

**State: KARNATAKA**

**Agriculture Contingency Plan for District: TUMKUR**

<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>					
	Agro Ecological Sub Region (ICAR)	Central Karnataka plateau, hot, moist, semi-arid eco-subregion (8.2)				
	Agro-Climatic Region (Planning Commission)	Southern Plateau And Hills Region (X)				
	Agro Climatic Zone (NARP)	Central Dry Zone (KA-4)				
	List all the districts or part thereof falling under the NARP Zone	Chitradurga, Mandya, Tumkur, Davanagere				
	Geographic coordinates of district	Latitude	Longitude		Altitude	
		13°20 <sup>0</sup> 34.82” N	77°06 <sup>0</sup> 07.45” E		894.6 M	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Hiriyur, Chitradurga- 572 143				
	Mention the KVK located in the district	Krishi Vigyan Kendra, Konehalli, Tiptur, Tumkur - 572 202				
<b>1.2</b>	<b>Rainfall</b>	Normal RF (mm)	Rainfall (mm) (2008)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	303.4	-	-	1 <sup>st</sup> week of June	2 <sup>nd</sup> week of October
	NE Monsoon(Oct-Dec):	173.9	-	-	3 <sup>rd</sup> week of October	2 <sup>nd</sup> week of November
	Winter (Jan- March)	10.3	-	-		
	Summer (Apr-May)	105.3	-	-		
	Annual	592.9	780	39		

<b>1.3</b>	<b>Land use pattern of the district (latest statistics)</b>	Geographical 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	Net area sown
	<b>Area (Lakh ha)</b>	1064.7	45.2	83.8	79.4	62.6	20.1	67.5	86.4	36.8	582.6

<b>1.4</b>	<b>Major Soils (common names like shallow red soils etc.,)</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total geographical area</b>
	<b>Black soil</b>	32.04	0.048
	<b>Red soil</b>	386.531	0.58
	<b>Sandy soil</b>	37.975	0.056
	<b>Sandy loam</b>	209.743	0.314
<b>1.5</b>	<b>Agricultural land use</b>	Area ('000 ha)	Cropping intensity %
	Net sown area	582.6	106.5
	Area sown more than once	39.0	
	Gross cropped area	621.6	

<b>1.6</b>	<b>Irrigation</b>	Area ('000 ha)		
	Net irrigated area	117.8		
	Gross irrigated area	-		
	Rainfed area	464.8		
	<b>Sources of Irrigation</b>	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			
	Tanks	1,642	1.661	
	Open wells	1,40,924	0.969	
	Bore wells	75,209	120.790	
	Lift irrigation	7	0.032	
	Micro-irrigation		-	-
	Other sources	-	-	-
	Total Irrigated Area		148.165	
	Pump sets	1,38,600		

No. of Tractors	20,468		
<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	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%

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

1.7	Major Field Crops cultivated	Area ('000 ha)					
		<i>Khariif</i>		<i>Rabi</i>		Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
	Paddy	22.4	0.4	0.3	-	10.4	33.5
	Ragi	6.4	183.9	0.1	0.5	1.1	192.1
	Maize	0.2	9.9	-	-	-	25.3
	Redgram	5.6	15.2	0.9	2.9	0.4	10.2
	Groundnut	0.06	86.8	-	-	6.4	93.3
	Horsegram	-	29.5	-	9.8	-	39.3
	<b>Horticulture crops - Fruits</b>	Total area					
	Mango	10.6					
	Banana	4.6					
	Sapota	0.4					
	Pomegranate	0.6					
	<b>Horticultural crops - Vegetables</b>	Total area					
	Vegetables	2.5					
	<b>Horticultural crops - Flowers</b>	2.2					
	<b>Medicinal and Aromatic crops</b>	0.1					
	<b>Plantation crops</b>	Total area					

	Coconut	122.5
	Arecanut	19.0
	<b>Fodder crops</b>	<b>Total area</b>
	Fodder Jowar	0.3
	<b>Total fodder crop area</b>	-
	<b>Grazing land</b>	-
	<b>Sericulture etc</b>	-
	<b>Others (Specify)</b>	-

<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)	180.8	267.2	448.0
	Crossbred cattle	4.9	136.2	141.1
	Non descriptive Buffaloes (local low yielding)	19.0	222.7	241.7
	Graded Buffaloes	-	-	241907
	Goat	-	-	517763
	Sheep	-	-	1061383
	Others (Camel, Pig, Yak etc.)	-	-	7718
	Commercial dairy farms (Number)			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial	-	711273	
	Backyard	-		
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>			
	<b>A. Capture</b>			
	<b>i) Marine (Data Source: Fisheries Department)</b>	<b>No. of fishermen</b>	<b>Boats</b>	
Mechanized			Non-mechanized	Mechanized (Trawl nets, Gill 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>	
	96		4		1285	
<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)	10		2.2		22.	
<b>Others</b>						

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

1.11	Name of crop	<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>		<b>Total</b>		<b>Crop residue as fodder</b> (‘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)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
	Paddy	846.9	3715	-	4577	-	-	84.7	4,146	-
	Ragi	392.7	2063	1.2	1925	-	-	393.9	1,994	-
	Redgram	6.2	615	-	-	-	-	6.2	615	-
	Maize	66.3	3186	7.4	1850	-	-	7.4	2518	-
	Groundnut	48.6	560	-	-	-	-	48.6	560	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
	Mango	-	-	-	-	-	-	186.2	-	-
	Banana	-	-	-	-	-	-	129.7	-	-
	Sapota	-	-	-	-	-	-	4.7	-	-

	Guava	-	-	-	-	-	-	3.7	-	-
	Vegetables	-	-	-	-	-	-	54.3	-	-
	Flowers	-	-	-	-	-	-	2.1	-	-
	Medicinal plants	-	-	-	-	-	-	0.1	-	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Finger millet	Groundnut	Redgram	Paddy	Vegetable
	Kharif- Rainfed	June 1 <sup>st</sup> week to July 2 <sup>nd</sup> week	June 1 <sup>st</sup> week to July end	2nd fortnight of May to 1 <sup>st</sup> fortnight of July	June 1 <sup>st</sup> week to July end	June-July
	Kharif-Irrigated	June 1 <sup>st</sup> week to August 2 <sup>nd</sup> week	June 1 <sup>st</sup> week to July end	2nd fortnight of May to 2nd fortnight of July	June 1 <sup>st</sup> week to August 2 <sup>nd</sup> week	June-July
	Rabi- Rainfed	-	-	-	-	Oct -Nov
	Rabi-Irrigated	-	December 2 <sup>nd</sup> week to January 2 <sup>nd</sup> week	-	-	Oct.-Nov.

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	Occasional	None
	Drought	√		
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave			√

	Frost			√
	Sea water intrusion			√
	Pests and diseases (specify)		√	
	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: No
		Soil map as Annexure 3	Enclosed: Yes

## 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	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation	
Delay by 2 weeks June 3 <sup>rd</sup> week	Red soil	Finger millet+ Redgram /Field bean	No change	<ul style="list-style-type: none"> <li>• Follow insitu moisture conservation practices</li> <li>• Conservation furrow</li> <li>• Wider spacing ( 90cm x 30 cm) for Pigeon pea</li> <li>• Selection of medium duration varieties</li> </ul>	<ol style="list-style-type: none"> <li>1.Seed drills under RKVY</li> <li>2.Supply of seeds through KSSC</li> <li>3.Supply of seeds through NFSM</li> <li>4. Supply of seeds through ISOPOM</li> </ol>	
		Groundnut + Pigeon pea	No change			
		Castor/ Sesamum/ Greengram	Castor			
		Pigeonpea Sole crop	No change			
	Sandy loam	Finger millet+ Redgram /Field bean	No change			
		Groundnut + Pigeon pea	No change			
		Castor/ Sesamum/ Greengram	Castor			
		Pigeonpea Sole crop	No change			
	Red soil, Sandy loam, black and red soil	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking			Drip irrigation/ Alternate furrow irrigation
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking			Drip irrigation/ Alternate furrow irrigation
	Sandy loam,sandy and red soil	Fodder Maize	No change			
		Hybrid Napier	No change			
Lucerne		No change				



Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 4 weeks (July 1 <sup>st</sup> week)	Red soil/Red sandy loam	Finger millet +Redgram /Field bean	Finger millets + Pigeonpea  Niger: HR-911, L-5, GPU-66, MR-6, MR-1, MR-2  Pigeonpea BRG-2	Staggered nursery, seed hardening, Contour cultivation, small section bunds, dry sowing 8-10 days before rains with 15-20% higher seed rate	1.Seed drills under RKVY 2. Supply of seeds through KSSC 3. Supply of seeds through NFSM
		Groundnut + Pigeon pea	Groundnut: TMV-2, GPBD-4 Redgram BRG-2	Contour cultivation, small section bunds	
		Castor/ Sesamum/ Greengram	Finger millet and minor millets( little millet, Foxtail millet) Little millet: Co-2, OLM-201 Foxtail millet: RS-118, K-221-1 Ragi: HR-911, L-5, GPU-28	Contour cultivation, ridges and furrows, tied ridges	
		Pigeonpea Sole crop	Pigeonpea:BRG-2	Contour cultivation, small section bunds	
	Canal irrigation and tank fed (Red soil, Red sandy loam, Sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH -1, KRH-2	Long/medium duration BR-2655, Jaya, Mandya Vijaya, KRH-1, KRH-2		
	Irrigated farming (Red soil, Red sandy loam, Sandy soil)	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Irrigated) (Red soil, Red sandy loam, Sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 6 weeks July 3 <sup>rd</sup> week	Red soil, sandy loam, sandy soil	Finger millet mixed cropping Redgram and avare mixed cropping	prefer short duration varieties in Ragi eg. GPU-28, HR-911, L-5	Staggered nursery, seed hardening, Contour cultivation, small section bunds, dry sowing 8-10 days before rains with 15-20% higher seed rate	1.Seed drills under RKVY 2.Supply of seeds through KSSC 3.Supply of seeds through NFSM
		Groundnut + Pigeon pea	Prefer Groundnut GPBD-4, TMV-2	-do-	
		Castor, Sesamum, Green gram	prefer finger millet and minor millets( little millet, Foxtail millet) Little millet: Co-2, OLM-201 Foxtail millet: RS-118, K-221-1	Contour cultivation, ridges and furrows, tied ridges	
		Pigeonpea	Prefer CowpeC-152), Soybean, Horsegram(PHG-9), little millet(CO-2), Foxtail millet (RS-118)	Contour cultivation, small section bunds	
	Canal irrigation and tank fed (Red soil, sandy loam, sandy soil)	Paddy (long/medium duration): BR-2655, Jaya, KRH –1, KRH-2	Prefer Short duration variety paddy: Tanu, IR-64, MTU-1001, Mangala		
	Irrigated farming (Red soil, sandy loam, sandy soil)	Vegetable: Tomato, Chilli Brinjal	Prefer same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Irrigated) (Red soil, sandy loam, sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 8 weeks August 1 <sup>st</sup> week	Red soil, sandy loam, sandy soil	Finger millet mixed cropping Redgram and avare mixed cropping	Prefer short duration varieties in Ragi eg. GPU-45, GPU-46, GPU-48, Indaf-5, PR-202, GPU-26	Contour cultivation, small section bunds,	1.Seed drills under RKVY  2.Supply of seeds through KSSC  3.Supply of seeds through NFSM  4. Supply of seeds through ISOPOM
		Groundnut + Pigeon pea	Prefer Cowpea/Horsegram and short duration Finger millet varieties as above	Inter cultivation, small section bunds,	
		Castor, Sesamum, Green gram	Prefer Finger millet and minor millets( little millet, Foxtail millet) Little millet: Co-2, OLM-201 Foxtail millet: RS-118, K-221-1	Inter cultivation, small section bunds,	
		Pigeonpea	Prefer Cowpea, Soybean, Horsegram, Minor millets	Contour cultivation, small section bunds	
	Canal irrigation and tank fed (Red soil, sandy loam,sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH -1, KRH-2	Prefer Short duration variety paddy: Mangala, CTH-1, CTH-3, Tanu		
	Irrigated farming  (Red soil, sandy loam,sandy soil)	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Irrigated) (Red soil, sandy loam,sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Red soil, sandy loam, Sandy soil	Finger millet mixed cropping Redgram and Avare mixed cropping	Gap filling and thinning, dibling of Cowpea seeds in borders and gaps, resowing	small section bunds, repeated inter cultivation, thinning and gap filling with Cowpea, top dressing after stress alleviation	Supply of inter cultural implements through RKVY
		Groundnut + Pigeon pea	Gap filling, resowing	small section bunds, furrow between paired rows	
		Castor, Sesamum, Greengram	Gap filling, thinning of excess population	Ridges and furrow and tied ridges, top dressing after stress alleviation	
		Pigeonpea	Gap filling, Resowing if plant stand is very poor	Ridges and furrow and tied ridges	
	Canal irrigation and tank fed (Red soil, sandy loam, sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH –1, KRH-2			
	Irrigated farming (Red soil, sandy loam, sandy soil)	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Red soil, sandy loam, sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>					
<b>At vegetative stage</b>	Red soil, sandy loam, Sandy soil	Finger millet mixed cropping Redgram and Avare mixed cropping	Thinning, Grazing leaf tips, postponement of top dressing	small section bunds, inter cultivation mulching	1) Supply of inter cultural implements through RKVY 2) Pigeon pea seeds supply
		Groundnut + Pigeon pea	Earthing up, apply Gypsum after receipt of rains Life saving irrigation	small section bunds, furrow between paired rows	
		Castor, Sesamum, Greengram	Gap filling, thinning	Ridges and furrow and tied ridges, top dressing after stress alleviation	
		Pigeonpea	Gap filling, thinning	Ridges and furrow and tied ridges	
	Canal irrigation and tank fed (Red soil, sandy loam, Sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH -1, KRH-2			
	Irrigated farming	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Irrigated)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
<b>Mid season drought (long dry spell)</b>					
<b>Flowering /Fruiting stage</b>	Red soil,sandy loam, sandy soil	Finger millet mixed cropping	Weeding and weed mulching	Second top dressing after stress alleviation	Farm pond for providing life saving irrigation to dry land
		Groundnut + Pigeon pea	Weeding and weed mulching	small section bunds, furrow between paired rows	
		Castor, Sesamum, Greengram	Weeding and weed mulching	Ridges and furrow and tied ridges, top dressing after stress alleviation	
		Pigeonpea	Weeding and weed mulching life saving irrigation	Ridges and furrow and tied ridges	
	Canal irrigation and tank fed (Red soil,sandy loam, sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH -1, KRH-2			
	Irrigated farming (Red soil,sandy loam, sandy soil)	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Red soil,sandy loam, sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi crop planning	Remarks on Implementation
Terminal drought	Red soil, sandy loam, sandy soil	Finger millet mixed cropping Redgram and Avare mixed cropping	Life saving irrigation	Cowpea, Sunflower, Field bean, Horsegram(October month)	
		Groundnut + Pigeon pea	Pigeonpea harvested for vegetable purpose, Harvest at physiological maturity		
		Castor, Sesamum, Greengram	Life saving irrigation Harvest for vegetable purpose		
		Pigeonpea	Harvest for vegetable purpose		
	Canal irrigation and tank fed (Red soil, sandy loam, sandy soil)	Paddy (long/medium duration): BR-2655 Jaya, KRH -1, KRH-2			
	Irrigated farming (Red soil, sandy loam, sandy soil)	Vegetable: Tomato, Chilli Brinjal	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
		Banana	Continue to same crop, Weeding, Earthing up, Provide staking	Drip irrigation/ Alternate furrow irrigation	
	Agrostology (Red soil, sandy loam, sandy soil)	Fodder Maize	No change		
		Hybrid Napier	No change		
		Lucerne	No change		

### 2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	NA				

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	NA				

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	NA				

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	Tube well irrigated soils	Paddy (sub merged condition)	Maize, Sunflower, Ragi and Aerobic paddy	.Limited irrigation Alternate Furrow irrigation Drip irrigation	Seeds through KSSC and 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	Tube well red soil	paddy	Aerobic rice, Maize and Vegetables(Tomato, Chilly and Brinjal)	Limited irrigation Alternate furrow irrigation Drip irrigation	Seeds through KSSC, NFSM, NHM and NAREGA.

## 2.2 Unusual rains (untimely, unseasonal etc) for both rain fed and irrigation situation

Condition	Suggested Contingency measures				
	Normal Crop/cropping system	Vegetative stage	Flowering Stage	Crop maturity stage	Post harvest
Finger millet		Drain out excess water	Drain out excess water	Delay harvesting	Make rain proof heaps
Groundnut		-do-	-do-	Harvest immediately after rains	Groundnuts plants are heaped
Redgram		-do-	-do-	Drain out excess water	Cover the heap with tarpaulin
Paddy		-do-	-do-	Harvest immediately after rains	Cover the heap with tarpaulin in threshing yards
Horticulture					
Vegetables		Provide staking	Provide staking	Provide staking collect fallen fruits	Ripening, Packing, marketing
Mango		Provide drainage	Provide drainage	Provide drainage, collect fallen fruits	Ripening, Packing, marketing
Banana		Provide drainage	Provide drainage, Provide staking	Provide drainage, Provide staking	Ripening, Packing, marketing

**Unusual rains (untimely, unseasonal etc) for both rain fed and irrigation situation**

Condition	Suggested Contingency measures							
	Vegetative stage		Flowering Stage		Crop maturity stage		Post harvest	
<b>Heavy rainfall with high speed winds in a short span</b>								
Finger millet	Drain out excess water		Drain out excess water		Delay harvesting			
Groundnut	-do-		-do-		Harvest immediately after rains			
Redgram	-do-		-do-		Delay harvesting			
Paddy	-do-		-do-		Harvest immediately after rains			
Horticulture								
<b>Vegetables</b>	Provide staking		Provide staking		Provide staking collect fallen fruits			
Mango	Provide drainage		Provide drainage		Provide drainage, collect fallen fruits		Ripening, Packing, marketing	
Banana	Provide drainage		Provide drainage, Provide staking		Provide drainage, Provide staking		Ripening, Packing, marketing	
<b>Outbreak of pests and diseases due to unseasonal rains</b>								
	Vegetative stage		Flowering Stage		Crop maturity stage		Post harvest	
	Pest	Remedy	Pest	Remedy	Pest	Remedy	Pest	Remedy
Finger millet	-		-		-		-	
Groundnut	Tikka leaf spot	Seed treatment with Captan/Thiram (2gm/Lit)						
	Root grubs	Seed treatment with Clorpyriphos (15 ml/kg seed)						
Redgram	Sterility Mosaic	Rouging followed by	Pod borer	Methomyl	Pod borer	(Indoxacarb	Bruchids	ITK (1

	disease	Dicofol 3ml/Lit spray		(0.6gm/Lit)		0.5 gm/Lit)		inch sand on top layer); Neem leaves
Paddy	Blast Leaf folder Stem borer	Carbendazim seed treatment (2 gm/Lit) Tricyclozole (0.6gm/Lit) Chlorpyriphos ( 2ml/Lit)						
Horticulture								
Vegetables								
Tomato	Blight	Mancozeb (2gm/Lit)	Fruit borer	Triazophos (2gm/Lit)				
Brinjal			Shoot and Fruit borer	Triazophos (2gm/Lit)				
Chillie	Murda Complex	Imidachloprid (0.5 ml/Lit)						
Mango			Powdery mildew	Wettable sulphur (3gms/Lit)	Fruitflies	Pheromone Lure (Methyl Eugenol)		
Banana	Sigatoka leaf spot Bunchy top Rhizome weevil	Copper oxy Chloride (3gm/Lit) Rouging followed by Dimethoate spray Carbofuran 10 gm/Plant						

### 2.3 Extreme events: Heat wave/cold wave/Frost/Hailstrom/Cyclone

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA			
Cold wave				
Frost				
Hailstorm				
Cyclone				

### 2.4 Contingent strategies for Livestock

Drought	Suggested Contingency measures		
	Before the event	During the event	After the event
Feed and fodder availability	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks,encouraging fodder crops in irrigated area Silage-using excess fodder for silage	Utilizing fodder fro perennial trees and fodder bank reserves utilizing silage Sprinkling 10%of jaggary solution Urea lick cake Transporting excess fodder from adjoining district Use of feed mixtures	Availing insurance culling unproductive livestock
Drinking water	Preserving water in the tank for drinking purpose Excavation of borewells	Using preserved water in the tanks f for drinking Whenever ground water resources are available priority for drinking purpose	
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health camps and treating the affected once in campaign	Culling sick animals

## 2.5 Contingent strategies for Poultry

Drought	Suggested Contingency measures		
	Before the event	During the event	After the event
Shortage of feed ingredients	Insurance and integration  Establishing feed serve bank	Utilizing from feed serve bank	Availing insurance Strengthening feed reserve banks
Drinking water			
Health and disease management	Emergency Veterinary preparedness with medicines and vaccination to birds	Campaigns and mass vaccination	Culling affected birds

### Annexure 1: Location Map



**Annexure 2: Average Annual Rainfall**

**Annual average rainfall of Tumkur District from 1998 to 2009**

Sl no	Taluks	Normal	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	C.N.Halli	503.8	578.4	559.9	719.6	401.3	409.6	276.6	480.2	667.1	483.4	563.5	594.2	584.0
2	Gubbi	617.8	564.1	415.6	818.1	471.0	370.4	355.5	558.8	626.6	327.1	516.2	642.2	585.2
3	Kunigal	700.5	954.7	804.6	970.8	570.9	406.2	495.2	695.1	1091.6	496.8	900.4	765.3	676.8
4	Koratagere	637.5	864.8	871.3	849.3	789.1	528.8	592.5	944.8	1139.8	542.5	804.6	911.3	669.4
5	Madhugiri	557.0	778.1	536.7	677.4	634.3	309.8	348.9	536.0	847.2	452.7	692.7	881.7	660.7
6	Pavagada	485.0	472.3	376.6	4695	457.7	260.8	251.4	350.4	571.6	342.4	471.8	712.5	480.2
7	Sira	520.2	661.6	531.9	794.0	551.9	466.1	357.5	532.6	897.5	422.3	709.4	894.7	727.9
8	Tiptur	612.6	711.2	858.7	743.8	642.5	520.2	498.8	596.1	827.1	499.8	691.7	741.7	767.4
9	Tumkur	629.0	850.2	812.8	1004	759.7	435.6	530.6	726.0	973.5	677.2	883.7	941.6	842.9
10	Turuvekere	665.9	845.6	636.0	681.3	672.8	497.4	460.6	843.6	699.3	460.2	609.4	715.6	644.9
	<b>Average rainfall</b>	<b>592.9</b>	<b>728.1</b>	<b>648.4</b>	<b>772.8</b>	<b>595.1</b>	<b>420.5</b>	<b>416.8</b>	<b>626.4</b>	<b>834.1</b>	<b>470.4</b>	<b>684.3</b>	<b>780.1</b>	<b>664.2</b>

### Annexure 3: Soil Map

