

State: Mizoram

Agriculture Contingency Plan for District: Champhai District

1.0 District Agriculture profile*			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Purvachal (Eastern range)(17.2)	
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Zone	
	Agro Climatic Zone (NARP)	Temperate sub-alpine zone, Sub-tropical Hill zone, Mild-tropical Hill zone	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	All district of Mizoram	
	Geographic coordinates of district head quarters	Latitude	Longitude
		24° 42'00''N to 23° 03' 98''N	93° 32'45''E to 93° 29'23''E
	Name and address of the concerned ZRS/ZARS/ RARS/RRS/RRTTS	ICAR RC for NEHR (i.e. Kolasib, Meghalaya and AAU Jorhat)	
	Mention the KVK located in the district with full address	KVK KHAWZAWL, CHAMPHAI DISTRICT	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	KVK KHAWZAWL, CHAMPHAI DISTRICT	

***Indicate source of data while furnishing information at different places in the district profile**

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)	1433.28	120	1 st week of June	Last week of September
	NE Monsoon (Oct-Dec)	18	8	1 st week of October	Last week of December
	Winter (Jan- February)	22.5	5	1 st Week of January	2 nd week of February
	Summer (March-May)	484.00	13	1 st week of March	4 nd week of May
	Annual	2130.1			

Annual Rainfall in Champhai District							
Month	2011	2012	2013	2014	2015	2016	2017
Jan	18.00	13.90	Nil	Nil	9.425	4.5	5.5
Feb	0.13	33.82	0.53	25.30	4.40	6.30	17
Mar	54.85	13.00	2.45	22.12	31.78	54.9	43.7
Apr	96.77	264.00	62.37	46.82	267.37	105	173
May	250.47	134.70	446.00	279.40	108.625	261.3	267.3
Jun	352.32	404.75	280.72	287.00	182.31	349.18	449
Jul	319.82	245.25	384.65	228.72	437.90	359.05	428.6
Aug	307.60	344.45	440.42	268.77	427.20	345.8	375.3
Sept	186.97	297.75	247.85	295.07	227.1	308.7	352.7
Oct	146.25	142.25	151.42	68.65	175.5	0.8	13
Nov	2.85	188.45	Nil	4.00	7.7	60.3	3
Dec	Nil	Nil	Nil	Nil	0.75	0.0	2
Total	1736.03	2082.32	2016.41	1525.85	1880.06	1855.83	2130.1
Avg	157.82	189.30	224.05	127.15	156.67	154.65	177.5

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	Net Area Sown	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	3185 Sq Km	314450 ha.	240832 ha	10855 ha.	500 ha.	1100 ha.	8292 ha	17701 ha	1120 ha.	7180 ha	26619 ha.

1.4	Major Soils (common names like red sandy loam deep soils(etc.,)*)	Area ('000 ha)**	Percent (%) of total geographical area
	1. Sandy soil	3600 Ha.	1.13 %
	2. Black soil	36550 Ha.	11.5 %
	3. Alluvial soil	31000 Ha.	9.82 %
	4. Acid soil	89600 Ha.	28.4 %
	5. Red soil	89600 Ha.	28.4 %
	Others (specify):		

* Mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP); ** Pl. give the details of the major soils occupying more than 5% of total geographical area. Degree of soil acidity (pH) may also be indicated

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	17701 ha	100 %
	Area sown more than once	503 ha.	
	Gross cropped area	314450 ha.	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	4701 ha.		
	Gross irrigated area	4701 ha.		
	Rainfed area	308711 ha.		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			Area may be indicated
	Tanks			
	Open wells			
	Bore wells			

	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (Rivers)	3		
	Total Irrigated Area	4701 Ha.		
	Pump sets	45		
	No. of Tractors	16		
	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			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.6. a.	Fertilizer and Pesticides use	Type	Total quantity (tonnes)
1	Fertilizers*	Urea DAP Potash SSP Other straight fertilizers (specify) Other complex fertilizers (specify)	384 848 261
2	Chemical Pesticides*	Insecticides Fungicides Weedicides Others (specify)	Negligible

* If break up is not available, indicate total quantity used in the district for any recent year, mention here the year and source of statistic

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2014 -2015)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			Rabi			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Jhum paddy		4.350	4.350					4.350	
2	WRC		3.750	3.750					3.750	
3	Maize		1.660	1.660					1.660	

	S.No.	Horticulture crops - Fruits	Area ('000 ha)		
			Total	Irrigated	Rainfed
	1	Passion fruit	0.1125 Ha.		0.1125 Ha.
	2	Grape	1.595 Ha.		1.595 Ha.
	3	Banana	0.74975		0.74975
	4	M.Orange	1.96		1.96
	5	Papaya	0.1125.		0.1125.
		Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	1	Bean	0.09875		0.09875
	2	Bitter gourd	0.44075		0.44075
	3	Cabbage	0.294	0.294	
	4	Onion	0.188	0.188	
	5	Brinjal	0.369		0.369
		Spices	Total	Irrigated	Rainfed
	1	Turmeric	1.291		1.291
	2	Ginger	1.077		1.077
	3	Chilli (Dried)	1.45925		1.45925
		Plantation crops	Total	Irrigated	Rainfed
	1	Tung	0.045		0.045
	2	Jatropha	0.3		0.3
		Roots and Tuber	Total	Irrigated	Rainfed
	1	Potato	0.0205		0.0205
	2	Sweet Potato	0.02675		0.02675
	3	Tapioca	0.017		0.017

	4	Colocacia	0.1		0.1
	Others (Specify)				
		Total fodder crop area			
		Grazing land, reserve areas etc			
		Availability of unconventional feeds/by products eg., breweries waste, food processing, fermented feeds bamboo shoots, fish etc			
		Sericulture etc			
		Other agro enterprises (mushroom cultivation etc specify)			
		Others (specify)			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)	
	Indigenous cattle	1493	4635	6128	
	Improved/Crossbred cattle	247	893	1140	
				7268	
	Buffaloes (local low yielding)	757	1931	2688	
	Improved Buffaloes	-	-	-	
	Goat	255	514	769	
	Sheep	277	155	231	
	Pig	17406	12831	30237	
	Mithun	391	700	1091	
	Yak				
	Others (Horse, mule, donkey etc., specify)				
	Commercial dairy farms (Number)				
1.9	Poultry	No. of farms	Total No. of birds ('000)		
	Commercial	-	44430 nos.		
	Backyard	-	151607 nos.		
1.10	Fisheries (Data source: Chief Planning Officer)				
	A. Capture				
	i) Marine (Data Source: Fisheries)	No. of fishermen	Boats	Nets	Storage

	Department)		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	facilities (Ice plants etc.)
		-	-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
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)			-	-	-	

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08; specify years)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)							
Major Field crops (Crops to be identified based on total acreage)										
Crop 1	Jhum paddy	4.431	1020	-	-	-	-	4.431	1020	
Crop 2	WRC paddy	18.148	2170					18.148	2170	
Crop 3	Maize	2249	1410					2249	1410	
Others										
Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	Grape	13.373	8384					13.373	8384	

Crop 2	Passion fruit	0.528	2626					0.528	2626	
Crop 3	Banana	9.40275	12541					9.40275	12541	
Crop 4	M.Orange			5.26	2683			5.26	2683	
Crop 5	Ginger	4.6695	3616					4.6695	3616	
Others	Turmeric	3.23425	3003					3.23425	3003	

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Crop 1: Paddy	2: Maize	3: Ginger	4: Pea	5: Cabbage
	Kharif- Rainfed	March – April	March- April	April – May		
	Kharif-Irrigated	June – July				
	Rabi- Rainfed					
	Rabi-Irrigated				Oct. – Nov.	Oct. – Nov.
	Summer-irrigated					
	Summer-rainfed					

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			✓
	Snowfall			✓
	Landslides/ Soil erosion			

	Earthquake			
	Pests and disease outbreak (specify) fruit and shoot borer, paddy stem borer, maize stem borer, leaf folder, termite, fruit flies, root knot nematodes, cut worms, aphids, blast, wilt, powdery mildew etc.			

*When contingency occurs in six out of 10 years

1.14	Include Digital maps of the district for	Location map of district within State as Annexure 1	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes ,
		Soil map as Annexure 3	Enclosed: Yes

2.0 Strategies for weather related contingencies Normal

2.1 Drought:

2.1.1 Rainfed situation (maintain separate rows for each cropping system and please write contingency measures)

2.1.1.1 Pre monsoon (4th week of March)

Condition	Suggested Contingency measures				Remarks on Implementation
	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures including soil and water conservation, life saving irrigation, nutrient sprays, etc.	
Early season drought (delayed onset of monsoon)					
Delay by 2 weeks (2 nd to of April)	Early rice	Tai, idaw, Buhsakei, Phulbuh, tialte, fangsei, farel	No change	--	--
Delay by 4 weeks (4 th week of April)	Early rice	Tai, idaw, Buhsakei, Phulbuh.	No change	--	--
Delay by 6 weeks (2 nd week of May)	NA				
Delay by 8 weeks (4 th week of May)	NA				

2.1.1.2 South West Monsoon (1st week of June)

Condition	Suggested Contingency measures				Remarks on Implementation
	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures including soil and water conservation, life saving irrigation, nutrient sprays, etc.	
Early season drought (delayed onset of monsoon)					

Delay by 2 weeks (3rd week of June)	1) Rainfed Upland /Jhum with Rich Alluvial Soil	Paddy	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	Supply of seeds through State Dept. ATMA's & KVKs
		Ginger (sole crop)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		Bird's eye chilli (sole crops)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		Maize (sole crops)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
	2)Terrace/mid land with no irrigation facility with rich alluvial soil	Horticulture crops: Cabbage French Bean Cow pea Brinjal	No change	Logwood bunding on sloppy land, Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	Promote optimum water supply system, WHS
		1.Rice 2. Maize 3. Soyabean	RCM7, CAUR1, Bhalum 3, 4, sararang. RCM 75, HQPM5, Charhang, Mimbanvar. RCS1-1, RCS1-9, RCS1-10, JS335	Normal sowing, Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	

		Horticulture crops: Passion Fruit Pineapple Banana M. Orange	No change	Mulching with organic materials, Earthing up, half moon terraces. Bunding, check dams, promote WHS, life saving irrigation, application of lime/FYM	
	3) Rainfed Low land	Rice	Paddy var. RCM-10, RCM-11, Local, CAU R1,	Deep ploughings (3 times), application of fertilizers & manures, Late sowing	
Delay by 4 weeks (1 st week of July)	1) Upland /Jhum Rich Alluvial Soil	Rice based Rice + Maize + Cucumber	Rice : local short duration var. Idaw, tai, Buhsakei, CAU R1 Maize: Local sticky maize, HQPM , RCM- 75, Cucumber: Var. Local, Pusa Sanyog, Pant Khiraa- 1 Local vegs	Late sowing, Sowing by dibbling, Interculture operations, Mulching Earthing up, Log/bamboo bunding to conserve run –off water & top soil, Spraying of 0.2% Urea spraying of 0.2% Potash	
		Ginger	Local var. Thingpui, Thinglaidum, & Thingria,	Mulching with organic materials, Earthing up, Spraying of 0.2% Urea spraying of 0.2% Potash	
		Bird's eye chilli	Local variety	Mulching, Spraying of 0.2% Urea spraying of 0.2 % Potash	
	2) Terrace / mid land with no irrigation facility	Horticulture crops Cabbage French Bean Cow pea Brinjal	1. Cabbage var. Ryozekei, Indam 1299, Improved Bahar, Rocky 2. French Bean var. Local, Arka Anoop, Arka Komal, Arka Sharat 3. Cow pea var. Local, Arka Garima Pusa Kumal, PKM-1 4. Brinjal var. Arka Kesav, Arka Neidhi, Arka Anand, Pusa Kranti	Logwood bunding on sloppy land, Sowing can be delayed up to May with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		Rice	Early varieties as above	Late sowing, Application of slaked lime & organic manure, Mulching with available bio-mass, Frequent inter-culture operations, Spraying of 0.2 % Urea spraying of 0.2 % Potash	
		Perennial crops Pineapple, Banan, M.	No change	Mulching, Application of slaked lime & organic manure	

		Orange			
	3) Low land with irrigation facility	Rice	Short duration varieties by system of rice intensification	Deep ploughing Application of organic manure Late sowing	
	4) Low land without irrigation facility	Rice	Short duration varieties by system of rice intensification	Deep ploughing Application of organic manure Late sowing	
		Lowland Paddy	Nursery preparation	Dry & Wet bed method	
Delay by 6 weeks (July 3 rd week)	1) Upland /Jhum Rich Alluvial Soil	NA	NA	NA	
	2) Terrace/ mid land with no irrigation facility	NA	NA	NA	
	3) Low land with irrigation facility	NA	NA	NA	
	4) Low land without irrigation facility	NA	NA	NA	
Delay by 8 weeks (August 1 st week)	1) Farming situation: Jhum/up land with rich alluvial soil	NA	NA	NA	
	2) Farming situation: Terrace/ Midland with red alluvial soil				

	3) Low land with no irrigation facility Sandy loam	NA	NA	NA	NA
	4) Low land with irrigation facility Clayey loam	NA	NA	NA	NA

***Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	Month and week for specifying condition of early season drought due to delayed onset of monsoon			
	Delay in onset of monsoon by			
	2 wks	4 wks	6 wks	8 wks
June 1 st wk	June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk
June 2 nd wk	June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk
June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk
June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk
July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk	Sep 1 st wk
July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk	Sep 2 nd wk

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	AES-II (Plain land-moderately deep to deep fine/ fine loamy soils)	Maize	Irrigation is necessary		
	AES-I (Mid hills-moderately deep to deep fine/ fine loamy soils)	Cropping system 1:	Ginger	Mulching	
		Cropping system 2:	Turmeric	Mulching	

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	1. AES-II (Plain land-moderately deep to deep fine/ fine loamy soils)	Kharif Maize	Intercultural operation		
		Turmeric	Earthing up		
	2. AES-I (Mid hills-moderately deep to deep fine/ fine loamy soils)	Jhum paddy	Weeding	Bunding of field with logs	
	3				
	4				
	5				

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell)					
At flowering/ fruiting stage	1	Kharif maize	Intercultural operation	Bunding of fields with logs, top soil bedded terrace	
		Turmeric			
		Ginger		Timely sprays with systemic insecticides to control shoot and fruit borer	
	2				
Condition			Suggested Contingency measures		

Terminal drought (Early withdrawal of monsoon)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
	AES-II (Plain land-moderately deep to deep fine/fine loamy soils)	Ginger	-	Harvest at maturity stage	
		Turmeric	-	Harvesting stage	
		Chilli	-	Harvesting stage	
	AES-I (Mid hills-moderately deep to deep fine/fine loamy soils)				
	3				
	4				
	5				

Notes:

- a. Describe the major farming situation to provide information on growing environment (rainfall and soil information - colour, depth & texture) such as low rainfall shallow red sandy loam soils, high rainfall deep black soils, uplands, medium lands, eroded hill slopes etc. tank fed black soils, shallow acid soils, sodicvertisols etc
- b. Describe the normal crop or cropping system grown in that farming situation including catch crop, sequence, rotation & variety if known
- c. Describe the alternative crop, variety and/or cropping pattern in view of the delay in monsoon and shortening of the growing period including delay in sowing of nurseries in case of paddy.
 - In case of normal onset followed by early season droughts re-sowing may be recommended including variety seed rate etc.
 - In case of early or mid season dry spells indicate crop management techniques to save standing crop.
 - In case of terminal drought indicate giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable grain/fodder yield etc.
- d. Describe all agronomic practices which help in coping with late planting like increased or decreased spacing, changes in planting geometry, intercropping in case of sole crops, thinning, mulching, spray of anti-transpirants or other chemicals, supplemental irrigation, soil and moisture conservation practices like ridging, conservation furrows, dust mulch etc.
 - In case of early and mid season dry spells indicate moisture conservation techniques to save standing crop.
 - In case of terminal drought indicate early rabi cropping with suitable crops/varieties with a possibility of giving pre-sowing/come up irrigation etc.
- e. Give details on the source of the breeder seed, in case an alternate crop or variety is suggested as part of the contingency. For agronomic measures, indicate any convergence possible with ongoing central or state schemes like National Rural Employment Guarantee Scheme (NREGS), Integrated Watershed Management Programme (IWMP), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), Community Land Development Programme (CLDP) etc., to meet the cost of materials, labour or implements etc. to carry out any field based activity quickly.

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in canals due to low rainfall	1) Farming situation: Upland , tank fed , loamy soil	French bean	No change	Arka Anoop, proper irrigation is must, raised bed is preferable	
		Tomato	No change	Arka Rakshak	
		Brinjal	No change	RCMBL 1	
	2) low land , canal water fed , loamy soil	Onion	No change	Time of sowing is important , irrigation is must	
		Pea	No change	Sowing should be done before December	

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
Limited release of water in canals due to low rainfall	1) Farming situation: loamy soil Upland, tank fed	-		-	
	2) low land , canal water fed , loamy soil	Pea	No change	Azad P 3. Arkel variety is best due to their short duration characters	-

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
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation: Upland, tank fed , loamy soil	Cropping system 1:	-	-	-
		Cropping system 2:			
		Cropping system 3:			
	2) low land , canal water fed , loamy soil	Cropping system 1:	Pea	No change	Azad P 3. Arkel variety is best due to their short duration characters
		Cropping system 2:			

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
		Cropping system 3:			

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
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation: Upland , tank fed , loamy soil	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
	2) low land, canal water fed, loamy soil	Cropping system 1:	Pea	No change	Azad P 3. Arkel variety is best due to their short duration characters
		Cropping system 2:			
		Cropping system 3:			
Insufficiency of surface water for irrigation					

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
Insufficient groundwater recharge due to low rainfall	1) Farming situation: up land loamy soil, tank fed	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
	2) Farming situation: low land loamy soil , canal irrigated water , loamy soil	Pea	No change	Azad P 3. Arkel variety is best due to their short duration characters	Pea
		Cropping system 2:			
		Cropping system 3:			
Any other condition (specify)					

Notes:

^f Describe such as uplands, medium and low lands and source of irrigation such as tank/medium or deep black/loamy/red soils, tube well irrigated red soils, canal irrigated red soils, well irrigated black soils etc.,

^gThe normal crop or cropping systems grown in a given irrigated situation

^h Suggested change in the crop, variety or cropping system in view of delay in release of irrigation water, less water availability etc.,

^l All agronomic measures like improved methods of irrigation (skip row etc.), micro irrigation (drip/sprinkler/sub-surface), deficit irrigation, limited area irrigation, mulching etc, that improve water use efficiency and make best use of limited water including methods of ground water recharge and sharing.

^j Comments on source of availability of seed of the alternate crop or variety, any constraints in marketing of alternative crop implications for livestock and dairy sectors and details of state or central schemes like National Rural Employment Guarantee Scheme (NREGS), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM) etc., which facilitate implementation of the agronomic measures suggested.

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

Condition	Suggested contingency measure			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
Mustard	Aphids infestation	Malathion is to be spray at 10 days interval to control aphids	-	
Paddy	Blast problem	Timely spray of fungicides		Destroyed spoiled harvested fruits
Ground nut	Rust problem	Timely spray of fungicides		
Crop4				
Crop5				
Horticulture				
Tomato	Bacterial wilt infestation, borer attacked , thrips	During kharif season bacterial wilt resistant Tomato is suggested , timely spray of fungicides and insecticides	-	Harvested fruit should be kept in a container or box with good air circulation , destroyed or collected spoiled harvested fruits
Cabbage	Aphids infestation , timely spray of			

	malathion is recommended			
Brinjal	Fruit and shoot borer , wilt problem	Timely spray of insecticides		Dumped spoiled harvested fruits
Crop4				
Crop5				
Heavy rainfall with high speed winds in a short span²				
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Crop4				
Crop5				
Outbreak of pests and diseases due to unseasonal rains				
Ginger	Proper seed treatment , soil drenching with copper Oxychloride , timely spray with Streptocycline @200ppm , Bacterial wilt , fruit and shoot borer		Harvested rhizome should be treated with fungicides	
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				

Crop4				
Crop5				

^kSuch as drainage in black soils, indicate taking up need based inter-culture operations, outbreak of pests/diseases along with their management etc.

^lSuch as drainage in black soils, application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruitletting and indicate possibility of pest/disease outbreak with need based prophylactic / curative management etc.

^mSuch as drainage in black soils, measures for preventing seed germination etc and Indicate possibility of harvesting at physiological maturity immediately and shifting produce to safer place and protection against pest/disease damage in storage etc.

ⁿSuch as shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc.

2.3 Floods: NA

Condition	Suggested contingency measures ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Crop1 (specify)				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture /Plantation crops				
Crop1 (specify)				
Crop2				
Crop3				
Crop 4				
Crop 5				
Continuous submergence for more than 2 days²				
Crop1				
Crop2				
Crop3				

Crop4				
Crop5				
Horticulture / Plantation crops				
Crop1 (specify)				
Crop2				
Crop3				
Crop 4				
Crop 5				
Sea water intrusion³				
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				

Notes:

Flood situation could arise during early season (eg. summer season) or in the main season; Accordingly contingency measures could be suggested

¹Water logging due to heavy rainfall, poor drainage in vertisols, flash floods in streams and rivers due to high rainfall, breach of embankments

²If the water remains in the field due to continuous rains, poor infiltration and push back effect

³Entry of sea water into cultivated fields in coastal districts due to tidal wave during cyclones or tsunami; intrusion of seawater into groundwater in coastal districts

^oCrop/field management depends on nature of material (sand or silt) deposited during floods. In sand deposited crop fields/ fallows indicate ameliorative measures such as early removal of sand for facilitating *rabi* crop or next kharif. In silt deposited indo-gangetic plains, indicate early *rabi* crop plan in current cropped areas and current fallow lands. Indicate drainage of stagnating water and strengthening of field bunds etc. In diara land areas indicate crop plans for receding situations. Usually rice cropped areas are flood prone causing loss of nurseries, delayed transplanting or damage to the already transplanted fields etc. Indicate community nursery raising, scheduling bushenings, re-transplanting in damaged fields and transplanting new areas or direct seeding including seed availability so that the season is not lost. Indicate steps for preventing pre-mature germination of submerged crop at maturity or harvested produce.

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				
Frost				
Crop1 Potato	After sowing/planting mulching should be done sowing should be done in such a way that maximum sunlight can be obtained i.e. sowing on the sunny wall of furrows and adjustment of the plants structure by orientation of the row direction	Addition of sand in small quantities to soil for every few years. Burning of stubbles/crop debris at the bunds in the evening/morning can reduce frost damage and frequent watering or irrigating the crops either by water or chemicals. Overhead sprinkler irrigation provides protection from cold/frost damage	Frequent irrigation/ watering may be done burning of stubbles/ crop debris at the bunds in the evening/morning can reduce frost damage and frequent watering or irrigating the crops either by water or chemicals. Overhead sprinkler irrigation provides protection from cold/frost damage	
Crop 2 Grape				
Soil erosion/land slide <ol style="list-style-type: none"> 1) Jhum paddy 2) Ginger 3) Grape 4) Pineapple 5) Banana etc. 	On sloppy/steep land construction of bench terraces, contour bunds, trenches should be made. Grasses/ crops which produce the maximum cover e.g. cow pea etc. should be grown on the bunds. Contour cultivation, tillage mulching of crops, strip cropping etc. should be undertaken. In unbundled areas cultural operations may be done across the slope to reduce runoff and soil loss. Multiple cropping system where the soil is covered with all crops through the year may be undertaken. Few rows of grasses and shrubs should be grown along the contours (closely placed plantation) as vegetative barriers for erosion control			

Notes:

^p In regions where the normal maximum temperature is more than 40⁰C, if the day temperature exceeds 3⁰C above normal for 5 days it is defined as heat wave. Similarly, in regions where the normal temperature is less than 40⁰C, if the day temperature remains 5⁰C above normal for 5 days, it is defined as heat wave.

^q In regions where normal minimum temperature remains 10⁰C or above, if the minimum temperature remains 5⁰C lower than normal continuously for 3 days or more it is considered as cold wave. Similarly in regions with normal minimum temperature is less than 10⁰C, if the minimum temperature remains 3⁰C lower than normal it is considered as cold wave

^r Indicate appropriate crop/soil management measures depending upon the crop and its stage for alleviating the specified stress.

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought NA			
Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA
Floods			
Feed and fodder availability	Storage of available fodder recourses at elevated place, Protection of stored fodder from unusual/ heavy rains with polysheet.	Collect and utilised locally available feed including kitchen waste	Collect the residual crop (maize, paddy, cowpea leaves etc) & dried for future
Drinking water	Harvest the rainwater and collect in tanky	Provide clean and Hygienic water	Cleaning tank, restore hygienic environment.
Health and disease management	Regular supplementation of Vitamin and minerals Vaccination and deworming should be regular Feeding of balanced diet, Restriction of the entry to farm premises, isolation of the dise4ase animals	Proper disposal of manure Regular cleaning of shed Disinfection of shed Restricting movement of livestock in any case of epidemics. Rescue of sick and injured animals and their treatments.	Disinfection and sanitation of all the shed Movement other than the attendant into the farm premises should be restricted Proper disposal of dead animals
Cyclone	NA	NA	NA

Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA
Cold wave			
Shelter/environment management	Provision of proper shelter.	Proper Housing, cover the surrounding with covers,	Clean the surrounding environment.
Health and disease management	Regular supplementation of Vitamin and minerals Vaccination and deworming should be regular Feeding of balanced diet, Restriction of the entry to farm premises, isolation of the dise4ase animals	Proper disposal of manure Regular cleaning of shed Disinfection of shed Restricting movement of livestock in any case of epidemics. Rescue of sick and injured animals and their treatments.	Disinfection and sanitation of all the shed Movement other than the attendant into the farm premises should be restricted Proper disposal of dead animals
Snowfall	NA	NA	NA
Earthquake	NA	NA	NA
Landslides	NA	NA	NA

based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought	NA	NA	NA	NA
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Floods				
Shortage of feed ingredients	Storage of available feed, Protection of stored feed from rodents	Collect and utilised locally available feed including kitchen waste	Collect the residual, routine managerial practices	
Drinking water	Harvest the rainwater and collect in tanky	Provide clean and Hygienic water	Cleaning tank, restore hygienic environment.	
Health and disease management	Regular supplementation of	Proper disposal of	Disinfection and	

	Vitamin and minerals Vaccination and deworming should be regular Feeding of balanced diet, Restriction of the entry to farm premises, isolation of the dise4ase animals	manure Regular cleaning of shed Disinfection of shed Restricting movement of livestock in any case of epidemics. Rescue of sick and injured animals and their treatments.	sanitation of all the shed Movement other than the attendant into the house Premises should be restricted Proper disposal of dead bird	
Cyclone	NA	NA	NA	NA
Shortage of feed ingredients				
Drinking water	NA	NA	NA	NA
Health and disease management	NA	NA	NA	NA
cold wave	NA	NA	NA	NA
Shelter/environment management	Proper Selection of housing site,	Provision of proper ventilation, protection from extreme temperature using covers. Provision of heater	Disinfection of sheds, disposal of dead /inferior birds	
Health and disease management	Stock preventive medicines, vaccines; procurements of feeds & litter materials	Measures to Prevent outbreak of diseases, continue feeding and construction of shed,	proper disposal of dead birds	NA
Snowfall	NA	NA	NA	NA
Earthquake, Landslides etc	NA	NA	NA	NA

based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
Shallow water in ponds due to insufficient rains/inflow	NA	NA	NA
Impact of heat in ponds / change in water quality	NA	NA	NA
2) Floods			
Inundation with flood waters	1. Storage of sand filled bags for emergency use. 2. Repair and maintenance of bunds. 3. Insurance coverage provision for life and property	1. Timely broadcast and telecast and other types of announcement warning about the danger level with respect to water level. 2. Relief operation.	1. Relief operation will continue. 2. Care of health of affected people 3. Settlement of insurance. 4. Financial support to other people.
Water contamination & change in BOD	Take appropriate measures to check seepage into pond e.g. Raising bunds to prevent entry of water	Check the water quality & take appropriate action	1. Application of lime 2. Application of Alum. 3. Application of KmnO4
Health and diseases management	Stock preventive medicines, vaccines	Prevent influx of diseased fish from outside source, Check through nets Administer medicines through random catch Disinfect water by lime , KMnO4	1. Application of lime and KmnO4. 2. Assessment of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds.
3. Cyclone / Tsunami	NA	NA	NA
A. Capture	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture	NA	NA	NA
(i) Overflow / flooding of ponds	NA	NA	NA
(ii) Changes in water quality (fresh water / brackish water ratio)	NA	NA	NA
(iii) Health and diseases	NA	NA	NA
(iv) Loss of stock and inputs (feed, chemicals etc)	NA	NA	NA
(v) Infrastructure damage (pumps,	NA	NA	NA

aerators, shelters/hutsetc)			
(vi) Any other	NA	NA	NA
4. Heat wave and cold wave	NA	NA	NA
A. Capture	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture	NA	NA	NA
(i) Changes in pond environment (water quality)	NA	NA	NA
(ii) Health and Disease management	NA	NA	NA
(iii)Any other			

based on forewarning wherever available