

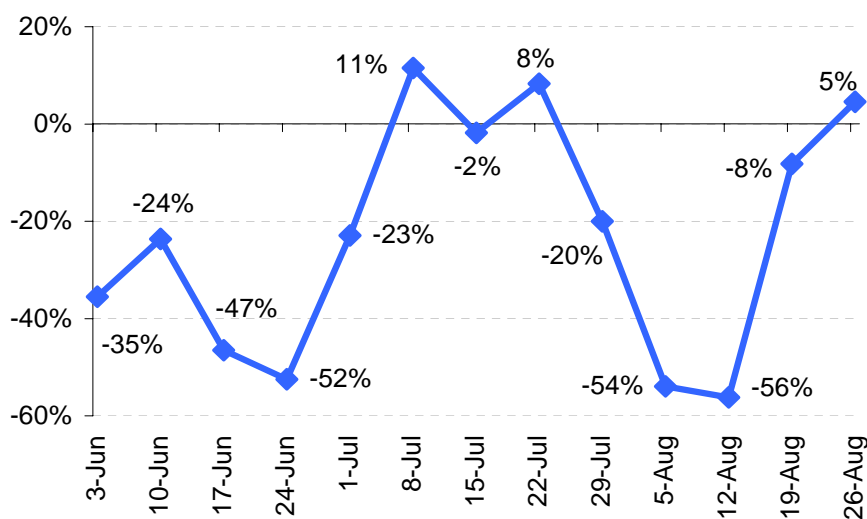
August 28, 2009

Research  
India

## India Monsoon Update

### Weekly Rainfall Trend Improves Further

Rainfall: Weekly Deviation from Long Period Average\*



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

MORGAN STANLEY RESEARCH

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India Monsoon Update

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

## Summary

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### *Weekly Rainfall Trend Improves Further*

- **Weekly rainfall was 5% above normal for the week ended August 26:** On an unweighted basis, aggregate country-wide rainfall was 5% above normal for the week ended August 26, compared to 8% below normal in the previous week. Total country-wide rainfall weighted by cropped area was 5% below normal for the week ended August 26 compared to 2% below normal for the week ended August 19. According to IMD, on an all India area weighted basis, cumulative rainfall was 25% below normal up to August 26, compared to 26% below normal during the previous week.
- **Southern region received more rains this week:** On an unweighted basis, rainfall for the week ended August 26 was above normal in the southern (55%) and eastern (14%) regions, but below normal in the northern (-77%) and western (-7%) regions. On a cumulative basis, the rain-fed states of Andhra Pradesh, Madhya Pradesh, and Bihar remain affected by below-normal rainfall. In addition, the northern states of Uttar Pradesh, Haryana, and Punjab remain the most affected, however we believe the well-developed irrigation facilities in these states could provide some buffer. So far, 252 districts have been declared drought prone (out of a total of 626 districts in the country).
- **Cropped area affected by below-normal rainfall improves marginally:** Based on cumulative rainfall up to August 26, the cropped area affected by below-normal rainfall (most important measure for assessing risk to crops) improved slightly to 72.8%. This compares with 75.9% up to August 19.
- **Water reservoir level in dams less than last year:** According to Central Water Commission data, the water storage at 81 key reservoirs across the country was 59.1 billion cubic metres for the week ended August 20, which is 39% of the live capacity at full reservoir level. This is lower than the storage level of 58% during the same period last year and 52% average for the last 10 years.
- **Crop area under cultivation for kharif crops declined further:** As of August 20, crop area under cultivation for summer (kharif) crop (accounting for about 52% of total crop output) declined 8.1% YoY. This compares with declines of 6.4% and 4.2% registered during the weeks ending August 12 and August 6, respectively.

## Summary

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### *Weekly Rainfall Trend Improves Further*

- **Government responding with drought-relief measures:** Drought-relief measures are being announced to lessen the damage inflicted on standing kharif crop and the coming rabi crop. These includes provisions for increased subsidized power to farms and subsidized diesel for pumps to ensure more water supply for irrigation, rescheduling of crop loans and their conversion to medium-term loans, ensuring strategic use of quality seeds, fertilizers, pest management, and availability of credit to the farmers in the coming rabi season, use of loans from NABARD to dig shallow tube wells in the potential areas on an urgent basis, etc. A few states are seeking central assistance to tackle drought in their respective districts. In addition, the government also recently increased the Minimum Support Prices (MSPs) for rice and pulses to provide relief to farmers.
- **Rains in the month of September crucial for rabi crop:** The month of September generally accounts for about 19.5% of total rainfall. With the cumulative rainfall trend disappointing so far in the season, it will be crucial to monitor the rains during the month of September as any deficiency in rainfall will result in lower moisture content in the soil and could adversely affect the productivity of rabi crops. In addition, good rainfall in September will also be important to improve water levels in the reservoirs.
- **Bottom line:** Although the rainfall trend has improved over the last two weeks, cumulative rainfall during the season so far has been much worse than expected. Depending on how the rest of the monsoon season pans out, we believe our agriculture growth will be likely between -2% and -4% and GDP growth will be between 5.8% and 5.2%. Our current forecast is 1.5% for agriculture growth and 6.4% for GDP growth. We believe the drought's impact on non-agriculture GDP will be limited. Our current non-agriculture GDP growth estimate is 7.4%.

## 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.

## Agricultural Outlook: Three Key Measures Measures 1 & 2 - Total Quantum of Rainfall and Temporal Distribution

**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
<b>2009*</b>	<b>75.0</b>	<b>-25.0</b>	<b>Drought</b>

Note: \*Cumulative upto August 26; \*\*We have classified Monsoons based on the latest definition by IMD.

**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>
27-May-09	3-Jun-09	15%	-83%	-33%	-35%	-35%
4-Jun-09	10-Jun-09	-45%	-48%	5%	-45%	-24%
11-Jun-09	17-Jun-09	-52%	-85%	-23%	-49%	-47%
18-Jun-09	24-Jun-09	-96%	-65%	-19%	-69%	-52%
25-Jun-09	1-Jul-09	-28%	-37%	-24%	-8%	-23%
2-Jul-09	8-Jul-09	-75%	11%	57%	1%	11%
9-Jul-09	15-Jul-09	-38%	37%	2%	-20%	-2%
16-Jul-09	22-Jul-09	-34%	51%	24%	-22%	8%
23-Jul-09	29-Jul-09	-13%	0%	-54%	-10%	-20%
30-Jul-09	5-Aug-09	-70%	-95%	-32%	-26%	-54%
6-Aug-09	12-Aug-09	-59%	-81%	-67%	-21%	-56%
13-Aug-09	19-Aug-09	12%	-56%	-29%	40%	-8%
20-Aug-09	26-Aug-09	-77%	-7%	55%	14%	5%
<b>1-Jun-09</b>	<b>26-Aug-09</b>	<b>-44%</b>	<b>-25%</b>	<b>-9%</b>	<b>-21%</b>	<b>-22%</b>

\*unweighted basis

Rainfall has been above normal in only 3 weeks out of the last 13 weeks.

## Agricultural Outlook: Three Key Measures Measure 3 - Spatial Distribution

Measure 3 (a): Spatial Distribution Yearly Comparison – Rainfall Deviation from Normal Average<sup>1</sup>

Major States	Region	Share of Kharif Output (%)	Net Irrigated Area (% of net sown area) <sup>@</sup>	Rainfall % Deviation <sup>^</sup> from Normal	Rainfall 2009	Rainfall 2008
Uttar Pradesh	North	15.9	79%	-47%	D	N
Punjab	North	10.5	95%	-40%	D	N
Haryana, Chandigarh & Delhi	North	3.1	86%*	-64%	D	N
West Bengal	East	9.0	59%	-13%	N	N
Bihar	East	8.0	54%	-25%	D	N
Orissa	East	4.4	32%	9%	N	N
Madhya Pradesh	West	8.8	38%	-35%	D	N
Maharashtra	West	7.9	19%	-22%	D	N
Rajasthan	West	2.8	37%	-35%	D	N
Gujarat	West	2.8	34%	-16%	N	N
Andhra Pradesh	South	8.6	41%	-36%	D	N
Karnataka	South	6.6	28%	-4%	N	N
Tamil Nadu & Pondicherry	South	6.4	56%#	-1%	N	N
<b>Cropped area with deficient rainfall (%)</b>					<b>72.8</b>	<b>17.1</b>
<b>Summer (Kharif)** Food Grain Output (YoY%)</b>						<b>-0.4%</b>

<sup>^</sup> as of August 26 <sup>@</sup> as of F2006, <sup>#</sup> only Tamil Nadu, <sup>\*</sup> average of Haryana and Delhi

<sup>1</sup> N = Normal Rainfall, D= Deficient Rainfall <sup>\*\*</sup> This rain dependent crop accounts for approximately 52% of the total crop output

Areas that have high irrigation facilities should see less damage from poor rainfall. A point to note here is that that the states that have a high proportion of irrigated land tend to have larger share in countrywide summer crop output.

## Agricultural Outlook: Three Key Measures

### Measure 3 - Spatial Distribution and Crop Area Under Cultivation

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>					
Upto 10th June	21.9	36.0	8.0	17.4	83.3
Upto 17th June	21.9	30.7	7.1	23.1	82.8
Upto 24th June	21.9	30.7	7.1	23.1	82.8
Upto 1st July	21.9	36.0	9.7	23.1	90.7
Upto 8th July	21.9	36.0	5.3	21.8	85.0
Upto 15th July	22.5	19.4	6.8	12.9	61.6
Upto 22nd July	22.5	6.6	6.8	12.9	48.8
Upto 29th July	21.9	7.2	10.6	12.9	52.6
Upto 5th August	22.5	27.9	6.8	17.9	75.1
Upto 12th August	22.5	27.9	14.1	17.9	82.4
Upto 19th August	19.3	33.1	6.8	90.7	75.9
Upto 26th August	22.5	28.4	5.3	16.6	72.8

Crop Area under Cultivation (As on August 20, 2009)

Mn Hectares	Area Typically Covered In Full			YoY%
	Season	2008YTD	2009YTD	
Rice	39.1	34.1	27.3	-20.1%
Coarse cereals	22.9	18.3	17.7	-2.8%
Pulses	11.2	8.3	8.9	7.4%
<b>Sub Total: Food Grains</b>	<b>73.1</b>	<b>60.7</b>	<b>53.9</b>	<b>-11.2%</b>
Oilseeds	15.9	16.8	15.4	-8.4%
Sugarcane	3.9	4.4	4.3	-2.9%
Cotton	8.4	8.5	9.5	12.3%
<b>Grand Total</b>	<b>101.3</b>	<b>90.3</b>	<b>83.0</b>	<b>-8.1%</b>

About 72.8% of the total cropped area has received below-normal rainfall. This will imply that the crop yield (output per acre) will be adversely affected.

Cropped area taken up for cultivation tends to be a good indicator of potential volume growth in agriculture production. Farmers so far have responded better than expected.

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

## Agricultural Outlook: Water Storage at 81 Key Reservoirs

A high level of water reservoir levels will be important for areas that are irrigated. Typically, by the end of the monsoon season in September, the water reservoir levels reach about 75-90% of storage capacity. If the reservoir levels are very low, there could be adverse impact on winter (rabi) crop. As of August 20, the water reservoir levels were at 39% of capacity compared with the average of 52% in the last years.

### Water Reservoir Levels

		F2003	F2004	F2005	F2006	F2007	F2008	F2009	F2010 (as of August 20, 2009)
<b>Number of Reservoirs</b>		70	71	71	76	76	81	81	81
<b>Total Designed live storage</b>	In BCM	130.6	131.3	131.2	133.0	133.0	151.8	151.8	151.8
<b>On June, 1 (start of water year)</b>	In BCM	15.7	14.3	16.7	17.0	29.3	31.1	29.5	
	In % of storage at FRL	12%	11%	13%	13%	22%	21%	19%	
<b>On Sept, 30 (End of Monsoon Period)</b>	In BCM	66.4	78.8	85.1	109.8	120.7	124.2	114.3	59.1
	In % of storage at FRL	51%	60%	65%	83%	91%	82%	75%	39%
<b>Monsoon Rainfall (Variation from Normal )</b>	%	-20.6	2.1	-12.6	-1.2	-0.6	5.0	-2.0	-26.0

Source: Central Water Commission , Economic Survey, Morgan Stanley Research



**Framework for Assessing Impact on Agriculture  
Output, Rural Consumption and GDP Growth**

What Is at Stake? Agriculture Output...

Share of Agriculture in GDP

Share in GDP (%)	
	F2009
<b>Agriculture and allied activities</b>	<b>18.9%</b>
-Agriculture, Forestry and Fishing	17.0%
---Agriculture	15.5%
---Forestry & Logging	0.7%
---Fishing	0.8%
-Mining & Quarrying	1.9%
<b>Industry</b>	<b>23.8%</b>
<b>Services</b>	<b>57.3%</b>

Share of Kharif (Summer crop) is about 8%

Highly rain dependent

Share of Rabi (Winter crop) is about 7.5%

If the rainfall is significantly below normal, then even the winter (rabi) crop will be affected. However, even in the worst case, damage to the winter (rabi) crop will be less than that to summer (kharif) crop as the winter crop is less rain dependent

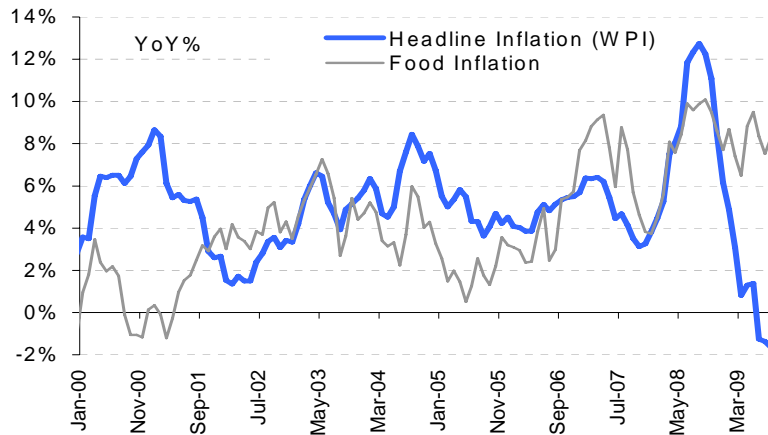
Agriculture – Basic Facts

Indicator	Year	Value
Agriculture, Forestry and Fishing (as % of GDP)	F2009	17.0%
Net irrigated Area as % of Net Sown Area	F2006	42.4%
Share of Rural Population (as % of total)	2008E	70.5%
Share of Kharif Production in Total Agriculture Production	F2009	51.7%
Fertilizer Consumption (Kg/hectares)	F2006	105.5

Source: CEIC, Economic Survey, Morgan Stanley Research

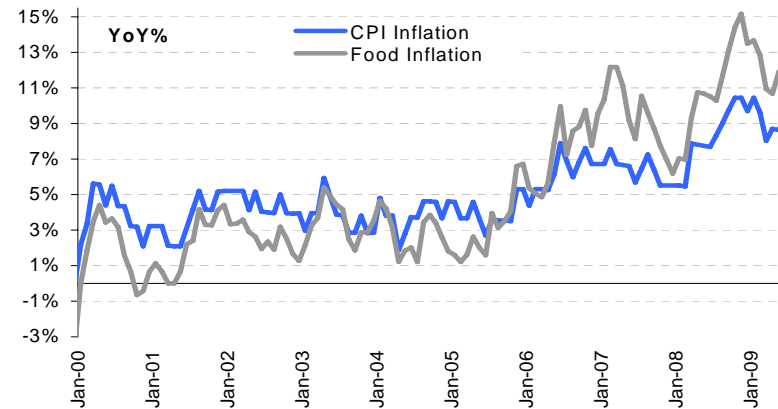
## What Is at Stake?...Inflation Outlook

Headline and Food Inflation (WPI), YoY%



Source: CEIC, RBI, Morgan Stanley Research

Headline and Food Inflation (CPI), YoY%



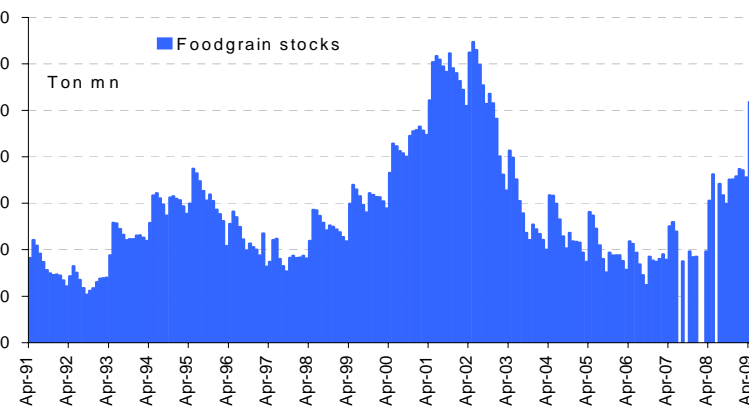
Source: CEIC, Morgan Stanley Research

Food Weight in WPI and CPI

**In WPI, food has a weight of 30.9%, while in CPI food has a weight of 46.2%.** While food inflation risks are high, the government is likely to mitigate the pressure to some extent by using grain reserve stocks and resorting to imports for items such as pulses and sugar.

Source: CEIC, Morgan Stanley Research

Food Grain Stock



## What Is at Stake?...Rural Private Consumption

Three key segments affected by potential weak rural demand?

1. Cars
2. Two wheelers
3. FMCG

### Car Industry: Sales Growth by Quarter and Geography

Cities	Share	Q1	Q2	Q3	Q4	FY09	Q1F10
Top 10	46%	7%	-7%	-23%	-9%	-8%	-10%
Top 11-20	13%	8%	0%	-12%	8%	1%	12%
Top 21-40	13%	14%	-4%	-11%	10%	2%	9%
Top 41-100	17%	17%	12%	2%	23%	13%	20%
All other cities	12%	31%	22%	11%	34%	25%	38%
<b>All India</b>	<b>100%</b>	<b>12%</b>	<b>-1%</b>	<b>-13%</b>	<b>4%</b>	<b>0%</b>	<b>5%</b>

About 10-15% of the car demand comes from rural economy

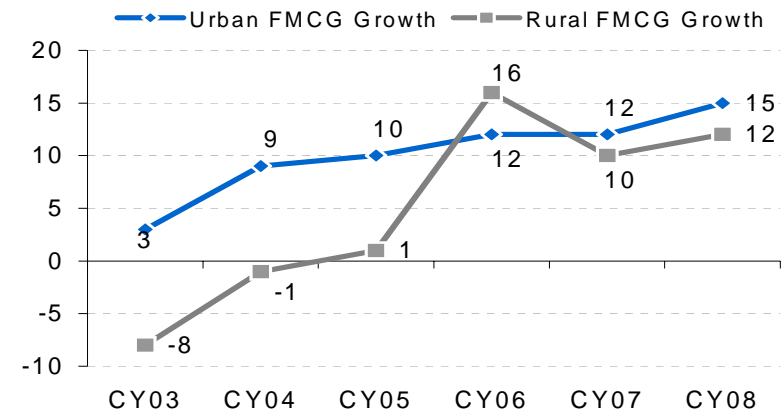
Source: SIAM data on A and C segment auto industry growth, Morgan Stanley Research

### Share of Rural Sales in Company's Total Auto Sales

Company	Share of Rural Sales in Total Auto Sales
Hero Honda Motor	50-55%
TVS Motors	50%
Maruti Suzuli India	9%

Source: Morgan Stanley Research

### Rural India Contributes One-third of the Overall Demand in FMCG (Consumer Staples) Sector



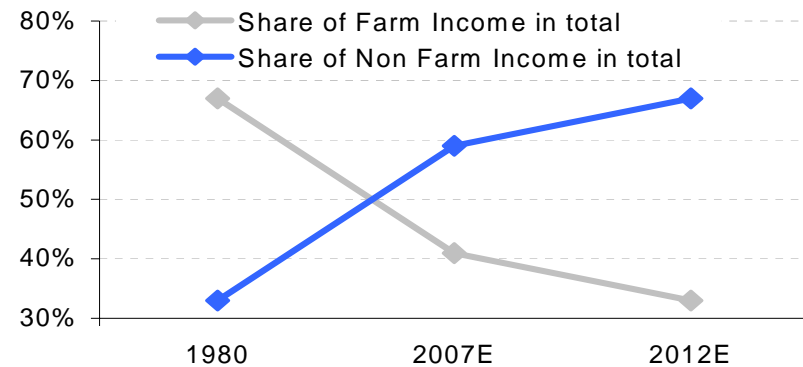
Source: Company data, Morgan Stanley Research

## This Time Downside to Non-agriculture Growth Will Be Limited

### Four Reasons Why

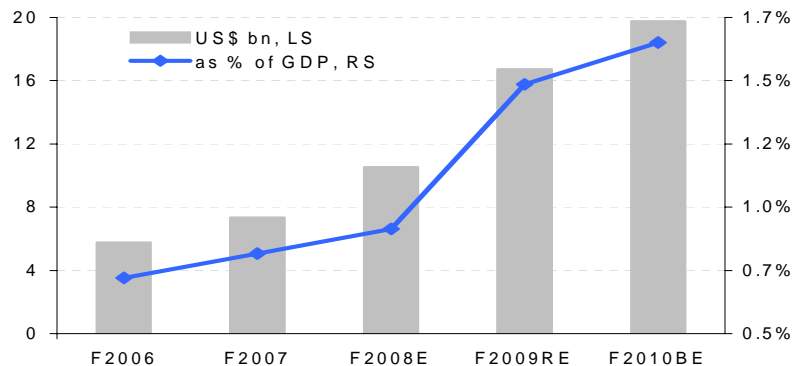
- 1) **Rural spending is now less dependent on farm income:** Share of farm income in total rural income is now lower than 50%.
- 2) **Government has increased rural spending:** Government's rural spending will be US\$18 billion (1.6% of GDP) in financial year ending Mar-10 compared with US\$7 billion in year ending Mar-08.
- 3) **Higher prices for farm output:** Government has significantly increased the price that farmers earn on farm produce sold to the government.
- 4) **Other mitigating measures:** Government will be initiating mitigating factors such as increased subsidized power to farms and subsidized diesel for pumps to ensure more water supply, and relaxation on loan repayment and interest burden.

### Non-Farm Incomes More Important Than Farm Incomes



<sup>1</sup> <http://www.livemint.com/2008/12/03224721/Spotlight-on-rural-consumers.html>;  
Source: NCAER

### Government's Rural Spending Has Increased Sharply



Source: Budget Documents, Morgan Stanley Research

### Increase in Minimum Support Prices (MSP) Has Contributed to Rural income growth

	Rs/Quintal						
	Paddy Common	Coarse Cereals	Wheat	Gram	Arhar	Moong	Urad
F1990	185	165	215	421	425	425	425
F2000	490	415	580	1015	1105	1105	1105
F2003	530	485	620	1220	1320	1330	1330
F2005	560	515	640	1425	1390	1410	1410
F2008	645	600	1000	1600	1550	1700	1700
F2009	850	840	1080	1730	2000	2520	2520
F2010	950	840	1080	1730	2300	2760	2520

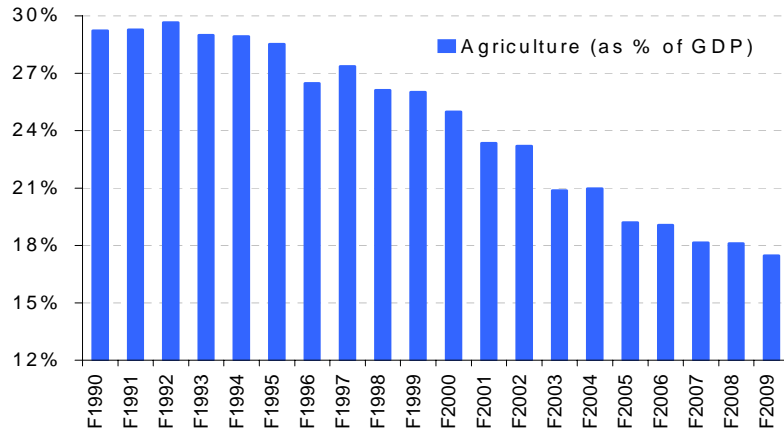
The government recently increased the MSPs of paddy, arhar, moong for F2010.

Source: CEIC, Ministry of Agriculture, Morgan Stanley Research

**Appendix**

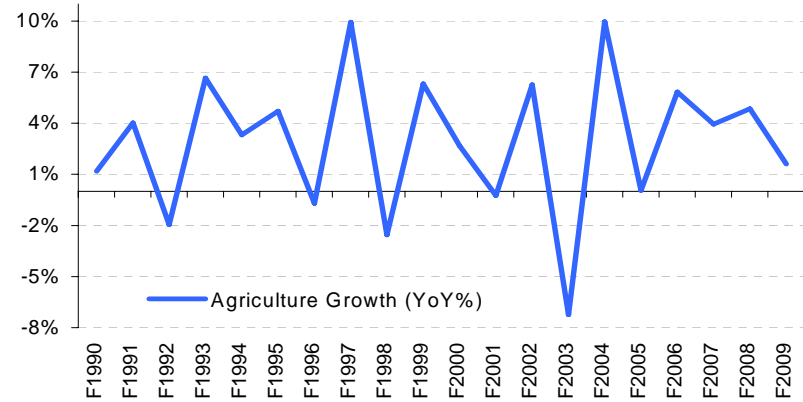
## Agriculture Sector – Declining Share in GDP But Still High Compared to Other AXJ Countries

Share of Agriculture in India's GDP



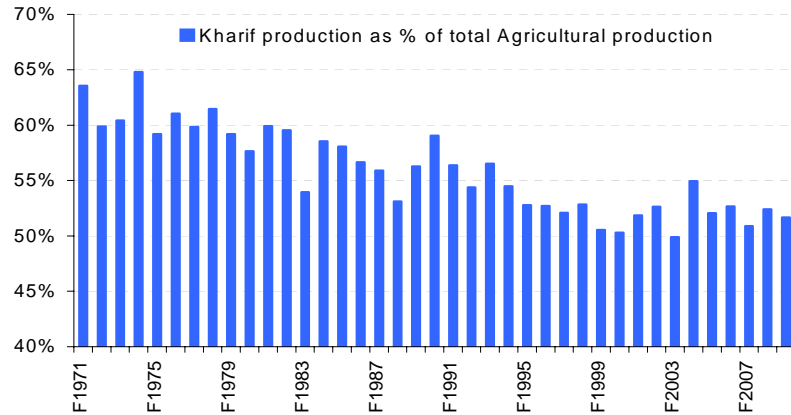
Source: CEIC, Morgan Stanley Research

Agriculture Growth Trend (YoY%)



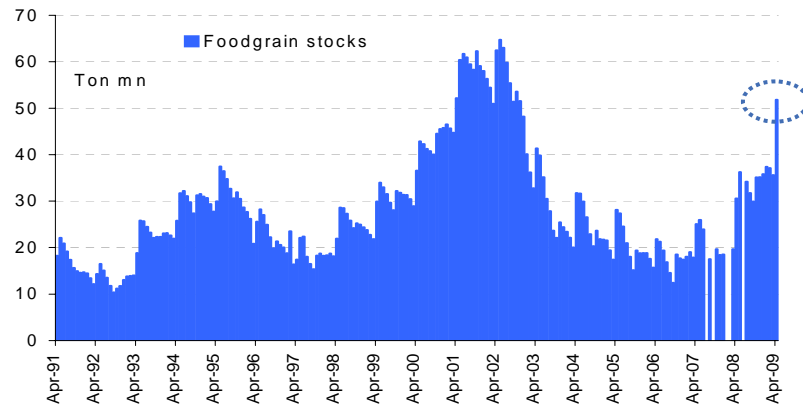
Source: CEIC, Morgan Stanley Research

Share of Kharif Production in Total



Source: CEIC, Morgan Stanley Research

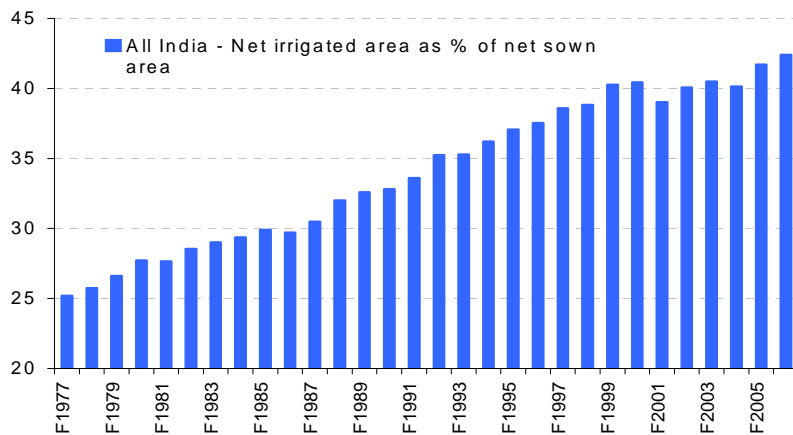
Food Grain Stock



Source: CEIC, Morgan Stanley Research

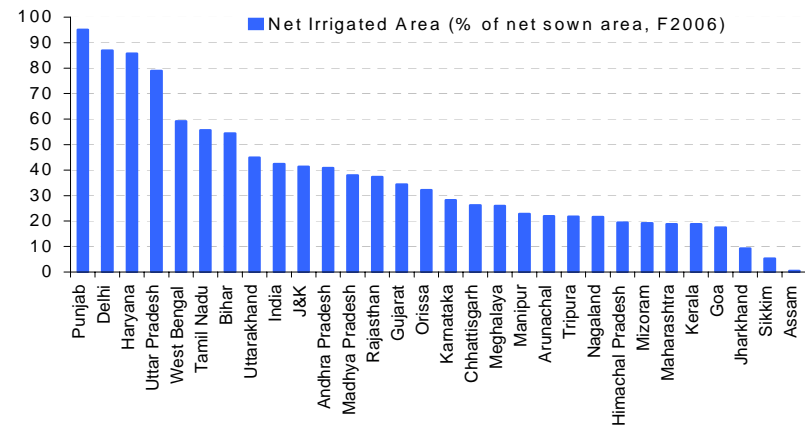
## Agriculture Outlook – Still Dependent on Rainfall

All India - Net Irrigated Area as % of Sown Area



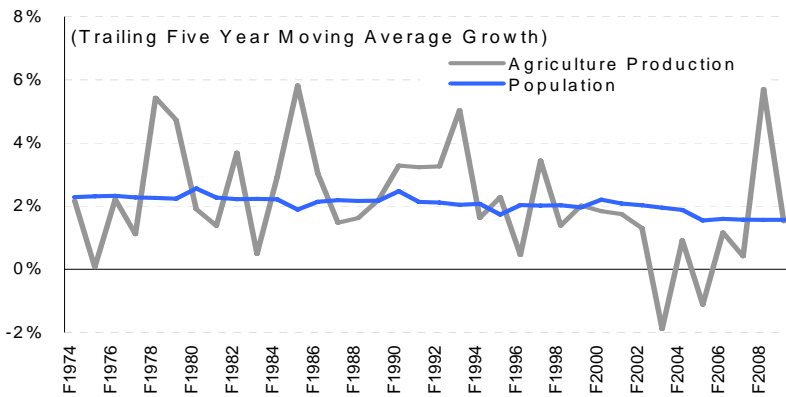
Source: CMIE, Morgan Stanley Research

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



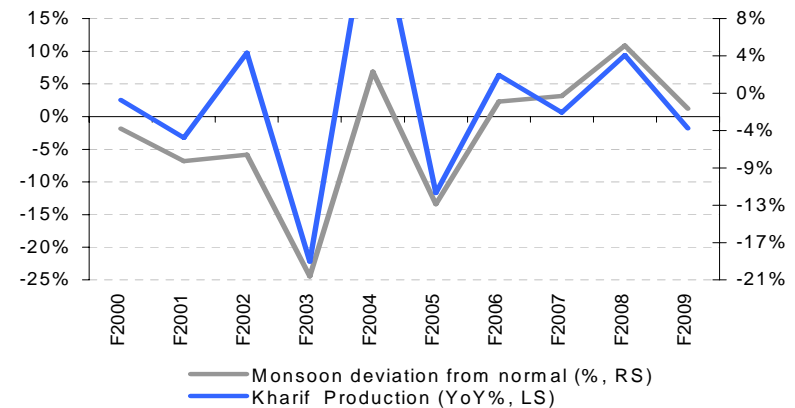
Source: CMIE, Morgan Stanley Research

Agriculture Production Growth and Population



Source: CEIC, Morgan Stanley Research

Summer Crop (Kharif) Production Growth and Monsoon Rainfall



Source: CEIC, CMIE, Morgan Stanley Research



## Trend in Rainfall Deviation, Agriculture Production and Agriculture Growth

	Rainfall in % Departure	Total Agriculture Production (YoY%)	Agriculture Growth (YoY%)
F1968	0.1	28.0%	14.9%
F1969	-10.3	-1.1%	-0.2%
F1970	0.2	5.8%	6.4%
F1971	12.2	8.9%	7.1%
F1972	4	-3.0%	-1.9%
F1973	-23.9	-7.7%	-5.0%
F1974	7.5	7.9%	7.2%
F1975	-12	-4.6%	-1.5%
F1976	15.2	21.2%	12.9%
F1977	2.5	-8.1%	-5.8%
F1978	4	13.7%	10.0%
F1979	9.2	4.3%	2.3%
F1980	-19	-16.8%	-12.8%
F1981	3.9	18.1%	12.9%
F1982	-0.2	2.9%	4.6%
F1983	-14.5	-2.8%	-0.3%
F1984	13	17.6%	10.1%
F1985	-4.4	-4.5%	1.6%
F1986	-7.1	3.4%	0.3%
F1987	-12.7	-4.7%	-0.4%
F1988	-19.4	-2.1%	-1.6%

	Rainfall in % Departure	Total Agriculture Production (YoY%)	Agriculture Growth (YoY%)
F1989	19.3	21.1%	15.6%
F1990	0.9	0.7%	1.2%
F1991	6.2	3.1%	4.0%
F1992	-9.3	-4.5%	-2.0%
F1993	-6.7	6.6%	6.7%
F1994	-0.9	2.7%	3.3%
F1995	12.5	3.9%	4.7%
F1996	-1.9	-5.8%	-0.7%
F1997	3.4	10.5%	9.9%
F1998	2.2	-3.2%	-2.6%
F1999	4	5.4%	6.3%
F2000	-4.4	3.0%	2.7%
F2001	-7.8	-6.2%	-0.2%
F2002	-7.8	8.1%	6.3%
F2003	-19.2	-17.9%	-7.2%
F2004	2.3	22.0%	10.0%
F2005	-13.8	-7.0%	0.0%
F2006	-1.3	5.2%	5.8%
F2007	-0.6	4.2%	4.0%
F2008	5.0	6.2%	4.9%
F2009	-2.0	1.3%	1.6%
F2010*	-25.0	NA	NA

Note: \*Cumulative rainfall upto August 26, 2009. Source: IMD, CEIC, CMIE, Morgan Stanley Research

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