

State: **KARNATAKA**

**Agriculture Contingency Plan for District: HASSAN**

<b>1.0 District Agriculture profile</b>					
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>				
	Agro Ecological Sub Region (ICAR)	Eastern Ghats And Tamil Nadu Uplands And Deccan (Karnataka) Plateau, Hot Semi-Arid Eco-Region (8.2)			
	Agro-Climatic Region (Planning Commission)	Southern Plateau And Hills Region (X)			
	Agro Climatic Zone (NARP)	Southern Transition Zone (KA-7)			
	List all the districts or part thereof falling under the NARP Zone	Hassan, Mysore, Chikmagalur, Shimoga, Uttara Kannada			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		13°00'29.30" N	76°06'13.06" E	943m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, VC Farm, Mandya - 571401 ZARS, Navile, Shimoga - 577204			
	Mention the KVK located in the district	KVK, Kandali, Hassan - 573217			
<b>1.2</b>	<b>Rainfall</b>	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	Kharif (June-Sep):	604.9	40	1 <sup>st</sup> to 2 <sup>nd</sup> Week of June	2 <sup>nd</sup> Week of Sept
	Rabi (Oct-Dec):	241.7	9	2 <sup>nd</sup> Week of October	1 <sup>st</sup> Week December
	Winter (Jan- March)	15.8	4	-	-
	Summer (Apr-May)	168.7	12	-	-
	Annual	1031.2	65	-	-

<b>1.3</b>	<b>Land use pattern of the district</b> (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
	<b>Area (000' ha)</b>	662.6	431.6	58.8	78.4	32.9	13.5	0.7	30.4	36.4	2.2

Source of data: District statistical office, Hassan

<b>1.4</b>	<b>Major Soils (common names like shallow red soils etc.,)</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total</b>
	1. Very Deep Red soils in Hilly zone	110.6	16.7 %
	2. Very deep Red soils in Plains	206.5	31.2 %
	3. Medium Deep Red gravelly soils in plains	4.6	0.73 %
	4. Shallow, Calcareous, Gravelly soils in plains	2.6	0.40 %
	5. Shallow to medium deep red soils in plains	55.6	8.40 %
	6. Deep Red soils with Moderate/ poor drained soils in plains.	80.8	12.2 %
	7. Rock out crops	12.6	1.9 %

Year and source of date: 2009-10, District statistical officer, Hassan

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	370	119%
	Area sown more than once	71	
	Gross cropped area	441	

Year and source of date: 2009-10, District statistical officer, Hassan

<b>1.6</b>	<b>Irrigation</b>	Area ('000 ha)		
	Net irrigated area	88.6		
	Gross irrigated area	97.4		
	Rainfed area	255.0 *		
	<b>Sources of Irrigation</b>	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		34.6	39.05
	Tanks		28.9	32.68
	Open wells		1.07	1.21
	Bore wells		22.7	25.48
	Lift irrigation		0.185	0.2
	Micro-irrigation			
	Other sources		1.03	1.16
	Total Irrigated Area		88.6	
	Pump sets	3952		
No. of Tractors	12517			
<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	No. of blocks/ Tehsils/ Watershed No.	(% area)		
Over exploited	48482	25		
Critical	-	-		
Semi- critical	40386	12.50		
Safe	48483 & 48484	62.50		
Wastewater availability and use	-			
Ground water quality	Good			

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

Year and source of date: 2009-10, District statistical officer, Hassan

1.7 Area under major field crops (2008-09) for Hassan district

1.7	Major Field Crops cultivated	Area ('000 ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rainfed	Irrigated	Rainfed		
Paddy	42.20	6.70	0	0	5.03	53.92	
Ragi	4.10	70.61	1.02	8.56	0.12	84.42	
Maize	5.29	53.33	1.23	3.53	0.37	63.76	
Cowpea	0.85	7.05	0.23	1.39	0.18	9.71	
Greengram	0.18	3.27	0.01	0	0.01	3.48	
Horsegram	0	6.97	0	9.46	0	16.43	
Field bean	0.37	5.96	0	1.43	0	7.77	
Sunflower	0.68	14.43	0.28	0.56	0.01	15.97	
Groundnut	0.17	0.69	0	0	0.58	1.44	
Tobacco	0.85	11.20	0	0	0	12.05	
Sugarcane	3.15	0	1.87	0	1.08	6.10	
Potato	4.26	53.22	0.48	-	-	57.96	

Area under major field crops (2008-09) for Zone-IV of Hassan district

1.7	Major Field Crops cultivated	Area ('000 ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rainfed	Irrigated	Rainfed		
Paddy	0.93	0	0	0	0.11	1.04	
Ragi	0.28	24.43	0.02	0.24	0	24.97	
Maize	0.65	4.10	0.08	0.09	0	4.92	
Cowpea	0	1.49	0.05	0.14	0.07	1.75	
Greengram	0.11	2.28	0	0	0	2.39	
Horsegram	0	3.49	0	2.95	0	6.44	
Fieldbean	0.25	2.11	0	0	0	2.36	
Sunflower	0.23	11.48	0	0	0	11.71	

	Groundnut	0.03	0.27	0	0	0.44	0.74
	Tobacco	0	0	0	0	0	0
	Sugarcane	0	0	0	0	0	0
	Potato	4.26	53.22	0.48	-	-	57.96

**Area under major field crops (2008-09) for Zone-VI of Hassan district**

1.7	Major Field Crops cultivated	Area ('000 ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rainfed	Irrigated	Rainfed		
Paddy	4.03	0	0	0	0.71	4.74	
Ragi	1.22	16.97	0.10	0.10	0.07	18.47	
Maize	0.75	5.40	0.06	0.39	0.14	6.74	
Cowpea	0	1.24	0.07	0.13	0.05	1.50	
Greengram	0.05	0.54	0.01	0	0.01	0.61	
Horsegram	0	0.35	0	1.90	2.25	6.43	
Fieldbean	0	1.11	0	0.06	0	1.17	
Sunflower	0.05	0.19	0.01	0.04	0.01	0.31	
Groundnut	0.05	0.20	0	0	0.01	0.26	
Tobacco	0	0	0	0	0	0	
Sugarcane	2.30	0	1.56	0	0.64	4.51	

**Area under major field crops (2008-09) for Zone-VII of Hassan district**

1.7	Major Field Crops cultivated	Area ('000 ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rainfed	Irrigated	Rainfed		
Paddy	31.31	3.20	0	0	3.53	38.04	
Ragi	2.60	29.20	0.90	8.22	0.05	40.98	
Maize	3.89	43.83	1.10	3.04	0.23	52.10	

Cowpea	0.85	4.32	0.10	1.12	0.02	6.42
Greengram	0.02	0.45	0	0	0	0.47
Horsegram	0	3.13	0	4.62	0	7.75
Fieldbean	0.12	2.75	0	1.37	0	4.24
Sunflower	0.40	2.76	0.28	0.52	0	3.96
Groundnut	0.09	0.22	0	0	0.13	0.44
Tobacco	0.85	11.20	0	0	0	12.05
Sugarcane	0.86	0	0.30	0	0.43	1.59

**Area under major field crops (2008-09) for Zone-IX of Hassan district**

1.7	Major Field Crops cultivated	Area ('000 ha)					Summer	Total
		<i>Kharif</i>		<i>Rabi</i>				
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>			
	Paddy	5.93	3.50	0	0	0.68	10.11	
	Ragi	0	0	0	0	0	0	
	Maize	0	0	0	0	0	0	
	Cowpea	0	0	0	0	0.04	0.04	
	Greengram	0	0	0	0	0	0	
	Horsegram	0	0	0	0	0	0	
	Field bean	0	0	0	0	0	0	
	Sunflower	0	0	0	0	0	0	
	Groundnut	0	0	0	0	0	0	
	Tobacco	0	0	0	0	0	0	
	Sugarcane	0	0	0	0	0	0	

Major Horticulture Crops cultivated	Area ('000 ha)
	<i>Total area</i>
Fruits	

Banana	3.4
Mango	2.2
Sapota	0.7
Lemon	0.4
Guava	0.3
<b>Vegetables</b>	<b>Total Area</b>
Potato	57.5
Green Chillies	2.4
Tomato	1.7
Cabbage	0.5
French beans	0.5
<b>Plantation crops</b>	<b>Total Area</b>
Coconut	61.8
Arecanut	3.9
Cashew	0.1
<b>Spices</b>	<b>Total Area</b>
Ginger	13.8
Cardamom	7.5
Pepper	2.7
Turmeric	0.1
<b>Flower crops</b>	<b>Total Area</b>
Marigold	0.6
Chrysanthemum	0.2

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	Non descriptive Cattle (local low yielding)	183.32	290.07	473.39
	Crossbred cattle	13.93	126.94	140.87
	Non descriptive Buffaloes (local low yielding)	19.96	170.38	190.34
	Graded Buffaloes	-	-	-
	Goat	41.51	7.14	48.65
	Sheep	74.41	126.74	201.15
	Pig	-	-	2.48
	Commercial dairy farms (Number)			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial	-	516.57	

	Backyard	-								
<b>1.10</b>	<b>Fisheries</b> (Data source: Chief Planning Officer)									
	<b>A. Capture</b>									
	<b>i) Marine</b> (Data Source: Fisheries Department)	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>			
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)				
		-	-	-	-	-	-	-	-	
	<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>				
			<b>103</b>		<b>3</b>		<b>3035</b>			
	<b>B. Culture</b>									
		<b>Water Spread Area (ha)</b>			<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>			
	<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)	-			-		-			
	<b>ii) Fresh water</b> (Data Source: Fisheries Department)	33354			60 kg/ha		8425 mt			
	<b>Others</b>									

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

<b>1.11</b>	<b>Name of crop</b>	<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>		<b>Total</b>		<b>Crop residue as fodder ('000 tons)</b>
		Prodn (000 t)	Productvty (Kg/ha)	Production (000 t)	Productivity (Kg/ha)	Production (000 t)	Productvty (Kg/ha)	Production (000 T)	Productvty (Kg/ha)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
	Paddy	214.1	4379.0	0.0	-	26474.9	5254	26689.1	5245.59	
	Ragi	128.2	1716.0	17.8	1856	243.0	2025	389.0	1904.07	
	Maize	261.4	4459.0	18.1	3790	1979.5	5350	2259.0	5212.3	



Cowpea	9.9	1250.0	1.5	950	251.1	1350	262.5	1342.6
Greengram	3.6	1050.0	0.0	-	12.5	1250	16.1	1198.2
Horsegram	5.9	845.0	6.8	720	0.0	-	12.7	773.1
Fieldbean	7.3	1150.0	1.3	940	0.0	-	8.6	1111.2
Sunflower	20.5	1357.0	1.1	1305	20.8	1385	42.4	1369.1
Groundnut	1.3	1550.0	0.0	-	1015.0	1750	1016.3	1749.7
Tobacco	7.8	839.1	0.0	-	0.0		7.8	839.1
Sugarcane	331.3	105000.0	0.0		0.0		331.3	305.32
Potato	135.9	2247.7	1.35	2820.0	-	-	97445	2251.5

Source Of Data: District statistical officer, Hassan

1.12	Situation	Sowing window for 5 major field crops (start and end of normal sowing week)				
		Paddy	Ragi	Maize	Potato	Sunflower
	Kharif- Rainfed	July 2 <sup>nd</sup> – Aug 1 <sup>st</sup>	May 4 <sup>th</sup> – June 4 <sup>th</sup>	May 4 <sup>th</sup> – June 4 <sup>th</sup>	June 1 <sup>st</sup> - June 2 <sup>nd</sup>	May 2 <sup>nd</sup> – May 3 <sup>rd</sup>
	Kharif-Irrigated	July 4 <sup>th</sup> – Aug 4 <sup>th</sup>	July 2 <sup>nd</sup> – Aug 1 <sup>st</sup>	June 3 <sup>rd</sup> - July 2 <sup>nd</sup>	May 3 <sup>rd</sup> – May 4 <sup>th</sup>	May 1 <sup>st</sup> - May 2 <sup>nd</sup>
	Rabi- Rainfed	-	Sept 1 <sup>st</sup> – Sept 2 <sup>nd</sup>	Sept 1 <sup>st</sup> – Sept 2 <sup>nd</sup>	-	Aug 1 <sup>st</sup> – Aug 2 <sup>nd</sup>
	Summer	Dec 1 <sup>st</sup> – Jan 2 <sup>nd</sup>				

1.13	What is the major contingency the district is prone to?	Regular	Occasional	None
	Drought		√ In 2003 (53 % of Normal Rains)	-
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave			✓
	Cold wave			✓
	Frost			✓
	Sea water intrusion			✓
	Pests and diseases (specify)		√ (Late blight in Potato (2008 and 2009))	

	Others			✓
--	--------	--	--	---

<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

(Conventional rains actually start in 1<sup>st</sup> week of May; Through Monsoon sets in 1<sup>st</sup> week of June)

<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Suggested Contingency measures</b>	
				<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
<b>Early season drought (delayed onset)</b>					
<b>Delay by 2 weeks May 3<sup>rd</sup> week</b>	1 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop 6:1) Potato- Kufri Jyothi	Potato – Soyabean/ Potato-Cowpea Potato-Ragi Potato+Redgram  Ragi- GPU-28; GPU- 45 GPU-26, GPU-48  Soyabean; J-365, K.B-79, Moneta  Cowpea – KBC-2, TVX- 944  Potato: Kufri jyothi, Kufri surya, Kufri pukraj	Monsoon delay by two weeks doesn't affect the normal cropping system since sowing window for potato open up to June 2 <sup>nd</sup> week	Timely supply of seeds through KSSC, NSC, UAS. Support through special package namely NFSM-Pulses/ paddy; Bhoochethana – to distribute gypsum, PSP, Boron + Zincsulphate PM Package Supply of Seed drill, weeder, sprayers and other mechanical implements under RKVY

			Redgram- BRG-1, BRG-2, TTB-7		
		Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	Maize – Soyabean (Late khariff) Cowpea/ Greengram  Ragi- GPU-28; GPU- 45 GPU-26  Soyabean; J-365, K.B-79, Moneta  Cowpea – KBC-2, TVX-944  Redgram- BRG-1, BRG-2, TTB-7		-do-
	2. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi / Sunflower / Maize  Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Sesamum – Ragi  Sesamum-Groundnut  Sunflower – KBSH-41 / KBSH-53  Ragi+ Red gram-Cow pea  Maize+Redgram-Soybean  Soyabean JSS-365 / KB-79  Sesamum-Navile-1  Grounut-GPBD-4, TMV-2  Ragi- GPU-28,GPU-66, MR-1, MR-6.		-do-

			Red gram-BRG-1, BRG-2, TTB-7  Maize- NAH-2049, NAH-1137, NAC-6004  Greengram - China moong / PDM – 84-178  Blackgram – T-9 / Rashmi		
	3. Shallow to medium deep soils (Zone-6)	Horsegram / Cow pea / black gram – Ragi / Maize/Groundnut, green gram-paddy, sesamum-potato, Sesamum-potato,	Horsegram / Cow pea / black gram – Ragi / Maize/Groundnut, green gram-paddy, sesamum-potato, Sesamum-potato,		-do-

<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Suggested Contingency measures</b>	
				<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
Early season drought (delayed onset)  Delay by 4 weeks June 1 <sup>st</sup> week	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) Potato- Kufri Jyothi	Potato – Soyabean/ Potato-Cowpea Potato-Ragi Potato+Redgram  Ragi- GPU- 45 GPU-26 GPU-48  Soyabean; J-365, K.B-79, Moneta  Cowpea – KBC-2, TVX-944  Potato: Kufri jyothi, Kufri surya, Kufri pukraj Redgram- BRG-1, BRG-		-do-

		Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	2, TTB-7 Maize – Soyabean/ Cowpea/ Greengram Ragi- GPU-28; GPU- 45 GPU-26 Soyabean; J-365, K.B-79, Moneta Cowpea – KBC-2, TVX- 944 Redgram- BRG-1, BRG- 2, TTB-7	
	3. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi  Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Ragi + Pulses Sunflower – Cowpea / Horsegram Groundnut + Redgram Ragi+ Red gram-Cow pea Maize+Redgram-Soybean Sunflower – KBSH – 41 / KBSH - 53 Groundnut-GPBD-4, TMV-2 Ragi- GPU-28,GPU-66, MR-1, MR-6. Red gram-BRG-1, BRG- 2, TTB-7 Soyabean; J-365, K.B-79,	

			<p>Moneta</p> <p>Maize- NAH-2049, NAH-1137, NAC-6004</p> <p>Horsegram – PHG-9</p>		
	4. Shallow to medium deep soils (Zone-6)	Cow pea- Groundnut, green gram-paddy, black gram-ragi, sesamum-potato, Sesamum-potato, cowpea-jowar, green gram-maize	<p>Groundnut + Redgram</p> <p>Ragi + Redgram / Fieldbean</p> <p>Paddy - Green gram / black gram / bengalgram / Cowpea</p> <p>Maize - Horsegram</p> <p>Potato + Redgram – Ragi</p> <p>Grounut-GPBD-4, TMV-2</p> <p>Ragi- GPU-28,GPU-66, MR-1, MR-6.</p> <p>Red gram-BRG-1, BRG-2, TTB-7</p> <p>Maize- NAH-2049, NAH-1137, NAC-6004</p> <p>Cowpea – KBC-2, TVX-944</p> <p>Bengalgram – JJ-11 / Vishal</p>		

			Field bean – Hebbal Avare-4		
			Blackgram – T-9, Rashmi		
<b>Condition</b>				<b>Suggested Contingency measures</b>	
<b>Early season drought (delayed onset)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
<b>Delay by 6 weeks June- 3<sup>rd</sup> Week</b>	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) Potato- Kufri Jyothi	Maize + cowpea  Ragi+soybean / Fieldbean / Redgram  Sunflower – Horsegram / Soybean  Maize- NAC-6004; NAH-2049, Nah-1137,  Ragi- GPU-28, GPU-66, MR-1, MR-6  Red gram- BRG-, BRG-2, TTB-7,  Soyabean; J-365, K.B-79, Moneta  Cow pea-KBC-2, TVX-944  Horsegram – PHG-9  Field bean – Hebbal Avare-4		
	3. Deep red soils in Plains	Sesamum/ Minor millets / pulses – Ragi	Ragi + Redgram / Field		

	(Zone-4)	Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	bean  Groundnut + Redgram / Field bean / Soybean  Maize+Redgram-Soybean / Horsegram  Grounut-GPBD-4, TMV- 2  Ragi- GPU-28,GPU-66, MR-1, MR-6.  Red gram-BRG-1, BRG- 2, TTB-7  Soyabean; J-365, K.B-79, Moneta  Maize- NAH-2049, NAH- 1137, NAC-6004  Horsegram – PHG-9  Field bean – Hebbal Avare-4		
	4. Shallow to medium deep soils (Zone-6)	Cow pea- Groundnut, green gram-paddy, black gram-ragi, sesamum- potato, Sesamum-potato, cowpea-jowar, green gram-maize	Groundnut + Redgram  Paddy – Cowpea / Bengalgram / Greengram  Maize – Soybean / Cowpea / Horsegram Sugarcane + Soybean  Ragi + Field bean		-do-



			<p>Grounut-GPBD-4, TMV-2</p> <p>Ragi- GPU-28,GPU-66, MR-1, MR-6.</p> <p>Field bean – Hebbal Avare-4</p> <p>Red gram-BRG-1, BRG-2, TTB-7</p> <p>Maize- NAH-2049, NAH-1137, NAC-6004</p> <p>Cowpea – KBC-2, TVX-944</p> <p>Bengalgram – JJ-11 / Vishal</p> <p>Horsegram – PHG-9</p> <p>Greengram - China moong / PDM – 84-178</p> <p>Soyabean; K.B-79, Moneta</p> <p>Sugarcane – CO-62175 / CO – 8371 / COVC – 2003 - 165</p>		
<b>Condition</b>				<b>Suggested Contingency measures</b>	
<b>Early season drought (delayed</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on Implementation</b>

onset)					
<b>Delay by 8 weeks</b>  <b>July 1<sup>st</sup> Week</b>	1 Very Deep Red soils hill zone (Zone -9)	Paddy- Intan cross	Paddy BR-2655; Tunga		Timely supply of seeds through KSSC, NSC, UAS. Through NFSM- Paddy; PM Package Seed drill under RKVY
	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) Potato- Kufri Jyothi  Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	Maize / Ragi –Sunflower  Maize-soybean  Maize- NAC-6004; NAH-2049, NAH-1137,  Ragi+Redgram-cowpea  Ragi- GPU-28,GPU-66, MR-1, MR-6.  Red gram-BRG-1, BRG-2, TTB-7  Soyabean; J-365, K.B-79, Moneta  Maize- NAH-2049, NAH-1137, NAC-6004		
	3. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi (2 <sup>nd</sup> crop) Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Ragi + Akkadi (field bean/ Redgram / jowar / castor / niger)  Ragi + Redgram Ragi- GPU-28; GPU-26 ; MR-1 and MR – 6 Redgram – BRG-2 only  Groundnut + Redgram Gnut- GPBD-4; TMV-2 Redgram – BRG-2 ;  Sunflower - Horsegram		

			KBSH-41 or 53; Niger – KBN-1 / KBN - 71		
	4. Shallow to medium deep soils (Zone-6)	Ragi with pulses as intercrop Ragi- GPU-28; local	Ragi+ Red gram Maize+ Red gram Sunflower- green gram Fieldbean +Niger Groundnut + Akkadi Ragi- GPU-28; GPU-66, MR-1 and MR – 6 Groundnut (GPBD-4; TMV-4) Redgram (BRG-2), BRG-2 Niger – KBN-1 / KBN – 71 Field bean – Hebbal Avare-4		-do-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
<b>Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop</b>	1 Very Deep Red soils hill zone (Zone -9)	Paddy- Intan	Gap filling Leaf clipping Seed treatment with Carbendazim in paddy @ 4 g / kg seed	Delay top dressing of N applications till next rains	-do-

stand etc.	2 Deep Red soils in plains (Zone-7)	<p>Potato - Ragi (Potato with Redgram/ castor as intercrop)</p> <p>Potato- Kufri Jyothi</p> <p>Maize – Ragi/ pulses</p> <p>Maize- Private Hybrids; NAC-6004;</p> <p>Ragi- GPU-28; Local</p>	<p>Gap filling of potato with vegetable beans or cowpea</p> <p>Gap filling with cow pea / field bean, jowar for fodder purpose</p> <p>Spray 1 ml / 1 NPV or 1ml/1 Indoxacarp or 5% NSKE when pod borer incidence starts on redgram.</p> <p>Seed treatment with 3g / 1 Cymoxanyl + Mancozeb based fungicides on potato</p> <p>Spray Cymoxanyl + Mancozeb 3g / 1 based fungicides when incidence noticed on potato</p> <p>Spray 2.5 ml / 1 Dicofol or 3g / 1 Wettable Sulphur for management of mite infestation on potato</p> <p>Seed treatment with 4g/ kg seeds Metalaxyl + Mancozeb based fungicides and spray 2ml / 1 Quinalphos against Stem Borer in maize</p>	<p>Delay top dressing till next rains</p> <p>Earthing up; inter-cultivation</p>	
	3. Deep red soils in Plains (Zone-4)	<p>Sesamum/ Minor millets / pulses – Ragi (2<sup>nd</sup> crop)</p> <p>Sesamum- local</p> <p>Minor millets- Same, Harka, etc</p> <p>Horsegram/ greengram/ Cowpea</p>	<p>If suppose previous crop is pulse incorporate into soil and go for long duration Ragi (GPU-28; GPU-66; MR-1 or MR-6) or Maize – NAC-6004, NAH-2049, NAH-1137</p> <p>Spray 1.7 ml / 1 Dimethoate at 20-25 days after crop</p>	<p>Apply only 50 % of the RDF 50:25:20 NPK for ragi, 75:37.5:20 kg NPK + 4 kg ZnSo4 for Maize if fertilizer is applied to the first crop and pulses only</p>	

			emergence for all crops		
	4. Shallow to medium deep soils (Zone-6)	Ragi with pulses as intercrop Ragi- GPU-28; local	Thinning and gap filling Leaf clipping  Spray 1.7 ml / l Dimethoate at 20-25 days after crop emergence for all crops	Delay top dressing of fertilizers	
<b>Condition</b>			<b>Suggested Contingency measures</b>		
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
<b>At vegetative stage</b>	1 Very Deep Red soils hill zone (Zone -9)	Paddy- Intan	Life saving irrigation Seed treatment with 4g / kg Carbendazim and spraying 1.7 ml / l Dimethoate + 2g / l Carbendazim in paddy	Foliar nutrient spray of potassium nitrate @ 2g/l or 19:19:19 water soluble fertilizer @ 2g/l	-do-
	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) Potato- Kufri Jyothi	Life saving irrigation Earthing up  Spray 1ml / l NPV or 1ml/l Indoxacarp or 5% NSKE when pod borer incidence starts on redgram.  Seed treatment with 3g / l Cymoxanyl + Mancozeb based fungicides on potato  Spray 3g/l Cymoxanyl + Mancozeb based fungicides when incidence noticed on potato  Spray 2.5ml / l Dicofol or 3g/l Wettable Sulphur for	Foliar spray of nutrients of potassium nitrate or 19:19:19 water soluble fertilizer @2g/l during drought period	

			management of mite infestation on potato		
		Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	Life saving irrigation Earthing up Seed treatment with Metalaxyl + Mancozeb based fungicides and spray Quinalphos against Stem Borer in maize	Foliar spray of nutrients during drought period	-do-
	3. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi (2 <sup>nd</sup> crop) Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Incorporate biomass into soil. Go for the 2 <sup>nd</sup> crop with Ragi (GPU-28; GPU-66; MR-1 or MR-6) or Maize Hybrids or Groundnut (GPBD-4)  Spray 1.7ml/l Dimethoate at 20-25 days after crop emergence for all crops	Apply only 50 % of the RDF 50:25:20 NPK for ragi, 75:37.5:20 kg NPK + 4 kg ZnSo4 for Maize if fertilizer is applied to the first crop and pulses only	
	4. Shallow to medium deep soils (Zone-6)	Ragi with pulses as intercrop Ragi- GPU-28; local	Use pulse biomass as fodder (Except Redgram)  Leaf clipping in ragi Thinning is also recommended  Spray 1.7ml / l Dimethoate at 20-25 days after crop emergence for all crops	Life saving irrigation  To conserve Moisture open dead furrow or conservation furrow for every 10mt distance furrow	
<b>Condition</b>			<b>Suggested Contingency measures</b>		
<b>Mid season drought (long dry spell)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
<b>At flowering/ fruiting stage</b>	1 Very Deep Red soils hill zone (Zone -9)	Paddy- Intan	Seed treatment with 2g/l Carbendazim and spraying 1.7ml/l Dimethoate + 2g/l Carbendazim in paddy	Foliar application potassium nitrate @ 2ml/l water.  Lift irrigation where it is possible	-do-

	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) 6:1 Potato- Kufri Jyothi	Protective irrigation Go for long duration Ragi + Soyabean in the ratio of 6:2 or Maize + Soyabean in row ratio of 2:1, If potato fails  Spray 1ml/l NPV or 1ml/l Indoxacarp or 5% NSKE when pod borer incidence starts on redgram.  Seed treatment with 3g/l Cymoxanyl + Mancozeb based fungicides on potato  Spray 3g/l Cymoxanyl + Mancozeb based fungicides when incidence noticed on potato  Spray 2.5ml/l Dicofol or 3g/l Wettable Sulphur for management of mite infestation on potato	Foliar application of 19:19:19 @ of 2g/l to potato,  Mulch with crop residues,  De hulming the potato crop ( if crop exceeds 70 days, other wise mite problem persists)	Any of the suitable measures as indicated above (in page-1)  Any of the suitable measures as indicated above (in page-1)
		Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	Apply 3ml/l Chlorpyriphos against defoliators or pests on flowers / pods	Protective irrigation  Foliar application of bio 20 or mangala 3X spray @ 2ml/	
	3. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi (2 <sup>nd</sup> crop) Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Incorporate biomass into soil. Go for the 2 <sup>nd</sup> crop with Ragi (GPU-28; GPU-66; MR-1 or MR-6) or Maize Hybrids or Groundnut (GPBD-4) with pulse intercrop 12:1  Spray 1.7ml/l Dimethoate at	Apply only 50 % of the RDF (25:10:10 kg NPK/ha) for the 2 <sup>nd</sup> crop ragi, if fertilizer is applied to the first crop	

			20-25 days after crop emergence for all crops		
	4. Shallow to medium deep soils (Zone-6)	Ragi with pulses as intercrop 8:1 Ragi- GPU-28; local	Use pulse biomass as fodder (Except Redgram)  Leaf clipping in ragi  Thinning is also recommended  Spray 1.7ml/l Dimethoate at 20-25days after crop emergence for all crops	Life saving irrigation Moisture  Open dead furrow or  Conservation furrow at 10mt distance	
<b>Condition</b>			<b>Suggested Contingency measures</b>		
<b>Terminal drought</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Rabi Crop planning</b>	<b>Remarks on Implementation</b>
	1. Very Deep Red soils in hilly zone (Zone -9)	Paddy- Intan	Protective irrigation  Seed treatment with 4g/kg Carbendazim and spraying 1.7ml/l Dimethoate + 2g/l Carbendazim in paddy	Greengram as a relay crop	-do-
	2 Deep Red soils in plains (Zone-7)	Potato - Ragi (Potato with Redgram/ castor as intercrop) Potato- Kufri Jyothi	Spray 1ml/l NPV or 1ml/l Indoxacarp or 5% NSKE when pod borer incidence starts on redgram.  Seed treatment with 3g/l Cymoxanyl + Mancozeb based fungicides on potato  Spray 3g/l Cymoxanyl + Mancozeb based fungicides when incidence noticed on potato  Spray 2.5 ml/l Dicofol or 3g/l	Protective irrigation Only intercrop ( redgram or castor)  Don't plan for second crop in redgram/castor  Crop residue mulch only for intercrop	



			Wettable Sulphur for management of mite infestation on potato		
		Maize – Ragi/ pulses Maize- Private Hybrids; NAC-6004; Ragi- GPU-28; Local	Protective irrigation  Spray 1.7ml/l Dimethoate at 20-25 days after crop emergence for all crops		
	3. Deep red soils in Plains (Zone-4)	Sesamum/ Minor millets / pulses – Ragi (2 <sup>nd</sup> crop) Sesamum- local Minor millets- Same, Harka, etc Horsegram/ greengram/ Cowpea	Incorporate biomass into soil. Go for the 2 <sup>nd</sup> crop with Ragi (GPU-28; GPU-66; MR-1 or MR-6) or Maize Hybrids or Groundnut (GPBD-4) with pulse intercrop  Spray 1.7ml/l Dimethoate at 20-25 days after crop emergence for all crops	Apply only 50 % of the RDF for the 2 <sup>nd</sup> crop, if fertilizer is applied to the first crop	
	4. Shallow to medium deep soils (Zone-6)	Ragi with pulses as intercrop Ragi- GPU-28; local	Use pulse biomass as fodder (Except Redgram)  Leaf clipping in ragi Thinning is also recommended  Spray 1.7ml/l Dimethoate at 20-25 days after crop emergence for all crops	Life saving irrigation Moisture Conservation / dead furrow	

**2.1.2 Irrigated situation**

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed rains in Hill zone	Upland	Paddy-fallow	Karna, Jaya, KHP-5	Punuji cultivation ( Direct dry seeding of paddy and later crop is grown as normal paddy	-do-

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				crop) Seed treatment with Carbendazim and spraying 1.7ml / l Dimethoate + 2g/l Carbendazim in paddy	
	Lowland	Paddy-fallow	Intan, Sharavathi, Hemavathi, BR-2655	Lime application 200 kg / acre and Green manuring Sunhemp, Diencha  Application of 100:50:50+ 8 kg ZnSO4 ( Zinc application once in three years)  Seed treatment with 2g/l Carbendazim and spraying 1.7ml/l Dimethoate + 2g/l Carbendazim in paddy	
	Tank Irrigation	Paddy-fallow	Mangala, KMP-105	Application of 100:50:50+ 8 kg ZnSO4 ( Zinc application once in three years)  Seed treatment with 2g/l Carbendazim and spraying 1.7ml/l Dimethoate + 2g/l Carbendazim in paddy	

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	-	Paddy-paddy	Mangala, KMP-105	<p>Application of 100:50:50+ 8 kg ZnSO<sub>4</sub> ( Zinc application once in three years)</p> <p>Seed treatment with 2g/l Carbendazim and spraying 1.7ml/l Dimethoate + 2g/l Carbendazim in paddy</p> <p>Green gram or cowpea as residue crop</p>	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall		Paddy-paddy	<p>Aerobic is suggested for water saving MAS-946/1; KMP-153 for Aerobic SRI method –KRH-2; other hybrids</p>	<p>100:50:50 kg NPK + Zinc and iron supplement through multiplex @ 10ml/l water.</p> <p>Seed treatment with Carbendazim and spraying Dimethoate + Carbendazim in paddy</p> <p>Inter cultivation with cono-weeder</p>	<p>Cono weeder use for weeding</p> <p>Any of the suitable measures as indicated above (in page-1)</p>

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment		Paddy- paddy	<p>Maize Sunflower Pulses</p> <p>Maize : NAC-6002, NAC-6004, NAH - 2049, NAH - 1137 Sunflower : KBSH – 41, KBSH-53 Cowpea : KBC-1, KBC-2, TVX – 944 Greengram : Chaina Moong</p>	<p>100:50:50 kg NPK + Zinc and iron supplement through multiplex @ 10ml/l water.</p> <p>Earthing up and Kaolin spray in maize</p> <p>Seed treatment with 4g/kg Metalaxyl + Mancozeb based fungicides and spray 2ml/l Quinalphos against Stem Borer in maize</p> <p>Seed treatment with 5g/kg imidacloprid in sunflower</p> <p>Spray 1.7ml/l Dimethoate at 20-25 days after crop emergence for all crops</p>	Any of the suitable measures as indicated above (in page-1)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon		Paddy	<p>Aerobic is suggested for water saving MAS-946/1; KMP-153 for Aerobic</p>	<p>Nutrient supplement through foliar application of multiplex @ 10ml/l water. Inter cultivation with cono-weeder</p>	Any of the suitable measures as indicated above (in page-1)

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall					

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Potato	<p>Proper drainage</p> <p>PP measures for early and late blight</p> <p>Early blight: Spray 3g/l mancozeb early blight + 2ml dimethoate</p> <p><b><i>Spodoptera litura:</i></b> Apply 3ml/l chlorpyriphys against defoliators</p> <p><b>Late blight:</b> Apply Mancozeb @ 3g/l at 45 days or prior to lateblight incidence</p> <p><b><i>Spodoptera litura:</i></b> Apply 1g/l Methomyl against defoliators</p>	<p>Proper drainage</p> <p><b>Late blight:</b> Spray 3g/l Cymoxanyl + Mancozeb based Apply dimethomorph@ 1ml/l+mancozeb 3g/l when incidence noticed on potato.</p> <p>Spray 3g/l Cymoxanyl + Mancozeb based fungicides at 7 days after first spray</p> <p><b><i>Spodoptera litura:</i></b> Apply Methomyl poison bait ( 10kg rice bran or polish, 3kg jiggery, 3 litre of water and 100 g methomyl) .</p> <p><b>Potato mite:</b> Spray 2.5ml/l Dicofol or</p>	<p>Proper drainage</p> <p><b>Potato tuber moth:</b> Apply 2ml/l Quinalphos against potato tuber moth Harvest at physiological maturity stage</p>	<p><b>Potato tuber moth:</b> Cover the stored potato tubers with dried sand or sawdust powder</p> <p>Storage in safe place</p> <p>Store in the elevated place Do not cover potato heaps with leaves</p>

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging		3g/l Wettable Sulphur for management of mite infestation on potato		
Maize	Proper drainage and Earthing up PP measures for downy mildew <b>Downy mildew :</b> Apply 2g/ml Metalaxyl + Mancozeb based fungicides <b>Stem borer :</b> 2ml/l Quinalphos	Proper drainage Foliar application of nutrients after rains PP measures for stem borer Stem borer: <b>spray dimethoate 1.7ml/l</b> <b>Leaf blight:</b> Apply 3g/l Mancozeb against Late blight	Proper drainage Harvest at physiological maturity stage	husking of cobs; dry the cobs <b>Rice weevil &amp; mould:</b> Proper drying of harvested crops to prevent infestation by rice weevil and moulds
Paddy	Drain out excess water Avoid inflow of water to the paddy fields <b>Blast , Stem borer &amp; defoliator:</b> Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against stem bore r& defoliators	Proper drainage Foliar application of nutrients after rains <b>Blast , Stem borer &amp; defoliator:</b> <b>Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against defoliators.</b>	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Anguimois grain moth and moulds:</b> Proper drying of harvested crops to prevent infestation by Anguimoisgrain moths and moulds
Ragi	Drain out excess water Avoid inflow of water to the fields	Proper drainage Foliar application of nutrients after rains	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds
Sunflower	Drain out excess water Avoid inflow of water to the fields <b>Thrips,</b> Apply 0.5ml/l Imidacloprid or 1.3 ml/l Metasystox or 1.7 ml/l Dimethoate	Drain out excess water Foliar application of nutrients after rains <b>Head borer &amp; leaf spot:</b> Apply 2ml/Phosalone or	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Moulds:</b> Proper drying of harvested

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
	against sucking pests <b>Powdery mildew, Rust:</b> 2ml/l hexaconazole against powdery mildew and rust	NPV against head borers followed by application of 3g/l Mancozeb against leaf spot		crops to prevent mould growth
Heavy rainfall with high speed winds in a short span				
Potato	Earthing up <b>Late blight:</b> Apply Mancozeb @ 3g/l at 45 days or prior to lateblight incidence <b>Spodoptera litura:</b> Apply 1g/l Methomyl against defoliators	Foliar application of nutrients after rains <b>Late blight:</b> Spray 3g/l Cymoxanyl + Mancozeb based Apply dimethomorph@ 1ml/l+mancozeb 3g/l when incidence noticed on potato.  Spray 3g/l Cymoxanyl + Mancozeb based fungicides at 7 days after first spray <b>Spodoptera litura:</b> Apply Methomyl poison bait ( 10kg rice bran or polish, 3kg jiggery, 3 litre of water and 100 g methomyl) .	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Potato tuber moth:</b> Cover the stored potato tubers with dried sand or sawdust powder  Storage in safe place  Store in the elevated place Do not cover potato heaps with leaves
Maize	Earthing up <b>Downy mildew :</b> Apply 2g/ml Metalaxyl + Mancozeb based fungicides <b>Stem borer :</b> 2ml/l Quinalphos	Earthing up Foliar application of nutrients after rains Stem borer: <b>spray dimethoate 1.7ml/l</b> <b>Leaf blight:</b> Apply 3g/l Mancozeb	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Rice weevil &amp; mould:</b> Proper drying of harvested crops to prevent infestation by rice weevil

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging		against Late blight		and moulds
Paddy	N supplementation through soil @ 25% RDN <b>Blast , Stem borer &amp; defoliator:</b> Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against stem bore r& defoliators	Potash supplementation through soil and foliar application <b>Blast , Stem borer &amp; defoliator:</b> Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against stem bore r& defoliators	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Anguimois grain moth and moulds:</b> Proper drying of harvested crops to prevent infestation by Anguimoisgrain moths and moulds
Ragi	N supplementation through soil @ 25% RDN	N and K supplementation through soil @ 25% RDN and RDK	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds
Sunflower	Earthing up <b>Powdary mildew, Rust:</b> 2ml/l hexaconazole against powdery mildew and rust	Earthing up, staking Foliar application of nutrients after rains Hand pollination <b>Head borer &amp; leaf spot:</b> Apply 2ml/l Phosalone or NPV against head borers followed by application of 3g/l Mancozeb against leaf spot	Proper drainage Harvest at physiological maturity stage	Avoid piling of harvested produce Dry the seeds <b>Moulds:</b> Proper drying of harvested crops to prevent mould growth
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Potato	<i>Spodoptera litura</i> Apply 3ml/l chlorpyriphos against	Late blight: Spray 3g/l Cymoxanyl + Mancozeb based	Potato tuber moth: Apply 2ml/l Quinalphos against potato tuber moth	<b>Potato tuber moth:</b> Cover the stored potato tubers with dried sand or



Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging	defoliators  Late blight: Spray 3g/l Cymoxanil + Mancozeb based fungicides when incidence noticed on potato	fungicides when incidence noticed on potato <i>Spodoptera litura</i> Apply 1g/l Methomyl against defoliators Mite: Spray 1.7ml/l fenazaquin or 2.5ml/l Dicofol or 3g/l Wettable Sulphur for management of mite infestation on potato		sawdust powder  Storage in safe place  Store in the elevated place Do not cover potato heaps with leaves
Maize	<b>Downy mildew :</b> Apply 2g/ml Metalaxyl + Mancozeb based fungicides <b>Stem borer :</b> 2ml/l Quinalphos	Leaf blight Apply 3g/l Mancozeb against leaf sheath blight	-	<b>Rice weevil &amp; mould:</b> Proper drying of harvested crops to prevent infestation by rice weevil and moulds
Paddy	Blast Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against defoliators	Blast Apply 0.6g/l Tricyclozole against - blast in combination with 3ml/l chloropyriphos against defoliators	-	<b>Anguimois grain moth and moulds:</b> Proper drying of harvested crops to prevent infestation by Anguimois grain moths and moulds
Ragi	-	-	-	-
Sunflower	Thrips: Apply 0.5ml/l Imidacloprid or 1.3ml/l Metasystox or 1.7ml/l Dimethoate against sucking pests Powdery mildew and rust 1.5ml/l Hexaconazole	Head borer Apply carbaryl 4g/l or NPV against head borer leaf spot application of 3g/l Mancozeb against	-	Proper drying of harvested crops to prevent from moulds growth

### 2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging/ partial inundation</b>				
Potato	Drain out water	Drain out water and then go for earthingup	Drain out water	Drain out water
Maize	Drain out water	Drain out water	Drain out water	Drain out water
Paddy	Drain out water	Drain out water	Drain out water	Drain out water
Ragi	Drain out water	Drain out water	Drain out water	Drain out water
Sunflower	Drain out water	Drain out water	Drain out water	Drain out water
<b>Continuous submergence for more than 2 days<sup>2</sup></b>				
Potato	Drain out water	Drain out water	Drain out water	Drain out water
Maize	Drain out water	Drain out water	Drain out water	Drain out water
Paddy	Drain out water	Drain out water	Drain out water	Drain out water
Ragi	Drain out water	Drain out water	Drain out water	Drain out water
Sunflower	Drain out water	Drain out water	Drain out water	Drain out water
<b>Sea water intrusion</b>	-	-	-	-

### 2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone – Not observed in this region

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>	Not applicable			
<b>Cold wave</b>				
<b>Frost</b>				
<b>Hailstorm</b>				
<b>Cyclone</b>				

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Plan for high production	Making use of dry fodder	Planning for fodder crops
Drinking water	Proper storage	Judicial use	Plan for water conservation
Health and disease management	Provide balanced nutrition	Increase concentrate mixture	Extra nutrient supplementation
<b>Floods</b>			
Feed and fodder availability	Enhance the availability	Use of unconventional fodder source	Proper storage of fodder – Silage making
Drinking water	Proper storage	Make use of borewell water	Avoid polluted water
Health and disease management	Vaccination for contagious diseases	Avoid using polluted water and feed	Boost up the immunity
<b>Cyclone</b>			
Feed and fodder availability	Sufficient storage – silage	Stall feeding	Avoid mould growth in dry fodder
Drinking water	Proper storage	Use borewell water	Water conservation
Health and disease management	Maintain good immunity status	Avoid exposure to adverse weather	Boost up the immunity
<b>Heat wave and cold wave</b>			
Shelter/environment management	Scientific shed making	Shed should be cool during summer and warmth during winter	Shed should be properly maintained and hygienic
Health and disease management	Maintain good immunity	Avoid exposure	Boost up the immunity

<sup>s</sup> based on forewarning wherever available

## 2.5.2

## Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	Procure and conserve economically feasible feed ingredients	Use unconventional feed ingredients	Preserve available feed ingredients in scientific manner	-
Drinking water	Conserve water source	Use borewell water	Plan for preserving water	
Health and disease management	Maintain good immunity	Increase concentrate supplementation	Scientific feeding	
<b>Floods</b>				
Shortage of feed ingredients	Plan for small batches of bird	Plan for small batches of bird	Plan for large number of batches	
Drinking water	Poultry not much get affected	Poultry not much get affected	Poultry not much get affected	
Health and disease management	Scientific shed construction	Avoid stress	Take up immunity boost up through deworming and vaccination	
<b>Cyclone</b>				
Shortage of feed ingredients	Plan for small batches of bird	Plan for small batches of bird	Plan for large number of batches	
Drinking water	Poultry not much get affected	Poultry not much get affected	Poultry not much get affected	
Health and disease management	Scientific shed construction	Avoid stress	Take up immunity boost up through deworming and vaccination	

<b>Heat wave and cold wave</b>				
Shelter/environment management	Scientific poultry house	Avoid stress	Proper shed management	
Health and disease management	Preventive measures – Vaccination	Avoid stress and supplement anti stress agents through feed / water	Supplementing extra nutrients	

<sup>a</sup> based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Take up Short duration seed rearing	Incorporate Stunted fingerlings	Market stunted fingerlings, transport smaller sized one to perennial tank / channel
(ii) Changes in water quality	Proper measures to be taken up to improve the water quality	Maintaining salinity increases and avoid the algal formation	-
(iii) Any other	-	-	-
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	Take measures to conserve water	Outsource water, provide aerators	Maintain optimum water depth
(ii) Impact of salt load build up in ponds / change in water quality	Avoid salty water	Mix quality water to reduce salinity	Maintain optimum salinity
(iii) Any other			

<b>2) Floods</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Average compensation paid due to loss of human life	Assess and insure the products as well as human beings	Insurance claim for compensation given to affected family	-
(ii) No. of boats / nets/damaged	Quantification made based on the inputs and accessories used during event	Collect the preliminary data , quantify	Quantify material and accessories
(iii) No.of houses damaged	-	-	-
(iv) Loss of stock	-	-	-
(v) Changes in water quality	-	Analyze the water quality	Analyze the water quality
(vi) Health and diseases	-	-	-
<b>B. Aquaculture</b>			
(i) Inundation with flood water	Precautionary measures will be taken up	Secure and shift the products	Estimate remaining products
(ii) Water continuation and changes in water quality	Take measures regarding basic water quality for monitoring purpose	Take possible measures based on the need	Act based on the condition of the water
(iii) Health and diseases	-	Solve the problems that occur during the event based on the available medicines	Diagnose & use the medicines
(iv) Loss of stock and inputs (feed, chemicals etc)	Arrangements to be made to secure inputs	Try to shift the inputs	Re use the inputs which are in good conditions
(v) Infrastructure damage (pumps, aerators, huts etc)	Security measures	Try to shift the materials	Repair the damaged material and make arrangements to shift suddenly the material
<b>3. Cyclone / Tsunami</b>	-	-	-
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>B. Aquaculture</b>	-	-	-
(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)	-	-	-
<b>4. Heat wave and cold wave</b>	-	-	-
<b>A. Capture</b>	-	-	-
Marine	-	-	-
Inland	-	-	-
<b>B. Aquaculture</b>	-	-	-
(i) Changes in pond environment (water quality)	-	-	-
(ii) Health and Disease management	-	-	-

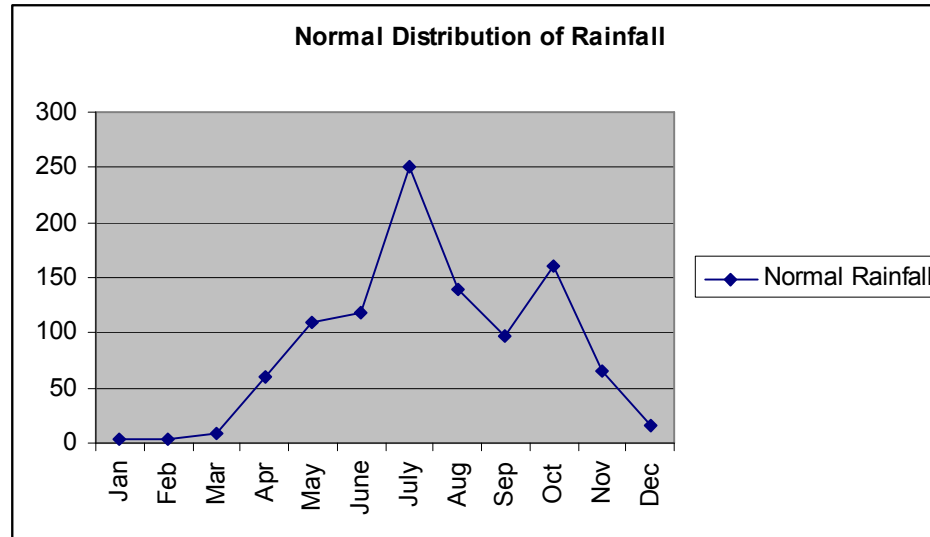
Hassan District Map





**Rainfall Distribution Map of Hassan District**

**Annexure-II**



Soil Map of Hassan District

