		Green gram	PDM-139,HUM-1	Adopt spacing of 30X10 cm, Apply 20:60:20: NPK Kg/ha+Rhizo+PSB@2.5 Kg/ha Follow the seed @15Kg/ha
		Sesame	TKG-21,TKG-22,JTS-8,TKG-306	Adopt spacing of 30X10 cm, Apply 20:60:20: NPK Kg/ha+Rhizo+PSB@2.5 Kg/ha Follow the seed @15Kg/ha
	Heavy soils (Kabar and Mar)	Kodo	Vamban-1,GPUK-3	Adopt spacing of 40x08 cm, Apply 40:20:20 NPK Kg/ha Follow the seed @15Kg/ha
		Sorghum	JS 1041, CHS -15	Adopt spacing of 45x10cm Apply 80 : 40 : 20 NPK Kg/ha Follow the seed @15Kg/ha

Resource management technologies

- Rainwater harvesting and its efficient use through construction and renovation of water storage structures.
- Rainwater harvesting and its efficient use through temporary sandbag checkdam.
- De-silting of open wells and recharging of borewells to enhance water availability.
- Contour cultivation for reducing soil erosion.
- Ridge and furrow for in-situ moisture conservation in maize and soybean.
- Zero-tillage in wheat-black gram-cropping system.
- Broad bed and furrow (BBF) to minimize the impact of moisture stress and water logging.
- Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall.
- Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing.
- Efficient use of harvested water through sprinkler irrigation for wheat.
- Efficient use of harvested water for high value crops using drip irrigation.
- Direct Seeded Rice for saving water and labour.
- Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	UJJAIN
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	884.4	More than 19%	Less than 716.364
June	119.7		
July	287.8		
August	286.2		
September	190.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	513581	Gross irrigated area:	513848
Net Rainfed area	4924	Gross rainfed area	519492

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	9836	9846
Wells	463583	463766
Tanks	9277	9317
Other sources	30885	30919

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	0	0	
2	Jowar	12	-	
3	Maize	172		172
4	Bajra	8		8
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	31		31
2	Groundnut	64		64
3	Sesamum	5		5
4	SOyabean	515179		515179
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	11	11	0
2	Tobacco	7		7
3	Guar seed	-		1459
4	Other Fodder crops	2393	934	1459

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d
1	2	3	4	5
Delay by 4 weeks (Specify month)	Deep black soil	Soybean-Wheat	early maturing var. of soybean <i>i.e.</i> JS 93-05, JS 95-60 followed by wheat	Apply 20 % higher seed rate
		Soybean-Gram	Soybean/urad/Mung/Tur/Maize/Gram	Apply 20 % higher seed rate and 20% reduced fertilizers
	Shallow Soil	Soybean-Gram	Urad(JU-86) followed by gram var. <i>i.e.</i> JG-74, U-21	Apply 20 % higher seed rate and 20% reduced fertilizers

Contingency measures- Mid season

Condition			Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d

1	2	3	4	5
At vegetative stage	Deep black soil	Soybean – Wheat	Foliar application of 2% urea or MOP during the dry spell Apply Kulpa for weed management	Dust mulch through frequent interculture Organic mulch in crop rows Ridges and furrows/BBF system Life saving irrigation
		Soybean - Gram	Foliar application of antitransparent and growth regulators	
	Shallow Soil	Soybean – Gram	Foliar application of antitransparent and growth regulators	

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Soil nutrient & moisture conservation measures^d
1	2	3	4	5
At flowering/ fruiting stage	Deep black soil	Soybean – Wheat		Dust mulch through frequent interculture organic mulch in crop rows Life saving irrigation of farm pond water
		Soybean - Gram	Foliar application of cycocel or 2% urea /MOP during the dry spell Weed management	
	Shallow Soil	Soybean - Gram	Foliar application of cycocel or 2% urea /MOP during the dry spell Weed management	

Contingency measures End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Rabi Crop planning^d
1	2	3	4	5
	Deep black soil	Soybean - Wheat		If the damage is severe, Plan for land preparation of chickpea/mustard apply dry sowing for gram/mustard and use moisture conservation tillage
		Soybean – Gram		
	Shallow Soil	Soybean – Gram	Foliar application of cycocel/ urea @% during the dry spell Life saving irrigation	

Resource management technologies

Rainwater harvesting and its efficient use through construction and renovation of water storage structures, temporary sandbag check dam, De-silting of open wells and recharging of borewells to enhance water availability, Contour cultivation for reducing soil erosion, Ridge and furrow for in-situ moisture conservation in maize and soybean, Zero-tillage in wheat-black gram-cropping system in bundelkhand, Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall, Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing, Efficient use of harvested water for high value crops using drip irrigation, Direct Seeded Rice for saving water and labour, On farm production of organic inputs through NADEP composting, On-farm production of vermicompost, Soil fertility enhancement through green manuring, Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	UMARIA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1075.6	More than 19%	Less than 871.236
June	150.4		
July	305.6		
August	352.2		
September	267.4		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	69543	Gross irrigated area:	149985
Net Rainfed area	45790	Gross rainfed area	69635

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	3218	3834
Wells	60587	109819
Tanks	2620	2960
Other sources	3118	33372

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	98317	64880	33437
2	Jowar	10	-	
3	Maize	2164	17	2147
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	7192	59	7133
2	Groundnut	-		
3	Sesamum	1273	12	1261
4	SOyabean	614	9	605
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		59
4	Other Fodder crops	59		59

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delay by 4 weeks 2 nd week of July	Upland unbunded shallow soils	Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,
		Kodo	Kodo - Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106	
		Kutki	Kutki - Jawahar Kutki 1, 2, 8, JK 36	
		Niger	Niger ---JNC-6, JNC-1, JNC-9, JVN-1	
		Soybean	Soybean : JS 335, JS 95-60 Or Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19 Or Greengram : Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1	

			L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139	
	Upland banded shallow(gravelly sandu) soils	Paddy	Paddy: JR- 201	
		Maize	Donot sow maize Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.	
		Pigeonpea	Pigeonpea- Pragati ,Jagriti,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189	
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil	Paddy: JR- 201	
		Paddy-Wheat/ lentil/Mustard		
		Soybean	Soybean: JS 335, JS 95-60	

Contingency measures- Mid season and End of the season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)			Crop management	Soil & moisture conservation measures
At vegetative stage	Upland unbanded shallow soils	Maize	Life saving irrigation if available Maintain optimum plant population	1. Provide Supplemental irrigation if available 2. Mulching, 3. Spray of anti-transpirants. 4. Interculture with Dora/Kulpha/Hand hoe in between rows 5. Use uprooted weeds as mulch for moisture conservation. 6. Ridges are made after 15-20 lines of crops for the moisture conservation 7. Adopt plant protection measures
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/ lentil/Mustard		
		Soybean		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
Mid season drought (long dry spell)			Crop management	Soil nutrient & moisture conservation measures
At Flowering stage	Upland unbanded shallow soils	Maize	Life saving irrigation if available	9. Interculture with Dora/Kulpha/Hand hoe in between rows . 10. Use of uprooted weeds use as
		Kodo		
		Kutki		
		Niger		
		Soybean		
		Paddy	-	

	Upland banded shallow(gravelly sandu) soils	Maize		mulch for moisture conservation. 11. Ridges are made after 15-20 lines of crops for the moisture conservation 12. Adopt plant protection measures
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/lentil/Mustard		
		Soybean		

Contingency measures- End of the season

Condition			Suggested Contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Upland unbanded shallow soils	Maize	1. Life saving irrigation through sprinkler. 2. Soil moisture conservation by use of mulch. 3. Prefer to sow short duration crop varieties .	9. Prefer to sow Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 10. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 11. Sowing of small seeded grains mix with FYM and vermicompos 12. Apply light irrigation to Kharif crops for proper grain filling if required and this will helpful in field preparation of <i>Rabi</i> crops
		Kodo		
		Kutki		
		Niger		
		Soybean		
	Upland banded shallow(gravelly sandu) soils	Paddy		
		Maize		
		Pigeonpea		
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil		
		Paddy-Wheat/lentil/Mustard		
		Soybean		

1.2

Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Medium deep to deep soils	Paddy-Wheat/ lentil/Mustard	Green gram-Mustard/ Black gram-Wheat/ Black gram- Chickpea Fallow-Chickpea Medium duration variety of Rice (JRH-4,5,8, MTU 1010, IR-64, PS-3,5,)	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea. Maintain optimum plant population	--
		Paddy-Chickpea/lentil			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Black gram/ Greengram-Wheat	Adopt water saving methods like direct seeding seeded rice, SRI Cultivation, Aerobic rice	-
		Rice -Chickpea	Limited irrigation requirement varieties of Wheat (JW 3020, JW 3173, 3269, HW 2004, Sujata) should be sown Limited irrigation requirement varieties of Chickpea (JG 218, 226, 130, 11, 14)	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Wheat Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat. Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early) Blackgram-Chickpea/ wheat	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage Farm bundin Deep ploughing Mulching	-

Resource management technologies

Rainwater harvesting and its efficient use through construction and renovation of water storage structures, temporary sandbag check dam, De-silting of open wells and recharging of borewells to enhance water availability, Contour cultivation for reducing soil erosion, Ridge and furrow for in-situ moisture conservation in maize and soybean, Zero-tillage in wheat-black gram-cropping system in bundelkhand, Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall, Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing, Efficient use of harvested water for high value crops using drip irrigation, Direct Seeded Rice for saving water and labour, On farm production of organic inputs through NADEP composting, On-farm production of vermicompost, Soil fertility enhancement through green manuring, Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	VIDISHA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1023.3	More than 19%	Less than 828.873
June	142.8		
July	337.9		
August	339.4		
September	203.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	472610	Gross irrigated area:	566451
Net Rainfed area	61001	Gross rainfed area	478771

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	90554	90554
Wells	124667	126789
Tanks	25887	25887
Other sources	231502	323221

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	67907	41188	26719
2	Jowar	1588	-	
3	Maize	7657	34	7623
4	Bajra	10		10
5	Ragi	1		1

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	110	19	91
2	Groundnut	47		47
3	Sesamum	56	3	53
4	SOyabean	409846		409846
5	Sunflower	2		2
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	10		10

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	11	8	3
2	Tobacco	-		
3	Guar seed	-		125
4	Other Fodder crops	197	72	125

Crop Plan- Beginning of the season

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 4 weeks 2 nd week of July	Deep black soils	Soybean/ Blackgram/ Maize/ Sorghum/ Pigeonpea	Don't prefer soybean, sorghum and continue Maize, Blackgram, Pigeonpea Prefer Pigeonpea- Pragati , Jagriti, Asha ,Nmuber-148,JKM-7, JA-4, Type-21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189 Greengram- Pusa vishal,K851,JM721,Jawahar 99 -37,Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684, TAU-1,Berkha, Sesame- TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1	1. Blade harrowing (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon 2. Increase seed rate 25 % under late sowing condition. 3. Sowing of crops against the slope in ridge and furrow methods 4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 4. Application of balanced fertilizer and biofertilizer according recommendation of the crop and application of zinc where deficiency is occurred. 5. Sowing of crops against the slope depends on crops. 6. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 7. Adoption of plant protection as per requirement. 8. Application of biofertilizer and potash fertilizer under late sown condition	SAU's Beej Nigam, NSC
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Contingency measures- Mid season

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 measues	Remarks on Implementation
At vegetative stage	Deep black soils	Soybean/ Blackgram/ Maize/ Sorghum/ Pigeonpea	Mainting optimum plant population Gap filling in case of poor plant stand Foliar spray of nutrients in pulses DAP 2.5%, Non pulses – Urea 2%	Frequent interculture	-

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
At flowering/ fruiting stage	Deep black soils	Soybean/ Blackgram/ Maize/ Sorghum/ Pigeonpea	Foliar spray of nutrients in pulses DAP 2.5%, Non pulses – Urea 2%	Life saving irrigation by sprinkler method Mulching	-

		Frequent interculture	
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Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Deep black soils	Soybean/ Blackgram/ Maize/ Sorghum/ Pigeonpea	Life saving irrigation, harvesting of crop at physiological maturity	Early sowing of wheat/Chickpea (Rainfed wheat, barley, oilseed & pulses)	-
				1) Moisture conservation practice adopt and destroy the weed under early withdrawal of monsoon for <i>Rabi</i> season 2) Preference will be given on sowing of Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 3) Increase seed rate up to 25% in late sown condition 4) Line sowing of Lentil, Linseed, Chickpea in moisture zone 5) Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed then after treated with biofertilizers 6) Sowing of small seeded grains mix with FYM and vermicompost 7) Apply light irrigation to <i>Kharif</i> crops for proper grain filling if required, this will be helpful in field preparation for <i>Rabi</i> crops	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed/ limited release of water in canals due to low rainfall	Deep black soils	Soybean/ Blackgram/ Maize/ Sorghum/ Pigeonpea- Wheat /Chickpea/lentil/linseed	In case of severe shortage of water in canals, plan for sowing of soybean with short duration varieties (JS-335, JS-9560)	Dry sowing followed by irrigation. Balanced application of fertilizers.	
			Mustard – Pusa, Jaikisan, Pusa bold, Varuna		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			Pulses – Lentil JL-3, Noorie		
			Chickpea – JG-11,12,14		
			Pea – Rachna, JP-885		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Medium to shallow soils	Soybean-wheat /Chickpea/lentil/linseed	Fallow-Chickpea/ Linseed/ Lentil Use of short duration varieties of Soybean (JS-335, JS-95-60) or Blackgram,greengram, sesame etc. Prefer dual purpose sorghum at large scale	Application of vermicompost. Raised bed sowing Interculture operation. Provide life saving irrigation at critical stages. Pre sowing irrigation is given for good germination Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS	SAU's Beej Nigam, NSC
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium to shallow soils	Soybean-wheat /Chickpea/lentil/linseed	Fallow-Chickpea/ Linseed/ Lentil In case of soybean, adopt sowing on ridges and give one pre sowing irrigation and if necessary one irrigation at critical stage i.e., pod development to be given	Supplement irrigation by using sprinkler method Mulching Life saving irrigation at critical stages	SAU's Beej Nigam, NSC
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Medium to shallow soils	Soybean-wheat /Chickpea/lentil/linseed	Fallow-Chickpea/ Linseed / Lentil Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	Supplement irrigation using sprinkler. Use of mulches. Interculture Irrigate the crop at critical stages and if possible with sprinklers Mulching. Adopt furrow irrigation and use of micro-irrigation system	SAU's Beej Nigam, NSC

Resource management technologies

Rainwater harvesting and its efficient use through construction and renovation of water storage structures, temporary sandbag check dam, De-silting of open wells and recharging of borewells to enhance water availability, Contour cultivation for reducing soil erosion, Ridge and furrow for in-situ moisture conservation in maize and soybean, Zero-tillage in wheat-black gram-cropping system in bundelkhand, Furrow irrigated raised bed (FIRB) planting for conserving moisture and minimizing the impact of excess rainfall, Modified seed drill (sweep seed drill) for simultaneous operation of ridge and furrow making and sowing, Efficient use of harvested water for high value crops using drip irrigation, Direct Seeded Rice for saving water and labour, On farm production of organic inputs through NADEP composting, On-farm production of vermicompost, Soil fertility enhancement through green manuring, Utilization of renewal energy through biogas plant.

Actionable Comprehensive Plans for Contingency

State	MADHYA PRADESH	District	WEST NIMAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	719.3	More than 19%	Less than 582.633
June	124.7		
July	214.5		
August	212		
September	168.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	329485	Gross irrigated area:	626071
Net Rainfed area	68409	Gross rainfed area	158952

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	6580	110712
Wells	268519	434359
Tanks	2940	4852
Other sources	51446	76148

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	20	2	18
2	Jowar	478	26	452
3	Maize	60777	19235	41542
4	Bajra	16	7	9
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	2343	687	1656
2	Groundnut	1208	747	461
3	Sesamum	5	2	3
4	SOyabean	100466	7607	92859
5	Sunflower	1		1
6	Castor	1515		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	219905	204115	15790
2	Jute	-		
3	Mesta	-		
4	Sunhemp	3		3

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	3584	3074	510
2	Tobacco	-		
3	Guar seed	-		211
4	Other Fodder crops	567	356	211