



भारतीय कृषि  
ICAR

INDIAN COUNCIL OF  
AGRICULTURAL RESEARCH

# DISTRICT WISE CONTINGENCY PLAN TO DEAL WITH **EL NIÑO**

PREPAREDNESS | RESPONSE | RESILIENCE



BUILDING A  
DROUGHT RESILIENT  
KARNATAKA



SORGHUM



PIGEONPEA  
(TUR)



RAGI



MAIZE



COTTON



EARLY WARNING  
& MONITORING



WATER  
MANAGEMENT



SUSTAINABLE  
AGRICULTURE



COMMUNITY  
PARTICIPATION

TOGETHER, LET'S BUILD A RESILIENT KARNATAKA

PREPARE TODAY • PROTECT TOMORROW • PROSPER TOGETHER

## Karnataka

Agriculture is the backbone of Karnataka's economy, contributing about 13% to the state's GDP and employing roughly 30% of the workforce. Endowed with 10 diverse agro-climatic zones, the state is India's largest producer of coarse cereals, coffee, and raw silk, and a major hub for horticulture and spices. Karnataka's exceptional agricultural diversity is driven by its varied geography, which is divided into key regions:

- **Coastal Zone:** Characterized by high rainfall and heavy alluvial/lateritic soils. Major crops include Rice, Arecanut, Coconut, and Cashews.
- **Malnad Region:** Cool, hilly slopes of the Western Ghats ideal for plantation crops. It leads India in Coffee production and also produces Pepper, Cardamom, and Spices.
- **Northern Dry Zone:** Receives the least rainfall and features deep black/red soils. Major crops include Sorghum (Jowar), Cotton, Sugarcane, and Oilseeds.
- **Southern Dry & Central Zones:** Characterized by red loamy soils. This is the heartland for Ragi (finger millet), Maize, and Groundnuts

Climate change in Karnataka severely impacts its agricultural sector, leading to crop yield declines ranging from 5% to 50%. The state faces unpredictable monsoon patterns, rising temperatures, and extreme weather events. More than three fourths of the land in Karnataka is under rainfed cultivation. Karnataka state has been divided into 10 agro-climatic zones. The dominant crops grown in Karnataka are cereals, pulses, oilseeds and cash crops. Important food crops in the state include ragi, paddy, jowar, maize and bajra; pulses like red gram, bengal gram, field bean, cowpea and horse gram; oilseed crops like groundnut, sunflower, safflower and sesame. Cotton, sugarcane, coffee, tobacco and mulberry are the major commercial crops. The climate in Karnataka has been analysed at a district level for the historical period (1985– 2015) and projected for the future period for two climate scenarios – RCP 4.5 and RCP 8.5 (Sarmah, 2021). Temperature in Karnataka showed a moderate warming trend during 1985 to 2015, for both the summer maximum and winter minimum temperature.

The summer maximum temperature has increased in the range of 0.18 °C to 0.61 °C, and the winter minimum temperature has increased in the range of 0.30 °C to 0.65 °C. During the historical period (1987–2016), annual rainfall has also increased up to 25%, with up to 15% increase in a majority of the districts, and 20% to 25% increase in the Western Ghats districts. However, both kharif and rabi season rainfall variability was high during the period of 1985 to 2015.

**Temperature:** Warming of summer maximum temperature is projected to be in the range 0.5°C to 1.5°C in the short-term (2030s), and 1°C to 2.5°C in the long-term, considering RCP 4.5 and RCP 8.5 scenarios. Similarly winter minimum temperature is also projected to be warmer by 0.5°C to 2.5°C and 1°C to 2.5°C in the short- and long-term period, respectively, considering RCP 4.5 and RCP 8.5 scenarios.

**Rainfall:** An increase in Kharif season rainfall in the range of 5% to 25%, and 10% to 25%, is projected in the short-term (2030s), considering RCP 4.5 and RCP 8.5 scenarios. The percentage increase in rainfall during Kharif season, compared to the recent decades, is projected to be higher, particularly in districts receiving >1000 mm mean annual rainfall. An increase in Rabi season rainfall, in the range of 7% to 39%, and 10% to 35% is projected in the short-term (2030s), considering RCP 4.5 and RCP 8.5 scenarios. However, the variability of rainfall (Coefficient of Variation) shows mixed trends with rainfall variability projected with increase in some districts, and a decline in other districts. The Kharif season rainfall variability is projected to increase by 7% to 14% in 7 districts under RCP 4.5 scenario and 5% to 9% in 3 districts under RCP 8.5 scenario, and these districts receive <1000 mm mean annual rainfall. The quantum of annual rainfall and number of rainy days have increased in south interior Karnataka and Malnad regions. During the same period, a reduction in amount of annual rainfall and marginal increase in number of rainy days is observed in north interior Karnataka and coastal regions.

**Rainy days:** In Karnataka, an increase in the number of rainy days is projected for a majority of the districts, under both RCP 4.5 and 8.5 scenarios.

**Heavy rainfall events:** An increase in the occurrence of 'Very High' (>100 mm rainfall per day) and 'High' intensity (51-100 mm rainfall per day) rainfall events is projected, largely in the range of 1 to 2 events per annum in the projected period, under both RCP 4.5 and RCP 8.5 scenarios.

**Drought years:** IMD classifies 'Drought' years as those receiving <20% of the long period average rainfall. In Karnataka, 'Drought' years are projected to decline, in the range of 1 to 3 years under RCP 4.5 scenario, and 1 to 4 years under RCP 8.5 scenario, in a majority of the districts, compared to the historical period.

### Area under major crops in Karnataka

| Crop       | Area (Lakh ha) |
|------------|----------------|
| Maize      | 19.14          |
| Red gram   | 17.45          |
| Paddy      | 11.81          |
| Ragi       | 8.79           |
| Green gram | 5.67           |
| Sugarcane  | 5.4            |
| Groundnut  | 3.97           |

### Districts vulnerable to El Nino

| High                       | Medium                                                                                                         | Low                                                                                 |
|----------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Kodagu, Dharwad, Ramanagra | Gadag, Bangalore Rural, Chik Ballapur, Hassan, Bangalore Urban, Kolar, Chikmagalur, Chitradurga, Haveri, Udupi | Koppal, Tumkur, Uttar Kannad, Davanagere, Belgaum, Shimoga, Bellary, Dakshin Kannad |

## Actionable Comprehensive Plans for Contingency

|       |           |          |                 |
|-------|-----------|----------|-----------------|
| State | KARNATAKA | District | BANGALORE RURAL |
|-------|-----------|----------|-----------------|

### Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 432.9                | More than 19%          | Less than 350.649      |
| June         | 66.6                 |                        |                        |
| July         | 88.2                 |                        |                        |
| August       | 101.5                |                        |                        |
| September    | 176.6                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

### Irrigation info:

|                     |       |                       |       |
|---------------------|-------|-----------------------|-------|
| Net irrigated area: | 28405 | Gross irrigated area: | 33482 |
| Net Rainfed area    | 81877 | Gross rainfed area    | 82140 |

### Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | -     | -     |
| Wells                | 28405 | 33482 |
| Tanks                | -     | -     |
| Other sources        | -     | -     |

### Crop Profile (Kharif)

#### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 81              | 81                  | 0                 |
| 2    | Jowar     | 1087            | 248                 | 839               |
| 3    | Maize     | 5158            | 1034                | 4124              |
| 4    | Bajra     | 2               |                     | 2                 |
| 5    | Ragi      | 63843           | 818                 | 63025             |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 466             | 74                  | 392               |
| 2    | Groundnut      | 67              | 5                   | 62                |
| 3    | Sesamum        | -               |                     |                   |
| 4    | SOyabean       | 4               | 3                   | 1                 |
| 5    | Sunflower      | 7               | 7                   | 0                 |
| 6    | Castor         | 3               |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | -               |                     |                   |
| 2    | Jute      | 1               |                     | 1                 |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | -               |                     |                   |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 167             | 167                 | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 550               |
| 4    | Other Fodder crops | 1602            | 1052                | 550               |

## Crop Plan- Beginning of the season

| Condition                                    |                         |                                                                           | Suggested Contingency measures |                                                                                                                                               |
|----------------------------------------------|-------------------------|---------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Early season drought (delayed onset)         | Major Farming situation | Crop/cropping system                                                      | Change in crop/cropping system | Agronomic measures                                                                                                                            |
| Delay by 4weeks<br>July 1 <sup>st</sup> week | Shallow red soil        | Finger millet, Maize, Pigeon pea, Field bean, Niger, Groundnut, Sunflower | No Change – as stated above    | <b>Finger millet:</b> No Change-as stated above<br><b>Groundnut:</b> No Change – as stated above<br><b>Maize:</b> No Change – as stated above |

## Contingency measures- Mid season

| Condition |  |  | Suggested Contingency measures |
|-----------|--|--|--------------------------------|
|-----------|--|--|--------------------------------|

| Mid season drought (long dry spell) | Major Farming situation | Normal Crop/cropping system                                                                                           | Crop management                                                                                                                                                                                                            | Soil management                                                                                                   |
|-------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| At vegetative stage                 | Shallow red soil        | Finger millet<br>Finger millet + Pigeon pea (8 :2)<br>Finger millet + Field bean (4:1)<br>Finger millet + Niger (4:1) | Finger millet: Thinning, Grazing leaf tips, postpone top dressing untill optimum moisture<br><br>1% Potassium spray before plant expresses wilting symptoms<br><br>Protective irrigation from farm pond water if available | Intercultivation (dust mulching), Conservation Furrow, weeding & thinning plant population and used for mulching. |
|                                     |                         | Maize<br>Maize + Redgram (4:1)<br>Maize + French bean (4:1)                                                           |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Pigeon pea                                                                                                            |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Field bean, Cowpea, Horse gram                                                                                        |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Groundnut                                                                                                             |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Niger                                                                                                                 |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Sunflower                                                                                                             |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Sesame                                                                                                                |                                                                                                                                                                                                                            |                                                                                                                   |
|                                     |                         | Ground nut + Pigeon pea<br>Groundnut                                                                                  | Earthing up, Gypsum application after receipt of rains                                                                                                                                                                     |                                                                                                                   |

#### Contingency measures- End of the season

| Contingency measures- End of the season |                         |                                                                                                          |                                                                                                                           |                                                                   |  |
|-----------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--|
| Condition                               |                         |                                                                                                          | Suggested Contingency measures                                                                                            |                                                                   |  |
| Terminal drought                        | Major Farming situation | Crop/cropping system                                                                                     | Crop management                                                                                                           | Rabi Crop planning                                                |  |
|                                         | Shallow red soil        | Finger millet<br>Finger millet + Pigeon pea (8 :2)<br>Figer millet + Field bean (4:1)<br>Finger millet + | Life saving irrigation<br><br>Harvest for vegetables (Pigeonpea and field bean)                                           | Cowpea, Field bean Horse gram if there are anticipated rabi rains |  |
|                                         |                         | Maize<br>Maize + Redgram (4:1)<br>Maize + French bean (4:1)<br>Maize + Cowpea (4:1)                      | Protective irrigation, Maize crop to be harvested for table / green fodder purpose, redgram to be harvested as green pods |                                                                   |  |
|                                         |                         | Pigeon pea, Field bean, Cowpea                                                                           | Life saving irrigation if available, Harvest as green pods                                                                |                                                                   |  |
|                                         |                         | Groundnut + Redgram                                                                                      |                                                                                                                           |                                                                   |  |
|                                         |                         | Sunflower                                                                                                | If possible protective irrigation, application of 0.1% borax                                                              |                                                                   |  |

## 1.2 Irrigated situation

| Condition                                                                  | Major Farming situation                                    | Crop/cropping system | Suggested Contingency measures                                                                                   |                                                                      |
|----------------------------------------------------------------------------|------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|                                                                            |                                                            |                      | Change in crop/cropping system                                                                                   | Agronomic measures                                                   |
| Delayed/limited release of water in canals due to low rainfall             | Low lands, canal irrigated red sandy and loamy soils       | Paddy                | Short duration varieties<br>Rasi, Mangala, KRH-1, IR-20, Jyoti,                                                  | SRI method, Aerobic Paddy / DSR                                      |
|                                                                            | Red sandy soils                                            |                      | Irrigated dry crops                                                                                              |                                                                      |
| Non release of water in canals under delayed onset of monsoon in catchment | Low lands, canal irrigated red sandy soils and loamy soils | Paddy (Upland)       | Maize, Sunflower, Groundnut                                                                                      | Rain water harvesting methods, cover crops, Conjunctive use of water |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon   | Low lands, tank irrigated red sandy soils and loamy soils  | Paddy                | Low water requiring dryland crops viz., Cowpea, Field bean (HA-3 & 4), blackgram, greengram, Niger and Sunflower | Rain water harvesting                                                |
| Insufficient groundwater recharge due to low rainfall                      | Red sandy soils and loamy soils                            | Paddy                |                                                                                                                  |                                                                      |

### Resource management technologies

#### In-situ moisture conservation practices

| S.No. | Practice                                                                      | Crops               |
|-------|-------------------------------------------------------------------------------|---------------------|
| 1     | Deep ploughing to a depth of 15-30 cm                                         | All crops           |
| 2     | Application of FYM and incorporation of green manure crops                    | All crops           |
| 3     | Application of tank silt, contour cultivation with vegetative barriers        | All crops           |
| 4     | Deep tillage to a depth of 25-30 cm using MB plough graded ridges and furrows | Maize and Sunflower |
|       |                                                                               |                     |

#### Ex-situ rainwater management

- Farm pond based supplemental irrigations to crops.

# Actionable Comprehensive Plans for Contingency

|       |           |          |         |
|-------|-----------|----------|---------|
| State | KARNATAKA | District | BELGAUM |
|-------|-----------|----------|---------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 573.3                | More than 19%          | Less than 464.373      |
| June         | 144                  |                        |                        |
| July         | 171.1                |                        |                        |
| August       | 129.4                |                        |                        |
| September    | 128.8                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 614754 | Gross irrigated area: | 877517 |
| Net Rainfed area    | 308928 | Gross rainfed area    | 459858 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 55108  | 78705  |
| Wells                | 421428 | 601307 |
| Tanks                | 163    | 230    |
| Other sources        | 138055 | 197275 |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 53296           | 4924                | 48372             |
| 2    | Jowar     | 6076            | 2164                | 3912              |
| 3    | Maize     | 206022          | 162321              | 43701             |
| 4    | Bajra     | 6154            | 1295                | 4859              |
| 5    | Ragi      | 734             | 124                 | 610               |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 4477            | 4076                | 401               |
| 2    | Groundnut      | 19655           | 8817                | 10838             |
| 3    | Sesamum        | 31              | 8                   | 23                |
| 4    | SOyabean       | 82089           | 8331                | 73758             |
| 5    | Sunflower      | 2983            | 1816                | 1167              |
| 6    | Castor         | 5               |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 19952           | 6855                | 13097             |
| 2    | Jute      | 34              |                     | 34                |
| 3    | Mesta     | 4               |                     | 4                 |
| 4    | Sunhemp   | 285             |                     | 285               |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 511329          | 511329              | 0                 |
| 2    | Tobacco            | 8087            | 2278                | 5809              |
| 3    | Guar seed          | -               |                     | 3524              |
| 4    | Other Fodder crops | 7941            | 4417                | 3524              |

## Crop Plan- Beginning of the season

| Condition                                    |                         |                             | Suggested Contingency measures                   |                                                                      |
|----------------------------------------------|-------------------------|-----------------------------|--------------------------------------------------|----------------------------------------------------------------------|
| Early season drought(delayed onset)          | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system                   | Agronomic measures                                                   |
| Delay by 4 weeks (July 2 <sup>nd</sup> week) | Medium deep black soils | Groundnut                   | PrefervarietieslikeJL-24, GPBD-4                 | Apply enriched compost (FYM+ press mud + poultry manure) to tobacco. |
|                                              |                         | Soybean                     | Avoid Soybean. Alternatively go for sole Tobacco |                                                                      |
|                                              |                         |                             | Groundnut                                        | Compartmental bunding for moisture conservation                      |
|                                              |                         |                             | Cotton,                                          | Compartmental bunding for moisture conservation                      |

|                         |                                                |                                                                                                                              |                                                                                                      |
|-------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|                         |                                                | Transplanted Chilli,                                                                                                         | Compartmental bunding for moisture conservation, Detop old seedlings in nursery before transplanting |
|                         |                                                | Bt.Cotton+Redgram–TS 3R (1:2)                                                                                                |                                                                                                      |
|                         |                                                | Maize (Arjun, 900 M)+ Red gram TS 3R (4:2) Tobacco-Bhagyashree)+ Onion-NashikRed(1:2)                                        |                                                                                                      |
|                         | Blackgram                                      | Avoid Blackgram and go For Maize,cowpea&sunflower                                                                            |                                                                                                      |
|                         | kharif sorghum                                 | Avoidkharif sorghum and go for Maize, cow pea & sunflower                                                                    |                                                                                                      |
|                         | Sunflower(Morden,SB 275)                       | SunflowerMorden,SB275                                                                                                        |                                                                                                      |
|                         | Greengram in Kharif– Rabi Sorghum              | Avoid Green gram, Blackgram, Soybean, kharif sorghum and plan for SunflowerMorden,SB 275)/Cowpea(C-152)/ Maize (Arjun, 900M) |                                                                                                      |
|                         | Wheat                                          | BijagaYellow,DWR-2006                                                                                                        | Compartmental bunding for moisture conservation                                                      |
|                         | Fallow-Safflower(A1, A2) / Chickpea (A1, JG11) |                                                                                                                              |                                                                                                      |
|                         | Hybrid cotton                                  | No change                                                                                                                    | Adopt 60x60 cm in Cotton                                                                             |
|                         | Maize-Chickpea                                 | No change                                                                                                                    | Compartmental bunding for moisture conservation                                                      |
|                         | Spreading groundnut(DSG-1)                     | No change                                                                                                                    | Contour cultivation Conservation furrows                                                             |
|                         | Hy.Bajra,Horsegram, Groundnut, Chilli          | Horsegram(local)                                                                                                             | Compartmental bunding for moisture conservation                                                      |
| Cowpea(C-152)           |                                                | Compartmental bunding for moisture conservation                                                                              |                                                                                                      |
| Castor(GCH-4),          |                                                | Compartmental bunding for moisture conservation                                                                              |                                                                                                      |
| Sunflower(MordenSB 275) |                                                | Compartmental bunding for moisture conservation                                                                              |                                                                                                      |

|  |               |                                                                                   |                                |                                                       |
|--|---------------|-----------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------|
|  | RedLoamysoils | Spreadinggroundnut                                                                | Nochange<br>(variety:DSG-1)    |                                                       |
|  |               | <u>Hy.Bajra, Horsegram, Hybrid cotton(Bt.), Groundnut, Chilli, Foxtail millet</u> | Horsegramnochange<br>Others,   |                                                       |
|  |               |                                                                                   | Cowpea(C-152)                  | Compartmental bunding<br>for moisture<br>conservation |
|  |               |                                                                                   | CastorGCH-4,                   | Compartmental bunding<br>for moisture<br>conservation |
|  |               |                                                                                   |                                | conservation                                          |
|  |               |                                                                                   | Sunflower Morden, SB275        | Compartmental bunding<br>for moisture<br>conservation |
|  |               | Hy.Sorghum +<br>Redgram(Maruti)(4:2)                                              | Avoidsorghum+Redgram<br>go for |                                                       |
|  |               |                                                                                   | Horsegram-Local                |                                                       |
|  |               |                                                                                   | Cowpea(C-152)                  |                                                       |
|  |               |                                                                                   | CastorGCH-4,                   |                                                       |
|  |               |                                                                                   | SunflowerMorden,SB275          |                                                       |
|  |               | Groundnut+Red<br>gram (4:1)                                                       | Horsegram-Local                |                                                       |
|  |               |                                                                                   | Cowpea(C-152)                  |                                                       |
|  |               |                                                                                   | CastorGCH-4,                   |                                                       |
|  |               |                                                                                   | SunflowerMorden,SB275          |                                                       |

#### Contingency measures- Mid season

| Condition                                                               |                            |                             | Suggested Contingency measures |                                                 |
|-------------------------------------------------------------------------|----------------------------|-----------------------------|--------------------------------|-------------------------------------------------|
| Mid Season drought(long dry spell) consecutive2 weeks of rainlessperiod | MajorFarmin<br>g situation | Normal crop/cropping system | Crop management                | Soils nutrient & moisture conservation measures |

|                                     |                         |                                                                                                                                                                |                                                                         |                                                                                                                                                                                                                                                          |
|-------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| At vegetative stage                 | Med-Deep Black soils    | Groundnut (- JL-24, GPBD-4)/Soybean/ Black gram                                                                                                                |                                                                         |                                                                                                                                                                                                                                                          |
|                                     |                         | Green gram-R. Jowar/wheat/chickpea/safflower                                                                                                                   |                                                                         |                                                                                                                                                                                                                                                          |
|                                     |                         | Hybrid cotton                                                                                                                                                  | Frequent intercultivation                                               | Foliar application of nutrients (N/K)<br>Postponement of top dressing with N<br>Life saving irrigation<br>Use anti-transpirants (PMA & Kaoline-6%) for 2-3 times at 15 days interval<br>Spraying of $\text{KNO}_3/\text{K}_2\text{SO}_4/\text{KCl}$ (1%) |
|                                     |                         | Maize-Chickpea                                                                                                                                                 | Thinning<br>Frequent intercultivation                                   |                                                                                                                                                                                                                                                          |
|                                     | Red Loamy soils         | Sunhemp-Tobacco                                                                                                                                                |                                                                         |                                                                                                                                                                                                                                                          |
|                                     |                         | Spreading groundnut (DSG-1) Hy. Bajra, Horse gram, Hybrid cotton (Bt.), Groundnut, Chilli, Foxtail millet                                                      | Intercultivation and Weeding                                            |                                                                                                                                                                                                                                                          |
|                                     |                         | Hy. Sorghum + Redgram (Maruti) (4:2)                                                                                                                           | Intercultivation and Weeding                                            |                                                                                                                                                                                                                                                          |
|                                     |                         | Groundnut + Redgram (4:1)                                                                                                                                      | Intercultivation and Weeding                                            |                                                                                                                                                                                                                                                          |
| Condition                           |                         |                                                                                                                                                                |                                                                         |                                                                                                                                                                                                                                                          |
| Mid season drought (long dry spell) |                         |                                                                                                                                                                |                                                                         |                                                                                                                                                                                                                                                          |
| At flowering/ fruiting stage        | Medium deep Black soils | Groundnut (- JL-24, GPBD-4)/Soybean/ Black gram                                                                                                                | Life saving irrigation<br>Planofix (TIBA/CCA)/PGR spray                 |                                                                                                                                                                                                                                                          |
|                                     |                         | Green gram-R. Jowar/wheat/chickpea / safflower                                                                                                                 | Plan for rabicrops                                                      |                                                                                                                                                                                                                                                          |
|                                     |                         | Hybrid cotton                                                                                                                                                  | Alternative furrow irrigation                                           |                                                                                                                                                                                                                                                          |
|                                     |                         | Maize-Chickpea                                                                                                                                                 | Removal of alternative rows in cereals<br>Alternative furrow irrigation |                                                                                                                                                                                                                                                          |
|                                     |                         | Sunhemp-Tobacco                                                                                                                                                | Removal of flower leaves in Tobacco                                     |                                                                                                                                                                                                                                                          |
|                                     |                         | Spreading groundnut (DSG-1) Hy. Bajra, Horse gram, Hybrid cotton (Bt.), Groundnut, Chilli, Foxtail millet<br>Hy. Sorghum + Redgram (Maruti) (4:2)<br>Groundnut |                                                                         |                                                                                                                                                                                                                                                          |

|  |  |                                          |  |  |
|--|--|------------------------------------------|--|--|
|  |  | +Redgram(4:1)                            |  |  |
|  |  | Paddy-Greengram/ Black gram/ Field beans |  |  |

#### Contingency measures- End of the season

| Terminal drought | Major Farming situation | NormalCrop/croppingsystem                            | Crop management                                                | RabiCropplanning                                                                                                             |
|------------------|-------------------------|------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                  | Med-DeepBlacksoils      | Groundnut (- JL-24, GPBD-4)/Soybean/ Black gram      | Harvest at Physiological maturity. Relaycroppingof Rabi crops. | Protectiveirrigation Rabisorghum/wheat/safflower / Chickpea Seed hardening with CaCl <sub>2</sub> (2%). Zero tilldrillsowing |
|                  |                         | Greengram-R. Jowar/Wheat/Chickpea/ safflower         |                                                                |                                                                                                                              |
|                  |                         | Hybridcotton                                         | Clippingoflateset flowers/pods.                                |                                                                                                                              |
|                  |                         | Maize-Chickpea Sunhemp-Tobacco                       | Harvest the crop for fodder and prepare landforRabisowing.     |                                                                                                                              |
|                  | RedLoamysoil s          | Spreading groundnut(DSG-1) Hy.Bajra,Horsegram,       | Harvest at physiological maturityexcept                        | Spraywithanti-transpirants (Kaoline 6%) for cotton                                                                           |
|                  |                         | Hybrid cotton (Bt.),Groundnut,Chilli, Foxtail millet | groundnut. Relaycroppingof Rabi crops                          |                                                                                                                              |
|                  |                         | Hy.Sorghum + Redgram(Maruti)(4:2)                    | do                                                             |                                                                                                                              |
|                  |                         | Groundnut + Redgram(4:1)                             | do                                                             |                                                                                                                              |
|                  | RedLateriticsoils       | Paddy- Green gram/ Blackgram/Fieldbean               | Harvestingearlyat physiological maturity                       |                                                                                                                              |

#### Irrigated situation

| Condition                                            |                                          |                           | SuggestedContingency measures            |                                                                                                                     |
|------------------------------------------------------|------------------------------------------|---------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|                                                      | MajorFarming situation                   | NormalCrop/croppingsystem | Change in crop/croppingsystem            | Agronomicmeasures                                                                                                   |
| Delayedrelease of water in canals due to lowrainfall | Canal irrigated mediumtodeep black soils | Maize-Wheat               | Early maturing maize hybrids(PEMHseries) | Sowthecropusingrain water & irrigate as and when water released from canal<br>Alternatefurrow irrigationConjunctive |

|  |  |                     |                                                            |                        |
|--|--|---------------------|------------------------------------------------------------|------------------------|
|  |  |                     |                                                            | use of open well water |
|  |  | Soybean-Maize/wheat | Avoid soybean<br>Grow sunflower<br>followed by maize/wheat | -do-                   |
|  |  | Sugarcane           | No change                                                  | -                      |
|  |  | Maize-Chickpea      | -do-                                                       | -do-                   |
|  |  | Cotton              |                                                            |                        |

| 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 | Canal irrigated medium deep black soils | Soybean-maize/wheat         | Soybean-Rabijowar/wheat<br>Chickpea<br>Sunflower--Rabijowar/ wheat<br>Chickpea/ | Alternate furrow irrigation.<br>Residue mulching<br>Frequent intercultivation<br>Use of sprinkler/micro irrigation | Use Govt Subsidy for drip /micro irrigation by KSDA |
|                                                        |                                         | Sugarcane                   | No Change                                                                       | -do-                                                                                                               |                                                     |
|                                                        |                                         | Maize-chickpea              | No Change                                                                       |                                                                                                                    |                                                     |
|                                                        |                                         | Cotton                      | No Change                                                                       |                                                                                                                    |                                                     |

| Condition                                                                  | Major Farming situation                    | Normal Crop/cropping system | Suggested Contingency measures    |                                                      |
|----------------------------------------------------------------------------|--------------------------------------------|-----------------------------|-----------------------------------|------------------------------------------------------|
|                                                                            |                                            |                             | Change in crop/cropping system    | Agro-nomic measures                                  |
| Non-release of water in canals under delayed onset of monsoon in catchment | Canal irrigated medium to deep black soils | Maize-Wheat                 | Sunflower Bajra, Sorghum.         | Compartment bunding                                  |
|                                                                            |                                            | Soybean-Maize/Wheat         | Rabi Sorghum Safflower, Chickpea, | Ridge-Furrow formation, Mulching                     |
|                                                                            |                                            | Sugarcane                   | No Change                         | Frequent intercultivation                            |
|                                                                            |                                            | Maize-Chickpea              | Sunflower Bajra, Sorghum          | Compartment bunding                                  |
|                                                                            |                                            | Cotton                      | No Change                         | Anti-transpirant spray (Kaolin 6%)<br>Seed hardening |

| Condition                                                                |                                                       |                            | SuggestedContingencymeasures     |                                                                                                                                       |
|--------------------------------------------------------------------------|-------------------------------------------------------|----------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | MajorFarming situation                                | NormalCrop/croppings ystem | Change in crop/croppingsystem    | Agronomicmeasures                                                                                                                     |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Tankfed medium to deep black soils                    | Maize-Wheat                | Sunflower Bajra, Sorghum.        | Compartment bunding Ridge-Furrow formation, Mulching Frequent intercultivation                                                        |
|                                                                          |                                                       | Soybean-Maize/Wheat        | Rabi Sorghum Safflower, Chickpea | Compartment bunding                                                                                                                   |
|                                                                          |                                                       | Maize-Chickpea             | No Change                        | Anti-transpirant spray (Kaolin 6%) Seed hardening                                                                                     |
|                                                                          |                                                       | Cotton                     | Sunflower, Sorghum               | -                                                                                                                                     |
| Insufficient ground water recharged due to low rainfall                  | Well / tube well irrigated Medium to deep black soils | Maize-wheat                | No Change                        | Irrigation at critical stages Alternate furrow irrigation Residue mulching Foliar application of N & K Seed Hardening microirrigation |
|                                                                          |                                                       | Soybean-maize/wheat        | No Change                        | -do-                                                                                                                                  |
|                                                                          |                                                       | Sugarcane                  | No Change                        |                                                                                                                                       |
|                                                                          |                                                       | Maize-chickpea             | No change                        |                                                                                                                                       |
|                                                                          |                                                       | Cotton                     | No Change                        |                                                                                                                                       |

### Resource management technologies

#### In-situ rainwater management

| S.No. | Practice          | Crops                                                         |
|-------|-------------------|---------------------------------------------------------------|
| 1     | Ridges and furrow | Pigeonpea, Greengram, Pearl millet, Sunflower                 |
| 2     | Deep ploughing    | Pigeonpea, Pearl millet, Rabi sorghum, chickpea and safflower |
| 3     | Compartment bund  | Sunflower, Rabi sorghum, chickpea and safflower               |

#### Ex-situ rainwater management

1. Farm pond based supplemental irrigations for crops.
2. Recharge of open wells by feeder channels/pipes

# Actionable Comprehensive Plans for Contingency

|       |           |          |         |
|-------|-----------|----------|---------|
| State | KARNATAKA | District | BELLARY |
|-------|-----------|----------|---------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 364.8                | More than 19%          | Less than 295.488      |
| June         | 73.4                 |                        |                        |
| July         | 62                   |                        |                        |
| August       | 82.7                 |                        |                        |
| September    | 146.7                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 161157 | Gross irrigated area: | 192984 |
| Net Rainfed area    | 50314  | Gross rainfed area    | 65715  |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross  |
|----------------------|-------|--------|
| Canals               | 97847 | 107095 |
| Wells                | 25283 | 37155  |
| Tanks                | 928   | 939    |
| Other sources        | 37099 | 47795  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 81593           | 81494               | 99                |
| 2    | Jowar     | 5824            | 4991                | 833               |
| 3    | Maize     | 27364           | 11429               | 15935             |
| 4    | Bajra     | 3400            | 1275                | 2125              |
| 5    | Ragi      | 1726            | 1008                | 718               |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 5817            | 1576                | 4241              |
| 2    | Groundnut      | 3305            | 962                 | 2343              |
| 3    | Sesamum        | 93              | 12                  | 81                |
| 4    | SOyabean       | 15              | 14                  | 1                 |
| 5    | Sunflower      | 489             | 177                 | 312               |
| 6    | Castor         | 149             |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 19170           | 3237                | 15933             |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 4               |                     | 4                 |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 1007            | 1007                | 0                 |
| 2    | Tobacco            | 3               | 3                   | 0                 |
| 3    | Guar seed          | -               |                     | 20                |
| 4    | Other Fodder crops | 854             | 834                 | 20                |

#### Crop Plan- Beginning of the season

| Condition                                  | Suggested Contingency measures                           |                            |                                        |
|--------------------------------------------|----------------------------------------------------------|----------------------------|----------------------------------------|
| Delay by 4 weeks July 2 <sup>nd</sup> week | Shallow blacksoils and red sandy soils ( <i>khariḥ</i> ) | Maize                      | Bajra/Pigeon pea/ Groundnut/ Sunflower |
|                                            |                                                          | Bajra                      | No Change                              |
|                                            |                                                          | Sorghum                    | Bajra/Pigeon pea/ Groundnut/ Sunflower |
|                                            |                                                          | Pigeon pea                 | No change                              |
|                                            |                                                          | Ground nut                 | No change                              |
|                                            |                                                          | Sunflower                  | No change                              |
|                                            |                                                          | Bajra + Pigeon pea (2:1)   | No change                              |
|                                            |                                                          | Setaria + Pigeon pea (4:2) | No change                              |

|  |                                     |                                     |           |                                                                                                                     |
|--|-------------------------------------|-------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------|
|  |                                     | Sorghum+<br>Groundnut(2:4)          | No change | -                                                                                                                   |
|  | Deep black soils<br>( <i>rabi</i> ) | Rabi sorghum                        | No change | Keep the land fallow in kharif by treating with<br>compartment bunds & furrows for in<br>situ moisture conservation |
|  |                                     | Safflower                           | No change |                                                                                                                     |
|  |                                     | Cotton                              | No change |                                                                                                                     |
|  |                                     | Sunflower                           | No change |                                                                                                                     |
|  |                                     | Rabi- sorghum +<br>Chickpea : (2:1) | No change |                                                                                                                     |
|  |                                     | Bengal gram +<br>Safflower: (4:2)   | No change |                                                                                                                     |

#### Contingency measures- Mid season

| Condition                                                                                                     | Suggested Contingency measures                   |                                 |                                                                               |                                                 |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------|
|                                                                                                               | Major Farming situation                          | Crop/cropping system            | Crop management                                                               | Soil nutrient & moisture conservation measures  |
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)<br><br>At vegetative stage | Shallow black soils and red sandy soils (kharif) | Maize                           | Repeated intercultivation and weeding                                         | Opening of conservation furrows at 15-20m apart |
|                                                                                                               |                                                  | Bajra                           | Repeated intercultivation and weeding, Removal of seedlings between 30-45 DAS | ---do---                                        |
|                                                                                                               |                                                  | Groundnut                       | Repeated intercultivation and weeding,<br>Mulching in spreading groundnut     | ---do---                                        |
|                                                                                                               |                                                  | Sunflower                       | Repeated intercultivation and weeding                                         | ---do---                                        |
|                                                                                                               |                                                  | Sorghum                         | Repeated intercultivation and weeding, Removal of seedlings between 30-45 DAS | Opening of conservation furrows at 15-20m apart |
|                                                                                                               |                                                  | Bajra+Pigeonpea(2:1)            | -<br>d<br>o<br>-                                                              | ---do---                                        |
|                                                                                                               |                                                  | Setaria + Pigeonpea (4:2)       | Repeated intercultivation and weeding,<br>Mulching in spreading groundnut     | ---do---                                        |
|                                                                                                               |                                                  | Sorghum+ groundnut(2:4)         | Repeated intercultivation and weeding                                         | ---do---                                        |
|                                                                                                               | Deep black soils (rabi)                          | Rabi sorghum                    | Repeated intercultivation and weeding                                         | Compartment bunding                             |
|                                                                                                               |                                                  | Safflower                       | ---do---                                                                      | ---do---                                        |
|                                                                                                               |                                                  | Cotton                          | ---do---                                                                      |                                                 |
|                                                                                                               |                                                  | Horsegram                       | ---do---                                                                      |                                                 |
|                                                                                                               |                                                  | Sunflower                       | ---do---                                                                      |                                                 |
|                                                                                                               |                                                  | Rabi- Sorghum+ Chickpea : (2:1) |                                                                               | ---do---                                        |
|                                                                                                               |                                                  | Chickpea +Safflower: (4:2)      |                                                                               | ---do---                                        |

| Condition                                                         | Suggested Contingency measures                   |                               |                                                                                                    |                                                                                                                          |
|-------------------------------------------------------------------|--------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                                                                   | Major Farming situation                          | Crop/cropping system          | Crop management                                                                                    | Soil nutrient & moisture conservation measures                                                                           |
| Mid season drought (Long dry spell ) at flowering/ fruitingstage) | Shallow black soils and red sandy soils (kharif) | Maize                         | Repeated intercultivation and weeding. Harvesting for fodder purpose.                              | Opening conservati on furrows at 1.5-2.0 m apart                                                                         |
|                                                                   |                                                  | Bajra                         | Repeated intercultivation and weeding .Harvest the crop for fodder purpose and allow for rationing | Opening conservati on furrows at 1.5-2.0 m apart. Spray antitranspirants like 5% Kaolin.Provide supplemental irrigation. |
|                                                                   |                                                  | Sunflower                     | Repeated intercultivation and weeding                                                              | Spray anti transpirants like kaolin @ 5%                                                                                 |
|                                                                   |                                                  | Sorghum                       | Stripping of old & nonfunctional leaves. Repeated intercultivation and weeding                     |                                                                                                                          |
|                                                                   |                                                  | Pigeon pea                    | -do-                                                                                               | Spray anti transpirants like kaolin @ 5%                                                                                 |
|                                                                   |                                                  | Groundnut                     | Harvesting for fodder purpose                                                                      | Foliar spraying of 2% urea soon after receipt of rains                                                                   |
|                                                                   |                                                  | Bajra+Pigeonpea (2:1)         | Repeated intercultivation and weeding .Harvest the crop for fodder purpose and allow for ratooning | Openingconservation furrows at 1.5-2.0 m apart. Spray antitranspirants like 5% Kaolin.Provide supplemental irrigation.   |
|                                                                   |                                                  | Setaria+Pigeonpea (4:2)       | -do-                                                                                               | -do-                                                                                                                     |
|                                                                   |                                                  | Sorghum+Groundnut(2:4)        | Harvest Pearlmillet for fodder and Repeated intercultivation                                       | -do-                                                                                                                     |
|                                                                   | Deep black soils (rabi)                          | Rabi sorghum                  | -                                                                                                  | Compartmental bunding                                                                                                    |
|                                                                   |                                                  | Safflower                     | -                                                                                                  | -do-                                                                                                                     |
|                                                                   |                                                  | Cotton                        | -                                                                                                  |                                                                                                                          |
|                                                                   |                                                  | Horsegram                     | -                                                                                                  |                                                                                                                          |
|                                                                   |                                                  | Sunflower                     | -                                                                                                  |                                                                                                                          |
|                                                                   |                                                  | Rabi- Sorghum+Chickpea: (2:1) | -                                                                                                  | -do-                                                                                                                     |
|                                                                   |                                                  | Chickpea+Safflower: (4:2)     |                                                                                                    | -do-                                                                                                                     |

#### Contingency measures- End of the season

| Condition | Suggested Contingency measures |
|-----------|--------------------------------|
|-----------|--------------------------------|

|                  | Major Farming situation                          | Crop/cropping system            | Crop management                                                                                                             | Soil nutrient & moisture conservation measures                                                                                         |
|------------------|--------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Terminal drought | Shallow black soils and red sandy soils (kharif) | Maize                           | Harvest the crop at physiological maturity and go for early rabi crop. Harvest for fodder purpose in case of severe drought | Spraying of anti transpirants like 5% Kaolin and provide supplemental irrigation                                                       |
|                  |                                                  | Bajra                           | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  |                                                  | Sunflower                       | --do--                                                                                                                      |                                                                                                                                        |
|                  |                                                  | Sorghum                         | --do--                                                                                                                      | After harvest of crops early at physiological maturity, take up sowing of rabi sorghum and Bengal gram during Sept 1 <sup>st</sup> F.N |
|                  |                                                  | Pigeon pea                      | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  |                                                  | Groundnut                       | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  |                                                  | Bajra+Pigeonpea (2:1)           | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  |                                                  | Setaria + Pigeonpea (4:2)       | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  |                                                  | Sorghum+Groundnut (2:4)         | --do--                                                                                                                      | --do--                                                                                                                                 |
|                  | Deep black soils (rabi)                          | Rabi sorghum                    | -                                                                                                                           | Compartmental bunding                                                                                                                  |
|                  |                                                  | Safflower                       | -                                                                                                                           | --do--                                                                                                                                 |
|                  |                                                  | Cotton                          | -                                                                                                                           |                                                                                                                                        |
|                  |                                                  | Horsegram                       | -                                                                                                                           |                                                                                                                                        |
|                  |                                                  | Sunflower                       | -                                                                                                                           |                                                                                                                                        |
|                  |                                                  | Rabi- Sorghum+Bengal gram (2:1) | -                                                                                                                           | --do--                                                                                                                                 |
|                  |                                                  | Chickpea+Safflower(4:2)         |                                                                                                                             | --do--                                                                                                                                 |

#### Irrigated situation

| Condition                                              | Suggested Contingency measures |                                           |                                                                                                           |                                                                                                             |
|--------------------------------------------------------|--------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|                                                        | Major Farming situation        | Normal Crop/cropping system               | Change in crop/cropping system                                                                            | Agronomic measures                                                                                          |
| Delayed release of water in canals due to low rainfall | Canal irrigated black soil     | Paddy-paddy                               | Follow DSR method of rice cultivation Paddy- Sunflower Paddy-Sesame Use of short duration paddy varieties | Use 4-5 seedlings/hill Add 25% extra Nitrogen Follow narrow spacing (15 cm x 10 cm as against 20 cm x 10cm) |
|                                                        |                                | Bt cotton                                 | No change                                                                                                 | Follow 90 cm x 45 cm spacing as against 90 x 60cm.                                                          |
|                                                        |                                | Paddy-paddy with short duration varieties | Use 35-40 days old seedlings with 4-5 seedlings/hill                                                      |                                                                                                             |

|                                                                             |                             |                             |                                                                  |                                                                                                                                           |
|-----------------------------------------------------------------------------|-----------------------------|-----------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Limited release of water in canals due to low rainfall                      | Canal irrigated black soils | Paddy-Paddy                 | Sunflower-Chickpea Maize-Chickpea Hy. Cotton ( Bt.)              | Alternate furrow irrigation<br>Mulching<br>Deep Intercultivation<br>Foliar application of N & K                                           |
|                                                                             |                             | Bt Hybrid Cotton            | No change                                                        | Raising cotton seedling in polythene bags before release of canal water and transplanting with closer spacing of 90 X 45 cm or 90 x 60 cm |
|                                                                             |                             | Sorghum-Groundnut           | No change                                                        |                                                                                                                                           |
|                                                                             |                             | Pigeonpea                   | No change                                                        | Raising seedling in polythene bags before release of canal water and transplanting with wider spacing of 150 X 90 cm                      |
|                                                                             |                             | Maize-chickpea              | No change                                                        | -                                                                                                                                         |
| Condition                                                                   |                             |                             |                                                                  |                                                                                                                                           |
|                                                                             | Major Farming situation     | Normal Crop/cropping system | Change in crop/cropping system                                   | Agronomic measures                                                                                                                        |
| Non release of water in canals under delayed onset of monsoon in catchments | Canal irrigated black soils | Paddy-paddy                 | Direct seeded paddy-sesame Prefer short duration paddy varieties | Aerobic system of paddy cultivation                                                                                                       |
|                                                                             |                             | Maize- Chickpea             | Sunflower/Rabi Sorghum/Chickpea                                  |                                                                                                                                           |
|                                                                             |                             | Maize- Coriander            | Bengal gram/Sesame/Sunflower                                     |                                                                                                                                           |
|                                                                             |                             | Bt Hybrid Cotton            | Chickpea/Coriander/Rabi Sorghum                                  | Coriander is a short duration crop grown on residual moisture in black soils.                                                             |
| Condition                                                                   |                             |                             |                                                                  |                                                                                                                                           |
|                                                                             | Major Farming situation     | Normal Crop/cropping system | Change in crop/cropping system                                   | Agronomic measures                                                                                                                        |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon    | Canal irrigated black soils | Paddy-Paddy                 | Direct seeded Paddy-Sesame Use of short duration paddy varieties | Aerobic system of paddy cultivation                                                                                                       |
|                                                                             |                             | Maize- Chickpea             | Sunflower/Rabi Sorghum/Chickpea                                  |                                                                                                                                           |
|                                                                             |                             | Maize- Coriander            | Chickpea /Sesame /Sunflower                                      |                                                                                                                                           |
|                                                                             |                             | Bt Hybrid Cotton            | Chickpea/Coriander/Rabi Sorghum                                  |                                                                                                                                           |
| Condition                                                                   |                             |                             |                                                                  |                                                                                                                                           |
|                                                                             | Major Farming situation     | Normal Crop/cropping system | Change in crop/cropping system                                   | Agronomic measures                                                                                                                        |
| Insufficient groundwater recharge due to low rainfall                       | Black soil                  | Paddy-paddy                 | Sunflower /Chickpea /Sesame /rabi sorghum                        | -                                                                                                                                         |
|                                                                             |                             | Cotton                      | Sunflower/Sesame/Rabi sorghum                                    | -                                                                                                                                         |

|  |  |       |      |   |
|--|--|-------|------|---|
|  |  | Maize | -do- | - |
|--|--|-------|------|---|

### Resource management technologies

#### In-situ rainwater management

| S.No. | Practice          | Crops                                                         |
|-------|-------------------|---------------------------------------------------------------|
| 1     | Ridges and furrow | Pigeonpea, Greengram, Pearl millet, Sunflower                 |
| 2     | Deep ploughing    | Pigeonpea, Pearl millet, Rabi sorghum, chickpea and safflower |
| 3     | Compartment bund  | Sunflower, Rabi sorghum, chickpea and safflower               |

#### Ex-situ rainwater management

3. Farm pond based supplemental irrigations for crops.
4. Recharge of open wells by feeder channels/pipes

# Actionable Comprehensive Plans for Contingency

|       |           |          |               |
|-------|-----------|----------|---------------|
| State | KARNATAKA | District | CHIK BALLAPUR |
|-------|-----------|----------|---------------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 417.8                | More than 19%          | Less than 338.418      |
| June         | 64.8                 |                        |                        |
| July         | 82.7                 |                        |                        |
| August       | 103.4                |                        |                        |
| September    | 166.9                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 48029  | Gross irrigated area: | 73356  |
| Net Rainfed area    | 122874 | Gross rainfed area    | 126023 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | -     | -     |
| Wells                | 48029 | 73356 |
| Tanks                | -     | -     |
| Other sources        | -     | -     |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 676             | 635                 | 41                |
| 2    | Jowar     | 450             | 159                 | 291               |
| 3    | Maize     | 62019           | 10049               | 51970             |
| 4    | Bajra     | 69              | 6                   | 63                |
| 5    | Ragi      | 42944           | 4256                | 38688             |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 2148            | 13                  | 2135              |
| 2    | Groundnut      | 17753           | 2276                | 15477             |
| 3    | Sesamum        | 5               | 3                   | 2                 |
| 4    | SOyabean       | 20              | 20                  | 0                 |
| 5    | Sunflower      | 266             | 266                 | 0                 |
| 6    | Castor         | 18              |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 621             | 601                 | 20                |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 13              |                     | 13                |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 112             | 112                 | 0                 |
| 2    | Tobacco            | 2               | 2                   | 0                 |
| 3    | Guar seed          | -               |                     | 616               |
| 4    | Other Fodder crops | 1990            | 1374                | 616               |

#### Crop Plan- Beginning of the season

| Condition                                           |                         |                                                                                 | Suggested Contingency measures                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------|-------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Early season drought (delayed onset)                | Major Farming situation | Normal Crop/cropping system                                                     | Change in crop/cropping system                                                                                                                                                                        | Agronomic measures                                                                                                                                                                                                                                                                                                              |
| Delay by 4 weeks<br><b>July 1<sup>st</sup> week</b> | Red loamy<br>Sandy loam | Finger millet+<br>Pigeonpea / Field<br>bean/Akkadi<br>Groundnut + Pigeon<br>pea | Finger millet: MR-1, MR-6<br>Pigeon pea: BRG-1, 2, 5<br>Field bean: HA-4, HA-5<br>Groundnut: KCG-6, GKVK-5                                                                                            | <ul style="list-style-type: none"> <li>❖ Optimum seed rate and recommended spacing</li> <li>❖ <i>In-situ</i> moisture conservation</li> <li>❖ Wider spacing (120cm x 30 cm) in Pigeon pea</li> <li>❖ Balanced nutrition with emphasis on recommended potassium</li> <li>❖ Contour cultivation</li> <li>❖ Tied ridges</li> </ul> |
|                                                     |                         | Castor/ Sesamum/<br>Greengra                                                    | Finger millet + Pigeonpea<br>Maize + Pigeon pea<br>Finger millet: MR-1, MR-6<br>Pigeon pea: BRG-1, 2, 5<br>Maize: Hema, Nityashree<br>Little millet: Co-2, OLM-201<br>Foxtail millet: RS-118, K-221-1 |                                                                                                                                                                                                                                                                                                                                 |
|                                                     |                         | Pigeonpea Sole crop                                                             | Pigeonpea (BRG-1, 2 and 5) + Field bean (HA-4, 5)                                                                                                                                                     | Contour cultivation, small section bunds                                                                                                                                                                                                                                                                                        |

|  |  |               |  |  |
|--|--|---------------|--|--|
|  |  | Hybrid Napier |  |  |
|--|--|---------------|--|--|

#### Contingency measures- Mid season

| Condition                                                                          |                         |                                                                                                                | Suggested Contingency measures                                                                                                                                                                        |                                                                                                                        |
|------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | Major Farming situation | Normal Crop/cropping system                                                                                    | Change in crop/cropping system                                                                                                                                                                        | Agronomic measures                                                                                                     |
| <b>At vegetative stage</b>                                                         | Red loamy<br>Sandy loam | Finger millet +<br>Pigeonpea<br>Finger millet +<br>Fieldbean<br>Fingermillet + Niger<br>Pigeon pea/ Field bean | Thinning and Gap filling<br>Grazing leaf tips,<br>Postponement of top dressing<br>Life saving irrigation, if available<br>Earthing up.<br>Protective irrigation of stored water if any in farm ponds. | Conservation Furrow<br>Mulching<br>Shallow inter-cultivation to eradicate weeds<br>Use of moderate amount of nutrients |

#### Contingency measures- End of the season

| Condition                    | Suggested Contingency measures |                                                                                                         |                                                                                                                           |                                                                                                |                                                 |
|------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------|
|                              | Major Farming situation        | Crop/cropping system                                                                                    | Crop management                                                                                                           | Rabi Crop planning                                                                             | Remarks on Implementation                       |
| <b>At reproductive stage</b> | Red loamy<br>Sandy loam        | Finger millet +<br>Pigeon pea<br>Finger millet +<br>Field bean<br>Finger millet +                       | Protective irrigation from farm pond<br>Weeding and Weed mulching<br>Harvesting for fodder                                | <i>In-situ</i> moisture conservation                                                           | Farm ponds through IWSM programme               |
| <b>Terminal drought</b>      | Red loamy<br>Sandy loam        | Finger millet +<br>Pigeon pea<br>Finger millet +<br>Field bean<br>Fingermillet +<br>Niger<br>Sunflower, | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean | Cowpea, Sunflower, Field bean, Horse gram (October month)<br>Harvest at physiological maturity | Harvesting and Threshing implements through CHC |

#### 2.1.2 Irrigated situation

| Condition                                                                |                                          |                             | Suggested Contingency measures                                                |                                                                                   |
|--------------------------------------------------------------------------|------------------------------------------|-----------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                                                          | Major Farming situation                  | Normal Crop/cropping system | Change in crop/cropping system                                                | Agronomic measures                                                                |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Deep to moderately deep to red clay soil | Paddy: Jaya, Mandya Vijaya  | Aerobic rice / SRI: IR 20, KRH-4, IR-30864, MAS 946-1, Anegha, Semi dry crops | Seed treatment<br>Weed management with cono weeder.                               |
| Insufficient groundwater recharge due to low rainfall                    | Deep to moderately deep to red clay soil | Maize                       | <b>Maize</b> Nityashree, Hema Vegetables                                      | Intercultivation / Earthing up<br>Balanced nutrition<br>Critical stage irrigation |

#### Resource management technologies

##### In-situ moisture conservation practices

| S.No. | Practice                                                                      | Crops               |
|-------|-------------------------------------------------------------------------------|---------------------|
| 1     | Deep ploughing to a depth of 15-30 cm                                         | All crops           |
| 2     | Application of FYM and incorporation of green manure crops                    | All crops           |
| 3     | Application of tank silt, contour cultivation with vegetative barriers        | All crops           |
| 4     | Deep tillage to a depth of 25-30 cm using MB plough graded ridges and furrows | Maize and Sunflower |

##### Ex-situ rainwater management

- Farm pond based supplemental irrigations to crops.

## Actionable Comprehensive Plans for Contingency

|       |           |          |             |
|-------|-----------|----------|-------------|
| State | KARNATAKA | District | CHIKMAGALUR |
|-------|-----------|----------|-------------|

### Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 1501                 | More than 19%          | Less than 1215.81      |
| June         | 357.1                |                        |                        |
| July         | 511.7                |                        |                        |
| August       | 409.8                |                        |                        |
| September    | 222.4                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

### Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 115912 | Gross irrigated area: | 118563 |
| Net Rainfed area    | 212866 | Gross rainfed area    | 246759 |

### Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | 7645  | 7645  |
| Wells                | 73912 | 76563 |
| Tanks                | 3244  | 3244  |
| Other sources        | 31111 | 31111 |

### Crop Profile (Kharif)

#### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 8684            | 2044                | 6640              |
| 2    | Jowar     | 1478            | 332                 | 1146              |
| 3    | Maize     | 6988            | 140                 | 6848              |
| 4    | Bajra     | 11              |                     | 11                |
| 5    | Ragi      | 57252           | 801                 | 56451             |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 147             | 3                   | 144               |
| 2    | Groundnut      | 1544            | 56                  | 1488              |
| 3    | Sesamum        | 222             | 104                 | 118               |
| 4    | SOyabean       | 15              | 13                  | 2                 |
| 5    | Sunflower      | 345             |                     | 345               |
| 6    | Castor         | 7               |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 1956            | 58                  | 1898              |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 1               |                     | 1                 |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 138             | 51                  | 87                |
| 2    | Tobacco            | 3               |                     | 3                 |
| 3    | Guar seed          | -               |                     | 625               |
| 4    | Other Fodder crops | 707             | 82                  | 625               |

## Crop Plan- Beginning of the season

| Condition                            |                         |                      | Suggested Contingency measures                             |                                     |
|--------------------------------------|-------------------------|----------------------|------------------------------------------------------------|-------------------------------------|
| Early season drought (delayed onset) | Major Farming situation | Crop/cropping system | Change in crop/cropping system                             | Agronomic measures                  |
| Delay by 4 weeks July 1st week       | Upland Paddy            | Transplanted Paddy   | Prefer short duration varieties Thunga, Tanu, KRH-1, IR-20 | Handweeding 40-50 days after sowing |
|                                      | Midland paddy           | -do-                 | Prefer varieties Thunga, KHP-10 and KHP-5                  | -                                   |

|  |                    |      |                                                        |                                                                                                                                                                                                                                                                                                          |
|--|--------------------|------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Lowlandpaddy       | -do- | Prefer varieties Jeerigesanna,KH P-9,KHP-5,CTH-1.CTH-2 | -                                                                                                                                                                                                                                                                                                        |
|  | Redsandyloam soils | Ragi | Prefer varietiesMR-1,MR-6,Indaf-8,L-5, GPU-28andHR-911 | <ul style="list-style-type: none"> <li>• Use20%higherseedrate thantherecommended</li> <li>• Seedhardeningby storingtheseedsina gunnybagfor36-40 hoursinwellaerated placeaftersoakingit for 24hoursinwater then keepaweightover gunnybag</li> <li>• Thinningupto30% dependingonthe severityand</li> </ul> |

#### Contingency measures- Mid season

| Condition                         |                               |                     | SuggestedContingencymeasures                                                   |                                                                                                                                                                                                   |
|-----------------------------------|-------------------------------|---------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Midseasondrought (long dry spell) | MajorFarming situation        | Crop/croppingsystem | Crop management                                                                | Soil management                                                                                                                                                                                   |
| Atvegetativestage                 | Upland/Midland/ Lowland Paddy | Paddy               | Life saving irrigation predominantly during the critical stages of crop growth | Use rock phosphate As fertilizersource, use of PSB, use of storagewaterin tanks and rivers, reductioninbasal fertilizerdose,weed management, Intercultivation. Splitapplicationof fertilizerdoses |
|                                   | Redsandyloamsoils             | Ragi                | -                                                                              | In-situgreen manuring incorporation,soil mulch,inter cultivation,weed management, reducingplant                                                                                                   |

|  |  |           |                       |                               |
|--|--|-----------|-----------------------|-------------------------------|
|  |  |           |                       | population                    |
|  |  | Sunflower | Thinning and resowing | Repeated intercultivation and |

| Condition                          |                         |                      | Suggested Contingency measures |                 |
|------------------------------------|-------------------------|----------------------|--------------------------------|-----------------|
| Midseason drought (long dry spell) | Major Farming situation | Crop/cropping system | Crop management                | Soil management |
|                                    |                         | Groundnut            |                                | thinning        |

| Condition                          |                              |                      | Suggested Contingency measures                                                             |                                                                |
|------------------------------------|------------------------------|----------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Midseason drought (long dry spell) | Major Farming situation      | Crop/cropping system | Crop management                                                                            | Soil management                                                |
| At reproductive stage              | Upland/Midland/Lowland Paddy | Paddy                | Irrigation at panicle initiation and grain filling stages                                  | Life saving irrigation using storage water from tank and river |
|                                    | Red sandy loam soils         | Ragi                 | Protective irrigation at ear head formation and grain filling stages                       | -do-                                                           |
|                                    |                              | Sunflower            | Critical stages of irrigation during flowering, anthesis and grain filling stages          | -do-                                                           |
|                                    |                              | Groundnut            | Earthing up before 40 days after sowing<br>Life saving irrigation<br>Thinning of the crops | Mulching of the soil to be done to conserve moisture           |

#### Contingency measures- End of the season

| Condition        |                              |                      | Suggested Contingency measures                      |                                                                                                                                                           |
|------------------|------------------------------|----------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminal drought | Major Farming situation      | Crop/cropping system | Crop management                                     | Rabi Crop planning                                                                                                                                        |
|                  | Upland/Midland/Lowland Paddy | Paddy                | Harvest the crop even at 75% physiological maturity | Cowpea, Greengram, Field bean, Soybean<br>Greengram varieties PDM-84-178, PS-16<br>Soybean varieties KHS B-2, KB-79<br>Field bean varieties HA-3 and HA-4 |

|  |                   |           |                                                                       |                                                                          |
|--|-------------------|-----------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|
|  | Redsandyloamsoils | Ragi      | Harvestatphysiologic<br>al maturity stage                             | HorsegramandJowar                                                        |
|  |                   | Sunflower | -do-                                                                  | Horsegramandfodder<br>Jowar                                              |
|  |                   | Groundnut | Lifesavingirrigation<br><br>Harvestatphysiologic<br>al maturity stage | Cowpea, Fodder<br>sorghum,Fieldbea<br>n,<br>Horsegram(Octob<br>er month) |

### Resource management technologies

Contour bunds, trench-cum-bunds, farm ponds, and groundwater recharge structures.

# Actionable Comprehensive Plans for Contingency

|       |           |          |             |
|-------|-----------|----------|-------------|
| State | KARNATAKA | District | CHITRADURGA |
|-------|-----------|----------|-------------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 296.2                | More than 19%          | Less than 239.922      |
| June         | 56.3                 |                        |                        |
| July         | 55.6                 |                        |                        |
| August       | 63.4                 |                        |                        |
| September    | 120.9                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 156440 | Gross irrigated area: | 207163 |
| Net Rainfed area    | 267345 | Gross rainfed area    | 331766 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 198    | 198    |
| Wells                | 156142 | 206865 |
| Tanks                | 72     | 72     |
| Other sources        | 28     | 28     |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 706             | 706                 | 0                 |
| 2    | Jowar     | 1543            | 643                 | 900               |
| 3    | Maize     | 134493          | 30699               | 103794            |
| 4    | Bajra     | 1327            | 329                 | 998               |
| 5    | Ragi      | 44606           | 10550               | 34056             |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 15484           | 61                  | 15423             |
| 2    | Groundnut      | 106138          | 7005                | 99133             |
| 3    | Sesamum        | 37              | 1                   | 36                |
| 4    | SOyabean       | 34              | 14                  | 20                |
| 5    | Sunflower      | 1413            | 141                 | 1272              |
| 6    | Castor         | 686             |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 9035            | 6933                | 2102              |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 40              |                     | 40                |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 32              | 32                  | 0                 |
| 2    | Tobacco            | 31              | 31                  | 0                 |
| 3    | Guar seed          | -               |                     | 4315              |
| 4    | Other Fodder crops | 5624            | 1309                | 4315              |

#### Crop Plan- Beginning of the season

| Condition                           |                         |                         | SuggestedContingencymeasures  |                                                                                                                                                                                                                                    |
|-------------------------------------|-------------------------|-------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Early season drought(delayed onset) | MajorFarm ing situation | Crop/croppingsystem     | Change in crop/croppingsystem | Agronomicmeasures                                                                                                                                                                                                                  |
| Delayby4weeks July 1st week         | Redsoils                | Groundnut               | Nochange                      | Fingermillet: <ul style="list-style-type: none"> <li>Drysowing8-10days before rains with 15-20% higher seed rate</li> <li>Nursery-transplanting (Longdurationvarieties of Finger millet)</li> <li>Seedhardening-(18hrs.</li> </ul> |
|                                     |                         | Groundnut+Pigeonpea     | NoChange                      |                                                                                                                                                                                                                                    |
|                                     |                         | Groundnut+Castor        | NoChange                      |                                                                                                                                                                                                                                    |
|                                     |                         | Fingermillet+Field bean | NoChange                      |                                                                                                                                                                                                                                    |
|                                     |                         | Fingermillet+Pigeon pea | NoChange                      |                                                                                                                                                                                                                                    |

|  |            |                   |                                                                                        |                                                                                                                                                                         |
|--|------------|-------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |            | PigeonPeasolecrop | NoChange                                                                               | soaking in water followed by 24 hrs. shade drying <ul style="list-style-type: none"> <li>repeatedIntercultivation</li> <li>Conservationfurrow</li> </ul>                |
|  | Blacksoils | Sunflower         | Sunflower+PigeonPea<br>Sunflower:(KBSH-1, 41, 42, 44 & 53)<br>PigeonPea(TTB-7&BRG-1,2) | <ul style="list-style-type: none"> <li>Followinsitumoisure conservationpractices</li> <li>Conservationfurrow</li> <li>Widerspacing (90cmx30cm) forPigeon pea</li> </ul> |
|  |            | Maize             | NoChange                                                                               |                                                                                                                                                                         |
|  |            | Maize+Castor      | Maize+Castor(DCS-9 & 48-1)                                                             | <ul style="list-style-type: none"> <li>Deadfurrows,</li> <li>Ridgesandfurrows</li> </ul>                                                                                |
|  |            | Maize+fieldbean   | Nochange                                                                               | <ul style="list-style-type: none"> <li>CompartmentalBunding</li> <li>Deepploughing</li> </ul>                                                                           |

#### Contingency measures- Mid season

| Contingency measures - mid season |                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                |                                                                                                            |
|-----------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Condition                         |                         |                                                                                                                                                                                                               | Suggested Contingency measures                                                                                                                                                                                                                                                 |                                                                                                            |
| Midseason drought(long dry spell) | Major Farming situation | Crop/cropping system                                                                                                                                                                                          | Crop management                                                                                                                                                                                                                                                                | Soil management                                                                                            |
| At vegetative stage               | Red soils               | <ul style="list-style-type: none"><li>• Groundnut</li><li>• Groundnut+Castor</li><li>• Groundnut+Pigeon Pea</li><li>• Fingermillet+Pigeon pea</li><li>• Fingermillet+Fieldbean</li><li>• Pigeon pea</li></ul> | Fingermillet<br>Thinning, Grazing leaf tips, postponement of topdressing<br>Life saving irrigation<br><br>Groundnut<br>Earthing up, apply Gypsum after receipt of rains<br>Life saving irrigation<br><br>Weeding and intercultivation<br><br>Foliar application (2% DAP spray) | Intercultivation<br><br>soil and stubble mulching<br><br>opening of conservation Furrow<br><br>Earthing up |
|                                   | Black soils             | <ul style="list-style-type: none"><li>• Maize</li><li>• Sunflower+Pigeon Pea</li><li>• Maize+pigeon pea</li><li>• Maize+fieldbean</li><li>• Maize+Castor</li></ul>                                            | Thinning<br>Earthing up<br>Life saving irrigation<br><br>Weeding and Intercultivation<br><br>Harvest for fodder                                                                                                                                                                |                                                                                                            |
| Condition                         |                         |                                                                                                                                                                                                               | Suggested Contingency measures                                                                                                                                                                                                                                                 |                                                                                                            |

| Midseason drought<br>(long dry spell) | Major Farming situation | Crop/cropping system                                                                                                                                                                                                | Crop management                                                                                                                                                                                                                                                                                                      | Soil management                                                               |
|---------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| At reproductive stage                 | Red soils               | <ul style="list-style-type: none"> <li>Groundnut</li> <li>Groundnut + Castor</li> <li>Groundnut + Pigeon Pea</li> <li>Finger millet + Pigeon pea</li> <li>Finger millet + Field bean</li> <li>Pigeon pea</li> </ul> | <p>Thinning</p> <p>Life saving irrigation<br/>Spraying of anti transpirants<br/>Weeding and Weed mulching<br/>Removal of alternative row<br/>Could be harvested for fodder purpose</p> <p>Life saving irrigation<br/>Weeding and Weed mulching</p> <p>Pigeon pea could be harvested for vegetable/fodder purpose</p> | <ul style="list-style-type: none"> <li>Blade harrowing if possible</li> </ul> |
|                                       | Black soils             | <p>Maize</p> <p>Sunflower + Pigeon Pea</p> <p>Maize + pigeon pea</p> <p>Maize + field bean</p> <p>Maize + Castor</p>                                                                                                | <p>Life saving irrigation</p> <p>Spraying of anti transpirants</p> <p>Pigeon pea and field bean could be harvested for Vegetable/fodder purpose</p> <p>Maize could be harvested for fodder purpose</p>                                                                                                               |                                                                               |

#### Contingency measures- End of the season

| Contingency measures- End of the season |                         |                           |                                                                                    |                            |
|-----------------------------------------|-------------------------|---------------------------|------------------------------------------------------------------------------------|----------------------------|
| Condition                               |                         |                           | Suggested Contingency measures                                                     |                            |
| Terminal drought                        | Major Farming situation | Crop/cropping system      | Crop management                                                                    | Rabi Crop planning         |
|                                         | Red soils               | Groundnut+castor          | Lifesaving irrigation<br><br>Pigeon pea/field bean harvested for vegetable purpose | Horse gram (October month) |
|                                         |                         | Groundnut+ Pigeon pea     | Harvest at physiological maturity stage                                            |                            |
|                                         |                         | Finger millet+ Pigeon pea | harvest for fodder                                                                 |                            |
|                                         |                         | Finger millet+ Field bean |                                                                                    |                            |
|                                         |                         | Black soils               | Maize+ Castor                                                                      |                            |
|                                         | Maize+ field bean       |                           | Pigeon pea/field bean harvested for vegetable purpose                              |                            |

|                                                                      |                               |                     |                                                                                      |                                                                                                                                   |
|----------------------------------------------------------------------|-------------------------------|---------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|                                                                      |                               | Sunflower+PigeonPea | Harvestatphysiological maturity stage                                                |                                                                                                                                   |
|                                                                      |                               | Maize+pigeon pea    | harvestforfodder                                                                     |                                                                                                                                   |
| Condition                                                            |                               |                     | SuggestedContingencymeasures                                                         |                                                                                                                                   |
|                                                                      | MajorFarming situation        | Crop/croppingsystem | Change in crop/cropping system                                                       | Agronomicmeasures                                                                                                                 |
| Lackofinflowsinto tanks due to insufficient/delayed onset of monsoon | Tankirrigation in Black soils | Paddy               | AerobicPaddy,Sunflower, Ragi,Maizeandvegetables<br><br>AerobicPaddy:MAS-946-1 MAS-26 | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> <li>Dripirrigation</li> </ul> |

|                                                    |                                           |                     |                                                                                      |                                                                                                           |
|----------------------------------------------------|-------------------------------------------|---------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Condition                                          |                                           |                     | SuggestedContingencymeasures                                                         |                                                                                                           |
|                                                    | MajorFarming situation                    | Crop/croppingsystem | Changeincrop/cropping system                                                         | Agronomicmeasures                                                                                         |
| Insufficient groundwater rechargeduetolow rainfall | Tube well irrigationinred soil/BlackSoils | Paddy               | AerobicPaddy,Sunflower, Ragi,Maizeandvegetables<br><br>AerobicPaddy:MAS-946-1 MAS-26 | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> </ul> |

#### Irrigated situation

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

| Condition                                                                |                                |                      | Suggested Contingency measures                                                              |                                                                                                                                    |                                         |
|--------------------------------------------------------------------------|--------------------------------|----------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
|                                                                          | Major Farming situation        | 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 | Tank irrigation in Black soils | Paddy                | Aerobic Paddy, Sunflower, Ragi, Maize and vegetables<br><br>Aerobic Paddy: MAS-946-1 MAS-26 | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> <li>Drip irrigation</li> </ul> | Seeds through KSSC, NFSM, NHM, & NAREGA |

| Condition                                             |                                               |                      | Suggested Contingency measures                                                              |                                                                                                                                    |                                         |
|-------------------------------------------------------|-----------------------------------------------|----------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
|                                                       | Major Farming situation                       | Crop/cropping system | Change in crop/cropping system                                                              | Agronomic measures                                                                                                                 | Remarks on Implementation               |
| Insufficient groundwater recharge due to low rainfall | Tube well irrigation in red soil /Black Soils | Paddy                | Aerobic Paddy, Sunflower, Ragi, Maize and vegetables<br><br>Aerobic Paddy: MAS-946-1 MAS-26 | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> <li>Drip irrigation</li> </ul> | Seeds through KSSC, NFSM, NHM, & NAREGA |
| <b>Any other condition (specify)</b>                  | -                                             |                      |                                                                                             |                                                                                                                                    |                                         |

#### Resource management technologies

Watershed-based soil and water conservation measures such as contour bunding, trench-cum-bunds, farm ponds, nala bunds, and groundwater recharge structures.

# Actionable Comprehensive Plans for Contingency

|       |           |          |                |
|-------|-----------|----------|----------------|
| State | KARNATAKA | District | DAKSHIN KANNAD |
|-------|-----------|----------|----------------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 3332.4               | More than 19%          | Less than 2699.244     |
| June         | 944                  |                        |                        |
| July         | 1116.1               |                        |                        |
| August       | 839.6                |                        |                        |
| September    | 432.7                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 149769 | Gross irrigated area: | 150720 |
| Net Rainfed area    | 14811  | Gross rainfed area    | 14852  |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | -      | -      |
| Wells                | 125490 | 126385 |
| Tanks                | -      | -      |
| Other sources        | 24279  | 24335  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 4533            | 0                   |                   |
| 2    | Jowar     | -               | -                   |                   |
| 3    | Maize     | 0               |                     |                   |
| 4    | Bajra     | -               |                     |                   |
| 5    | Ragi      | -               |                     |                   |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | -               |                     |                   |
| 2    | Groundnut      | -               |                     |                   |
| 3    | Sesamum        | -               |                     |                   |
| 4    | SOyabean       | -               |                     |                   |
| 5    | Sunflower      | -               |                     |                   |
| 6    | Castor         | -               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | -               |                     |                   |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | -               |                     |                   |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 1               | 1                   | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 311               |
| 4    | Other Fodder crops | 394             | 83                  | 311               |

#### Crop Plan- Beginning of the season

| Condition                                 |                              |                                     | SuggestedContingencymeasures                   |                                                                                                                               |
|-------------------------------------------|------------------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Earlyseason drought(delayed onset)        | MajorFarming situation       | Normal Crop / Cropping system       | Changeincrop/cropping system including variety | Agonomicmeasures                                                                                                              |
| Delayby4weeks (July 1 <sup>st</sup> week) | Shallow,lateritic, acid soil | Paddy                               | PreferJyothicultivar                           | <ul style="list-style-type: none"> <li>Drumseeded sowing</li> <li>Protective irrigation</li> </ul>                            |
|                                           |                              | Vegetables (Ridge gourd,Bhendi,etc) | Nochange                                       | <ul style="list-style-type: none"> <li>Protective irrigation</li> <li>Mulching</li> <li>Use of more organicmanures</li> </ul> |

#### Contingency measures- Mid season

| Condition                                                                         |                               |                                       | Suggested Contingency measures                                                                                                              |                                                             |
|-----------------------------------------------------------------------------------|-------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5mm) period) | Major Farming situation       | Normal Crop/cropping system           | Crop management                                                                                                                             | Soil nutrient & moisture conservation measures              |
| At vegetative stage                                                               | Shallow, lateritic, acid soil | Paddy                                 | Insect pest management (Leaf folder) spraying of Quinalphos 2ml / litre of water Postponement of fertilizer top dress Protective irrigation | Scooping of top soil                                        |
|                                                                                   |                               | Vegetables (Ridge gourd, Bhendi, etc) | Protective irrigation                                                                                                                       | Mulching<br>Spraying of anti-transpirant (Kaolin @ 6% w/v ) |
| Condition                                                                         |                               |                                       | Suggested Contingency measures                                                                                                              |                                                             |
| Mid season drought (long dry spell)                                               | Major Farming situation       | Normal Crop/cropping system           | Crop management                                                                                                                             | Soil nutrient & moisture conservation measures              |
| At flowering/ fruiting stage                                                      | Shallow, lateritic, acid soil | Paddy                                 | Protective irrigation                                                                                                                       | Protective irrigation using available seepage water         |
|                                                                                   |                               | Vegetables (Ridge gourd, Bhendi, etc) |                                                                                                                                             |                                                             |

#### Contingency measures- End of the season

| Condition                                      |                               |                                       | Suggested Contingency measures                                        |                                                                                |
|------------------------------------------------|-------------------------------|---------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Terminal drought (Early withdrawal of monsoon) | Major Farming situation       | Normal Crop/cropping system           | Crop management                                                       | Rabi Crop planning                                                             |
|                                                | Shallow, lateritic, acid soil | Paddy                                 | Protective irrigation using available seepage water                   | Blackgram, Cowpea, Vegetables – Coccinia, Ash gourd, Brinjal, Cucumber, Chilli |
|                                                |                               | Vegetables (Ridge gourd, Bhendi, etc) | Protective irrigation in alternate rows using available seepage water | -                                                                              |

#### Resource management technologies

Rainwater harvesting structures , Farm ponds (agri ponds), Percolation pits, Borewell recharge structures

## Actionable Comprehensive Plans for Contingency

|       |           |          |            |
|-------|-----------|----------|------------|
| State | KARNATAKA | District | DAVANAGERE |
|-------|-----------|----------|------------|

### Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 387.2                | More than 19%          | Less than 313.632      |
| June         | 78.4                 |                        |                        |
| July         | 92.5                 |                        |                        |
| August       | 90.5                 |                        |                        |
| September    | 125.8                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

### Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 167905 | Gross irrigated area: | 203172 |
| Net Rainfed area    | 129833 | Gross rainfed area    | 139938 |

### Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 24986  | 27759  |
| Wells                | 136675 | 166877 |
| Tanks                | 1330   | 1462   |
| Other sources        | 4914   | 7074   |

### Crop Profile (Kharif)

#### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 53557           | 53557               | 0                 |
| 2    | Jowar     | 138             | 80                  | 58                |
| 3    | Maize     | 135870          | 14765               | 121105            |
| 4    | Bajra     | 144             | 35                  | 109               |
| 5    | Ragi      | 16168           | 10472               | 5696              |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 612             | 28                  | 584               |
| 2    | Groundnut      | 3712            | 952                 | 2760              |
| 3    | Sesamum        | 2               | 2                   | 0                 |
| 4    | SOyabean       | 86              | 61                  | 25                |
| 5    | Sunflower      | 1523            | 373                 | 1150              |
| 6    | Castor         | 17              |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 407             | 151                 | 256               |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 23              |                     | 23                |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 1169            | 1169                | 0                 |
| 2    | Tobacco            | 81              | 81                  | 0                 |
| 3    | Guar seed          | -               |                     | 75                |
| 4    | Other Fodder crops | 507             | 432                 | 75                |

## Crop Plan- Beginning of the season

| Condition                               |                           |                             | SuggestedContingencymeasures   |                                                                                                                                                                        |
|-----------------------------------------|---------------------------|-----------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Early season drought(delayed onset)     | Major Farmin g situati on | Normal Crop/cropping system | Change in crop/cropping system | Agronomicmeasures                                                                                                                                                      |
| Delayby4weeks July 1 <sup>st</sup> week | Redsand y soils           | Maize                       | Maize + Redgram(BRG-2)         | <ul style="list-style-type: none"> <li>Selecttheshortdurat ion pulses</li> <li>Sowingofthemaizein60x30 cm spacing</li> <li>Applicationoftheorga nic manures</li> </ul> |

|  |                                |                                                     |                                                                                                 |                                                                                                                                                                                                                                                 |
|--|--------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Deep to medium deep black soil | Finger millet + Avare Finger millet + Redgram (8:2) | Finger millet + Avare (8:1) Preferred medium to short duration varieties of Ragi GPU-48, GPU-45 | In Finger millet Sowing with high seed rate [20%] than recommendation                                                                                                                                                                           |
|  |                                | Redgram                                             | Finger millet (GPU-28) + Redgram (BRG-2) (8:1)                                                  | Nursery (Transplanting of long duration finger millet varieties: Paga di lines) If we want to go for sowing of long duration Ragi varieties like Indof-8, MR-1, MR-6, HR-911 (110-115 days). It is better to make nursery to get higher yields. |
|  |                                | Maize                                               | Maize + Redgram (BRG-2)                                                                         | <ul style="list-style-type: none"> <li>Soaking these seeds overnight and sowing with the closer spacing (45x30)</li> </ul>                                                                                                                      |
|  |                                | Cotton                                              | Sunflower/Maize/Redgram                                                                         | Sowing of the sunflower or maize instead of cotton. Medium duration varieties                                                                                                                                                                   |
|  |                                | Sunflower                                           | Sunflower (KBSH-53) + Redgram                                                                   | Soaking of these seeds in the water and dibbling two seeds per hill.                                                                                                                                                                            |

#### Contingency measures- Mid season

| Condition                                                                           |                                 |                             | Suggested Contingency measures                                                                                                                                                                                                       |                                                                                                                                   |
|-------------------------------------------------------------------------------------|---------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (> 2.5 mm) period) | Major Farming situation         | Normal Crop/cropping system | Crop management                                                                                                                                                                                                                      | Soil nutrient & moisture conservation measures                                                                                    |
| At vegetative stage                                                                 | Red sandy soils                 | Maize                       | <ul style="list-style-type: none"> <li>Split application of the nitrogen</li> <li>Mulching with organic to extend the period of moisture availability.</li> <li>Thin out the 25% of the crop and use them as a feed/mulch</li> </ul> | <ul style="list-style-type: none"> <li>Repeated intercultivation</li> <li>opening of furrow for the conservation weeds</li> </ul> |
|                                                                                     |                                 | Finger millet + Avare (8:1) | Thinning of crops - Ragi                                                                                                                                                                                                             | Repeated Inter cultivation -                                                                                                      |
|                                                                                     |                                 | Redgram                     | <ul style="list-style-type: none"> <li>Mulching with organic to extend the period of moisture availability.</li> <li>Thin out the 25% of the crop and use them as a feed/mulch</li> </ul>                                            | <ul style="list-style-type: none"> <li>Repeated intercultivation</li> <li>opening of furrow for the conservation weeds</li> </ul> |
|                                                                                     | Deep to medium deep black soils | Maize                       | Complete hoeing and weeding in the field to provide dust mulch                                                                                                                                                                       | Repeated intercultivation                                                                                                         |

|                                                                                   |                                 |                             |                                                                                                    |                                                            |
|-----------------------------------------------------------------------------------|---------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------|
|                                                                                   |                                 | Cotton                      | Take 2 Sprays of planofix 2ml/9 l of water at 45 and 55 DAS in cotton to prevent the square drying | Blade harrowing, Ridges and furrow                         |
|                                                                                   |                                 | Sunflower                   | Intercultivation<br>Protective irrigation                                                          | Mulching                                                   |
| Midseason drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | Major Farming situation         | Normal Crop/cropping system | Crop management                                                                                    | Soil nutrient & moisture conservation measures             |
| At flowering/fruiting stage                                                       | Red sandy soils                 | Maize                       | Protective irrigation                                                                              | Nutrient spray with 2% urea or DAP- Maize, Red gram, Ragi, |
|                                                                                   |                                 | Finger millet + Avare (8:1) |                                                                                                    |                                                            |
|                                                                                   |                                 | Red gram                    |                                                                                                    |                                                            |
|                                                                                   | Deep to medium deep black soils | Maize                       | Repeated Intercultivation                                                                          | Protective irrigation                                      |
|                                                                                   |                                 | Cotton                      |                                                                                                    |                                                            |
|                                                                                   |                                 | Sunflower                   |                                                                                                    |                                                            |

#### Contingency measures- End of the season

| Condition        |                                 |                             | Suggested Contingency measures                                                                                                                                                                                         |                                                                                                                                                                                             |
|------------------|---------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminal drought | Major Farming situation         | Normal Crop/cropping system | Crop management                                                                                                                                                                                                        | Rabi Crop planning                                                                                                                                                                          |
|                  | Red sandy soils                 | Maize                       | <ul style="list-style-type: none"> <li>Protective irrigation - Maize</li> <li>Red gram harvested for vegetable purpose.</li> <li>Harvested at physiological maturity stage harvest for fodder - Maize, Ragi</li> </ul> | <ul style="list-style-type: none"> <li>Horse gram (October month)</li> <li>Safflower, Chickpea, Jowar</li> </ul>                                                                            |
|                  |                                 | Finger millet + Avare (8:1) |                                                                                                                                                                                                                        |                                                                                                                                                                                             |
|                  |                                 | Red gram                    |                                                                                                                                                                                                                        |                                                                                                                                                                                             |
|                  | Deep to medium deep black soils | Maize                       | <ul style="list-style-type: none"> <li>Protective irrigation</li> <li>Harvesting at physiological maturity stage</li> </ul>                                                                                            | Rabi cotton - In some areas of Harapanahalli tq. Farmers will take up sowing of cotton during the month of Oct. those who have protective irrigation facility in red and black cotton soils |
|                  |                                 | Cotton                      |                                                                                                                                                                                                                        |                                                                                                                                                                                             |
|                  |                                 | Sunflower                   |                                                                                                                                                                                                                        |                                                                                                                                                                                             |

#### Irrigated situation

| Condition |                         |                             | Suggested Contingency measures |                    |
|-----------|-------------------------|-----------------------------|--------------------------------|--------------------|
|           | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures |

|                                                                            |                                 |                             |                                                                                                                                    |                                                                      |
|----------------------------------------------------------------------------|---------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Delayed/Limited release of water in canals due to low rainfall             | Deep to medium deep black soils | Rice- Rice                  | <ul style="list-style-type: none"> <li>• Greengram</li> <li>• Maize</li> <li>• Aerobic rice - Upto 25 DAS</li> </ul>               | Alternate furrow irrigation<br>Limited irrigation<br>Drip irrigation |
| Condition                                                                  |                                 |                             |                                                                                                                                    |                                                                      |
|                                                                            | Major Farming situation         | Normal Crop/cropping system | Change in crop/cropping system                                                                                                     | Agronomic measures                                                   |
| Non release of water in canals under delayed onset of monsoon in catchment | Deep to medium deep black soils | Rice-Rice                   | Go for crops like minor millets, groundnut - If the rainfall occurs at the time of sowing and then it will withstand up to 25 days | soil mulching                                                        |
| Condition                                                                  |                                 |                             |                                                                                                                                    |                                                                      |
|                                                                            | Major Farming situation         | Normal Crop/cropping system | Change in crop/cropping system                                                                                                     | Agronomic measures                                                   |
| Lack of inflows into tanks due to insufficient/delayed onset of monsoon    | Deep to medium deep black soils | Rice-Rice                   | Maize + Pigeon pea Ragi + cowpea<br><br>Irrigate crops in critical stages. Vegetative stage, Dough stage, grain filling stage      | Repeated intercultivation<br>Earthing up,                            |
| Condition                                                                  |                                 |                             |                                                                                                                                    |                                                                      |
|                                                                            | Major Farming situation         | Normal Crop/cropping system | Change in crop/cropping system                                                                                                     | Agronomic measures                                                   |
| Insufficient groundwater recharged due to low rainfall                     | Deep to medium deep black soils | Maize<br>Cotton             | No change                                                                                                                          | Adopt alternate row/ furrow irrigation                               |
| Any other condition (specify)                                              |                                 |                             |                                                                                                                                    |                                                                      |

#### Resource management technologies

Compartment bund and farm pond based supplemental irrigation

# Actionable Comprehensive Plans for Contingency

|       |           |          |         |
|-------|-----------|----------|---------|
| State | KARNATAKA | District | DHARWAD |
|-------|-----------|----------|---------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 521.1                | More than 19%          | Less than 422.091      |
| June         | 129.3                |                        |                        |
| July         | 143.9                |                        |                        |
| August       | 116.6                |                        |                        |
| September    | 131.3                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 36471  | Gross irrigated area: | 61760  |
| Net Rainfed area    | 258744 | Gross rainfed area    | 466794 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | 3977  | 5683  |
| Wells                | 28138 | 49297 |
| Tanks                | 258   | 258   |
| Other sources        | 4098  | 6522  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 9814            | 781                 | 9033              |
| 2    | Jowar     | 91              | -                   |                   |
| 3    | Maize     | 86532           | 15208               | 71324             |
| 4    | Bajra     | 10              | 1                   | 9                 |
| 5    | Ragi      | 27              | 2                   | 25                |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 103             |                     | 103               |
| 2    | Groundnut      | 15854           | 659                 | 15195             |
| 3    | Sesamum        | 2               |                     | 2                 |
| 4    | SOyabean       | 35862           | 3314                | 32548             |
| 5    | Sunflower      | 99              | 60                  | 39                |
| 6    | Castor         | 3               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 26592           | 2094                | 24498             |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 3               |                     | 3                 |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 14305           | 14305               | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 503               |
| 4    | Other Fodder crops | 617             | 114                 | 503               |

#### Crop Plan- Beginning of the season

| Condition                                 |                          |                            | SuggestedContingencymeasures                                                                                                     |                                    |
|-------------------------------------------|--------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Earlyseason drought(delayed onset)        | MajorFar ming situation  | NormalCrop/croppings ystem | Changeincrop/croppings ystem                                                                                                     | Agronomicmeasures                  |
| Delayby4weeks (Specify month) July 1 week | Mediumto deep black soil | Maize-Chickpea             | Avoid green gram –rabi Jowar Cropping sequence. Continued upto July 15 <sup>th</sup> Maize + Redgram (4:2)Groundnut+Redgram(4:2) | Ridgesandfurrows method of sowing. |
|                                           |                          | Soybean-RabiJowar          |                                                                                                                                  |                                    |
|                                           |                          | Groundnut–RabiJowar/Wheat  |                                                                                                                                  |                                    |
|                                           |                          | Greengram-RabiJowar/Wheat  |                                                                                                                                  |                                    |
|                                           |                          | Chilli+desiCotton+Onion    |                                                                                                                                  |                                    |

**Contingency measures- Mid season**

| Condition                                                                         |                                 |                                        | Suggested Contingency measures                                         |                                                                                          |
|-----------------------------------------------------------------------------------|---------------------------------|----------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Midseason drought (long dry spell, consecutive 2 weeks rainless (> 2.5mm) period) | Major Farming situation         | Normal Crop/cropping system            | Crop management                                                        | Soil nutrient & moisture conservation measures                                           |
| At vegetative stage                                                               | Medium to deep black soil       | Maize-Chickpea                         | Thinning of alternate rows. Spraying of anti-transpirants Weed control | Surface mulching. Foliar application of N & K (2 %), protective irrigation if available. |
|                                                                                   |                                 | Soybean-Rabi Jowar                     |                                                                        |                                                                                          |
|                                                                                   |                                 | Groundnut-Rabi Jowar/Wheat             |                                                                        |                                                                                          |
|                                                                                   |                                 | Greengram-Rabi Jowar/Wheat             |                                                                        |                                                                                          |
|                                                                                   |                                 | Chilli+desi Cotton+Onion               |                                                                        |                                                                                          |
|                                                                                   |                                 | Hy.Cotton(Bt).                         |                                                                        |                                                                                          |
|                                                                                   | Rainfed drilled paddy situation | Paddy-Greengram/Black gram/ field bean | Weed control                                                           | Intercultivation. Foliar application of N & K                                            |

| Condition                           |                                 |                                       | Suggested Contingency measures                                                                       |                                                              |
|-------------------------------------|---------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Mid season drought (long dry spell) | Major Farming situation         | Normal Crop/cropping system           | Crop management                                                                                      | Soil nutrient & moisture conservation measures               |
|                                     | Medium to deep black soil       | Maize- Chickpea                       | Foliar application of N & K (2%), Harvesting Maize for fodder purpose                                | Intercultivation Compartment                                 |
| At flowering/ fruiting stage        | black soil                      | Soybean-Rabi Jowar                    | Go for early sowing Protective irrigation Plant protection measures for sucking/defoliators/cutworms | Intercultivation Compartment bunding in early harvested crop |
|                                     |                                 | Groundnut-R. Jowar/Wheat              |                                                                                                      | Intercultivation Compartment bunding in early harvested crop |
|                                     |                                 | Greengram-Rabi Jowar/Wheat            |                                                                                                      | Intercultivation Compartment bunding in early harvested crop |
|                                     |                                 | Chilli+ desi Cotton+Onion             |                                                                                                      | -                                                            |
|                                     |                                 | Hy.Cotton(Bt).                        |                                                                                                      | -                                                            |
|                                     | Rainfed drilled paddy situation | Paddy-Greengram/Black gram/field bean | Foliar application of N & K                                                                          |                                                              |

**Contingency measures- End of the season**

| Condition |  |  | Suggested Contingency |
|-----------|--|--|-----------------------|
|-----------|--|--|-----------------------|

|                      |                                          |                                      | measures                                                                                                                                    |                                                                                                        |
|----------------------|------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Terminaldroug<br>ght | MajorFarming<br>situation                | NormalCrop/croppingsys<br>tem        | Cropmanagement                                                                                                                              | RabiCropplanning                                                                                       |
|                      | Mediumtodeep<br>black soil               | Maize-Chickpea                       | Harvesting early at<br>physiologicalmaturityandpl<br>an for earlyrabi cropping.<br>In case of maize, go for<br>green cob/ fodder<br>purpose | RabiSorg<br>hum<br>Chickpea<br>Wheat                                                                   |
|                      |                                          | Soybean-RabiJowar                    |                                                                                                                                             | Safflower<br>Wheat+Safflower/<br>Chickpea( 4:2)<br>RabiSorghum,Chickpea<br>/Linseed(mixed<br>cropping) |
|                      |                                          | Groundnut-R.Jowar/ Wheat             |                                                                                                                                             | RabiSorghum<br>Chickpea Wheat                                                                          |
|                      |                                          |                                      |                                                                                                                                             | safflower                                                                                              |
|                      |                                          | Greengram-<br>RabiJowar/Wheat        |                                                                                                                                             | RabiSorghum<br>Chickpea Wheat<br>safflower                                                             |
|                      |                                          | Chilli+desiCotton+Onion              |                                                                                                                                             | -                                                                                                      |
|                      |                                          | Hy.Cotton( Bt).                      |                                                                                                                                             |                                                                                                        |
|                      |                                          | Paddy-Greengram/<br>Blackgreen gram/ |                                                                                                                                             | Greengram Blackgram<br>Field bean                                                                      |
|                      | Rainfeddrill<br>ed<br>paddysituat<br>ion | fieldbean                            | Harvesting early<br>at<br>physiologicalmat<br>urity                                                                                         |                                                                                                        |
|                      |                                          |                                      |                                                                                                                                             |                                                                                                        |

#### Irrigatedsituation

| Condition                                                        | SuggestedContingencymeasures  |                               |                                                                        |                                        |
|------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------------------|----------------------------------------|
|                                                                  | MajorFarming<br>situation     | NormalCrop/croppingsys<br>tem | Changeincrop/croppingsyste<br>m                                        | Agronomicmeasures                      |
| Delayedreleas<br>e of<br>waterincanals<br>due to low<br>rainfall | Canalirrigatedblack<br>soil   | Maize-Chickpea                | Sunflower-<br>Chickpea                                                 | Alternatefurr<br>ow irrigation         |
|                                                                  |                               | Maize-Wheat                   | Sunflower-<br>Wheat                                                    | Mulching<br>Ridgesandfurrows           |
|                                                                  |                               | Hy.Cotton(Bt).                | Maize-Chickpea<br><br>Maize-Wheat<br><br>Hy.Cotton(Bt.)                |                                        |
| Condition                                                        | SuggestedContingencymeasures  |                               |                                                                        |                                        |
|                                                                  | MajorFarm<br>ing<br>situation | NormalCrop/croppingsys<br>tem | Change in<br>crop/cropping<br>system                                   | Agronomicmeasures                      |
| Limited release<br>of<br>waterincanalsd<br>ue to low             | Canalirrigatedbl<br>ack soil  | Maize-Chickpea                | Sunflower-<br>ChickpeaGreen<br>gram- R. Jowar/<br>Wheat/Chickpea/Saffl | Alternatefurrowirrig<br>ation Mulching |

|                                                                                         |                               |                               |                                                                  |                                                                  |
|-----------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
| rainfall                                                                                |                               |                               | ower                                                             |                                                                  |
|                                                                                         |                               | Maize-Wheat                   | Sunflower/Chickpea                                               | DeepIntercultivation<br>FoliarapplicationofN&K                   |
|                                                                                         |                               | Hy.Cotton(Bt).                | Nochange                                                         | -do-                                                             |
| Condition                                                                               |                               |                               | SuggestedContingencymeasures                                     |                                                                  |
|                                                                                         | MajorFarming<br>situation     | NormalCrop/croppingsy<br>stem | Changeincrop/croppingsyst<br>em                                  | Agronomicmeasures                                                |
| Nonreleaseofwat<br>er in canals<br>under delayed<br>onset of<br>monsoon in<br>catchment | Canalirrigatedblack<br>soil   | Maize-Chickpea                | Chilli+Onion+JayadharCot<br>ton Sunflower-<br>Safflower/Chickpea | Early sowing<br>Intercultivation                                 |
|                                                                                         |                               | Maize-Wheat                   | Fallow-Sunflower/ Chickpea/<br>Safflower/R.Sorghum               | -do-                                                             |
|                                                                                         |                               | Hy.Cotton( Bt)                | Fallow-Sunflower/Chickpea/<br>Safflower/R.Sorghum                |                                                                  |
| Condition                                                                               |                               |                               | SuggestedContingencymeasures                                     |                                                                  |
|                                                                                         | MajorFarm<br>ing<br>situation | NormalCrop/croppingsy<br>stem | Change in crop/cropping<br>system                                | Agronomicmeasures                                                |
| Lackofinflowsinto<br>tanks due to<br>insufficient/delay<br>ed onset of<br>monsoon       | Drillsownpaddy                | Paddy                         | Maize<br><br>Paddy+Sorghum/Mai                                   | Goinformixedcropping                                             |
| Condition                                                                               |                               |                               | SuggestedContingencymeasures                                     |                                                                  |
|                                                                                         | MajorFarm<br>ing<br>situation | NormalCrop/croppingsy<br>stem | Change in crop/cropping<br>system                                | Agronomicmeasures                                                |
| Insufficient<br>groundwater<br>rechargeduetol<br>ow<br>rainfall                         | Mediumdeepblac<br>k Soils,    | Maize                         | Groundnut                                                        | Useofsprinjlrs,Ado<br>pt ridges-<br>furrowmethodof<br>irrigation |
|                                                                                         | Loamy/lateritesoils           | paddy                         | Maize                                                            |                                                                  |
| Condition                                                                               |                               |                               | SuggestedContingencymeasures                                     |                                                                  |
|                                                                                         | MajorFarming<br>situation     | NormalCrop/croppingsy<br>stem | Changeincrop/cropping<br>system                                  | Agronomicmeasures                                                |
| Anyothercondi<br>tion (specify)                                                         |                               |                               |                                                                  |                                                                  |

## Resource management technologies

### In-situ rainwater management

| S.No. | Practice          | Crops                                                         |
|-------|-------------------|---------------------------------------------------------------|
| 1     | Ridges and furrow | Pigeonpea, Greengram, Pearl millet, Sunflower                 |
| 2     | Deep ploughing    | Pigeonpea, Pearl millet, Rabi sorghum, chickpea and safflower |
| 3     | Compartment bund  | Sunflower, Rabi sorghum, chickpea and safflower               |

### Ex-situ rainwater management

5. Farm pond based supplemental irrigations for crops.
6. Recharge of open wells by feeder channels/pipes

## Actionable Comprehensive Plans for Contingency

|       |           |          |       |
|-------|-----------|----------|-------|
| State | KARNATAKA | District | GADAG |
|-------|-----------|----------|-------|

### Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 356.6                | More than 19%          | Less than 288.846      |
| June         | 84.2                 |                        |                        |
| July         | 64                   |                        |                        |
| August       | 72.9                 |                        |                        |
| September    | 135.5                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

### Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 79188  | Gross irrigated area: | 127375 |
| Net Rainfed area    | 231513 | Gross rainfed area    | 400194 |

### Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | 37475 | 56242 |
| Wells                | 32288 | 56902 |
| Tanks                | 1221  | 1751  |
| Other sources        | 8204  | 12480 |

### Crop Profile (Kharif)

#### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 3600            | 3600                | 0                 |
| 2    | Jowar     | 191             | 46                  | 145               |
| 3    | Maize     | 141986          | 41255               | 100731            |
| 4    | Bajra     | 1369            | 24                  | 1345              |
| 5    | Ragi      | 49              | 19                  | 30                |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 364             | 7                   | 357               |
| 2    | Groundnut      | 27226           | 12591               | 14635             |
| 3    | Sesamum        | 13              | 7                   | 6                 |
| 4    | SOyabean       | 219             | 95                  | 124               |
| 5    | Sunflower      | 7978            | 4970                | 3008              |
| 6    | Castor         | 22              |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 9424            | 6092                | 3332              |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 11              |                     | 11                |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 4057            | 4036                | 21                |
| 2    | Tobacco            | 26              | 26                  | 0                 |
| 3    | Guar seed          | -               |                     | 5                 |
| 4    | Other Fodder crops | 31              | 26                  | 5                 |

## Crop Plan- Beginning of the season

| Condition Delayed onset                                                          | Major Farming situation                   | Normal Crop/cropping system                   |                                                                                                          | Suggested Contingency measures |             |
|----------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------|-------------|
| Delay by 4 weeks (July 2 <sup>nd</sup> week)<br><br>Kharif sowing: II FN of July | area in shallow black soils and red soils | Groundnut (bunch/spreading)                   |                                                                                                          | Groundnut (Spreading)          |             |
|                                                                                  |                                           | Greengram                                     |                                                                                                          | Sunflower                      |             |
|                                                                                  |                                           | Maize                                         |                                                                                                          | No change                      |             |
|                                                                                  |                                           | Chilli + Onion + Desi Cotton                  |                                                                                                          | Chilli + Desi Cotton           |             |
|                                                                                  |                                           | Bt. Cotton                                    |                                                                                                          |                                |             |
|                                                                                  | Cropping area in Rabi Season in           | <i>Kharif</i>                                 | <i>Rabi</i>                                                                                              | <i>Kharif</i>                  | <i>Rabi</i> |
|                                                                                  |                                           | Follow insitu moisture conservation practices | Rabi sorghum Safflower Sunflower Chickpea, Mize Rabi sorghum + Chickpea (2:1) Chickpea + Safflower (4:2) | No change                      | No change   |

|  |                                                                   |                |                             |                     |                 |
|--|-------------------------------------------------------------------|----------------|-----------------------------|---------------------|-----------------|
|  | Deepblacksoils and both Kharif and Rabi in mediumdeep black soils | Greengram      | Rabisorghum                 | Chilli+Onion+Cotton | -               |
|  |                                                                   |                | Chickpea                    |                     | Chickpea        |
|  |                                                                   | Groundnut      | Sunflower                   |                     | Sunflower/Wheat |
|  |                                                                   |                | Rabisorghum                 |                     | Rabi sorghum    |
|  |                                                                   | Maize          | Chickpea                    |                     | Chickpea/Wheat  |
|  |                                                                   | Cotton         | -                           | Nochange            | -               |
|  |                                                                   | Sunflower      | Chickpea                    |                     | Nochange        |
|  | Cropping in denudedshallow soils                                  | Naturalpasture | TBObasedsilvipasture system |                     |                 |

#### Contingency measures- Mid season

| Contingency measures- Mid season                                                                             |                                                                                                    |                                                |                                                                                                                          |                                         |                               |                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Condition Delayed onset                                                                                      | Major Farming situation                                                                            | Normal Crop/cropping system                    |                                                                                                                          | Suggested Contingency measures          |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    |                                                |                                                                                                                          | Crop management                         |                               | Soil nutrient & moisture conservation measures                                                                                  |
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5mm) period)<br><br>At vegetative stage | Kharif cropping area in shallow black soils and red soils                                          | Sorghum                                        |                                                                                                                          | Intercultivation                        |                               | Opening of conservation furrows at a distance of 15-20m                                                                         |
|                                                                                                              |                                                                                                    | Groundnut (bunch)                              |                                                                                                                          |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Greengram                                      |                                                                                                                          |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Maize                                          |                                                                                                                          | Weeding and Intercultivation<br>Weeding |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Chilli + Onion + Desi Cotton                   |                                                                                                                          |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Bt Cotton                                      |                                                                                                                          |                                         |                               |                                                                                                                                 |
|                                                                                                              | Cropping area in Rabi Season in Deep black soils and both Kharif & Rabi in medium deep black soils | <i>Kharif</i>                                  | <i>Rabi</i>                                                                                                              | <i>Kharif</i>                           | <i>Rabi</i>                   | Compartment bunding/ridges and furrows/Tied ridges to conserve rain water during kharif for regular sowing of <i>Rabi</i> crops |
|                                                                                                              |                                                                                                    | Follow in situ moisture conservation practices | Rabi sorghum<br>Safflower<br>Sunflower<br>Chickpea, maize<br>Rabi sorghum + Chickpea (2:1)<br>Chickpea + Safflower (4:2) | No Change                               | No Change                     |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Greengram                                      | Rabi sorghum                                                                                                             | Intercultivation                        |                               | Opening of conservation furrows at a distance of 15-20m                                                                         |
|                                                                                                              |                                                                                                    |                                                | Chickpea                                                                                                                 |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Groundnut                                      | Sunflower                                                                                                                | Intercultivation and weeding            |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    |                                                | Rabi sorghum                                                                                                             |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Maize                                          | Chickpea                                                                                                                 | Intercultivation                        |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Bt Cotton                                      | -                                                                                                                        |                                         |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    | Sunflower                                      | Chickpea                                                                                                                 | Intercultivation and weeding            |                               |                                                                                                                                 |
|                                                                                                              |                                                                                                    |                                                |                                                                                                                          |                                         |                               |                                                                                                                                 |
|                                                                                                              | Cropping in denuded                                                                                | Natural pasture                                | TBO based silviculture pasture system                                                                                    | Spreading of grass/legume forage seeds  | Opening of stage red trenches |                                                                                                                                 |



|                                                                                                              |                                                                                                                            |                                                       |                                                                                                                                                 |                                                 |                                              |                                                                                                                                                 |   |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                                                                                                              | Croppin<br>g in<br>denude<br>dshallo<br>w<br>soils                                                                         | Naturalpasture                                        | TBO<br>base<br>dsilv<br>i<br>past<br>ure<br>syst<br>em                                                                                          | Removalofperennialweed<br>s                     | Openingofstaggeredtr<br>enches               |                                                                                                                                                 |   |
| Condition                                                                                                    | Major Farmi<br>ng<br>situati<br>on                                                                                         | Crop/croppingsystem                                   |                                                                                                                                                 | SuggestedContingencymeasures                    |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            |                                                       |                                                                                                                                                 | Crop<br>management                              | Soilnutrient&moisture<br>conservationmeasues |                                                                                                                                                 |   |
| Mid<br>seas<br>on<br>dro<br>ugh<br>t<br><br>(Longdrys<br>pell)<br><br>at<br>flowering/<br>fruitingsta<br>ge) | Kharif<br>cropping<br>area<br>inshallowbla<br>cksoils and<br>red soils                                                     | Sorghum                                               |                                                                                                                                                 | Removalofflowerle<br>aves                       |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Groundnut(bunch)                                      |                                                                                                                                                 |                                                 |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Greengram                                             |                                                                                                                                                 |                                                 |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Maize                                                 |                                                                                                                                                 | -                                               |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Chilli+Onion+DesiCot<br>ton                           |                                                                                                                                                 | Removeonioncro<br>pby<br>intercultivation       |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | BtCotton                                              |                                                                                                                                                 | Spraywithanti-<br>transpirants                  |                                              |                                                                                                                                                 |   |
|                                                                                                              | Croppingare<br>ainRabi<br>SeasoninDe<br>ep black<br>soils and<br>both Kharif<br>& Rabi in<br>medium<br>deep black<br>soils | <i>Kharif</i>                                         | <i>Rabi</i>                                                                                                                                     | <i>Kharif</i>                                   | <i>Rabi</i>                                  | Compartment<br>bunding/ridges and<br>furrows/Tied ridges to<br>conservetherainwaterdur<br>ing kharif for regular<br>sowing of <i>Rabi</i> crops |   |
|                                                                                                              |                                                                                                                            | Followinsitu<br>moisture<br>conservation<br>practices | Rabi<br>sorghum<br>Safflower<br>Sunflowe<br>r<br>Chickpea,<br>maize<br>Rabisorg<br>hum+<br>Chickpea<br>(2:1)<br>Chickpea+Saff<br>lower<br>(4:2) | NoCh<br>ange                                    | NoChang<br>e                                 |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Greengram                                             | Rabisorghum                                                                                                                                     | HarvestingandSoi<br>lincorporationof<br>biomass |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            |                                                       | Chickpea                                                                                                                                        |                                                 |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Groundnut                                             | Sunflower                                                                                                                                       | -                                               |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            |                                                       | Rabisorghum                                                                                                                                     | -                                               |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Maize                                                 | Chickpea                                                                                                                                        | Removalofflowerle<br>aves                       |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Cotton                                                | -                                                                                                                                               | Spraywithanti-<br>transpirants                  |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Sunflower                                             | Chickpea                                                                                                                                        | -                                               |                                              |                                                                                                                                                 |   |
|                                                                                                              |                                                                                                                            | Croppinginde<br>nuded<br>shallowsoils                 | Naturalpasture                                                                                                                                  | TBObasedsilvi<br>pasturesystem                  | Removalofperenn<br>ialweeds                  |                                                                                                                                                 | - |

**Contingency measures- End of the season**

Irrigated situation

| Condition                                                      | Major Farming situation                                          | Crop/cropping system |                 | Suggested contingency measure  |                           |                                                                                                                              |
|----------------------------------------------------------------|------------------------------------------------------------------|----------------------|-----------------|--------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                                                                |                                                                  |                      |                 | Change in crop/cropping system | Agronomic measures        |                                                                                                                              |
| Delayed/limited release of water in canals due to low rainfall | Cropping with canal irrigation both in black soils and red soils | Kharif               | Rabi            | Kharif                         | Rabi                      |                                                                                                                              |
|                                                                |                                                                  | Maize                | Chickpea/ Wheat | No change                      | No change                 | Alternatively alternate furrow irrigation during kharif                                                                      |
|                                                                |                                                                  | Sunflower            | Maize           |                                |                           |                                                                                                                              |
|                                                                |                                                                  | Maize                | Groundnut       |                                | Groundnut/wheat           |                                                                                                                              |
|                                                                |                                                                  | Maize                | Groundnut       |                                |                           |                                                                                                                              |
|                                                                |                                                                  | Groundnut            | Wheat/ chickpea | Sunflower                      | Groundnut/ chickpea/wheat | Broad bed and furrow irrigation during kharif                                                                                |
|                                                                |                                                                  | Bt. Cotton           | -               | No change                      | -                         | Transplant 25-30 days aged seedlings. Alternatively alternate furrow irrigation                                              |
|                                                                | Cropping with canal irrigation both in black soils and red soils | Maize                | Chickpea/       |                                | No Change                 | Compartment bunding/ridges and furrows/Tied ridges to conserve the rain water during kharif for regular sowing of Rabi crops |
|                                                                |                                                                  |                      | Wheat           | Follow in situ                 |                           |                                                                                                                              |
|                                                                |                                                                  | Groundnut            | Wheat/          | moisture                       | Groundnut/                |                                                                                                                              |
|                                                                |                                                                  |                      | chickpea        | conservation                   | chickpea/wheat            |                                                                                                                              |
|                                                                |                                                                  | Sunflower            | Maize           | practices                      | No change                 |                                                                                                                              |
|                                                                |                                                                  | Maize                | Groundnut       |                                | Groundnut/wheat           |                                                                                                                              |
|                                                                |                                                                  | Groundnut            | Wheat/          | Sunflower                      | Groundnut/                |                                                                                                                              |
|                                                                |                                                                  |                      | chickpea        |                                | chickpea/wheat            |                                                                                                                              |
|                                                                |                                                                  |                      |                 |                                |                           | Transplant 25-30 days aged                                                                                                   |
|                                                                |                                                                  | Bt. Cotton           | -               | No change                      | -                         | seedlings. Alternatively                                                                                                     |
|                                                                |                                                                  |                      |                 |                                |                           | alternate furrow irrigation                                                                                                  |
| Lack of inflows Into tanks                                     | Cropping with tan                                                | Maize                | Chickpea/ Wheat | -                              | No Change                 | Compartment bunding/ridges and furrows/Tied ridges to conserve the rain water                                                |

|                                                        |                                                                                                |           |                |                  |                                 |                                                                                                                                     |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------|----------------|------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| due to insufficient                                    | k bed /bore-wel                                                                                |           |                |                  |                                 | <i>during kharif for regular</i>                                                                                                    |
|                                                        |                                                                                                | Groundnut | Wheat/chickpea | -                | <i>Groundnut/chickpea/wheat</i> |                                                                                                                                     |
|                                                        |                                                                                                | Sunflower | Maize          | -                | <i>No change</i>                |                                                                                                                                     |
| /delayed onset                                         | irrigation both in                                                                             |           |                |                  |                                 | <i>sowing of Rabi crops</i>                                                                                                         |
|                                                        |                                                                                                | Maize     | Groundnut      | -                | <i>Groundnut/wheat</i>          |                                                                                                                                     |
| of monsoon                                             | black and red soils                                                                            |           |                |                  |                                 |                                                                                                                                     |
|                                                        |                                                                                                |           |                |                  |                                 | <i>Transplant 25-30 days aged</i>                                                                                                   |
|                                                        |                                                                                                | Cotton    | -              | <i>No change</i> | -                               | <i>seedlings. Alternatively</i>                                                                                                     |
|                                                        |                                                                                                |           |                |                  |                                 | <i>alternate furrow irrigation</i>                                                                                                  |
| Insufficient groundwater recharged due to low rainfall | Cropping with bore-wel / Open well irrigation both in black and red soils or any other sources | Maize     | Chickpea/Wheat | <i>Sunflower</i> | <i>No Change</i>                | <i>Compartment bunding/ridges and furrows/Tied ridges to conserve the rain water during kharif for regular sowing of Rabi crops</i> |
|                                                        |                                                                                                | Groundnut | Wheat/chickpea |                  | <i>Groundnut/chickpea/wheat</i> |                                                                                                                                     |
|                                                        |                                                                                                | Sunflower | Maize          | <i>No change</i> | <i>No change</i>                |                                                                                                                                     |
|                                                        |                                                                                                | Maize     | Groundnut      | <i>Sunflower</i> | <i>Groundnut/wheat</i>          |                                                                                                                                     |
|                                                        |                                                                                                | Cotton    | -              | <i>No change</i> | -                               | <i>Transplant 25-30 days aged seedlings. Alternatively</i>                                                                          |
|                                                        |                                                                                                |           |                |                  |                                 | <i>alternate furrow irrigation</i>                                                                                                  |

#### Resource management technologies

##### In-situ rainwater management

| S.No. | Practice          | Crops                                                         |
|-------|-------------------|---------------------------------------------------------------|
| 1     | Ridges and furrow | Pigeonpea, Greengram, Pearl millet, Sunflower                 |
| 2     | Deep ploughing    | Pigeonpea, Pearl millet, Rabi sorghum, chickpea and safflower |
| 3     | Compartment bund  | Sunflower, Rabi sorghum, chickpea and safflower               |

##### Ex-situ rainwater management

7. Farm pond based supplemental irrigations for crops.
8. Recharge of open wells by feeder channels/pipes



# Actionable Comprehensive Plans for Contingency

|       |           |          |        |
|-------|-----------|----------|--------|
| State | KARNATAKA | District | HASSAN |
|-------|-----------|----------|--------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 680.1                | More than 19%          | Less than 550.881      |
| June         | 160.1                |                        |                        |
| July         | 206.5                |                        |                        |
| August       | 160.8                |                        |                        |
| September    | 152.7                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 128319 | Gross irrigated area: | 145639 |
| Net Rainfed area    | 290532 | Gross rainfed area    | 390868 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross  |
|----------------------|-------|--------|
| Canals               | 36070 | 37225  |
| Wells                | 86681 | 102530 |
| Tanks                | 5274  | 5590   |
| Other sources        | 294   | 294    |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 21678           | 10917               | 10761             |
| 2    | Jowar     | 4385            | 265                 | 4120              |
| 3    | Maize     | 123847          | 37215               | 86632             |
| 4    | Bajra     | 8               | 5                   | 3                 |
| 5    | Ragi      | 111081          | 20294               | 90787             |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 258             | 39                  | 219               |
| 2    | Groundnut      | 120             | 49                  | 71                |
| 3    | Sesamum        | 1125            | 64                  | 1061              |
| 4    | SOyabean       | 14              | 4                   | 10                |
| 5    | Sunflower      | 126             | 1                   | 125               |
| 6    | Castor         | 49              |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 661             | 48                  | 613               |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 86              |                     | 86                |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 2688            | 1754                | 934               |
| 2    | Tobacco            | 5932            | 57                  | 5875              |
| 3    | Guar seed          | -               |                     | 3215              |
| 4    | Other Fodder crops | 3750            | 535                 | 3215              |

#### Crop Plan- Beginning of the season

| Condition                                               |                                   | Suggested Contingency measures                                                                                                                    |                                                                                                                         |                                                                                                    |
|---------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Early season drought (delayed onset)                    | Major Farming situation           | Normal Crop/cropping system                                                                                                                       | Change in crop/cropping system                                                                                          | Agronomic measures                                                                                 |
| Delay by 4 weeks<br><br><b>June 1<sup>st</sup> week</b> | Deep Red soils in plains (Zone-7) | Potato - Ragi (Potato with Redgram/ castor as intercrop 6:1)<br>Potato- Kufri Jyothi                                                              | Potato- Ragi / Cowpea<br>Potato+Redgram<br><br>Potato: Kufri jyothi, Kufri surya, Kufri pukraj<br>Redgram: BRG-1, 2, 5  | ❖ Optimum seed rate and spacing<br>❖ Contour cultivation<br>❖ <i>In-situ</i> moisture conservation |
|                                                         |                                   | Maize – Ragi/ pulses<br>Maize- Private Hybrids; NAC-6004;                                                                                         | Maize - Cowpea/<br>Greengram (Late <i>khari</i> )<br><br>Maize: Nityashree, Hema<br>Cowpea: KBC-2, Redgram: BRG-1, 2, 5 | ❖ Contour cultivation<br>❖ <i>In-situ</i> moisture conservation<br>❖ Ridges and furrows            |
|                                                         | Deep red soils in Plains          | Sesamum/ Minor millets / pulses – Ragi / Sunflower / Maize<br>Sesamum- local<br>Minor millets- Same, Haraka, etc<br>Horseggram/ greengram/ Cowpea | Sesamum – Ragi<br>Ragi+ Red gram<br>Maize+Redgram<br><br>Sesamum: Navile-1                                              |                                                                                                    |

|  |                                       |                                                          |                                                                                                                                                                      |                               |
|--|---------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|  |                                       |                                                          | Groundnut: KCG-6, GKV-5<br>Ragi: MR-1, MR-6.<br>Red gram: BRG-1, 2, 5<br>Maize: Nityashree, Hema<br>Greengram: China moong / PDM – 84-178<br>Blackgram: T-9 / Rashmi |                               |
|  | Shallow to medium deep soils (Zone-6) | Cow pea/Black gram – Ragi/Maize/Groundnut sesamum-potato | Pigeonpea<br>Pigeonpea + Cowpea / field bean                                                                                                                         | ❖ Wider spacing (150 X 60 cm) |

#### Contingency measures- Mid season

| Condition                           |                             |                                                                                                                      | Suggested Contingency measures                                                                                                |                                                                                                    |
|-------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Early season drought (Normal onset) | Major Farming situation     | Normal Crop/Cropping system                                                                                          | Crop management                                                                                                               | Soil nutrient & moisture conservation measures                                                     |
| At vegetative stage                 | Deep to very Deep Red soils | Paddy, Potato - Ragi<br>Maize – Ragi/ pulses<br>Sesamum/ Minor millets / pulses – Ragi<br>Finger millet + Pigeon pea | Thinning & Gap filling<br>Life saving irrigation<br>Earthing up / intercultivation                                            | Foliar nutrient spray of 1% potassium or 19:19:19 water soluble fertilizer<br>conservation furrow  |
| At reproductive stage               |                             |                                                                                                                      | Life saving irrigation from farm pond<br>Weeding and Weed mulching<br>Harvesting for fodder if suitable under extreme drought | <i>In-situ</i> moisture conservation                                                               |
| Terminal drought                    |                             |                                                                                                                      | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean     | Cowpea, Sunflower, Field bean, Horse gram (October month)<br><br>Harvest at physiological maturity |

#### Contingency measures- End of the season

| Condition                           |                         |                             | Suggested Contingency measures                                                                                            |                                                                                                    |
|-------------------------------------|-------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Early season drought (Normal onset) | Major Farming situation | Normal Crop/Cropping system | Crop management                                                                                                           | Soil nutrient & moisture conservation measures                                                     |
| Terminal drought                    |                         |                             | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean | Cowpea, Sunflower, Field bean, Horse gram (October month)<br><br>Harvest at physiological maturity |

#### 2.1.2 Irrigated situation

| Condition                  | Suggested Contingency measures |                              |                                 |                                                              |
|----------------------------|--------------------------------|------------------------------|---------------------------------|--------------------------------------------------------------|
|                            | Major Farming situation        | Normal Crop/ cropping system | Change in crop/ cropping system | Agronomic measures                                           |
| Delayed rains in Hill zone | Upland                         | Paddy-fallow                 | Karna, Jaya, KHP-5              | Direct seeded rice / SRI<br>Lime application @ 200 kg / acre |
|                            | Lowland                        | Paddy-fallow                 | Intan, Hemavathi, BR-2655       |                                                              |
|                            | Tank Irrigation                | Paddy-fallow                 | Mangala, KMP-105                |                                                              |

| Condition                                                                  | Major Farming situation | Normal Crop/ cropping system | Suggested Contingency measures                                                                               |                                                                                                   |
|----------------------------------------------------------------------------|-------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                                                                            |                         |                              | Change in crop/ cropping system                                                                              | Agronomic measures                                                                                |
| Delayed release of water in canals due to low rainfall                     | Canal command           | Paddy-paddy                  | Mangala, KMP-105                                                                                             | Green manuring<br>Sunhemp & Diancha<br>Cono weeder use<br>for weeding<br>Balanced nutrition       |
| Limited release of water in canals due to low rainfall                     |                         |                              | Drought tolerant varieties                                                                                   |                                                                                                   |
| Non release of water in canals under delayed onset of monsoon in catchment |                         |                              | Maize, pulses<br>Maize: Hema, Nityashree<br>Cowpea: IT-38956-1, KBC-1                                        | Optimum seed rate and spacing<br>Contour cultivation<br>Balanced fertilization<br>Bio-fertilizers |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon   | Tankfed areas           |                              | Field bean: HA-4, HA-5<br>Grain Amaranth: Suvarna,<br>Fodder crops: SA Tall,<br>Fodder bajra, fodder sorghum |                                                                                                   |

### Resource management technologies

#### In-situ moisture conservation practices

| S.No. | Practice                                                                      | Crops               |
|-------|-------------------------------------------------------------------------------|---------------------|
| 1     | Deep ploughing to a depth of 15-30 cm                                         | All crops           |
| 2     | Application of FYM and incorporation of green manure crops                    | All crops           |
| 3     | Application of tank silt, contour cultivation with vegetative barriers        | All crops           |
| 4     | Deep tillage to a depth of 25-30 cm using MB plough graded ridges and furrows | Maize and Sunflower |
|       |                                                                               |                     |

#### Ex-situ rainwater management

- Farm pond based supplemental irrigations to crops.

# Actionable Comprehensive Plans for Contingency

|       |           |          |        |
|-------|-----------|----------|--------|
| State | KARNATAKA | District | HAVERI |
|-------|-----------|----------|--------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 495.6                | More than 19%          | Less than 401.436      |
| June         | 119.2                |                        |                        |
| July         | 146.1                |                        |                        |
| August       | 117.3                |                        |                        |
| September    | 113                  |                        |                        |

Forecast probability for the season (as per IMD): Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 143642 | Gross irrigated area: | 188995 |
| Net Rainfed area    | 234098 | Gross rainfed area    | 375873 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 693    | 693    |
| Wells                | 124523 | 167198 |
| Tanks                | 910    | 920    |
| Other sources        | 17516  | 20184  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 27247           | 21418               | 5829              |
| 2    | Jowar     | 88              | 64                  | 24                |
| 3    | Maize     | 305010          | 70287               | 234723            |
| 4    | Bajra     | 18              | 17                  | 1                 |
| 5    | Ragi      | 159             | 129                 | 30                |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 49              |                     | 49                |
| 2    | Groundnut      | 14499           | 3867                | 10632             |
| 3    | Sesamum        | 6               | 3                   | 3                 |
| 4    | SOyabean       | 11420           | 1692                | 9728              |
| 5    | Sunflower      | 4948            | 4877                | 71                |
| 6    | Castor         | 2               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 14438           | 3786                | 10652             |
| 2    | Jute      | 1               |                     | 1                 |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 37              |                     | 37                |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 12042           | 12034               | 8                 |
| 2    | Tobacco            | 2               | 2                   | 0                 |
| 3    | Guar seed          | -               |                     | 118               |
| 4    | Other Fodder crops | 305             | 187                 | 118               |

#### Crop Plan- Beginning of the season

##### Rainfed Situation:

| Condition                                   |                         |                           | SuggestedContingencymeasures   |                                |                           |
|---------------------------------------------|-------------------------|---------------------------|--------------------------------|--------------------------------|---------------------------|
| Early season drought (delayed onset)        | Major Farming situation | NormalCrop/croppingsystem | Change in crop/cropping system | Agronomicmeasures              | Remarks on Implementation |
| Delayby 4 weeks (July 1 <sup>st</sup> week) | Medium todeepblacksoils | Maize–Rabisorghum         | NoChange                       | Ridgeandfurrowmethodofsoiling; |                           |
|                                             |                         | Maize+Redgram(6:2)        | -do-                           | -do-                           |                           |
|                                             |                         | Hybridcotton(Bt)          | -do-                           | Reducespacing(90x60cm)         |                           |

|  |                 |                                                                |                             |        |  |
|--|-----------------|----------------------------------------------------------------|-----------------------------|--------|--|
|  |                 | Rice followed by short duration pulse (Green gram/ Black gram) | -do-                        | Normal |  |
|  |                 | Groundnut)-R.Jowar                                             | -do-                        | -do-   |  |
|  |                 | Soybean-Rabi Sorghum                                           | Fallow-Rabi Sorghum         | -do-   |  |
|  |                 | Greengram-Rabi Sorghum                                         | Fallow-Rabi Sorghum         | do-    |  |
|  |                 | Chillie+Desicotton                                             | NoChange                    | do-    |  |
|  | Red loamy soils | Maize                                                          | do-                         | -do-   |  |
|  |                 | Rice followed by short duration pulse                          | do-                         | -do-   |  |
|  |                 | Hybrid cotton                                                  | do-                         | -do-   |  |
|  |                 | Sorghum+Pigeon pea(5:1 and 4:2)                                | do-                         | do-    |  |
|  |                 | Groundnut                                                      | Spreading groundnut (DSG-1) | do-    |  |
|  |                 | Little Millets+Red gram(6:1)                                   | NoChange                    | -do-   |  |

#### Contingency measures- Mid season

| Condition                                                               |                            |                                                                                                                                                            | Suggested Contingency measures                                              |                                                                                                                              |                           |
|-------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Mid season                                                              |                            | Crop/cropping system                                                                                                                                       | Crop management                                                             | Soil nutrient & moisture                                                                                                     | Remarks on Implementation |
| drought (long dry spell, consecutive 2 weeks rainless (> 2.5mm) period) |                            |                                                                                                                                                            |                                                                             | conservation measures                                                                                                        |                           |
| At vegetative Stage                                                     | Medium to deep black soils | Maize – Rabi sorghum<br>Maize+Red gram(6:2)<br>) Hybrid cotton (Bt)<br>Rice followed by short duration pulse (Green gram/ Black gram)<br>Groundnut-R.Jowar | Foliar application of N & K 2%<br>Plant Protection measures for Defoliators | Protective irrigation<br>Thinning,<br>Frequent intercultivation<br>Weed control<br>Spraying of antitranspirant<br>Kaoline 6% |                           |

|  |                |                                |                         |                              |  |
|--|----------------|--------------------------------|-------------------------|------------------------------|--|
|  |                | Soybean-R.Sorghum              |                         |                              |  |
|  |                | Greengram-Sorghum              |                         |                              |  |
|  |                | Chilli+Desicotton              |                         |                              |  |
|  | Redloamy soils | Maize                          | Foliar application of N | Weed control                 |  |
|  |                | Hybrid cotton                  | &K                      | Frequent Intercultivation    |  |
|  |                | Sorghum+Pigeonpea(5:1 and 4:2) |                         | Spraying of antitranspirants |  |
|  |                | Spreading groundnut            |                         | Kaoline 6%                   |  |
|  |                | Little Millet+Redgram(6:1)     |                         |                              |  |

| Condition                          |                            |                                                                                                                                                                                                                      | Suggested Contingency measures                                                                                                                                                                          |                                                                      |                           |
|------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------|
| Midseason drought (long dry spell) | Major Farming situation    | Normal Crop/cropping system                                                                                                                                                                                          | Crop management                                                                                                                                                                                         | Soil nutrient & moisture conservation measures                       | Remarks on Implementation |
| At flowering/fruiting stage        | Medium to deep black soils | Maize –Rabi sorghum<br>Maize+Redgram(6:2) Hybrid cotton (Bt)<br>Rice followed by short duration pulse (Greengram/Black gram)<br><br>Groundnut-R.Jowar<br>Soybean-R.Sorghum<br>Greengram-Sorghum<br>Chilli+Desicotton | Foliar application of N & K<br>Harvesting maize for green cob and fodder purpose<br>Go for early rabi sowing<br>PP for defoliators and sucking pests<br>Sowing groundnut and soybean, chilli, greengram | Compartment bunding in early harvested crop<br>Protective irrigation |                           |
|                                    | Red loamy soils            | Maize<br>Hybrid cotton<br>Sorghum+Pigeonpea(5:1 and 4:2) Spreading groundnut<br>Little Millets+Redgram(6:1)                                                                                                          | Foliar application of N & K<br>Horsegram<br>Foliar application of N & K<br>Harvesting maize for fodder and early rabi sowing<br>Spraying of growth hormones<br>like Planofix @ 250 ppm                  | Intercultivation                                                     |                           |

#### Contingency measures- End of the season

| Condition |  |  | Suggested Contingency measures |
|-----------|--|--|--------------------------------|
|-----------|--|--|--------------------------------|

| Terminaldroug<br>ght<br>(Earlywithdraw<br>alof<br>monsoon) | MajorFarmi<br>ng situation      | Crop/croppingsystem                                                                                                                        | Cropmanageme<br>nt                                                                                                     | RabiCropplann<br>ing | Remarks on<br>Implementati<br>on                                           |
|------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------------|
|                                                            | Mediumtod<br>eep black<br>soils | Maize –Rabi<br>sorghum<br>Maize+Redgr<br>am(6:2)<br>Hybrid cotton<br>(Bt)<br>Ricefollowedbyshortdurationpulse(Gr<br>een<br>gram/Blackgram) | Life saving<br>irrigation<br>Harvesting at<br>physiological<br>maturity<br>andplanforearly<br>rabi sowing              | -                    | Threshing<br>implements<br>throughRK<br>VY; supply<br>groundnut<br>diggers |
|                                                            |                                 | Groundnut-R.Jowar                                                                                                                          |                                                                                                                        |                      |                                                                            |
|                                                            |                                 | Soybean-R.Sorghum                                                                                                                          |                                                                                                                        |                      |                                                                            |
|                                                            |                                 | Greengram-Sorghum                                                                                                                          |                                                                                                                        |                      |                                                                            |
|                                                            |                                 | Chilli+Desicotton                                                                                                                          |                                                                                                                        |                      |                                                                            |
|                                                            | Redloamysoils                   | Maize<br>Hybridcotton                                                                                                                      | Life saving<br>irrigation<br>Harvesting at<br>physiological<br>maturity Plan<br>for growing rabi<br>crops<br>Horsegram | -                    | Supplycotton<br>stack pullers                                              |
|                                                            |                                 | Sorghum+Pigeonpea(5:1and4:2)                                                                                                               |                                                                                                                        |                      |                                                                            |
|                                                            |                                 | SpreadingGroundnut                                                                                                                         |                                                                                                                        |                      |                                                                            |
|                                                            |                                 | LittleMillets+Redgram(6:1)                                                                                                                 |                                                                                                                        |                      |                                                                            |

#### 1. RealTimeContingencyPlan

| Weatheraberration           | Crop      | Stage of crop            | Realtimecontingencymeasureimplemented                                                                                                                                                                                                                                                                                      |
|-----------------------------|-----------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of<br>monsoon | Soybean   | -                        | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                           |
|                             | Maize     | -                        | Short duration varieties (70-80 days)<br>likePatidar-999wereplanted                                                                                                                                                                                                                                                        |
|                             | Pigeonpea | -                        | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                          |
|                             |           |                          | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems              |
| Midseason<br>drought        | Soybean   | Vegetative,<br>flowering | 1- <i>In-situ</i> moisture conservation measures <i>viz</i> , Mulching<br>with polythene sheets<br>Inter-culturaloperation-Dora for soil mulching and weed control.<br>And BBF, ridge and furrow system, contour ditches, strip<br>intercropping and conservation furrow in alternate furrow<br>and compartmental bunding. |

|                  |           |                          |                                                                                                       |
|------------------|-----------|--------------------------|-------------------------------------------------------------------------------------------------------|
|                  |           |                          | 2- Spraying of<br>VAM-C@375ml/ha<br>Thio urea @ 250 g/ha                                              |
|                  | Maize     | Vegetative,<br>flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation     |
|                  | Pigeonpea | Vegetative               | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                 |
|                  |           |                          | Supplemental Irrigation at crop critical stages                                                       |
| Terminal drought |           |                          | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder |

## 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/ limited release of water in canals due to low rainfall | Medium/Shallow red/black paddy soils | - Paddy                     | -<br><br>Maize/Cotton in up lands. | -<br><br>Earthing up, laying in to ridges and furrows<br>Uplands are prone for weed menace, hence maize and cotton can be cultivated as in neighbouring districts. |                           |

| 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 | Medium/Shallow red/black paddy soils | Paddy                       | -<br>Maize/Cotton in up lands. | -do-               |                           |

| Condition                                                                |                              |                                       | Suggested Contingency measures                            |                                                                                               |                           |
|--------------------------------------------------------------------------|------------------------------|---------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------|
|                                                                          | Major Farming situation      | 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 | Tank fed black and red soils | Rice-pulse<br>Hy.Cotton (Bt)<br>Maize | Maize -pulse<br>Hybrid Bt cotton<br>Soybean-<br>R.Sorghum | Alternate furrow irrigation<br>Irrigation at critical stages<br>Intercultivation<br>Mulching. |                           |

| 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 | Bore well irrigated medium deep black and red loamy soils | Seed production in Cotton, Sunflower, Maize | No change                      | Adopt micro-irrigation systems<br>Alternate furrow irrigation<br>Mulching<br>Growth retardant spray<br>Paired row planting<br><br>Frequent intercultivation, | Recharging of bore wells  |

#### Resource management technologies

##### Preparedness:

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |        |
|-------|-----------|----------|--------|
| State | KARNATAKA | District | KODAGU |
|-------|-----------|----------|--------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 2248.3               | More than 19%          | Less than 1821.123     |
| June         | 597.7                |                        |                        |
| July         | 788.4                |                        |                        |
| August       | 568.3                |                        |                        |
| September    | 293.9                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 1693   | Gross irrigated area: | 1693   |
| Net Rainfed area    | 201353 | Gross rainfed area    | 228547 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net  | Gross |
|----------------------|------|-------|
| Canals               | 1651 | 1651  |
| Wells                | -    | -     |
| Tanks                | -    | -     |
| Other sources        | 42   | 42    |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 13284           | 1244                | 12040             |
| 2    | Jowar     | 526             | -                   |                   |
| 3    | Maize     | 1964            |                     | 1964              |
| 4    | Bajra     | -               |                     |                   |
| 5    | Ragi      | 23              |                     | 23                |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | -               |                     |                   |
| 2    | Groundnut      | -               |                     |                   |
| 3    | Sesamum        | -               |                     |                   |
| 4    | SOyabean       | -               |                     |                   |
| 5    | Sunflower      | -               |                     |                   |
| 6    | Castor         | -               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | -               |                     |                   |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | -               |                     |                   |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | -               |                     |                   |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     |                   |
| 4    | Other Fodder crops | -               |                     |                   |

#### Crop Plan- Beginning of the season Rainfed situation:

| Condition                                                                                                                    |                        |                                                                                                                          | SuggestedContingencymeasures     |                    |                                                                             |
|------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------|-----------------------------------------------------------------------------|
| Earlyseason drought(delayed onset)                                                                                           | MajorFarming situation | Crop/croppingsystem                                                                                                      | Change in crop/cropping system   | Agronomic measures | Remarks on Implementation                                                   |
| Delayby2,4,6 &8 weeks<br><br>(June3 <sup>rd</sup> ,July1 <sup>st</sup> andJuly3 <sup>rd</sup> andAugust1 <sup>st</sup> week) | Redsandyloam soils     | 1. Coffee +Pepper +Jungle trees /Silver oak /Erythrina. Coffee: 1R, 2R,3R, Cauveri., Pepper:Karimunda, Punniyur Hybrid 1 | Nochangeincrop /cropping system. | -                  | 1. Supply of inputs throughcoffe eboard.<br>2. Supplyo finputs through NHM, |
|                                                                                                                              |                        | 2.Cardamom+Jungle wood trees Cardamom :M1, CCS1, SKP14,Clone37,Nalyan igold                                              | Nochangeincrop /cropping system. | -                  |                                                                             |

|  |                       |                                                                                        |                                  |   |  |
|--|-----------------------|----------------------------------------------------------------------------------------|----------------------------------|---|--|
|  | Sandy clay loam soils | 3. Banana +pepper + Coffee<br>Banana:Puttabale,Nae ndran, Robusta, Budubale            | Nochangeincrop /cropping system. | - |  |
|  | Sandy clay loam soils | 4.Arecanut+Pepper+Cocoa +Banana +Nutmeg.<br>Arecanut :Thirthahalli Cocoa:NC.23,NC. 29. | Nochangeincrop /cropping system. | - |  |
|  | Redsandysoils         | 4.Arecanut+Pepper+Cocoa +Banana +Nutmeg.<br>Arecanut :Thirthahalli Cocoa:NC.23,NC. 29. | Nochangeincrop /cropping system. | - |  |

#### Contingency measures- Mid season

| Condition                                                                                                                                  |                         |                                                                                                                     | SuggestedContingencymeasures                                                                                                                                                                                                                                                                           |                                                                                                                                                        |                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Early season & Mid season drought (Normal onset,followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.) | Major Farming situation | Crop/croppingsystem                                                                                                 | Crop management                                                                                                                                                                                                                                                                                        | Soilmanagement                                                                                                                                         | Remarks on Implementation                                                                   |
|                                                                                                                                            | Redsandy loamsoils      | 1. Coffee+Pepper+Jungletrees /Silver oak /Erythrina.Coffee: 1R, 2R,3R, Cauveri,. Pepper:Karimunda,Punniyur Hybrid 1 | Coffee<br>1. Pruning&Training<br>2. Shademanagement<br>3. Weedmanagement<br>4. Sprinklerirrigation to induce flowering.<br>5. Harvestatphysiological maturity stage<br>Pepper<br>1. Weedmanagement<br>2. Fertilizermanagement.<br>3. Provideproppersupport<br>4. Harvestatphysiological maturity stage | 1. FYMandcompost to be added in adequate quantities to the soil<br>2. Supplementsoils with calcium rich fertilizers<br>3. ApplyTrichoderma to the soil | 1. Supply of inter culturalimpliments through RKVY .<br>2. Farmpondst hrough IWSM programme |

|  |  |                                                                             |                                                                                                                                                                                                                            |                                                |                                                                                             |
|--|--|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------|
|  |  | 2.Cardamom+Jungle woodtrees Cardomum :M1, CCS1, SKP14,Clone 37, Nalyanigold | Cardamom<br>1. Maintainprosperspacing.<br>2. Supplementalirrigation.<br>3. Fertilizermanagement.<br>4. Shademanagement.<br>5. Mulchingofthesoilto bedone to conserve moisture.<br>6. Harvestatphysiological maturity stage | 1.Application of calcium and magnesiumsulphate | 1. Supply of inter culturalimpl ements through RKVY.<br>2. Farmpondst hrough IWSM programme |
|--|--|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------|

| Condition |                         |                                                                            | SuggestedContingencymeasures                                                                                                                                                                                     |                                    |                                                                                              |
|-----------|-------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------|
|           | Major Farming situation | Crop/croppingsystem                                                        | Crop management                                                                                                                                                                                                  | Soilmanagement                     | Remarks on Implementation                                                                    |
|           | Sandy clay loam soils   | 3. Banana +pepper + Coffee<br>Banana:Puttabale,Naendran, Robusta, Budubale | Banana:<br>1. Useofwordsuckers/tissue culture plants for planting<br>2. Diseasefreeplantingmaterial.<br>3. Earthingup2-3times.<br>4. Raiseofwindbreaks/shelter belts<br>5. Harvestatphysiological maturity stage | Applyorganicmanure and fertilizers | 1. Supply of inter culturalimpl ements through RKVY .<br>2. Farmpondst hrough IWSM programme |

|                                                                                       |                       |                                                                                                   |                                                                                                                                                                                                          |                                                  |                                                                                              |
|---------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------|
|                                                                                       | Sandy clay loam soils | 4. Arecanut + Pepper + Cocoa + Banana + Nutmeg.<br>Arecanut: Thirithahalli<br>Cocoa: NC.23, NC.29 | Arecanut<br>1. Maintain proper spacing<br>2. Fertilizer management<br>3. Raise of windbreaks/shelter belts<br>4. Mulching of the soil to conserve moisture<br>5. Harvest at physiological maturity stage | 1. Application of calcium and magnesium sulphate | 1. Supply of inter cultural implements through RKVY.<br>2. Farm pond through IWSM programme. |
| Mid season drought (long dry spell, consecutive 2 weeks rainless At vegetative stage. | As above-             |                                                                                                   |                                                                                                                                                                                                          |                                                  |                                                                                              |
| Mid season drought (long dry spell)                                                   | As above-             |                                                                                                   |                                                                                                                                                                                                          |                                                  |                                                                                              |

**Contingency measures- End of the season : Not available**

#### Real Time Contingency Plan

| Weather aberration       | Crop       | Stage of crop         | Real time contingency measure implemented                                                                                                                                                                                                                                                                     |
|--------------------------|------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean    | -                     | Short duration varieties (80-90 days) like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                 |
|                          | Maize      | -                     | Short duration varieties (70-80 days) like Patidar-999 were planted                                                                                                                                                                                                                                           |
|                          | Pigeon pea | -                     | Medium duration varieties (160-180 days) like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                |
|                          |            |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems |
| Mid season drought       | Soybean    | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation-Dora for soil mulching and weed control.<br>And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow                              |

|                  |           |                          |                                                                                                       |
|------------------|-----------|--------------------------|-------------------------------------------------------------------------------------------------------|
|                  |           |                          | and compartmental bunding.<br><br>2- Spraying of<br>VAM-C@375ml/ha<br>Thio urea @ 250 g/ha            |
|                  | Maize     | Vegetative,<br>flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation     |
|                  | Pigeonpea | Vegetative               | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                 |
|                  |           |                          | Supplemental Irrigation at crop critical stages                                                       |
| Terminal drought |           |                          | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder |

#### Irrigated situation

| Condition                                                                  |                         |                      | Suggested Contingency measures |                    |                           |
|----------------------------------------------------------------------------|-------------------------|----------------------|--------------------------------|--------------------|---------------------------|
|                                                                            | Major Farming situation | Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Delayed/ limited release of water in canals due to low rainfall            | Data not available      |                      |                                |                    |                           |
| Non release of water in canals under delayed onset of monsoon in catchment | Data not available      |                      |                                |                    |                           |

|                                                                          |                    |  |  |  |  |
|--------------------------------------------------------------------------|--------------------|--|--|--|--|
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Data not available |  |  |  |  |
| Insufficient groundwater recharge due to low rainfall                    | Data not available |  |  |  |  |

#### Resource management technologies

- **Preparedness:**
  - Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
  - Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
  - Energy management: Compartmental bunding
  - Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |       |
|-------|-----------|----------|-------|
| State | KARNATAKA | District | KOLAR |
|-------|-----------|----------|-------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 404.2                | More than 19%          | Less than 327.402      |
| June         | 67.6                 |                        |                        |
| July         | 81.5                 |                        |                        |
| August       | 88.1                 |                        |                        |
| September    | 167                  |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 52527  | Gross irrigated area: | 70268  |
| Net Rainfed area    | 110797 | Gross rainfed area    | 114774 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | -     | -     |
| Wells                | 52526 | 70266 |
| Tanks                | -     | -     |
| Other sources        | 1     | 2     |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 2244            | 2105                | 139               |
| 2    | Jowar     | 1089            | 14                  | 1075              |
| 3    | Maize     | 4015            | 4009                | 6                 |
| 4    | Bajra     | 37              |                     | 37                |
| 5    | Ragi      | 46821           | 3494                | 43327             |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 675             | 6                   | 669               |
| 2    | Groundnut      | 4027            | 25                  | 4002              |
| 3    | Sesamum        | 2               |                     | 2                 |
| 4    | SOyabean       | 2               | 2                   | 0                 |
| 5    | Sunflower      | 3               | 3                   | 0                 |
| 6    | Castor         | 5               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 213             | 213                 | 0                 |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | 1               |                     | 1                 |
| 4    | Sunhemp   | -               |                     |                   |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 41              | 41                  | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 0                 |
| 4    | Other Fodder crops | 5753            | 5753                | 0                 |

#### Crop Plan- Beginning of the season

##### 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 4 weeks<br><b>July 1<sup>st</sup> week</b> | Red soil/Red sandy loam | Finger millet+ Pigeonpea/Field bean/Akkadi Groundnut + Pigeon pea | Finger millet: MR-1, MR-6<br>Pigeon pea: BRG-1, 2, 5<br>Field bean: HA-4, HA-5<br>Groundnut: KCG-6, GKV-5 | <ul style="list-style-type: none"> <li>❖ Optimum seed rate and recommended spacing</li> <li>❖ <i>In-situ</i> moisture conservation</li> <li>❖ Wider spacing (120cm x 30 cm) in Pigeon pea</li> <li>❖ Balanced nutrition with emphasis on recommended potassium</li> </ul> | Seed drills under CHC<br><br>Supply of seeds through KSSC / NSC / RSK |
|                                                     |                         | Castor/ Sesamum/ Greengra                                         | Finger millet + Pigeonpea<br>Maize + Pigeon pea<br>Finger millet: MR-1, MR-6                              |                                                                                                                                                                                                                                                                           |                                                                       |

|  |                                                 |                                                              |                                                                                                                       |                                                                                                                                 |                                                                      |
|--|-------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|  |                                                 |                                                              | Pigeon pea: BRG-1, 2, 5<br>Maize: Hema, Nityashree<br>Little millet: Co-2, OLM-201<br>Foxtail millet: RS-118, K-221-1 | <ul style="list-style-type: none"><li>❖ Contour cultivation</li><li>❖ Tied ridges</li></ul>                                     |                                                                      |
|  |                                                 | Pigeonpea Sole crop                                          | Pigeonpea (BRG-1, 2 and 5) + Field bean (HA-4, 5)                                                                     | Contour cultivation, small section bunds                                                                                        |                                                                      |
|  | Tank fed (Red soil, Red sandy loam, Sandy soil) | Paddy (long/medium duration): BR-2655<br>Jaya, KRH –1, KRH-2 | Paddy: MAR-946-1, Anegha<br>Finger millet + Pigeonpea<br>Maize + Pigeonpea                                            | <ul style="list-style-type: none"><li>❖ SRI/Aerobic cultivation</li><li>❖ Pre-emergent herbicides for weed management</li></ul> | Timely supply of quality seeds<br><br>Seed drill / sowing equipments |
|  | Irrigated farming (Borewell)                    | Vegetable: Tomato, Chilli Brinjal                            | No change                                                                                                             | <ul style="list-style-type: none"><li>❖ Drip irrigation/ Alternate furrow irrigation</li><li>❖ Balanced nutrition</li></ul>     |                                                                      |
|  |                                                 | Banana, Grapes, Pomogranate                                  |                                                                                                                       |                                                                                                                                 |                                                                      |
|  | Agrostology (Red sandy to Sandy loam soil)      | Fodder Maize                                                 |                                                                                                                       | <ul style="list-style-type: none"><li>❖ Optimum seed rate</li><li>❖ Balanced nutrition</li></ul>                                |                                                                      |
|  |                                                 | Hybrid Napier                                                |                                                                                                                       |                                                                                                                                 |                                                                      |
|  |                                                 | Lucerne                                                      |                                                                                                                       |                                                                                                                                 |                                                                      |

#### Contingency measures- Mid season

| 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                       |
| <b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b> |                                                                                  |                                                                                                           |                                                                                                                                                                                        |                                                                                                                          |                                                 |
| <b>At vegetative stage</b>                                                                   | Deep red clay soils<br>Moderately deep red clay/loamy soils.<br>Shallow redsoils | Finger millet + Pigeonpea<br>Finger millet + Fieldbean<br>Finger millet + Niger<br>Pigeon pea/ Field bean | Thinning,<br>Grazing leaf tips,<br>Postponement of top dressing<br>Life saving irrigation, if available<br>Earthing up.<br>Protective irrigation of stored water if any in farm ponds. | Conservation<br>Furrow<br>Mulching<br>Shallow intercultivation to eradicate weeds<br>Use of moderate amount of nutrients | Supply of inter cultural implements through CHC |

| Condition                    | Suggested Contingency measures                                                    |                                                                                                 |                                                                                                                               |                                      |                                   |
|------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------|
|                              | Major Farming situation                                                           | Crop/cropping system                                                                            | Crop management                                                                                                               | Rabi Crop planning                   | Remarks on Implementation         |
| <b>At reproductive stage</b> | Deep red clay soils<br>Moderately deep red clay/loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Finger millet + Field bean<br>Finger millet + Niger<br>Pigeon pea | Life saving irrigation from farm pond<br>Weeding and Weed mulching<br>Harvesting for fodder if suitable under extreme drought | <i>In-situ</i> moisture conservation | Farm ponds through IWSP programme |

#### Contingency measures- End of the season

| Condition               | Suggested Contingency measures                                                      |                                                                                                              |                                                                                                                           |                                                                                                    |                                                 |
|-------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|
|                         | Major Farming situation                                                             | Crop/cropping system                                                                                         | Crop management                                                                                                           | Rabi Crop planning                                                                                 | Remarks on Implementation                       |
| <b>Terminal drought</b> | Deep red clay soils<br>Moderately deep red clay / loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Finger millet + Field bean<br>Finger millet + Niger<br>Sunflower<br>Pigeon pea | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean | Cowpea, Sunflower, Field bean, Horse gram (October month)<br><br>Harvest at physiological maturity | Harvesting and Threshing implements through CHC |

#### Real Time Contingency Plan

| Weather aberration       | Crop      | Stage of crop         | Real time contingency measure implemented                                                                                                                                                                                                                                                                                                                              |
|--------------------------|-----------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean   | -                     | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                                                                       |
|                          | Maize     | -                     | Short duration varieties (70-80 days)<br>like Patidar-999 were planted                                                                                                                                                                                                                                                                                                 |
|                          | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                      |
|                          |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                          |
| Mid season drought       | Soybean   | Vegetative, flowering | 1- In-situ moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation - Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of<br>VAM-C @ 375 ml/ha<br>Thio urea @ 250 g/ha |
|                          | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                      |
|                          | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                  |
|                          |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                        |
| Terminal drought         |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                  |

#### 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                           |                             |                                                                               |                                                                                   |                           |
| Non release of water in canals under delayed onset of monsoon in catchment | Not applicable                           |                             |                                                                               |                                                                                   |                           |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon   | Deep to moderately deep to red clay soil | Paddy: Jaya, Mandya Vijaya  | Aerobic rice / SRI: IR 20, KRH-4, IR-30864, MAS 946-1, Anegha, Semi dry crops | Seed treatment<br>Weed management with cono weeder.                               | Timely Seeds supply       |
| Insufficient groundwater recharge due to low rainfall                      | Deep to moderately deep to red clay soil | Maize                       | <b>Maize:</b> Nityashree, Hema<br>Vegetables                                  | Intercultivation / Earthing up<br>Balanced nutrition<br>Critical stage irrigation |                           |

#### Resource management technologies

- **Preparedness:**
  - Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
  - Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
  - Energy management: Compartmental bunding
  - Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |        |
|-------|-----------|----------|--------|
| State | KARNATAKA | District | KOPPAL |
|-------|-----------|----------|--------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 383.4                | More than 19%          | Less than 310.554      |
| June         | 78.7                 |                        |                        |
| July         | 65.5                 |                        |                        |
| August       | 81.6                 |                        |                        |
| September    | 157.6                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 199384 | Gross irrigated area: | 211794 |
| Net Rainfed area    | 194632 | Gross rainfed area    | 312079 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 44579  | 49875  |
| Wells                | 133078 | 140192 |
| Tanks                | 17071  | 17071  |
| Other sources        | 4656   | 4656   |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 59636           | 58471               | 1165              |
| 2    | Jowar     | 1130            | 732                 | 398               |
| 3    | Maize     | 147657          | 53311               | 94346             |
| 4    | Bajra     | 47355           | 2744                | 44611             |
| 5    | Ragi      | 59              | 24                  | 35                |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 30192           | 657                 | 29535             |
| 2    | Groundnut      | 28936           | 16770               | 12166             |
| 3    | Sesamum        | 2802            | 116                 | 2686              |
| 4    | SOyabean       | 14              | 7                   | 7                 |
| 5    | Sunflower      | 9827            | 4066                | 5761              |
| 6    | Castor         | 923             |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 18245           | 14693               | 3552              |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | 1               |                     | 1                 |
| 4    | Sunhemp   | 15              |                     | 15                |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 1574            | 1066                | 508               |
| 2    | Tobacco            | 5               | 5                   | 0                 |
| 3    | Guar seed          | -               |                     | 790               |
| 4    | Other Fodder crops | 1364            | 574                 | 790               |

## Crop Plan- Beginning of the season

### Rainfed situation:

| Condition                                          | Major Farming situation                         | Normal Crop/cropping system | Suggested Contingency measures |                                   |                           |
|----------------------------------------------------|-------------------------------------------------|-----------------------------|--------------------------------|-----------------------------------|---------------------------|
|                                                    |                                                 |                             | Change in crop/cropping system | Agronomic measures                | Remarks on Implementation |
| Delay by 4 weeks<br>(Specify month) July<br>1 week | Rainfed Kharif<br>Shallow black/Red sandy soils | Bajra                       | No change                      | Seed hardening, wider row spacing | -                         |
|                                                    |                                                 | Sorghum                     |                                | Seed hardening                    |                           |
|                                                    |                                                 | Groundnut                   |                                |                                   |                           |
|                                                    |                                                 | Sunflower                   |                                |                                   |                           |

|  |                                           |                                                          |                              |                                                                                                              |
|--|-------------------------------------------|----------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|
|  |                                           | Maize                                                    |                              |                                                                                                              |
|  |                                           | Red gram                                                 | Use 20% higher seed rate     | Take up transplanting                                                                                        |
|  |                                           | Sesamum                                                  | No change                    |                                                                                                              |
|  |                                           | Bajra+ Red gram (2:1)                                    | No change                    | Seed hardening, wider row spacing & 20% higher seed rate in Red gram                                         |
|  |                                           | Groundnut + Red gram (3:1 or 4:2):<br>Sorghum+ Groundnut | Setaria<br>Sesamum<br>Castor |                                                                                                              |
|  | Rainfed post-monsoon.<br>Deep black soils | Rabi sorghum                                             | No change                    | Keep the land fallow in kharif by treating with compartment bunds & furrows for insitu moisture conservation |
|  |                                           | Safflower                                                |                              |                                                                                                              |
|  |                                           | Cotton                                                   |                              |                                                                                                              |
|  |                                           | Sunflower                                                |                              |                                                                                                              |
|  |                                           | Rabi- sorghum+ Bengal gram (2:1)                         |                              |                                                                                                              |

|  |                                    |                               |                    |                      |                    |           |  |
|--|------------------------------------|-------------------------------|--------------------|----------------------|--------------------|-----------|--|
|  |                                    | Bengal gram+ Safflower: (4:2) |                    |                      |                    |           |  |
|  | Rainfed cropping Kharif and Rabi   | <b><u>Kharif</u></b>          | <b><u>Rabi</u></b> | <b><u>Kharif</u></b> | <b><u>Rabi</u></b> | No change |  |
|  | Medium deep black/sandy clay soils | Red gram                      | -<br>-<br>-        | No change            | ---                |           |  |
|  |                                    | Green gram                    | Rabi-sorghum       | Fallow               | Rabi Sorghum       |           |  |
|  |                                    | Castor                        |                    | No change            |                    |           |  |
|  |                                    | Groundnut                     | Sunflower          | Fallow               | Sunflower          |           |  |
|  |                                    | Sunflower                     | Fallow             | No change            | Fallow             |           |  |

#### Contingency measures- Mid season

| Condition                                          |                         |                             | Suggested Contingency measures |                                                |                           |
|----------------------------------------------------|-------------------------|-----------------------------|--------------------------------|------------------------------------------------|---------------------------|
| Early season drought (Normal onset)                | Major Farming situation | Normal Crop/cropping system | Crop management                | Soil nutrient & moisture conservation measures | Remarks on Implementation |
| Condition                                          | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures |                                                |                           |
| Mid season drought (long dry spell, consecutive 2) |                         |                             | Crop management                | Soil nutrient & moisture conservation          | Remarks on Implementation |

|                                  |                                                                     |                                  |                                                                                                         |                                                 |  |
|----------------------------------|---------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------|--|
| weeks rainless (>2.5 mm) period) |                                                                     |                                  |                                                                                                         | on measures                                     |  |
| At vegetative stage              | Rainfed Kharif Shallow black/Red sandy soils                        | Bajra                            | Repeated inter cultivation and weeding, removal of weaklings between 30-45 DAS                          | Opening of conservation furrows at 15-20m apart |  |
|                                  |                                                                     | Sorghum                          |                                                                                                         | ---do---                                        |  |
|                                  |                                                                     | Groundnut                        | Repeated inter cultivation up to 45 days or peg formation ,weeding, and mulching in spreading groundnut |                                                 |  |
|                                  |                                                                     | Sunflower                        | Repeated inter cultivation and weeding                                                                  |                                                 |  |
|                                  |                                                                     | Maize                            |                                                                                                         |                                                 |  |
|                                  |                                                                     | Red gram                         |                                                                                                         |                                                 |  |
|                                  | Rainfed area cropping in post monsoon season                        | Rabi sorghum                     | Repeated inter cultivation and weeding, Removal of weaklings between 30-45 DAS                          | Compartment bunding                             |  |
|                                  |                                                                     | Safflower                        | Repeated inter cultivation and weeding                                                                  |                                                 |  |
|                                  |                                                                     | Cotton                           |                                                                                                         |                                                 |  |
|                                  |                                                                     | Horsegram                        |                                                                                                         |                                                 |  |
|                                  |                                                                     | Sunflower                        |                                                                                                         |                                                 |  |
|                                  |                                                                     | Rabi- sorghum+ Bengal gram (2:1) |                                                                                                         |                                                 |  |
|                                  |                                                                     | Bengal gram + Safflower (4:2)    |                                                                                                         |                                                 |  |
|                                  | Rainfed cropping Kharif and Rabi Medium deep black/sandy clay soils | Kharif                           |                                                                                                         |                                                 |  |
|                                  |                                                                     | Red gram                         | -<br>-<br>-<br>-                                                                                        | Opening furrows to conserve water               |  |
|                                  |                                                                     | Green gram                       | Rabi-sorghum                                                                                            |                                                 |  |
|                                  |                                                                     | Black gram                       | Safflower                                                                                               |                                                 |  |
|                                  |                                                                     | Groundnut                        | Sunflower                                                                                               |                                                 |  |

|           |  |  |                                |
|-----------|--|--|--------------------------------|
| Condition |  |  | Suggested Contingency measures |
|-----------|--|--|--------------------------------|

| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | Major Farming situation                      | Normal Crop/cropping system                  | Crop management                                                                                                             | Soil nutrient & moisture conservation measures                                                                           | Remarks on Implementation |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------|
| At Flowering / fruiting stage                                                      | Rainfed kharif Shallow black/Red sandy soils | Hybrid Bajra                                 | Repeated inter cultivation and weeding .Harvest the crop for fodder purpose and allow for ratooning in sole & intercropping | Opening conservation furrows at 15-20 m apart. Spray anti transpirants like 5% Kaoline. Provide supplemental irrigation. |                           |
|                                                                                    |                                              | Sorghum                                      | Stripping of old & nonfunctional leaves.<br><br>Repeated inter cultivation and weeding                                      | ---do---                                                                                                                 |                           |
|                                                                                    |                                              | Groundnut                                    | Harvesting for fodder purpose                                                                                               | Foliar spraying of 2% urea soon after receipt of rains                                                                   |                           |
|                                                                                    |                                              | Sunflower                                    | Repeated inter cultivation and weeding                                                                                      | Opening conservation furrows at 15-20 m apart                                                                            |                           |
|                                                                                    |                                              | Maize                                        | Repeated inter cultivation and weeding. Harvesting for fodder purpose.                                                      | do                                                                                                                       |                           |
|                                                                                    |                                              | Red gram                                     | Repeated inter cultivation and weeding                                                                                      | do                                                                                                                       |                           |
|                                                                                    |                                              | Rainfed area cropping in post monsoon season | Rabi sorghum                                                                                                                | -                                                                                                                        |                           |
|                                                                                    | Safflower                                    |                                              |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    |                                              | Cotton                                       |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    |                                              | Horsegram                                    |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    |                                              | Sunflower                                    |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    |                                              | Rabi- sorghum+ Bengal gram (2:1)             |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    |                                              | Bengal gram + Safflower: (4:2)               |                                                                                                                             |                                                                                                                          |                           |
|                                                                                    | Rainfed                                      | <i>Kharif</i>                                | <i>Ra</i>                                                                                                                   |                                                                                                                          |                           |

|  |                                                                        |            |                            |                                                        |  |
|--|------------------------------------------------------------------------|------------|----------------------------|--------------------------------------------------------|--|
|  | cropping<br><i>kharif</i> and<br>Rabi<br>Medium<br>deep<br>black/sandy |            | <i>b</i><br><i>i</i>       |                                                        |  |
|  |                                                                        | Red gram   | -<br>-<br>-<br>-           | Opening<br>conservation<br>furrows at 15-20 m<br>apart |  |
|  |                                                                        | Green gram | Rabi-sorghum               | Incorporate<br>greengram in<br>soil                    |  |
|  |                                                                        | Black gram | Safflower                  |                                                        |  |
|  | clay soils                                                             | Groundnut  | Sunflower                  | Foliar spraying of 2%<br>urea                          |  |
|  |                                                                        |            | Bengal gram +<br>safflower | Harvest the crop                                       |  |

#### Contingency measures- End of the season

| Conditio<br>n       |                                                              |                                      | Suggested Contingency measures                                                                                                        |                                                                                                       |                                  |
|---------------------|--------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------|
| Terminal<br>drought | Major<br>Farmin<br>g<br>situatio<br>n                        | Normal Crop/cropping<br>system       | Crop management                                                                                                                       | Soil<br>nutrient &<br>moisture<br>conservatio<br>n measures                                           | Remarks on<br>Implementatio<br>n |
|                     | Rainfed <i>kharif</i><br>Shallow<br>black/Red<br>sandy soils | Hybrid Bajra                         | Harvest the crop at<br>physiological maturity & go for<br>early rabi crop. Harvest for<br>fodder purpose in case of severe<br>drought | Spraying of<br>anti<br>transpirants<br>like 5%<br>Kaoline &<br>provide<br>supplement<br>al irrigation |                                  |
|                     |                                                              | Sorghum                              | --                                                                                                                                    | ---do---                                                                                              |                                  |
|                     |                                                              | Groundnut                            | do-                                                                                                                                   |                                                                                                       |                                  |
|                     |                                                              | Sunflower                            | --                                                                                                                                    | supplement<br>al irrigation                                                                           |                                  |
|                     |                                                              | Maize                                |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Red gram                             |                                                                                                                                       |                                                                                                       |                                  |
|                     | Rainfed area<br>cropping in<br>post<br>monsoon<br>season     | Rabi sorghum                         | -                                                                                                                                     | Compartment<br>bundling                                                                               |                                  |
|                     |                                                              | Safflower                            |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Cotton                               |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Horsegram                            |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Sunflower                            |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Rabi- sorghum + Bengal gram<br>(2:1) |                                                                                                                                       |                                                                                                       |                                  |
|                     |                                                              | Bengal gram + Safflower: (4:2)       |                                                                                                                                       |                                                                                                       |                                  |

|                                                                  |          |                  |  |                                                                                                                           |  |  |
|------------------------------------------------------------------|----------|------------------|--|---------------------------------------------------------------------------------------------------------------------------|--|--|
| 3 Rainfed cropping<br>Kharif and Rabi<br>Medium deep black/sandy | Kharif   | Rabi             |  | Harvest the crop at physiological maturity & go for early rabi crop. Harvest for fodder purpose in case of severe drought |  |  |
|                                                                  | Red gram | -<br>-<br>-<br>- |  |                                                                                                                           |  |  |

|            |            |              |     |            |  |  |
|------------|------------|--------------|-----|------------|--|--|
| clay soils | Green gram | Rabi-sorghum | --- | do--<br>-- |  |  |
|            | Black gram | Safflower    |     |            |  |  |
|            | Groundnut  | Sunflower    |     |            |  |  |

### 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 | Canal irrigated black soil | TBP area                        |                                           |                                                                                                                                              |                           |
|                                                        |                            | Hybrid Jowar-wheat-Hybrid bajra | No change                                 |                                                                                                                                              |                           |
|                                                        |                            | Hybrid bajra-cotton-groundnut   |                                           |                                                                                                                                              |                           |
|                                                        |                            | Groundnut-no-Hybrid Jowar       |                                           |                                                                                                                                              |                           |
|                                                        |                            | Paddy-no-Hybrid Jowar/Groundnut |                                           |                                                                                                                                              |                           |
|                                                        |                            | TBP left bank canal             |                                           |                                                                                                                                              |                           |
|                                                        |                            | Paddy-paddy                     | Paddy-paddy with short duration varieties | For 35-40 days old seedlings use 4-5 seedlings/hill in the case of paddy Provide additional 20% nitrogen to compensate for reduced tillering |                           |
|                                                        |                            |                                 |                                           |                                                                                                                                              |                           |

| 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 | Canal irrigated black soil | TBP area                                 |                                           |                                                                                             |                           |
|                                                        |                            | Hybrid Jowar-Hybrid bajra                |                                           |                                                                                             |                           |
|                                                        |                            | Hybrid bajra-cotton-groundnut            |                                           |                                                                                             |                           |
|                                                        |                            | Groundnut-no-Hybrid Jowar                |                                           |                                                                                             |                           |
|                                                        |                            | Paddy-no- Hybrid Jowar/Groundnut, cotton |                                           | Irrigate the paddy maintaining saturation level moisture or adopt SRI method of cultivation |                           |
|                                                        |                            | TBP left bank canal                      |                                           |                                                                                             |                           |
|                                                        |                            | Paddy-paddy                              | Grow light irrigated crops like sunflower |                                                                                             |                           |

| 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 | -                       | -                           | -                              | -                  | -                         |

| 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 | Kharif-irrigated Medium deep to deep black/sandy clay soils | Maize                       | Follow rain fed cropping system |                    |                           |
|                                                                          |                                                             | Sorghum                     | -do-                            |                    |                           |
|                                                                          |                                                             | Cotton                      |                                 |                    |                           |
|                                                                          |                                                             | Groundnut+ Red gram (4:2)   |                                 |                    |                           |
|                                                                          | Rabi-irrigated Medium deep to deep black/sandy clay soils   | Green gram (rainfed)        |                                 |                    |                           |
|                                                                          |                                                             | Blackgram (rainfed)         |                                 |                    |                           |
|                                                                          |                                                             | Sunhemp green manuring      |                                 |                    |                           |

| 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 |                         | Not applicable              |                                |                    |                           |
| Any other condition (specify)                         |                         |                             |                                |                    |                           |

## 2. Real Time Contingency Plan

| Weather aberration       | Crop      | Stage of crop         | Real time contingency measure implemented                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-----------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean   | -                     | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                                                                              |
|                          | Maize     | -                     | Short duration varieties (70-80 days)<br>like Patidar-999 were planted                                                                                                                                                                                                                                                                                                        |
|                          | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                             |
|                          |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                                 |
| Midseason drought        | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation - Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of<br>VAM-C @ 375 ml/ha<br>Thio urea @ 250 g/ha |
|                          | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                             |
|                          | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                         |
|                          |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                               |
| Terminal drought         |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                         |

## Resource management technologies

### 3. Preparedness:

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |           |
|-------|-----------|----------|-----------|
| State | KARNATAKA | District | RAMANAGRA |
|-------|-----------|----------|-----------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 459.6                | More than 19%          | Less than 372.276      |
| June         | 72.2                 |                        |                        |
| July         | 86.5                 |                        |                        |
| August       | 111.2                |                        |                        |
| September    | 189.7                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 28990  | Gross irrigated area: | 32801  |
| Net Rainfed area    | 121868 | Gross rainfed area    | 123975 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | -     | -     |
| Wells                | 28752 | 32563 |
| Tanks                | 238   | 238   |
| Other sources        | -     | -     |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 2935            | 2935                | 0                 |
| 2    | Jowar     | 1529            | 70                  | 1459              |
| 3    | Maize     | 3039            | 1444                | 1595              |
| 4    | Bajra     | 5               |                     | 5                 |
| 5    | Ragi      | 67264           | 1189                | 66075             |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 567             |                     | 567               |
| 2    | Groundnut      | 242             |                     | 242               |
| 3    | Sesamum        | 1338            |                     | 1338              |
| 4    | SOyabean       | -               |                     |                   |
| 5    | Sunflower      | 4               | 4                   | 0                 |
| 6    | Castor         | 68              |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 2               |                     | 2                 |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 81              |                     | 81                |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 191             | 191                 | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 1703              |
| 4    | Other Fodder crops | 5588            | 3885                | 1703              |

#### Crop Plan- Beginning of the season

##### 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 4weeks<br>July 1st week     | Deep red clay soils             | Pigeonpea                     | Pigeon pea: BRG-1, 5                                                            | Intercultivation,                                                                                                                                                                                  |                           |
|                                      | Moderately deep red clay soils. | Cowpea/Field bean             | Field bean: HA-4, HA-3                                                          | In-situ moisture conservation, Conservation furrow, Seed treatment with bio-fertilizers in pulses Dry sowing and seed hardening in Finger millet Staggered nursery for finger millet when no rains |                           |
|                                      |                                 | Groundnut+Pigeonpea           | Cowpea: IT-38956-1, KBC-1 & 2                                                   |                                                                                                                                                                                                    |                           |
|                                      |                                 | Sesame                        | Groundnut + Pigeonpea (8:2): Groundnut: KCG-6, GKVK-5 Pigeon pea : BRG-2, BRG-4 |                                                                                                                                                                                                    |                           |
|                                      |                                 | Sesame: TMV-3, T-7& Navelle-1 | Finger millet + Pigeonpea (8:2): Finger millet: MR-1, MR-6 Pigeonpea: BRG-1     |                                                                                                                                                                                                    |                           |

### Contingency measures- Mid season

| Condition                                        |                                                                                     |                                                                                                         | Suggested Contingency measures                                                                                                                                                         |                                                                                                                          |                                                 |
|--------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Mid season Drought<br><b>At vegetative stage</b> | Deep red clay soils<br>Moderately deep red clay / loamy soils.<br>Shallow red soils | Finger millet + Pigeonpea<br>Figer millet + Fieldbean<br>Fingermillet + Niger<br>Pigeon pea/ Field bean | Thinning,<br>Grazing leaf tips,<br>Postponement of top dressing<br>Life saving irrigation, if available<br>Earthing up.<br>Protective irrigation of stored water if any in farm ponds. | Conservation<br>Furrow<br>Mulching<br>Shallow intercultivation to eradicate weeds<br>Use of moderate amount of nutrients | Supply of inter cultural implements through CHC |
| Condition                                        | Suggested Contingency measures                                                      |                                                                                                         |                                                                                                                                                                                        |                                                                                                                          |                                                 |
|                                                  | Major Farming                                                                       | Crop/cropping system                                                                                    | Crop management                                                                                                                                                                        | Rabi Crop planning                                                                                                       | Remarks on Implementation                       |
| <b>At reproductive stage</b>                     | Deep red clay soils<br>Moderately deep red clay / loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Figer millet + Field bean<br>Finger millet + Niger<br>Pigeon pea          | Life saving irrigation from farm pond<br>Weeding and Weed mulching<br>Harvesting for fodder if suitable under extreme drought                                                          | <i>In-situ</i> moisture conservation                                                                                     | Farm ponds through IWSM programme               |

### Contingency measures- End of the season

| Condition               | Suggested Contingency measures                                                      |                                                                                                            |                                                                                                                           |                                                                                                    |                                                 |
|-------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|
|                         | Major Farming                                                                       | Crop/cropping system                                                                                       | Crop management                                                                                                           | Rabi Crop planning                                                                                 | Remarks on Implementation                       |
| <b>Terminal drought</b> | Deep red clay soils<br>Moderately deep red clay / loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Figer millet + Field bean<br>Fingermillet + Niger<br>Sunflower<br>Pigeon pea | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean | Cowpea, Sunflower, Field bean, Horse gram (October month)<br><br>Harvest at physiological maturity | Harvesting and Threshing implements through CHC |

#### 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          |                             |                                |                    |                           |

| 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                     | Not applicable                           |                              |                                                               |                                                                                   |                           |
| Non release of water in canals under delayed onset of monsoon in catchment | Not applicable                           |                              |                                                               |                                                                                   |                           |
| Lack of inflows into tanks due to insufficient/delayed onset of monsoon    | Deep to moderately deep to red clay soil | Paddy: Jaya, Mandya Vijaya   | Aerobic rice / SRI: IR 20, KRH-4, IR-30864, MAS 946-1, Anegha | Seed treatment<br>Weed management with cono weeder.                               | Timely Seeds supply       |
| Insufficient groundwater recharge due to low rainfall                      | Deep to moderately deep to red clay soil | Maize                        | <b>Maize:</b> Nityashree, Hema                                | Intercultivation / Earthing up<br>Balanced nutrition<br>Critical stage irrigation |                           |

#### Resource management technologies

##### 4. Preparedness:

- e. Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- f. Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- g. Energy management: Compartmental bunding
- h. Nutrient management: Intercropping with RDF

## 5. Real Time Contingency Plan

| Weather aberration       | Crop      | Stage of crop         | Real time contingency measure implemented                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-----------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean   | -                     | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                                                                              |
|                          | Maize     | -                     | Short duration varieties (70-80 days)<br>like Patidar-999 were planted                                                                                                                                                                                                                                                                                                        |
|                          | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                             |
|                          |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                                 |
| Midseason drought        | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation - Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of<br>VAM-C @ 375 ml/ha<br>Thio urea @ 250 g/ha |
|                          | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                             |
|                          | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                         |
|                          |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                               |
| Terminal drought         |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                         |

# Actionable Comprehensive Plans for Contingency

|       |           |          |         |
|-------|-----------|----------|---------|
| State | KARNATAKA | District | SHIMOGA |
|-------|-----------|----------|---------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 1626.5               | More than 19%          | Less than 1317.465     |
| June         | 387                  |                        |                        |
| July         | 579.3                |                        |                        |
| August       | 450.1                |                        |                        |
| September    | 210.1                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 177960 | Gross irrigated area: | 203998 |
| Net Rainfed area    | 63122  | Gross rainfed area    | 67978  |

## Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | 40544  | 44320  |
| Wells                | 101977 | 121814 |
| Tanks                | 11762  | 12063  |
| Other sources        | 23677  | 25801  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 64675           | 37377               | 27298             |
| 2    | Jowar     | 35              | 13                  | 22                |
| 3    | Maize     | 41301           | 14371               | 26930             |
| 4    | Bajra     | 1               | 1                   | 0                 |
| 5    | Ragi      | 233             | 55                  | 178               |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 32              | 26                  | 6                 |
| 2    | Groundnut      | 33              | 25                  | 8                 |
| 3    | Sesamum        | 2               | 1                   | 1                 |
| 4    | SOyabean       | 12              | 11                  | 1                 |
| 5    | Sunflower      | 363             | 363                 | 0                 |
| 6    | Castor         | -               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 62              | 24                  | 38                |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 3               |                     | 3                 |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 676             | 622                 | 54                |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 342               |
| 4    | Other Fodder crops | 405             | 63                  | 342               |

#### Crop Plan- Beginning of the season

##### 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 4 weeks July 1st week       | Red gravelly mixed with deep black soils | Maize                        | Maize + Redgram (3:1)<br>Use BRG-2 (Redgram variety) as intercrop | Seed treatment with Metalaxyl @ 4g./kg | Supply of seeds through KSSC/NSP |

|  |                                                      |           |                                                                                                   |                  |                                                   |
|--|------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------|
|  |                                                      | Cotton    | Maize + Redgram (3:1)                                                                             | -                | -do-                                              |
|  |                                                      | Redgram   | No change                                                                                         | 2 ft row spacing | Supply of seeds through NFSM                      |
|  | Red sandy soils Heavy and assured rainfall situation | Paddy     | Drill sown paddy<br>Use of medium duration Paddy varieties like IET-7191, KHP-2, KHP-5, IET-13901 | -                | -do-                                              |
|  | Red loamy soils                                      | Groundnut | Sunflower/Ragi/<br>Groundnut (TMV-2) + Redgram (8:2)                                              |                  | Breeder seed supply-<br>UAS(B)<br>F1 seed supply- |

|  |  |  |  |  |            |
|--|--|--|--|--|------------|
|  |  |  |  |  | KSSC & KOP |
|--|--|--|--|--|------------|

#### Contingency measures- Mid season

| Condition                                                                          |                                                      |                              | SuggestedContingencymeasures                     |                                                                        |                           |
|------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------|--------------------------------------------------|------------------------------------------------------------------------|---------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | Major Farming situation                              | Normal Crop/ cropping system | Crop management                                  | Soil nutrient & moisture conservation measures                         | Remarks on Implementation |
| At vegetative stage                                                                | Red gravelly mixed with deep black soils             | Maize                        | Reducing plant population. Protective irrigation | Seed hardening, soil mulch, inter cultivation, weed management         | Implements under RKVY     |
|                                                                                    |                                                      | Cotton                       | Use of anti-transpirants                         | Intercultivation, weed management, alternate furrow irrigation.        |                           |
|                                                                                    |                                                      | Red gram                     | Protective irrigation                            | Intercultivation, weed management, dead furrow opening                 |                           |
|                                                                                    | Red sandy soils Heavy and assured rainfall situation | Paddy                        | Protective irrigation                            | Weed management, use of stored water from tank and river, top dressing |                           |
|                                                                                    | Red loamy soils                                      | Groundnut                    | -                                                | Intercultivation, weed management                                      |                           |

| Condition                           |                                          |                            | SuggestedContingencymeasures                    |                                                                                                                        |                           |
|-------------------------------------|------------------------------------------|----------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Mid season drought (long dry spell) | Major Farming situation                  | Norm Crop/ cropping system | Crop management                                 | Soil nutrient & moisture conservation measures                                                                         | Remarks on Implementation |
| At flowering/fruiting stage         | Red gravelly mixed with deep black soils | Maize                      | Intercrop harvested for or vegetable purpose    | Mulching with leaves (Ex-situ), intercropping, protective irrigation. Tank silt application to conserve soil moisture. | Implements under RKVY     |
|                                     |                                          | Cotton                     | split application of fertilizer and mixing with | Mulching, Topping to reduce vertical growth                                                                            |                           |
|                                     |                                          |                            | soil harvest to                                 |                                                                                                                        |                           |

|  |                                                         |           |                                   |          |  |
|--|---------------------------------------------------------|-----------|-----------------------------------|----------|--|
|  |                                                         |           | fintercrops as vegetables         |          |  |
|  |                                                         | Redgram   | Protectiveirrigation              | Mulching |  |
|  | Red sandy soils<br>Heavyandassured<br>rainfallsituation | Paddy     | Splitapplicationofpotash          | -do-     |  |
|  | Redloamy soils                                          | Groundnut | Earthingup, protective irrigation | -do-     |  |

#### Contingency measures- End of the season

| Condition        | SuggestedContingencymeasures                          |                   |                                                                                                                                                      |                                                                                                                                                                                                         |                           |
|------------------|-------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Terminal drought | MajorFarming situation                                | Normalping system | Crop management                                                                                                                                      | Rabi Crop planning                                                                                                                                                                                      | Remarks on Implementation |
|                  | Redgravelly mixedwithdeep black soils                 | Maize             | Protective irrigation, Maize crop tobeharvestedfortablepurpose, Red gram to be harvested as green pods,toppingofmaizeif grain fillingstagecompleted. | Dolichosbean-Hebbalavare 3 & 4<br>HorsegramvarietyKBH-1, PHG-9                                                                                                                                          | -                         |
|                  |                                                       | Cotton            | Mulchingwithintercropfoliage                                                                                                                         | Cotton:DCH-32,DHB-105, NHH-44/<br>Chilli :Bellary red, Arkabindu, Arkalaalima, Byadagi, Arkalohit /<br>Jowar : KHSB-2, KB-79, PS-16, PDM-84-178 (Hybridjowarcultivars)/<br>HorsegramvarietyKBH-1, PHG-9 |                           |
|                  |                                                       | Redgram           | Mulchingwithintercropfoliage                                                                                                                         | Horsegram,minormillet<br>HorsegramvarietyKBH-1,PHG-9                                                                                                                                                    |                           |
|                  | Red sandy soils<br>Heavyandassured rainfall situation | Paddy             | Harvest the crop even at 75% maturity in Hemavathi and other long duration varieties                                                                 | BlackgramvarietiesT-9, LBG-625/<br>Greengram varieties PDM-84-178,PS-16/<br>SoybeanvarietiesKHSB-2, KB-79/<br>Chilli varieties Byadagi, Arkalohit                                                       |                           |
|                  | Redloamysoils                                         | Groundnut         | Ifpossibleprotectiveirrigation, application of 0.1% borax                                                                                            | Sunflower/<br>BlackgramvarietiesT-9, LBG-625/<br>Greengram varieties PDM-84-178,PS-16,                                                                                                                  |                           |

#### Real Time Contingency Plan

| Weatheraberration | Crop | Stage of crop | Realttimecontingencymeasureimplemented |
|-------------------|------|---------------|----------------------------------------|
|-------------------|------|---------------|----------------------------------------|

|                          |           |                       |                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|-----------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean   | -                     | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                                                                      |
|                          | Maize     | -                     | Short duration varieties (70-80 days)<br>like Patidar-999 were replanted                                                                                                                                                                                                                                                                                              |
|                          | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                     |
|                          |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                         |
| Midseason drought        | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation-Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of VAM-C@375ml/ha<br>Thio urea @ 250 g/ha |
|                          | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                     |
|                          | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                 |
|                          |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                       |
| Terminal drought         |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                 |

#### 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 | Low lands, canal irrigated red sandy soils and loamy soils | Paddy                       | Prefer Short duration varieties<br>Rasi, Mangala, KRH-1, KRH-2, IR-20, IR-64, Jyoti, MTU 1010 | SRI method                                               |                           |
|                                                        | Canal irrigated red soils                                  | Sugarcane                   | No change                                                                                     | Improved package of practices, mulching in standing crop |                           |

| 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 | Low lands, canal irrigated red sandy soils and loamy soils | Paddy                       | Prefer Short duration varieties<br>Rasi, Mangala, KRH-1, IR-20, Jyoti | SRI (System of Rice Intensification) method                                                                                    | Supply of seeds through KSSC & NSP |
|                                                        | Canal irrigated red soils                                  | Sugarcane                   | No change                                                             | Paired row technique, single eye budded (seedlings raised in nursery), skip row irrigation, trash mulching, intercrop mulching |                                    |

| 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 | Low lands, canal irrigated red sandy soils and loamy soils | Paddy (Upland)              | Maize, Cowpea, Sunflower, Soybean, Groundnut, Ragi                 | Cover crops ( Short duration pulses) | Supply of seeds through KSSC & NSP |
|                                                                            |                                                            | Paddy (Low land)            | Prefer Short duration paddy varieties viz., KHP-10, IR-20, Mangala |                                      |                                    |
|                                                                            | Canal irrigated red soils                                  | Sugarcane                   | Ragi, Sunflower, Soybean, Pulses                                   | -                                    | -                                  |

| 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 | Tank fed irrigated red sandy soils and loamy soils | Paddy for kharif/ Blackgram- Rabi | Cowpea, HA - 3 & 4, Pulses, Black gram, Greengram, Niger, Sunflower | -                  | -                         |
|                                                                          |                                                    | Sugarcane                         | Ragi, Sunflower, Soybean, Pulses                                    | -                  | -                         |
|                                                                          | Tank fed red soils                                 |                                   |                                                                     |                    |                           |

| 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 irrigated alluvial soils | Areca nut                                    | -                              | Use of advanced irrigation system for water saving, mulching | -                         |
|                                                       |                                    | Banana                                       | No change                      |                                                              |                           |
|                                                       |                                    | Floriculture                                 | No change                      |                                                              |                           |
|                                                       |                                    | Vegetables (for both kharif and rabi season) | No change                      |                                                              |                           |

#### Resource management technologies

##### Preparedness:

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF



## Actionable Comprehensive Plans for Contingency

|       |           |          |        |
|-------|-----------|----------|--------|
| State | KARNATAKA | District | TUMKUR |
|-------|-----------|----------|--------|

### Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 379.7                | More than 19%          | Less than 307.557      |
| June         | 63.9                 |                        |                        |
| July         | 69.2                 |                        |                        |
| August       | 82.1                 |                        |                        |
| September    | 164.5                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

### Irrigation info:

|                     |        |                       |        |
|---------------------|--------|-----------------------|--------|
| Net irrigated area: | 302462 | Gross irrigated area: | 302810 |
| Net Rainfed area    | 278400 | Gross rainfed area    | 320855 |

### Source wise irrigation area details (ha)

| Source of irrigation | Net    | Gross  |
|----------------------|--------|--------|
| Canals               | -      | -      |
| Wells                | 302462 | 302810 |
| Tanks                | -      | -      |
| Other sources        | -      | -      |

### Crop Profile (Kharif)

#### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 2238            | 2238                | 0                 |
| 2    | Jowar     | 5943            | 469                 | 5474              |
| 3    | Maize     | 28049           | 6824                | 21225             |
| 4    | Bajra     | 74              |                     | 74                |
| 5    | Ragi      | 152292          | 21519               | 130773            |

## Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | 7459            | 7                   | 7452              |
| 2    | Groundnut      | 49154           | 11229               | 37925             |
| 3    | Sesamum        | 218             |                     | 218               |
| 4    | SOyabean       | 8               | 5                   | 3                 |
| 5    | Sunflower      | 38              | 32                  | 6                 |
| 6    | Castor         | 602             |                     |                   |

## Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 4760            | 3755                | 1005              |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 30              |                     | 30                |

## Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 326             | 326                 | 0                 |
| 2    | Tobacco            | 28              | 28                  | 0                 |
| 3    | Guar seed          | -               |                     | 3470              |
| 4    | Other Fodder crops | 7110            | 3640                | 3470              |

### Crop Plan- Beginning of the season

#### Rainfed situation:

|                                                     |                         |                                                                 |                                                                                                            |                                                                                                                                                                                                                                                                           |                                                                    |
|-----------------------------------------------------|-------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Delay by 4 weeks<br><b>July 1<sup>st</sup> week</b> | Red soil/Red sandy loam | Finger millet+ Pigeonpea / Field bean<br>Groundnut + Pigeon pea | Finger millet: MR-1, MR-6<br>Pigeon pea: BRG-1, 2, 5<br>Field bean: HA-4, HA-5<br>Groundnut: KCG-6, GKVK-5 | <ul style="list-style-type: none"> <li>❖ Optimum seed rate and recommended spacing</li> <li>❖ <i>In-situ</i> moisture conservation</li> <li>❖ Wider spacing (120cm x 30 cm) in Pigeon pea</li> <li>❖ Balanced nutrition with emphasis on recommended potassium</li> </ul> | Seed drills under CHC<br><br>Supply of seeds through KSSC/ NSC/RSK |
|                                                     |                         | Castor/ Sesamum/ Greengram                                      | Finger millet: MR-1, MR-6<br>Little millet: Co-2, OLM-201<br>Foxtail millet: RS-118, K-221-1               | <ul style="list-style-type: none"> <li>❖ Contour cultivation</li> <li>❖ Tied ridges</li> </ul>                                                                                                                                                                            |                                                                    |
|                                                     |                         | Pigeonpea Sole crop                                             | Pigeonpea (BRG-1, 2 and 5) + Field bean (HA-4, 5)                                                          | Contour cultivation, small section bunds                                                                                                                                                                                                                                  |                                                                    |

#### Contingency measures- Mid season

| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) |                                                                                     |                                                                                                             |                                                                                                                                                                                        |                                                                                                                       |                                                 |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>At vegetative stage</b>                                                         | Deep red clay soils<br>Moderately deep red clay / loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Finger millet + Field bean<br>Finger millet + Niger<br>Pigeon pea/ Field bean | Thinning,<br>Grazing leaf tips,<br>Postponement of top dressing<br>Life saving irrigation, if available<br>Earthing up.<br>Protective irrigation of stored water if any in farm ponds. | Conservation Furrow<br>Mulching<br>Shallow intercultivation to eradicate weeds<br>Use of moderate amount of nutrients | Supply of inter cultural implements through CHC |

| Condition                    | Suggested Contingency measures                                                    |                                                                                                 |                                                                                                                               |                                      |                                   |
|------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------|
|                              | Major Farming situation                                                           | Crop/cropping system                                                                            | Crop management                                                                                                               | Rabi Crop planning                   | Remarks on Implementation         |
| <b>At reproductive stage</b> | Deep red clay soils<br>Moderately deep red clay/loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Finger millet + Field bean<br>Finger millet + Niger<br>Pigeon pea | Life saving irrigation from farm pond<br>Weeding and Weed mulching<br>Harvesting for fodder if suitable under extreme drought | <i>In-situ</i> moisture conservation | Farm ponds through IWSP programme |

#### Contingency measures- End of the season

|                         |                                                                                   |                                                                                                              |                                                                                                                           |                                                                                                    |                                                 |
|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>Terminal drought</b> | Deep red clay soils<br>Moderately deep red clay/loamy soils.<br>Shallow red soils | Finger millet + Pigeon pea<br>Finger millet + Field bean<br>Finger millet + Niger<br>Sunflower<br>Pigeon pea | Protective irrigation from farm pond<br>Harvest crops for fodder<br>Harvesting of green pods of pigeon pea and field bean | Cowpea, Sunflower, Field bean, Horse gram (October month)<br><br>Harvest at physiological maturity | Harvesting and Threshing implements through CHC |
|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|

#### 6. Real Time Contingency Plan

| Weather aberration       | Crop    | Stage of crop | Real time contingency measure implemented                                     |
|--------------------------|---------|---------------|-------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean | -             | Short duration varieties (80-90 days) like JS 95-60 and JS 93-05 were planted |
|                          | Maize   | -             | Short duration varieties (70-80 days) like Patidar-999 were planted           |

|                   |           |                       |                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|-----------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                          |
|                   |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                              |
| Midseason drought | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation - Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of VAM-C @ 375 ml/ha<br>Thio urea @ 250 g/ha |
|                   | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                          |
|                   | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                      |
|                   |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                            |
| Terminal drought  |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                      |

### 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                           |                             |                                                               |                                                                                   |                           |
| Non release of water in canals under delayed onset of monsoon in catchment | Not applicable                           |                             |                                                               |                                                                                   |                           |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon   | Deep to moderately deep to red clay soil | Paddy: Jaya, Mandya Vijaya  | Aerobic rice / SRI: IR 20, KRH-4, IR-30864, MAS 946-1, Anegha | Seed treatment<br>Weed management with cono weeder.                               | Timely Seeds supply       |
| Insufficient groundwater recharge due to low rainfall                      | Deep to moderately deep to red clay soil | Maize                       | Maize Nityashree, Hema                                        | Intercultivation / Earthing up<br>Balanced nutrition<br>Critical stage irrigation |                           |

### Resource management technologies

- **Preparedness:**

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |       |
|-------|-----------|----------|-------|
| State | KARNATAKA | District | UDUPI |
|-------|-----------|----------|-------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 3762.3               | More than 19%          | Less than 3047.463     |
| June         | 1100.1               |                        |                        |
| July         | 1259.1               |                        |                        |
| August       | 919.2                |                        |                        |
| September    | 483.9                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |       |                       |       |
|---------------------|-------|-----------------------|-------|
| Net irrigated area: | 43220 | Gross irrigated area: | 45437 |
| Net Rainfed area    | 48446 | Gross rainfed area    | 57219 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | -     | -     |
| Wells                | 39962 | 41956 |
| Tanks                | 946   | 1012  |
| Other sources        | 2312  | 2469  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 30141           | 0                   |                   |
| 2    | Jowar     | -               | -                   |                   |
| 3    | Maize     | 33              | 33                  | 0                 |
| 4    | Bajra     | -               |                     |                   |
| 5    | Ragi      | 2               | 2                   | 0                 |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | -               |                     |                   |
| 2    | Groundnut      | 1411            |                     | 1411              |
| 3    | Sesamum        | 8               | 2                   | 6                 |
| 4    | SOyabean       | -               |                     |                   |
| 5    | Sunflower      | -               |                     |                   |
| 6    | Castor         | -               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | -               |                     |                   |
| 2    | Jute      | -               |                     |                   |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | -               |                     |                   |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 17              | 17                  | 0                 |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 0                 |
| 4    | Other Fodder crops | 83              | 83                  | 0                 |

#### Rainfed situation:

##### Crop Plan- Beginning of the season

| Condition                                      |                                     |                                          | SuggestedContingencymeasures                |                                                                                                           |                                                                                                                                                                                 |
|------------------------------------------------|-------------------------------------|------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Early season drought(delayed onset)            | MajorFarming situation <sup>a</sup> | Normal Crop/cropping system <sup>b</sup> | Change in crop/cropping system <sup>c</sup> | Agronomicmeasures <sup>d</sup>                                                                            | Remarks on Implementation                                                                                                                                                       |
| Delay by 4 weeks(1 <sup>st</sup> week of July) | Shallow, lateritic, acid soil       | Paddy                                    | Paddy                                       | Shortdurationvarieties<br>Drum seeded sowing<br><br>Alteringplanting geometry<br><br>Protectiveirrigation | Supply of short durationvarietiesby the Dept. of Agri.<br><br>SupplyDrumseeders through RSKs<br><br>Pests and disease control measures needtobetakenup and Dept. of Agriculture |

|  |  |  |  |  |                                                                           |
|--|--|--|--|--|---------------------------------------------------------------------------|
|  |  |  |  |  | Use of seepage water/well water ensure availability of required chemicals |
|--|--|--|--|--|---------------------------------------------------------------------------|

#### Contingency measures- Mid season

| Condition                                                                         |                                |                             | Suggested Contingency measures                                                                                                     |                                                |                                                                   |
|-----------------------------------------------------------------------------------|--------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|
| Midseason drought (long dry spell, consecutive 2 weeks rainless (> 2.5mm) period) | Major Farming situation        | Normal Crop/cropping system | Crop management                                                                                                                    | Soil nutrient & moisture conservation measures | Remarks on Implementation                                         |
| At vegetative stage                                                               | Shallow, lateritic, acid soils | Paddy                       | Protective irrigation<br>Postponement of fertilizer top dressing<br>Insect pest management by (Leaf folder) spraying of Quinolphos | Scooping of topsoil Growing azolla             | Supply of azolla seeds<br>Ensuring the availability of Quinolphos |

| Condition                          |                                |                             | Suggested Contingency measures |                                               |                           |
|------------------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------------------------|---------------------------|
| Midseason drought (long dry spell) | Major Farming situation        | Normal Crop/cropping system | Crop management                | Soil nutrient & moisture conservation measure | Remarks on Implementation |
| At flowering/ fruiting stage       | Shallow, lateritic, acid soils | Paddy                       | Use of seepage water           |                                               |                           |

#### Contingency measures- End of the season

| Condition        |                                |                             | Suggested Contingency measures                      |                                                                                  |                           |
|------------------|--------------------------------|-----------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------|---------------------------|
| Terminal drought | Major Farming situation        | Normal Crop/cropping system | Crop management                                     | Rabi Crop planning                                                               | Remarks on Implementation |
|                  | Shallow, lateritic, acid soils | Paddy                       | Protective irrigation using available seepage water | Black gram, cowpea, Vegetables – coccinia, ash gourd, brinjal, cucumber, Chilli, |                           |

#### Real Time Contingency Plan

| Weather aberration       | Crop       | Stage of crop | Real time contingency measure implemented                                                      |
|--------------------------|------------|---------------|------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean    | -             | Short duration varieties (80-90 days) like JS 95-60 and JS 93-05 were planted                  |
|                          | Maize      | -             | Short duration varieties (70-80 days) like Patidar-999 were replanted                          |
|                          | Pigeon pea | -             | Medium duration varieties (160-180 days) like JA-4, JKM-189 and JS 93-05<br>Rising of seedling |

|                   |           |                       |                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|-----------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |           |                       |                                                                                                                                                                                                                                                                                                                                                                          |
|                   |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                            |
| Midseason drought | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation-Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of<br>VAM-C@375ml/ha<br>Thio urea @ 250 g/ha |
|                   | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                        |
|                   | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                    |
|                   |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                          |
| Terminal drought  |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                    |

#### Irrigated situation – NA-

#### Resource management technologies

##### 7. Preparedness:

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF

# Actionable Comprehensive Plans for Contingency

|       |           |          |              |
|-------|-----------|----------|--------------|
| State | KARNATAKA | District | UTTAR KANNAD |
|-------|-----------|----------|--------------|

## Rainfall info (mm)

| Month/season | Normal rainfall (mm) | Expected deficiency, % | Expected rainfall (mm) |
|--------------|----------------------|------------------------|------------------------|
| June-Sep     | 2747.9               | More than 19%          | Less than 2225.799     |
| June         | 743                  |                        |                        |
| July         | 960.4                |                        |                        |
| August       | 702.4                |                        |                        |
| September    | 342.1                |                        |                        |

Forecast probability for the season (as per IMD): Below Normal

## Irrigation info:

|                     |       |                       |       |
|---------------------|-------|-----------------------|-------|
| Net irrigated area: | 61383 | Gross irrigated area: | 68174 |
| Net Rainfed area    | 53896 | Gross rainfed area    | 65397 |

## Source wise irrigation area details (ha)

| Source of irrigation | Net   | Gross |
|----------------------|-------|-------|
| Canals               | 182   | 182   |
| Wells                | 58079 | 64794 |
| Tanks                | 109   | 110   |
| Other sources        | 3013  | 3088  |

## Crop Profile (Kharif)

### Cereals

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Rice      | 38068           | 1629                | 36439             |
| 2    | Jowar     | 27              | -                   |                   |
| 3    | Maize     | 10185           | 2423                | 7762              |
| 4    | Bajra     | 1               | 1                   | 0                 |
| 5    | Ragi      | 5               | 4                   | 1                 |

### Pulses & Oilseeds

| S.No | Crop name      | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|----------------|-----------------|---------------------|-------------------|
| 1    | Arhar/ Redgram | -               |                     |                   |
| 2    | Groundnut      | 926             | 32                  | 894               |
| 3    | Sesamum        | 1               | 1                   | 0                 |
| 4    | SOyabean       | 103             | 84                  | 19                |
| 5    | Sunflower      | 3               | 3                   | 0                 |
| 6    | Castor         | -               |                     |                   |

#### Fibre

| S.No | Crop name | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|-----------|-----------------|---------------------|-------------------|
| 1    | Cotton    | 97              |                     | 97                |
| 2    | Jute      | 2               |                     | 2                 |
| 3    | Mesta     | -               |                     |                   |
| 4    | Sunhemp   | 3               |                     | 3                 |

#### Other crops

| S.No | Crop name          | Total area (ha) | Irrigated area (ha) | Rainfed area (ha) |
|------|--------------------|-----------------|---------------------|-------------------|
| 1    | Sugarcane          | 14613           | 14565               | 48                |
| 2    | Tobacco            | -               |                     |                   |
| 3    | Guar seed          | -               |                     | 2306              |
| 4    | Other Fodder crops | 2336            | 30                  | 2306              |

#### Crop Plan- Beginning of the season

##### 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 4 weeks (July 1 <sup>st</sup> week) | High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks) | Paddy - Pulse               | No change                      | Plan for medium duration varieties of paddy like MTU 1010 and MGD 101 if early sown nursery fails. If early sown nursery is protected by protective irrigation, plan for early land preparation and planting. | -                         |

|  |                                                                                                          |                    |                                                                                                                            |                                                                                                         |                                 |
|--|----------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------|
|  | Medium rainfall – rainfed drill sown situation<br><br>(Parts of Mundgod, Sisri, Siddapur, Hliyal taluks) | Paddy – Pulses     | No change<br>But plan for medium duration varieties of paddy (MTU-1001, Jaya, IR-64, and Rasi) for transplanted situation. | repeated inter cultivations in drill sown paddy<br><br>Go in for planking when it rains to manage weeds | Seed Source<br>KSS<br>C/N<br>SC |
|  |                                                                                                          | Maize              | No Change                                                                                                                  | Go in for repeated inter cultivations                                                                   |                                 |
|  |                                                                                                          |                    |                                                                                                                            | and earthing up.                                                                                        |                                 |
|  |                                                                                                          | Cotton             | No Change                                                                                                                  | Go in for repeated inter cultivations                                                                   |                                 |
|  |                                                                                                          |                    |                                                                                                                            | and earthing up.                                                                                        |                                 |
|  | Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)                                       | Paddy – Paddy      | -do-                                                                                                                       | Impound water and apply fertilizers                                                                     |                                 |
|  |                                                                                                          |                    |                                                                                                                            | (1 <sup>st</sup> top dressing) No change suggested.                                                     |                                 |
|  |                                                                                                          | Paddy – Pulses     | -do-                                                                                                                       | -do-                                                                                                    |                                 |
|  |                                                                                                          | Paddy – Groundnut  | -do-                                                                                                                       | -do-                                                                                                    |                                 |
|  |                                                                                                          | Paddy – Vegetables | -do-                                                                                                                       | No change suggested                                                                                     |                                 |

#### Contingency measures- Mid season

| Condition                                                                          |                                                                                          |                             | Suggested Contingency measures                                                    |                                                                                                      |                           |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (<2.5 mm) period) | Major Farming situation                                                                  | Normal Crop/cropping system | Crop management                                                                   | Soil nutrient & moisture conservation measures                                                       | Remarks on Implementation |
| At vegetative stage                                                                | High Rainfall – Rainfed transplanted situation (Sirsi, Siddapur, Joida, Yellapur taluks) | Paddy - Pulses              | Spray the crop with 2% KNO <sub>3</sub> solution and postpone top dressing with N | Plugging holes made by crab to keep the water which is already there in the field for longer period. |                           |
|                                                                                    | Medium rainfall – rainfed drill sown situation                                           | Paddy – Pulses              | Spray the crop with 2% KNO <sub>3</sub> solution and postpone top dressing with N | Weeding, intercultivation                                                                            |                           |
|                                                                                    | (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)                                       | Maize                       | Life saving irrigation for maize                                                  | -do-<br><br>Go in for repeated inter cultivations and earthing up.                                   |                           |

|  |                                                                    |                    |                                                                                               |                                                                                                     |  |
|--|--------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--|
|  |                                                                    | Cotton             | Life saving irrigation for cotton                                                             | -do-                                                                                                |  |
|  |                                                                    |                    |                                                                                               | Go in for repeated inter cultivations and earthing up.                                              |  |
|  | Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas) | Paddy – Paddy      | Spray the crop with 2% KNO <sub>3</sub> solution and postpone top dressing with N             | Plugging holes made by crab to keep the water which is already there in the field for longer period |  |
|  |                                                                    | Paddy – Pulses     | -do-                                                                                          | -do-                                                                                                |  |
|  |                                                                    | Paddy – Groundnut  | -do-                                                                                          | -do-                                                                                                |  |
|  |                                                                    | Paddy – Vegetables | -do-                                                                                          | -do-                                                                                                |  |
|  | Medium rainfall – rainfed drill sown situation                     | Paddy – Pulses     | Spray the paddy crop with 2% KNO <sub>3</sub> solution.<br><br>Protective irrigation for rice | -do-                                                                                                |  |

| Condition                           |                                                                                          |                             | Suggested Contingency measures                                                                |                                                                                                      |                           |
|-------------------------------------|------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------|
| Mid season drought (long dry spell) | Major Farming situation                                                                  | Normal Crop/cropping system | Crop management                                                                               | Soil nutrient & moisture conservation measures                                                       | Remarks on Implementation |
| At flowering/ fruiting stage        | High Rainfall – Rainfed transplanted situation (Sirsi, Siddapur, Joida, Yellapur taluks) | Paddy - Pulses              | Spray the paddy crop with 2% KNO <sub>3</sub> solution.<br><br>Protective irrigation for rice | Plugging holes made by crab to keep the water which is already there in the field for longer period. |                           |
|                                     | Medium rainfall – rainfed drill sown situation                                           | Paddy – Pulses              | Spray the paddy crop with 2% KNO <sub>3</sub> solution.<br><br>Protective irrigation for rice | -do-                                                                                                 |                           |

|  |                                                                    |                   |                                                         |                                                     |  |
|--|--------------------------------------------------------------------|-------------------|---------------------------------------------------------|-----------------------------------------------------|--|
|  | (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)                 | Maize             | Protective irrigation                                   | Weeding, intercultivation                           |  |
|  |                                                                    | Cotton            | Protective irrigation                                   | -do-                                                |  |
|  | Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas) | Paddy – Paddy     | Spray the paddy crop with 2% KNO <sub>3</sub> solution. | Plug crab holes to keep the water for longer period |  |
|  |                                                                    | Paddy – Pulses    | Protective irrigation for rice                          | -do-                                                |  |
|  |                                                                    | Paddy – Groundnut | -do-                                                    | -do-                                                |  |

|  |  |                    |      |      |  |
|--|--|--------------------|------|------|--|
|  |  | Paddy – Vegetables | -do- | -do- |  |
|--|--|--------------------|------|------|--|

**Contingency measures- End of the season**

| Condition        |                                                                                                          |                             | Suggested Contingency measures |                                                                            |                           |
|------------------|----------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------|----------------------------------------------------------------------------|---------------------------|
| Terminal drought | Major Farming situation                                                                                  | Normal Crop/cropping system | Crop management                | Rabi Crop planning                                                         | Remarks on Implementation |
|                  | High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)                  | Paddy - Pulses              | Life saving irrigation         | Pulses in Paddy fallows<br>Greengram, DU1<br>Blackgram, Dh-86<br>Groundnut |                           |
|                  | Medium rainfall – rainfed drill sown situation<br><br>(Parts of Mundgod, Sisri, Siddapur, Hliyal taluks) | Paddy – Pulses              | Life saving irrigation         | Pulses in paddy fallows Greengram, DU1 Blackgram, Dh-86 Groundnut          |                           |
|                  |                                                                                                          | Maize                       | -do-                           | -                                                                          |                           |
|                  |                                                                                                          | Cotton                      | -do-                           | -                                                                          |                           |
|                  | Coastal belt (Karwar, Ankola, Kumta, Honnavar                                                            | Paddy – Paddy               | Life saving irrigation         | Pulses / groundnut in paddy fallows                                        |                           |
|                  | and Bhatkal talukas)                                                                                     | Paddy – Pulses              | -do-                           | -do-                                                                       |                           |
|                  |                                                                                                          | Paddy – Groundnut           | -do-                           | -do-                                                                       |                           |
|                  |                                                                                                          | Paddy – Vegetables          | -do-                           | -do-                                                                       |                           |

**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          |                             |                                |                    |                           |
| 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 | Not Applicable          |                             |                                |                    |                           |
| Condition                                              |                         |                             | Suggested Contingency measures |                    |                           |

| Condition                                                                  |                                                           |                             | Suggested Contingency measures                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |
|----------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                            | Major Farming situation                                   | Normal Crop/cropping system | Change in crop/cropping system                                                                        | Agronomic measures                                                                                                                                                                                                                                                                                                                                                                                                                   | Remarks on Implementation |
|                                                                            | 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 |
|                                                                            | 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   | Bachanaki Dam area (Paddy growing areas) in Mundgod taluk | Long duration rice          | Plan for medium (MTU-1001, Jaya, IR-64, Rasi) /short duration (Mangala, MTU 1010,) varieties of paddy | Go in for dry sowing of treated rice seeds using drill or if semi wet condition prevails (and sowing with drill is not possible), go in for plough sole method of sowing.<br>or<br>Go in for staggered nursery, if drought occurs during June. If dry period (or period not suitable for transplanting) continues, use medium duration rice cultivars.<br><br>Repeat the puddling operation to manage weeds or go in for herbicides. | Seed Source KSSC/NSC      |

| Condition                                             |                         |                             | Suggested Contingency measures |                    |                           |
|-------------------------------------------------------|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
|                                                       | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
|                                                       | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Insufficient groundwater recharge due to low rainfall | Not Applicable          |                             |                                |                    |                           |

## 8. Real Time Contingency Plan

| Weather aberration       | Crop      | Stage of crop         | Real time contingency measure implemented                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-----------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delayed onset of monsoon | Soybean   | -                     | Short duration varieties (80-90 days)<br>like JS 95-60 and JS 93-05 were planted                                                                                                                                                                                                                                                                                              |
|                          | Maize     | -                     | Short duration varieties (70-80 days)<br>like Patidar-999 were planted                                                                                                                                                                                                                                                                                                        |
|                          | Pigeonpea | -                     | Medium duration varieties (160-180 days)<br>like JA-4, JKM-189 and JS 93-05<br>Rising of seedling                                                                                                                                                                                                                                                                             |
|                          |           |                       | Thinning and intercultivation<br>Transplanting and opening of conservation furrow<br>Weeding<br>Desilting of farm pond and channels<br>Utilizing farm pond water efficiently<br>Shift from water intensive crops to millets, pulses and oil seeds<br>Instead of single mono crop go for intercropping systems                                                                 |
| Midseason drought        | Soybean   | Vegetative, flowering | 1- <i>In-situ</i> moisture conservation measures viz., Mulching with polythene sheets<br>Inter-cultural operation - Dora for soil mulching and weed control. And BBF, ridge and furrow system, contour ditches, strip intercropping and conservation furrow in alternate furrow and compartmental bunding.<br><br>2- Spraying of<br>VAM-C @ 375 ml/ha<br>Thio urea @ 250 g/ha |
|                          | Maize     | Vegetative, flowering | Intercultural operations to remove weeds and earthing up for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                             |
|                          | Pigeonpea | Vegetative            | Intercultural operations to remove weeds and for <i>in-situ</i> moisture conservation                                                                                                                                                                                                                                                                                         |
|                          |           |                       | Supplemental Irrigation at crop critical stages                                                                                                                                                                                                                                                                                                                               |
| Terminal drought         |           |                       | Foliar spray<br>Supplemental Irrigation and mulching<br>Harvesting of crops for vegetables and fodder                                                                                                                                                                                                                                                                         |

## Resource management technologies

### • Preparedness:

- Rainwater management: Insitu and ex-situ moisture conservation, recharging of Borewells, alternate furrow irrigation. Protective irrigation at critical stages of crop and use micro irrigation like drip and sprinkler or raingun irrigation.
- Cropping systems: Improves crop varieties, crops and cropping systems and intercropping
- Energy management: Compartmental bunding
- Nutrient management: Intercropping with RDF