Agriculture Contingency Plan for District: West Jaintia Hills
State: Meghalaya

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	North-Eastern Hills (Purvachal), Warm Perhumid Eco-Region. (17.1)Assam And Bengal Plain, Hot Sub humid To Humid (Inclusion of Perhumid) Eco-Region (15.2)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Division		
	Agro Climatic Zone (NARP)	Eastern Himalayan Division		
	List all the districts or part thereof falling under the NARP Zone	Sub-Tropical Hill Zone		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		$25^{o}02$ -$25^{o}45$'N	$91^{o}58$ – $92^{o}50$'E	76m-1627m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ICAR Research Complex for NEH Region, Umiam, Meghalaya – 793103		
	Mention the KVK located in the district	Krishi Vigyan Kendra, Jaintia Hills, Department of Agriculture, Rymphum Jowai West Jaintia Hills District Pin- 793150		

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):	2387	89	1st Week of June	4th Week of September
	NE Monsoon(Oct-Dec):	112	13	1st Week of October	4th Week of December
	Winter (Jan- March)	129	0	1st Week of January	4th Week of March
	Summer (Apr-May)	283.5	30	1st Week of April	4th Week of May
	Annual	2911.5	125		

Source : Department of Food Security and Agriculture Development, Govt. of Meghalaya

1.3	Land use pattern of the district (latest statistics)	Geographical area (‘000 ha)	Total Cultivable area (‘000 ha)	Forest area (‘000 ha)	Land under non-agricultural use (‘000 ha)	Permanent Pastures (‘000 ha)	Cultivable wasteland (‘000 ha)	Land under Misc. tree crops and groves (‘000 ha)	Barren and uncultivable land (‘000 ha)	Current Fallows (‘000 ha)	Other fallows
	Area (‘000 ha)	381.9	194.6	154.0	18.1	-	113.7	17.5	18.1	9.8	176.1

* Source: District Crop Forecast Committee ,Jaintia Hills ,2012

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)	Area (‘000 ha)	Percent (%) of total
1.	Black Soils	16.1	4.2
2.	Red Soils	264.9	69.4
3.	Alluvial Soils	16.6	4.4
4.	Sandy Soils	36.5	9.6
	Total	381.9	100

1.5	Agricultural land use	Area (‘000 ha)	Cropping intensity %
	Net sown area	36.1	101.1%
	Area sown more than once	0.4	
	Gross cropped area	36.5	

1.6	Irrigation	Area (‘000 ha)
	Net irrigated area	5.1
	Gross irrigated area	6.9
	Rainfed area	-

	Sources of Irrigation	Number	Area (‘000 ha)	% of total irrigated area
	Canals/close conduits (No. of Schemes)Surface flow	73	4.908	
	Tanks / ponds	-	-	-
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	6	0.042	
	Micro-irrigation	-	-	-
	Other sources (Springs)	-	-	-
	Catch water drains	-	-	-
	Tap	-	-	-
	Harvested water (rain)	23	0.144	
	Total Irrigated Area	102	5.094	
	Pump sets	-	-	-
	No. of Tractors	-	-	-
	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	Nil		
	Critical	Nil		
	Semi- critical	Nil		
	Safe	-	-	-
	Wastewater availability and use	-	-	-
	Ground water quality	-		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				
* Source: District Crop Forecast Committee, Jaintia Hills ,2012				

1.6.a.	Fertilizer and Pesticides Use	Type	Distribution of Fertilizers (2009-2010)MT Total Quantity(tonnes)
1.	Fertilizers	Urea DAP SSP MOP	239.408 40.074 470.164 66.579
		Other Straight Fertilizers(specify): 1.Bone meal Other Complex Fertilizers(specify)	177.925
2.	Chemical Pesticides	Insecticides Fungicides Weedicides Others(specify)	NA

*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 source: -
Source: MECOFED, Jowai Branch .Jaintia Hills District,2011

1.6.b Consumption of Fertilizers (2009-2010)						
	Kharif			Rabi		
	N	P	K	N	P	K
	83.51	85.41	28.46	33.82	8.24	11.48

Source: MECOFED, Jowai Branch .Jaintia Hills District, 2011

1.7 Area under major field crops & horticulture

1.7a	Major field crops cultivated	Area (‘000 ha)									
		Kharif/Sali/Rainy/Winter			Rabi /Aus/Ahu/Autum			Summer/Spring/Boro			Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	
1	Rice	3.89	8.417	12.307	0.056	-	0.056	0.077	-	0.077	12.44
2	Maize	-	2.1511	2.151	0.43022	0.18438	0.6146	0.21511	0.09219	0.3073	3.073
3	Soybean	0.0416	0.3744	0.416	-	-	-	-	-	-	0.416
4	Rapeseed and Mustard	-	-	-	-	-	-	0.023	0.0345	-	0.0575
5	Pulses	-	0.0525	0.0525	-	0.015	0.015	0.006	0.0015	0.0075	0.075
Source: Directorate of Agriculture, Meghalaya, 2013-14											

1.7b	Horticulture crops - Fruits	Area (‘000 ha)		
		Total	Irrigated	Rainfed (‘000 ha)
1	Citrus	1.108	-	1.108
2	Banana	0.352 ha	-	0.352 ha
3	Pineapple	0.077 ha	-	0.077 ha
1.7c	Horticulture crops - Vegetables	Total area (‘000 ha)	Irrigated area (‘000 ha)	Rainfed area (‘000 ha)
1	Potato	0.207	-	0.207
2	Vegetables	2.042	0.35	1.692
1.7d	Medicinal and Aromatic crops	Total area (‘000 ha)	Irrigated area (‘000 ha)	Rainfed area (‘000 ha)
1.7e	Plantation/ Spices crops	Total area (‘000 ha)	Irrigated area (‘000 ha)	Rainfed area (‘000 ha)
1	Turmeric	1.257	-	1.257
2	Ginger	0.340	-	0.340
3	Arecanut	1.775	-	1.775

4.	Black pepper	0.037	-	0.037
Source: Directorate of Horticulture, Meghalaya, 2012-13				
1.7f	Fodder crops	Total area (‘000 ha)	Irrigated area (‘000 ha)	Rainfed area (‘000 ha)
	Total fodder crop area	-	-	-
1.7g	Grazing land,reserve areas etc	-	-	-
	Availability of unconventional feeds/by products eg., breweries waste,food processing, fermented feeds bamboo shoots,fish etc	-	-	-
1.7h	Sericulture 1.Area of Sericultural farms 2.Eri- seed grainage Other agro enterprises(mushroom cultivation etc specify)	 0.03 0.0024	-	-
1.7i	Others (specify)	-	-	--

Source: District Crop Forecast Committee, Jaintia Hills 2011-2012

1.8	Livestock (in number) of West Jaintia Hills District	Male (‘000)	Female (‘000)	Total (‘000)
	Indigenous cattle	34.65	24.079	58.729
	Improved/Crossbred cattle	0.182	0.787	0.969
	Buffaloes (local low yielding)	.727	0.373	1.100
	Goat	5.259	6.932	12.191
	Sheep	0.027	0.045	0.075
	Pig	11.883	20.574	32.457
	Others(Horse, mule, donkey etc., specify)	0.139	0.178	0.317
	Commercial dairy farms (Number)	-	-	-
Source: Fisheries Department Jaintia Hills District,2011				

1.9	Poultry	No. of farms	Total No. of birds (‘000)
	Commercial		327.963
	Backyard		5.969

Source : Summary Report on 18th Livestock census 2007, Department of AH,LF& VS, Govt. of Meghalaya

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
	900	1	5

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)	90	2.5	225
Others (swamps, under low lying areas	5.6	0.6	3.360

1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif/Sali/rainy/Winter		Rabi /Aus/Ahu/Autum		Summer/Spring/Boro		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)										
Crop 1	Rice	21.03	3135	0.112	1556	0.209	4354	21.351	9045	-
Crop 2	Maize	3.663	1191	-	-	-	-	3.663	1191	-
Crop 3	Soyabean	0.465	1288	-	-	-	-	0.465	1288	-
Crop 4	Rapeseed and Mustard	-	-	-	-	0.034	539	0.034	539	-
Crop 5	Pulses	-	-	-	-	0.0526	668	0.0526	668	-
Major Horticultural crops (Crops to be identified based on total acreage) Fruits										
Crop 1	Citrus	6.065	5474	-	-	-	-	6.065	5474	-
Crop 2	Black Pepper	0.025	676	-	-	-	-	0.025	676	-
Crop 3	Pineapple	0.593	7701					0.593	7701	-
Crop 4	Turmeric	7.381	5872	-	-	-	-	7.381	5872	-
Crop 5	Ginger	3.561	10474	-	-	-	-	3.561	10474	-
Crop 6	Potato	1.029	4971	-	-	-	-	1.029	4971	-
Crop 7	Banana	1.146	3256	-	-	-	-	1.146	3256	-
Crop 8	Arecanut	2.667	1503					2.667	1503	-
Crop 9	Vegetables	22.500	11019	-	-	-	-	22.500	11019	-

Source: 1 Directorate of Horticulture, Meghalaya, 2012-13, District Crop Forecast committee Report 2012-2013

1.12	Sowing window for 5 major Field crops (start and end of normal sowing period)	Crop 1 : Rice	Crop 2:Maize	Crop 3: Soybean	Crop 4: Rapeseed and Mustard	Crop 5: French bean
Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),	Kharif- Rainfed	July-August	May-June	July-August	-	July-August
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	June-July	July-August	-	October-November	-
	Rabi-Irrigated	-	-	-	-	
	Spring-irrigated	-	-	-	-	-
	Spring-rainfed	November-December	March-April	-		-
Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping	Kharif- Rainfed	June-July	April-May	June-July	-	June-July
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	May-June	July -august	-	October-November	
	Rabi-Irrigated	-	-	-	-	-
	Spring-irrigated	-	-	-	-	-
	Spring-rainfed	November	March-April	-	-	-
High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping	Kharif- Rainfed	May	April-May	May-June	March- July	May-June
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	May-June	July	-	November	-
	Rabi-Irrigated	-	-	-	-	-
	Spring-irrigated	-	-	-	-	-
	Spring-rainfed	November	March		-	-

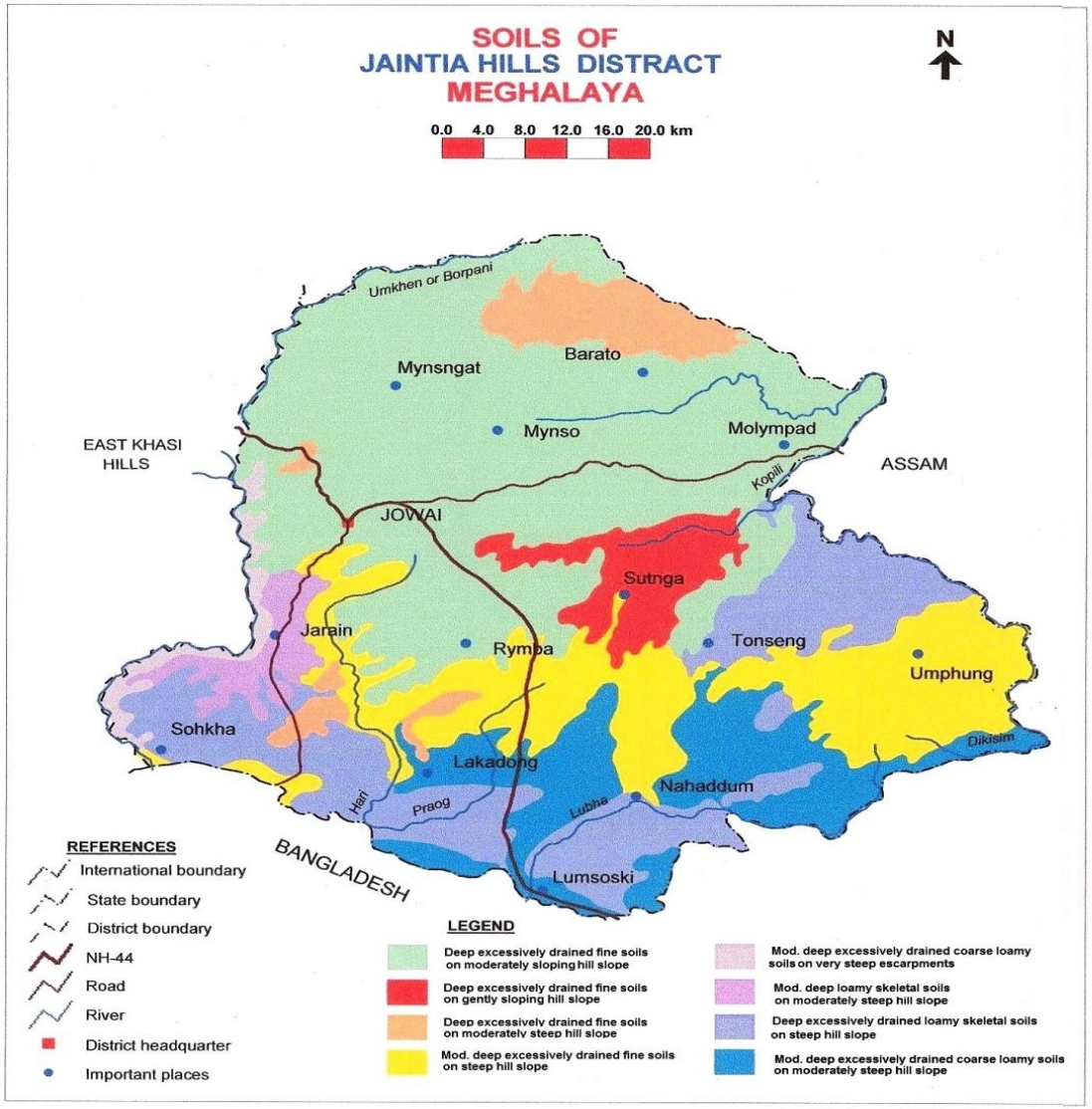
	Sowing window for 5 major horticultural crops (start and end of normal sowing period)	Crop 1 : Turmeric	Crop 2: Ginger	Crop 3: Potato	Crop 4: Tomato	Crop 5: Cabbage
Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall (more than 8000mm)very steep slope (25-33%),	Kharif- Rainfed	-	-	-	-	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	October-November	-	-
	Rabi-Irrigated	-	-	-	December-January	November-January
	Spring-irrigated	-	-	-	-	-
	Spring-rainfed	-	-	-		-
Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping	Kharif- Rainfed	April-May	April-May	-	-	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	-	-	
	Rabi-Irrigated	-	-	-	-	-
	Spring-irrigated	-	-	-	-	-
	Spring-rainfed	-	-	-	-	-
High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping	Kharif- Rainfed	April-May	April-May	-	March- July	March-September
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-		-	
	Rabi-Irrigated	-	-	-	-	October-December
	Spring-irrigated	-	-	-	January-February	-
	Spring-rainfed	-	-	January - March	-	-

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)- Rice Stem borer/leaf folder, Maize Cob borer/termites,Turmeric Taphrina/stem borer, ginger stemborer & soft rot,Tomato wilt	✓		
Others (Like fog,cloud bursting etc.)		✓	

*when contingency occurs in 6 out of 10 years = Regular

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: No
		Soil map as Annexure 3	Enclosed: Yes

Location map of West Jaintia district
Annexure I


SOILS OF
JAINTIA HILLS DISTRACT
MEGHALAYA
N
0.0 4.0 8.0 12.0 16.0 20.0 km
Umkhen or Borpani
Mynsngat
Barato
Mynso
Molympad
EAST KHASI HILLS
ASSAM
Kopili
JOWAI
Sutnga
Jarain
Rymba
Tonseng
Umphung
Sohkha
Lakadong
Nahaddum
Dikkiam
Harl
Praog
Lubha
Lumsoski
BANGLADESH
REFERENCES
International boundary
State boundary
District boundary
NH-44
Road
River
District headquarter
Important places
LEGEND
Deep excessively drained fine soils on moderately sloping hill slope
Deep excessively drained fine soils on gently sloping hill slope
Deep excessively drained fine soils on moderately steep hill slope
Mod. deep excessively drained fine soils on steep hill slope
Mod. deep excessively drained coarse loamy soils on very steep escarpments
Mod. deep loamy skeletal soils on moderately steep hill slope
Deep excessively drained loamy skeletal soils on steep hill slope
Mod. deep excessively drained coarse loamy soils on moderately steep hill slope

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation (maintain separate rows for each cropping system)

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks(specify month)* June 3rd week(REFER TO THE MATRIX TABLE)	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping System:1 Rice based Cropping System a. Rice-Ranjit,Bahadur,Pankaj	No Change	Normal recommended practice of sowing	Sowing time-June to July
		b. Maize-Vijay,Ganga-101,Ranjit,Deccan,Ganga-5,Ganga safed,Ganga-4,Amber,Sona,Kisan,Jawahar,Vikram	No Change	Normal recommended practice of sowing	Sowing time-April to May
		c. Soyabean-Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time-June to July/August to September
Pre monsoon Delay by 2 weeks April 2nd week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management with organic fertilizers should be followed • Cleaning of basin and mulching.	Planting time-June- August
		b. Arecanut – Local selection, Mangla, Sumangala	No change	• Apply recommended dose of organic manures • Mulching with organic	Transplanting time – June-July

				materials	
		c. Black pepper- Panniyur 1, Panniyur 2	No change	• Apply recommended dose of organic manures • Mulching with organic materials	Planting time- May- June
		d. Litchi - Muzaffarpur	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management with organic fertilizers should be followed • Cleaning of basin and mulching.	Planting time- June- August
		e. Potato – Kufri Jyoti, Kufri Megha	No change	• Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity stage	Sowing time- October- November
	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	a.Rice-Shah Sarang I,Lampnah I,RCPL 1-3,RCPL 3-3,Ngoba,Manipur	No Change	Normal recommended practice of sowing	Sowing time- May to June
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	No Change	Normal recommended practice of sowing	Sowing time- March to April
		c. Soyabean-Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time- June to July/August to

					September
Pre monsoon Delay by 2 weeks April 2nd week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	Horticulture based cropping system a. Pineapple – Kew, Queen	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Planting time- May- August
		b.Turmeric- Lakadong, RCT-1	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		c.Ginger- Nadia	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		d. Banana- Jahaji, Local variety	No change	• Intercropping with leguminous vegetables • Apply recommended	Planting time- May- July

				dose of organic manures • Cleaning of basin and mulching with plant materials	
	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	a.Rice-Megha Rice I,Megha Rice II,US I,Local varieties	No Change	Normal recommended practice of sowing	Sowing time-April to 1st week of May
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	No Change	Normal recommended practice of sowing	Sowing time-March to April
		c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time-June to July/August to September
Pre monsoon Delay by 2 weeks April 2nd week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed • Cleaning of basin and mulching.	Planting time-June- August
		b.Turmeric- Lakadong, RCT-1	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time-April to May

		c.Ginger- Nadia	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		d. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- March- July
		e. Potato– Kufri Jyoti, Kufri Megha	No change	• Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity	Sowing time- January - March
		f. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at head formation stage	Sowing time- March- September

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 4 weeks July 1st week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping System:1 Rice based Cropping System a. Rice-Ranjit,Bahadur,Pankaj	No Change	Normal recommended practice of sowing	Sowing time-June to July
		b. Maize-Vijay,Ganga-101,Ranjit,Deccan,Ganga-5,Ganga safed,Ganga-4,Amber,Sona,Kisan,Jawahar,Vikram	No Change	Normal recommended practice of sowing	Sowing time-April to May
		c. Soyabean-Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time-June to July/August toSeptember
Premonsoon Delay by 4 weeks May 1st week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed • Cleaning of basin and mulching.	Planting time-June- August

		b. Arecanut – Local selection, Mangla, Sumangala	No change	• Apply recommended dose of organic manures • Mulching with organic materials	Transplanting time – June-July
		c. Black pepper- Panniyur 1, Panniyur 2	No change	• Apply recommended dose of organic manures • Mulching with organic materials	Planting time- May- June
		d. Litchi - Muzaffarpur	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed • Cleaning of basin and mulching.	Planting time- June- August
		e. Potato – Kufri Jyoti, Kufri Megha	No change	• Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity stage	Sowing time- October- November
	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly	a.Rice-Shah Sarang I,Lampnah I,RCPL 1-3,RCPL 3-3,Ngoba,Manipur	No Change	Normal recommended practice of sowing	Sowing time- May to June
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	No Change	Normal recommended practice of sowing	Sowing time- March to April

	sloping,rain fed	c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time- June to July/August to September
Premonsoon Delay by 4 weeks May 1st week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	Horticulture based cropping system a.Pineapple – Kew, Queen	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Planting time- May- August
		b.Turmeric- Lakadong, ,RCT-1	No Change	• Delay sowing till May • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		c.Ginger- Nadia, Suprabha, Thinglaidong, Thingpui	No Change	• Delay sowing by May • Land should be well prepared • Recommended dose of organic manure should be	Sowing time- April to May

				applied before planting • Mulching should be done with plant materials	
		d. Banana- Jahaji, Local variety	No change	• Intercropping with leguminous vegetables • Apply recommended dose of organic manures • Cleaning of basin and mulching with plant materials	Planting time- May- July
	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	a.Rice-Megha Rice I,Megha Rice II,US I,Local varieties	No Change	Normal recommended practice of sowing	Sowing time- April to 1st week of May
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	No Change	Normal recommended practice of sowing	Sowing time- March to April
		c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time- June to July/August to September
Premonsoon Delay by 4 weeks May 1st week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Intercropping with leguminous vegetables • Construction of half moon trenches • Proper nutrient management should be followed • Cleaning of basin and mulching.	Planting time- June- August

		b. Potato– Kufri Jyoti, Kufri Megha	No change	• Sowing can be done from February • Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity	Sowing time- January - March
		c.Turmeric- Lakadong ,RCT-1	No Change	• Delay sowing till May • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		d.Ginger- Nadia	No Change	• Delay sowing till May • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Sowing time- April to May
		e. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Delay sowing till March • Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at	Sowing time- March- July

				flowering and fruit set stage	
		f. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at head formation stage	Sowing time-March-September

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 6 weeks July 3rd week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping System:1 Rice based Cropping System a. Rice-Ranjit,Bahadur,Pankaj	No Change	Normal recommended practice of sowing	Sowing time-June to July
		b. Maize-Vijay,Ganga-101,Ranjit,Deccan,Ganga-5,Ganga safed,Ganga-4,Amber,Sona,Kisan,Jawahar,Vikram	Use normal seeds	Normal recommended practice of sowing	Pre- Rabi Maize
		c. Soyabean-Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	Use normal seed	Normal recommended practice of sowing	PreRabi crop August to September

Premonsoon Delay by 6 weeks May 3rd week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed with organic manures. • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage	Planting time- June- August
		b. Arecanut- Local selection, Mangla, Sumangala	No change	• Proper nutrient management should be followed • Cleaning of basin and mulching. • Life saving irrigation should be given	Transplanting time – June- July
		c. Black pepper- Panniyur 1, Panniyur 2	No change	• Proper nutrient management should be followed with organic manures. • Cleaning of basin and mulching. • Life saving irrigation should be given	Planting time- May- June

		d. Litchi - Muzaffarpur	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage	Planting time-June- August
		e. Potato – Kufri Jyoti, Kufri Megha	No change	• Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity stage	Sowing time-October-November
Delay by 6 weeks July 3rd week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	a.Rice-Shah Sarang I,Lampnah I,RCPL 1-3,RCPL 3-3,Ngoba,Manipur	No Change	Normal recommended practice of sowing	Sowing time-May to June
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	Use Hybrid Maize	Normal recommended practice of sowing	Pre-Rabi Maize
		c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	Use normal seeds	Normal recommended practice of sowing	Pre Rabi crop August to September

Premonsoon Delay by 6 weeks May 3rd week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	Horticulture based cropping system a. Pineapple – Kew, Queen	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Planting time- May- August
		b.Turmeric- Lakadong, ,RCT-1	Change to maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		c.Ginger- Nadia	Change to maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		d. Banana- Jahaji, Local variety	No change	• Intercropping with leguminous vegetables • Apply recommended dose of organic manures • Cleaning of basin and mulching with plant materials Life saving irrigation should be given at flowering and bunch initiation stage	Planting time- May- July
Delay by 6 weeks July 3rd week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-	a.Rice-Megha Rice I,Megha Rice II,US I,Local varieties	No Change	Normal recommended practice of sowing	Sowing time- April to 1st week of May
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	No Change	Normal recommended practice of sowing	Sowing time- March to April

	8000mm)Moderately sloping,rain fed	c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time- June to July/August to September
Premonsoon Delay by 6 weeks May 3rd week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed with organic manures. • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage.	Planting time- June- August
		b.Turmeric- Lakadong, RCT-1	Change to maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		c.Ginger- Nadia	Change to maize/ Soyabean /cole crops/ crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc

		d. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Delay sowing till April • Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- March- July
		e. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Delay sowing till April • Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- March- September
		f. Potato– Kufri Jyoti, Kufri Megha	No change	• Sowing can be done from February • Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity	Sowing time- January - March

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 8 weeks August 1st week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall (more than 8000mm) very steep slope (25-33%), rainfed	Cropping System:1 Rice based Cropping System a. Rice- Ranjit,Bahadur,Pankaj	Change to Short duration varieties	Use power tiller,for speedy land preparation.Follow close planting of 4-5 seedlings per hill.Apply full P,K and 50% N at the time of transplating	Normal Sowing time-June to July
		b. Maize- Vijay, Ganga-101, Ranjit, Deccan, Ganga-5, Ganga safed, Ganga-4, Amber, Sona, Kisan, Jawahar, Vikram	Use Hybrid Maize	Normal recommended practice of sowing	Pre- Rabi Maize
		b. Soyabean- Clark-63,Bragg Hill, Punjab-1, Hardee, Lee, Local	Use normal seed	Normal recommended practice of sowing	Pre Rabi crop August to September
Premonsoon Delay by 8 weeks June 1st Week	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall (more than 8000mm) very steep slope (25-33%), rainfed	Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Proper nutrient management should be followed • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage	Planting time- June-August
		b. Arecanut- Local selection, Mangla,	No change	• Proper nutrient management should be followed	Transplanting time – June- July

		Sumangala		• Cleaning of basin and mulching. • Life saving irrigation should be given	
		c. Black pepper- Panniyur 1, Panniyur 2	No change	• Apply recommended dose of organic manures • Mulching with organic materials	Planting time-May-June
		d. Litchi - Muzaffarpur	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management should be followed • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage	Planting time- June-August
		e. Potato – Kufri Jyoti, Kufri Megha	No change	• Use short duration varieties • Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity stage	Sowing time- October- November
Delay by 8 weeks August 1st week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	Cropping system 1 : a.Rice-Shah Sarang I,Lampnah I,RCPL 1-3,RCPL 3-3,Ngoba,Manipur	Change to Hybrid Maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi maize/intercropped with early raising of cole crops etc
		b.Maize-Local white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	Change to Hybrid Maize	Normal recommended practice of sowing	Pre- Rabi Maize

		c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No change	Normal recommended practice of sowing	Sowing time-June to July/August to September
Premonsoon Delay by 8 weeks June 1st Week	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed	Horticulture based cropping system c. Pineapple – Kew, Queen	No Change	• Normal sowing can be done • Land should be well prepared • Recommended dose of organic manure should be applied before planting • Mulching should be done with plant materials	Planting time- May-August
		b.Turmeric- Lakadong ,RCT-1	Change to maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		c.Ginger- Nadia	Change to maize/ Soyabean /cole crops/ crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		d. Banana- Jahaji, Local variety	No change	• Intercropping with leguminous vegetables • Apply recommended dose of organic manures • Cleaning of basin and mulching with plant materials • Life saving irrigation should be given at flowering and bunch initiation stage	Planting time- May-July
Delay by 8 weeks August 1st week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-	Cropping system 1 : a.Rice-Megha Rice I,Megha Rice II,US I,Local varieties	Change to Hybrid Maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Sowing time- April to 1st week of May
		b.Maize-Local	Change to Hybrid	Normal recommended practice of sowing	Pre-Rabi Maize

	8000mm)Moderately sloping,rain fed	white,Local yellow,Vijay,Kisan,NLD white,Naveen,Ageti 76	Maize		
		c.Soyabean- Clark-63,Bragg Hill,Punjab-1,Hardee,Lee,Local	No Change	Normal recommended practice of sowing	Sowing time- June to July/August to September
Premonsoon Delay by 8 weeks June 1st Week	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed	Horticulture based cropping system a.Citrus- Khasi mandarin	No change	• Construction of half moon trenches • Intercropping with leguminous vegetables • Proper nutrient management are followed • Cleaning of basin and mulching. • Life saving irrigation should be given at fruit set and fruit enlargement stage	Planting time- June-August
		b.Turmeric- Lakadong, ,RCT-1	Change to maize/Soyabean/cole crops/crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		c.Ginger- Nadia	Change to maize/ Soyabean /cole crops/ crucifers etc	Normal recommended practice of sowing	Change to Pre rabi Maize/intercropped with early raising of cole crops etc
		d. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Delay sowing from May • Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- March- July

		e. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Delay sowing from May • Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- March- September
		f. Potato– Kufri Jyoti, Kufri Megha	Change to maize/Soyabean/cole crops/crucifers etc	• Use short duration varieties • Land should be thoroughly ploughed • Proper manuring with organic manures should be done • Life saving irrigation should be given at tuber initiation to tuber maturity	Change to maize/Soyabean/cole crops/crucifers etc

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop / Cropping system	Crop management & Plant protection measure	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Cropping system 1 : Rice,	• Resow the crop if the mortality is more than 50%. • Adjust the plant population by redistribution of hills (Khelua) in directed seeded rice. • Prophalytic spray of Carbendazim or Edinophos or Mancozeb against brown spot • Release of bio agents *Trichogramma* spp against stem borer and leaf folder	• • Organic matter,FYM application. • Lime,potash,P application as basal prior to transplanting. • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation. •	Supply of seed drills and intercultural implements through RKVY
		Maize, soybean	• Application of *Metarrhizium anisopliae, Bacillus thuringiensis, Stinernema spp* or Carbofuran for management of cutworm, white grub and termite		
		Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	• Normal crop management • Spray Imidacloprid against soft bodied insect viz, psylla, miners, scales, aphids,mealy bugs ets	• Construction of half moon trenches • Intercropping with leguminous vegetables • Application of organic manure.	Constructions of water harvesting structures

			• Spray Neem oil against Citrus butterfly • Plugging holes made by trunk borer and application of fumigants • Spraying of Copper fungicides against pink diseases, powdery mildew,etc	• Cleaning of basin and mulching • Life saving irrigation should be given	
		b. Arecanut- Local selection, Mangla, Sumangala	• Normal crop management • Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	• Application of organic manure. • Cleaning of basin and mulching • Life saving irrigation should be given	-do-
		c. Black pepper- Panniyur 1, Panniyur 2	• Remove infected vines • Spray Bordeaux mixture 1% against Phytopthora Foot rot • Apply Bordeaux paste to stem from the ground level upto 50 cm height	• Apply recommended dose of organic manures • Mulching with organic materials	-do-
		d. Litchi - Muzaffarpur	Normal crop management	• Construction of half moon trenches • Intercropping with leguminous vegetables • Application of organic manure. • Cleaning of basin and mulching. • Life saving irrigation should be given	-do-
		e. Tomato- Hybrid 17, Jessica,	• Resow the crop if the mortality is more than 50%.	• Application of organic manure.	-do-

		Namdhari, Chiranjeevi	• Nursery raising is done in the kitchen garden so that irrigation can be given • . Prophalytic spray with Indofil or Dithane M-45 for late blight disease • Installation of pheromone trap for *Helicoverpa armigera* monitoring • Prophalytic spray with Streptocycline for bacterial wilt	• Weeding and mulching • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation. • Life saving irrigation should be given	
		f. Cabbage – Mahyco Hybrid 139, Wonderball	• Resow the crop if the mortality is more than 50%. • Nursery raising is done in the kitchen garden so that irrigation can be given • Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* • Application of *Metarrhizium anisopliae, Bacillus thuringien, sis*, *Stinernema sp* or Carbofuran for management of cutworm and white grub • Prophalytic spray with botanical Neem oil for lepidopteran pests • Spray Mancozeb against black spot	-do-	-do-
		g. Potato – Kufri	• Resow the crop if the	• Application of organic	-do-

		Jyoti, Kufri Megha	mortality is more than 50%. • Prophalytic spray with bio pesticide *Trichoderma viridae* or Indofil or Dithane M-45 for late blight disease •	manure. • Weeding and mulching • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation.	
	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed.	Cropping system 1 : Rice,maize,soybean	• Resow the crop if the mortality is more than 50%. • Adjust the plant population by redistribution of hills (Khelua) in directed seeded rice.	• Organic matter,FYM application. • Lime,potash,P application as basal prior to transplanting. • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation.	Supply of seed drills and intercultural implements through RKVY
		Cropping system 2 : Horticulture based cropping system a. Pineapple	Normal	• Application of organic manure. • Mulching • Life saving irrigation should be given	Constructions of water harvesting structures
		b.Turmeric-Lakadong, RCT-1	• Resow the crop if the mortality is more than 50%.	• Application of organic manure. • Weeding and mulching • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation. • Life saving irrigation should be given	-do-
		c.Ginger- Nadia	-do-	-do-	-do-

		d. Banana- Jahaji, Local varieties	• Regular removal of old, dried and infested leaves • Manual collection and killing of Pseudostem and Rhizome adult weevil • Inject Carbaryl@ 2g/l in the infested pseudostem	-do-	-do-
	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed.	Cropping system 1 : Rice,maize,soybean	• Resow the crop if the mortality is more than 50%. • Adjust the plant population by redistribution of hills (Khelua) in directed seeded rice.	• Organic matter,FYM application. • Lime,potash,P application as basal prior to transplanting. • Complete hoeing weeding and earthling up at 20 DAS for moisture conservation.	Supply of seed drills and intercultural implements through RKVY
		Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	Normal	• Construction of half moon trenches • Application of organic manure. • Intercropping with leguminous vegetables • Cleaning of basin and mulching • Life saving irrigation should be given	Constructions of water harvesting structures
		b.Turmeric-Lakadong, ,RCT-1	• Resow the crop if the mortality is more than 50%.	• Application of organic manure. • Weeding and mulching • Complete hoeing weeding and earthling up at 20	-do-

				DAS for moisture conservation. • Life saving irrigation should be given	
		c.Ginger- Nadia	-do-	-do-	-do-
		d. Potato– Kufri Jyoti, Kufri Megha	-do-	-do-	-do-
		e. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	• Resow the crop if the mortality is more than 50%. • Nursery raising is done in the kitchen garden so that irrigation can be given	-do-	-do-
		f. Cabbage – Mahyco Hybrid 139, Wonderball	-do-	-do-	-do-

Condition			Suggested Contingency measures		
Mid season drought (long dry spell consecutive 2 weeks rainless,(> 2.5mm) period	Major Farming situation	Normal Crop/cropping system	Crop management &Plant protection measures	Soil nutrient & moisture conservation measures	Remarks on Implementation

At vegetative stage	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Rice	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Spray Tricyclazole against blast • Spray Carbendazim or Edinophos or Mancozeb against brown spot • Release of bio agents *Trichogramma* spp or spraying of Chloropyriphos, Regent against stem borer and leaf folder	• Weed out the field. • Strength the field bunds & close the holes • Provide life saving irrigation. • Inter-cultivation(Soil mulching) • Open conservation furrow(give distance/interval) • Organic mulching with previous crop residues. • Compartmental bunding • Follow ridge and furrow method of planning • .	Sowing of good quality seeds.
		Maize	• Application of *Metarrhizium anisopliae, Bacillus thuringiensis*, *Stinernema spp* for management of cutworm • Application of Carbofuran for control of borer, cutworm, thrips, termite & Shoot fly.		
		Soybean	• Application of phorate for control of stem fly, blue beetle. • Application of Methomyl for controlling defoliators, semiloopers etc		

		Cropping system 2 : Horticulture based cropping system a.Citrus- Khasi mandarin	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Spray Imidacloprid against soft bodied insect viz, psylla, miners, scales, aphids,mealy bugs ets • Spray Neem oil against Citrus butterfly • Plugging holes made by trunk borer and application of fumigants • Spraying of Copper fungicides against pink diseases, powdery mildew,etc	• Construction of half moon trenches • Organic mulching with previous crop residues. • Follow intercropping in rolling topography for moisture conservation. • Follow ridge and furrow method of planting • Application of organic manure • Life saving irrigation should be given at critical stages	Constructions of water harvesting structures
		b. Litchi	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Spray Malathion against Litchi bug	-do-	-do-
		c. Arecanut	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	-do-	-do-
		d. Black pepper	• Remove infected vines • Spray Bordeaux mixture 1% against Phytopthora Foot rot Apply Bordeaux paste to stem	-do-	-do-

			from the ground level upto 50 cm height		
		e. Tomato	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Spray bio pesticide *Trichoderma viridae* or Indofil or Dithane M-45alternate with Blue copper for management of late blight disease • Spray NPV or Neem oil against *Helicoverpa armigera* Soil drenching with COC or Steptocycline against bacterial wilt -	-do-	-do-
		f. Cabbage	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* • Spray Neem oil for management of lepidopteran pests • Application of *Metarrhizium anisopliae, Bacillus thuringiensis*, *Stinernema spp* or Carbofuran for management of cutworm and white grub • Spray Mancozeb against black spot	-do-	-do-

		g. Potato	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Spray bio pesticide *Trichoderma viridae* or Indofil or Dithane M-45alternate with Blue copper for management of late blight disease • Spray NPV or Neem oil against *Helicoverpa armigera* • Soil drenching with COC or Steptocycline against bacterial wilt	-do-	-do-
	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed.	Rice	-do-	-do-	-do-
		Maize	-do-	-do-	-do-
		Soyabean	-do-	-do-	-do-
		Cropping system 2 : Horticulture based cropping system a.Pineapple	• Application of organic manure • Foliar application of nutrientss 1% urea	• Organic mulching with previous crop residues. • Follow ridge and furrow method of planting • Life saving irrigation should be given at critical stages	Constructions of water harvesting structures
		b.Turmeric-	-do-	-do-	-do-
		c.Ginger	-do-	-do-	-do-

		g. Banana-	• Foliar application of nutrients 2% urea or 2% DAP or 1% KNO_3 • Intercropping with leguminous vegetables • Regular removal of old, dried and infested leaves • Manual collection and killing of Pseudostem and Rhizome adult weevil • Inject Carbaryl@ 2g/l in the infested pseudostem	-do-	-do-
	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed.	Rice	-do-	-do-	-do-
		Maize	-do-	-do-	-do-
		Soyabean	-do-	-do-	-do-
		Horticulture based cropping system Citrus Potato, tomato,cabbage, turmeric, ginger	-do-	-do-	-do-

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management &Plant protection measures	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas	a.Rice b.maize c.soybean	Thinning,mulching,,supplemental irrigation	Ridging,conservation furrow,dust mulch	Construction of Farm ponds through NREGS,RKVY Linkage with

stage	Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.				MRDS,NHM,NABARD etc
		Rice	• Spray Malathion against Gundhi bug		
		Maize	• Spray Dimethoate against aphid		
		Soyabean	• Application of phorate for control of stem fly, blue beetle • Spray Methomyl for defoliators, semiloopers etc • Spray mancozeb against foliar diseases		
		Cropping system 2 : Horticulture based cropping system a. Citrus	• Irrigation at critical stages • Foliar spray of urea 1% • Spray Neem oil against Citrus butterfly • Plugging holes made by trunk borer and application of fumigants • Spraying of Copper fungicides against pink diseases, powdery mildew,etc	• Construction of half moon trenches for citrus and litchi • Organic mulching with previous crop residues • Follow intercropping in rolling topography for moisture conservation. • Follow ridge and furrow method of planting • Life saving irrigation should be given	Construction of water harvesting structures
		b. Tomato	• Spray bio pesticide *Trichoderma viridae* for management of late blight	-do-	-do-

			disease • Spray NPV or Neem oil against *Helicoverpa armigera*		
		c. Cabbage	• Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* • Spray Neem oil for management of lepidopteran pests • Spray Mancozeb against black spot	-do-	-do-
		d. Black pepper	• Remove infected vines • Apply Bordeaux paste to stem from the ground level upto 50 cm height	-do-	-do-
		e. Litchi	• Spray Malathion against Litchi bug	-do-	-do-
		f. Arecanut	• Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	-do-	-do-
	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed.	Rice,maize,soybean	Thinning,mulching,,supplemental irrigation	Ridging,conservation furrow,dust mulch	Construction of Farm ponds through NREGS,RKVY Linkage with MRDS,NHM,NABARD etc
		Cropping system 2 : Horticulture based cropping system Pineapple, banana	• Irrigation at critical stages • Foliar spray of urea 1%	• Organic mulching with previous crop residues • Follow intercropping in	Construction of water harvesting structures

				rolling topography for moisture conservation. • Follow ridge and furrow method of planting • Life saving irrigation should be given at critical stages	
		Turmeric	• Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	-do-	-do-
		Ginger	• Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	-do-	-do-
	3. FS-III (Agri+Hort+AH) High altitude areas. Elevation more 1200m msl+) Medium and heavy rainfall (4000-8000mm) Moderately sloping,rain fed.	Rice,maize,soybean	Thinning,mulching,,supplemental irrigation	Ridging,conservation furrow,dust mulch	Construction of Farm ponds through NREGS,RKVY Linkage with MRDS,NHM,NABARD etc
		Cropping system 2 : Horticulture based cropping system Citrus, turmeric, gimger, potato, tomato, cabbage	• Thinning • Irrigation at critical stages • Foliar spray of urea 1%	• Construction of half moon trenches for fruit crops • Organic mulching with previous crop residues • Follow intercropping in rolling topography	Construction of water harvesting structures

				for moisture conservation. • Follow ridge and furrow method of planting • Life saving irrigation should be given at critical stages	

Condition			Suggested Contingency measures		
Terminal drought (early withdrawal of Monsoon)	Major farming situation	Normal Crop/cropping system[b]	Crop management[c]	Rabi Crop Planning	Remarks on Implementation[e]
At vegetative stage	1.FS-I (Agri+Hort+AH+Fisheries) Low altitude areas Elevation (0-600m msl).Very High and heavy rainfall(more than 8000mm)very steep slope (25-33%),rain fed.	Rice,maize,soybean	Harvesting at physiological maturiry	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Construction of Farm ponds through NREGS,RKVY Linkage with MRDS,NHM,NABARD etc
		Cropping system 2 : Horticulture based cropping system Citrus, arecanut, black pepper, potato, litchi, tomato, cabbage	Harvesting at horticultural maturity	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Constructions of water harvesting structures

	2. FS-II (Agri+Hort+AH+Seri)Mid altitude areas.Elevation more than (600-1200m msl)heavy rainfall (less than 4000-8000mm) Moderately-strongly sloping,rain fed.	Rice,maize,soybean	Harvesting at physiological maturiry	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Construction of Farm ponds through NREGS,RKVY Linkage with MRDS,NHM,NABARD etc
		Cropping system 2 : Horticulture based cropping system Pineapple, turmeric, ginger, banana	Harvesting at horticultural maturity	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Constructions of water harvesting structures
	3. FS-III (Agri+Hort+AH)High altitude areas.Elevation more 1200m msl+)Medium and heavy rainfall(4000-8000mm)Moderately sloping,rain fed.	Rice,maize,soybean	Harvesting at physiological maturiry	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Construction of Farm ponds through NREGS,RKVY Linkage with MRDS,NHM,NABARD etc
		Cropping system 2 : Horticulture based cropping system Citrus, turmeric, ginger, Potato, tomato, cabbage	Harvesting at horticultural maturity	Utilization of residual moisture for early sowing of pre-rabi vegetable crops	Constructions of water harvesting structures

2.1.2 Drought – Irrigated situation

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

Delayed release of water in canals due to low rainfall for Irrigated situation	1.FS-I).Agri+Hort+AH+Fishery)Low Altitude area Elevation (o-600 m msl). Very High and heavy rainfall (more than 8000 mm) Very steep slope (2.5-33%). Lowland	1.Rice-rice	No change	• For High altitude Short duration of rice crop varieties (Luit,Vivek dhan) 90days duration for 3weeks delayed • SRI practice • Community nursery	NA
		Cropping system 2 : Horticulture based cropping system a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with organic materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- December-January
		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- November- January
	3. FS-III (Agri+Hort+AH) High altite areas. Elevation more 1200 m msl+) Medium and heavy rainfall (4000 – 8000mm) Moderately sloping, Lowland	a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- January- February
		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- October- December

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	1.FS-I).Agri+Hort+AH+Fishery)Low Altitude area Elevation (o-600 m msl). Very High and heavy rainfall (more than 8000 mm) Very steep slope (2.5-33%). Lowland	1.Rice-rice	No change	• For High altitude Short duration of rice crop varieties (Luit,Vivek dhan) 90days duration for 3weeks delayed • SRI practice • Community nursery	NA
		b.Rice-potato	No change	• Medium duration Kharif rice variety(130 days)for 2weeks delay • Potato var:Kufri megha	
		c..Rice-toria	No change	• Medium duration Kharif rice variety(130 days) • Late sown toria variety(TS-38,TS-46)	
		Cropping system 2 : Horticulture based cropping system a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with organic materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time-December-January

		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- November- January
	3. FS-III (Agri+Hort+AH) High altite areas. Elevation more 1200 m msl+) Medium and heavy rainfall (4000 – 8000mm) Moderately sloping, Lowland	Cropping system 2 : Horticulture based cropping system a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- January- February
		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- October- December

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficiency of surface water for irrigation	1.FS-I).Agri+Hort+AH+Fishery)Low Altitude area Elevation (o-600 m msl). Very High and heavy rainfall (more than 8000 mm) Very steep slope (2.5-33%).	Rice- Ranjit, Bahadur, Pankaj	SRI hybrid to be used	• Low seed rate • Critical irrigation of crops at critical stage	

	Lowland	Cropping system 2 : Horticulture based cropping system a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with organic materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- December-January
		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- November-January
	2. FS-II (Agri+ Hort+ AH+ Seri)Mid altitude areas. Elevation more than 600-1200 m msl) heavy rainfall (less than 4000-8000mm) Moderately-Strongly sloping, Lowland	Rice-Shah Sarang I, Lampnah I, RCPL 1-3 RCPL 3-3, Ngoba, Manipur	Delayed transplanting	Direct sown under transplanting	
	3. FS-III (Agri+Hort+AH) High altite areas. Elevation more 1200 m msl+) Medium and heavy rainfall (4000 –	Rice-Megha Rice I,Megha Rice II, US I Local varieties	Delayed transplanting	Direct sown under transplanting	

	8000mm) Moderately sloping, Lowland	Cropping system 2 : Horticulture based cropping system a. Tomato- Hybrid 17, Jessica, Namdhari, Chiranjeevi	No change	• Apply recommended dose of organic manures • Mulching with plant materials • Life saving irrigation should be given at flowering and fruit set stage	Sowing time- January- February
		b. Cabbage – Mahyco Hybrid 139, Wonderball	No change	• Apply recommended dose of organic manures • Mulching • Life saving irrigation should be given at head formation stage	Sowing time- October- December

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Crop 1:-Rice	Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. Filling may be done by redistributing the tillers. Wet seeding of spouted seeds (@75-80 kg/ha) of medium duration varieties management of pests & diseased Management of pests &	Excess rain water to be drained out through surface drainage channel to avoid submergence Forthcoming rabi crops Growing of vegetables after receding flood water and adoption of integrated farming system to obtain more income and to compensate the loss during kharif.	Excess rain water to be drained out through surface drainage channel to avoid submergence Crop to be harvested at physiological maturity stage. Should be given on forthcoming rabi crops supply of seeds and other agro-inputs of rabi crops at subsidized rate, provision of bank loan	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage

	diseased		etc. Wet seeding of short duration. Growing of vegetables after receding flood water	
Crop 2:-Maize	Ensure drainage, Make ridge & furrows	Ensure drainage, Make ridge & furrows	Harvest the cobs as soon as possible	-do-
Crop 3:-Soya bean	Ensure drainage, Make ridge & furrows	Ensure drainage, Make ridge & furrows	Harvest the pods as soon as possible	-do-
Horticulture				
Crop 1**:-** Khasi Mandarin	Provide drainage, Earthing up to plant base/root zone	Provide drainage, Earthing up to plant base/root zone Application of two sprays of growth regulators- 2,4 D (15 ppm) or GA_3 (15 ppm) along with Benomyl (1000ppm) and urea (1%) at flower and fruit set at monthly interval in May and June. The same spray schedule may be followed in September and October in order to control the flower and fruit drop.	Provide drainage, Earthing up to plant base/root zone Harvest at horticultural maturity	Dry the fruits, keep at safer place, may be sold at green stage
Crop 2 :- Turmeric	Make ridge & furrows Provide drainage, Earthing up to plant base/root zone	Earthing up to plant base/root zone	Harvest at horticultural maturity	Shifting produce to safer place and protection against pest/disease damage in storage etc
Crop 3 :- Ginger	Make ridge & furrows Provide drainage, Earthing up to plant base/root zone	Earthing up to plant base/root zone	Harvest at horticultural maturity	Shifting produce to safer place and protection against pest/disease damage in storage etc
Crop 4 :- Potato	Make ridge & furrows Provide drainage,	Provide drainage Earthing up to plant base/root zone	Harvest at horticultural maturity	Shifting produce to safer place and protection against

	Earthing up to plant base/root zone			pest/disease damage in storage etc
Crop 5 :- Banana	Provide drainage, Earthing up to plant base/root zone	Provide drainage, Earthing up to plant base/root zone	Provide drainage, Earthing up to plant base/root zone Harvest at green stage or table purpose, there is no problem for marketing as it has buyers preference	Store for ripening in closed godowns for marketing
Crop 6 :- Tomato	Nursery raising in a low cost raised bamboo structure with provision of shade or low cost polyhouse to prevent damage of seedlings, disease and pest infestation, Make ridge & furrows Provide drainage, Earthing up to plant base/root zone	Provide drainage, Earthing up to plant base/root zone Application of two sprays of growth regulators- 2,4 D (15 ppm) or GA_3 (15 ppm) along with Benomyl (1000ppm) and urea (1%) at flowering and fruit set in order to control the flower and fruit drop.	Harvest at green/breaker stage Provide drainage	Shifting produce to safer place and protection against pest/disease damage in storage etc
Crop 7 :- Cabbage-	Nursery raising in a low cost raised bamboo structure with provision of shade or low cost polyhouse to prevent damage of seedlings, disease and pest infestation, Make ridge & furrows Provide drainage, Earthing up to plant base/root zone	-do-	Provide drainage Harvest at horticultural maturity	Shifting produce to safer place and protection against pest/disease damage in storage etc
Crop 8: Black pepper	Nursery raising in low cost polyhouse Provide drainage, Earthing up to plant base/root	-do-	Provide drainage, Earthing up to plant base/root zone Harvest at horticultural	Dry the fruits, keep at safer place and protection against pest/disease damage in storage etc

	zone		maturity	
Crop 9: Litchi	Provide drainage, Earthing up to plant base/root zone	-do-	Provide drainage, Earthing up to plant base/root zone Harvest at horticultural maturity	Dry the fruits, keep at safer place and protection against pest/disease damage in storage etc
Crop 10: Pineapple	Provide drainage, Earthing up to plant base/root zone	-do-	Provide drainage, Earthing up to plant base/root zone Harvest at horticultural maturity	Dry the fruits, keep at safer place, may be sold at green stage
Crop 11: Arecanut	Nursery raising in low cost polyhouse Provide drainage, Earthing up to plant base/root zone	-do-	Provide drainage, Earthing up to plant base/root zone Harvest at horticultural maturity	Keep at safer place and protection against pest/disease damage in storage etc
Outbreak of pests and diseases due to unseasonal rains				
Crop 1 :- Rice	Spray Tricyclazole against blast, NSKE, Chloropyriphos, Regent against stem borer, leaf folder and swarming caterpillars	Spray Tricyclazole against blast, NSKE, Chloropyriphos, Regent against stem borer, leaf folder and swarming caterpillars	Malathion spray against Gundhi bug	Sun drying / disinfection of gunny bags with malathion Or Heat treatment to manage stored grain pests
Crop 2 :- Maize-	Application of Carbofuran for control of borer, cutworm, thrips, termite & Shoot fly. Removal and destruction of dead hearts.	Spray Dimethoate against aphid	Wrapping of cobs against bird damage	Store in clean godown, disinfection of gunny bags/storage structure with malathion
Crop 3:-Soya bean	Application of phorate for control of stem fly, blue beetle.	Application of phorate for control of stem fly, blue beetle.	Sanitation and early harvest	Sun drying / disinfection of gunny bags with malathion

	Application of Methomyl for controlling defoliators, semiloopers etc	Application of Methomyl for controlling defoliators, semiloopers etc Application of mancozeb against foliar diseases		Or Heat treatment to manage stored grain pests
Horticulture				
Crop 1:- Mandarin Oranges	Spraying of NSKE to manage lemon butterfly, Imidaclorpid against leaf miner,aphids,psylla,scales,mealy bug & white fly Spraying of Copper fungicides against pink diseases, powdery mildew,etc	Spraying of NSKE to manage lemon butterfly, Imidaclorpid against leaf miner,aphids,psylla,scales,mealy bug & white fly Spraying of Copper fungicides against pink diseases, powdery mildew,etc	Early harvest	Dry the fruit, keep at safer place, may be sold at green stage
Crop 2 :- Turmeric	Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	Early harvest	Segregation of infected rhizomes & destruction
Crop 3 :- Ginger	Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	Spray Chloropyriphos to manage stem borer & *Trichoderma* viridae for soft rot	Early harvest	Segregation of infected rhizomes & destruction
Crop 4 :- Potato	Application of *Metarrhizium anisopliae*, *Bacillus thuringiensis*, *Stinernema spp* or Carbofuran for management of cutworm and white grub	Apply mancozeb for control of blight	Early harvest & disposal	Segregation of infected turbers & destruction
Crop 5 :- Tomato	Spraying malathion against beetle, hand collection of egg mass,Spray bio pesticide *Trichoderma viridae* or Indofil or Dithane M-45 alternate with Blue copper for management	Spray NPV or Neem oil against *Helicoverpa armigera*/leaf curl virus,	Early harvest & disposal	Segregation of infested fruit & destruction

	of late blight disease Soil drenching with COC or Steptocycline against bacterial wilt			
Crop 6 :- Cabbage-	Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* Application of *Metarrhizium anisopliae, Bacillus thuringien, sis, Stinernema sp* or Carbofuran for management of cutworm and white grub Prophalytic spray with botanical Neem oil for lepidopteran pests Spray Mancozeb against black spot	Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* , spray with botanical Neem oil for lepidopteran pests Spray Mancozeb against black spot	Release of bio agents *Trichogramma brassicae* against *Pieris brasiccae* Spray Neem oil for management of lepidopteran pests Spray Mancozeb against black spot	Segregation of infested cabbage head & destruction
Crop 7 :- Arecanut	Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	Drench the crown with Bordeaux mixture 1% against bud rot and fruit rot	Segregation of infested nut & destruction
Crop 8:Litchi		• Malathion spray against Litchi bug	Sanitation and early harvest	Segregation of infested fruits & destruction
Crop 9: Black pepper	• Remove infected vines • Spray Bordeaux mixture 1% against Phytopthora Foot rot • Apply Bordeaux paste to stem from the ground level upto 50 cm height	• Remove infected vines • Apply Bordeaux paste to stem from the ground level upto 50 cm height	Sanitation and early harvest	Segregation of infested vines & destruction
Crop 10: Banana	• Regular removal of old, dried and infested	• Regular removal of old, dried and infested leaves	Early harvest	Destruction of infested pseudostem

	leaves • Manual collection and killing of Pseudostem and Rhizome adult weevil • Inject Carbaryl@ 2g/l in the infested pseudostem	• Manual collection and killing of Pseudostem and Rhizome adult weevil • Inject Carbaryl@ 2g/l in the infested pseudostem		

2.3 Floods: Not experienced

Condition	Suggested contingency measure[o]			
Transient water logging/ partial inundation[1]	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
	NA	NA	NA	NA
Sea water intrusion	NA	NA	NA	NA

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone : Not experienced / encountered

Extreme event type	Suggested contingency measure[r]			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA	NA	NA	NA
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm				
Crop 1 :- Rice	Re-sowing/Re-planting/Seed rhizomes or tuber replacement with provision of shade for small seeded crops	Gap filling aged seedling/saplings	Clean & Sanitary measurement to avoid outbreak of pests and diseases	Timely Harvest at Physiological maturity
Crop 2 :- Maize-	-do-	-do-	-do-	-do-
Crop 3:-Soya bean	-do-	-do-	-do-	-do-

Horticulture				
Crop 1**:-** Khasi Mandarin	Re-sowing/Re-planting with provision of shade for nursery area	Gap filling with aged seeding/saplings Provide shade to young plants	• Application of two sprays of growth regulators- 2,4 D (15 ppm) or GA_3 (15 ppm) along with Benomyl (1000ppm) and urea (1%) at flowering and fruit set at monthly interval in order to prevent flower and fruit drop • Clean & Sanitary measures to avoid outbreak of pest and diseases	Timely Harvest at horticultural maturity
Crop 2 :-Litchi	-do-	-do-	-do-	-do-
Crop 3 :- Black pepper	-do-	-do-	-do-	-do-
Crop 4 :- Arecanut	-do-	-do-	-do-	-do-
Crop 5: Pineapple	Re-sowing/Re-planting	Gap filling	-do-	-do-
Crop 6: Banana	Re-sowing/Re-planting with provision of shade for the plants	Gap filling with aged seeding/saplings Provide shade to young plants	-do-	-do-
Crop 7: Cabbage	Re-sowing/Re-planting with provision of shade for nursery area	Gap filling	-do-	-do-
Crop 8: Tomato	-do-	-do-	-do-	-do-
Crop 9 :- Turmeric	Re-sowing/Re-planting/Seed rhizomes or tuber replacement	-do-	Clean & Sanitary measures to avoid outbreak of pest and diseases	-do-
Crop 10 :- Ginger	-do-	-do-	-do-	-do-
Crop 11 :- Potato	-do-	-do-	-do-	-do-

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			
Feed and fodder availability	Creation of permanent fodder, feed and seed banks Raising drought tolerant perennial grasses and fodders like congosignal, guinea, oat etc. as permanent source of fodder. Preservation and conservation of legume trees, bushes, brooms, grasses and legumes through silage and hay making Burning of jungles of hills and paddy straw should not be allowed. Development of fodder varieties of cultivated crops having tolerance for varying degree of drought	Feeding of locally available jungle tree leaves like Artocarpus hetrophyllus, Fircus hookerii, Symingtonia populnea, Schefflera wallichiana for ruminant. Feeding of non conventional feed and forage resources like broom, stylosanthes, Job's tears etc. Feeding of crop residues (rice straw) and agro industrial byproduct after chemical or biological treatment and processing. Iv. The maintenance ration should be reduced to half.	Cultivation of high yielding and drought tolerant varieties of grasses and fodder like oat, congosignal,guinea, para and napier grasses. Introduction of fodder trees, bushes and grasses as rehabilitation option on all kinds of wasted and abandoned lands.
Drinking water	Preserve water in community tanks, ponds etc with sanitization, well or dug well may be constructed in advance, Training & awareness camp among extension personnel	Water source from Temple Mosques, and Church may be used in case of shortfall of existing potable water, Animals not to be exposed to outside rather they should be commonly fed.	Plan accordingly for next year
Health and disease management	Veterinary preparedness with vaccines & medicines, Training & awareness camp among extension personnel	Conducting animal health camps and treating the affected animals, Supplementation of mineral and vitamin mixtures	Culling of unproducting livestock, Proper disposal of dead animal
Floods	N A	N A	N A
Cyclone	N A	N A	N A
Heat wave and cold wave	N A	N A	N A
Earthquake	N A	N A	N A
Landslide	N A	N A	N A

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				
Shortage of feed ingredients	Insurance of Poultry farms Ensure procurement of feed ingredients sufficient ahead Establish feed serve bank	Feed Utilizing from feed serve banks Feed supplementation will be made to the farms	Availing insurance Attempt will be made for available of feed ingredient or compound frrd to the formers	
Drinking water	Check water source for ensuring sufficient potable water during draught	Attempt will be made to provide sanitized drinking water	Available of water will be ensured by digging of bore well	
Health and disease management	Procurement of vaccines and medicines and anti-stress agent. Feeding antibiotics Procurement of litter materials	Administration of vaccine Continue feeding of anti- stress agent	Culling of affected birds	
Floods	N A	N A	N A	
Cyclone	N A	N A	N A	
Heat wave and cold wave	N A	N A	N A	
Earthquake Landslide etc.	N A	N A	N A	

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture	NA	NA	NA
Marine	NA	NA	NA
Inland			
(i) Shallow water depth due to insufficient rains/ inflow	i. 10%of the total area should be created into deep pool/channels in selected area of the water(to ensure 1.5 m depth of water)	i. Partial harvesting of fishes should be done ii. Aquatic weeds and unwanted animals should be removed.	i. Aquatic weeds and unwanted animals should be removed ii. Lime should be applied @ 200 kg to 300 kg/ha to correct the soil P^H and for disinfecting the area.
(ii) Changes in water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Stop fertilizing/ manuring and feeding if necessary.	iii. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. iv. Application of lime and fertilizer based on water quality
(iii) Any other	NA	NA	NA
B. Aquaculture			
(i) Shallow water depth due to insufficient rains/ inflow	i)Supply of water from nearby sources	i. For time being application of manure/ fertilizer should be stopped. ii. Supply water from nearby sources iii. Aquatic weeds and unwanted animals should be removed.	i. Remove all the unwanted aquatic weeds and predators to culture fishes ii. Lime should be applied @ 200 kg to 300 kg/ha to correct the soil P^H and for disinfecting the area

		iv. Partial harvesting of fishes. v. Culture of airbreathing fishes/introduction of genetically improved variety	
(ii) Impact of salt load build up in ponds/ change in water quality	NA	NA	NA
(i) Inundation with flood water			
2) Floods			
A. Capture	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA
(i) Average compensation paid due to loss of human life	NA	NA	NA
(ii) No. of boats/ nets damaged	NA	NA	NA
(iii) No. of houses damaged	NA	NA	NA
(iv) Loss of stock	NA	NA	NA
(v) Changes in water quality	NA	NA	NA
(vi) Health and Diseases	NA	NA	NA
B. Aquaculture	NA	NA	NA
(i) Inundation with flood water	i. Construction of ring bund/embankment of fish farm. The height of the bund should have 0.5 – 1.0 m higher than the highest flood level	i. Encircle the pond /farm areas with proper nylon nets in order to prevent escape of fish from ponds/ farms during flood. ii. Immediate harvest of the stock and keep it in a happa till the flood	i. Analysis of water quality (pH, alkalinity, salinity, temperature etc. ii. Based on the result of water quality parameter analysis application of lime and fertilizer should be adjusted

	(data should be taken 10 yrs.) ii. The pond must have emergency spillway & the level of the emergency spillway is that of the proposed water level.	persist.	
(ii) Water continuation and changes in water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality
(iii) Health and diseases	i. Maintain ideal water quality and hygienicity ii. Periodical netting should be done as it gives an idea about the health conditions of the fishes as well as the environment.	i. Analysis of water quality (pH, alkalinity, salinity, temperature etc.) ii. Use lime as disinfectant or to raise pH with proper dose@200-400kg/ha iii. Use $KMnO_4$ as disinfectant or to increase O_2 content of water with proper dose(4mg/1t of water or 5kg/ha) iv. Remove the affected fishes in quarantine ponds/identification of the causing agent/proper treatment procedure to be followed.	i. Analysis of water quality (pH, alkalinity, salinity, temperature etc.) ii. Use lime as disinfectant or to raise pH with proper dose@200-400kg/ha iii. Use $KMnO_4$ as disinfectant or to increase O_2 content of water with proper dose(4mg/1t of water or 5kg/ha) iv. Observe for any disease outbreak
(iv) Loss of stock and inputs (feed, chemicals, etc)			
(v) infrastructure damage (pumps,			

aerators, huts etc)			
(vi) Any other			
3) Cyclone/ Tsunami			
A. Capture	NA	NA	NA
Marine	NA	NA	NA
(i) Average compensation paid due to loss of fishermen lives	NA	NA	NA
(ii) Average no. of boats/ nets damaged	NA	NA	NA
(iii) Average mo. of houses damaged	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. Aerators, shelters/huts etc)	NA	NA	NA
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			

Inland			
B. Aquaculture			
(i) Changes in pond in pond environment (water quality)	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality	i. Water exchange if necessary ii. Analysis of water quality (pH, alkalinity, salinity, temperature etc.) iii. Application of lime and fertilizer based on water quality	i. Analysis of water quality parameter like PH, alkalinity, temperature, Hardnes etc. ii. Application of lime and fertilizer based on water quality
(ii) Health and Disease management	i. Maintain ideal water quality and hygienicity ii. Periodical netting should be done as it gives an idea about the health conditions of the fishes as well as the environment.	i. Analysis of water quality (pH, alkalinity, salinity, temperature etc.) ii. Use lime as disinfectant or to raise pH with proper dose@200-400kg/ha iii. Use $KMnO_4$ as disinfectant or to increase O_2 content of water with proper dose(4mg/1t of water or 5kg/ha) iv. Remove the affected fishes in quarantine ponds/identification of the causing agent/proper treatment procedure to be followed.	i. Analysis of water quality (pH, alkalinity, salinity, temperature etc.) ii. Use lime as disinfectant or to raise pH with proper dose@200-400kg/ha iii. Use $KMnO_4$ as disinfectant or to increase O_2 content of water with proper dose(4mg/1t of water or 5kg/ha) iv. Observe for any disease outbreak
(iii) Any other			