State: KARNATAKA

Agriculture Contingency Plan for District: RAMANAGARA

	1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Karnataka Plateau, Hot Moist semi arid eco sub region (8.2)			
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills region (X)			
	Agro Climatic Zone (NARP)	Eastern Dry Zone (KA-5)			
	List all the districts or part thereof falling under the NARP Zone	Ramnagar, Bangalore, Kolar, Tumkur (part), Chikballapur, Mandya (part),			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		12° 42'52.49" N	77° 60'36.03 E	746	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	-None-			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Chandurayanahalli, Kalya (P); Magadi (Tq), Ramanagara (Dist) PIN : 562 120			
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):	426	39	1st week of June	2nd week of October
	NE Monsoon(Oct-Dec):	230	17	3rd week of October	2nd week of November
	Winter (Jan- March)	17	-	-	-
	Summer (Apr-May)	150	7	-	-
	Annual	823	63	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Cultivable area	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (`000 ha)	355.9	69.9	26.2	24.7	1.2	158.9	4.0	24.3	16.6	30.1

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area (‘000 ha)**	**Percent (%) of total**
	Deep red clay soils	169.1	31.6
	Moderately deep red clay soils.	93.7	25.6
	Shallow red soils	70.5	19.3
	Moderately deep, loamy soils	17.3	4.7
	Deep red sandy loam soils	14.4	3.9
1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	167	105.6
	Area sown more than once	5.3	
	Gross cropped area	176.4	

1.6	**Irrigation**	**Area (‘000 ha)**		
	Net irrigated area	56.4		
	Gross irrigated area	-		
	Rainfed area	156.6 (68% of the cropped area)		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	7	3.1	5.5
	Tanks	808	15.1	8.6
	Open wells	-	-	-
	Bore wells including wells	47902	36.6	20.8
	Lift irrigation schemes	2	0.1	0.3
	Micro-irrigation			
	Other sources	-	1.2	2.2

	Total Irrigated Area		56.4	
	Pump sets	49412		
	No. of Tractors	2496		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils**	**(%) area**	
	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%				

1.7Area under major field crops & horticulture etc. (2008-09)

1.7	**Major Field Crops cultivated**	**Area ('000 ha)**					
		Kharif		***Rabi***		**Summer**	**Total**
		Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	Ragi	-	78.02	-	0.01	0.17	78.21
	Groundnut	-	7.72	-	-	0.05	7.77
	Paddy	6.25	-	-	-	0.36	6.61
	Field bean	-	5.48	-	0.03	-	5.51
	Red gram	-	3.75	-	-	-	3.75
	Horticulture crops - Fruits	**Total area('000 ha)**					
	Mango	20.00					
	Banana	4.40					
	Citrus	1.90					
	Sapota	0.76					
	Jack	0.45					
	Horticultural crops - Vegetables	**Total area('000 ha)**					
	Tomato	1.20					
	Brinjal	0.90					

	Ladies finger	0.23
	Beans	0.18
	Onion	0.16
	Medicinal and Aromatic crops	**Total area('000 ha)**
	Crop 1	-
	Plantation crops	**Total area('000 ha)**
	Coconut	3.1
	Arecanut	2.2
	Tamarind	0.8
	Beetle vein	0.3
	Cashew	0.003
	Fodder crops	**Total area('000 ha)**
	Total fodder crop area	-
	Grazing land	
	Sericulture etc ('000 ha)	15.1
	Others (Specify)	

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	41.4	136.8	178.2
	Crossbred cattle	4.0	83.8	87.8
	Non descriptive Buffaloes (local low yielding)	1.7	38.5	40.3
	Graded Buffaloes			
	Goat			167.6
	Sheep			221.8
	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			-
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	107	2163.6	

<table>
<tr><td></td><td>Backyard</td><td colspan="2">-</td><td colspan="4">-</td></tr>
<tr><td rowspan="6">1.10</td><td colspan="7">Fisheries (Data source: Chief Planning Officer)</td></tr>
<tr><td colspan="7">A. Capture</td></tr>
<tr><td rowspan="2">i) Marine (Data Source: Fisheries Department)</td><td rowspan="2">No. of fishermen</td><td colspan="2">Boats</td><td colspan="2">Nets</td><td rowspan="2">Storage facilities (Ice plants etc.)</td></tr>
<tr><td>Mechanized</td><td>Non-mechanized</td><td>Mechanized (Trawl nets, Gill nets)</td><td>Non-mechanized (Shore Seines, Stake & trap nets)</td></tr>
<tr><td colspan="6">Not Applicable</td></tr>
<tr><td rowspan="2">ii) Inland (Data Source: Fisheries Department)</td><td colspan="2">No. Farmer owned ponds</td><td colspan="2">No. of Reservoirs</td><td colspan="2">No. of village tanks</td></tr>
<tr><td colspan="6">Not Applicable</td></tr>
<tr><td rowspan="5"></td><td colspan="7">B. Culture</td></tr>
<tr><td></td><td colspan="2">Water Spread Area (ha)</td><td colspan="2">Yield (t/ha)</td><td colspan="2">Production (‘000 tons)</td></tr>
<tr><td>i) Brackish water (Data Source: MPEDA/ Fisheries Department)</td><td colspan="6" rowspan="3">Not Applicable</td></tr>
<tr><td>ii) Fresh water (Data Source: Fisheries Department)</td></tr>
<tr><td>Others</td></tr>
</table>

1.11 Production and Productivity of major crops (Average of last 2 years: 2007 and 2008)

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)										
	Ragi	145.9	1968	0.03	1487	0.3	2031	146.2	1917	-
	Paddy	16.2	2764	-	-	0.3	1130	16.7	2641	
	Field bean	4.9	926	0.008	471	-	-	4.9	901	
	Groundnut	4.4	585	-	-	-	-	4.4	569	
	Horsegram	1.9	514	2.2	561	-	-	4.2	523	
	Others									
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	-	-	-	-	217.29	10.30			
	Banana	70.23	30.4	12.70	30.4	50.89	30.4	133.82	30.4	
	Coconut (lakh nuts)	702	0.10	298	0.10	1685	0.10	2685	0.10	
	Sapota	2900	11.6	-	-	6543	11.6	9443	11.6	
	Jack	-	-	-	-	9100	20.2	9100	20.2	

1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	**Ragi**	**Paddy**	**Groundnut**	**Field bean**	**Red gram**
	Kharif- Rainfed	1st week of july to 6th week of August	-	1st week of May to 4 th week of July	1st week of August to 4 th week of September	1st week of May to 4 th week of July
	Kharif-Irrigated	1st week of july to 4th week of August	1st week of June to 4 th week of August	-	-	-
	Rabi- Rainfed	-	-	-	1st week of February to 1st March	-
	Rabi-Irrigated	-	1st week to 4 th week of January	1st week of December-to 4 th week of January	-	-

1.13	**What is the major contingency the district is prone to?** (Tick mark and mention years if known during the last 10 year period)	**Regular**	**Occassional**	**None**
	Drought			✓
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave			✓
	Cold wave			✓
	Frost			✓

	Sea water intrusion			✓
	Pests and diseases (specify) Redgram : Pod borer, Wilt disease, Sterility mosaic disease Coconut : Black-headed caterpillar and Coconut mite	✓		

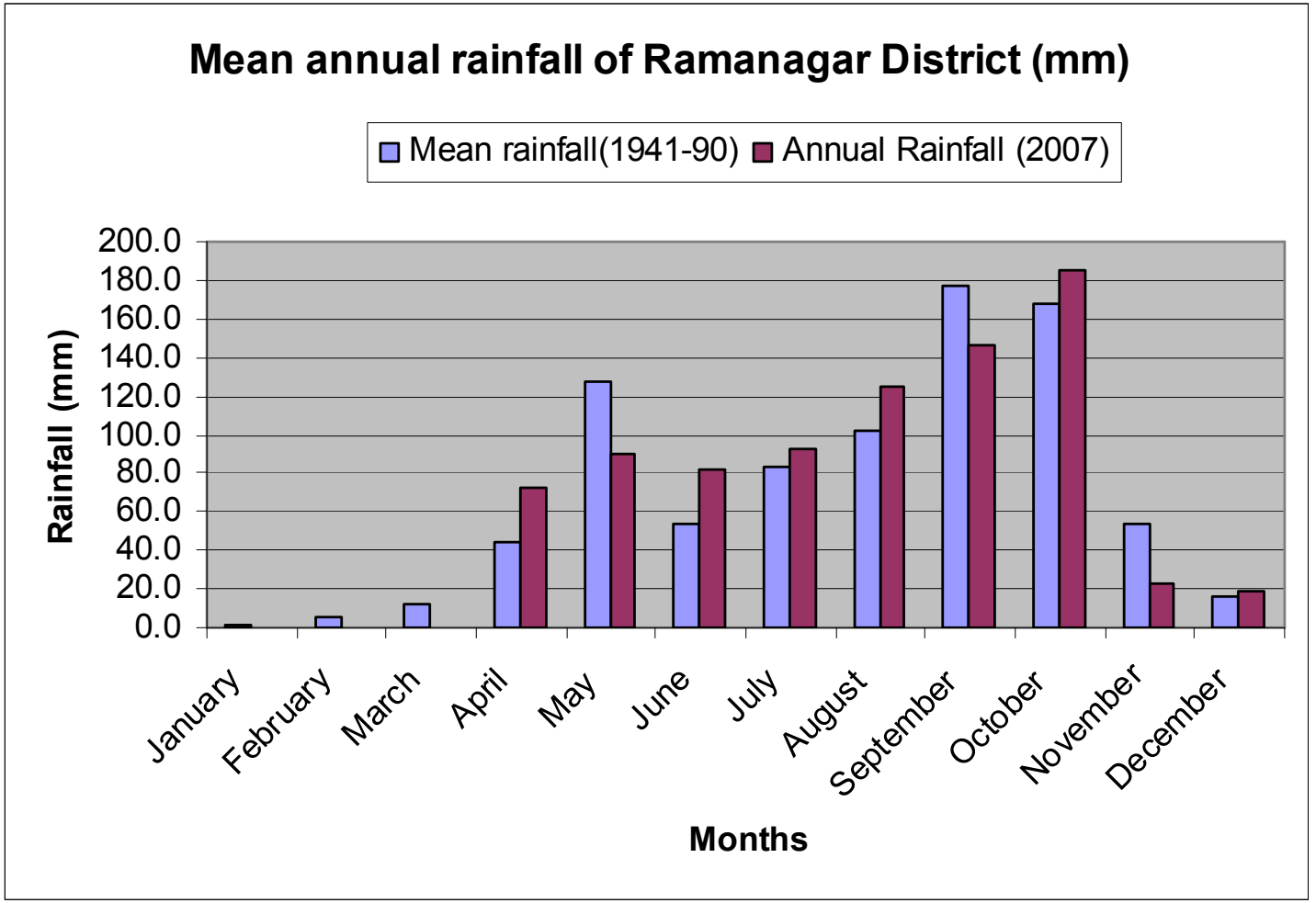
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure – 1: LOCATION MAP OF RAMANAGARA DISTRICT IN KARNATAKA

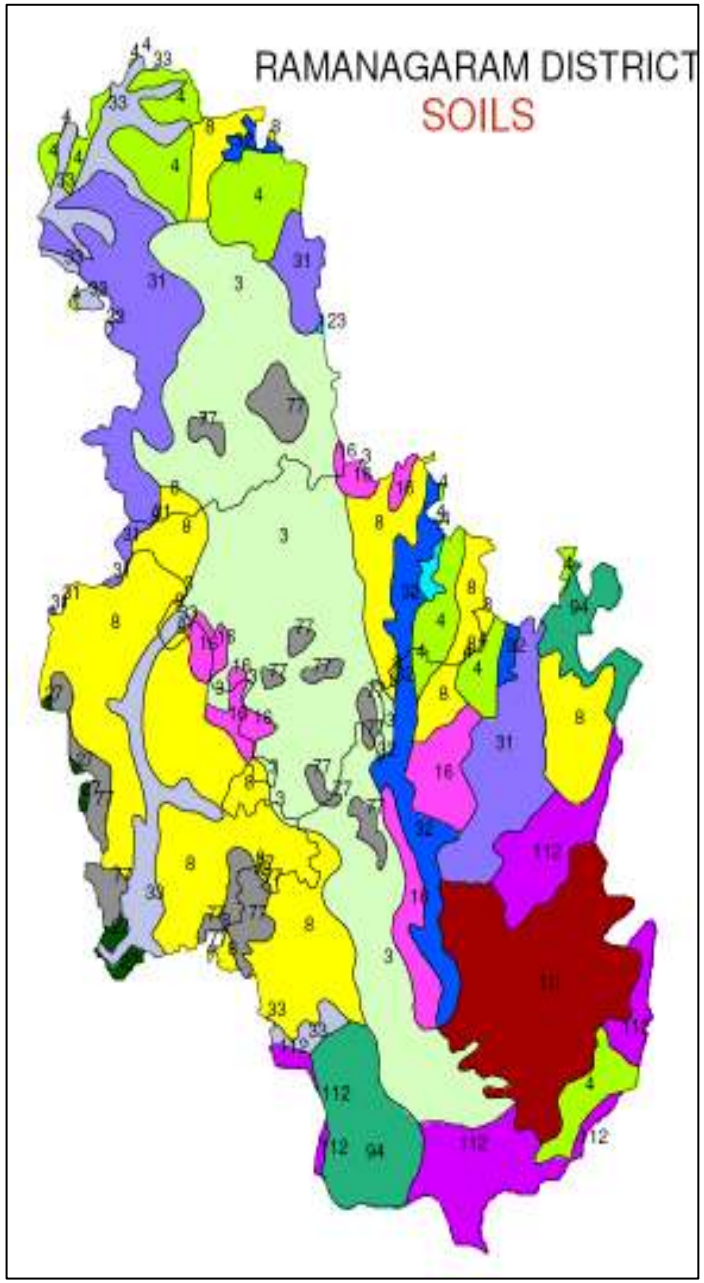
Source: mapsofindia.com

Annexure – 2: ACTUAL (2007) AND MEAN MONTHLY RAINFALL OF RAMANAGARA DISTRICT

DATA BASE: 1941-90



Annexure – 3: SOIL MAP OF RAMANAGARA DISTRICT, KARNATAKA



LEGEND		
	003	Clayey-skeletal, mixed, Kandic Paleustalfs Fine, mixed, Kandic Paleustalfs
	004	Fine, kaolinitic, Kandic Paleustalfs Fine, kaolinitic, rhodic kandiustalfs
	008	Fine, mixed, Rhodic Paleustalfs Clayey-skeletal, mixed, Ultic Haplustalfs
	010	Clayey-skeletal, mixed, Typic Rhodustalfs Fine, mixed, Typic Ustropepts
	016	Fine, mixed, Typic Haplustalfs Clayey-skeletal, mixed, TypicRhodustalfs
	027	Clayey-skeletal, mixed, Typic Ustropepts Fine, mixed, Typic Haplustalfs
	031	LFine, mixed, Typic Ustropepts Fine, mixed, Typic Rhodustalfs
	032	Fine, mixed, Typic Ustropepts Fiine, mixed, Typic Ustifluvents
	033	Fine, mixed, Typic Ustropetps Fine mixed, Typic Ustifluvents
	077	Rock land
	094	Clayey skeletal mixed, Typic Ustropepts Clayey skeletal, mixed Lithic Ustropepts
	112	Rock land Loamy-skeletal, mixed, Typic Ustropepts
		Waterbody

Source: NBSSLUP, Regional Centre, Bangalore

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**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **June 3rd week**	Deep red clay soils	Pigeonpea	Pigeon pea	Wider spacing (90cm x 30 cm) for Pigeon pea,	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Cowpea	Field bean	Conservation furrow / dead furrow	
		Field bean	Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2	Inter cultivation	
		Groundnut	Field bean local , HA 3, HA 4	Proper weeding and Thinning,	
		Sesame: TMV-3, T-7& Navelle-1	Pigeon pea : TTB-7,BRG-1		
	Moderately deep, loamy soils	Pigeonpea	Pigeonpea	Wider spacing (90cm x 30 cm) for Pigeon pea	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Cowpea	Field bean	Conservation furrow / dead furrow	
		Field bean	Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2	Inter cultivation,	
		Groundnut	Field bean local , HA 3, HA 4	Proper weeding and Thinning,	
		Sesame: TMV-3, T-7& Navelle-1	Pigeon pea : TTB-7,BRG-1		
	Deep red sandy loam soils	Sesame	Pigeon pea	Wider spacing (90cm x 30 cm) for Pigeon pea	Seed drills under RKVY Supply of seeds through KSSC

		Pigeonpea	Field bean	Conservation furrow / dead furrow	Supply of seeds through NFSM
		Cowpea	Ground nut + Field bean	Inter cultivation	
		Field bean	Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2	Proper weeding and Thinning,	
		Groundnut + Pigeonpea Groundnut + Field bean	Field bean local , HA 3, HA 4 Pigeon pea : TTB-7,BRG-1 Groundnut: TMV-2, JL-24, GPBD -4, K-13	Across slope cultivation	
	Shallow red soils	Sesame	Field bean	Inter cultivation, Thinning,	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Cowpea	Ground nut + Field bean Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2	Proper weeding	
		Field bean Groundnut + Field bean	Field bean local , HA 3, HA 4 Groundnut: TMV-2, JL-24, GPBD -4, K-134	Inter cultivation, Thinning, Across slope cultivation	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4weeks **July 1st week**	Deep red clay soils	Pigeonpea	Pigeon pea	Intercultivation,	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Cowpea	Field bean		
		Groundnut Field bean	Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2	Conservation furrows Seed treatment with bio-	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
		Groundnut + Pigeonpea Groundnut + Field bean Sesame: TMV-3, T-7& Navelle-1	Field bean local , HA 3, HA 4 Pigeon pea : TTB-7,BRG-1 Paddy: Jaya, Mandya Vijaya, IR 20, IET 8116	fertilizers for better fertilizer use efficiency in pulses *In-situ* moisture conservation	
	Moderately deep red clay soils.	Pigeonpea	Pigeon pea	Intercultivation,	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Cowpea	Field bean	Conservation furrows Seed treatment with bio-fertilizers for better fertilizer use efficiency in pulses *In-situ* moisture conservation	
		Groundnut Field bean	Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2		
		Groundnut + Pigeonpea Groundnut + Field bean	Groundnut: TMV-2, JL-24, GPBD -4, K-134 Field bean local , HA 3, HA 4 Pigeon pea : TTB-7,BRG-1 Ground nut + Field bean		
		Sesame: TMV-3, T-7& Navelle-1	Paddy: Jaya, Mandya Vijaya, IR 20, IET 8116		
		Groundnut Field bean Groundnut + Pigeonpea Groundnut + Field bean Sesame: TMV-3, T-7& Navelle-1	Ground nut + Field bean Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2 Groundnut: TMV-2, JL-24, GPBD -4, K-134 Field bean local , HA 3, HA 4		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Moderately deep, loamy soils	Cowpea Groundnut Field bean Groundnut + Pigeonpea Groundnut + Field bean **Sesame:** TMV-3, T-7& Navelle-1	Field bean **Cowpea:** TVX-944, IT-38956-1, KBC-1 & KBC -2 **Field bean** local , HA 3, HA 4	Intercultivation, Conservation furrows Seed treatment with bio-fertilizers for better fertilizer use efficiency in pulses *In-situ* moisture conservation	1.Seed drills under RKVY 2.Supply of seeds through KSSC 3.Supply of seeds through NFSM
Delay by 4weeks (Specify month) **July 1st week**	Deep red sandy loam soils	Cowpea Groundnut Field bean Groundnut + Pigeonpea Groundnut + Field bean Sesame: TMV-3, T-7& Navelle-1	Field bean Ground nut + Field bean Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC -2 Groundnut: TMV-2, JL-24, GPBD -4, K-134 Field bean local , HA 3, HA 4	Intercultivation, Conservation furrows Seed treatment with bio-fertilizers for better fertilizer use efficiency in pulses *In-situ* moisture conservation	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks **July 3rd week**	Deep red clay soils	Finger millet	Finger millet : GPU-28, HR-911,Indaf-5, MR 1	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet Thinning to retain one seedling at 30 cm Intercultivation Conservation furrow seedling at 30 cm Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
		Field bean	No change		
		Groundnut + Pigeon pea	Pigeon pea Castor Pigeon pea : BRG-2, Hyd-3C, ICP-7035 and TTB-7		
	Moderately deep red clay soils.	Finger millet	Finger millet : GPU-28, HR-911,Indaf-5, MR 1	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet Thinning to retain one seedling at 30 cm Intercultivation Conservation furrow seedling at 30 cm Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

	Shallow red soils	Finger millet Groundnut	Finger millet : GPU-28, HR-911,Indaf-5, MR 1	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet Thinning to retain one seedling at 30 cm Intercultivation Conservation furrow seedling at 30 cm Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Moderately deep, loamy soils	Finger millet	Finger millet : GPU-28, HR-911,Indaf-5, MR 1	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet Thinning to retain one seedling at 30 cm Intercultivation Conservation furrow seedling at 30 cm Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Deep red sandy loam soils	Finger millet	Finger millet : GPU-28, HR-911,Indaf-5, MR 1	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet Thinning to retain one seedling at 30 cm Intercultivation Conservation furrow seedling at 30 cm Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks **August 1st week**	Deep red clay soils	Finger millet Field bean	Finger millet: GPU-28, GPU-26, GPU-48, GPU 66, PR-202, Indaf-5, Field bean TVX-944, IT-38956-1, KBC-1 & KBC- 2 Cowpea	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet, Thinning to retain one seedling at 30 cm, Inter cultivation Conservation furrow / dead furrow Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Moderately deep red clay soils.	Finger millet Field bean	Finger millet: GPU-28, GPU-26, GPU-48, GPU 66, PR-202, Indaf-5, Field bean TVX-944, IT-38956-1, KBC-1 & KBC- 2 Cowpea	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet, Thinning to retain one seedling at 30 cm, Inter cultivation Conservation furrow / dead furrow Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Shallow red soils	Finger millet Field bean	Finger millet: GPU-28, GPU-26, GPU-48, GPU 66, PR-202, Indaf-5, Field bean TVX-944, IT-38956-1, KBC-1 & KBC- 2 Cowpea	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet, Inter cultivation	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

			Horse gram :KBH-1, PHG -9 Field bean TVX-944, IT-38956-1, KBC-1 & KBC- 2 Cowpea	Staggered nursery for finger millet	
	Moderately deep, loamy soils	Finger millet	Finger millet: GPU-28, GPU-26, GPU-48, GPU 66, PR-202, Indaf-5,	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet, Thinning to retain one seedling at 30 cm, Inter cultivation Conservation furrow / dead furrow Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Deep red sandy loam soils	Finger millet	Finger millet: GPU-28, GPU-26, GPU-48, GPU 66, PR-202, Indaf-5, Field bean TVX-944, IT-38956-1, KBC-1 & KBC- 2 Cowpea: TVX-944, IT-38956-1, KBC-1 & KBC- 2	Dry sowing 8-10 days before rains with 15-20% higher seed rate and seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying in Finger millet, Thinning to retain one seedling at 30 cm, Inter cultivation Conservation furrow / dead furrow Staggered nursery for finger millet	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

Condition			Suggested Contingency measures		
Early season drought (Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Deep red clay soils	Finger millet Finger millet + Pigeon pea Figer millet + Field bean Finger millet + Niger	Thinning and gap filling the existing crop Re-sowing at high seed rate Removal of basal 3 to 4 leaves of crop at later stages. Harvesting at physiological maturity stage Spraying with 2 per cent DAP/Urea just after rains. Transplanting of Finger millet seedlings.	Intercultivation, *In-situ* moisture conservation, Conservation Integrated nutrient management practices, Minimum tillage Shallow intercultivation to eradicate weeds	Supply of inter cultural implements through RKVY Pigeon pea seeds supply through NFSM
	Moderately deep red clay soils.	Finger millet Finger millet + Pigeon pea Figer millet + Field bean Finger millet + Niger	Thinning and gap filling the existing crop Re-sowing at high seed rate Crust breaking Removal of basal 3 to 4 leaves of crop at later stages. Harvesting at physiological maturity stage Spraying with 2 per cent DAP/Urea just after rains. Transplanting of Finger millet seedlings.	Intercultivation, *In-situ* moisture conservation, Conservation Furrow / dead furrow Integrated nutrient management practices, Minimum tillage Shallow intercultivation to eradicate weeds	Supply of inter cultural implements through RKVY
	Shallow red soils	Finger millet Figer millet + Field bean Finger millet + Niger Groundnut	Thinning and gap filling the existing crop Re-sowing at high seed rate Crust breaking Removal of basal 3 to 4 leaves of crop at later stages. Harvesting at physiological	Intercultivation, *In-situ* moisture conservation, Conservation Furrow / dead furrow Integrated nutrient management practices, Minimum tillage	Supply of inter cultural implements through RKVY

Condition			Suggested Contingency measures		
Early season drought (Normal onset,	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
			maturity stage Spraying with 2 per cent DAP/Urea just after rains. Transplanting of Finger millet seedlings.	Shallow Intercultivation to eradicate weeds	
	Moderately deep, loamy soils	Finger millet Finger millet + Pigeon pea Figer millet + Field bean Finger millet + Niger Groundnut + Pigeon pea	Thinning and gap filling the existing crop Re-sowing at high seed rate Crust breaking Removal of basal 3 to 4 leaves of crop at later stages. Harvesting at physiological maturity stage Spraying with 2 per cent DAP/Urea just after rains. Transplanting of Finger millet seedlings.	Intercultivation, *In-situ* moisture conservation, Conservation Furrow / dead furrow Integrated nutrient management practices, Minimum tillage Shallow intercultivation to eradicate weeds	Supply of inter cultural implements through RKVY Pigeon pea seeds supply through NFSM
	Deep red sandy loam soils	Finger millet Finger millet + Pigeon pea Figer millet + Field bean Finger millet + Niger Groundnut + Pigeon pea	Thinning and gap filling the existing crop Re-sowing at high seed rate Crust breaking Removal of basal 3 to 4 leaves of crop at later stages. Harvesting at physiological maturity stage Spraying with 2 per cent DAP/Urea just after rains. Transplanting of Finger millet seedlings.	Intercultivation, *In-situ* moisture conservation, Conservation Furrow / dead furrow Integrated nutrient management practices, Minimum tillage Shallow Intercultivation to eradicate weeds	Supply of inter cultural implements through RKVY Pigeon pea seeds supply through NFSM

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At vegetative stage	Deep red clay soils	Finger millet + Pigeonpea Figer millet + Fieldbean Fingermillet + Niger Pigeon pea/ Field bean	Thinning, Grazing leaf tips, Postponement of top dressing Life saving irrigation, if available Removal of basal 3 to 4 leaves of crop at later stages Earthing up. Recycling of stored water if any in farm ponds.	Conservation Furrow Mulching Shallow intercultivation to eradicate weeds *In-situ* moisture conservation Use of moderate amount of nutrients	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme Pigeon pea seeds supply through NFSM
	Moderately deep red clay soils.	Finger millet + Pigeonpea Figer millet + Fieldbean Finger millet + Niger Pigeon pea/ Field bean	Thinning, Grazing leaf tips, Postponement of top dressing Life saving irrigation, if available Removal of basal 3 to 4 leaves of crop at later stages Earthing up. Recycling of stored water if any in farm ponds.	Conservation Furrow Mulching Shallow intercultivation to eradicate weeds *In-situ* moisture conservation Use of moderate amount of nutrients	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme Pigeon pea seeds supply through NFSM

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Shallow red soils	Finger millet + Pigeonpea Figer millet + Fieldbean Finger millet + Niger Field bean Groundnut	Thinning, Grazing leaf tips, Postponement of top dressing Life saving irrigation, if available Removal of basal 3 to 4 leaves of crop at later stages Earthing up. Recycling of stored water if any in farm ponds. Application of gypsum to groundnut	Conservation Furrow Mulching Shallow intercultivation to eradicate weeds *In-situ* moisture conservation Use of moderate amount of nutrients	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme
	Moderately deep, loamy soils	Finger millet + Pigeonpea Figer millet + Fieldbean Fingermillet + Niger Pigeon pea/ Field bean Groundnut + pigeon pea	Thinning, Grazing leaf tips, Postponement of top dressing Life saving irrigation, if available Removal of basal 3 to 4 leaves of crop at later stages Earthing up. Recycling of stored water if any in farm ponds. Application of gypsum to groundnut	Conservation Furrow Mulching Shallow intercultivation to eradicate weeds *In-situ* moisture conservation Use of moderate amount of nutrients	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme Pigeon pea seeds supply through NFSM

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Deep red sandy loam soils	Finger millet + Pigeonpea Figer millet + Fieldbean Fingermillet + Niger Pigeon pea/ Field bean Groundnut + pigeon pea	Thinning, Grazing leaf tips, Postponement of top dressing Life saving irrigation, if available Removal of basal 3 to 4 leaves of crop at later stages Earthing up. Recycling of stored water if any in farm ponds. Application of gypsum to groundnut	Conservation Furrow Mulching Shallow intercultivation to eradicate weeds *In-situ* moisture conservation Use of moderate amount of nutrients	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme Pigeon pea seeds supply through NFSM

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At reproductive stage	Deep red clay soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Pigeon pea	Life saving irrigation, if available Weeding and Weed mulching Effective pest and disease management strategies Harvesting at physiological maturity stage (pigeonpea, fieldbean, cowpea). Harvesting of green pods of pigeon pea and field bean	*In-situ* moisture conservation	Farm ponds through IWSM programme

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Moderately deep red clay soils.	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Groundnut + Pigeon pea	Life saving irrigation, if available Weeding and Weed mulching Effective pest and disease management strategies Harvesting at physiological maturity stage (pigeonpea, fieldbean, cowpea). Harvesting of green pods of pigeon pea and field bean	*In-situ* moisture conservation	Farm ponds through IWSM programme
	Shallow red soils	Finger millet Figer millet + Field bean Fingermillet + Niger Groundnut	Life saving irrigation, if available Weeding and Weed mulching Effective pest and disease management strategies Harvesting at physiological maturity stage (pigeonpea, fieldbean, and cowpea). Harvesting of green pods of field bean	*In-situ* moisture conservation	Farm ponds through IWSM programme

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Moderately deep, loamy soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger	Life saving irrigation, if available Weeding and Weed mulching Effective pest and disease management strategies Harvesting at physiological maturity stage (pigeonpea, fieldbean, cowpea). Harvesting of green pods of pigeon pea and field bean	*In-situ* moisture conservation	Farm ponds through IWSM programme
	Deep red sandy loam soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Groundnut + Pigeon pea	Life saving irrigation, if available Weeding and Weed mulching Effective pest and disease management strategies Harvesting at physiological maturity stage (pigeonpea, fieldbean, cowpea). Harvesting of green pods of pigeon pea and field bean	*In-situ* moisture conservation	Farm ponds through IWSM programme

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Deep red clay soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger	Harvest at physiological maturity stage	Cowpea, Sunflower, Field bean, Horse gram (October month)	Farm ponds through IWSM programme Threshing

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
		Sunflower Pigeon pea	Harvest crops for fodder Harvesting of green pods of pigeon pea and fieldbean	Harvest at physiological maturity	implements through RKVY Groundnut digger and plucker through RKVY. Seed supply through KSSC
	Moderately deep red clay soils.	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Sunflower Pigeon pea	Harvest at physiological maturity stage Harvest crops for fodder Harvesting of green pods of pigeon pea and fieldbean	Cowpea, Sunflower, Field bean, Horse gram (October month) Harvest at physiological maturity	Farm ponds through IWSM programme Threshing implements through RKVY Groundnut digger and plucker through RKVY. Seed supply through KSSC
	Shallow red soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Sunflower Groundnut + Pigeon pea	Harvest at physiological maturity stage Harvest crops for fodder Harvesting of green pods of pigeon pea and fieldbean	Cowpea, Sunflower, Field bean, Horse gram (October month) Harvest at physiological maturity	Farm ponds through IWSM programme Threshing implements through RKVY Groundnut digger and plucker through RKVY. Seed supply through KSSC
	Moderately deep, loamy soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Sunflower	Harvest at physiological maturity stage Harvest crops for fodder	Cowpea, Sunflower, Field bean, Horse gram (October month) Harvest at	Farm ponds through IWSM programme Threshing implements through

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
		Groundnut + Pigeon pea	Harvesting of green pods of pigeon pea and fieldbean	physiological maturity	RKVY Groundnut digger and plucker through RKVY. Seed supply through KSSC
	Deep red sandy loam soils	Finger millet + Pigeon pea Figer millet + Field bean Fingermillet + Niger Sunflower Groundnut + Pigeon pea	Harvest at physiological maturity stage Harvest crops for fodder Harvesting of green pods of pigeon pea and fieldbean	Cowpea, Sunflower, Field bean, Horse gram (October month) Harvest at physiological maturity	Farm ponds through IWSM programme Threshing implements through RKVY Groundnut digger and plucker through RKVY. Seed supply through KSSC

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 release of water in canals due to low rainfall	Not applicable				
Limited release of water in canals due to low rainfall	Not applicable				

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	Not applicable				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep to moderately deep to red clay soil	Paddy**:** Jaya, Mandya Vijaya	Paddy**:** Jaya, Mandya Vijaya, IR 20, IET 8116 Aerobic rice – MAS 946-1	Seed treatment Weed management with cono weeder.	seeds supply through NFSM

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	Deep to moderately deep to red clay soil	Maize	**Maize** NAH 2049, Deccan 103	Intercultivation Split application of fertilizers for maize Foliar application of micronutrients for vegetables and maize. Compulsory Irrigation at flowering stage for vegetables	

2.2 Unusual rains (untimely, un-seasonal etc) (for both rainfed and irrigated situations)

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Finger millet + pigeon pea	Provide drainage and better soil and water conservation measures	Provide drainage	Drain out excess water. Harvesting at physiological maturity stage	Shift the produce to safer place
Groundnut + pigeon pea	Provide drainage and better soil and water conservation measures	Provide drainage	Drain out excess water Harvesting at physiological maturity stage and Harvest of pigeon pea for vegetable purpose	Shift to safe place, dry in shade and turn frequently
Field bean	Provide drainage and better soil and water conservation measures	Provide drainage	Drain out excess water Harvest for vegetable purpose	Safe storage against storage pest and disease
Horse gram	Provide drainage and better soil and water conservation measures	Provide drainage	Drain out excess water	Safe storage against storage pest and disease
Horticulture				
Mango	Provide drainage and better soil and water conservation measures *viz*. basin preparation, contour bunding, trenches, silt traps	Provide drainage	Drain out excess water Shelter belts with live trees appropriate	Damp proof storage house with adequate ventilation
Banana	Provide drainage and mulching with polythene and agricultural waste	Provide drainage	Drain out excess water Staking and shelter belts	Damp proof storage house with adequate ventilation
Coconut	Provide drainage and mulching with polythene and agricultural waste	Provide drainage	Drain out excess water	Proper storage of unshelled nuts

	Opening of trenches			
Sapota	Provide drainage and better soil and water conservation measures *viz*. basin preparation, contour bunding, trenches, silt traps	Provide drainage	Drain out excess water	Damp proof storage house with adequate ventilation
Jack	Provide drainage and better soil and water conservation measures *viz*. basin preparation, contour bunding, trenches, silt traps	Provide drainage	Drain out excess water	Damp proof storage house with adequate ventilation
Sericulture	Provide drainage and better soil and water conservation measures	Provide drainage	Drain out excess water in field Harvesting mulberry when leaves are not wet for feeding silkworms	Harvested mulberry/ cocoons should be covered with tarpaulin during transportation Damp proof storage house with adequate ventilation
Heavy rainfall with high speed winds in a short span	Not applicable			
Outbreak of pests and diseases due to un-seasonal rains	-	--	-	-
Finger millet + pigeon pea	Need based plant protection measures for pluses	Need based plant protection measures for pluses	-	Safe storage against storage pest and diseases
Groundnut + pigeon pea				
Field bean				
Horse gram				

2.3 Floods:

Condition	Suggested contingency measure			
Transient water logging/ partial inundation	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Continuous submergence for more than 2 days	Not applicable			
Sea water intrusion				

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

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

2.5 Contingent strategies for Livestock, Poultry & Fisheries: --

2.6 2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**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	-	-	-

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**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	**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			
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			
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 continuation 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)			
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)			

4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			