

*North-East Monsoon 2009: A Review** (October 1 to December 31, 2009)

The performance of the North-East monsoon 2009 was more than satisfactory with the average precipitation being 8 per cent above normal. Considering that the South-West monsoon 2009 witnessed a large deficiency in rainfall impacting negatively the Kharif foodgrains production, good performance of the North-East monsoon augurs well for the Rabi crops that are expected to partially compensate for the shortfall in crop production during Kharif 2009. The agricultural sector is also expected to derive support from the strong and large 'allied sector' and the planned Government efforts towards enhancing Rabi production in the current financial year.

Introduction

The Indian subcontinent experiences two monsoon seasons viz., South-West, covering the period from June to September and North-East from October to December. While the South-West monsoon accounts for about 70-80 per cent of the annual rainfall in the country, rainfall during North-East monsoon that coincides with *Rabi* sowing is also gaining importance, particularly in recent years with the increasing share of *Rabi* production in overall foodgrains production. During 2009, the unsatisfactory performance of South-West monsoon with a short fall of 23 per cent in precipitation resulted in drought in several states and an estimated decline of 15.9 per cent¹ in *Kharif* crop production during 2009-10. Unlike in

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1 As per the revised First Advance Estimates released by Ministry of Agriculture, Government of India.

previous drought years, North-East monsoon performance during 2009 has been satisfactory keeping the overall Rabi crop prospects bright. This article reviews the performance of North-East Monsoon 2009.

North-East Monsoon 2009 - Highlights

- During the year 2009, the North-East monsoon rains arrived over Tamil Nadu and adjoining States of South Peninsula on October 29, 2009.
- The cumulative rainfall during North East monsoon 2009 over the country as a whole averaged at about 135.5 mm as against the normal of 125.9 mm. At this level, rainfall was 8 per cent above normal as compared to 31 per cent below normal during the corresponding period of the previous year.
- During the period under review, rainfall remained excess in November 2009 and deficient during October and December 2009.
- The spatial distribution exhibited an excess rainfall in Central India, normal rainfall in South Peninsular India and North-East and deficient rainfall in North-West India.
- The seasonal rainfall from October 1, 2009 to December 31, 2009 was normal/excess in 23 (64 per cent) meteorological sub-divisions and deficient/scanty/no rain in the remaining 13 (36 per cent).
- District wise, of the 526 meteorological districts for which data are available, 58 per cent received excess/normal rainfall, while the rest received deficient/scanty/no rain.

An Overview of North-East Monsoon 2009

Cumulative Rainfall

Cumulative rainfall recorded during the period October 1 to December 31, 2009 was 8 per cent above normal as compared to a shortfall of 31 per cent from normal during the corresponding period of the previous year (October 1 to December 31, 2008).

It may be noted that in the current decade, India experienced large deficiency in rainfall during South-West monsoon and consequent drought (partially or wholly) on three occasions - 2002, 2004 and in the current financial year 2009. While North-East monsoon also remained deficient during 2002 and 2004, it has been above normal in the year 2009 (Table 1). This is a positive development that is likely to partially offset the impact of drought in the current year *via* supporting overall crop production through improved Rabi production.

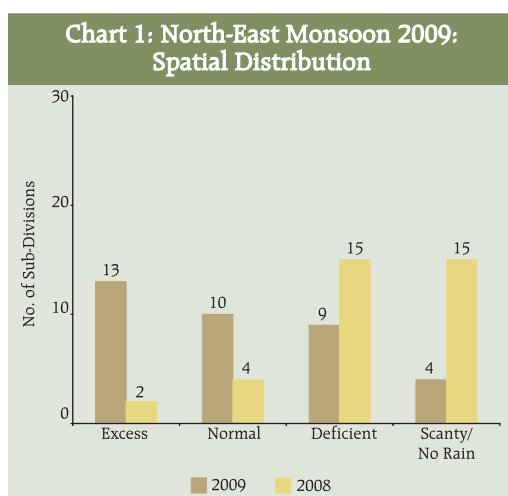
Spatial Distribution

The spatial distribution of rainfall during North-East monsoon 2009 remained uneven. Of the 36 meteorological sub-divisions,

Table 1: South-West and North-East Performance during Drought Years

Drought years	South West Monsoon (percentage deviation from normal)	North East monsoon (percentage deviation from normal)	Agricultural GDP growth (per cent)
1	2	3	4
2009	-23	+8	-
2004	-13	-11	0.0
2002	-19	-33	-7.2

Source: India Meteorological Department, Ministry of Agriculture.



cumulative rainfall was excess/normal in 23 sub-divisions (6 in the corresponding period, last year) and deficient/scanty/no rains in 13 sub-divisions (30 last year) (Chart 1, Table 2 and Statement I).

Among the four homogeneous regions², North-East monsoon rainfall was excess

over Central India, normal over South Peninsular Region and North-East India, while it was deficient over North-West India (Table 3).

District-wise, out of the 526 meteorological districts for which data has been reported, 58 per cent of the total number of districts received excess/normal rainfall, while the rest received deficient/scanty/no rain during the season (Statement II).

Temporal Distribution

The temporal distribution of the North-East monsoon 2009 during the period October to December 2009 remained highly skewed. While there was deficient rainfall during part of October and whole of December, there was excess rainfall during the first half of October and whole of

Table 2: Distribution of Sub-divisions According to Category of Rainfall

Category of Rainfall	Sub-divisions
1	2
Excess	Sub-Himalayan West Bengal and Sikkim, Jharkhand, East Uttar Pradesh, West Uttar Pradesh, East Rajasthan, West Madhya Pradesh, East Madhya Pradesh, Konkan and Goa, Madhya Maharashtra, Marathwada, Vidarbha, Coastal Karnataka and North Interior Karnataka.
Normal	Orissa, Bihar, Uttarakhand, Gujarat Region, Daman, Dadra and Nagar Haveli, Telangana, Rayalaseema, Tamil Nadu & Puducherry, South Interior Karnataka, Kerala and Lakshadweep.
Deficient	Andaman and Nicobar Islands, Arunachal Pradesh, Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura, Gangetic West Bengal, Himachal Pradesh, Jammu and Kashmir, Chhattisgarh and Coastal Andhra Pradesh.
Scanty	Haryana, Chandigarh & Delhi, Punjab, West Rajasthan and Saurashtra & Kutch.

Note : Excess: + 20 per cent or more; Normal: + 19 per cent to -19 per cent; Deficient: -20 per cent to -59 per cent; Scanty: -60 per cent to -99 per cent; No Rain: -100 per cent (All with respect to the Long Period Average).

Source : India Meteorological Department.

2 **1. North-West India:** Uttar Pradesh, Rajasthan, Haryana, Chandigarh and Delhi, Punjab, Uttarakhand, Himachal Pradesh, and Jammu and Kashmir. **2. Central India:** Madhya Pradesh, Chhattisgarh, Maharashtra and Gujarat. **3. South Peninsula:** Andhra Pradesh, Karnataka, Tamil Nadu & Puducherry, Kerala and Lakshadweep. **4. North-East India :** Bihar, Jharkhand, Orissa, West Bengal, Sikkim, Assam, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, and Andaman and Nicobar Islands.

Table 3: Region-wise Rainfall during the North-East Monsoon 2009 (1.10.09 to 31.12.09)

Region	Actual (in mm)	Normal (in mm)	Deviation (per cent)	Category
1	2	3	4	5
North-West India	52.9	66.7	-21	Deficient
Central India	120.3	79.9	51	Excess
South Peninsular India	294.8	268.4	10	Normal
North-East India	130.8	161.5	-19	Normal
Country as a whole	135.5	125.9	8	Normal

Note: mm: Millimeters.

Source: India Meteorological Department.

November (Chart 2). Month-wise, rainfall remained deficient in October (13 per cent below LPA) and December (35 per cent below LPA) while it was substantially excess during November (107 per cent above LPA) (Table 4).

Reservoir Status

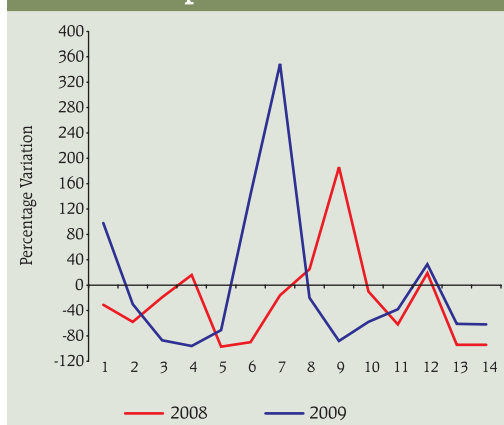
In India, the Central Water Commission monitors the total live water storage in the 81 major reservoirs having full reservoir level of 151.77 billion cubic metres (BCM) that accounts for around 67 per cent of the

Table 4: Month-wise Rainfall during North-East Monsoon 2009

Month	Absolute Rainfall (in mm)		Percentage Departure from Normal
	Actual	Normal	
1	2	3	4
October 2009	72.7	84.0	-13
November 2009	51.9	25.1	107
December 2009	10.9	16.8	-35
Overall	135.5	125.9	8

Note: mm: Millimeters.

Source: India Meteorological Department.

Chart 2: North-East monsoon 2009; Temporal Distribution

total reservoir capacity of the country. Consequent upon the good rainfall during the North East monsoon season, the reservoir levels have improved from their lows during summer 2009. As on January 28, 2010 water stock in these 81 major reservoirs was 44 per cent of the Full Reservoir Level (FRL), same level as that of previous year. This is about 107 per cent of the average of last 10 years (Table 5).

Progress of Sowing

The delayed withdrawal of South West monsoon and the resultant higher moisture retention in the soil facilitated early *Rabi*

Table 5 : Reservoir Status

Status As on	Last 10 years average	31.01.2008	28.01.2009	28.01.2010
1	2	3	4	5
Percentage to Live Capacity at FRL	42	50	44	44

Note: BCM: Billion Cubic Meters; FRL: Full Reservoir Level
Source: Central Water Commission.

sowing. This together with good progress of North East monsoon has supported the *Rabi* sowing this year (up to January 22, 2010)

that has remained close to last year's levels. Sowing is particularly high for foodgrains *viz.*, rice, wheat and pulses (Table 6).

Table 6: Progress of Area under Rabi Crops - 2009-10

Crop	Normal Area	Area Coverage (as on January 22, 2010)			
		2009	2010	Variation	
				Absolute	Percentage
1	2	3	4	5	6
Rice	4.0	1.4	1.5	0.0	2.8
Wheat	27.1	27.6	27.6	0.1	0.3
Coarse Cereals	6.3	6.7	6.3	-0.4	-5.9
<i>of which:</i>					
Barley	0.6	0.7	0.8	0.0	4.9
Jowar	4.8	4.9	4.5	-0.4	-8.5
Maize	0.9	1.0	1.0	0.0	-0.4
Total Pulses	11.9	12.9	13.6	0.7	5.8
Total Foodgrains	49.3	48.6	49.0	0.5	1.0
Total Oilseeds	9.5	9.3	8.8	-0.5	-5.1
<i>of which:</i>					
Rapeseed & mustard	6.5	6.6	6.4	-0.2	-3.2
Groundnut	0.9	0.6	0.7	0.1	14.0
Sunflower	1.3	1.1	0.8	-0.3	-24.9
All Crops	58.8	57.8	57.8	0.0	0.0

Source : Ministry of Agriculture, Government of India.

Statement I : Basic Rainfall Data (Cumulative)

Sub-Divisions	Rainfall for the period from October 1 to December 31, 2009				Rainfall for the period from October 1 to December 31, 2008.			
	Actual (mm)	Normal (mm)	% deviation from Normal		Actual (mm)	Normal (mm)	% deviation from Normal	
1	2	3	4	5	6	7	8	9
1. Andaman & Nicobar Islands	428.1	700.4	-39	D	643.6	700.4	-8	N
2. Arunachal Pradesh	140.1	243.7	-43	D	137.3	243.7	-44	D
3. Assam & Meghalaya	148.6	190.5	-22	D	133.5	190.5	-30	D
4. Nagaland, Manipur, Mizoram & Tripura	147.9	195.3	-24	D	151.6	195.3	-22	D
5. Sub-Himalayan West Bengal and Sikkim	264.6	183.1	44	E	112.0	183.1	-39	D
6. Gangetic West Bengal	95.7	159.3	-40	D	70.4	159.3	-56	D
7. Orissa	147.4	155.2	-5	N	29.9	155.2	-81	S
8. Jharkhand	127.5	100.4	27	E	16.4	100.4	-84	S
9. Bihar	76.9	78.6	-2	N	29.8	78.6	-62	S
10. East Uttar Pradesh	103.9	61.9	68	E	16.1	61.9	-74	S
11. West Uttar Pradesh	77.7	50.8	53	E	10.0	50.8	-80	S
12. Uttarakhand	97.1	86.7	12	N	38.8	86.7	-55	D
13. Haryana, Chandigarh & Delhi	3.3	27.4	-88	S	7.0	27.4	-74	S
14. Punjab	8.8	41.5	-79	S	10.4	41.5	-75	S
15. Himachal Pradesh	71.6	111.5	-36	D	54.7	111.5	-51	D
16. Jammu & Kashmir	73.8	152.6	-52	D	152.7	152.6	0	N
17. West Rajasthan	0.5	8.9	-95	S	6.6	8.9	-26	D
18. East Rajasthan	31.8	26.0	22	E	4.3	26.1	-84	S
19. West Madhya Pradesh	121.5	52.0	134	E	26.7	52.0	-49	D
20. East Madhya Pradesh	139.0	59.1	135	E	15.3	59.1	-74	S
21. Gujarat Region, Daman, Dadra & Nagar Haveli	36.0	34.7	4	N	11.9	34.7	-66	S
22. Saurashtra & Kutch	4.1	26.0	-84	S	12.8	26.0	-51	D
23. Konkan and Goa	417.9	135.4	209	E	52.8	135.4	-61	S
24. Madhya Maharashtra	222.8	105.4	111	E	61.2	105.4	-42	D
25. Marathwada	139.5	96.0	45	E	29.1	96.0	-70	S
26. Vidarbha	113.2	75.3	50	E	19.9	75.3	-74	S
27. Chhattisgarh	50.5	82.0	-38	D	11.2	82.0	-86	S
28. Coastal Andhra Pradesh	261.6	326.2	-20	D	262.1	326.2	-20	D
29. Telangana	128.2	109.6	17	N	42.9	109.6	-61	S
30. Rayalaseema	210.3	212.1	-1	N	251.9	212.1	19	N
31. Tamil Nadu & Puducherry	482.7	431.8	12	N	563.6	431.8	31	E
32. Coastal Karnataka	430.5	258.0	67	E	124.5	258.0	-52	D
33. North Interior Karnataka	286.4	136.7	109	E	100.0	136.7	-27	D
34. South Interior Karnataka	202.8	199.7	2	N	145.2	199.7	-27	D
35. Kerala	529.3	498.5	6	N	427.0	498.5	-14	N
36. Lakshadweep	388.3	328.9	18	N	450.6	328.9	37	E
E : Excess, i.e., +20% or more			13				2	
N : Normal, i.e., +19% to -19%			10				4	
D : Deficient, i.e., -20% to -59%			9				15	
S : Scanty, i.e., -60% or less			4				15	
NR : No Rain, i.e. -100%			0				0	
TOTAL			36				36	

Source : India Meteorological Department.

Statement II : Statewise Distribution of No. of Districts
with Excess, Normal, Deficient, Scanty and No Rainfall

01.10.2009 to 31.12.2009

S. No.	State/Ut	E	N	D	S	NR	ND	Total
1	2	3	4	5	6	7	8	9
1	A & N Island (UT)	0	0	2	0	0	0	2
2	Arunachal Pradesh	1	6	2	3	1	0	13
3	Assam	2	8	11	0	0	1	22
4	Meghalaya	1	1	0	0	0	1	3
5	Nagaland	0	1	3	0	0	0	4
6	Manipur	0	1	1	0	0	1	3
7	Mizoram	0	1	1	0	0	0	2
8	Tripura	1	0	2	0	0	0	3
9	Sikkim	0	0	1	0	0	0	1
10	West Bengal	5	2	10	0	0	0	17
11	Orissa	9	11	9	1	0	0	30
12	Jharkhand	4	5	3	1	0	2	15
13	Bihar	11	5	11	4	0	1	32
14	Uttar Pradesh	37	10	5	9	3	0	64
15	Uttarakhand	4	1	3	4	0	0	12
16	Haryana	0	1	0	9	9	0	19
17	Chandigarh (UT)	0	0	0	1	0	0	1
18	Delhi (UT)	0	0	1	0	0	0	1
19	Punjab	0	0	3	7	6	0	16
20	Himachal Pradesh	1	0	6	5	0	0	12
21	Jammu & Kashmir	0	0	7	3	0	1	11
22	Rajasthan	9	1	7	8	7	0	32
23	Madhya Pradesh	39	4	2	0	0	0	45
24	Chhattisgarh	4	2	3	7	0	0	16
25	Gujarat	5	3	3	11	3	0	25
26	DNH & Daman (UTs)	1	0	0	0	0	0	1
27	Diu (UT)	0	0	0	1	0	0	1
28	Goa	1	0	0	0	0	0	1
29	Maharashtra	27	5	1	0	0	0	33
30	Andhra Pradesh	3	11	8	1	0	0	23
31	Tamilnadu	9	15	6	0	0	0	30
32	Puducherry (UT)	1	0	0	0	0	0	1
33	Karnataka	19	1	6	1	0	0	27
34	Kerala	3	11	0	0	0	0	14
35	Lakshadweep (UT)	0	1	0	0	0	0	1
Total		197	107	117	76	29	7	533

E : Excess. N : Normal. D : Deficient.
S : Scanty. NR : No Rain. ND : No Data.

Source: India Meteorological Department.

