

## 1. Introduction:

The State of Karnataka is located between 11.50 to 18.50 N latitudes and 74.25 to 78.50 E longitudes and covers an area of 1,91,976 Sq Km, which accounts for 5.8 percent of the total area of the country. The State is composed of 30 districts divided into 176 Taluks (Fig.1). These Taluks are further divided into 747 hoblis and 5628 Gram Panchayats. The state is bounded by Goa in the northwest, Maharashtra in the north, Andhra Pradesh in the east, Tamil Nadu in the south and Kerala in the south west. It has four major regions namely, North Interior Karnataka (NIK), South Interior Karnataka (SIK), Malnad region and Coastal region. It has four administrative divisions' viz. Mysuru division, Kalaburgi division, Belagavi division and Bengaluru division.

The climate of the State is determined mainly by the geographical location with respect to the sea, monsoon winds and physiography. Karnataka State has sub-humid climate on the West Coast and Western Ghats and semi-arid to arid (very warm) climate in central and northern districts of plateau region. The year is divided into four seasons viz., winter (December-January-February), summer (March to May); South-West monsoon (June to September) and North East monsoon (October to November). The occurrence of rainfall and its spatial distribution is highly variable and not dependable. Taluk wise Normal rainfall of the state varies from 477 mm to 4747 mm. Rainfall contribution is very high, from Southwest Monsoon Season (around 80% of the state rainfall), it is seen that the annual rainfall is highest (4747mm) over the Western Ghats and lowest (477mm) in the eastern parts of Chitradurga district. Taluk wise annual rainfall variation is increasing over most of the taluks in south interior Karnataka. More than 2/3<sup>rd</sup> of the State receives less than 750 mm of rainfall. Taluk wise Annual variability (CV) of the rainfall ranges from 16 to 40%. The atmospheric temperature in the State ranges from 43°C to 23°C in summer and 27°C to 9°C in winter. Hailstorms are common in plateau region of the State during pre-monsoon period.

There are different kinds of soil types in the State, because of complex topographic, geologic, vegetation and climatic conditions. These soil resources are characterized, mapped and grouped taxonomically under Alfisols (27% of TGA), Inceptisols (25% of TGA), Entisols (16% of TGA), Vertisols (15% of TGA). Ultisols, Aridisols and Mollisols cover 8%,

5%, 1%, of TGA respectively. Traditionally, these soils can be grouped under five categories Viz., Red soils, Lateritic soils, Black soils, Alluvial soils, Forest soils.

According to Agri Census 2010-11, Karnataka state has about 121.62 lakh ha of cultivable area which is 65 % of the total geographic area of the state. About 34.4 lakh ha is Net irrigated area (35 % of net cultivated area) and about 65.01 lakh ha is the net rainfed cultivated area. Karnataka has the second largest area under rain-fed agriculture after Rajasthan in the country. Nearly 55% of total food grain production and 74% of oilseeds production come from rain-fed agriculture in Karnataka. Therefore rain-fed agriculture plays an important role in total food grain production in the State. Further the rain-fed agriculture has substantial untapped potential, this can be brought to use by increasing the crop yields in the dry land areas through the adoption of proper dry-land production technologies.

The State is spread over 27,481 villages. In Karnataka, agriculture is the major occupation for a majority of the rural population. As per Census 2011, agriculture supports 13.74 million workers, of which 23.61 per cent are cultivators and 25.67 per cent agricultural workers. The agricultural sector of Karnataka is characterized by vast steppes of drought prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land in the State is exposed to the vagaries of monsoon with severe agro-climatic and resource constraints. Agriculture employs more than 60 per cent of Karnataka's work force.

Agriculture in Karnataka is heavily dependent on the southwest monsoon. The state ranks fifth in India in terms of total area under horticulture. It stands fifth in production of vegetable crops and third in fruit crop production. It is also the largest producer of spices, aromatic and medicinal crops and tropical fruits. It is the second largest milk-producing state after Gujarat. Karnataka is also the second largest producer of grapes in the country, and accounts for the production of 12 per cent of total fruits, 8 per cent of total vegetables and 70 per cent of coffee in the country. It is the third largest producer of sugar and ranks fourth in sugarcane production. In floriculture, Karnataka occupies the second position in India. Karnataka is the major silk producing state in the country.

## **2. Incidence and Spread of Drought during Rabi 2016 in Karnataka State.**

Karnataka State is reeling under drought condition of rare severity. The State witnessed severe drought condition consecutively for 6 years from 2011 to 2016. During 2016 State has been experiencing drought in Kharif and extended during Rabi season also.

During Kharif 2016 State has declared 139 taluks as drought affected and submitted a revised memorandum to Ministry of Agriculture and Farmers Welfare on November 2016 for financial assistance of Rs.4702.54 crores under NDRF which is under consideration with Government of India. During North East monsoon season (Rabi) the major part of the State recorded scanty rainfall resulting in tremendous stress on the socio-economic condition of the State.

Consequently, the Govt of Karnataka notified 160 taluks falling in all the 30 districts of the state as drought affected. This chapter deals with all the factors which indicate incidence and spread of drought in the state.

### **2. 1. RAINFALL DURING NORTH-EAST MONSOON**

After a delayed withdrawal of Southwest monsoon, Northeast monsoon commenced over South Peninsular India from the 30th October, 2016. Generally, withdrawal of Southwest monsoon gives good rain over the State, but this year it failed to rain, North-east monsoon started with weak monsoon activity with one or two spells over coastal and Malnad regions of the state. South Interior Karnataka witnessed Normal monsoon condition during 1st-2nd November whereas Malnad & Coastal regions observed Normal to Active monsoon conditions during 1st-2nd and 15th-16th November. No other appreciable rainfall events were witnessed during November and the monsoon remained weak over the State for the rest of the days.

### **2.2. Rainfall During October 2016:**

Rainfall during October is important to take up the Rabi sowings in the state. The State as a whole recorded an actual amount of **29 mm** of rainfall as against the normal rainfall of **136 mm** with percentage departure from normal being **(-) 78 %**. Thus the State as a whole is classified under “**Scanty**” Category.

Meteorological sub division-wise rainfall indicates that percentage departure from Normal was (-) **85%** in South Interior Karnataka, (-) **80%** % in North Interior Karnataka, (-) **81%** in Malnad region and (-) **57%** in Coastal Region. (Fig.1)

### **2.3. Rainfall during November 2016**

The State as a whole recorded an actual amount of **8 mm** of rainfall as against the normal rainfall of **41 mm** with percentage departure from normal being (-) **80%**. Thus the State as whole is classified under “**Scanty**” Category.

Meteorological sub division-wise rainfall indicates that percentage departure from Normal was (-) **90%** in South Interior Karnataka, (-) **89 %** in North Interior Karnataka, (-) **65%** in Malnad region and (-) **58%** in Coastal Region. (Fig.2)

### **2.4. Rainfall during December 2016**

The State as a whole recorded an actual amount of **17 mm** of rainfall as against the normal rainfall of **10 mm** with percentage departure from normal being (-) **64%**. Thus the State as whole is classified under “**Scanty**” Category.

Meteorological sub division-wise rainfall indicates that percentage departure from Normal was (+) **174%** in South Interior Karnataka, (-) **67 %** in North Interior Karnataka, (+) **94%** in Malnad region and (-) **54%** in Coastal Region. (Fig.3)

Monsoon conditions were Normal over South Interior Karnataka & Malnad during 2<sup>nd</sup>-6<sup>th</sup> December, due to Cyclone ‘**Nada**’, whereas it was Normal to Vigorous over the State from 13<sup>th</sup>-15<sup>th</sup> December under the influence of Cyclone “**Vardah**”.

### **2.5. Rainfall during North-east monsoon 2016**

During North east monsoon the State as a whole recorded an actual amount of **54 mm** of rainfall as against the normal rainfall of **188 mm**. with percentage departure from normal being (-) **71%**, classified under **Scanty Category**.

Meteorological sub division-wise rainfall indicates that percentage departure from Normal was (-) **68%** in South Interior Karnataka, (-) **81 %** in North Interior Karnataka, (-) **68%** in Malnad region and (-) **57%** in Coastal Region.

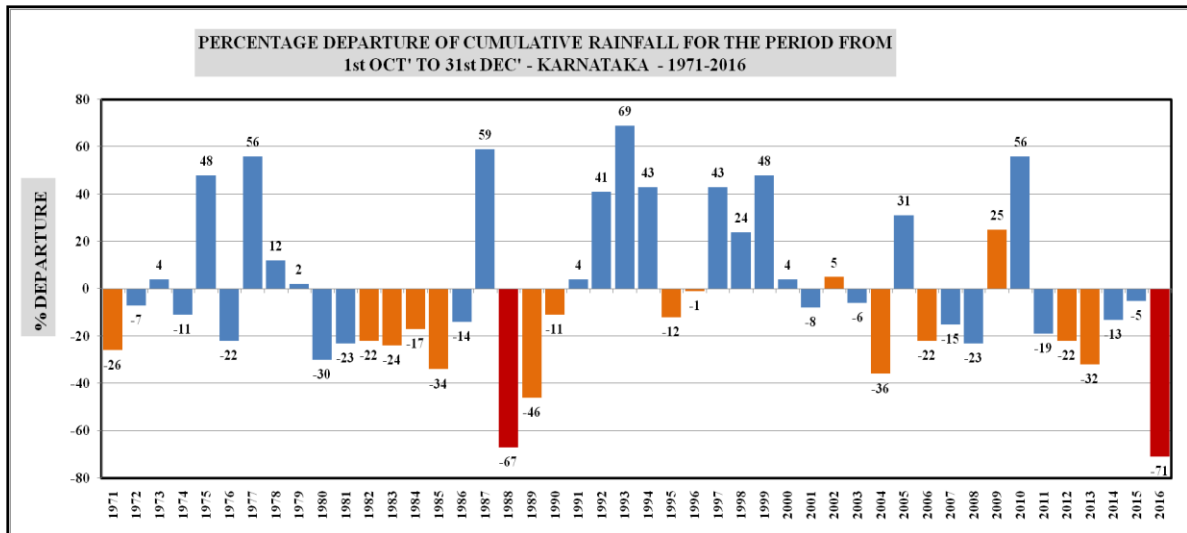
**District wise Rainfall pattern during North-east monsoon 2016:**

<b>Rainfall Category</b>	<b>No. Of Districts</b>	<b>Name of the District</b>
Excess ( $\geq 20\%$ )	0	-
Normal (-19 to +19%)	1	Bidar
Deficit (-20 to -59%)	4	Bengaluru urban, Bengaluru rural, Kolara, Uttara Kannada
Scanty (-60 to -99%)	25	Ramanagara, Chikkaballapura, Tumakuru, Chitradurga, Chamarajanagara, Mysuru, Davanagere, Mandya, Gadag, Haveri, Dharwad, Ballari, Koppala, Raichur, Kalaburagi, Yadgir, Belagavi, Bagalkote, Vijayapura, Hassan, Shivamogga, Chikkamagaluru, Kodagu, Dakshina Kannada and Udupi

**Taluk wise Rainfall pattern during North-east monsoon 2016:** Out of 176 taluks rainfall was deficit in 169 taluks which constitutes 96% of the total taluks. Taluk wise rainfall pattern is given in the Form -1 and depicted in Fig-4.

Sl. No.	Category	No.of taluks	
1	Excess ( $\geq 20\%$ )	0	7 (4%)
2	Normal (-19 to +19%)	7	
3	Deficit (-20 to -59%)	27	169 (96%)
4	Scanty (-60 to -99%)	142	

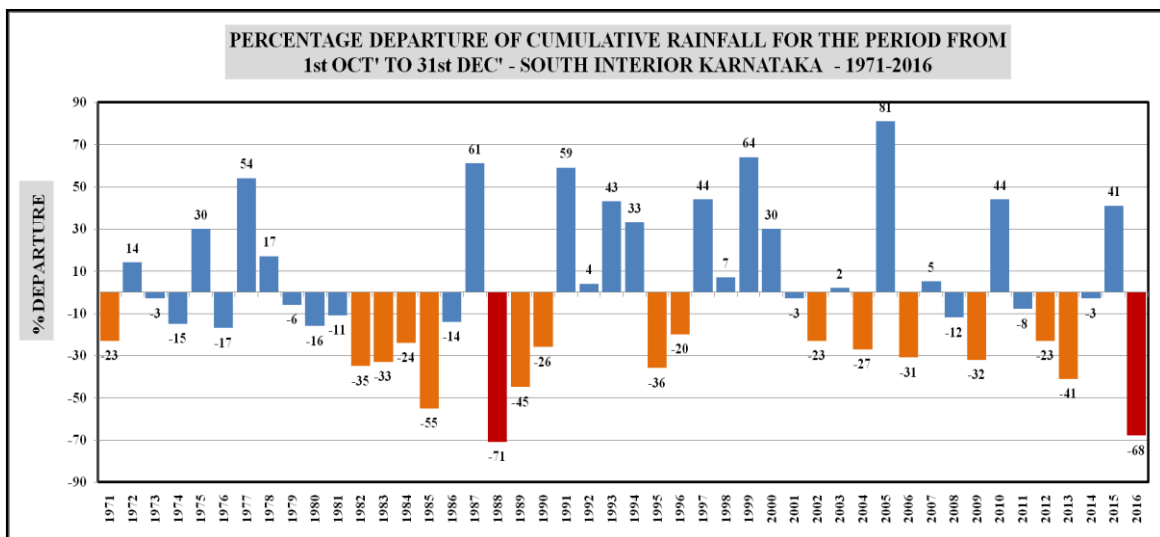
The percentage departure of rainfall from normal during Northeast Monsoon since 1971, for the **State** as a whole, is presented in the figure below:



Perusal of the above figure indicates that the percentage departure of Northeast Monsoon 2016 rainfall for the Karnataka is (-) 71%, which is the lowest in last 45 years i.e., since 1971.

The **South Interior Karnataka** region as a whole recorded an actual amount of 67 mm of rainfall against the normal rainfall of 210 mm with percentage departure from normal being (-) 68%. Thus the South Interior Karnataka region as a whole is classified under “SCANTY” Category.

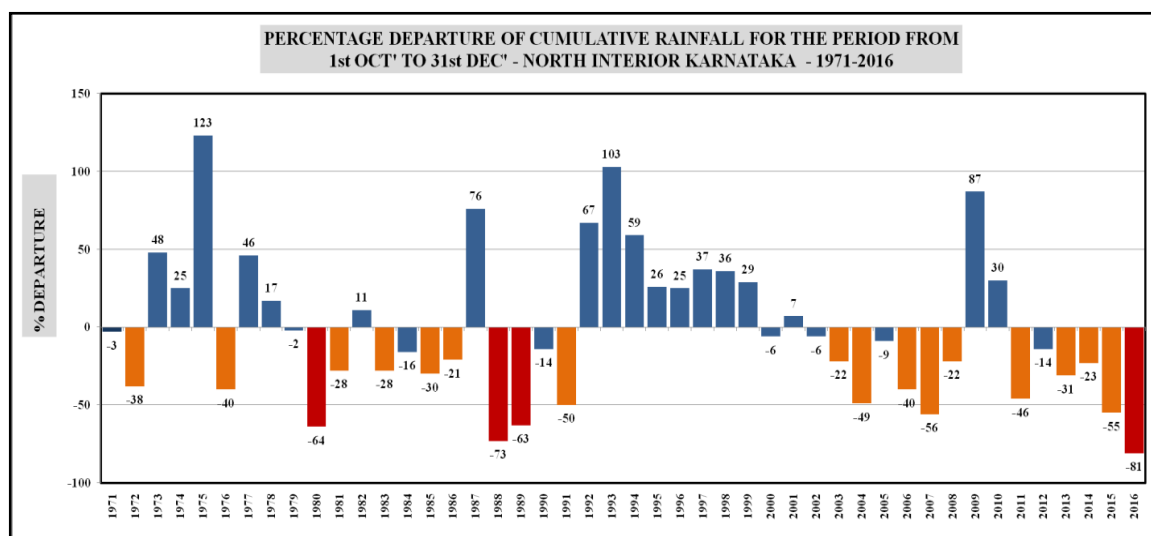
The percentage departure of rainfall from normal during Northeast Monsoon since 1971, for the South Interior Karnataka region as a whole, is presented in the figure below:



Perusal of the above figure indicates that the percentage departure of Northeast Monsoon 2016 rainfall for the South Interior Karnataka region is (-) 68 %, which is the 2<sup>nd</sup> lowest negative departure since 1971.

The **North Interior Karnataka** region as a whole recorded an actual amount of **27 mm** of rainfall against the normal rainfall of **145 mm** with percentage departure from normal being (-) **81%**. Thus the North Interior Karnataka region as a whole is classified under “**SCANTY**” Category.

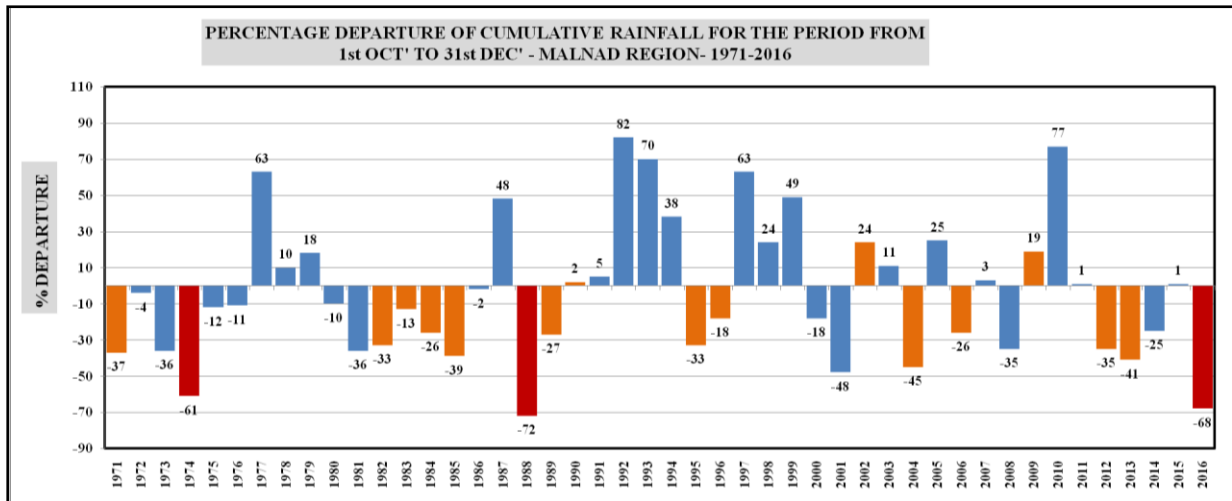
The percentage departure of rainfall from normal during Northeast Monsoon since 1971, for the North Interior Karnataka region as a whole, is presented in the figure below:



Perusal of the above figure indicates that the percentage departure of Northeast Monsoon 2016 rainfall for the North Interior Karnataka region is (-) **81%**, which is the lowest negative departure since 1971.

The **Malnad** region as a whole recorded an actual amount of **74 mm** of rainfall against the normal rainfall of **228 mm** with percentage departure from normal being (-) **68%**. Thus the North Interior Karnataka region as a whole is classified under “**SCANTY**” Category.

The percentage departure of rainfall from normal during Northeast Monsoon since 1971, for the Malnad region as a whole, is presented in the figure below:



Perusal of the above figure indicates that the percentage departure of Northeast Monsoon 2016 rainfall for the Malnad region is (-) 68%, which is the 2<sup>nd</sup> lowest negative departure since 1971.

### 3. DRY SPELL PATTERN DURING NORTHEAST MONSOON 2016

During the period from 1st October to 31st December 2016, which constitutes 12 standard weeks, as many as 111 taluks of 28 districts have experienced dry spell for  $\geq 6$  consecutive weeks. The total number of dry spells in each of the taluks is given in the table and depicted in Fig.-5.

### 4. MOISTURE ADEQUACY INDEX (MAI) 2016

As on 31st December 2016, about 94% of the geographical area in the State was under severe to moderate moisture stress condition. During this period as many as 165 taluks of 30 districts are under Moisture Stress condition (Fig.-6), which can be classified under severe to moderate drought affected taluks.

### 5. NORMALISED DIFFERENCE VEGETATION INDEX (NDVI) 2016

The agricultural crop condition is monitored based on normalized difference vegetation index (NDVI) information derived from MODIS Terra satellite data. The NDVI values for vegetation generally range from 0.2 to 0.6, the higher index values being associated with greater green leaf area and biomass. ( Fig.7)

Satellite based crop condition anomalies which point towards agricultural drought can be generated by computing Vegetation Condition Index NDVI deviations from the normal



years. Normal NDVI is generated by averaging the NDVI of 3 recent normal years (2005,2007,2010). Such comparisons enable minimization of the effect on account of the differences in cropping pattern and crop calendar.

## **6. DROUGHT INDICATORS:**

Guidelines in the Drought Manual 2009, Ministry of Agriculture and Cooperation, Govt. of India, are being followed for drought declaration in the State. Rainfall deficiency of more than 20% of the normal,  $\geq 6$  consecutive weeks of dry spell, Moisture Adequacy Index (MAI), Normalized Difference Vegetation Index (NDVI) along with crop area affected by deficit rainfall, were considered for identifying areas affected by drought.

KSNDMC has generated information on all drought indicators at HOBLI level with high spatial and temporal resolution rainfall data obtained from its extensive network of telemetric rain gauges.

**By considering above said drought indicators, 160 taluks of all the 30 districts have been declared as drought affected.** (Fig.-8) and (Annexure 1).

## **7. STORAGES IN MAJOR RESERVOIRS**

In addition to above said indicators, hydrological aspects like storages in reservoirs, river flows, tanks and groundwater levels are also the characteristic features of drought.

As on 31<sup>st</sup> December 2016 as against the total Live Storage of 825.35 TMC, only 315.75 TMC of water was stored, which constitutes 38% of the total capacity in all the 13 major reservoirs. The deficient rainfall during this period has caused concern about the filling up these reservoirs which are major source of water for power generation, irrigation, drinking and industrial use.

<b>MAJOR RESERVOIR STORAGE CAPACITY in (TMC) – 31-12-2016</b>					
		<b>Live Storage Capacity TMC</b>	<b>Live storage as on 31/12/2016 TMC</b>	<b>Last year live Storage as on 31/12/2015 TMC</b>	<b>% Live Capacity to Live Storage</b>
1	Linganamakki	151.75	74.28	76.87	49
2	Supa	145.33	75.88	62.89	52
3	Varahi	31.10	14.40	17.15	46
		<b>328.18</b>	<b>164.56</b>	<b>156.91</b>	<b>50</b>
4	Harangi	8.07	2.14	0.25	27
5	Hemavathi	35.76	3.71	4.88	10
6	K.R.S.*	45.05	6.16	23.61	14
7	Kabini	15.67	3.76	5.68	24
		<b>104.55</b>	<b>15.78</b>	<b>34.42</b>	<b>15</b>
8	Bhadra	63.04	21.41	36.24	34
9	Tungabhadra	100.86	8.39	23.20	8
10	Ghataprabha	48.98	27.25	12.53	56
11	Malaprabha	34.35	6.47	4.65	19
12	Almatti	119.26	50.87	23.83	43
13	Narayanapura	26.14	21.04	12.46	80
		<b>393</b>	<b>135</b>	<b>113</b>	<b>34</b>

As on end of December 2016 the storages in Cauvery basin is only 15% of the live storage and storages in Bhadra, Tungabhadra and Malaprabha 34%, 8% and 19% respectively and these storages are not enough for even drinking water requirements.

#### **8. STORAGES IN MINOR IRRIGATION TANKS:**

Out of total 3600 minor irrigation tanks in the State more than 53% of the tanks are dry or with insignificant storages by the end of December 2016. As per the latest statistics available out of 3600 tanks 2 tanks in South zone and 3 tanks in north zone are filled up to the full extent, 243 tanks are filled to an extent of 50% to 90%, 348 tanks are filled to an extent of 30% to 50% and 1109 tanks are filled up to 30%, while the remaining 1895 tanks are empty. This means due to the uneven distribution of rains and no rains at all, drought is prevailing in majority of area as far as the status of filling up tanks is considered.

<b>Zonewise/ District-wise Status Of Minor Irrigation Tanks ( Abstract)</b>									
Sl No.	DISTRICT	No Of Tanks	Full Capacity mct.	Total atchkat area designed	No.of tanks not received water	30%	31-50%	51-99%	100%
1	2	3	4	5	6	7	8	9	10
<b>(a) Minor Irrigation South Zone as on 31/12/2016</b>									
1	Bangalore Urban	46	1400	4530	27	8	9	0	2
2	Bangalore Rural	98	3107	9681	71	15	12	0	0
3	Ramanagara	102	4216	15092	59	31	12	0	0
4	Kolar	138	5181	12147	120	8	10	0	0
5	Chikkaballapura	201	7863	19581	143	42	16	0	0
6	Tumkur	370	17,188	36,822	263	99	5	3	0
7	Chitradurga	133	6,678	17,472	89	44	0	0	0
8	Davanagere	92	5,145	11,325	82	3	7	0	0
9	Shimoga	306	3,594	22,981	93	155	58	0	0
10	Mysore	50	1,116	6,781	46	2	2	0	0
11	Chamarajnaragar	64	2571	13088	56	3	4	1	0
12	Mandya	48	1,170	4447	41	5	2	0	0
13	Hassan	167	4877	12262	103	63	1	0	0
14	Chikkamagalur	123	3898	16786	74	34	12	3	0
15	Dakshina Kannada	2	7	131	1	0	0	1	0
16	Udupi	4	42	283	0	0	0	4	0
17	Kodagu	29	509	1948	29	0	0	0	0
<b>South Total</b>		<b>1973</b>	<b>68562</b>	<b>205355</b>	<b>1297</b>	<b>512</b>	<b>150</b>	<b>12</b>	<b>2</b>
					<b>66%</b>	<b>26%</b>	<b>8%</b>	<b>1%</b>	<b>0%</b>
<b>(b) Minor Irrigation North Zone as on 31/12/2016</b>									
1	Belgaum	276	3300	30399	158	65	27	26	0
2	Bijapur	154	4348	28887	130	11	12	1	0
3	Bagalkote	64	1569	12072	57	2	0	5	0
4	Dharwad	112	1724	14048	4	85	23	0	0
5	Gadag	30	1315	8301	22	3	3	2	0
6	Haveri	263	4,048	23,403	20	214	21	8	0
7	Uttara kannada	91	1,735	7,080	43	41	7	0	0
8	Gulburga	160	3,819	27,705	22	4	51	80	3
9	Yadgiri	72	1,482	6,601	3	48	13	8	0
10	Bidar	124	2,920	21,143	5	22	17	80	0
11	Bellary	86	3617	13504	82	3	1	0	0
12	Koppala	122	1,937	15844	34	81	3	4	0
13	Raichur	73	1788	8779	18	18	20	17	0
<b>North Total</b>		<b>1627</b>	<b>33602</b>	<b>217766</b>	<b>598</b>	<b>597</b>	<b>198</b>	<b>231</b>	<b>3</b>
					<b>37%</b>	<b>37%</b>	<b>12%</b>	<b>14%</b>	<b>0%</b>
<b>State Total (a &amp; b)</b>		<b>3600</b>	<b>102164</b>	<b>423121</b>	<b>1895</b>	<b>1109</b>	<b>348</b>	<b>243</b>	<b>5</b>
					<b>53%</b>	<b>31%</b>	<b>10%</b>	<b>7%</b>	<b>0%</b>

## **9. GROUND WATER LEVELS IN KARNATAKA STATE –NOVEMBER 2016**

Groundwater level measurements from Ground water level monitoring stations in Karnataka were carried out by CGWB and State Ground water directorate. Out of a total network of 1494 stations, 1451 stations were monitored. The remaining 43 stations could not be monitored due to various reasons. Similarly, out of 440 piezometers, 258 piezometers were monitored; remaining 182 piezometers could not be monitored due to site-specific problems. A total of 118 Ground Water Monitoring Stations and 8 piezometers were found to be dry during the period. The water level data recorded from the GWMS with Annual fluctuation seasonal data and Decadal fluctuation data.

### **9.1. DEPTH TO WATER LEVEL during November 2016:**

The depth to water level recorded in the State during November 2016 ranged from 0.05 mbgl to 30.30 mbgl. It is seen that out of 1429 stations' data analysed for the month, 13% of wells have water level less than 2 mbgl, 32% of wells have water level in the range of 2 to 5 mbgl and 38 % of wells have water level in the range of 5 to 10 mbgl. Thus, about 83% of the analysed wells have water level within 10 mbgl. Moderately deep water levels of 10 to 20mbgl are seen in 16% of wells and deep water levels of more than 20 m is found in about 1% of the analysed wells. A map showing the depth to water level in the ranges of less than 2, 2 to 5, 5 to10, 10 to 20 and more than 20 mbgl was prepared and is enclosed as 'Depth to Water Level November 2016 of Karnataka'. Water level in range of less than 2 mbgl occurs as small patches in almost all the districts of Karnataka State except Gadag, Dharwad, Haveri, Bagalkote, Mysuru, Chamarajnagar, Kodagu, Hassan, Ramnagara and Dakshina Kannada districts. The map shows that the water levels in the range of 2 to5 and 5 to 10 mbgl are the general water levels prevalent in the State. Depth to water level between 10-20 mbgl is observed as small patches in almost all the districts except in Bengalur Urban, Chikkaballapur and Udupi districts and water level more than 20 mbgl occur as small patches in Gadag, Koppal, Bagalkote and Dharwad districts.

## **9.2. WATER LEVEL FLUCTUATION, MEAN (November 2006 to November 2015)- November 2016**

Mean groundwater level for the period November 2006 to November 2015 is analysed and compared with the groundwater level in November 2016 for 1415 stations out of 1417 stations. **It is seen that, out of the 1415 stations compared, 340 stations accounting for 24% have shown a rise in water level during November 2016 as compared to the preceding decadal mean and the remaining 1075 stations accounting for 76 % have shown a fall in water level.**

A map for the change in water levels showing rise/fall in the ranges of 0-2 m, 2-4 m and more than 4m was prepared and enclosed as 'Water Level Fluctuation Decadal Mean of (Nov 2006 to Nov 2015) – Nov 2016' of Karnataka (Fig 9). Major part of the State is showing fall in water level as compared to decadal mean water level of November 2006 - November 2015 with respect to November 2016 water level. In the rise category, water level showing less than 2 m is observed in parts of almost all the districts as minor patches. Rise in the range of 2-4 m is observed in Bengaluru Rural, Bengaluru Urban, Belgaum, Bidar, Vijayapura, Dakshina Kannada, Dharwad, Gadag, Kalaburagi, Yadgiri, Haveri, Kodagu, Kolar, Raichur, Shimoga, Chikkaballapur, Tumkur and Uttara Kannada districts. Rise of more than 4 m water level is observed as small patches in parts of Bengaluru Rural, Bidar, Tumkur, Kalaburgi, Yadgiri and Uttara Kannada districts. Fall in water level less than 2 m and 2-4 m is noticed in parts of almost all the districts. Fall of water level of more than 4 m is observed as small patches in all the districts except Bidar, Kalaburgi, Chikkaballapur and Kolar districts.

Hydrological parameters like water storages in Reservoir and Minor Irrigation Tanks levels are in very poor status. Depletion of ground water levels also exacerbates the drought situation in the State.

**Maps -----**



## Proceedings of the Government of Karnataka

**Sub:** Declaration of certain taluks of the State as drought affected during Rabi 2016-17.

**Read:** Proceedings of the meeting of the Cabinet Sub Committee held on 10.01.2017

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### **Preamble:**

The Cabinet Sub Committee constituted under the Chairmanship of Hon'ble Revenue Minister to take stock of the drought, flood and other natural calamities in the State in its meeting held on 10.01.2017 reviewed the seasonal conditions arising from rainfall deficiency during Rabi 2016-17. The Director, KSNDMC has made a presentation to the committee that during Rabi 2016-17 (from 1<sup>st</sup> October to 31<sup>st</sup> Dec 2016) the State as a whole recorded an actual amount of 54mm rainfall against the normal rainfall of 188mm with percentage departure from normal being (-)71%. 587 hoblis of 147 taluks of 25 districts have not received any rain during this period. The severity of rainfall is the highest in last 46 years resulting to deplete of ground water level, moisture stress indicator in more than 92% area. As against the target of 32.25 lakhs hectare, the sowing was taken place in 24.69 lakhs ha only. The storage of water in major reservoirs are very poor, 7% of M.I tanks having 50% of water, in 40% M.I tanks storage capacity is 30% to 50% and 53% of M.I tanks are completely dried.

Due to failure of rainfall during Rabi 2016-17, the sown area agriculture and horticulture crops are completely damaged in few districts. Keeping the norms prescribed by Government of India in Drought Manual 2016 ie., rainfall deficiency, moisture adequacy index, cumulative dry spell for more than 6 weeks and other parameters, the Cabinet Sub Committee has decided to declare 160 taluks out of 176 taluks of the State as severe drought affected taluks during Rabi 2016-17. Hence the following order.

### **Government Order No. RD 18 TNR 2017; Bengaluru, dated:24.01.2017**

In the circumstances explained above, sanction of Government is accorded to declare 160 taluks of 30 districts annexed to this Government order as **severe drought affected taluks** during Rabi 2016-17, with immediate effect and continue to be effect for 6 months or until further orders whichever is earlier.

The concerned Deputy Commissioners of districts are directed to undertake joint survey to assess the crop loss in the drought affected taluks and submit report to Government immediately.

In view of the declaration of taluks as drought affected, it is ordered to take up relief employment works for landless and small farmers & marginal farmers, emergent supply of drinking water , supply of fodder, livestock protection and other drought releated works in the drought affected taluks, as per SDRF/NDRF norms.

By Order and in the name of the  
Governor of Karnataka

Sd/-  
(K.R Ravi kumar )  
Under Secretary to Government  
Revenue Department  
(Disaster Management & Services-3)



**Annexure to Government Order No: RD 18 TNR 2016; Dated: 24.01.2017**

**List of Taluks declared as Drought affected during Rabi 2016-2017**

<b>Sl.No.</b>	<b>District</b>	<b>Drought affected Taluks</b>
1	BENGALURU-URBAN	1.ANEKAL 2.BENGALURU NORTH 3.BENGALURU SOUTH 4. BENGALURU EAST
2	BENGALURU-RURAL	5.DEVANAHALI 6.DODBALLAPUR 7.HOSAKOTE 8.NELAMANGALA
3	RAMANAGARAM	9.CHANNAPATNA 10.KANAKAPURA 11.MAGADI 12.RAMANAGARA
4	KOLAR	13.BANGARAPET 14.KOLAR 15.MALUR 16.MULABAGAL 17.SRINIVASAPURA
5	CHIKBALLAPUR	18.BAGEPALLI 19.CHIKBALLAPUR 20.CHINTAMANI 21.GAURIBIDANUR 22.GUDIBANDA 23.SIDLAGHATTA
6	TUMAKURU	24.C.N. HALLI 25.GUBBI 26.KORATAGERE 27.KUNIGAL 28.MADHUGIRI 29.PAVAGADA 30.SIRA 31.TIPTUR 32.TUMAKURU 33.TURUVEKERE
7	CHITRADURGA	34.CHALLAKERE 35.CHITRADURGA 36.HIRIYUR 37.HOLALKERE 38.HOSADURGA 39.MOLAKALMURU
8	DAVANGERE	40.CHANNAGIRI 41.DAVANGERE 42.HARAPANAHALLI 43.HARIHAR 44.HONNALI 45.JAGALUR
9	CHAMARAJANAGAR	46.CHAMARAJANAGAR 47.GUNDLUPET 48.KOLLEGAL 49.YELANDUR
10	MYSURU	50.HEGGADADEVANAKOTE 51. HUNSUR 52.KRISHNARAJANAGAR 53.MYSURU 54.NANJANAGUD 55.PERIYAPATNA 56.T.NARASIPUR
11	MANDYA	57.KRISHNARAJAPET 58.MADDUR 59.MALAVALLI 60.MANDYA 61.NAGAMANGALA 62.PANDAVAPURA 63.SRIRANGAPATNA

12	BALLARI	64.BALLARI 65.HADAGALI 66.HOSPET 67.HAGARIBOMMANAHALLI 68.KUDLIGI 69.SANDUR 70.SIRUGUPPA
13	KOPPAL	71.GANGAVATHI 72.KOPPALA 73.KUSHTAGI 74.YELBURGA
14	RAICHUR	75.DEODURGA 76.LINGSUGUR 77.MANVI 78.RAICHUR 79.SINDHANUR
15	KALABURAGI	80.AFZALPUR 81.ALAND 82.CHINCHOLI 83.CHITAPUR 84. KALABURAGI 85.JEWARGI 86.SEDAM
16	YADGIR	87.SHAHAPUR 88.SHORAPUR 89.YADGIR
17	BIDAR	90.HUMNABAD
18	BELAGAVI	91.ATHANI 92.BAILHONGAL 93.BELAGAVI 94.CHIKKODI 95.GOKAK 96.HUKKERI 97.KHANAPUR 98.RAMDURG 99.RAIBAGH 100.SOUNDATTI
19	BAGALKOTE	101.BADAMI 102.BAGALKOTE 103.BILGI 104.HUNGUND 105.JAMKHANDI 106.MUDHOL
20	VIJAPURA	107.BASAVANABAGEWADI 108.VIJAYPURA 109.INDI 110.MUDDEBIHAL 111.SINDGI
21	GADAG	112.GADAG 113.MUNDARGI 114.NARAGUND 115.RON 116.SHIRAHATTI
22	HAVERI	117.BYADGI 118.HANAGAL 119.HAVERI 120.HIREKERUR 121.RANIBENNUR 122.SAVANUR 123.SHIGGAON
23	DHARWAD	124.DHARWAD 125.HUBLI 126.KALGHATGI 127.KUNDGOL 128.NAVALGUND
24	SHIVAMOGGA	129.BHADRAVATHI 130.HOSANAGAR 131.SHIKARIPUR 132.SHIVAMOGGA 133.SORAB 134.TIRTHAHALLI
25	HASSAN	135.ALUR 136.ARKALGUD 137.ARASIKERE 138.BELUR 139.CHANNARAYAPATNA 140.HASSAN 141.HOLENARASIPUR

26	CHIKKAMAGALURU	142.CHIKMAGALUR 143.KADUR 144.KOPPA 145.NARASIMHARAJAPUR 146.TARIKERE
27	KODAGU	147.SOMWARPET 148.VIRAJPET
28	DAKSHINA KANNADA	149.BANTWAL 150.MANGALORE
29	UDUPI	151.KARKALA 152.KUNDAPUR 153.UDUPI
30	UTTARA KANNADA	154.BHATKAL 155.HALIYAL 156.HONNAVAR 157.KARWAR 158.MUNDGOD 159.SUPA 160.YELLAPUR

Sd/-  
(K.R Ravi kumar )  
Under Secretary to Government  
Revenue Department  
(Disaster Management & Services-3)

## Summary of Relief Claimed and Loss due to drought during Rabi 2016

(Rs. in crores)

Sl. No	Item	Estimated Loss	Relief claimed as per SDRF Norms
1	<b>Assistance for Agriculture Crop loss</b>	<b>6993.58</b>	<b>919.92</b>
2	<b>Assistance for Horticulture Crop Loss</b>	<b>104.28</b>	<b>24.21</b>
3	<b>Animal Husbandry</b>		
	Assistance for purchase of 16 lakh fodder minikits for drought declared taluks		40.00
	Opening of Goshalas to maintain 500 animals for 90 days 105 cattle camps@ of Rs.50.00 lakhs for each Goshala		52.50
	Establishment of 400 Fodder Banks/Fodder Depot		80.00
	Assistance for Medical care for cattle		20.00
	Assistance for cattle feed, mineral mixture and tonics etc		10.00
	<b>Sub Total</b>		<b>202.50</b>
4	<b>Drinking Water:</b>		
	Tanker Supply of drinking water		115.20
	Water supply works in drought declared taluks in Rural Areas		1772.25
	Water supply works in Urban Areas		276.75
	<b>Sub Total</b>		<b>2164.20</b>
	<b>Total (sub total of 1 to 4)</b>	<b>7097.89</b>	<b>3310.83</b>

**The total Estimated Loss due to drought in the State: Rs.7097.89 Crores**

**Assistance sought from Government of India under NDRF: Rs.3310.83 Crores**

**Amount spent by the State Government for drought:**

<b>SDRF</b>	<b>Rs.366.90 crore</b>
<b>Urban Development Dept</b>	<b>Rs.195.10 crore</b>
<b>Rural Development and Panchayat Raj</b>	<b>Rs.201.00 crore</b>
<b>Total</b>	<b>Rs.763.00 crore</b>

## **AGRICULTURE SECTOR**

### **a. Area**

Karnataka State has 121.61 lakh ha cultivable area out of its' total geographical area of 190.50 lakh ha, accounting for 64 % of total area. (District-wise Details furnished in Statement-1).

### **b. Population (Proportion of Scheduled Caste / Scheduled Tribe Population)**

Total population of Karnataka was 6.11 crore as per General Census of 2011 (male- 3.10 crore and female 3.01 crore), out of which, number of Scheduled caste and Scheduled Tribe was 1.05 Core and 0.42 Crore, respectively. (District-wise details furnished in Statement - 2).

### **c. Cultivable Area Crop-wise**

Agriculture crops are cultivated in about 105 lakh hectares accounting for about 84% of the total cultivated area in the State. Season-wise normal area of major agricultural crops is Kharif 69.20 lakh hectares, Rabi 3.30 lakh hectares and Summer 5.90 lakh hectares. (Season-wise and Crop-wise details are furnished in Statement -3).

### **d. Area under Irrigation and Dryland Farming**

Out of the total cultivated area in the state about 35% is under various sources of irrigation and the rest 65% is under rainfed cultivation. The major sources of irrigation are tube/bore wells (39%), Canals (33%) and other sources like tanks, open wells, lift irrigation etc account for the rest 28% in the total irrigated area. About 62% of the area is under five Dry Zones out of the total ten agro-climatic zones in the State. (District-wise details of irrigated and rainfed area during 2014-15 are furnished in Statement-4).

### **e. Total number of farmers in the State (District-wise)**

As per the Agricultural census of 2010-11, there were 78,32,189 agricultural land holdings with operated area of 121,64,457 hectares. Average land holding size has come

down to 1.55 hectare in 2010-11 from 3.20 hectares in 1970-71. (District-wise number of agriculture holdings and operated area details are furnished in Statement-5).

#### **f. Number of Small and Marginal Farmers**

As per the Agricultural census of 2010-11, there were 59,87,042 small and marginal farmers accounting for 76% of the total holdings and operated area of small and marginal farmers was 48,70,948 hectares accounting for 40% of the total operational holdings. The number and operated area of small and marginal farmers has further increased due to fragmentation. (District-wise details are furnished in Statement -6).

#### **g. Number of landless agricultural labourers**

As per the General Census of 2011 the number of landless agricultural labourers in the State is 71,55,963. (District-wise details are furnished in Statement -7).

#### **h. Agriculture- its contribution to State GDP**

Contribution of Agriculture to State Gross Domestic Product (SGDP) during 2015-16 was 12.30% compared to 17% in 2010-11. The decline can be mostly attributed to successive drought situation in previous six years. However, agriculture continues to be the largest employment sector as about 54% of the total work force is engaged in agricultural and allied activities as per the General Census of 2011. (Details of Sector-wise share in State GDP during 2014-15 and 2015-16 are furnished in Statement -8).

#### **KHARIF 2016:**

Pre-monsoon rainfall (April-May) was deficit by 31% in the State and it hampered normal coverage of early kharif crops. Area coverage up to May end was 1.73 lakh hectares as against a normal of 3.55 lakh hectares

Southwest monsoon rainfall during June and July was normal in the State and facilitated timely sowing of Kharif crops. But, deficit rainfall during August (-39%) and September (-31%) and long dry spell affected the rainfed kharif crops in a large area.

During August, monsoon was weak over entire State (except Belagavi and Uttara Kannada districts). Actual average rain fall was 126 mm as against a normal of 206 mm, deficit by 39%. Long dry spell of more than 4 consecutive weeks in several taluks affected the prospects of rainfed crops. Rain fall was deficit in 101 taluks and scanty in 55 taluks out of total 176 taluks.

Cummulative rainfall from 1<sup>st</sup> June to 30<sup>th</sup> September was 688 mm as against a normal of 839 mm (-18%) and the deficiency in Malnad and Coastal regions was as high as 29% and 21%, respectively.

After detail review of the rainfall, dry spell duration, crop area coverage and the crop status the State Government declared 139 taluks as “drought affected taluks”.

Month-wise and Region-wise rainfall pattern during Southwest monsoon was as follows:

Unit: MM.

Region	June 2016			July 2016			August 2016			September 2016			South West Monsoon 2016 (1st June to 30th Sept.)			
	N	A	% DEP	N	A	% DEP	N	A	% DEP	N	A	% DEP	N	A	% DEP	
SIK	64	106	65	79	134	71	81	35	-57	135	37	-72	359	313	-13	
NIK	101	127	25	131	141	8	118	63	-47	145	133	-8	494	463	-6	
Malnad	358	347	-3	598	369	-38	382	241	-37	165	105	-36	150	106	-29	
Coastal	813	838	3	115	6	780	-33	760	550	-28	290	229	-21	301	239	-21
<b>STATE</b>	<b>195</b>	<b>220</b>	<b>13</b>	<b>280</b>	<b>233</b>	<b>-17</b>	<b>206</b>	<b>126</b>	<b>-39</b>	<b>159</b>	<b>109</b>	<b>-31</b>	<b>839</b>	<b>688</b>	<b>-18</b>	

N-Normal Rainfall, A-Actual Rainfall, % Dep- Percentage departure from normal rainfall.

Sowing of kharif crops was completed in an area of 71.67 lakh hectares against a set target of 73 lakh hectares, accounting for 98% coverage. Normal coverage by end of September stood at around 69.19 lakh hectares; the corresponding coverage of previous Kharif season was 64 lakh hectares. Failure of rains during August, September, October and November affected rainfed Kharif crops in about 35.41 lakh hectares (49%).

## Rabi 2016-17

Rabi production programme depends upon residual soil moisture and Northeast monsoon rainfall during October – December. The northern districts account for nearly 90% of the total Rabi area in the State. The major crops grown are Rabi Jowar, Bengal gram, Wheat, Maize, Sunflower, Safflower, Linseed etc.

Anticipating well distributed northeast monsoon rainfall, following production programme for Rabi 2016-17 was drawn up for covering an area of 32.25 lakh hectares (Irrigated 6.20 lakh hectares and Rainfed 26.05 lakh hectares):

Sl. No.	Crop/Crop Group	Area (lakh ha.)	Prodn. (Lakh Tonnes)
I	Cereals	14.50	20.49
II	Pulses	12.83	7.52
	<b>Total Food grains</b>	<b>27.33</b>	<b>28.01</b>
III	Oilseeds	3.78	2.72
IV	Commercial Crops:		
1	Cotton	0.75	1.20 Lakh bales
2	Sugarcane	0.38	
3	Tobacco	0.01	0.01
	<b>Total</b>	<b>32.25</b>	

### Rainfall:

Rainfall during October was scanty in all the northern districts of the State except Bidar, where normal rainfall occurred. Actual average rainfall was 29 mm as against a normal of 136 mm in the State, thus deficit by 78%. During November also, rainfall continued to be scanty in the State and in northern districts the deficiency was 89%. Actual average rainfall was 8 mm as against a normal of 41 mm, thus deficit by 80%.

During December light to moderate rainfall occurred over major parts of South Interior Karnataka and Malnad regions on 13<sup>th</sup> & 14<sup>th</sup> December under the influence of “VARDAH” Cyclonic Storm. Only parts of Ballari, Gadag and Haveri districts in North Interior Karnataka received light to moderate rainfall. Rainfall deficiency was 67% in northern districts. Actual average rainfall during the month was 17 mm as against a normal of 10 mm.



Cumulative rainfall from 1<sup>st</sup> October to 31<sup>st</sup> December 2016 was 54 mm as against a normal of 188 mm, deficit by 71%, but the deficiency was 81% in North Interior districts. Cumulative rainfall was normal only in 7 taluks, deficit in 27 taluks and scanty in the rest 142 taluks.

<b>Region- wise Weighted Average Rainfall Pattern during Rabi 2016</b>												
District Name	October 2016			November 2016			December 2016			North East Monsoon 2016		
	Normal (mm)	Actual (mm)	% Dep.	Normal (mm)	Actual (mm)	% Dep.	Normal (mm)	Actual (mm)	% Dep.	Normal (mm)	Actual (mm)	% DEP
	<b>South Interior Karnataka</b>	146	23	-84	50	5	-90	14	38	174	210	67
<b>North Interior Karnataka</b>	111	22	-80	28	3	-89	7	2	-67	145	27	-81
<b>Malnad</b>	161	30	-81	55	19	-65	13	24	94	228	74	-68
<b>Coastal</b>	187	80	-57	61	26	-58	13	6	-54	261	112	-57
<b>STATE</b>	136	29	-78	41	8	-80	10	17	64	188	54	-71

District-wise rainfall details are furnished in Statement- 9.

The State Government declared 160 taluks out of total of 176 as drought affected taluks considering rainfall deficiency, dry spell duration, soil moisture adequacy index and other drought parameters.

#### **Area Coverage:**

Sowing of Rabi crops was completed in an area of 25.98 lakh hectares by end of December against a set target of 32.25 lakh hectares, accounting for 81% coverage. Normal coverage by end of December stands at around 30.29 lakh hectares; the corresponding coverage of previous Rabi season was 34.73 lakh hectares. Crop-wise and District-wise details are furnished in Statement 10 and 11 respectively.

Complete failure of rains from October to December in Northern districts caused set back in area coverage of Rabi crops especially Jowar, Wheat and Sunflower.

#### **Crop Condition:**

Scanty rains and long dry spell in major parts of North Interior Karnataka affected the prospects of Rabi crops and the crops were under severe moisture stress. As per the Joint Survey by the Officers of Agriculture and Revenue Department agriculture crops in an area

of 15.00 lakh hectares have been affected and >33% crop loss is estimated in an area of about 13.57 lakh hectares.

This is the second year in succession wherein both Kharif and Rabi crops have been badly affected by failure of rains.

### **Mitigation Measures- Input Supply**

The State Government has arranged supply of seeds and fertilizers through wide net work of Raitha Samparka Kendras. The Government has provided seeds at subsidized rates to farmers for requirement up to 2 hectares; about 1.87 lakh quintals of seeds were provided to farmers at subsidised rates.

During Rabi/Summer 5.04 lakh tonnes of fertilizers have been distributed up to end of December 2016 against the estimated requirement of 15 lakh tonnes. About 6.47 lakh tonnes of DAP, MOP, Complexes and Urea were available as closing stock as on 31<sup>st</sup> December 2016.

### **Estimated Crop Loss**

The estimated crop loss at cost of cultivation per hectare for each crop works out to Rs.6993.58 crores (Annexure-2).

**Central Assistance sought as per SDRF guidelines:** As per SDRF guidelines Small and Marginal farmers are eligible for input assistance of Rs. 6,800 per ha in rainfed areas, Rs. 13,500/- per ha in Irrigated areas and Rs. 18,000/-per ha for Perennial crops. Out of the total affected area of 15.00 lakh hectares, crop loss more than 33% in an area of about 13.57 lakh hectares, out of which about 8.95 lakh hectares belongs to small and marginal farmers and assistance sought is Rs.621.02 crores and 4.61 lakh ha belongs to OSMF and assistance sought is Rs.298.90 crores.

**Details of agricultural land, sown area affected by drought are as under: -**

Sl. No.	Item	Area
a)	Total cultivable area (as per Agriculture Census 2010-11)	121.61 lakh ha
b)	Total agricultural land	105.40 lakh ha annually (Avg of 2010-11 to 2014-15)
c)	Total sown area Rabi (target area-32.25 lakh ha)	25.98 lakh ha
d)	Total agriculture area affected Rabi	15.00 lakh ha
e)	Total affected sown agriculture area where more than 33% crop loss.	13.57 lakh ha
f)	Out of (e), the area belonging to SMFs	8.95 lakh ha (Rainfed:8.78 lakh ha & Irrigated:0.17lakh ha)
g)	Out of (e), the area belonging to farmers (OSMFs)	4.61 lakh ha (Rainfed: 4.45 lakh ha, Irrigated 0.16 lakh ha)
h)	Number of OSMFs	2,29,697

**The requirement of funds under agriculture sector is as under**

**I. SMFs**

Area held by SMFs where crop loss was more than 33%	Area (ha)	Norms (Rs.) /per ha	Amount (Rs. in lakh)
i) Rainfed area	878243	6,800/-	59720.52
ii) Irrigated area	17645	13,500/-	2382.07
iii) Perennial	Nil	Nil	Nil
<b>Total</b>	<b>895888</b>		<b>62102.59</b>

(District-wise details are at **Appendix - 3**)

**II. OSMFs**

OSMFs where area sown / area affected is less than 2 ha per farmer where crop loss was more than 33%	Area (ha)	Norms (Rs.) per ha. per farmer	Amount (Rs. in lakh)
i) Rainfed area	83757	6,800/-	5695.47
ii) Irrigated area	1923	13,500/-	304.15
iii) Perennial	Nil	Nil	Nil
<b>Total</b>	<b>85680</b>		<b>5999.62</b>

<b>OSMFs where area sown / area affected is greater than 2 ha per farmer where crop loss is &gt;33%</b>	<b>No of Farmers</b>	<b>Norms (Rs.) per ha. per farmer</b>	<b>Amount (Rs. in lakh)</b>
i) Rainfed area (361814 ha)	163211	6,800/-	22196.70
ii) Irrigated area (13295 ha)	6273	13,500/-	1693.71
iii) Perennial	Nil	Nil	Nil
<b>Total</b>	<b>169484</b>		<b>23890.41</b>

**Abstract of Calculation of Input Subsidy for OSMF**

<b>Item</b>	<b>Amount (Rs. in lakh)</b>
OSMFs where area sown / area affected is less than 2 ha per farmer where crop loss is > 33%	5999.62
OSMFs where area sown / area affected is greater than 2 ha per farmer where crop loss is >33%	23890.41
<b>Total</b>	<b>29890.03</b>

(District-wise details are at **Appendix - 4**)

**Assistance Claimed for the damage of Agriculture crops**

Input subsidy for SMF as per SDRF Norms - Rs. 621.02 Crores

Input subsidy for OSMF as per SDRF Norms - Rs.298.90 Crores

**Total Assistance Claimed as per SDRF Norms - Rs.919.92 Crores**

### **Action taken by the Government:**

- Nodal-officers (District in charge Ministers/ District in charge Secretaries) were appointed in all the districts to review the season and crop conditions.
- “Bhoo-Chetana” programme in all districts with a focus on retaining / increasing soil fertility and use of micro nutrients to improve crop production.
- More than 1 lakh farm ponds have been created in farmers land under “Krishi Bhagya Programme” to conserve rain water and provide critical irrigation to rainfed crops.
- Seeds and Fertilizer requirement/ supply in the districts monitored constantly by Agriculture Department.
- Fertilizer supply plan was monitored and arrangements were made for timely supply during Kharif 2016.
- Farmers were covered under Crop Insurance Karnataka Raitha Suraksha PMFBY in a campaign mode leading to more than 90% coverage.
- A Mobile App has been developed to ensure a close watch on Crop Cutting Experiments under Crop Estimation Survey and special attention has been paid to ensure none of the experiments will lapse.
- Micro irrigation programmes are extended to more areas for judicious use of ground water.
- Scientists of University of Agriculture and Horticulture are closely monitoring the seasonal conditions and advising farmers to improve crop conditions.

## Horticulture Sector

### Introduction

As per the estimates for 2015-16, 21.03 lakh hectares area was expected to be covered under horticulture. Horticultural area in the State accounts about 17 % of the total cultivable area.

Sl. No	Category of Horticulture crops	Area of crops during 2014-15 (Ha)	Total expected area for 2015-16 (Ha)	Total estimated production during 2015-16 (Ha)
1.	Fruits Crops	407120	418644	7306547
2.	Vegetables Crops	462860	509542	9080804
3.	Spices Crops	209080	241960	766528
4.	Plantation crops	891330	898369	595816
5.	Commercial flowers	30700	31967	242061
6.	Medicinal and Aromatic crops	3530	3491	19051
<b>Total</b>		<b>2004620</b>	<b>2103973</b>	<b>18010807</b>

### Horticulture - Its Contribution to State GDP:

The total expected GSDP (Gross State Domestic Product) of Karnataka in 2014-15 is about Rs. 9,07,839 crores. Combined Agriculture sector including Agriculture, Horticulture, Forestry, Sericulture, which is 8.81 % is about Rs.79947 crores. Out of this Horticulture sector's contribution to State GSDP is Rs. 40,002 crores i.e. 4.41%. The share of Horticulture in Agriculture GSDP is 34.80%. (Source: DES and Dept. of Horticulture)

Agriculture/Horticulture is the major occupation for rural habitants of Karnataka. Over the years, Horticulture has emerged as one of the potential enterprises in accelerating the growth of economy. Horticulture in Karnataka is heavily dependent on the South West Monsoon since, the extent of arid land is next only to Rajasthan. Only about 35% of net sown area is subjected to irrigation.

The State has three agricultural seasons- Kharif (April to September), Rabi (October to December) and Summer (January to March). Major Horticultural crops grown are fruits

(Mango, Grapes, Pomegranate, Banana, Papaya etc.,) vegetables (Onion, Potato, Tomato, Chillies), Plantation Crops (Coconut, Arecanut, Coffee) and Spices (Cardamom, Pepper, etc.,).

### **Recurring droughts and their effect on Horticulture crops in the State**

Most parts of Karnataka encompass vast stretches of dry arid zones. Recurring occurrence of drought and dry spells has been leading to wide spread losses to the horticulture crops. During the last six years, an unprecedented drought has occurred in the State successively and has caused extensive damages/losses to the horticulture crops and also has brought untold miseries to the farmers.

#### **Crop condition in the state**

In view of deficit rainfall crop loss is reported in most of the vegetable crops (Onion, Tomato Chillies and other vegetables). The crop growth in different perennial horticulture crops, is adversely affected. Major yield losses may take place in Coconut, Arecanut, Pomegranate, Banana and other horticulture crops. Further, irrigation water availability from bore wells, reservoirs, tanks will also be severely depleted and hence that would also be of no assistance to farmers to save their crop. The total horticulture crop loss in **15092.2** hectares.

### **Steps taken by the Government to mitigate the drought situation in the State**

The State Department of Horticulture has initiated several measures to overcome the adverse effects of the drought in the State. These measures are broadly categorized in to five groups.

#### **a) Drought proofing in the frequently drought affected rainfed areas.**

- i) Popularizing dry land horticultural crops, such as Mango, Cashew, Jack, Tamarind, Jamun, Amla, Anona, Ber etc., in the drought prone areas. The Department is providing extension support and is extending subsidy to the farmers for cultivation of these crops under NHM, MGNREGA, RKVY and State scheme of Comprehensive Horticulture Development (CHD).
- ii) Support to farmers is provided for adoption of on farm in-situ water conservation measures such as contour trenching /bunding, soak pits, crescent bunding, Mulching etc. under Krishi Bhagya State sector innovative project.

**b) Rain Water harvesting:**

- i) Assistance is provided to the farmers for the construction of farm ponds, check dams, nala bunds, community tanks etc., under different schemes of Horticulture Department and Watershed Development Department. Through this measure, the ground water gets recharged, and indirectly helps for improving water yields in the bore wells.
- ii) Creation of water harvesting structures to hold the water and use the same for life saving irrigations. These structures are lined with 300 micron geo-membrane poly sheets, so that the percolation of water does not take place. Subsidy is provided for this component under Krishi Bhagya Scheme.

**c) Measures for improving water use efficiency**

Subsidy is provided under micro irrigation scheme to an extent of 90% for drip irrigation and sprinkler irrigation as against about 17.50 to 30% assistance provided by the Govt. of India. Support is also being provided under State funds to cover more beneficiaries.

**d) Providing Crop Insurance Cover:**

- i) Weather based crop insurance scheme for sensitive horticultural crops grown in rainfed areas.
- ii) A portion of crop insurance premium is being paid by the State Govt. Awareness is being created to horticulture farmers about advantages of insuring their horticulture crops.

**e) Creating awareness about the drought and providing information on the ameliorative measures under taken by the Department of Horticulture**

The Department of Horticulture has taken up propaganda, publicity and mass communication strategies to educate the farmers in the drought prone areas about the adverse effects of deficit rainfall, the resultant effects of drought such as outbreak of pests and diseases etc. Further, the department is conducting several seminars, group discussions, night meetings etc. to create awareness about the assistance / benefits given through various schemes / projects.



**Assistance for Damages occurring to Horticulture Crops:** The major crops affected include Coconut, Mango, Lime, Arecanut, Papaya, Banana, Chilly, Onion, Tomato, Flowers and Other Vegetables. The Total area affected due to drought is 15,092 ha, **estimated loss calculated based on cost of cultivation is Rs.104.28** crores (Crop wise area damaged is given in Annexure – 3 and 4)

Sl. No.	Item	Area
a)	Total horticulture land	21.03 lakh ha
b)	Total horticulture area affected	15,092 ha
c)	Total affected horticulture area where crop loss is greater than 33%.	15,092 ha
d)	Out of (c), the area belonging to SMFs	10,162 ha (Rainfed:360 ha, Irrigated 3170 ha Perennial:6632 Ha)
e)	Out of (c), the area belonging to farmers other than SMFs (OSMFs)	4,930 ha (Rainfed: 525 ha, Irrigated: 1185 ha, Perennial 3220 ha)
f)	Number of OSMFs	4,946 farmers

**The requirement of funds under Horticulture Sector for SMFs is as under**

Area held by SMFs where crop loss was more than 33%	Area (ha)	Norms Rs. /per ha	Amount (Rs. in lakh)
i) Rainfed area	359.88	6,800/-	24.47
ii) Irrigated area	3170.11	13,500/-	427.96
iii) Perennial	6632.58	18,000/-	1193.86
<b>Total</b>	<b>10162.57</b>		<b>1646.29</b>

(District-wise details are at **Appendix – 3A** )

## II. OSMFs

Area held by OSMFs where crop loss was more than 33%	Area (ha)	Norms (Rs.) per ha. per farmer	Amount (Rs. in lakh)
i) Rainfed area (439 OSMFs)	525.46	6,800/-	35.73
ii) Irrigated area (1317 OSMFs)	1184.58	13,500/-	159.92
iii) Perennial (3190 OSMFs)	3219.66	18,000/-	579.54
<b>Total</b>	<b>4929.70</b>		<b>775.19</b>

(District-wise details are at **Appendix – 4A** )

**Note: While calculating the assistance sought in case of other than Small & Marginal farmers (OSMF), the minimum of the actual affected area or the number of farmers \* 2 has been taken into account, so that the actual area will be computed in cases where the actual area affected is less.**

**Assistance Claimed for the damage of Horticulture crops**

Input subsidy for SMF as per SDRF Norms - 16.46 Crores

Input subsidy for OSMF as per SDRF Norms - 7.75 Crores

**Total Assistance Claimed as per SDRF Norms - Rs. 24.21 Crores**

**Abstract of Horticulture Crops affected due to drought**

Sl.no	Crop	Area affected (in Ha)	Estimated loss (Rs lakhs)
1	Grapes	5.80	13.05
2	Pomegranate	166.71	120.86
3	Mango	912.40	684.30
4	Sapota	9.00	6.75
5	Guava	3.20	2.56
6	Coconut	5595.30	3357.18
7	Arecanut	241.05	180.79
8	Lime/ Citrus	331.67	232.17
9	Papaya	120.54	120.54
10	Banana	333.60	600.48
11	Tomato	881.1	616.77
12	Chilly	914.6	640.22
13	Onion	330.40	148.68
14	Cabbage	58.85	58.85
15	Cauliflower	20.65	20.65
16	Flowers	127.79	115.01
17	Other vegetables	5039.54	3509.67
	<b>Total</b>	<b>15092.20</b>	<b>10428.23</b>

## **RURAL DRINKING WATER SUPPLY**

In Karnataka there are 60,220 rural habitations in 176 Talukas, out of which 46,118 habitations of 160 Talukas are drought affected during Rabi 2016 season. More than 80% of Rural Water Supply Schemes depend on ground water source. In the 2016-17 Action plan 4,343 – PWS schemes & 2,273- MWS schemes have been taken up.

Successive drought and over exploitation of ground water by different sectors have affected source and sustainability, due to which coverage is affected and supply level is drastically reducing and quality is also getting affected.

As per the NRDWP guidelines and as a permanent measure, State has already taken up number of Multi village schemes with surface water as a source to address the coverage and quality. These funds can't be diverted for drinking water stress due to drought. If additional funds are made available under drought same shall be utilized to complete such of the schemes which are on verge of completion.

The Regular grants of **NRDWP** both under State and Central sector cannot be diverted for the above said Contingency Action Plan works, since it will hamper approved action plan works and MVS schemes are in progress. However, in accordance with the approved CAP, works are going on for supply of drinking water in the rural areas to tackle drinking water scarcity, in anticipation of GoI assistance and support.

Karnataka is the second largest state after Rajasthan with arid and dry land where quality and coverage is main problem, and to overcome this multi village water supply schemes are designed to cater purified water from distant sustainable source like big dams and reservoirs. The cost of such multi village water supply scheme is higher compared to local source based ones which is not sustainable for such arid regions with depleting ground water. To complete these schemes in time, regular financial fund flow is very essential. There are 163 ongoing MVS schemes. The completion of these on-going schemes will permanently solve drinking water problem. In the drought affected area 121 important schemes are to be completed on priority. For 2016-17 the action plan is for 1980 cr, out of which Rs.298.91 cr

is Central share. Hence Rural Development and Panchayat Raj Department requests for Rs. **1082.64 cr. as a special package** for early completion of ongoing Multi village schemes.

Karnataka has taken up a massive programme of providing safe drinking water, to habitations with ground water source, through installation of water purification plants. At present more than 8484 plants are commissioned in the rural areas in the State.

### **Measures already initiated by State Government**

- To take up works for emergency supply of drinking water which are not covered under NRDWP and MVS, Rs. 200.90 cr. is released to 189 rural constituencies out of which Rs. 89.14 Cr. is the expenditure.
- Regular meeting with the Deputy Commissioners and Chief Executive Officers ZP of District to review seasonal conditions and drought relief measures are being taken up.
- Identifying the villages which are facing /likely to face shortage of Drinking water and contingent action plan to tackle the issue.
- Zilla Panchayats have initiated combat measures viz., flushing, deepening, hydro-fracturing of borewells and repair and maintenance of RWS schemes, with energizing the schemes wherever civil works are completed. 160 drought affected blocks and many more pockets are facing severe drinking water problem and there is a dire need to take up certain emergent works. Block level" Control rooms" have been activated to address complaints then and there itself.
- State has also taken action for hiring private bore wells through respective Deputy Commissioners to mitigate drinking water stress.
- Revival through hydro fracturing, identifying new sources, augmenting sources will have to be taken up. To reinforce sustainability, water harvesting structures, recharge works are also taken up under various other schemes like MGNREGA.
- To assist, in addressing drinking water grievances toll free no 1800 4258 666 is made available.
- Due to drought many more habitations in future may have to be covered through water tankers.

- Due to consecutive droughts, lowering of underground water table is being reported across the State. This has affected quality of underground water due to increase of Fluoride, Nitrate, Iron, TDS and other contaminations in the underground water.
- Constant monitoring for
  - Effective implementation of on-going drinking water schemes.
  - Quick implementation of works approved during 2016-17.
- Quick implementation of Repair and Rejuvenation works.
  - Emergency Supply of drinking water through tankers in consultation with the DC as well as purchase of motor-pump, extension of pipelines and other measures.
  - Bore-well have to be drilled only during emergency.
  - Steps to ensure effective supply of clean drinking water through tankers.

#### **Requirement of Additional funds for mitigating drought**

Due to continuous drought condition for the past 5 years and the drought situation during this year also **160 taluks** have been severely affected. Taluk level Task Force committees / control Rooms are functioning very effectively. Hence, Central Assistance at this critical juncture will be more helpful, so that approved action plan and contingent action plan works will not be hampered and there will not be any escalation in the approved cost estimates. Required financial discipline and accountability is being ensured in the implementation of approved works as per the Contingent Action plan.

Regular meetings and Video conferences with the district officers, in the affected districts on the status of drinking water supply is being conducted. Under these circumstances, **GOI is requested to release Rs.1772.25 crores to tackle rural drinking water problem in the affected 160 taluks, during this year and ensure proper water supply in the affected areas. (District wise and Taluk wise details given in separate sheet)**

**The Abstract of Action plan is as follows: -**

<b>Sl.No.</b>	<b>Component Name</b>	<b>Fund Requirement Rs in crores for 160 Taluks</b>
1.	Extension of Pipeline: From new Borewell source it is necessary to lay new Raising main to connect to existing distribution system.	449.30
2.	Due to successive droughts there is a depletion in the yield of existing borewells. The funds required to establish new source points, pumping machineries, including energisation required in drought prone habitations.	195.84
3.	Hydro fracturing, Flushing & Redrilling/ deepening of Borewells	44.47
4.	To complete on going Multi Village water supply schemes and rejuvenation of defunct water supply schemes.	1082.64
	<b>Grand Total</b>	<b>1772.25</b>

## Supply of Drinking Water through Tankers

As on 28.01.2017, for 465 habitations water is being supplied through 962 tankers. Water supply through tankers may increase up to 6400 habitations by May-2017, on an average 2 trips/tankers per day.

It has been estimated that 40 villages in each of the 160 taluks of 30 districts may have to be transported water in the coming days at the rate of 2 trips per village per day for the next 90 days as per NDRF norms. **An assistance of Rs.115.20 crores is required for transportation of water.**

### Requirements of funds for Rural Areas is calculated as under:-

Total number of drought declared taluks	- 160	
Average no of affected villages in each drought affected taluka	- 40	
Total number of villages for transportation	- 6400	
No of trips by each tanker per each village per day	- 2	
Total No of trips per day	- 12,800 (6400*2)	
Average rate of tanker per trip	- Rs.700/-	
Amount required per day (700*12,800)	- Rs.89.60	lakhs
<b>Amount required for 90 days</b>	<b>- Rs.80.64 crores</b>	

### Requirements of funds for Urban Areas is calculated as under:-

Total number of drought declared taluks	- 160	
Average no of affected wards in each taluka	- 20	
Total number of wards for transportation	- 3200	
No of trips by each tanker per each ward per day	- 2	
Total No of trips per day	- 6400 (3200*2)	
Average rate of tanker per trip	- Rs. 600/-	
Amount required per day	- Rs.38.40 lakhs (600*6400)	
<b>Amount required for 90 days</b>	<b>- Rs.34.56 crores.</b>	

## Drinking Water Management in Urban Areas of Karnataka

During 2016, due to failure of South West Monsoon and North-East Monsoon in most parts of the State, 160 Taluks are affected and declared as drought hit. In the urban areas of 160 taluks, the cities/towns are facing shortage of drinking water. At present, 264 wards are supplied with drinking water using water tankers, 253 water tankers are being used for this at present for 978 trips daily. The cities which do not have surface water are severely hit due to depletion of ground water and drying up of borewells. New borewells have to be dug. During the year, an amount of Rs.105.00 crores has been spent on supply of drinking water to urban population from the State Finance Commission Grants.

Drought and over exploitation of ground water have affected source and sustainability, due to which supply level is reduced. Karnataka has taken up major water supply projects in urban areas, where water source is identified and there is sufficient quantity of water available and are planned schemes.

It has been estimated that 271 ULBs in 160 taluks require about Rs.276.75 crores for mitigating the problems of drinking water in urban areas of the State towards transportation of water through tankers, digging of new borewells, hydro-fracturing and fixing new pumpsets and pipeline, deepening of existing borewells and for providing temporary bunds, barricades etc. The citywise, details are given in Annexure-I. The temporary water supply works are approved and monitored by Task Force Committee.

The districtwise details are given below:

Sl.No.	Name of the District	Population	No.of ULBs	No. of Tankers	No. of Trips
1	Bengaluru Rural	241,377	5	24	129
2	Bengaluru Urban	204,137	6	13	59
3	Ramanagara	278,540	5	0	0
4	Tumkur	599,464	10	15	72
5	Kolar	434,851	6	94	427
6	Chickballapur	265,278	6	2	1
7	Chitradurga	332,958	7	13	54
8	Davanagere	644,259	7	2	0
9	Shimogga	623,742	9	4	11
10	Mysuru	1,166,839	9	24	29
11	Chamarajanagara	175,623	5	0	0
12	Mandya	293,188	7	0	0
13	Hassan	354,196	8	4	14



Sl.No.	Name of the District	Population	No.of ULBs	No. of Tankers	No. of Trips
14	Kodagu	72,682	4	0	0
15	Chickmagalur	292,988	9	0	0
16	Dhakshina Kannada	755,057	10	1	6
17	Udupi	218,635	5	0	0
18	Belgavi	1,269,556	33	0	0
19	Uttara Kannada	395,207	12	0	0
20	Vijypura	530,732	13	0	0
21	Bagalkote	555,184	15	0	0
22	Dharwad	1,049,539	6	32	122
23	Haveri	342,175	9	0	0
24	Gadag	379,309	9	8	47
25	Kalaburagi	788,483	10	0	0
26	Raichur	494,959	12	0	0
27	Koppal	302,765	9	1	3
28	Bidar	404,768	6	0	0
29	Bellary	929,266	15	16	4
30	Yadgiri	104,697	7	0	0
<b>Total</b>		<b>14,500,454</b>	<b>274</b>	<b>253</b>	<b>978</b>

Till June 2017, these towns require Rs.262.50 crores to mitigate the problems of drinking water. (Details in Annexure -1).

Karnataka Water Supply and Drainage Board (KUWS&DB) which is maintaining the water supply system in 10 cities requires about Rs. 14.25 crores to mitigate water supply scarcity during January 2017 to June 2017.

SL NO	Name of the town	Amounts( Rs.in lakhs)
1	Kushanl Nagar	5.00
2	Bethmanagala(KGF)	100.00
3	Hubli-Dharwad	100.00
4	Mandya	200.00
5	Ramanagaram	10.00
6	Channapatna	10.00
7	Belgaum	515.00
8	Vijayapura	350.00
9	Kalaburagi	75.00
10	Shimoga	60.00
<b>Total</b>		<b>1,425</b>

ANNEXURE-1									
Sl.No.	Name of the District	Population	No.of ULBs	Grants Required for (Rs. Lakhs)					Total Grants required for solving drinking water problems (Rs in Lakhs)
				New Borewells	Tankers	Borwell deepening/ Hydrofracturing	Borwell Maintenance	Miscellaneous	
1	Bangalore Rural	241,377	5	129.38	181.13	103.50	62.10	41.40	517.50
2	Bangalore Urban	204,137	6	189.38	265.13	151.50	90.90	60.60	757.50
3	Ramanagara	278,540	5	217.88	305.03	174.30	104.58	69.72	871.50
4	Tumkur	599,464	10	297.00	415.80	237.60	142.56	95.04	1188.00
5	Kolar	434,851	6	393.75	551.25	315.00	189.00	126.00	1575.00
6	Chickballapur	265,278	6	300.00	420.00	240.00	144.00	96.00	1200.00
7	Chitradurga	332,958	7	168.75	236.25	135.00	81.00	54.00	675.00
8	Davanagere	644,259	7	312.51	437.51	250.01	150.00	100.00	1250.03
9	Shimogga	623,742	9	131.25	183.75	105.00	63.00	42.00	525.00
10	Mysore	1,166,839	9	221.25	309.75	177.00	106.20	70.80	885.00
11	Chamarajanagara	175,623	5	114.38	160.13	91.50	54.90	36.60	450.00
12	Mandya	293,188	7	112.50	157.50	90.00	54.00	36.00	457.50
13	Hassan	354,196	8	45.00	63.00	36.00	21.60	14.40	1207.50
14	Kodagu	72,682	4	301.88	422.63	241.50	144.90	96.60	180.00
15	Chickmagalur	292,988	9	153.86	215.41	123.09	73.85	49.24	615.45
16	Dhakshina Kannada	755,057	10	229.29	321.01	183.44	110.06	73.37	917.18
17	Udupi	218,635	5	101.25	141.75	81.00	48.60	32.40	405.00
18	Belgavi	1,269,556	33	744.12	1041.76	595.29	357.18	238.12	2976.47
19	Uttara Kannada	395,207	12	273.75	383.25	219.00	131.40	87.60	685.50
20	Vijypura	530,732	13	165.00	231.00	132.00	79.20	52.80	660.00
21	Bagalkote	555,184	15	337.50	472.50	270.00	162.00	108.00	1095.00
22	Dharwad	1,049,539	6	234.38	328.13	187.50	112.50	75.00	937.50
23	Haveri	342,175	9	73.13	102.38	58.50	35.10	23.40	1350.00
24	Gadag	379,309	9	171.38	239.93	137.10	82.26	54.84	292.50
25	Kalaburagi	788,483	10	116.25	162.75	93.00	55.80	37.20	465.00
26	Raichur	494,959	12	101.25	141.75	81.00	48.60	32.40	810.00
27	Koppal	302,765	9	202.50	283.50	162.00	97.20	64.80	534.93
28	Bidar	404,768	6	133.73	187.23	106.99	64.19	42.79	375.00
29	Bellary	929,266	15	93.75	131.25	75.00	45.00	30.00	1985.96
30	Yadgiri	104,697	7	496.49	695.08	397.19	238.31	158.88	405.00
<b>Total</b>		<b>14,500,454</b>	<b>274</b>	<b>6562.50</b>	<b>9187.50</b>	<b>5250.00</b>	<b>3150.00</b>	<b>2100.00</b>	<b>26250.01</b>

## **Animal Husbandry Sector**

The state has 130 lakh fodder dependent animals in 176 Taluks of the state. As of now 160 Taluks have been declared drought affected which have a total Cattle population of 121 lakhs.

### **1.Fodder Situation in the State**

The total available fodder in the State is assessed every week during the drought period by taking the sown area and the crop residues available post harvest. Accordingly, as on 23-01-2017, the total available dry fodder in the State is 67.61 lakh tones which is expected to be sufficient for next 14 weeks (@ 5kgs /animal / day). In view of the poor monsoon and drought affected crops during Kharif and Rabi seasons have affected the availability of crop residues post-harvest. Hence, to overcome the shortage of fodder in the ensuing days, the following drought mitigation measures are taken up/proposed in drought affected taluks of the State.

About 16 lakh minikits at a total cost of Rs.40.00 crores are proposed to be distributed in the affected 160 taluks for farmers with irrigational facilities, under NDRF. District wise statement is enclosed in **Annexure-I**. About 1,60 lakh hectares will be covered under fodder cultivation for 16 lakh minikits yielding approximately 80 lakh metric tonnes of green fodder (1 minikit of 5 kg seeds will be sown in 0.1 hectare which yields about 5 tonnes of green fodder)

### **2. Establishment of Cattle Camps**

It is proposed to establish temporary cattle camps wherever required which will be decided by the District Administration strictly on need basis. Each cattle camp can shelter 500 cattle heads to be maintained for a period of 90 days under NDRF norms. It is proposed to establish 105 cattle camps at a total cost of Rs.52.50 crores (@ Rs.50.00 lakh per camp of 500 cattle) including the cost of transportation of fodder to the cattle camps @ Rs.15/ton / km for a maximum of 500 kms as approved by the State Government. Taluk wise statement for opening of the cattle camps is enclosed in **Annexure-I**.

### **Establishment of Fodder Banks / Fodder Depot:**

It is normally proposed to store dry fodder of about 250 tons in each fodder bank at the selected sensitive places to supply fodder to the affected farmers. The purchase rate of dry fodder (ragi, paddy, jowar, maize etc.,) is about Rs. 6,000 per ton as per State Government Order. The stored dry fodder will be sold on subsidised rate to the farmers @ Rs.3/kg.

A total of 400 fodder banks of various capacities (Rs.5 lakh to Rs.20 lakhs/bank) are proposed at a total cost of Rs.80 crores. **(Annexure-I).**

### **3. Medical Assistance /Health Care**

It is proposed to provide urgent and essential medical assistance to the animals in the drought affected areas to save the lives of the cattle during the stress period. It is mostly observed during the previous drought conditions that about 10% of the cattle population is affected due to stress and prone to diseases which necessitates medical intervention with antibiotics, analgesics, anti-inflammatory agents fluids, steroids, antiallergics, parasiticides etc., The medical assistance is proposed at the cost of Rs.20 crores for the affected 160 Taluks. **(Annexure-I).**

### **4. Supplementary Nutrition**

In order to take care of the nutritional status of the animals particularly of milch animals in the milk shed area apart from fodder and health, supplementation of additional nutrients in the form of mineral mixture cattle feed, tonics etc., are very essential. Therefore, supplementation of nutrient is proposed at a total cost of Rs.10 crores in the affected taluks**(Annexure-I).**

### **5. Migration of Cattle Population**

No reports of migration of cattle is received till today from the affected 30 districts. The district Deputy Directors have been watchful on the distress sale of livestock in the shandies

## **6. Relief Measures undertaken**

### **Supply of Fodder Minikits to farmers**

- a) 4.00 lakh Fodder Minikits are being distributed (from December 2016) to the farmers with irrigational facilities (@ Rs.250/- per Minikit) at the total cost of Rs.10 crores. In the 1<sup>st</sup> phase about 40,000 hectares was covered under fodder cultivation which may approximately yield 20 lakh metric tonnes of green fodder in the 1<sup>st</sup> phase (1 minikit of 5 kg seeds will be sown in 0.1 hectare which yields about 5 tonnes of green fodder)
- b) Presently, 84 Fodder Banks and 42 Goshalas (Cattle camps) have been established at various places of draught affected taluks by District Administration.
- c) Instruction has been given to District Deputy Directors to assist the District Administration to establish cattle camps and fodder banks wherever essentially required to cater to the needs of the local affected areas.
- d) Periodical Vaccination is conducted in drought affected taluks
- e) Nutritional supplements and mineral mixtures are distributed to the animals in drought affected taluks to overcome the mineral deficiency.
- f) Periodical health check-up is undertaken in the livestock
- g) Periodical deworming has been undertaken for parasitic infestation.
- h) State level meeting was convened to assess the fodder situation in the state as well as instructions have been issued to consider cattle population while calculating the requirement of drinking water.

**Approximate unit cost for maintaining a Goshala for 90 days**

Item	Rate	Total cost in Rupees
To shelter 500 cattle heads for 90 days	Rs.70/- per animal per day (As per NDRF norms)	31,50,000
To transport 225 tonnes of fodder (at the rate of 5 kg/animal/day for 90 days) up to maximum of 500 Kms.	Rs.15/- KM As per Government of Karnataka order	16,87,500
Infrastructure for fencing, drinking water, watch ward, Shelter etc.,		1,62,500
<b>Total</b>		<b>50,00,000</b>

**Assistance sought for under NDRF**

Sl.no	Item	Amount Sought (Rs in crores)
1	Assistance for purchase of 16 lakh fodder minikits for drought declared taluks	40.00
2	Opening of Goshalas to maintain 500 animals for 90 days 105 cattle camps@ of Rs.50.00 lakhs for each Goshala	52.50
3	Establishment of 400 Fodder Banks/Fodder Depot	80.00
4	Assistance for Medical care for cattle	20.00
5	Assistance for cattle feed, mineral mixture and tonics etc	10.00
	<b>Total</b>	<b>202.50</b>

## **Measures undertaken under MGNREGA in Drought affected areas**

### **Providing employment in drought affected areas under MGNREGS**

State Government during 2016-17 due to the failure of south west monsoon has declared 139 taluks of 26 revenue districts in the State as drought affected. In Rabi season due to failure of North East monsoon the total number of taluks declared as drought affected are 160. To mitigate the impact of drought, under Mahatma Gandhi NREGS more than 8 lakh works are being undertaken and 5.34 crore person days have been generated in these 139 drought affected taluks as of 20<sup>th</sup> January 2017. Further 12.14 lakh households have been provided with employment and 52,146 households have already completed 100 days of employment. Total expenditure in these taluks under the scheme is Rs. 1937.13 crores (139 taluks).

Ministry of Rural Development, Government of India has vide their letter dated: 30<sup>th</sup> December 2016 communicated their approval for the enhancement of employment days from 100 to 150 for the 139 taluks. The MORD is being requested to increase the employment days to 150 days proposal for additional 21 taluks. Instructions have been given to take up drought proofing works on priority and also one major community works at each village level to ensure adequate work is available to the labourers under MGNREGS.

IEC Activities in drought affected districts have also been scaled up and more than 28,700 Rozgar Diwas have been organized in the current year at village and Gram Panchayat levels to ensure maximum participation and adequate work for the labourers demanding employment and prevention of large scale migration.

Apart from this, about 17,523 calls have been received on MGNREGS toll free no: 1800-425-8666 in the current year and strenuous efforts are being made to provide employment to all the labourers who seek employment under the scheme.

## **Additional demand for work in the drought affected areas**

In view of the severe drought situation prevailing in these blocks, there is an increased demand for employment to be provided under MGNREGS. Considering the increased demand for employment in these blocks and upon the proposal from State Government, Ministry of Rural Development Government of India has revised the labour budget from 607.26 lakh person days to 1000 lakh person days. Same has been communicated to all the drought affected districts. Since more than 52,000 households have already completed 100 days and 3.80 lakh households more than 50 days, the Government of India is requested to consider an increase in eligible person days to 200 in the drought affected taluks, considering there are still more than two months to go in the current year.

Approved revised labour budget for the current year is 1000 lakh person days and corresponding allocation will be Rs. 3957.30 crores.

## **Details of MGNREGS works undertaken under drought proofing**

During the current year, more than 98,000 drought proofing works like construction of Bunds, Farm ponds, Multi arch check dams, Bore well recharge structures, River and Tank Rejuvenation works, Gokatte and Open wells have been undertaken under MGNREGS. The cumulative expenditure for all these works in the drought affected districts is more than Rs. 533 crores.

## **Advantages of the following works with dimension details and estimated cost**

### **1. Bore well recharge structures:**

Thrust on bore well recharge structures is given to enable the ground water recharging. Hence these structures are taken up in large numbers to enhance the yield in the bore wells. This would avoid the drinking water problem in the drought affected areas and provide succour to human beings and live stock as the over exploitation of ground water has resulted in depletion of yield in majority of the bore well sources. These structures are being executed in GP areas (Govt land) at an estimated cost of Rs. 70,000 per work. The dimension of this work is 3m x 3m x 0.6m.



## 2. River Rejuvenation:

In Karnataka State, three rivers viz., Vedavathi, Kumudavathi and Palar Rivers have been taken up to get the ground water level recharged by executing water harvesting structures like Percolation wells, Injection wells, Boulder checks and Water ponds. The catchment areas and villages surrounding these rivers are facing perennial water shortages due to drought situation for the past five years. The water scarcity is further aggravated due to indiscriminate digging of bore wells dimension details and estimate cost for the following works which are being taken up in the river areas.

Type of work	Dimension	Estimated cost
Boulder Check	8m x 5m x 2m	Rs. 58,200/-
Injection recharge well	5m x 2m x 60m	1,01,600/-
Recharge well	2m x 5m x 30m	59,300/-
Water pond	22m x 22m x 4m	5,51,100/-

## 3. Multi Arch Check Dams:

Multi Arch Check Dams are small arch dams constructed across nalas to impound water by which the ground water table in surrounding areas could be increased. These dams are low cost and more durable structures which is built across streams to prevent rain water from flowing away to the sea which also helps in preventing soil erosion. The dimension of the dam along with estimated cost for Check Dam: 5m x 1.7m is Rs. 40,500/- per work.

## 4. Farm ponds:

Farm pond works are being taken up individually by farmers land as well as being constructed as community works for the villagers of the area. Advantages of the Farm ponds are they harvest rain water, provide temporary storage and recharge ground water, it provides irrigation water during dry spells between rain falls and increases the yield. The dimension of the dam along with estimated cost is as follows:

<b>Type of work</b>	<b>Dimension</b>	<b>Estimated cost</b>
Farm Pond	12m x 12m x 3m	Rs. 87,000/-
	9m x 9m x 3m	Rs. 50,000/-
	6m x 6m x 3m	Rs. 26,000/-

### **5. Bunding:**

Bunds can be used to raise vegetables and fruit trees, thus supplying the farm household with an additional source of income and of nutritious food. It checks soil erosion and minimize the silt of the water ways and reservoirs.