State: MADHYA PRADESH

Agriculture Contingency Plan: District NEEMUCH

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Hot moist semi arid ecological sub region (5.2)		
	Agro-Climatic Region (Planning Commission)	Western Plateau & Hill Region (IX)		
	Agro Climatic Zone (NARP)	Malwa plateau zone (M P-10)		
	List all the districts or part thereof falling under the NARP Zone	Neemuch, Mandsaur, Ratlam, Ujjain, Shajapur, Indore, Dewas, Rajgarh & some part of Dhar and Jhabua district		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		24°27”55.03 N	74°52”15.98 E	534meter MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Under RARS Mandsaur -458001		
	Mention the KVK located in the district	Krishi Vigyan Kendra, 56-14/2 Vikas Nagar, Neemuch M P- 458441		
1.2	**Rainfall**	Average (mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	797.96	III week of June 25MW	IV week of September 39MW
	NE Monsoon(Oct-Dec):	11.56	-	-
	Winter (Jan- March)	3.5	-	-
	Summer (Apr-May)	5.98	-	-
	Annual	819	-	-

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)	393.5	94.4	46.45	8.14	19.27	0.01	37.19	0.6	0.7

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soil	143.00	33.65
	2. Medium deep soil	91.80	21.65
	3. Shallow soils	190.20	44.70

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	186.84	155.27
	Area sown more than once	104.27	
	Gross cropped area	290.11	

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	75.7		
	Gross irrigated area	75.9		
	Rain fed area	214.21		
	Sources of Irrigation	Number	Area ('000 ha)	% area
	Canals	15	3.1	3.0
	Tanks	22	4.2	1.0
	Open wells	50029	47.2	61.0
	Bore wells	6410	17.2	32.0
	Lift irrigation	-		-
	Other sources	-	3.8	3.0
	Total	-	75.9	100.0
	Pumpsets	-	-	
	Micro-irrigation	No. of blocks	% area	
	Groundwater availability and use			Quality of water

				Yes, rainfed area converted to irrigated in rabi season. Yes, About 12000 ha rainfed area is cultivated more than one
	Over exploited	Over exploited		
	Critical	--	92% of ground water is exploited	
	Semi- critical	--		
	Safe	--		
	Wastewater availability and use			

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

Area under major field crops & horticulture etc.

1.7	**Major Field Crops cultivated**	**Area ('000 ha)**					
		Kharif		***Rabi***		**Summer**	**Total**
		Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	Soybean	-	120.3	-	-	-	120.3
	Maize	-	27.3	-	-	-	27.3
	Wheat	-	-	27.9	-	-	27.9
	Mustard	-	-	23.1	-	-	23.1
	Gram	-	-	17.3	-	-	17.3
	Horticulture crops - Fruits	**Total Area ('000 ha)**		**Irrigated**		**Rainfed**	
	Mango	0.30					
	Guava	0.16					
	orange	2.00					
	Lemon	0.20					
	Pomegranate	0.08					
	Custard Apple	0.11		**Irrigated**		**Rainfed**	
	Papaya	0.62					
	Musk Melon	1.50					
	Straw Berry	0.24					
	Others	0.10					
	Horticulture crops - Vegetables						
	Tomato	0.35					

	Potato	0.00		
	Lady Finger	0.87		
	Brinjal	0.16		
	Green Peas	0.13		
	Sweet Potato	0.01		
	Cauliflower	0.13		
	Cabbage	0.21		
	Cucurbits	0.88		
	Leafy vegetables	0.21		
	Bitter guard	0.17		
	Radish	0.30		
	Carrot	0.18		
	Cucumber	0.10		
	French Beans	0.14		
	Cow pea	0.01		
	Others	0.01		
	Horticulture crops - Spices			
	Coriander	2.79		
	Chilly	0.28		
	Garlic	5.89		
	Turmeric	0.02		
	Fenugreek seed	0.97		
	Cumin seeds	0.10		
	Kalonji	0.08		
	Others	0.01		
	Horticulture crops - Medicinal and Aromatic			
	Ashwa Gandha	1.50		
	Chandra Sur	0.20		
	Ajwain	0.08		
	Isabgol	6.62		
	Kalmegh	0.70		
	Others	0.20		

	Horticulture crops - Flowers			
	Rose	0.01		
	Mari Gold	0.03		
	Bijli (Local name)	0.01		
	Guldawadi	0.01		
	Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	Total fodder crop area	20.9		
	Grazing land	-		
	Sericulture etc	-		
	Others (Specify)	-		

Source - Department of Horticulture, Ujjain Division, Ujjain (M.P.)

1.8	**Livestock**	**Number ('000)**
	Cattle	228
	Buffaloes total	60
	Commercial dairy farms	-
	Goat	175
	Sheep	15
	Others (Camel, Pig etc.)	3

1.9	**Poultry**	
	Commercial	-
	Backyard	41115

1.10	**Fisheries : Fisheries data not given**	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)
	Soybean	134.5	1086	-	-	-	-	134.5	1086
	Maize	51.8	1805	-	-	-	-	51.8	1805
	Wheat	-	-	73.7	2443	-	-	73.7	2443
	Gram	-	-	17.6	880	-	-	17.6	880
	Mustard	-	-	27.9	1047	-	-	27.9	1047
	Major Horticultural crops								
	Isabgol	-	-	7.8	1200	-	-		
	Garlic	-	-	58.2	7500	-	-		
	Coriander	-	-	4.2	1490	-	-		

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Soybean	Maize	Wheat	Gram	Mustard
	Kharif- Rainfed	Last Week of June-First week of July 26-27 MW	Last Week of June-First week of July 26-27MW	-	-	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	-	-	3rd week of October.- 2nd week of November 42-46MW	1st week of October- End of October. 40-44MW	1st week of October – Mid of October. 40-42MW

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 inundation	-	-	-
	Pests and diseases (specify)	√	-	-

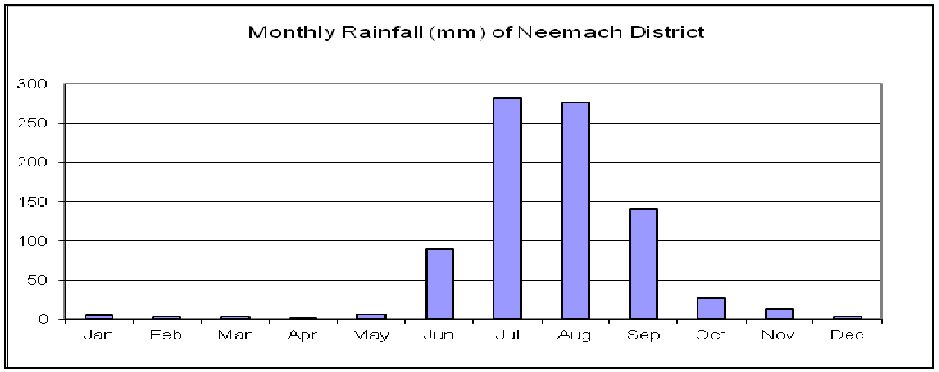
1.14	**Include Digital maps of the district for**	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

Location Map

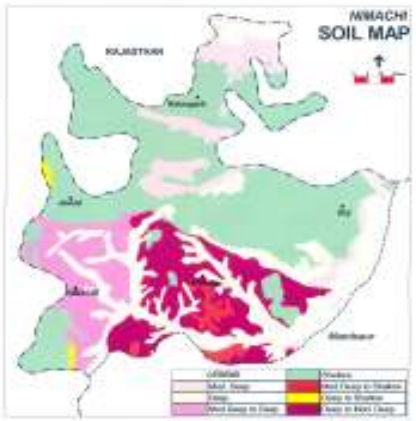
Annexure II

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 Rain fed situation

Condition	Suggested Contingency measures				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implemen-tation**
1	2	3	4	5	6
Delay by 2 weeks (July 1st Week) 27MW	Shallow soils	Soybean	Soybean-JS-9305, JS-9560	Intercrop soybean with maize in 10:2 row ratio	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed
		Maize	Maize-Sathi,JM-216	• Inter cropping of blackgram (10:2) • Seed priming of maize (0.1 % Thiourea) for 6 hrs	
		Black gram	Black gram-T-9,JU-86	-	
		Sesame	Sesame-JT-21,JT-22,TKG-8	Line sowing	
	Moderate deep soils	Soybean	Soybean-JS-9305,JS-9560	Intercrop soybean with maize in 10:2 row ratio	
		Maize	Maize-Sathi,JM-216	• Inter cropping of blackgram (10:2) • Seed priming of maize (0.1 % thiourea)for 6 hrs	
		Black gram	Black gram-T-9,JU-86	-	
		Sesame	Sesame-JT-21,JT-22,TKG-8	Line sowing	

Condition	Suggested Contingency measures				
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 4 weeks (July 3 rd Week) 29MW	Shallow soils	Soybean	Soybean-JS-9305,JS-9560	Increase seed rate by 25 %	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed
		Maize	Maize-African Tall Jowar-MP Chari,SSG-49-3		
		Black gram	Black gram-T-9,JU-86		
		Sesame	Sesame-JT-21,JT-22,TKG-8		
	Moderate deep soils	Soybean	Soybean-JS-9305,JS-9560		
		Maize	Maize-African Tall Jowar-MP Chari,SSG-49-3		
		Black gram	Black gram-T-9,JU-86		
		Sesame	Sesame-JT-21,JT-22,TKG-8		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 6 weeks (August 1st Week) 32MW	Shallow soils	Soybean	Ashwagandha	One hoeing may be done for conserving soil moisture	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed
		Maize	Maize-African Tall Maize + Cowpea(Fodder) Jowar-SSG-49-3		
		Black gram	Ashwagandha Onion- AFDR		
		Sesame	Ajwain		
	Moderate deep soils	Soybean	Ashwagandha Onion- AFDR		
		Maize	Maize-African Tall Maize + Cowpea(Fodder) Jowar-SSG-49-3		
		Black gram	Ashwagandha Onion- AFDR		
		Sesame	Ajwain		

Condition	Suggested Contingency measures				
Early season drought **(Normal onset)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow soils	Soybean Maize Black gram Sesame	If germination is less than 50% then farmers should go for re-sowing with early maturing varieties with 25% higher seed rate and if plant population is more that 75% one should go for gap filling.	Hoeing by Dora/Kolpa/hand hoe to develop soil mulch Removal of Weeds in time. Use organic mulch in the crop rows	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed Link watersheds and MGREGS for the support of farm pond technology
	Moderate deep soils	Soybean Maize Black gram Sesame			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 8 weeks ((August 3 rd Week) 34MW	Shallow soils	Soybean Maize Black gram Sesame	Fallow -Toria/ Taramira/ Mustard/Gram /Isabgole/Ajwain/Ashwagandha	Line Sowing is recommended	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed
	Moderate deep soils	Soybean Maize Black gram Sesame			

Condition	Suggested Contingency measures				
Early season drought **(Normal onset)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow soils	Soybean Maize Black gram Sesame	If germination is less than 50% then farmers should go for re-sowing with early maturing varieties with 25% higher seed rate and if plant population is more that 75% one should go for gap filling.	Hoeing by Dora/Kolpa/hand hoe to develop soil mulch Removal of Weeds in time. Use organic mulch in the crop rows	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed Link watersheds and MGREGS for the support of farm pond technology
	Moderate deep soils	Soybean Maize Black gram Sesame			

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**	**Remarks on Implementation**
1	2	3	4	5	6
At vegetative stage	Shallow soils	Soybean Maize Black gram Sesame	• In situ mulching of weeds • Weed free environment • Removal of susceptible crop for fodder (maize) and retain the hardy crop (urd) in maize blackgram inter cropping	• Earthing at 30 to 35 days after sowing. • Spray of kaolin at 5% • Spray of 1000 ppm thiourea • Ridging in maize • Life saving irrigation through sprinkler	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed Link watersheds and MGREGS for the support of farm pond technology
	Moderate deep soils	Soybean Maize Black gram Sesame			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
1	2	3	4	5	6
At reproductive stage	Shallow soils	Soybean Maize Black gram Sesame	• Harvest maize for green cob corn if market is available • Detasseling in maize • Removal of lower leaves for fodder in maize and sorghum • Weed free environment	• Spray of kaolin at 5 % • Spray of Thiourea at 1000 ppm • Life saving irrigation through sprinkler should be given except sesame	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed Link watersheds and MGREGS for the support of farm pond technology
	Moderate deep soils	Soybean Maize Black gram Sesame			

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
1	2	3	4	5	6
	Shallow soils	Soybean Maize Black gram Sesame	• Harvest maize for green cobs if market is available • Life saving irrigation through sprinkler should be given	If late season rains are there, after failure of kharif crops, rabi crops i.e. taramira/toria/mustard/Ashwa gandha/ Ajwain/Isabgole can be sown	Link SAU,NSC and Farmers societies, state seed corporations and related agencies for good quality seed Link watersheds and MGREGS for the support of farm pond technology
	Moderate deep soils	Soybean Maize Black gram Sesame			

2.1.2 Irrigated situation:-

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed/ limited release of water in canals due to low rainfall	Shallow soils	Gram Wheat Lentil	No change	Sowing of crop through Seed priming Sowing crop in ridges and furrows Irrigatin at critical crop growth stages Alternate furrow irrigation Use micro irrigation systems like sprinkler or drip if feasible	Proper training and guidance to the farmer by ATMA/KVK
	Moderate deep soils	Gram Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Gram Wheat Lentil	No change	Sowing of crop through Seed priming Seed sown in proper depth In-situ moisture conservation measures like Ridges and furrows Frequent interculture for dust mulch Or green leaf mulch in crop rows Rain water conservation, harvesting and recycling	Proper training and guidance to the farmer by ATMA/KVK
	Moderate deep soils	Gram Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Shallow soils	Gram Wheat Lentil	No change	Mulching in crop rows Sowing of crop through Seed priming Irrigation at critical growth stages of crops Use micro irrigation systems like sprinkler/ drip	Proper training and guidance to the farmer by KVK/ATMA
	Moderate deep soils	Gram Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation	**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	Gram Wheat Lentil	No change	Use drought tolerant varieties Sowing of crop through Seed priming Mulching in crop rows or dust mulch through frequent interculture Critical irrigation through sprinkler if feasible alternate furrow system Use proper manuring Moisture conservation practises to be adopted (Capillary breaking)	Proper training and guidance to the farmer by KVK/ATMA
	Moderate deep soils	Gram Wheat			

2.2 Unusual rains (untimely, unseasonal etc) (for both rain fed and irrigated situations). Same for all crops. Measures to be taken upon preventive basis. Any remedial measures for these crops such as chemical spray for immediate fertilizer application.

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
1	2	3	4	5
Soybean Maize	Crop sown in Ridge & Furrow system, make drainage channels and join with main drainage channel Maintain slope Opening of furrows	Make drainage channels and join with main drainage channel Maintain slope Opening of furrows	Make drainage channels and join with main drainage channel , Maintain slope Foliar spray of urea Opening of furrows	Protect the harvested crop from rains, after rains proper drying of harvested crop in threshing floor and then thresh Maintain slope
Maize	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Harvest the cobs after they are dried up properly. Dry the grain to optimum moisture condition before storing

	water Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds Earthen up the crop for anchorage Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for Pink stem borer, sheath blight and Turcicum leaf blight	water Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for sheath blight and post flowering stalk rots		
Blackgram	Drain the excess water as early as possible Apply 4-5 kg N /ha after draining excess water Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the outbreak of pests like *Spodoptera* etc.	Drain the excess water as early as possible Apply 4-5 kg N /ha after draining excess water Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the outbreak of pests like *Spodoptera* etc.	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying Thresh the bundles after they are dried properly Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Sesame				

Horticulture				
Onion	Make drainage channels and joint with main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of Mencozeb 75 WP 2gm/l with sticker for root rot control.	Make drainage channels and joint with main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of Mencozeb 75 WP 2gm/l with sticker for root rot control.	Harvest the crop and sell it at the earliest.	Crop harvest at physiological stage
Tomato			Drainage channels make and joint to main drainage channel, Pick the matured fruits and sell it.	
Heavy rainfall with high speed winds in a short span				
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 • 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
Maize	Crop sown in Ridge & Furrow system, make drainage channels and join with main drainage channel, after proper drainage apply urea for better vegetative growth.	Make drainage channels and join with main drainage channel, after proper drainage apply urea for good cob formation.	-do-	-do-
Black gram	Crop sown in Ridge & Furrow system, make drainage channels and join with main drainage channel	Make drainage channels and join with main drainage channel	Make drainage channels and join with main drainage channel , Spray sulphur for control of fungal infection	Protect the harvested crop from rains, after rains proper drying of harvested crop in threshing floor and then thresh
Sesame				

Horticulture				
Onion	Make drainage channels and joint with main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of Mencozeb 75 WP 2gm/l with sticker for root rot control.	Make drainage channels and joint with main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of Mencozeb 75 WP 2gm/l with sticker for root rot control.	Harvest the crop and sell it at the earliest.	Make drain to remove excess water
Tomato	Make drainage channels and joint with main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of Ridomil MZ @ 2gm/l with sticker for disease control.	Make drainage channels and joint with main drainage channel, Spray planofix for flower drop control, and one spray of Ridomil MZ @ 2gm/l with sticker for disease control,	Drainage channels make and joint to main drainage channel, Pick the matured fruits and sell it.	
Outbreak of pests and diseases due to unseasonal rains				
Soybean	Control the semi looper, blue beetle girdle beetle and stem fly	Control the semi looper, girdle beetle, tobacco caterpillar and pod borer	Control the pod borer, for controlling fungal infection use sulphur dust.	Proper drying of seed or grains before storage.
Maize	Apply proper insecticides to control the sucking pests , stem borer and bihar hairy caterpillar	Use fungicides to control stalk rot	Spray sulphur for control of fungal infection	Proper drying of seed or grains before storage. use EDB ampoules (one ampoule / q)
Black gram	Control of semi looper, blue beetle	Control of semi looper, blue beetle, tobacco caterpillar	Pick the mature pods and dry these , control the fungal infection by applying sulphur dust.	Proper drying of seed or grains before storage
Sesame	Apply proper insecticides to control the sucking pests	Apply proper insecticides to control the capsule borer	Spray sulphur for control of fungal infection	Proper drying of seed before storage.

Horticulture				
Onion	Control the white grub and fungal disease	Control the white grub and fungal disease	Control the rotting of bulbs. Harvest the crop and proper drying	Proper drying the crop and store it properly
Tomato	One spray of Mencozeb 75WP 2gm/l for root rot control, Control the sucking pests and stem borer.	Control the root rot and early blight, sucking pests and stem borer and fruit borer. Control the flower drop.	Control the fruit drop & late blight Pick the mature fruits and sell	-

2.3 Floods- N.A.

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

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone N.A.

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Horticulture				
Cold wave				
Horticulture				
Frost				
Horticulture				
Hailstorm				
Horticulture				
Cyclone				
Horticulture				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1	**2**	**3**	**4**
Drought			
Feed and fodder availability	Hay and silage making, storage of locally available roughage	Use unconventional feeds as a source of roughage, use urea treated roughage, use urea molasses block as a source of nitrogen and energy.	Feed green feed/ fodder and conventional feed.
Drinking water	Treat water with quick lime	Use clean and sanitized water	Treat water with quick lime
Health and disease management	Vaccination & de-worming	Feed Mineral mixture , keep animals in favorable environment	Vaccination & de-worming
Floods			
Feed and fodder availability	Hay and silage making, storage of locally available roughage	Use unconventional feeds as a source of roughage, use urea treated roughage ; avoid spoiled fodder feeding	Feed green feed/ fodder and conventional feed.
Drinking water	Treat water with quick lime	Use clean and sanitized water	Treat water with quick lime
Health and disease management	Vaccination & de-worming	Avoid food poisoning by spoiled feed, keep the cattle in dry and properly ventilated place	Vaccination & de-worming
Cyclone			
Feed and fodder availability	Hay and silage making, storage of locally available roughage	Use unconventional feeds as a source of roughage, use urea treated roughage, ; avoid spoiled fodder feeding	Feed green feed/ fodder and conventional feed.
Drinking water	Treat water with quick lime	Use clean and sanitized water	Treat water with quick lime
Health and disease management	Vaccination & de-worming	Avoid food poisoning by spoiled feed, keep the cattle in dry and properly ventilated place	Vaccination & de-worming
Heat wave and cold wave			
Shelter/environment management	House of animal should be N-S direction, availability of plenty water, animal house window should have provision of curtain to cope with cold and heat wave	Provide favorable environment during heat/ cold wave Heat: availability of plenty of cold water to drink. Keep animal on cool places, bath the animals twice Cold: Availability of l sun shine in animal shed, keep animal body warm.	Keep uniform environment for better recovery
Health and disease management	Availability of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc must be ensured.	Use suitable drugs depending on condition.	Vaccination & de-worming,

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1	**2**	**3**	**4**
Drought			
Shortage of feed ingredients	Storage of local available food grains/feed 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 feed.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water
Health and disease management	Vaccination and de-worming	Vaccination and de-worming	Vaccination and de-worming
Floods			
Shortage of feed ingredients	Storage of local available food grains/feed ingredients,	Feed should be protected by fungus, down the curtain of window	Feeding high quality balance feed. Open the curtain for proper aeration and drying of litter.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water with quick lime.
Health and disease management	Vaccination and de-worming	Vaccination and de-worming, use anti fungal and liver tonic during feeding and drinking.	Vaccination and de-worming
Cyclone			
Shortage of feed ingredients	Storage of local available food grains/feed ingredients,	Feed should be protected by fungus, down the curtain of window	Feeding high quality balance feed. Open the curtain for proper aeration and drying of litter.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water
Health and disease management	Vaccination and de-worming	Vaccination and de-worming, use anti fungal and liver tonic during feeding and drinking.	Vaccination and de-worming
Heat wave and cold wave			
Shelter/environment management	Storage of local available food grains/feed ingredients,	Down the curtain of window, maintain the temperature of shed , lighting in the shed in cold condition	Feeding high quality balance feed.
Health and disease management	Vaccination and de-worming	Vaccination and de-worming, use anti stress drugs and liver tonic during feeding and drinking.	Vaccination and de-worming

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1	**2**	**3**	**4**
Drought			
Shallow water in ponds due to insufficient rains/inflows	All the fish should be marketed	Dry ponds should be treated with lime.	After onset of monsoon and ponds fill with water seedling the fish seed.
Impact of heat and salt load build up in ponds / change in water quality	All the fish should be marketed	Dry ponds should be treated with lime.	After onset of monsoon and ponds fill with water seedling the fish seed.
Any other (specify)			
Floods			
Inundation with flood waters	Keeps net in west wear of ponds	Protect the fish to flow with runoff water	-
Water contamination and changes in BOD	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
Health and disease management	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
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
Infrastructure damage	Dust and debris should be clean in west wear.	Continuous Dust and debris cleans in west wear.	-
Cyclone			
Overflow / flooding of ponds	Keeps net in west wear of ponds	Keeps net in west wear of ponds	-
Change in fresh/brackish water ratio	-	-	-
Health and disease management	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
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
Infrastructure damage			
Heat wave and cold wave			
Management of pond environment	Showering of water by pump for proper availability of oxygen in water	Showering of water by pump for proper availability of oxygen in water	-
Health and disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-

[a] based on forewarning wherever available