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## India Economics

### Quick Comment: Crop Sowing Progressing Well

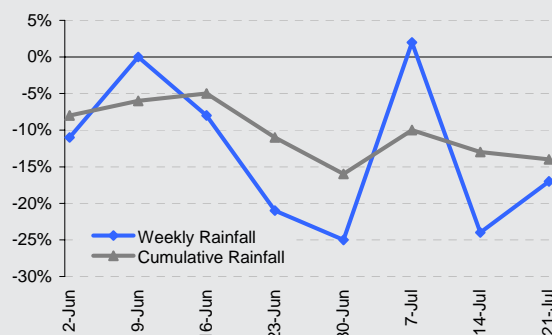
**Rainfall trend remains in deficit during the week ended July 21:** The total country-wide rainfall weighted by cropped area was 17% below normal for the week ended July 21 compared to 24% below normal for the week ended July 14. According to IMD, on an all-India area weighted basis, cumulative rainfall was 14% below normal up to July 21 compared to 13% below normal in the previous week.

**Southern and northern received above normal rains during the week ended July 21:** Weekly rainfall received in the southern and northern regions was 22% and 18% above normal during the week ended July 21 compared to 28% and 18% below normal in the eastern and western regions during the same period.

**Cropped area affected by below-normal rainfall improves:** The cropped area affected by below normal rainfall was 39.6% as of July 21. This compares with 51.4% during the previous week.

**Crop area under cultivation was up 9.1% as of July 22:** Typically, volume growth in farm output tends to track the area under cultivation. As of July 22, 2010 overall crop area under cultivation for summer (kharif) crop stood at +9.1%YoY compared with +9.4%YoY as of July 15. This compares with decline of 8.6% in crop area under cultivation last year (as of July 17, 2009). With about 60% of the crop sowing already been completed, we believe that the rainfall trend over the next two weeks will be critical to determine the outlook for agriculture growth.

**Area Weighted Rainfall: Deviation from Long Period Average**



Source: Indian Meteorological Department, Morgan Stanley Research.

For important disclosures, refer to the Disclosures Section, located at the end of this report.

## Agricultural Outlook: Three Key Measures

Exhibit 1

### Measure 1: Total Quantum of Rainfall in the Season (Variation from Normal %)

Year	Actual rainfall (% of LPA)	Deviation from Long Period Average	Monsoons**
1995	98.1	-1.9	Near Normal
1996	103.4	3.4	Near Normal
1997	102.2	2.2	Near Normal
1998	104.0	4	Above Normal
1999	95.6	-4.4	Below Normal
2000	92.2	-7.8	Below Normal
2001	92.2	-7.8	Below Normal
2002	80.8	-19.2	Drought
2003	102.3	2.3	Near Normal
2004	86.2	-13.8	Drought
2005	98.7	-1.3	Near Normal
2006	99.4	-0.6	Near Normal
2007	105.0	5.0	Above Normal
2008	98.0	-2.0	Near Normal
2009	77.0	-23.0	Drought
2010*	86.0	-14.0	

Note: \* up to July 21; Source: Indian Meteorological Department, CMIE, Morgan Stanley Research

Exhibit 2

### Measure 2: Temporal Distribution: Weekly Trend (Variation from Normal %)\*

From	To	North	West	South	East	All India
<b>Cropped Area</b>		<b>22.5</b>	<b>36.0</b>	<b>18.5</b>	<b>23.1</b>	<b>100.0</b>
26-May-10	2-Jun-10	96%	-70%	-50%	-13%	-28%
3-Jun-10	9-Jun-10	121%	-22%	-40%	1%	-14%
10-Jun-10	16-Jun-10	-56%	39%	57%	-51%	4%
17-Jun-10	23-Jun-10	-61%	-5%	0%	-22%	-13%
24-Jun-10	30-Jun-10	-34%	-40%	-4%	0%	-15%
1-Jul-10	7-Jul-10	49%	23%	24%	-33%	9%
8-Jul-10	14-Jul-10	-39%	-27%	-40%	-14%	-28%
15-Jul-10	21-Jul-10	18%	-18%	22%	-28%	-4%
<b>1-Jun-09</b>	<b>21-Jul-10</b>	<b>-4.3%</b>	<b>-9.3%</b>	<b>-0.2%</b>	<b>-18%</b>	<b>-9%</b>

\*unweighted basis; Source: Indian Meteorological Department, CMIE, Morgan Stanley Research

Exhibit 3

### Measure 3 (a): Spatial Distribution Yearly Comparison – Rainfall Deviation from Normal Average\*

Major States	Region	Share of Kharif Output (%)	Net Irrigated Area (% of net sown area)@	Rainfall % Deviation* from Normal	Rainfall 2010*	Rainfall 2009	Rainfall 2008
Uttar Pradesh	North	15.9	79.7%	-26%	D	D	N
Punjab	North	10.5	98.2%	14%	N	D	N
Haryana, Chandigarh & Delhi	North	3.1	89.9%	0%	N	D	N
West Bengal	East	9.0	59.2%	23%	N	N	N
Bihar	East	8.0	61.1%	-19%	D	D	N
Orissa	East	4.4	38.4%	-31%	D	N	N
Madhya Pradesh	West	8.8	43.7%	-29%	D	D	N
Maharashtra	West	7.9	18.2%	2%	N	N	N
Rajasthan	West	2.8	37.7%	-23%	D	D	N
Gujarat	West	2.8	36.2%	-23%	D	N	N
Andhra Pradesh	South	8.6	43.2%	41%	N	D	N
Karnataka	South	6.6	30.1%	-13%	N	N	N
Tamil Nadu & Pondicherry	South	6.4	56.6%#	79%	N	N	N
Cropped area with deficient rainfall (%)					39.6	63.8	17.1
Summer (Kharif)** Food Grain Output (YoY%)						-12.1%	-2.3%

^ as of July 21 @ as of F2008, # only Tamil Nadu, \* average of Haryana and Delhi

1 N = Normal Rainfall, D= Deficient Rainfall \*\* This rain dependent crop accounts for approximately 52% of the total crop output  
Source: Indian Meteorological Department, CMIE, Morgan Stanley Research

Exhibit 4

### Measure 3 (b): Spatial Distribution Regional Trend: Crop Area Affected (%)

As on	North	West	South	East	All India
<b>Cropped Area</b>	<b>22.5</b>	<b>36.0</b>	<b>18.5</b>	<b>23.1</b>	<b>100.0</b>
<b>Cropped Area Affected By Poor Rainfall as on</b>					
Up to 9th June	13.7	19.6	10.6	19.4	63.3
Up to 16th June	14.2	16.0	2.8	19.4	52.4
Up to 23rd June	17.4	16.2	0.2	21.3	55.1
Up to 30th June	17.4	16.2	2.6	16.1	52.3
Up to 7th July	13.7	11.4	0.0	21.3	46.4
Up to 14th July	13.7	16.2	0.2	21.3	51.4
Up to 21st July	7.0	16.2	0.0	16.4	39.6

Source: Indian Meteorological Department, Ministry of Agriculture, CMIE, Morgan Stanley Research

Exhibit 5

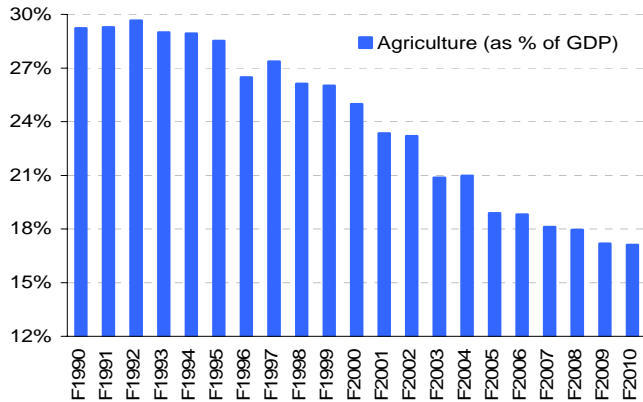
### Crop Area under Cultivation (As on July 22, 2010)

Mn Hectares	Area Typically Covered In Full Season	2009YTD	2010YTD	YoY%
Rice	39.5	15.8	17.0	7.6%
Coarse Cereals	22.2	13.2	14.1	6.8%
Pulses	10.8	5.1	5.7	13.2%
<b>Sub Total: Food Grains</b>	<b>72.5</b>	<b>34.1</b>	<b>36.8</b>	<b>8.1%</b>
Oilseeds	17.6	12.4	12.9	4.5%
Sugarcane	4.5	4.2	4.7	13.4%
Cotton	9.1	8.1	9.5	17.9%
<b>Grand Total</b>	<b>103.7</b>	<b>58.7</b>	<b>64.0</b>	<b>9.1%</b>

Source: Ministry of Agriculture, Press Information Bureau, Morgan Stanley Research

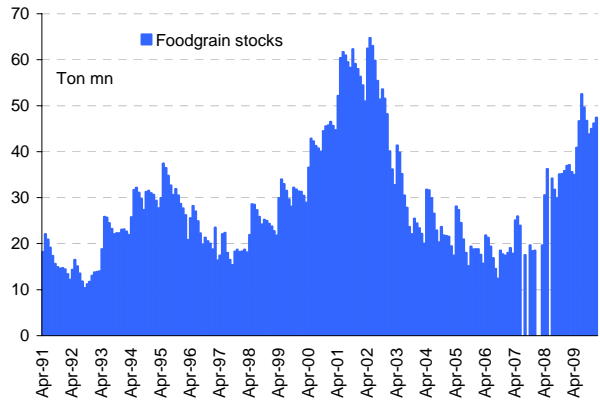
## India – Agriculture Sector: Basic Facts

Exhibit 6  
Share of Agriculture in India's GDP



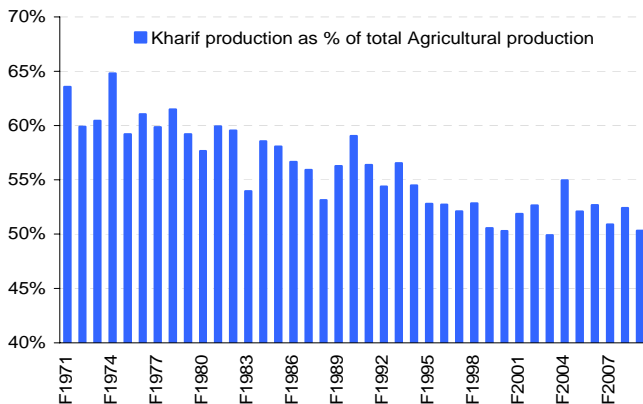
Source: CEIC, Morgan Stanley Research

Exhibit 7  
Food Grain Stock



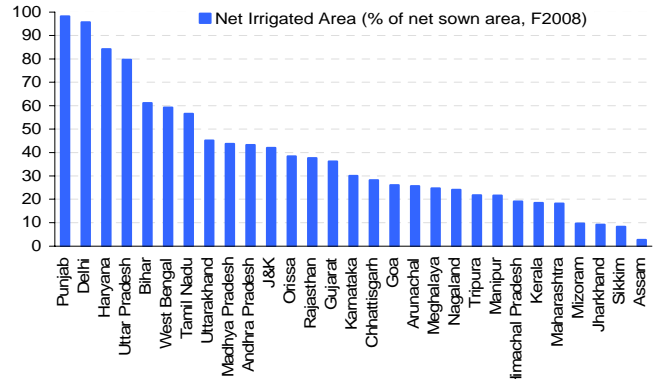
Source: CMIE, Economic Survey, Morgan Stanley Research

Exhibit 8  
Share of Kharif Production in Total



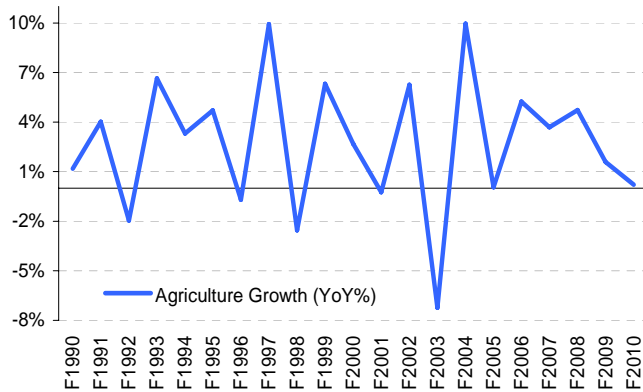
Source: CEIC, Morgan Stanley Research

Exhibit 9  
State-wise - Net Irrigated Area as % of Sown Area



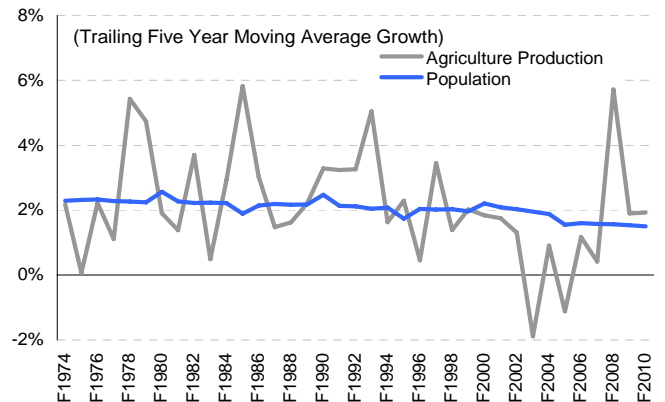
Source: CMIE, Morgan Stanley Research

Exhibit 10  
Agriculture Growth Trend (YoY %)



Source: CEIC, Morgan Stanley Research

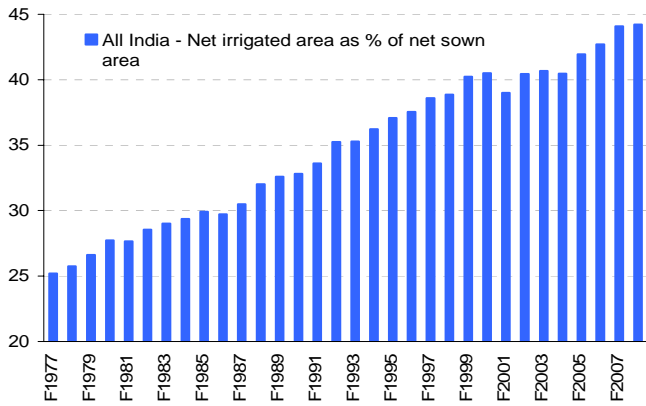
Exhibit 11  
Agriculture Production Growth and Population



Source: CEIC, Morgan Stanley Research

Exhibit 12

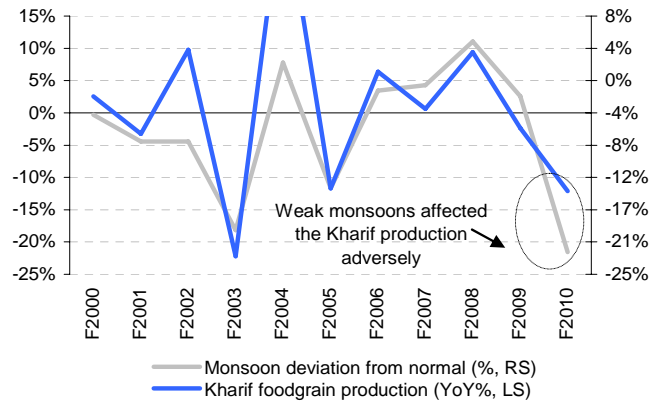
## All India - Net Irrigated Area as % of Sown Area



Source: CMIE, Morgan Stanley Research

Exhibit 13

## Summer Crop (Kharif) Production Growth and Monsoon Rainfall



\* Fourth Advance estimates of Kharif production in F2010 released by Ministry of Agriculture; Source: CMIE, CEIC, Morgan Stanley Research

## Appendix: How to Read Monsoon Data

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We use three measures to assess the success or failure of monsoons. These are:

**(1) Total quantum of rainfall.** This measure gives the rains received as a proportion of the Long Period Average (LPA). According to the IMD, if the total quantum of rainfall is less than 90% of the LPA, it is a drought; 90-96% of the LPA is below-normal rainfall; 96-104% of the LPA qualifies as near-normal rains; 104-110% of the LPA is above normal; and more than 110% of the LPA implies excess rain.

**(2) Temporal distribution.** This measures the distribution of rainfall over the entire season. This indicates whether the rains were normal all through the four-month season. For instance, it is possible for the total quantum of rainfall to be normal, but the distribution of rainfall to have been such that the first eight

weeks' above-normal rainfall compensated for the last eight weeks' below-normal rainfall. Such a trend would affect the crop output; hence, it is important to check the spread of rainfall over each month of the season.

**(3) Spatial distribution.** We have observed that, at times, while the total quantum of rainfall is normal or above normal, the geographical spread of rainfall is not consistent. We measure this trend by monitoring rainfall over all the major crop area clusters. For assessing the overall trend, we calculate the proportion of cropped area affected out of the total cropped area taken up for cultivation. For this purpose, the affected area would mean the area that receives below-normal rainfall. This is by far the most important measure of the impact of rains on agricultural output.

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