State: Madhya Pradesh

Agriculture Contingency Plan for District: Datia

1.0 District Agriculture profile

1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Semi-arid Lava Plateau and Central Highlands			
	Agro-Climatic Zone (Planning Commission)	Central Plateau and Hills Region			
	Agro Climatic Zone (NARP)	Bundelkhand Zone			
	List all the districts or part there of falling under the NARP Zone	Datia, Tikamgarh and Chhatarpur			
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**	
		25^0 20" - $25^0$28" North	78.10^0 – 78.45^0 East	-	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station (RVSKVV), Near Commissioner office A-B Road , Morena -476001 (M. P.)			
	Mention the KVK located in the district	Programme Coordinator, Krishi Vigyan Kendra, Jhansi Road, Distt. Datia – 475661			
1.2	**Rainfall**	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	809.00	37	III week of June	2^{nd} Week of September
	NE Monsoon(Oct-Dec):	67.30	4	-	-
	Winter (Jan- Feb.)	-	-	-	-
	Summer (Mar-May)	-	-	-	-
	Annual	876.30	41	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable 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 (old fallow)
	Area ('000 ha)	295.9	186.7	29.4	23.8	4.6	10.3	2.8	12.7	16.5	9.1

Source – Directorate of Farmers welfare and Agriculture, Development of Madhya Pradesh, Bhopal, Agriculture Statistics 2009.

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soil	133.92	68.6
	2. Medium deep soils	49.20	25.20
	3. Shallow soils	12.15	6.20

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	195.959	117.6
	Area sown more than once	34.533	
	Gross cropped area	230.492	

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	172.430		
	Gross irrigated area	175.732		
	Rainfed area	58.062		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals	03	105.969	61.46
	Tanks			
	Open wells	24856	59.601	34.57
	Bore wells	414	5.469	3.17
	Lift irrigation schemes	NA	-	-
	Micro-irrigation	NA	-	-
	Other sources (reservoir)		1.391	0.80
	Total Irrigated Area		172.430	
	Pump sets	28083	-	-
	No. of Tractors	6478	-	-

	Groundwater availability and use* (Data source: State/Central Ground water Department / Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			Nitrate (Presence of Chemical constituents more than permissible limit (e.g. EC, F, As, Fe)
	Safe	03 blocks	100	Type of Water - Alkaline
	Wastewater availability and use			
	Ground water quality			
***over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%**				

**Source :District Ground Water Information Booklet Ministry of Water Resources Central Ground Water Board North Central Region Government of India BHOPAL July' 2009

1.7 Area under major field crops & horticulture etc. (2010-11)

1.7		Major Field Crops cultivated	Area ('000 ha)							
			Kharif			Rabi			Summer	Total
		Kharif crops	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	1	Black Gram		22.20	22.20					22.20
	2	Groundnut		10.40	10.40					10.40
	3	Sesame		34.30	34.30					34.30
	4	Wheat				135.00				135.00
	5	Gram				30.60	7.00	37.60		37.60
	6	Pea				21.50				21.50
	7	Mustard				19.50				19.50
		Horticulture crops - Fruits	**Total area (ha)**			**Irrigated**		**Rainfed**		
	1	Guava	21.00					21.00		
	2	Lime	56.00					56.00		
	3	Aonla	31.00					31.00		
		Others (specify)								

		Horticultural crops - Vegetables	Total area (ha)	Irrigated	Rainfed
	1	Tomato	146.00	146.00	
	2	Potato	405.00	405.00	
	3	Brinjal	85.00	85.00	
	4	Table pea	700.00	700.00	
	5	Cauliflower	138.00	138.00	

		Spices crops	Total area (ha)	Irrigated	Rainfed
	1	Coriander	131.00	131.00	
	2	Chilli	210.00	210.00	
	3	Garlic	158.00	158.00	

		Flower crops	Total area (ha)	Irrigated	Rainfed
	1	Marry gold	35.00	35.00	
	2	Rose	9.55	9.55	

1.8		Plantation crops	Total area	Irrigated	Rainfed
	1	Teak wood	0.25		0.25
	2	Mahua	1.50	Trees of Mahua found in forest and cultivated	1.50
	3	Bans			
		Others such as industrial pulpwood crops etc (specify)			
		Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	1	Barseem	0.20	0.20	
	2	Jowar	0.10	0.10	
		Others (specify)			
		Total fodder crop area			
		Grazing land	14.15		14.15
		Sericulture etc			
		Others (Specify)			

	Non descriptive Cattle (local low yielding)	502.78	493.40	996.18
	Crossbred cattle	0.010	0.775	0.785
	Non descriptive Buffaloes (local low yielding)	0.874	904.34	905.214
	Graded Buffaloes	0.085	2.67	2.755
	Goat			122.86
	Sheep			21.86
	Others (Pig, ,horse etc.)			11.791
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	5	40.92	
	Backyard	10	2.67	

*Source - State Veterinary Department, Datia (MP) 2010-11

1.10	**Fisheries**						
	A. Capture						
	i) **Marine** (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		Nets		Storage facilities (Ice plants etc.)
			Mechanized	**Non-mechanized**	**Mechanized (Trawl nets, Gill nets)**	**Non-mechanized (Shore Seines, Stake & trap nets)**	
		-	-	-	-	-	-
	ii) **Inland** (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		09		30		30	

	B. Culture			
		Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)			
	ii) **Fresh water** (Data Source: Fisheries Department)	106.230	1.16	68.80
	Others			

*Source -State Fisheries Department Datia (2010-11)

1.11 Production and Productivity of major crops (Average of last 5 years: 2004to 08)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
1	Black Gram	17.31	780					17.31	780	13.84
2	Groundnut	13.38	1325					13.38	1325	16.19
3	Sesame	28.80	800					28.80	800	75.00
4	Wheat			385.80	2858			385.80	2858	482.25
5	Gram			47.10	1253			47.10	1253	35.32
6	Pea			18.30	850			18.30	850	9.15
7	Mustard			20.50	1053			20.50	1053	43.05
Major Horticultural crops (Crops to be identified based on total acreage)										
	Fruits	**(t/ha)**								
1	Guava	37.00	176.19					37.00	176.19	5.60
2	Lime	95.75	170.69					95.75	170.69	10.11
3	Aonla	58.00	193.30					58.00	193.30	6.20
	Vegetables									
1	Tomato	146.50	114.00					146.50	114.00	90.45
2	Potato	501.00	123.70					501.00	123.70	125.50
3	Brinjal	59.90	70.47					59.90	70.47	40.00
4	Table pea	655.00	93.57					655.00	93.57	350.00
5	Cauliflower	277.80	200.00					277.80	200.00	50.00
	Spices crops									
1	Coriander	5.10	3.89					5.10	3.89	1.56
2	Chilli	4.74	22.50					4.74	22.50	0.95
3	Garlic	167.28	100.00					167.28	100.00	12.36
	Flower crops									
1	Marry gold	750.00	50.00					750.00	50.00	11.34
2	Rose	4.60	4.80					4.60	4.80	0.67

1.12	Sowing window for 5 major field crops	Sesame	Black gram (Urd)	Groundnut	
	Kharif- Rainfed	01 Jul – 25 Jul	01 Jul - 25 Jul	25 Jun - 20 July	
	Kharif-Irrigated	-	-	-	-
	Crops	**Gram**	**Pea**	**Wheat**	**Mustard**
	Rabi- Rainfed	25 Sept -5Oct.	25 Sept -5Oct.	5 Oct.-15Oct.	25 Sept -5Oct.
	Rabi-Irrigated	15Oct.-15 Nov	15Oct.-15 Nov	5 Oct.-15 Nov.	15Oct.-15 Nov

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	√	-
	Cyclone	-	-	√
	Hail storm	-	√	-
	Heat wave	-	√	-
	Cold wave	-	√	-
	Frost	-	√	-
	Sea water intrusion	-	-	√
	Pests and disease outbreak (specify) Aphid in Mustard and Gram pod Borer	-	√	-

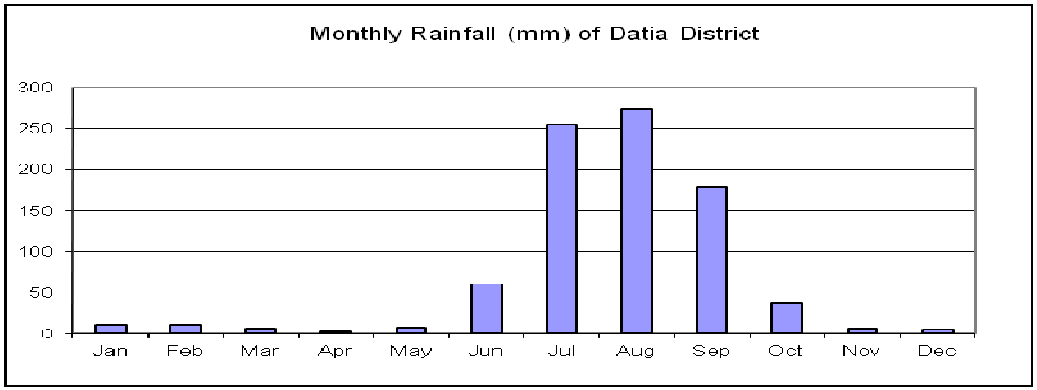
	Others (specify)		-	-	-
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes		
		Mean annual rainfall as Annexure 2	Enclosed: Yes		
		Soil map as Annexure 3	Enclosed: Yes		

Annexure I

Location map of Datia district

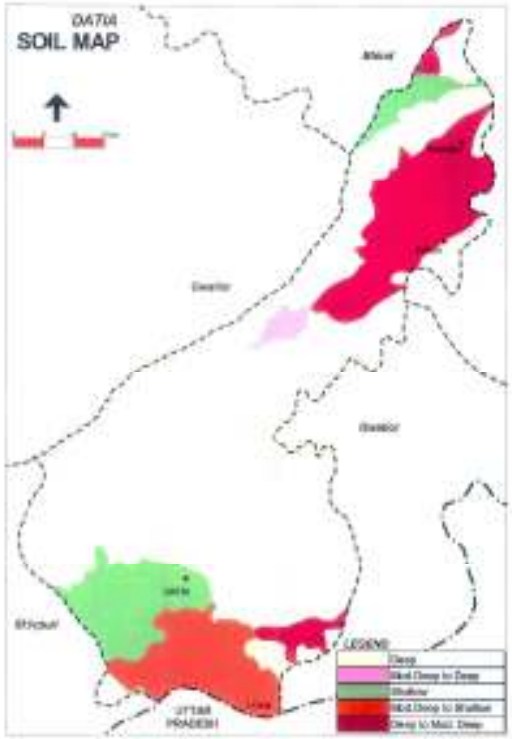
Annexure II

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 systems including variety**	**Agronomic measured**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed 2 week 1st week July	**Light soils**	Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306	-Ridge/BBF sowing of Kharif crops -Select short duration varieties for sowing -Seed dressing with Thirum + carbodezim in 2:1 ratio 3g/kg seed - Rhyzobium/ Azotobector culture + PSB 5g./kg -Cultivate the field on receiving pre monsoon showers -White grub Management in ground nut- Chloropyriphos 20EC @ 2.5 l/ha	-Link RKVY for the seed drills with BBF maker -Supply of certified seeds through seed societies - link with NFSM
		Ground nut	No change - JGN-3, JG-24, Jyoti		
		Black Gram	No change - LBG-20, Azad-1, TU-98-14		
	Red black medium soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306		
	Heavy soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping systems including variety**	**Agronomic measured**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed 4 week 3th week July	**Light soils**	Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306	-Ridge/BBF sowing of Kharif crops -Select short duration varieties for sowing -Seed dressing with Thirum + carbodezim in 2:1 ratio 3g/kg seed - Rhyzobium/ Azotobector culture + PSB 5g./kg -Cultivate the field on receiving pre monsoon showers -White grub Management in ground nut- Chloropyriphos 20EC @ 2.5 l/ha	-Link RKVY for the seed drills with BBF maker -Supply of certified seeds through seed societies - link with NFSM
		Ground nut	No change - JGN-3, JG-24, Jyoti		
		Black Gram	No change - LBG-20, Azad-1, TU-98-14		
	Red black medium soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306		
	Heavy soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	No change - TKG-21, TKG-22, JTS-8, TKG-306		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping systems including variety**	**Agronomic measured**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed 6 week 1st week August	**Light soils**	Sesame	Black gram - LBG-20, Azad-1, TU-98-14	Ridge/BBF sowing of Kharif crops -Select short duration varieties for sowing -Seed dressing with Thirum + carbodezim in 2:1 ratio 3g/kg seed - Rhyzobium/ Azotobector culture + PSB 5g./kg -Cultivate the field on receiving pre monsoon showers	-Link RKVY for the seed drills with BBF maker -Supply of certified seeds through seed societies - link with NFSM
		Ground nut	Black gram - LBG-20, Azad-1, TU-98-14		
		Black Gram	No change - LBG-20, Azad-1, TU-98-14		
	Red black medium soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	Black gram - LBG-20, Azad-1, TU-98-14		
	Heavy soils	Black Gram	No change - LBG-20, Azad-1, TU-98-14		
		Sesame	Black gram LBG-20, Azad-1, TU-98-14		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping systems including variety**	**Agronomic measured**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed 8 week 3rd week August	**Light soils**	Sesame	Plan for rabi irrigated crops	- Moisture Conservation through Ploughing and planking - Selection of Improved Suitable Varieties for Rabi crops.	Convergence for rural employment generation by the concerned departments Select suitable crops and varieties for Rabi crops and assured the seed availability
		Ground nut			
		Black Gram			
	Red black medium soils	Black Gram			
		Sesame			
	Heavy soils	Black Gram			
		Sesame			

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measures[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	**Light soils**	Sesame	• Life saving irrigation, • Intercultural operation, • mulching	Hand and wheel hoe weeding, mulching with green leaves/ Straw	Convergence with State line Department for Micro irrigation System and pump set. Link Khet Talab/ Balaram talab Yojana of the state. Link RKVY for micro irrigation systems
		Ground nut			
		Black gram			
	Red black medium soils	Blackgram			
		Sesamum			
	Heavy soils	Blackgram			
		Sesamum			

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 measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At vegetative stage	**Light soils**	Sesame	• life saving irrigation, • intercultural operation,	Hand and wheel hoe weeding,	Convergence with State line Department for Micro irrigation System and pump set. Link KhetTalab/ Balaram talab Yojana of the state. Link RKVY for micro irrigation systems
		Ground nut			
		Black gram			
	Red black medium soils	Blackgram			
		Sesamum			
	Heavy soils	Blackgram			
		Sesamum			

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 measues[d]**	Remarks on Implementation[e]
1	2	3	4	5	6
At flowering/ fruiting stage	**Light soils**	Sesame	intercultural operation,	Organic mulch/ green leaf mulch Life saving irrigation if water is available	Link KhetTalab/ Balaram talab Yojana of the state. Link RKVY for micro irrigation systems Convergence for water lifting pumps and Fuel (electric/diesel)
		Ground nut			
		Black gram			
	Red black medium soils	Blackgram			
		Sesamum			
	Heavy soils	Blackgram			

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation[a]**	**Normal Crop/ cropping system[b]**	**Crop management[c]**	**Rabi Crop planning[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
(Early withdrawal of monsoon)	**Light soils**	Ground nut	• Harvested at physiological maturity • Use anti transparent foliar Spray of water	-Plan for irrigated rabi crops ----Timely sowing limited irrigated wheat, varieties-JW-17,HW-2004, -Mustard short duration varieties- Pusa Agarani	Link KhetTalab/ Balaram talab Yojana of the state Link RKVY for micro irrigation systems Convergence for water lifting pumps and Fuel (electric/diesel)
		Sesame			
		Black gram			
	Red black medium soils	Black gram			
		Sesame			
	Heavy soils	Black gram	Life saving irrigation, Hand and wheel hoe weeding, mulching with green leaves, straw and paddy thatch	-Timely wheat sowing, -sow limited irrigated varieties-JW-17,HW-2004, -lentil varities-JL-3,DPL-62,Pea-JM-6,	

2.1.2 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 canals due to low rainfall	1. Light soil	Wheat Gram Pea Mustard	Late Wheat variety – MP 4010, Mustard - Pusa Kranti & Pusa pragati Gram – JG-16	Moisture conservation practices . (mulches etc). Intercropping . use of organic manures . In case of delayed sowing increase seed rate (20%).	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
	2 . . Red black medium	Wheat Gram Pea Mustard			
	3. Heavy Soil	Wheat Gram Pea Mustard			

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]**
Limited release of water in canals due to low rainfall	1. Light soil	Wheat Gram Pea Mustard	Wheat variety –MP 4010, GW-366 Mustard - Pusa Kranti & Pusa pragati Gram – JG-16	Moisture conservation practices . (mulches etc). Intercropping . use of organic manures . In case of delayed sowing increase seed rate (20%).	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
	2 . . Red black medium	Wheat Gram Pea Mustard			
	3. Heavy Soil	Wheat Gram Pea Mustard			

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]**
Non release of water in canals under delayed onset of monsoon in catchment	1. Light soil	Wheat Gram Pea Mustard	Wheat variety –MP 4010, Mustard - Pusa Kranti & Pusa pragati Gram – JG-16	Moisture conservation practices. (mulches etc). Intercropping . use of organic manures . In case of delayed sowing increase seed rate (20%). Use of micro irrigation and own water source 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
	2 . Red black medium	Wheat Gram Pea Mustard			
	3. Heavy Soil	Wheat Gram Pea Mustard			

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	1. Light soil	Wheat Gram Pea Mustard	Wheat variety –MP 4010, Mustard - Pusa Kranti & Pusa pragati Gram – JG-16	chickpea cultivation Use IPNM and IPM techniques Adopt drought mitigation techniques	Convergence with NREGS/NFSM for desilting and Deepening and rural employment generation
	2 . Red black medium	Wheat Gram Pea Mustard			
	3. Heavy Soil	Wheat Gram Pea Mustard			

Condition	Major Farming situation[f]	Normal Crop/ cropping system[g]	Suggested Contingency measures		
			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	1. Light soil 2 . Red black medium 3. Heavy Soil	Chick pea / mustard Wheat	No change Chick pea / Mustard	• Irrigation at critical crop growth stages through micro irrigation systems • Seed priming in water for 12-15 hrs • Efficient use of ground water for sowing of chickpea • Application of IPNM and IPM technologies • Mulching in-between crop rows	Convergence with NREGS/NFSM for desilting and Deepening of percolation tanks Convergence for water lifting pumps and Fuel (electric/diesel)

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
1	2	3	4	5
Sesame	Draining of excess water Interculture to loosen the soil and to improve aeration Topdressing with N10-20kg/ha at optimum moisture	Drain excess water Interculture to loosen the soil and to improve aeration	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
Black gram	Draining of excess water Interculture along with earthing to loosen the soil and to improve aeration	Draining of excess water Interclture to loosen the soil and to improve aeration	Draining of excess water Shift the produce to safer place	Dry the grain to optimum moisture content before storage
Groundnut	Draining of excess water Intercultivation with hoe	Draining of excess water Intercultivation with hoe	Draining of excess water Shift the produce to safer place	-Spread the bundles drenched in the rain on the field bunds/ drying floors to quicken drying -Thresh bundles after they are dried properly -Separate Seed from Kernel by Ground Nut Decorticator. -Dry the grain to proper moisture content before bagging and storing
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
Gram	Drain excess water Interculture along with earthing to loosen the soil and to improve aeration	Drain excess water Interculture along with earthing to loosen the soil and to improve aeration	Drain excess water Timely harvest of produce on a clear sunny day	Shifting to safer place and drying the produce before bagging and storage

Heavy rainfall with high speed winds in a short span[2]				
Sesame	Draining of excess water Interculture to loosen the soil and to improve aeration	Drain excess water Interculture to loosen the soil and to improve aeration	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
Black gram	Draining of excess water Interculture along with earthing to loosen the soil and to improve aeration	Draining of excess water Interclture to loosen the soil and to improve aeration	Draining of excess water Shift the produce to safer place	Dry the grain to optimum moisture content before storage
Groundnut	Draining of excess water Intercultivation with hoe	Draining of excess water Intercultivation with hoe	Draining of excess water Shift the produce to safer place	Spread the bundles drenched in the rain on the field bunds/ drying floors to quicken drying Thresh bundles after they are dried properly Separate Seed from Kernel by Ground Nut Decorticator. Dry the grain to proper moisture content before bagging and storing
Wheat	Drain excess water	Drain excess water 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
Gram	Drain excess water Interculture along with earthing to loosen the soil and to improve aeration	Drain excess water Interculture along with earthing to loosen the soil and to improve aeration	Drain excess water Timely harvest of produce on a clear sunny day	Shifting to safer place and drying the produce before bagging and storage

Outbreak of pests and diseases due to unseasonal rains	Vegetative stage[k]	Flowering stage[l]	Crop maturity stage[m]	Post harvest[n]
Sesame	Seed Treatment with Bavistin thirum in 2:1 ratio for the control of Phytpthora blight	Foliar spray of Triazophos for the control of Leaf roller and capsule borer	-	-
Ground Nut	Application of Chlorpyriphos 1 kg a.i./ha	-	-	-
Black Gram	Spray of Imidachlorprid @ 250 ml/ha for control the secondary spred of yellow vien mosaic virus disease.	-	-	-
Wheat	Spray 0.2% mancozeb 76% WP against wheat rust.	Spray 0.2% mancozeb 76% WP against wheat rust.	Spray 0.2% mancozeb 76% WP against wheat rust.	-
Chick pea	Spray triazophos 40 % EC @ 1-1.5 l/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 Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used.	Spray triazophos 40 % EC @ 1-1.5 l/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 Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. with duster	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. Carry out critical survey of fields for insect and disease attack in crops	

2.3 Floods Not Applicable

Condition	Suggested contingency measure[o]			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 (specify)				
Crop2				

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[p]				
Wheat	NA	NA	Light irrigation	Harvest at physiological maturity
Chickpea	NA	NA	Light irrigation	Harvest at physiological maturity
Cold wave[q]				
Wheat	NA	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	Harvest at physiological maturity
Chickpea	NA	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	Harvest at physiological maturity
Frost				
Wheat	NA	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	Harvest at physiological maturity
Chickpea	NA	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	Harvest at physiological maturity
Hailstorm				
Wheat	Re-sowing in case of severe damage	Apply 10% additional of nitrogen Light and frequent irrigation	Apply 10% additional nitrogen Light and frequent irrigation	Keep the produce in protected area preferably under the roof
Chickpea	Re-sowing in case of severe damage	Light irrigation	Light irrigation	-Do-
Cyclone	NA	NA	NA	NA

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measure**		
	Before the event[s]	**During the event**	**After the event**
Feed and fodder availability	Ensured availability of fodder and mineral mixture	Complete feed block using local residues.	Treatment of roughage with urea-molasses to increase its feed value
Drinking water	Arrange portable water supply for all the cattle with admitted of cattles	Ensure water supply for all the cattles	Ensure water supply for all the cattles
Health and disease management	Deworm for better feed conservation efficiency. The clearness for hygiene condition be given top priority	Ensure proper sanitation and cleanliness measures in cattle sheds	Ensure proper sanitation and cleanliness measures in cattle sheds.
Floods			
Feed and fodder availability	Practice of feeding chopped straw along with oil seed cake concentration	Protected fodder / feed from fungal contamination	Urea-molasses treatment of roughage to increase its feed value, along with concentrate
Drinking water	Ensure clean and potable water supply camps in cattle	Ensure clean and potable water supply for all the cattle	Ensure clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps
Health and disease management	Vaccination should be done well in advance.	Keep animals under shade	Keep animals under shade to the extent possible. The hygiene should be given top priority
Cyclone	-	-	-
Feed and fodder availability	-	-	-
Drinking water	-	-	-
Health and disease management	-	-	-
Heat wave and cold wave	-	-	-
Shelter/environment management	Protective measures should be done for preventing extreme heat and cold wave	Protective measures should be done for preventing extreme heat and cold wave by providing room heaters. Curtains of gunny begs in the cattle shed.	Protective measures should be done for preventing extreme heat and cold wave
Health and disease management	-	-	-

2.5.2 Poultry

	Suggested contingency measure		
	Before the event[s]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Ensure proper feed with mixture of straw concentration	Ensure proper feed with mixture of straw concentration	Ensure proper feed with mixture of straw concentration
Drinking water	Provide potable water supply for birds.	Provide potable water supply for birds.	Provide potable water supply for birds.
Health and disease management	Periodic check up of birds may be done for infectious disease	Periodic check up of birds may be done for infectious disease.	Periodic check up of birds may be done for infectious disease
Heat wave and cold wave			
Shelter/environment management	Cover the sheds with gunny beg curtains cpaddy straw and arrange sprinklers/fans and foggers in sheds, as per needs. Protective measures should be done for preventing extreme heat and cold wave	Protective measures should be done for preventing extreme heat and cold wave. Cover the sheds with paddy straw and arrange sprinklers/fans and foggers in sheds, as per needs.	-
Health and disease management	Periodic check up of birds may be done for infectious disease like bird flue and Adopt suitable control measures like culling of birds flue infected poultry and burn them	Periodic check up of birds may be done for infectious disease like bird flue and Adopt suitable control measures like culling of birds flue infected poultry and burn them	-

2.5.3 Fisheries/ Aquaculture

1) . DROUGHT	**Suggested contingency measures**		
	Before the event[a]	**During the event**	**After the event**
A. Capture	Suggest farmers to collect fishes and sell in the market.	Minimize the stock and sell in the market.	To stock the fish culture until recovered the water scarcity
Marine	Condition may not be possible because 65% of the land is covered with water		
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Stocking density should be low & short period fish culture can be adopted	Minimize the stock	Harvest and sell out the stock
(ii) Changes in water quality	Minimum ponds manure apply in the ponds and dissolve the oxygen content by putting electrical erraters		No need to maintain the water quality
(iii) Any other	Organic load will enhance during the drought event in to the water bodies so mud and detritus should be maintained properly		

B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	4-6 months fish culture may be adopted	Low stocking density with artificial feeding should be adopted	Not possible to go for fish culture
(ii) Impact of salt load build up in ponds / change in water quality	Recycling of the subsurface water and add fresh water from tube well or other sources	Recycling of the subsurface water and add fresh water from tube well or other sources	Scraping /desilting 4-6 inches soil
(iii) Any other	Nil	Nil	Nil
2). FLOODs			
A. Capture	Fix the slug gates with iron meshed nets and as much as stock should be netted out and sell in the	If possible fix the nets across the flow	Catch the fish in low lying areas of runoff of water and in this condition net out the ponds & remove unwanted spp and also remove mud and detritus
Marine	This condition may not be arrises as per past experiences of the world.		
Inland			
(i) Average compensation paid due to loss of human life	No need to compensate before flood	Compensation may be given as per fisheries departments norms	Compensation may be given as per fisheries departments norms
(ii) No. of boats / nets/damaged	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department
(iii) No. of houses damaged	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department	A Package for fisherman community has been established as per constitution of fisheries legislation by MP fish department
(iv) Loss of stock	Rs 6-10 has been suggested by the MP fish department as per the terms and conditions available	Rs 6-10 has been suggested by the MP fish department as per the terms and conditions available	Rs 6-10 has been suggested by the MP fish department as per the terms and conditions available
(v) Changes in water quality	No change	No any precautionary measures suggested	As per the symptoms the profilative measures will be adopted Lime and copper sulphate may be applied as a causative agent to control the pollution in the ponds
(vi) Health and diseases			

B. Aquaculture			
(i) Inundation with flood water	Remove the stock	Fishes will be migrate against the current flow catch them from the areas	Ponds treatments will be needed by addition of purifiers
(ii) Water contamination and changes in water quality	Stop the addition of organic load	Not possible	Prophylactic measures will be adopted as per suggestions of experts
(iii) Health and diseases	Minimum stock with proper water quality care should be taken	As per suggestions of the experts and causative agents	As per suggestions of the experts and causative agents
(iv) Loss of stock and inputs (feed, chemicals etc)	As per rate of loss different chemicals will be added to ponds	Control measures will be adapted to minimize the loss	Will try to recovered the inputs
(v) Infrastructure damage (pumps, aerators, huts etc)	As per the norms decided by the MP fisheries department	As per the norms decided by the MP fisheries department	As per the norms decided by the MP fisheries department
(vi) Any other	NIL	NIL	NIL
3. CYCLONE / TSUNAMI			
A. Capture	Suggest to the farmers not to go for fishing and remove the ships and boats and keep away from water bodies	Suggest to the farmers not to go for fishing and remove the ships and boats and keep away from water bodies	Compensation may be given as per govt decision
Marine	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(i) Average compensation paid due to loss of fishermen lives	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(ii) Avg. no. of boats / nets/damaged	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(iii) Avg. no. of houses damaged	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
Inland	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities

B. Aquaculture	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(i) Overflow / flooding of ponds	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(ii) Changes in water quality (fresh water / brackish water ratio)	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(iii) Health and diseases	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(iv) Loss of stock and inputs (feed, chemicals etc)	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	As per decision taken by the govt authorities	As per decision taken by the govt authorities	As per decision taken by the govt authorities
(vi) Any other			
4. HEAT WAVE AND COLD WAVE			
A. Capture	Maintain water depth	Remove fish stock	Add the water body
Marine	Suggest not to go for fishing		
Inland	Suggest not to go for fishing	Suggest not to go for fishing	Suggest not to go for fishing
B. Aquaculture			
(i) Changes in pond environment (water quality)	Temperature of water increases so add water.	Keep maintained maximum water depth	
(ii) Health and Disease management	As per infection and causative agent, prophylactic measures will be adopted.		
(iii) Any other			