

# IOPEPC Kharif-2017 Survey of Groundnut Crop



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## **INTRODUCTION**

Groundnut (*Arachis hypogaea* L.) is an important oilseed and supplementary food crop of the world. It is fourth most important source of edible oil and third most important source of vegetable protein. It is commercially grown between 40°N and 40°S latitude. Globally, the crop is raised on 26.4 million hectares with a total production of 37.1 million MT. The average productivity is 1400 kg/ha. The annual global export of groundnuts is of two million MT valued at 2,600 million US \$.

Globally, with annual all-season coverage of about 70 lakh hectares India ranks first in acreage and with an output of about 85 lakh MT of in shell groundnuts, second in production.

India also happens to be one of the largest exporters in the world and competes closely with Argentina, USA and China by commanding a share of 20-25% in global markets.

For estimating production from kharif-2017 groundnut crop, an extensive survey was organized by IOPEPC in five major groundnut growing states of India during the peak harvesting period.

## **NECESSITY FOR IOPEPC TO ORGANIZE CROP SURVEY**

The arrival of kharif groundnut produce begins in the last week of October. As production varies considerably over the years it significantly impacts the prices. Hence the prices in the Indian markets are determined by demand and supply situation. The export trade needs a reliable forecast of production every year coinciding with the commencement of harvesting operations i.e. in the last week of October. In addition to production figures, the trade also needs information on the quality of the produce which is often adversely affected by the vagaries of weather prevailing during the field, the harvest and the post-harvest stages of the crop. The Second Advance Estimates, the earliest realistic government estimates, are announced in January/February, i.e. about three-four months after the harvest of kharif crops. Therefore, with a view to

fulfilling this crucial need of the stakeholders for getting the production figures in the month of October-November, the IOPEPC has been organizing survey of groundnut crop in major growing states every year. The estimates based on kharif-2017 groundnut survey were released in the month of November-2017. The methodology adopted for conducting the survey and the results obtained are described here.

## METHODOLOGY

**Selection of states and districts for inclusion in survey:** For selecting states, the states were first arranged in their decreasing order of acreages and then only as many states as would jointly account for at least 80% of the national acreage were identified for inclusion in the survey. Similarly, within a state, the districts were first arranged in decreasing order of their acreages. Then, depending on the proximity of the districts with the headquarters of the state agriculture university concerned, as many districts as would jointly account for at least 80% of the state acreage were selected.

**State Survey Coordinators and Survey Teams:** In each state, one of the agricultural universities was opted as the collaborating partner. Names of the states and the respective agricultural universities are given in table 1.

**Table 1. States and partner agricultural universities**

State	Partner agricultural university
Gujarat	Junagadh Agricultural University, Junagadh
Andhra Pradesh	Acharya N.G.Ranga Agricultural University, Guntur
Karnataka	University of Agricultural Sciences, Dharwad
Maharashtra	Mahatma Phule Krishi Vidyapeeth, Rahuri
Rajasthan	Swami Keshwanand Rajasthan Agricultural University, Bikaner

A senior faculty member, nominated by the vice chancellor of the university concerned, was designated as the State Survey Coordinator. Names of the nominated state survey coordinators are given in appendix I. The activity was conducted by survey teams using a pre-designed questionnaire and by interacting with the farmers in their villages at their fields.

Each survey team comprised a Team Leader and two or three Team-Members. The team leadership was assigned to a faculty member or senior

technical personnel of the university and memberships to the UG/PG students. The number of teams constituted for a state was determined on the basis of acreage of the state and also the availability of human resource with the state agriculture university concerned.

**Rainfall data and maps:** Month-wise (June, July, August, September and October) and season-wise (June to September) cumulative data and maps on normal and actual rainfall along with its departure from the normal rainfall were downloaded from the website of India Meteorology Department, Govt. of India. The data pertained to meteorological sub divisions of various states and union territories of India.

**State-wise weekly progress of sowing and district-wise acreage:** The data on state-wise weekly progress of sowing was downloaded from the website of the Department of Agriculture Cooperation and Farmers Welfare, Govt. of India.

**District-wise acreage:** Information on district wise acreage within a state was obtained either from the website of the state government or through correspondence with state department of agriculture concerned.

**Scheduling of survey:** The survey was planned in such a way so as to have maximum number of farmers interviewed in their respective fields during the peak harvesting period (October-November).

**Number of farmers to be interviewed:** In each state, all the efforts were made to interview as many farmers as would be equal to 0.1% of the figures for the acreage of that state. E.g. in a state with a crop acreage of 2,21,000 ha the minimum number of farmers required to be interviewed would be 221. A pre-set questionnaire was used for interviewing farmers at their farms/villages.

**Estimation of average yield of the districts and the states:** The mathematical average of the expected/realized yields as reported by the farmers in a district was considered to be average yield of that district.



Andhra Pradesh



Gujarat



Karnataka



Maharashtra



Rajasthan

### Interaction with groundnut farmers

For each district, the anticipated production was calculated by multiplying the figures for acreage of that district (given by the state govt. concerned) with the figures for its average yield. The anticipated production from non-surveyed districts (often referred to as 'others') was calculated by multiplying the figures of the collective acreage of non-surveyed districts with the figures of weighted average yield of the surveyed districts in that state.

The total anticipated production in the state was calculated by summing up the figures for anticipated production in the surveyed and non-surveyed (others) districts.

**Estimation of average yield of non surveyed states:** The average yield of the non-surveyed states was assumed to be equal to that of the weighted average yield of the surveyed states.

The all India production was accordingly calculated by summing up the anticipated production of the surveyed states and the non-surveyed states.

## **RESULTS**

### **Kharif 2017: State wise net acreage**

In kharif-2017, the all-India acreage was 41,52,500 hectares. Eight states viz., Gujarat, Andhra Pradesh, Rajasthan, Karnataka, Madhya Pradesh, Maharashtra and Tamil Nadu and Uttar Pradesh were identified to have acreages greater than one lakh hectares and these states jointly accounted for 95.5% of the national acreage. The crop acreages of various Indian states are given in table 2.

Only five states viz., Andhra Pradesh, Gujarat, Karnataka, Rajasthan and Maharashtra which jointly accounted for 34,74,100 hectares i.e. 83.7% of the national acreage (41,52,500 ha) were selected as the target states for survey. Due to some practical considerations Maharashtra (at sixth rank) was opted in place of Madhya Pradesh (at fifth rank).

**Table 2. Kharif-2017 groundnut acreage in various states of India**

	State	Acreage (ha)		State	Acreage (ha)
1.	Gujarat	1625600	13.	Haryana	6100
2.	Andhra Pradesh	666000	14.	West Bengal	2500
3.	Rajasthan	590700	15.	Bihar	2100
4.	Karnataka	378000	16.	Punjab	2000
5.	Madhya Pradesh	218000	17.	Uttarakahnd	1800
6.	Maharashtra	213800	18.	Others	1000
7.	Tamil Nadu	160600	19.	Arunachal Pradesh	700
8.	Uttar Pradesh	115000	20.	Jammu & Kashmir	100
9.	Odisha	64600	21.	Assam	0
10.	Chattisgarh	58000	22.	Himachal Pradesh	0
11.	Jharkhand	33900	23.	Kerala	0
12.	Telangana	12000	24.	All India	4152500

As on 21.09.2017; Source DES, GOI

### **Weekly progress of crop coverage**

An analysis of data revealed that across the target states, the sowing operations began in the week ending 14 June and concluded up to the week ending 20 September.

In Rajasthan, peak period of sowing was 15 June to 29 June, which accounted for 56% of the state acreage. In both Gujarat and Maharashtra, the peak sowing period was 29 June to 13 July during which 57% and 42% of the state acreage, respectively, was covered.

Although in Andhra Pradesh and Karnataka, there was not any distinct peak period of sowing yet in Karnataka, 50% of the state acreage was sown between 13 July and 9 August. In Andhra Pradesh, the sowing operations were highly staggered and nearly evenly distributed between 22 June and 6 September.

The weekly progress of sowing in the five states surveyed is graphically depicted in Figure 1.

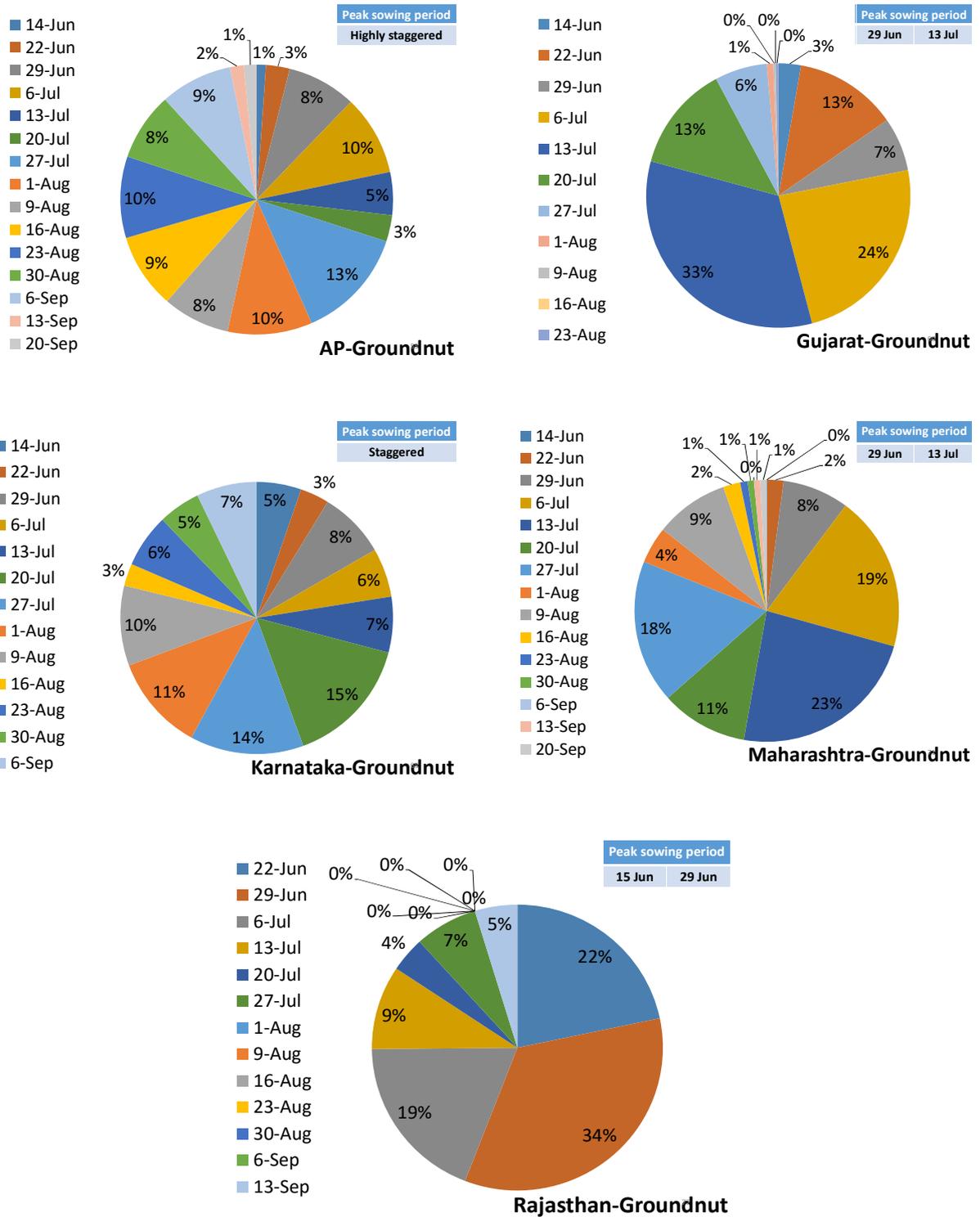


Figure 1. Weekly progress of sowing (dates indicate week-endings)

### **Change in acreage of major growing states with respect to kharif-2016:**

Considerable changes were observed in the extent of crop coverage at state as well as national level. At national level, with respect to kharif-2016, a decrease by 11.8% was observed in kharif-2017.

Among the five states selected for survey, the maximum decrease was observed in Karnataka (28.9%) and almost to the same extent in Andhra Pradesh (28.5%). In Gujarat and Maharashtra the change in area was only nominal and numerically nearly equal but with opposite signs i.e. -1.1% and +1.2%, respectively. A decrease in acreage by 4.2% was observed in Rajasthan.

In Kharif 2017, Gujarat alone accounted for 39.1% of the national acreage- a lion's share, and was distantly followed by Andhra Pradesh and Rajasthan with their respective shares of 16.0% and 14.2%. The acreages of Karnataka and Maharashtra accounted for only 9.1% and 5.1% respectively.

The total national kharif-2017 acreage was 41,52,500 hectares. Five states viz., Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Rajasthan jointly accounted for 34,74,100 hectares, i.e. 83.7% of the national acreage. The kharif 2017 crop acreages of these five states, their shares in the national acreage and change in acreage with respect to kharif 2016 are given in table 3.

**Table 3. Kharif-2017 vis-à-vis kharif-2016 acreage in major growing states**

State	Kharif 2016		Kharif 2017		
	Acreage (ha)	Share (%)	Acreage (ha)	Share (%)	Δ over 2016 (%)
<b>Andhra Pradesh</b>	932000	19.8	666000	16.0	-28.5
<b>Gujarat</b>	1643500	34.9	1625600	39.1	-1.1
<b>Karnataka</b>	532000	11.3	378000	9.1	-28.9
<b>Maharashtra</b>	211300	4.5	213800	5.1	1.2
<b>Rajasthan</b>	616600	13.1	590700	14.2	-4.2
<b>Sub-total</b>	3935400	83.6	3474100	83.7	-11.7
<b>Others</b>	772100	16.4	678400	16.3	-12.1
<b>All India</b>	4707500	100.0	4152500	100	-11.8

Source of data on acreage: Directorate of Economics and Statistics, Govt. of India

### **Districts identified for survey:**

On the basis of district-wise acreage in the target states vis-à-vis proximity of the districts with the head quarters of the State Survey Coordinators and also the availability of human resource for the purpose, an appropriate number of districts were identified for each state for survey.

Four districts viz., Anantapuram, Chittoor, Kurnool and YSR Kadapa were selected in Andhra Pradesh. In Gujarat nine districts viz., Rajkot, Junagadh, Dawarka, Amreli, Jamnagar, Banaskantha, Gir Somnath, Bhavanagar and Kutch were identified. As many as 11 districts viz., Chitradurga, Bellary, Tumkur, Belgaum, Vijayapura, Gadag, Koppal, Haveri, Chikkaballapura, Dharwad and Davanagere were selected in Karnataka and in Maharashtra seven districts viz., Kolhapur, Satara, Sangli, Nashik, Pune, Dhule and Ahmednagar were selected. In Rajasthan nine districts viz., Bikaner, Jodhpur, Churu, Jaipur, Hanumangarh, Sikar, Dausa, Nagaur and Tonk were identified. Of the total groundnut acreages of the states, the aforementioned districts collectively comprised 97.0% in Andhra Pradesh, 81.9% in Gujarat, 93% in Karnataka, 76.9% in Maharashtra and 84% in Rajasthan. The state wise information on the number of districts covered, teams engaged and the farmers interviewed along with the peak period of sowing and timings of survey is summarized in table 4.

**Table 4. Number of districts covered, teams engaged and farmers interviewed**

State	Districts covered (no.)	Teams (no.)	Farmers consulted (no.)	Peak period of sowing		Period of survey	
				From	To	From	To
<b>Andhra Pradesh</b>	4	5	720	Highly staggered		25 Oct	30 Oct
<b>Gujarat</b>	9	11	1331	29 Jun	13 Jul	01 Oct	09 Oct
<b>Karnataka</b>	11	5	339	Staggered		30 Sep	30 Oct
<b>Maharashtra</b>	7	3	387	29 Jun	13 Jul	27 Oct	04 Nov
<b>Rajasthan</b>	9	6	522	15 Jun	29 Jun	09 Oct	30 Oct
<b>Total</b>	40	30	3299	-	-	-	-

The districts covered by survey are indicated in the district boundary maps of the state concerned (figure 2a to 2e).







**Figure 2e. Districts (colour shaded) surveyed in Rajasthan**

## **ESTIMATES OF PRODUCTION**

The figures for state wise and all India production were estimated according to the procedure outlined earlier. The share of the estimated production of each district in the total estimated production of the respective state is described below.

### **Andhra Pradesh**

All the four districts covered under survey are in Rayalaseema region and jointly accounted for 97% of the state acreage implying that groundnut is grown only for name sake in Coastal Andhra Pradesh. The highest yield (1,703 kg/ha) was estimated for Kurnool district and the lowest (1,121 kg/ha) for Anantapur. The highest and half of the estimated state production (53.9%) could be attributed to Anantapur district, which also accounted for the largest acreage (61.1%). The total production of in shell groundnut in Andhra Pradesh was estimated at 8,35,084 MT with an average yield of 1,272 kg/ha (table 5).

**Table 5. Production of groundnut (in shell) in Andhra Pradesh**

	Districts	Acreage (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Anantapur	401228	61.1	429	1121	449777	53.9
2.	Chittoor	116877	17.8	162	1416	165498	19.8
3.	Kurnool	91987	14.0	85	1703	156654	18.8
4.	YSR Kadapa	26232	4.0	44	1437	37695	4.5
	Sub-total	636324	97.0	720	-	809624	97.0
	Others	20016	3.0	-	-	25460	3.0
	<b>State total</b>	<b>656340</b>	<b>100</b>	<b>-</b>	<b>1272</b>	<b>835084</b>	<b>100</b>

**Gujarat**

In Gujarat, among the nine districts surveyed, the highest yield (2,377 kg/ha) was estimated for Jamnagar and the lowest (1,374 kg/ha) for Amreli. The highest production (18.1%) was estimated for Rajkot which accounted for the largest acreage too. The total production of in shell groundnut in Gujarat was estimated at 30,54,671 MT with an average yield of 1,879 kg/ha (table 6).

**Table 6. Production of groundnut (in shell) in Gujarat**

	Districts	Acreage (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Rajkot	262800	16.2	263	2102	552406	18.1
2.	Junagadh	258300	15.9	271	1727	446084	14.6
3.	Dawarka	184600	11.4	146	1877	346494	11.3
4.	Amreli	126300	7.8	128	1374	173536	5.7
5.	Jamnagar	131500	8.1	129	2377	312576	10.2
6.	Banaskantha	106200	6.5	114	1901	201886	6.6
7.	Gir Somnath	114900	7.1	119	1881	216127	7.1
8.	Bhavanagar	92900	5.7	91	1603	148919	4.9
9.	Kutch	53400	3.3	70	1927	102902	3.4
	Sub total	1330900	81.9	1331	-	2500929	81.9
	Others	294700	18.1	-	-	553741	18.1
	<b>State total</b>	<b>1625600</b>	<b>100</b>	<b>-</b>	<b>1879</b>	<b>3054671</b>	<b>100</b>

**Karnataka**

In Karnataka, the highest yield of 1,894 kg/ha was estimated for Haveri and the lowest of 500 kg/ha for Chikkaballapura. Among the 11 districts surveyed, the

highest production of 51,385 MT was estimated for Chitradurga– the district having the largest acreage in the state but the estimated yield was quite low (561 kg/ha).

**Table 7. Production of groundnut (in-shell) in Karnataka**

	Districts	Acreage (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Chitradurga	91596	24.2	84	561	51385	15.5
2.	Bellary	52394	13.9	49	796	41706	12.6
3.	Tumkur	50894	13.5	51	560	28501	8.6
4.	Belgaum	26100	6.9	26	1282	33460	10.1
5.	Vijayapura	23784	6.3	26	731	17386	5.3
6.	Gadag	22361	5.9	26	859	19208	5.8
7.	Koppal	17472	4.6	16	939	16406	5.0
8.	Haveri	17425	4.6	16	1894	33003	10.0
9.	Chikkaballapura	17163	4.5	17	500	8582	2.6
10.	Dharwad	16157	4.3	12	1583	25577	7.7
11.	Davanagere	16131	4.3	16	1988	32068	9.7
	Sub-total	351477	93.0	339	-	307282	93.0
	Others	26523	7.0	-	-	23181	7.0
	State total	<b>378000</b>	<b>100</b>	-	<b>874</b>	<b>330463</b>	<b>100</b>

The total production of in shell groundnut in Karnataka was estimated at 3,30,463 MT with an average yield of 874 kg/ha (table 7).

### **Maharashtra**

In all, seven districts were surveyed in Maharashtra. The highest yield (2,885 kg/ha) was estimated for Pune and the lowest (900 kg/ha) for Kolhapur– a district which ironically accounted for the largest share (21.3%) in the state acreage. The maximum production (53,926 MT) was estimated for Sangli with a yield of 2,000 kg/ha.

The total estimated production of in shell groundnut in Maharashtra was estimated at 2,95,404 MT with an average yield of 1,382 kg/ha (Table 8).

### **Rajasthan**

In Rajasthan, the highest yield (2,862 kg/ha) was estimated for Sikar and the lowest (869 kg/ha) for Dausa. The highest production was estimated for Bikaner, the district with the largest acreage (35.4%) in the state. Bikaner alone, accounted

for two-fifths (39.4%) of the estimated production of Rajasthan. The production of in shell groundnut in Rajasthan was estimated at 14,05,781 MT with an average yield of 2,380 kg/ha (Table 9).

**Table 8. Production of groundnut (in shell) in Maharashtra**

	Districts	Acreage (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Kolhapur	45538	21.3	91	900	40984	13.9
2.	Satara	31561	14.8	72	1076	33960	11.5
3.	Sangli	26963	12.6	61	2000	53926	18.3
4.	Nashik	25752	12.0	67	1171	30156	10.2
5.	Pune	15502	7.3	30	2885	44723	15.1
6.	Dhule	12636	5.9	34	1187	14999	5.1
7.	Ahmednagar	6483	3.0	32	1301	8434	2.9
	Sub total	164435	76.9	387	-	227182	76.9
	Others	49365	23.1	-	-	68222	23.1
	<b>State total</b>	<b>213800</b>	<b>100</b>	<b>-</b>	<b>1382</b>	<b>295404</b>	<b>100</b>

**Table 9. Production of groundnut (in shell) in Rajasthan**

	Districts	Acreage (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Bikaner	209225	35.4	168	2644	553191	39.4
2.	Jodhpur	115000	19.5	89	2192	252080	17.9
3.	Churu	44215	7.5	18	2756	121857	8.7
4.	Jaipur	34689	5.9	77	1630	56543	4.0
5.	H'garh	29440	5.0	44	2286	67300	4.8
6.	Sikar	20006	3.4	29	2862	57257	4.1
7.	Dausa	19151	3.2	26	869	16642	1.2
8.	Nagaur	13207	2.2	49	2348	31010	2.2
9.	Tonk	11400	1.9	22	2220	25308	1.8
	Sub total	496333	84.0	522	-	1181188	84.0
	Others	94367	16.0	-	-	224593	16.0
	<b>State total</b>	<b>590700</b>	<b>100</b>	<b>-</b>	<b>2380</b>	<b>1405781</b>	<b>100.0</b>

### All-India production

The all India production was estimated at 70,77,397 MT with an average yield of 1,704 kg/ha (table 10). The five states covered by survey collectively contributed 83.7% of the national production. All figures pertain to production of in-shell groundnut.

**Table 10. State wise and all-India production of kahrif-2017 groundnut (in shell)**

	State	Acreage* (ha)	Share (%)	Farmers (no.)	Yield (kg/ha)	Production (MT)	Share (%)
1.	Andhra Pradesh	666000	16.0	720	1272	835084	11.8
2.	Gujarat	1625600	39.1	1331	1879	3054671	43.2
3.	Karnataka	378000	9.1	339	874	330463	4.7
4.	Maharashtra	213800	5.1	387	1382	295404	4.2
5.	Rajasthan	590700	14.2	522	2380	1405781	19.9
	Sub-total	3474100	83.7	3299	-	5921403	83.7
	Others	678400	16.3	-	-	1155994	16.3
	<b>All India</b>	<b>4152500</b>	<b>100</b>	<b>-</b>	<b>1704</b>	<b>7077397</b>	<b>100</b>

As on 21<sup>st</sup> September 2017; Source: Directorate of Oilseeds Development, Hyderabad

With an estimated production of 30,54,671 MT, Gujarat accounted for two-fifths (43.2%) of the national production. Gujarat was followed by Rajasthan (14,05,781 MT) with a share of 19.9%, Andhra Pradesh (8,35,084 MT) with 11.8%, Karnataka (3,30,463 MT) with 4.7% and Maharashtra (2,95,404 MT) with 4.2%. The highest state average yield of 2,380 kg/ha was estimated for Rajasthan which was followed by 1,879 kg/ha for Gujarat, 1,382 kg/ha for Maharashtra, 1,272 kg/ha for Andhra Pradesh and the lowest of 874 kg/ha for Karnataka.

### **Concurrence between estimated yields and seasonal rainfall pattern:**

The groundnut crop requires about 700 mm rainfall and an optimum temperature range of 20-35°C. The crop is susceptible to several diseases and insect pests. Exposure to protracted drought adversely affects the crop yield. End-of-the-season drought severely affects pod filling and lowers yield as well as quality. Adequate care is required while harvesting the crop and post-harvest curing of the produce to conserve the organoleptic quality and safeguard the produce from infestation of aflatoxin

producing fungi and storage pests. Excessive rain enhances the susceptibility to fungal diseases besides causing erosion in quality.

The yield of groundnut crop in the preceding five years (2012-13 to 2016-17) and its average (often referred to as normal yield) and the yield estimated for 2017-18 through the survey are given in the table 11.

**Table 11. Normal yield (kg/ha) of kharif groundnut in states surveyed**

State	GOI estimates for kharif groundnut					Normal (five-year average)	Survey 2017-18
	2012-13	2013-14	2014-15	2015-16	2016-17		
Andhra Pradesh	518	627	410	877	566	600	1272
Gujarat	498	2716	2168	1654	1795	1766	1879
Karnataka	560	844	729	675	560	674	874
Maharashtra	992	1213	1037	969	1199	1082	1382
Rajasthan	1549	1950	2019	2029	2051	1920	2380
All India	811	1735	1478	1399	1361	1356	1704

Source: DES, GOI; Final estimates for 2012-13 to 2015-16 and fourth advance estimate for 2016-17

The data on cumulative rainfall in various meteorological sub-divisions of India during 2017 monsoon season (1 June – 27 September) along with its departure from the normal and the post-September rains (1 October – 1 November) are given in table 12.

**Table 12. Actual and normal rainfall in the target states**

Meteorological sub divisions	From 01.06.17 to 27.09.17			From 01.10.17 to 01.11.17		
	Actual (mm)	Normal (mm)	Departure (%)	Actual (mm)	Normal (mm)	Departure (%)
West Rajasthan	365.6	262.4	39	0	5	-100
East Rajasthan	566.0	612.5	-8	0	17	-100
Gujarat region	995.3	905.3	+10	15	24	-34
Saurashtra and Kutch	646.3	472.9	+37	5	19	-75
Madhya Maharashtra	837.6	712.3	+18	113	80	+41
Rayalaseema	482.0	382.6	+26	225	133	+69
N.I. Karnataka	481.8	487.8	-1	149	114	+31
S.I. Karnataka	626.1	641.8	-2	179	150	+19

Source: India Meteorological Department, Govt. of India

The all India real time data maps for the months of June, July, August and September, cumulative south west monsoon rainfall from June to September, and rainfall in October are given as appendices II to VII.

On the basis of rainfall data maps for June, July, August, September and October 2017, the following interpretations have been made for the areas of groundnut crop in the five states covered under survey.

**June:** Both East and West Gujarat received normal rains while Rayalaseema, North Interior Karnataka, Madhya Maharashtra and both West and East Rajasthan received excess rains. It was only South Interior Karnataka that received deficient rains.

**July:** Madhya Maharashtra received normal rains. In entire Gujarat and entire Rajasthan there were excess rains while in Rayalaseema and both North and South Interior Karnataka there were deficient rains.

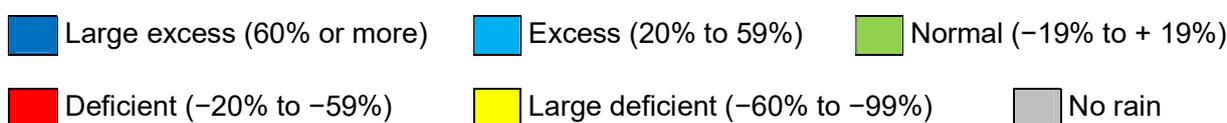
**August:** Entire Karnataka and Madhya Maharashtra received normal rains. The Rayalaseema region and West Gujarat received excess rains while the rains were deficient in East Gujarat and entire Rajasthan

**September:** Rayalaseema, entire Karnataka and Madhya Maharashtra received excess rains. The rains were deficient in entire Gujarat and entire Rajasthan.

**October:** Entire Rajasthan was completely dry (no rains). In West Gujarat there was a large deficiency while in east Gujarat there was deficiency. In Madhya Maharashtra and both South Interior Karnataka and North Interior Karnataka there were excessive rains while in Rayalaseema there was a large-excess of rains.

The graphic representation of rainfall pattern in the target areas of the surveyed states is given in figure 3.

Month	Rayalseema (AP)	West Gujarat	East Gujarat	NI Karnataka	SI Karnataka	Madhya Maharashtra	West Rajasthan	East Rajasthan
June	31	-5	5	25	-23	31	174	42
July	-45	96	79	-43	-41	16	114	30
August	66	22	-37	-10	14	1	-53	-40
September	45	-45	-58	43	81	24	-49	-53
October	74	-73	-34	33	21	43	-100	-100



**Figure 3. Departure from the normal monthly rainfall in meteorological subdivisions of the states covered by survey**

In the following discussion attempts at validating the estimated yields on the basis of rainfall pattern of kharif 2017 season in the meteorological subdivisions of the targeted states.

A cluster of four districts in Rayalaseema region accounts for entire (97%) groundnut acreage of in Andhra Pradesh. It is a low bimodal rainfall area with normal south west monsoon rainfall of 383 mm from June to September and subsequently 133 mm in October from the north east monsoon.

Compared to Gujarat, Rajasthan, and Maharashtra, the sowing season of groundnut in Rayalaseema is generally staggered and in Kharif-2017 it stretched for nearly two and a half months (June to mid August). In the first four months (June to September) a total of 482 mm rainfall was received and in October another 225 mm was received. Thus there was a total of 707 mm rainfall against the normal rainfall of 515 mm. Hence the yield of the crop in Andhra Pradesh was unusually high.

In Gujarat, groundnut cultivation is most extensive in west Gujarat (Saurashtra and Kutch meteorological region). The normal June to September rainfall for this region is 473 mm and just 19 mm in October. In Kharif-2017, this region received

646 mm June to September rainfall and only 5 mm in October. Thus in this season a good rainfall in June and July helped in timely sowing of crop with a peak period during 29 June and 13 July and this coverage coupled with excess rains in August (with its residual effect partly compensating for the deficient rains in September) resulted in realization of a good yield in Gujarat.

The total quantum of south west monsoon rainfall in North Interior Karnataka (481.8 mm) and South Interior Karnataka (626.1 mm) has been near normal (487.8 mm and 641.8 mm, respectively) but its distribution across the months showed considerable departures. In South Interior Karnataka, rains were deficient in June and July while in North Interior Karnataka rains were deficient only in July. In both the sub-divisions rainfall was normal in August and excess in September and also in October. Quite like Andhra Pradesh, the sowing period in Karnataka was also protracted and given the scenario of sufficient post July rains, the late sown crop appears to have performed well, evidenced by its yield estimation. Hence in spite of initial adverse effects of deficient rains early in the season, the overall realization of yield was rather satisfactory. Realization of very high yield in Haveri districts can be attributed to Integrated Micro-Irrigation Scheme which facilitates farmers to use water through sprinklers.

Both West and East Rajasthan had identical rainfall pattern i.e. excess rains in June and July, deficient rains of August and September, and no rains in October. In Rajasthan, groundnut cultivation is characterized by early sowing, use of long-duration varieties and widespread adoption of sprinkler irrigation. In keeping with this characterization, 22% of the total acreage was accomplished by the week ending 22 June, 56% by the week ending 29 June and 75% by the week ending 6 July and during this period there were sufficient rains. Subsequently, availability of irrigation water in the command area of Indira Gandhi Canal and also recharging of ground water (due to good rains in June and July) facilitated availability of water for sprinkler irrigation resulting in realization of quite high yield as usual for Rajasthan.

Although there are a host of soil and environmental yield determining factors in rain-fed areas, the pattern and extent of rainfall assumes a crucial position for realizing good yields. Among the five states surveyed, the reasons for realization of

unusually high yields in Andhra Pradesh; moderate yields in Karnataka and Maharashtra have already been explained in terms of June to September and post-September rainfall patterns of these states.

Rajasthan is the only state where a large number of farmers have access to irrigation water to compensate for the deficient rains and thus protect their crop from any short or long spell of drought. In Gujarat too depending on availability of ground water some farmers are able to protect their crops from short spells of drought. A good rainfall in June and July facilitated timely sowing and also recharges the ground water which later becomes available to farmers for providing protective irrigations during the dry spells that prevail due to deficient or absence of rains for weeks together. Use of micro irrigations systems is fast becoming popular in Gujarat too. This explains realization of good yields in Rajasthan and Gujarat even with moderate rains.

**General comments:**

The kharif-2017 appears to a very good year for groundnut crop in India. In major groundnut areas other than Rajasthan the June to October rainfall either approached close to or surpassed 700 mm. For Rajasthan widespread use of sprinkler irrigations coupled with use of long duration varieties has been giving very high yields for the several past years. In the southern states (Andhra Pradesh and Karnataka), the post September rainfall rescued the crop well from the initial periods of deficient rains. Thus, kharif 2017 may turn out to be a year of record groundnut productivity as well as production (in spite of reduction in acreage).

**ACKNOWLEDGEMENT:** The IOPEPC is thankful to the Vice Chancellors and other authorities of the five agricultural universities for allowing their faculty members, technical officers and students to function as State Survey Coordinator, Team Leaders and Team members and conduct the crop survey.

Report compiled by:

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Mr. Gaurav S. Gawande, Sr. Manager, IOPEPC

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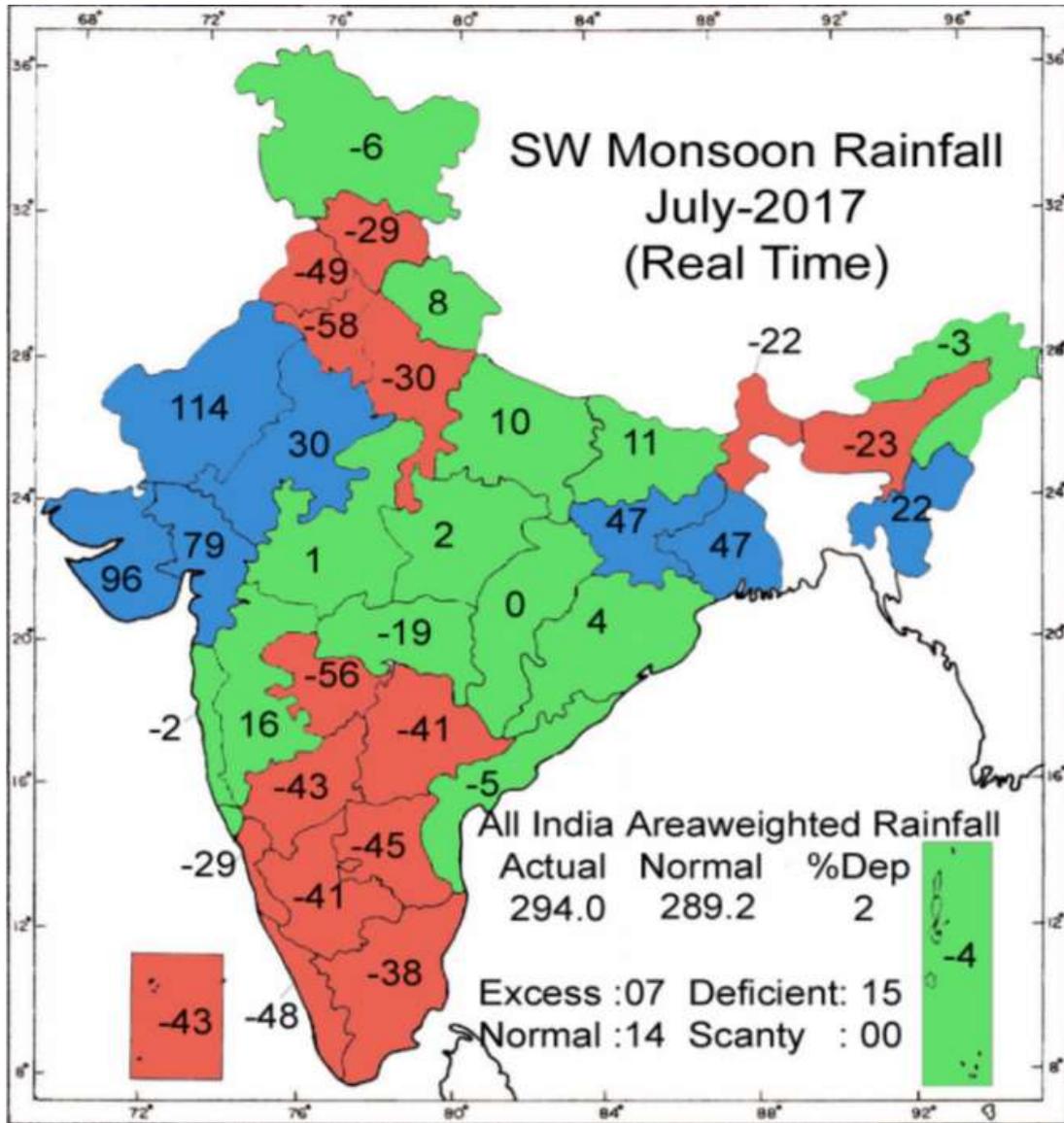
The projections made in this report about the yield and production of kharif-2017 groundnut crop have been made on the basis a limited survey conducted by adopting the methodology outlined in the beginning of this report. Due to inherent complexities associated with preparing the production estimates and also the limited resources and sample-size, the figures projected in this book may or may not be in harmony with the figures projected by other private or public agencies. The IOPEPC shall not be responsible for any gains or loss incurred by any individual or institution on account of using the figures given in this report. The IOPEPC therefore advises the readers to use discretion before taking any commercial or policy decision on the basis of projections made in this report.

## Appendix I

### Particulars of the designated State Survey Coordinators

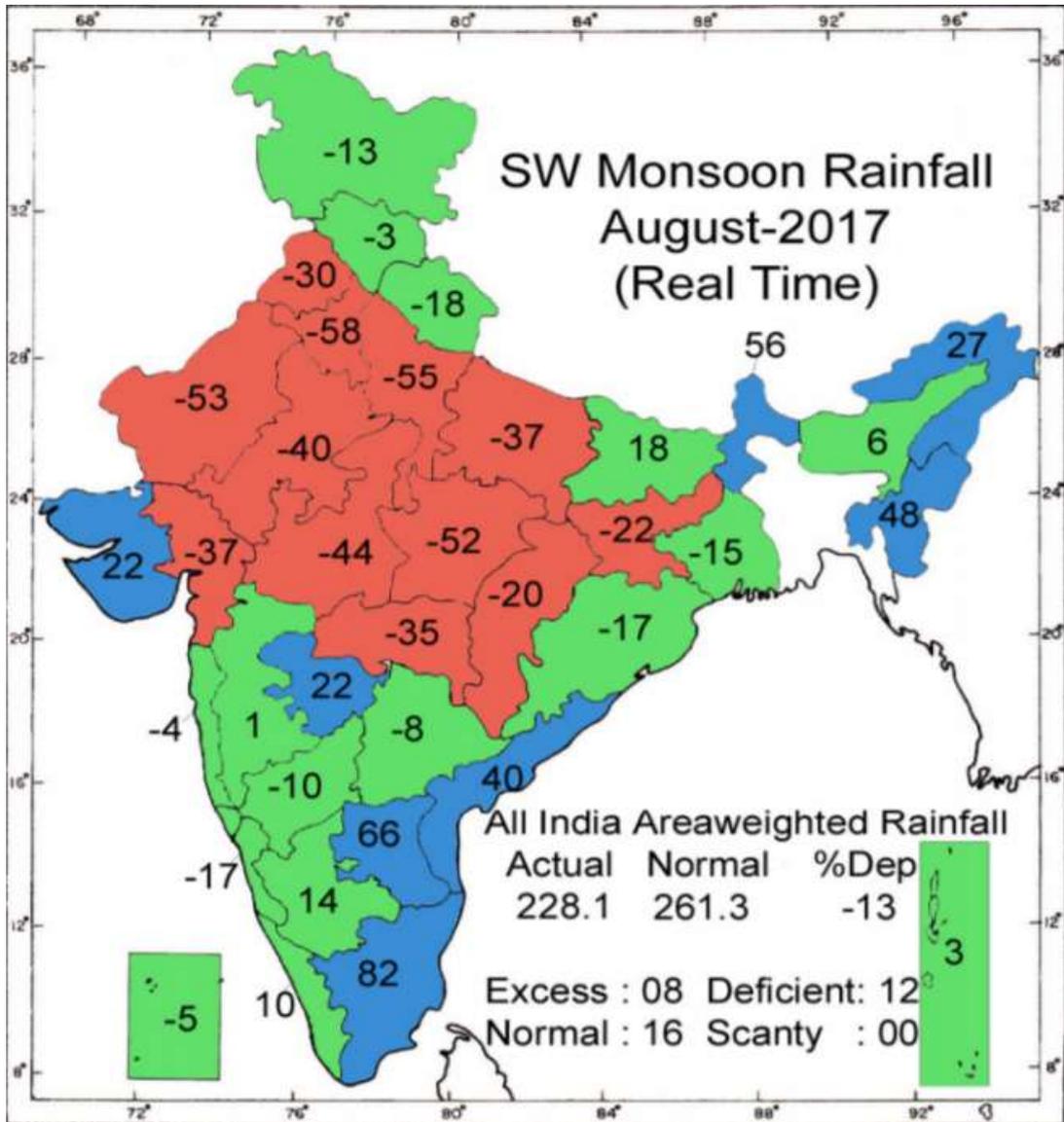
	<b>Name, designation and affiliation</b>	<b>Contacts</b>	<b>State assigned</b>
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5.	Dr. M.M. Sharma Professor (PB&G) SK Rajasthan Agricultural University, Bikaner-334 006	09414451910 mmohanrau@yahoo.com	Rajasthan





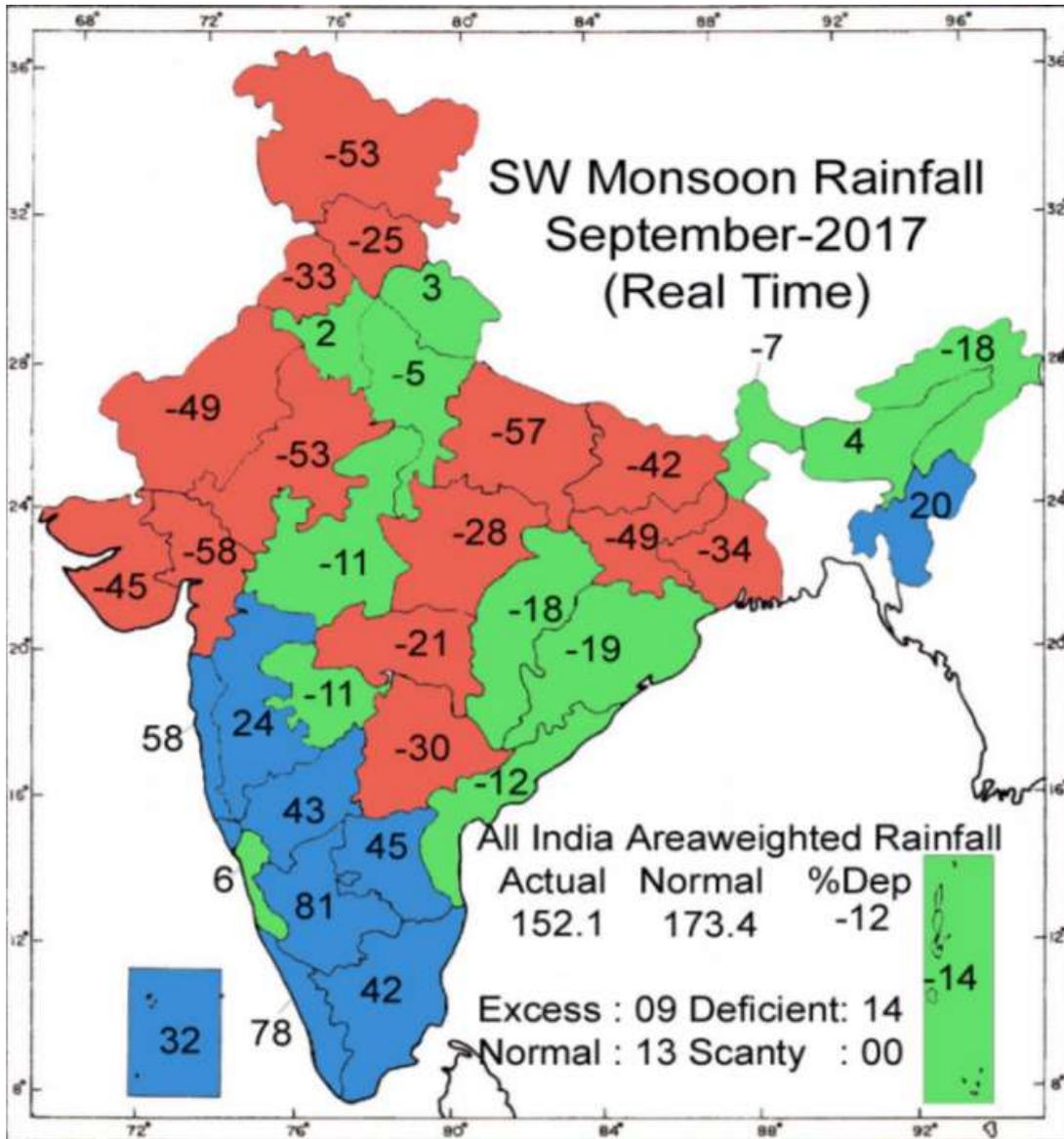
Source: India Meteorological Department

■ Excess (>19%)   
 ■ Normal (-19% to + 19%)   
 ■ Deficient (-20% to -59%)



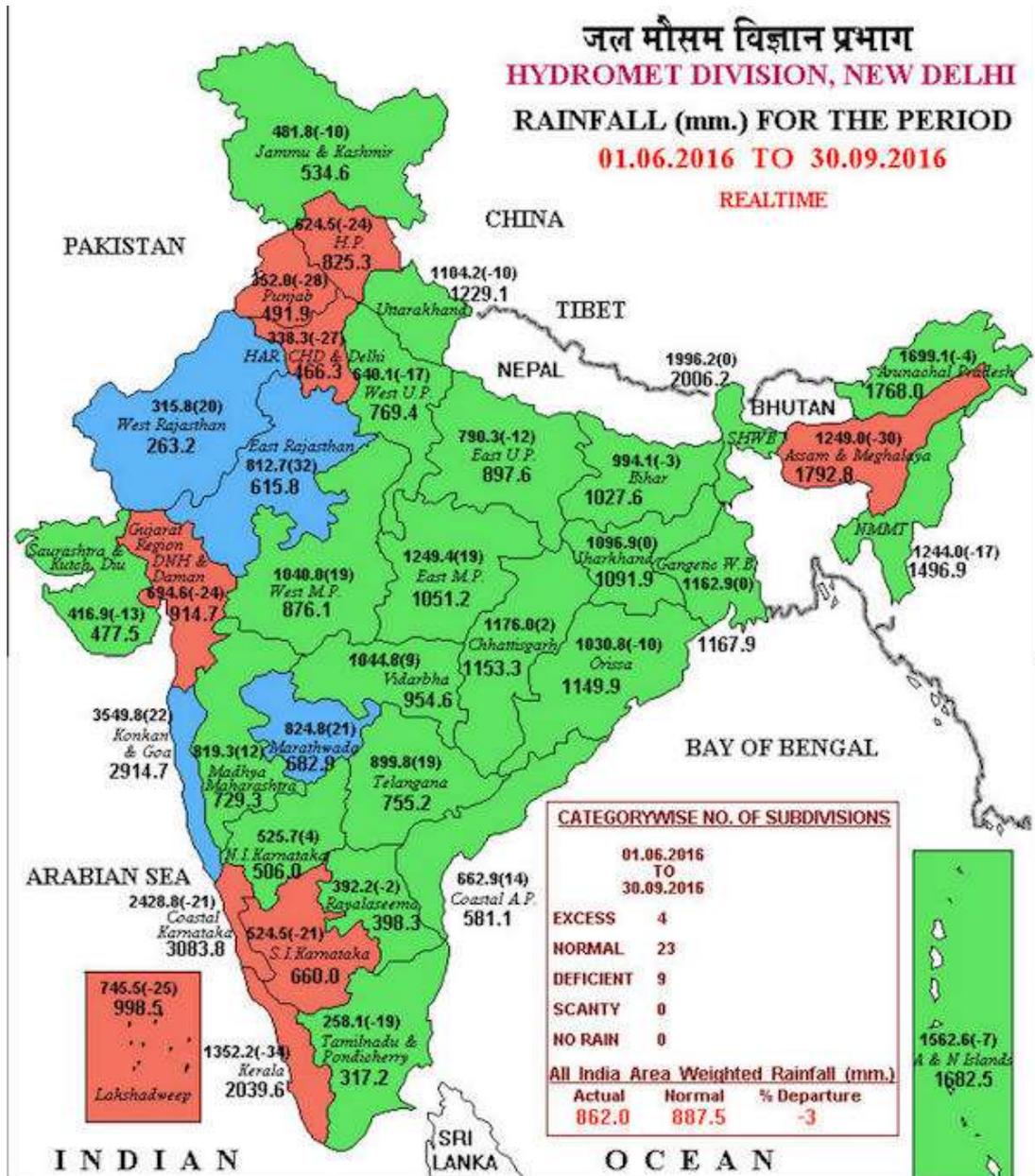
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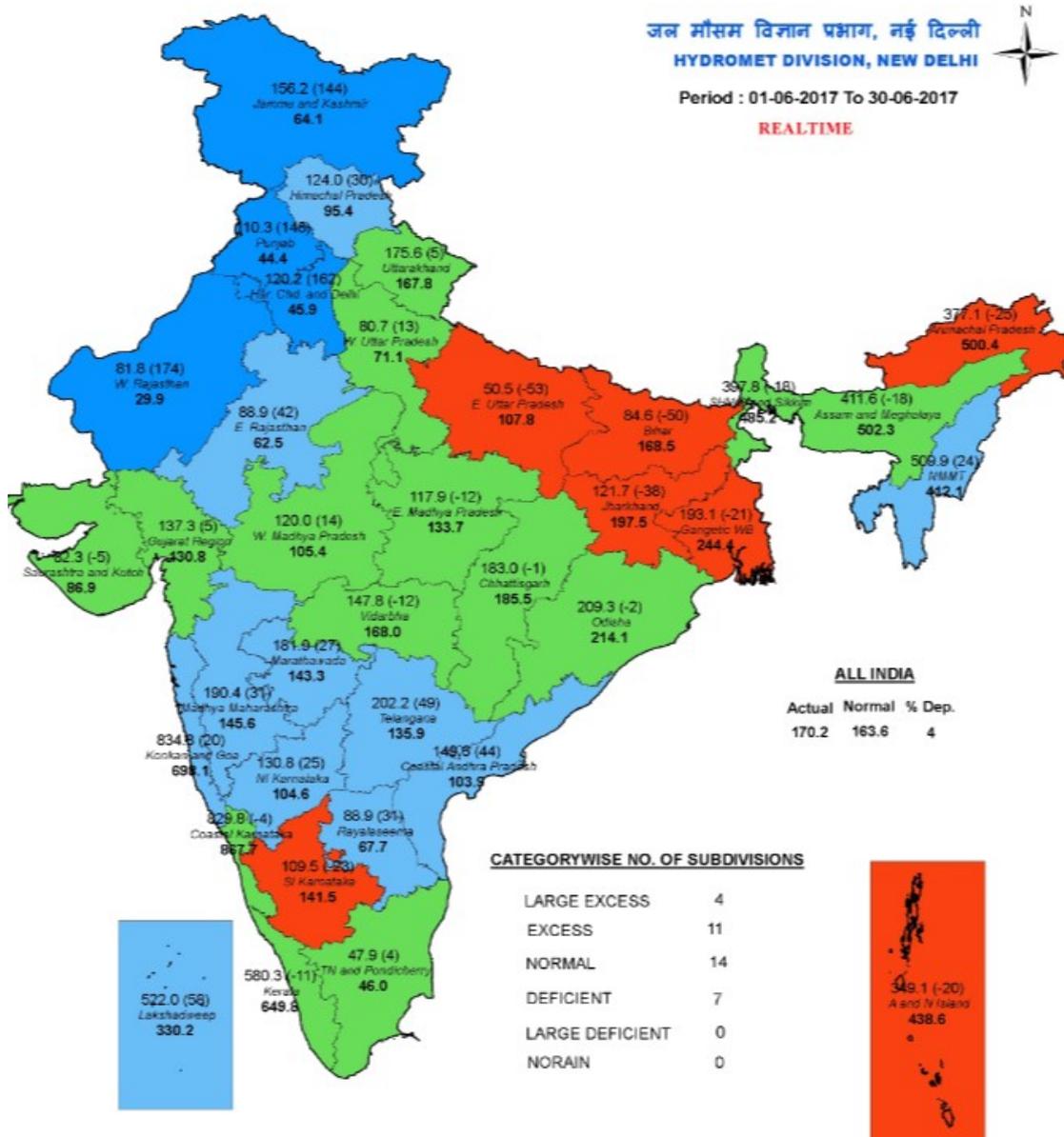
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■ Excess (>19%)     
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## Appendix VII



Source: India Meteorological Department

