State: **Madhya Pradesh**

Agriculture Contingency Plan: **Agar Malwa District**

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**	IX		
	Agro Ecological Sub Region (ICAR)	Sub region No.13, AE Sub region 5.2, Agro ecological region :$I_5 D_2$ & $I_5 C_3$		
	Agro-Climatic Region (Planning Commission)	Sub Zone 24, ACZ 9.3, Region : Central Plateau, PCS3		
	Agro Climatic Zone (NARP)	Malwa Plateau Agro-ecological Zone (X)		
	List all the districts or part thereof falling under the NARP Zone	Indore, Ujjain, Ratlam, Mandsour, Nimach, Rajgarh, some part of Dhar and Jhabua district		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		23.06 ^{0} to 24.19 ^{0} N	75.41 ^{0} to 77.02^0 E	453 MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station, College of Agriculture, Old Sehore road near to Daly college, Indore Madhya Pradesh-452 001		
	Mention the KVK located in the district	Krishi Vigyan Kendra, Girwar, Shajapur (M.P.) 465001		
1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	697.6	3rd week of June	Last week of Sept
	NE Monsoon (Oct-Dec)	221		
	Winter (Jan- March)	00	-	-
	Summer (Apr-May)	00	-	-
	Annual	927	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	618	6	102	50	10	--	2	--	--

1. 4	**Major Soils**	Area (‘000 ha)	Percent (%) of total
	1. Deepk soil	442.20	71.43
	2. Mediun deep soil	30.80	5.02
	3. Shallow soils	145.40	23.55
1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	419	172
	Area sown more than once	302	
	Gross cropped area	455	

1.6	**Irrigation**	Area (‘000 ha)	Percent (%)	
	Net irrigated area	281	56	
	Gross irrigated area	282	55	
	Rainfed area	-	-	
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals	67	10.4	-
	Tanks	109	7.3	-
	Open wells	61759	145	-
	Bore wells	18657	86.8	-
	Lift irrigation	-	31	-
	Other sources	-	281	-
	Total	69506	-	-
	Pumpsets	-	-	-
	Micro-irrigation	22	--	-
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited	-	114%	-
	Critical	-	-	-
	Semi- critical	-	-	-
	Safe	-	-	-
	Wastewater availability and use	-	-	-

1.7		**Major Field Crops cultivated**	**Area ('000 ha)***		
			Total area	**Irrigated**	**Rainfed**
	1	**Soybean**	**312**	**--**	***312***
	2	Jowar	25	-	25
	3	Maize	46	-	46
	4	Gram	152	152	-
	5	Wheat	96	96	-
		Horticulture crops - Fruits	-	-	-
		Mango	0.56	-	-
		Guava	0.455	-	-
		orange	22.052	-	-
		Sweet Lime	1.679	-	-
		Lemon	0.312	-	-
		Grapes	0.015	-	-
		Pomegranate	0.16	-	-
		Aamla	1.543	-	-
		Custard Apple	0.614	-	-
		Papaya	0.254	-	-
		Others	1.257	-	-
		Horticulture crops - Vegetables	-	-	-
		Tomato	0.998	-	-
		Potato	6.927	-	-
		Okra (Ladies finger)	1.375	-	-
		Brinjal	0.837	-	-
		Green Peas	2.541	-	-
		Cauliflower	0.826	-	-
		Cabbage	0.545	-	-
		Kaddu Vargoya	0.963	-	-
		Bitter guard	0.269	-	-
		Others	1.474	-	-
		Horticulture crops - Spices	-	-	-
		Coriander	16.274	-	-
		Chilly	1.680	-	-
		Garlic	6.141	-	-
		Onion	14.659	-	-

		Turmeric	0.057	-	-
		Ginger	0.049	-	-
		Sauf	0.019	-	-
		Fenugreek seed	1.249	-	-
		Cumin seeds	0.016	-	-
		Kaloji	0.064	-	-
		Ajwain	0.015	-	-
		Others	0.400	-	-
		Horticulture crops - Medicinal and Aromatic		-	-
		Ashwa Gandha	0.057	-	-
		Chandra Sur	0.034	-	-
		Isabgol	0.023	-	-
		Basil	0.031	-	-
		Lkalmegh	0.019	-	-
		Musli	0.004	-	-
		Sarp Gandha	0.002	-	-
		Shatawari	0.002	-	-
		Sanaya	0.018	-	-
		Others	0.021	-	-
		Horticulture crops - Flowers	-	-	-
		Rose	0.064	-	-
		Mari Gold	0.334	-	-
		Morga	0.011	-	-
		Gladiolus	0.014	-	-
		Glardiya	0.100	-	-
		Bijli	0.056	-	-
		Others	0.057	-	-
		Total fodder crop area	-	-	-
		Grazing land	-	-	-
		Sericulture etc	-	-	-
		Others (Specify)	-	-	-

Area under major field crops & horticulture etc.

*If break-up data (irrigated, rainfed) is not available, give total area

1.8	**Livestock**	**Number ('000)**		
	Cattle	446		
	Buffaloes total	305		
	Commercial dairy farms	-		
	Goat	200		
	Sheep	0.67		
	Others (Camel, Pig, Yak etc.)	3.04		
1.9	**Poultry**	-		
	Commercial	25.5		
	Backyard	3.0		
1.10	**Fisheries**	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water	-	-	--
	Fresh water	-	-	-
	Others	-	-	-

1.11	**Production and Productivity of major crops** (Average of last 3 years: 2006, 07, 08)	***Kharif***		***Rabi***		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Crop 1	Soybean	328	989	-	-	-	-	328.0	989
Crop 2	Gram	68.2	1100	-	-	-	-	68.2	1100
Crop 3	Wheat	95	3150	-	-	-	-	95.0	3150
Crop 4	Maize	77.2	1790	-	-	-	-	77.2	1790
Crop 5	Jowar	37.2	1370	-	-	-	-	37.2	1370
	Major Horticultural crops - Fruits								
	Mango	-	-	-	-	-	-	42.6	7602
	Guava	-	-	-	-	-	-	58.8	12932
	orange	-	-	-	-	-	-	2851.4	12930
	Sweet Lime	-	-	-	-	-	-	292.3	17409
	Lemon	-	-	-	-	-	-	53.9	17276
	Grapes	-	-	-	-	-	-	0.2	1467
	Pomegranate	-	-	-	-	-	-	51.1	31931
	Aamla	-	-	-	-	-	-	123.71	8017.50

	Custard Apple	-	-	-	-	-	-	62.42	10166.12
	Papaya	-	-	-	-	-	-	71.17	28019.69
	Others	-	-	-	-	-	-	401.66	31953.86
	Horticultural crops - Vegetables								
	Tomato	-	-	-	-	-	-	253.74	25432.19
	Potato	-	-	-	-	-	-	1392.93	20109.58
	Okra (Ladies Finger)	-	-	-	-	-	-	124.05	9022.00
	Brinjal	-	-	-	-	-	-	164.38	19636.66
	Green Peas	-	-	-	-	-	-	54.18	2132.03
	Cauliflower	-	-	-	-	-	-	211.04	25545.94
	Cabbage	-	-	-	-	-	-	143.88	26424.24
	Kaddu Vargoya	-	-	-	-	-	-	107.31	11148.57
	Bitter guard	-	-	-	-	-	-	27.23	10124.74
	Others	-	-	-	-	-	-	185.85	12608.21
	Horticultural crops - Spices								
	Coriander	-	-	-	-	-	-	233.75	1436.30
	Chilly	-	-	-	-	-	-	90.10	5363.13
	Garlic	-	-	-	-	-	-	65.63	1068.57
	Onion	-	-	-	-	-	-	2836.02	19346.60
	Turmeric	-	-	-	-	-	-	10.85	19117.60
	Ginger	-	-	-	-	-	-	9.87	19989.67
	Sauf	-	-	-	-	-	-	0.24	1232.01
	Fenugreek seed	-	-	-	-	-	-	49.75	3981.34
	Cumin seeds	-	-	-	-	-	-	0.20	1259.75
	Kaloji	-	-	-	-	-	-	0.94	1474.95
	Ajwain	-	-	-	-	-	-	0.18	1166.01
	Others	-	-	-	-	-	-	12.02	3004.82

	Horticultural crops - Medicinal and Aromatic								
	Ashwa Gandha	-	-	-	-	-	-	0.74	1460.00
	Chandra Sur	-	-	-	-	-	-	0.58	1693.55
	Isabgol	-	-	-	-	-	-	0.35	1521.65
	Basil	-	-	-	-	-	-	0.46	1487.66
	Lkalmegh	-	-	-	-	-	-	0.28	1431.82
	Musli	-	-	-	-	-	-	0.11	2438.64
	Sarp Gandha	-	-	-	-	-	-	0.02	1000.00
	Shatawari	-	-	-	-	-	-	0.02	1000.00
	Sanaya	-	-	-	-	-	-	0.30	1687.50
	Others	-	-	-	-	-	-	0.36	1723.92
	Horticultural crops - Flowers								
	Rose	-	-	-	-	-	-	2.91	4566.06
	Mari Gold	-	-	-	-	-	-	17.32	5197.69
	Morga	-	-	-	-	-	-	0.31	2661.40
	Gyadilous	-	-	-	-	-	-	0.27	2000.00
	Glardiya	-	-	-	-	-	-	4.77	4756.63
	Bijli	-	-	-	-	-	-	2.24	4043.60
	Others	-	-	-	-	-	-	1.14	2018.52

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Crop 1:Soybean	2: Maize	3: Jowar	4: Wheat	5: Gram
	Kharif- Rainfed	June-July	June-July	June-July	-	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	-	October-November	October
	Rabi-Irrigated	-	-	-	November-December	November

1.13	**What is the major contingency the district is prone to? (Tick mark)**	Regular			Sporadic (specify month of occurrence in brackets)			None
		Severe	Moderate	Mild	Severe	Moderate	Mild	
	Drought	-	-	-	-	-	√	-
	Flood	-	-	-	-	-	-	√
	Cyclone	-	-	-	-	-	-	√
	Hail storm	-	-	-	-	√	-	-
	Heat wave	√	-	-	-	-	-	-
	Cold wave	-	√	-	-	-	-	-
	Frost	-	-	√	-	-	-	-
	Sea water inundation	-	-	-	-	-	-	√
	Pests and diseases (specify)	-	-	-	-	-	-	-

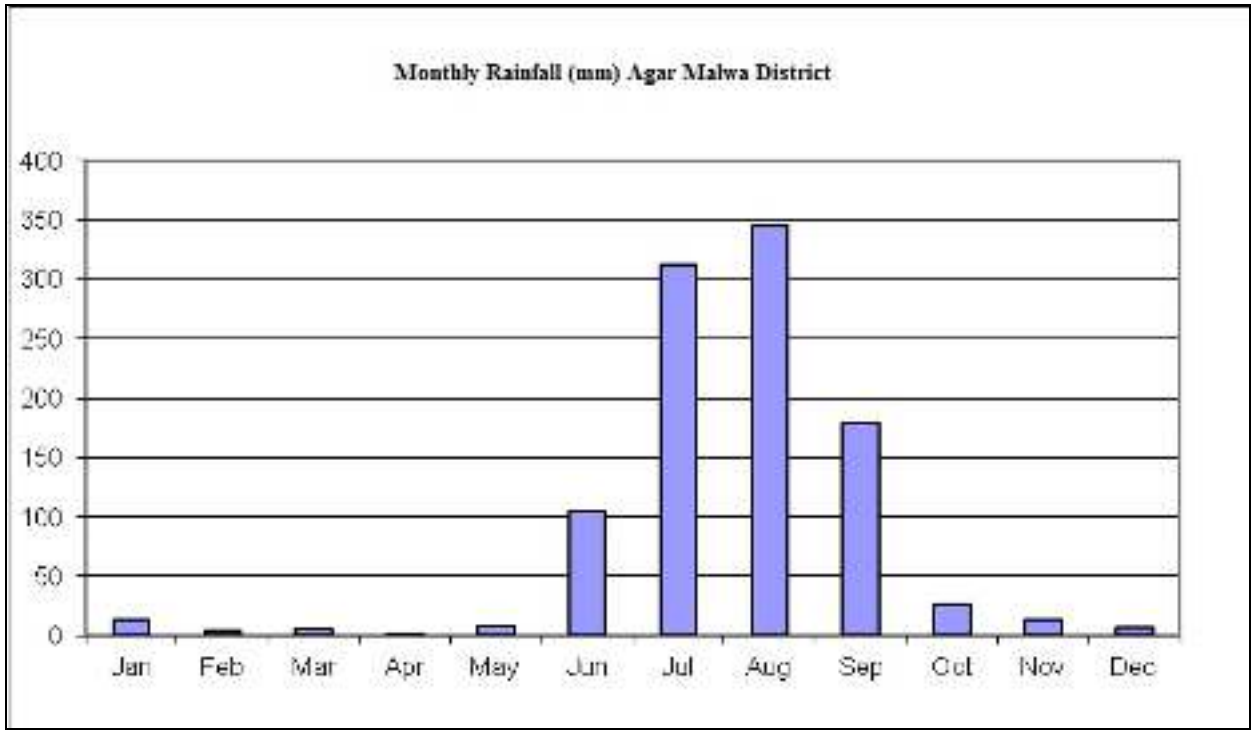
1.14	**Include Digital maps of the district for**	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I
Location map of Agar Malwa District

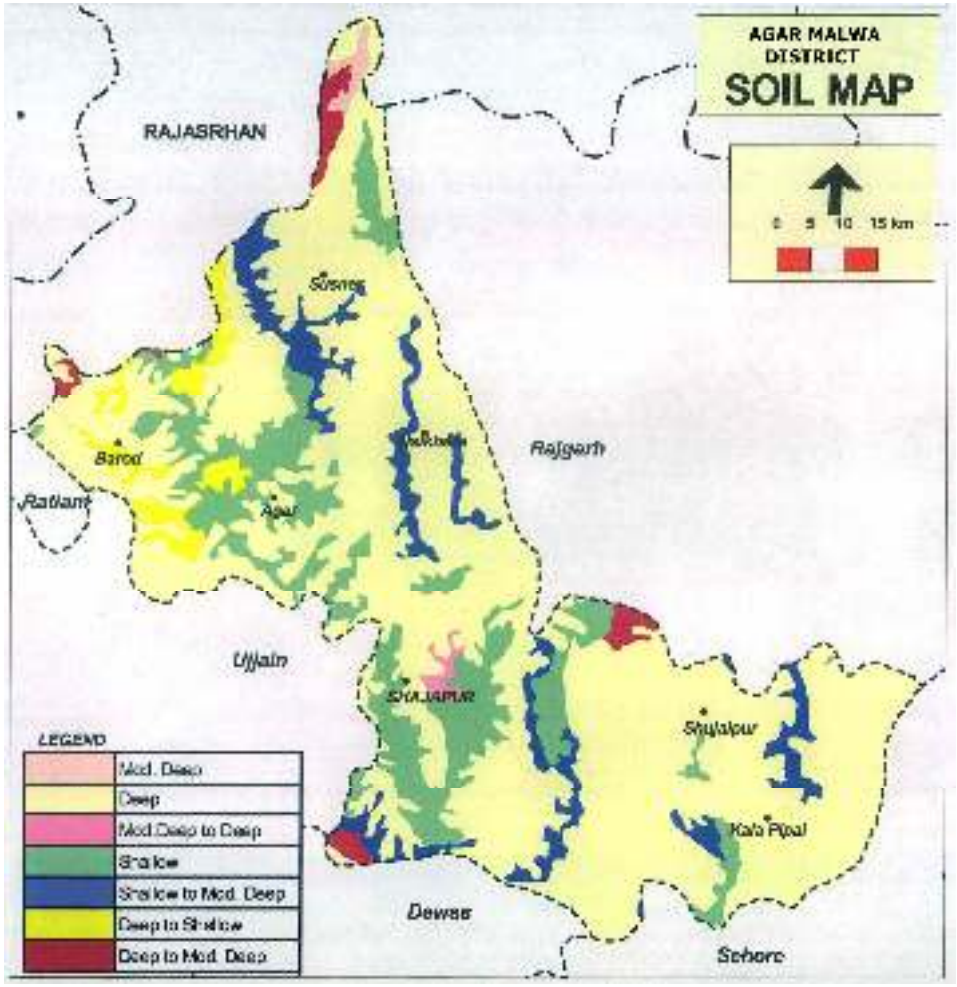

Morena
Bhind
Gwalior
Datia
Sheopur
Shivpuri
Tikamgarh
Chhatarpur
Rewa
Satna
Ashok Nagar
Guna
Panna
Sidhi
Singrauli
Neemuch
Mandsaur
Vidisha
Sagar
Damoh
Agar Malwa
Rajgarh
Katni
Umaria
Ratlam
Ujjain
Shajapur
Bhopal
Raisen
Jabalpur
Shahdol
Jhabua
Sehore
Narsinghpur
Anuppur
Indore
Dewas
Hoshangabad
Dindori
Dhar
Mandla
Seoni
Alirajpur
Harda
Chhindwara
Barwani
Khargone
Khandwa
Betul
Balaghat
Burhanpur

Annexure II

Mean annual rainfall



Annexure III
Soil map



(Source: NBSS&LUP, Amravati Road, Nagpur)

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 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 2 weeks **1st week of July**	Deep soil	Soybean-Chickpea	Early variety of crop like blackgram, arhar and greengram	Soil mulching by Dora and kolpa 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			

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 **3rd 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			

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**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 6 weeks **1st week of Aug**	Deep soil	Soybean-chickpea	Early maturity crop/ varieties of blackgram , sesame, sunflower, arhar and green gram	Increase seed rate upto 20% Use intercropping Proper manuring Use bio-fertilizer and moisture conservation practices	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			

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 8 weeks **3rd week of Aug**	Deep soils	Soybean –chickpea	Green manure crops like sunnhemp, sanai, dancha, blackgram, toria and greengram	Straw Mulching Increase seed rate upto 20% Proper manuring Use bio-fertilizer and moisture conservation practices	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			

Condition			Suggested Contingency measures	
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient and moisture conservation measures**
1	2	3	4	5
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	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
	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
6Mid 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		

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		

2.1.2 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 Soybean-potato-onion	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
	Shallow soils	Soybean-wheat/ gram Soybean-potato-onion			
Insufficient groundwater recharge due to low rainfall	Deep soil	Soybean-wheat/ gram Soybean-potato-onion	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
	Shallow soils	Soybean-wheat/ gram Soybean-potato-onion			

2.2 Unusual rains (untimely, unseasonal etc)

Condition - Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
1	2	3	4	5
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Soybean	• Drain excess water • Ridge and furrow system of planting • Top dressing with N 10-20 kg/ha at optimum soil moisture • Intercultivation to loosen the soil and to improve aeration	• Drain excess water • Ridge and furrow system of planting • Top dressing with N 10-20 kg/ha at optimum soil moisture • Intercultivation to loosen the soil and to improve aeration	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place • Preparation of proper threshing floor	Shifting of produce at safe place
Maize	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Earthing	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Earthing	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Dry the produce up to 10- 12 % moisture before storage
Wheat	• Drain excess water • Ridge and furrow system of planting • Top dressing with N 20-30 kg/ha at optimum soil moisture to regain vigour • Intercultivation to loosen the soil and to improve aeration			
Chickpea	• Drain excess water • Ridge and furrow system of planting • Top dressing with N 10-20 kg/ha at optimum soil moisture • Intercultivation to loosen the soil	• Drain excess water • Intercultivation to loosen the soil and improve aeration • Foliar spray with 2% urea/DAP to regain lost vigour	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Dry the produce up to 10- 12 % moisture before storage

	and to improve aeration			
Sorghum	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Earthing	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Earthing	-do-	-do-
Horticulture				
Orange	• Drain excess water • Interculture at optimum soil moisture to improve soil aeration • Apply Bordeaux paste	• Drain excess water • Nutrient spray of NAA 10 ppm + 1% urea to prevent flower drop	• Drain excess water • Timely harvest to avoid losses	Grading of fruits, cleaning of mold affected ones followed by washing and waxing
Condition-Heavy rainfall with high speed winds in a short span				
Soybean	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture	• Drain excess water • Intercultivation to loosen the soil and improve aeration • Foliar spray with 2% urea/DAP to regain lost vigour	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Maintain optimum moisture content in grain by drying before bagging and marketing
Maize	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Earthing	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Earthing up	-do-	-do-
Wheat	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Adopt need based plant protection measures	• Drain excess water • Adopt need based plant protection measures • Harvest on a clear sunny day	Maintain optimum moisture of grain by drying
Chickpea	• Drain excess water • Foliar spray with 2% urea after	• Drain excess water • Foliar spray with 2% urea after	• Drain excess water • Timely harvest of	Shifting to safer place and drying of the produce before bagging

	cessation of rains	cessation of rains	produce on a clear sunny day	and storage
Sorghum	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Earthing	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Earthing up	-do-	-do-
Horticulture				
Orange	• Drain excess water • Provide bamboo staking to less than 3 year aged plants to avoid lodging	• Drain excess water • Provide bamboo staking to less than 3 year aged plants to avoid lodging	Drain excess water	Collection and grading of fallen fruits followed by washing, waxing and marketing
Condition-Outbreak of pests and diseases due to unseasonal rains				
Soybean	• Early planting to minimize the incidence of girdle beetle and green semilooper • Foliar spray with 5% NSKE or dimethoate 30 EC 1 ml/l to protect against semilooper • Spray NSKE 5%, erect bird perches	• Monitor adult moth activity of spodoptera through pheromone traps (5 traps/ha) • Apply quinalphos 25 EC 20 ml/10 lit or emamectin benzoate 5 SG 4 g/10 lit to control spodoptera • Spray NSKE 5%, erect bird perches	• Early planting to minimize the incidence of girdle beetle and green semilooper • Foliar spray with 5% NSKE or dimethoate 30EC 1 ml/l to protect against semilooper	• Monitor adult moth activity of spodoptera through pheromone traps (5 traps/ha) • Apply quinalphos 25 EC 2 ml/l or Emamectin benzoate 5 SG 4 g/10 lit to control spodoptera
Maize	Whorl application of phorate 10 G or carbofuran 3 G @ 8-10 kg/ha to control shoot borer attack	• Spray of mancozeb @ 2 g / lit 0.4% at 8-10 days interval to control *Turcicum* leaf blight	*Trichoderma* mixed @10 g/kg with FYM at 10 days prior to its use in the field can be applied to control stalk rot incidence which is likely during post flowering	-
Wheat	Spray 0.2 % mancozeb against wheat rust.	Spray 0.2 % mancozeb against wheat rust	Spray 0.2 % mancozeb against wheat rust	-

Chickpea	• Spray triazophos 40 % EC @ 1.5 lit/ha in chickpea against pest incidence. • 'T' shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of quinalphos 25 EC or chlorpyriphos 20 EC C or methyl parathion 50 EC @ 600 ml mixed in 500 L of water should be used. Dusting of felvunerate 0.4% or endosulphan 4% 15-20 kg or quinalphos 1.5 WP 20-25 kg /ha with duster.	• Spray triazophos 40 % EC @ 1.5 lit/ha in chickpea against pest incidence. • 'T' shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of quinalphos 25 EC or chlorpyriphos 20 EC C or methyl parathion 50 EC @ 600 ml mixed in 500 L of water should be used. Dusting of felvunerate 0.4% or endosulphan 4% 15-20 kg or quinalphos 1.5 WP 20-25 kg/ha with duster.	• Spray triazophos 40 % EC @ 1.5 lit/ha in chickpea against pest incidence. • Carry out critical survey of fields for insect and disease attack in crops	-
Sorghum	Whorl application of phorate 10 G or carbofuran 3 G @ 8-10 kg/ha to control shoot borer attack	• Spray of mancozeb @ 2 g/ lit at 8-10 days interval to control *Turcicum* leaf blight	*Trichoderma* mixed @10 g/kg with FYM at 10 days prior to its use in the field can be applied to control stalk rot incidence which is likely during post flowering	-
Horticulture				
Orange	Protect against citrus psylla with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml/10 lit	Protect against citrus psylla with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml/10 lit	•	

2.3 Floods: NA

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days	-	-	-	-
Sea water inundation	**NA**	-	-	-

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	-	-	-	-
Soybean	-	-	-	-
Maize	-	-	-	-
Wheat	-	-	-	-
Chickpea	-	-	-	-
Sorghum	-	-	-	-
Horticulture				
Orange	Increase the frequency of irrigation Use temporary shade net Mulching	Increase the frequency of irrigation Pruning of damaged branches/twigs	Increase the frequency of irrigation Mulching to reduce soil temperature Pruning damaged parts and apply Bordeaux paste 1% to cut ends	Immediate harvesting of fruits, grading and marketing
Cold wave				
Soybean	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	Harvest at physiological maturity
Maize	-do-	-do-	-do-	-do-
Wheat	-do-	-do-	-do-	-do-
Chickpea	-do-	-do-	-do-	-do-
Sorghum	-do-	-do-	-do-	-do-

Horticulture				
Orange	Protect with polythene sheet	Smoking, frequent and light irrigation during evening hours, basin mulching, apply supplementary dose of fertilizer	Smoking, frequent and light irrigation during evening hours, basin mulching, apply supplementary dose of fertilizer	-
Frost				
Soybean	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	Harvest at physiological maturity
Maize	-do-	-do-	-do-	-do-
Wheat	-do-	-do-	-do-	-do-
Chickpea	-do-	-do-	-do-	-do-
Sorghum	-do-	-do-	-do-	-do-
Horticulture				
Orange	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	Harvesting of crop as early as possible and marketed or keep in cold store Store the produce in shed or safe place.
Hailstorm				
Soybean	Resowing in case of severe damage	Light and frequent irrigation	Apply 10% additional nitrogen Light and frequent irrigation	Timely harvesting and shifting of produce to safer place in case of early forewarning
Maize	-do-	-do-	-do-	-do-
Wheat	-do-	-do-	-do-	-do-
Chickpea	-do-	-do-	-do-	-do-
Sorghum	-do-	-do-	-do-	-do-
Horticulture				
Orange	-	Prune damaged branches and twigs and apply Bordeaux paste 1% to avoid fungal infections	Prune damaged branches and twigs and apply bordeaux paste 1% to avoid fungal infections Apply hormonal spray NAA 20 ppm + 1% urea to prevent flower drop	Immediate harvesting, grading and marketing of produce
Cyclone	**NA**			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measures**		
	Before the event	**During the event**	**After the event**
Feed and fodder availability	Adoption of fodder bank, Use of surplus fodder for silage, Urea treatment: 4 kg Urea 75 litter of water 100 kg fodder. Insurance	Use of reserve fodder Use of stored silage Balance ration Use of chaffed fodder Transportation of fodder from adjoining districts if excess there Use unconventional feeds as a source of roughage, use urea treated roughage, use urea molasses block as a source of nitrogen and energy. Use low quality processed with mild acid and alkali treatment.	Feeding green feed/ fodder and conventional feed. Regularly sprinkling of water on live stock body. Use of wet *bhusa*. Availing the insurance. Separation of unproductive livestock. .
Drinking water	Provision of hygienic supply of water . Storage of water in the tank for drinking Excavations of bore wells	Judicious use of stored water. Use of potassium permanganate 1ppm, Heat treatment of Water before use.	Ensure the cleanlinell of drinking water Water treated with quick lime
Health and disease management	Deworming, Regular vaccination of HS, BQ and FMD Provision of mineral mixture	Treatment of sick animal through camp. Isolation of sick animals	Culling of sick animal Vaccination & deworming
Floods	NA **(Not occur in the district)**		
Cyclone	NA **(Not occur in the district)**	NA	
Cold wave			
Shelter/environment management	House of animal should be N-S direction Plan of proper housing, Collection of waste gunny bags for shelter	Availability of full sun rays in animal shed, keep animal body warm Use of gunny bags to cover the windows during night hours	Adopt curative measures to obtain the milk production level Keep environment uniformly to recover animal
Health and disease management	Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event Storage for balanced ration	Treatment of sick animals Balanced ration Use of warm water Inhalation of *Eucalyptus* water	Vaccination & deworming Culling of sick animals

Heat wave			
Shelter/environment management	Provision of proper shade Provision of trees Reflector paints over roof, two times bathing of animals.	Provision of cold water Keep environment uniformly to recover animal	Vaccination & deworming
Health and disease management	-Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event -Use suitable drugs depending on condition.	Vaccination & deworming	

2.5.2. Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event	**During the event**	**After the event**	
Drought	Insurance of birds	Keep watch on mortality and adopt measures	Materialized the benefit of insurance	Convergence with alling department Linkage with local poultry departments
Shortage of feed ingredients	-Storage of food ingredients	Mineral mixture feeding, use unconventional feed in feeding of poultry ration, use animal protein source like fish meal, silk worm pupa, blood meal by products of slaughter house etc, ration should be made from locally available feed ingredients.	Feeding high quality balance fee	
Drinking water	-Storage of Sanitized drinking water	Judicious use of stored water	Fresh drinking water	
Health and disease management	Deworming Vaccination Deticking of shed Provision of rapid growing strain	Use of high weight gain breeding stock Treatment of sick birds	Vaccination and deworming Culling of sick birds	
Floods	**NA - Not occur in the district**			
Cyclone:	**NA - Not occur in the district**			

Heat wave and cold wave				
Shelter/environment management	-Repair of sheds -Use of sprinklers for maintenance of temperature -Storage of local available food grains/feed ingredients	-Down the curtain of windows -lighting in the shed in cold condition -maintain the temperature of shed	Feeding high quality balance feed	Culling of sick birds
Health and disease management	Deworming Vaccination	Vaccination and deworming, use anti stress drugs and liver tonic during feeding and drinking.	Vaccination and deworming	
		Deworming Deticking		

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture	NA		
Marine	NA	-	-
Inland	NA		
(i) Shallow water depth due to insufficient rains/inflow	All the fish should be marketed Shifting of small sized fishes to small storage water bodies such as Plastic or cemented structures	Harvesting of fish Shifting of small sized fishes to in small storage water bodies such as Plastic or cemented structures Provision of net-shed over the tank Dry ponds should be treated with lime	Safe disposal of first event of runoff for storage of only clean water Waste ware should be protected by net for stay of fishes in the tank. After onset of monsoon and ponds fill with water seedling the fish seed
(ii Impact of heat and salt load build up in ponds / change in water quality	Apply the lime to neutralize the concentrated water	Apply the lime to neutralize the concentrated water	Safe disposal of first event of runoff for storage of only clean water Waste ware should be protected by net for stay of fishes in the tank. After onset of monsoon and ponds fill with water seedling the fish seed
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	-	Aeration	Rain Gun (Oxygen)
(ii) Impact of salt load build up in ponds / change in water quality	-	-	-

2) Floods			
NA			
B. Aquaculture			
(i) Inundation with flood water	Keeps net in waste weir of ponds	Protect the fish to flow with runoff water	
(ii) Water contamination and changes in water quality	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
(iii) Health and diseases	-do-	-do-	-do-
(iv) Loss of stock and inputs (feed, chemicals etc)	Manufactured feed should be given in ponds	Manufactured feed should be given in ponds	Natural feed should be available in ponds
(v) Infrastructure damage (pumps, aerators, huts etc)	Dust and debris should be clean in west wear.	Continuous Dust and debris cleans in west wear.	-
3. Cyclone / Tsunami : No any possibilities of event in the district			
NA	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	Net-shed	-	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	Showering of water by pump for proper O_2 in water	Showering of water by pump for proper O_2 in water	-
(ii) Health and Disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-