State: Jharkhand

Agriculture Contingency Plan for District: Garhwa

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Moderately To Gently Sloping ChattisgarhMahanadi Basin, Hot Moist/Dry Subhumid Transitional ESR (11.0)			
	Agro-Climatic Zone (Planning Commission)	EASTERN PLATEAU AND HILLS REGION (VII)			
	Agro Climatic Zone (NARP)	WESTERN PLATEAU ZONE (BI-5)			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		23^0 34' 11"– 24^0 32'-05" N	83^0.10' 13" - 83^0 56' 38" E	364 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Research Station (Z.R.S.), Chianki, medinigar, Palamau, Pin – 822133 (Birsa Agricultural University, Ranchi) Pin – 834006.			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Garhwa, Pin - 822114			
1.2	**Rainfall**	Normal RF(mm) 2008	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	780.8	47	3rd week of June	4th week of September
	NE Monsoon(Oct-Dec):	00	00		
	Winter (Jan- March)	53.4	31	-	-
	Summer (Apr-May)	31.6	3	-	-
	Annual Average rain fall 1355	865.8	53	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	428.550	100.950	169.790	19.456	2.05704	6.600	2.271	24.727	102.351	

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Sandy loam	201.419	47
	Red loam (Moram)	184.277	43
	Grey soil	42.855	10

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	100.950	115
	Area sown more than once	35.178	
	Gross cropped area	136.128	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	35.180		
	Gross irrigated area	35.180		
	Rainfed area	65.770		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals, Ponds, check dams, lifts		19.740	19.554
	Tanks			7.53
	Open wells		7.6	0.86
	Bore wells, Pump sets		0.870	

	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (please specify)			
	Total Irrigated Area		28.210	27.95
	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			
	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%				

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2009-10 eg., 2008-09)

1.7	Major field crops cultivated	**Area ('000 ha)**							
		Kharif			*Rabi*				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Paddy			51.00					
	Maize	1.5	25.6	27.1					
	Wheat				6.875	-	6.875		
	Pigeonpea		14.833	14.833					
	Mustard						4.00		
	Chickpea					3.033	3.033		

Source : Rabi and Kharif report (2009-10) Department of Agriculture, Garhwa.

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	Irrigated	Rainfed
		-	-	-
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Potato	1.5		

	Okra	1.00		
	Chilies	0.670		
	Brinjal	0.640		
	Tomato	0.600	0.600	
	Cauliflower	0.520	0.520	
	Medicinal and Aromatic crops -			
	Plantation crops -			
	Fodder crops -			
	Total fodder crop area			
	Grazing land			
	Sericulture etc			
	Others (specify)			

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	193.407 (Bullocks)	397.995	591.402
	Calf			79.173
	Non descriptive Buffaloes (local low yielding)			15.835
	Graded Buffaloes			-
	Goat			159.305

	Sheep			1.131
	Pig			28.051
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial		344.966	
	Backyard			

1.10 **Fisheries** (Data source: Chief Planning Officer)

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**

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)			
Others			

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)	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)										
	Rice	18.58	1279.0					18.58	1279.0	
	Maize	14.24	870.0	3.75	2500.00			17.99		
	Pigeonpea	3.00	460.0					3.00	460.00	
	Wheat			13.75	2000.00			13.75	2000.00	
	Mustard			2.00	500.00			2.00	500.00	
Major Horticultural crops (Crops to be identified based on total acreage) -										

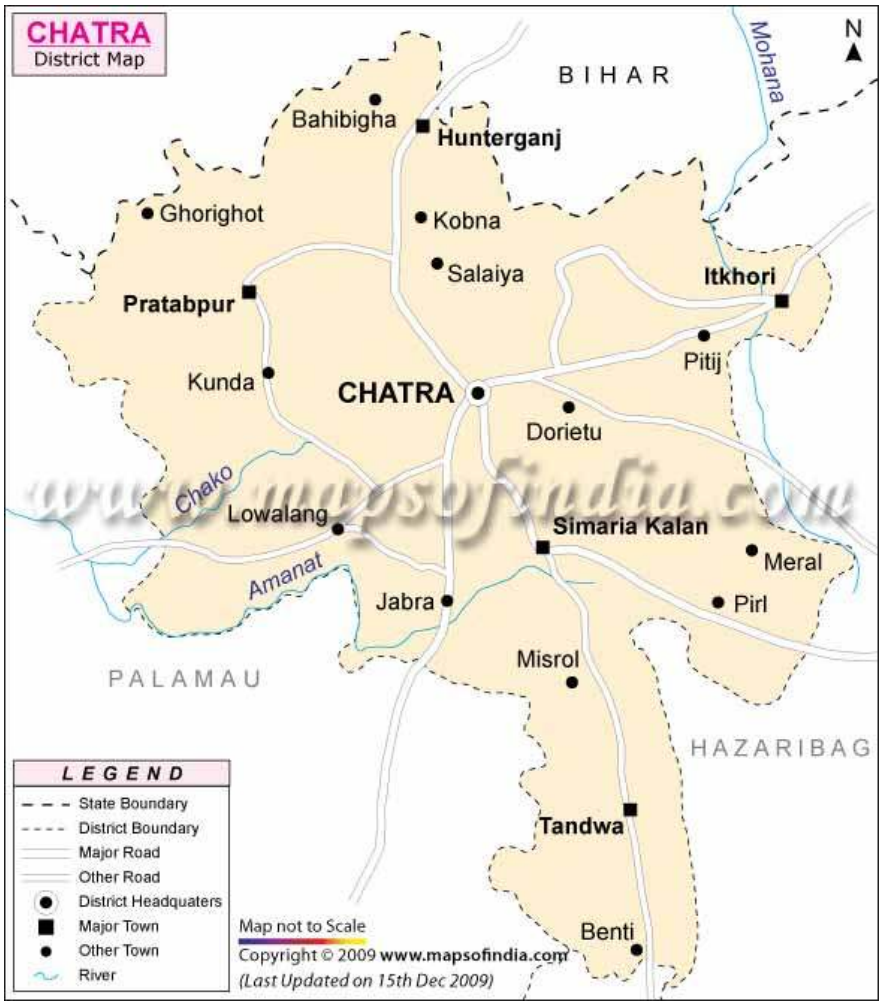
1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Maize	Pigeonpea	Wheat	Mustard
	Kharif- Rainfed	2nd week of June to 3rd week of June	2nd week of June to 1st week of July	1st week of June to3rd week of June		
	Kharif-Irrigated	1st week of June to 1st week of July	2nd week of June to 4th week of June	2nd week of June to3rd week of July		
	Rabi- Rainfed				2nd week of October to 4th week of October	1st week of October to 2nd week of October
	Rabi-Irrigated				2nd week of November to 4th	1st week of October to 2nd

					week of November	week of November

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought			
	Flood			
	Cyclone			
	Hail storm			
	Heat wave			
	Cold wave			
	Frost			
	Sea water intrusion			
	Pests and disease outbreak (specify)			
	Others (specify) Late blight in potato			

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 / No

Annexure 1


CHATRA
District Map
BIHAR
N
Mohana
Bahibigha
Hunterganj
Ghorighot
Kobna
Salaiya
Itkhori
Pratabpur
Pitij
Kunda
CHATRA
Dorietu
Chako
Lowalang
Simaria Kalan
Meral
Amanat
Jabra
Pirl
Misrol
PALAMAU
HAZARIBAG
Tandwa
Benti
LEGEND
State Boundary
District Boundary
Major Road
Other Road
District Headquaters
Major Town
Other Town
River
Map not to Scale
Copyright © 2009 www.mapsofindia.com
(Last Updated on 15th Dec 2009)

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (Specify month)* 1st week of July	1 Upland	Maize + Pigeonpea	Maize + Cowpea Maize: Birsa Maize-1	Maize : 60 cm x 20 cm	Supply of seeds under RKVY
		Pigeonpea + Groundnut	Pigeonpea : Bahar, Narendra Arhar, Birsa Arhar-1		
		Maize + Groundnut	Groundnut: AK. 12.24, Birsa Bold		
		Blackgram/ Sesame	Sesame : Kanke safed		
		Finger millet	Finger millet: A 404 (Transplanting)/ Pigeonpea + Castor /Soybean/ Sorghum Soybean : Birsa Soybean safed – 2 Sorghum: CSV – 20	Transplanting Field management by banding	MNREGS & NWDPRA Schemes
	2 Medium land Medium deep sandy loom	Rice Hybrids	Rice : Sahbhagi, Naveen, IR - 64	Direct sowing through drum seeder Use of pre emergence weedicides e.g. Glyphosate or post emergence Butachlor.	Supply of seeds and implements under RKVY
			Hybrids: PAC. 807, Uday – 111, Abhishek, 27P31		
	3 Lowland deep	Rice	Rajendra Mansuri, Rajshree (OP) Sonam,	• Transplanting at	

	clay		Rupali, Mansuri, Vandana, BVD – 109, IR- 64 Local, Birsamati, MTU - 7029	closer spacing • Field Bunding	
		Arize – 6444, Advanta – 801	IR – 36, IR - 64		
		PHB – 71 (Hybrid)	PAC – 807, 25P31, Abhishek ,Uday-111 (Hybrids)		MNREGS & NWDPRA Schemes
		Blackgram	Urd – Birsa Urd – 1, T – 9, Pant U - 19		
Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 4 weeks (Specify month) 3rd week of July	Rainfed, shallow, acidic, redsoil	Maize + Pigeonpea, Maize + Groundnut Maize + Blackgram	Maize + Cowpea, Maize + Okra, Maize + Ridgeground Maize : Birsa Vikas makka -2 Pigeonpea : Birsa Arhar – 1 ICPH – 2671 Pigeonpea + Fingermillet (A 404) Soybean : Birsa Soybean Safed- 2 Sorghum: CSV – 20 Sesame : Kanke white, Pragati.	Closer spacing of Pigeon pea and maize	Seeds to be needed available under RKVY and NFSM

	Medium deep sandy loom soil	Rice – IR – 36, IR – 64	Rice : Vandana, Naveen, Sahbhagi, PAC – 807, 27 P 31, Uday - 111, Abhishek (Hybrid)	
	Deep, heavy clay soil	Rice	Naveen, IR – 64, IR – 36, Rupali, PAC – 807, Uday – 111, Abhishek	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 6 weeks (Specify month) 1st week of August	Upland	Maize + Pigeonpea	Maize + Cowpea (Swarna Harita/S. Sweta) Maize : Birsa Maize – 2 Cowpea :Swarna Harita, Swarna Sweta		
		Sesame/ Blackgram	Pigeonpea : Birsa Arhar – 1 + Okra		
		Finger millet	Sorghum: CSV – 20		
			Groundnut : Birsa Bold		
			Soybean : Birsa Soyabean safed – 2		
	2. Medium land sandy loom with medium depth	Rice	Rice : Sahabhagi, Naveen (OP) PAC – 807 27P - 31 (Hybrid)		Vegetable seeds supply under RKVY
		Maize	Maize : Birsa Maize – 2, HSPM - 1		
		Vegetable	Vegetable : Tomato, Brinjal, Cowpea		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 8 weeks (Specify month) 3rd week of August	1. Upland, Rainfed, Redsoil.	Maize + Pigeonpea	Pigeonpea – Birsa Arhar-1		
		Sesame/ Blackgram	Sesame – Kanke safed, Pragati, Krishna		
			Blackgram - Shekhar-2		
			Fingermillet - A 404 (Transplanting)		
			Niger – Birsa Niger – 1		
			Horsegram : Birsa Kulthi–1 JNC – 6		
	2. Medium land medium deep sandy loom soil	Rice / Pigeonpea +Sesame	Pigeonpea – ICPH – 2671, Bahar Narendra Arhar – 1/ Pigeonpea + Castor/Sesame /Toria – PT 303/ Niger–JNC-6,Birsa Niger–1/Horsegram – Birsa Kulthi–1/ Tomato – Swarna Lalima /Cabbage – Early Kuwari, Pusa Deepali	• Close planting (60cm x 20 cm) • Closer spacing and planting of average seedlings • Closer spacing • Heavy dose of NPK	Seed supply under RKVY
	3. Lowland clay soil		Rice : Naveen, Sahbhagi, Vandana, PAC-807, Abhishek, Uday-111	Transplanting of average seedlings of long duration varieties/ hybrids	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	1. Upland	Maize + Pigeonpea Maize + Blackgram Pigeonpea + Sesame Maize + Groundnut Pigeonpea + Groundnut Finger millet	Re sowing Maize (Birsa Vikas Makka-2 Birsa Arhar – 1 Sesame – Kanke safed Groundnut : Birsa Bold	Sprinkler system or irrigation by lifting the water from rivers	Supply of sprinkler system under RKVY Supply of seeds of pulses under NFSM (Pulses)
			Hoeing of Maize + Pigeon pea	Hoeing to break the capillarity	
			Thinning replanting		
	2 Medium deep Medium land	Rice soil	Direct sowing of Naveen, Shabhagi, Vandana.	Irrigation of crop by lifting the water from ponds, wells.	Supply of Pipe – Pumps under RKVY
	3. Low land deep clay soil.	Rice crop		Irrigation of crops by lifting the water from well of ponds	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
	Uplands	Maize + Pigeonpea /	1. Supply of life saving	1. Application of	

At vegetative stage		Blackgram / Pigeonpea + Sesame/ Maize + Groundnut/Cowpea / Finger millet	irrigation 2. Weeding cum – hoeing to break capillarity 3. Finger millet has better drought tolerance capacity (Area extension) 4. Weeding and weed mulching of the field	compost to enhance the water holding capacity of soil 2. Judicious land of P for better penetration of root system 3. Weeding and weed mulching of the field 4. Pre sowing application of compost and judicious land of P&K for better water holding and root growth.	
	2. Medium land	Rice – IR – 36, IR – 64, Saryu – 52	IR – 36, IR – 64, Saryu – 52	• Life saving irrigation through pumps and sprinkler. • Area extension under Shabhagi Dhan	Supply of Pumps (Sprinkler) sets under RKVY
	3. Lowland	rice	Low lands mostly covered under hybrids with stand 2 – 3 weeks long stress PHB – 71, A – 801, Arize 6444, Rupali, Sonam	Life saving irrigation through Pumps	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At flowering/ fruiting stage	1. Upland Shallow red soils	Maize + Pigeonpea Maize + Blackgram Pigeonpea + Sesame Maize + Groundnut Pigeonpea + Groundnut Finger millet	Life saving irrigation through sprinkler system Weed – cum – hoeing and weed mulching	Intercultivation (soil mulching) Conservation Furrow	Supply of seeds through D.A.O. Supply seeds through N.F.S.M.
	2. Medium land medium deep sandy clay loom.	Rice : IR – 36 , IR - 64		Life irrigation by lifting the water from ponds/ wells	Supply of irrigation devices under RKVY.
	3. Low land deep heavy clay soil.	Rice : Varieties and Hybrids Sonam, Rupali, Arize – 6444, PHB – 71		Life saving irrigation through Pumps/Ponds/wells	

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]**
	1.Upland shall one red soils	Maize + Pigeonpea / Blackgram/ Groundnut/Cowpea Pigeonpea + Sesame Finger millet	Life saving irrigation Harvesting of pods of Cowpea and Black gram for vegetable purpose and fodder	Niger, Mustard, Chickpea, Linseed.	Supply of Pumps (Sprinkler) sets under RKVY
				Rye + Wheat, Linseed + Horsegram, Niger, Toria, Chickpea, Vegetable like – tomato, Vegetable pea, Potato, Wheat + Mustard, Lentil	Seeds and planting materials supply under RKVY
	2. Medium land	Rice : Varieties	Supply of life saving irrigation lifting the water from ponds wells.		
	3. Low land	Long duration rice varieties and hybrids.	Life saving irrigation Crop protection measures		Ponds/wells under MNREGS and RKVY

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; tankfed medium deep				

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
	black soils				
	Medium land sandy/clay looms	Medium land rice – IR – 36, IR – 64.	Aerobic rice var. Naveen, Shabhagi, Vandana.	Limited irrigation by the sprinklers.	Seed through RKVY, NFSM (Pigeonpea)
			Maize + Pigeonpea	Irrigation through drip or alternate row irrigation.	
			Pigeonpea + Sesame		
			Vegetable – Tomato, Chilli		
			Treated Cucurbits		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
		Rice	Aerobic rice / Transplanted rice var. Naveen, Shabhagi, Vandana.		
			Pigeonpea + Sesame Maize + Pigeonpea Tomato, Chillies		
	Medium land	Medium maturing rice varieties	Direct sown (Aerobic) Rice var. Naveen Shabhagi, Vandana, IR - 64		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of	NA				

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
water in canals under delayed onset of monsoon in catchment					
Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	NA				

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	NA				

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Rice	Bunding to store water in medium lands	Water restoring	Draining out	Shifting to

		in medium lands		safer place and drying
Pigeon pea	Draining out since cultivated in uplands which is undulated, self drainage occur therefore	Draining out application of plant protection chemicals	Provided drainage	Shifting to safer place and drying
Maize	Provided drainage	Provided drainage	Provided drainage	Shifting to safer place and drying
Wheat	Draining out	Draining out	Draining out	Shifting to safer place and drying
Groundnut	Draining out followed by hoeing the field	Draining out followed by hoeing	Draining out	Shifting to safer place and drying
Horticulture				
Potato	Provided drainage and plant protection		Drainage and diggiout	Shifting to safer place and drying
Brinjal	Provided drainage and plant protection	Provided drainage and Plant Protection	Provided drainage	Shifting to safer place and drying
Tomato	Provided drainage and plant protection	Provided drainage and Plant Protection	Drainage and Picking up fruits	Value addition
Cucurbit	Provided drainage and plant protection	Proper drainage	Drainage and Picking up fruits	Value addition
Chillies	Provided drainage and plant protection	Drainage and Plant protection	Drainage and Picking up fruits	Storage or drying or value addition
Heavy rainfall with high speed				

winds in a short span[2]				
Rice	Water restoring in medium land		Immediate drainage and harvesting crop	Drying on safer place
Pigeonpea	Draining and earthing up	Drainage and erecting the Plants	Drainage and erecting the Plants	Drying safer place
Maize	Draining and earthing up	Drainage and erecting the Plants	Drainage and harvesting at physiological maturity	Piling at safe place
Wheat	Drainage	Drainage	Drainage	Drying safer place
Pulses (Rabi)	Drainage and hoeing	Drainage and hoeing	Drainage	Drying safer place
Horticulture				
Potato	Drainage and Plant protection	Drainage and Plant protection	Drainage	Shade drying and store in cold storage
Brinjal	Drainage and Plant protection	Drainage and Plant protection	Drainage	Sail
Tomato	Drainage and Plant protection	Drainage and Plant protection	Drainage	Value addition
Cucurbits	Drainage and Plant protection	Drainage and Plant protection	Drainage	Value addition
Chillies	Drainage and Plant protection	Drainage and Plant protection	Drainage	Preservation and drying
Outbreak of pests and diseases due to unseasonal rains				
Rice	Need based plant protection measure IPM or IDPM for field crop			
Pigeonpea	Need based plant protection measure IPM or IDPM for field crop			
Maize	Need based plant protection measure IPM or IDPM for field crop			

Pulses (Rabi)	Need based plant protection measure IPM or IDPM for field crop			
Rye – Mustard	Need based plant protection measure IPM or IDPM for field crop			
Horticulture				

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
NA				
Horticulture	NA			
Continuous submergence for more than 2 days[2]				
Horticulture	NA			
Sea water intrusion[3]	NA			

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p] (loo)				
Wheat	-	-	Maintaining soil moisture by irrigation	
Pigeonpea	-	-	Maintaining soil moisture by irrigation	
Rye	-	-	Maintaining soil moisture by irrigation	
Lentil and Chickpea	-	-	Maintaining soil moisture by irrigation	
Rice	Maintaining soil moisture	-	Maintaining soil moisture by irrigation	
Horticulture				

Okra	Moisture management	Maintaining wind breaks and soil moister	Wind breaks and irrigation	
Chillies	Moisture management	Maintaining wind breaks and soil moister	Wind breaks and irrigation	
Cucurbits	Moisture management			
Cold wave[q]				
Pigeonpea	N.A.	Spray of fungicide and IPM	Before initiation of flower use of IPM Which include fungicide + insecticide	
Pea		Spray of fungicide and IPM	Watering of plant	
Lentil		Spray of fungicide and IPM	Smoking at 3 to 4 am in the morning	
Rabi Maize				
Horticulture				
Potato	-	Proper moisture mgt.		
Tomato	-	Proper moisture mgt.		
Chilli	-	Proper moisture mgt.		
Frost				
Horticulture	NA			
Hailstorm	NA			
Horticulture	NA			
Cyclone	NA			
Horticulture	NA			

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			
Drinking water			
Health and disease management			
Floods			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			

[s] 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				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Floods				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods			
A. Capture			
Marine			
Inland			
(i) Average compensation paid due to loss of human life			
(ii) No. of boats / nets/damaged			

(iii) No.of houses damaged			
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			

(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

[a] based on forewarning wherever available