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# India

# Grain and Feed Annual

# 2017

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**Report Highlights:**
India is heading for a near-record wheat harvest with marketing year (MY) 2017/18 wheat production forecast at 95 million metric tons (MMT) on record area (31.8 million hectares). Assuming continued current price parity for imported wheat and import policy, MY 2017/18 imports are forecast at 5 MMT to sustain the consumption demand and enable government to augment the depleting wheat stocks. Assuming normal 2017 monsoon and overall weather conditions, MY 2017/18 (October/September) rice production is forecast slightly lower at 106 MMT from 44.5 million hectares, and exports at 8.5 MMT. MY 2017/18 coarse grain production is forecast lower at 41.2 MMT with corn production at 24 MMT.

**Commodities:**
Wheat

**Production:**

After two years of slowdown in production, India is heading for a near-record wheat harvest this summer on record planting and relatively favorable growing conditions in major growing areas. Assuming normal weather conditions through harvest (April), Post forecasts marketing year (MY) 2017/18 wheat production at 95 million metric tons (MMT) from a record 31.8 million hectares, marginally lower than the record harvest of 95.9 MMT in MY 2014/15. Although the Ministry of Agriculture's (MoA's) 2nd Advance estimate pegged 2017 wheat production at a record 96.6 MMT, trade sources estimate production between 90 to 95 MMT. Post estimates MY 2017/18 durum wheat production at 1.0 MMT, same as last year on reported lower planting but higher yields.

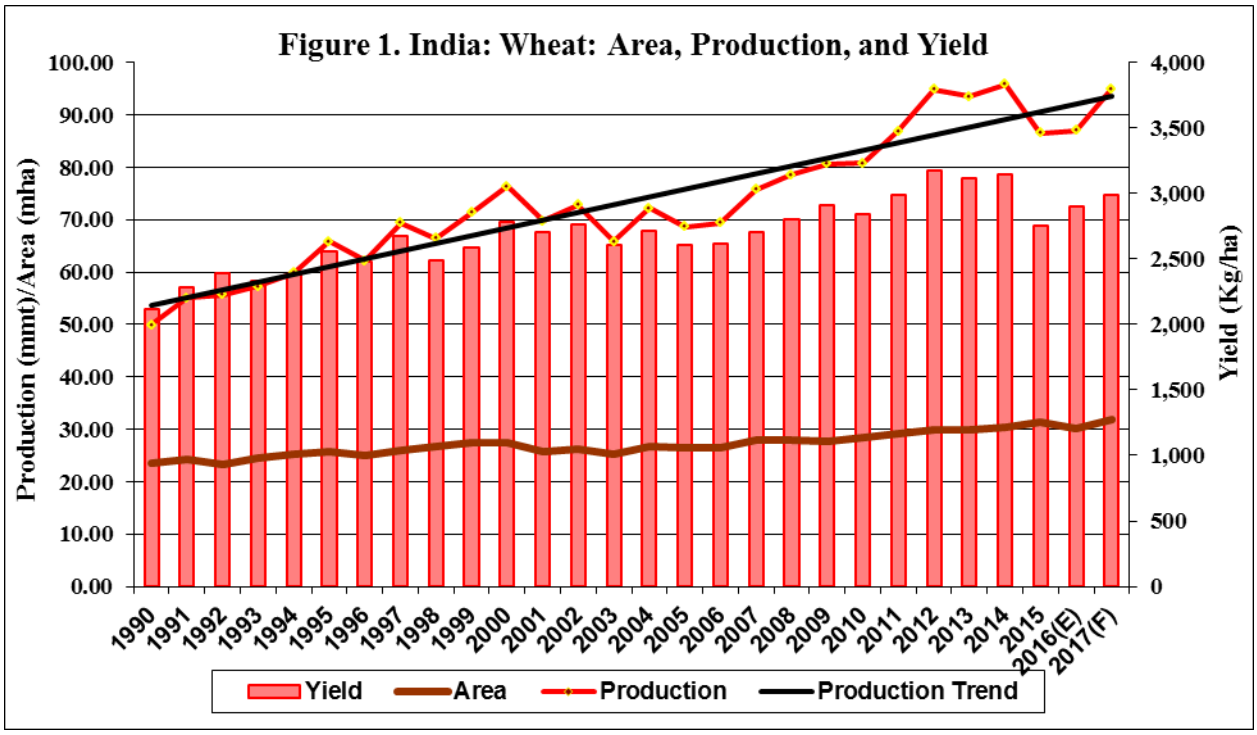
Favorable planting conditions due to a normal 2016 monsoon and strong domestic prices bolstered wheat planting to record levels in most growing states as reported by the MoA's latest crop condition report. Since December, the overall growing conditions were better than last year, with low temperature and scattered rains during January providing favorable conditions for crop growth and tillering. There have been no reports of any pest or disease outbreaks in major growing areas. However, temperatures were slightly above normal during most of the period, and are gradually rising since the 2nd week of February indicating early onset of spring. Agriculture experts report that while the overall growing conditions have been favorable compared to last year, the conditions are less than optimal compared to the record harvest year MY 2014/15, when an extended winter (relatively cool temperature with sufficient well spread rains through March) supported record yield realization. Consequently, Post estimates MY 2017/18 production at 95 MMT from 31.8 million hectare and about 3.0 MT/hectare yield. Any 'abnormal' increase in temperature during March/April (grain filling and maturity stage) and/or untimely rains during harvest can lower the production for the forecast level.

Post continues to estimate MY 2016/17 wheat production unchanged at 87 MMT from 30.4 million hectares as the government's final estimate of 93.2 MMT is not consistent with the domestic market fundamentals of tight supplies and strong prices. Market sources continue to report wheat production much lower in the range of 80-85 MMT.

Indian wheat is comparable to U.S. hard white wheat. Wheat grown in central and western India under relatively drier condition typically has higher protein and gluten in comparison to wheat from north India. Wheat yields across major growing states show large variations due to varying soil conditions, irrigation availability, and adoption of technology. Wheat yields in the largely irrigated northern India (Punjab, Haryana, and Western Uttar Pradesh) are above 4.5 to 5.0 tons per hectare, while yields in western and central states (Gujarat, Rajasthan, Madhya Pradesh, Bihar and parts of Uttar Pradesh) are relatively lower (below 3.0 tons per hectare).

India produces about 1.0 MMT of durum, mostly in Madhya Pradesh, Rajasthan and Maharashtra. Over the last decade, more farmers have shifted from durum wheat cultivation to non-durum varieties due to higher profit margins (higher yields and rising government minimum support prices). Most durum wheat is purchased by the private sector at a premium over common non-durum wheat for higher value bakery and confectionary products. Availability of relatively 'cheap' high quality imported wheat

(APW) for blending and processing has lowered the price premium for local durum wheat compared to common wheat since MY 2015/16, and consequently affected planting and production prospects for the MY 2017/18 marketing year.




Source: MoA, Government of India (GOI); and FAS/New Delhi - MY 2016/117 & MY2017/18.

Indian wheat production has been growing steadily with stronger growth in the last decade. After the two year decline in production due to adverse weather, India's wheat production is likely to move above the trend in MY 2017/18. Due to the continued increase in government's Minimum Support Price (MSP) and an effective government procurement program, wheat acreage has been relatively steady in recent years. Unlike the weak international wheat prices, domestic prices have been very strong during MY 2016/17, which has bolstered the wheat acreage to a record 31.8 million hectares in MY 2017/18. Although India's wheat crop is largely irrigated (91 percent), monsoon rainfall affects soil moisture conditions and irrigation water availability at the time of planting and critical growth stages, thereby affecting overall harvest prospects.

Indian wheat cultivation faces future threats of diversion of acreage to non-agricultural use, soil degradation and climate change. Since most wheat area is irrigated with dependable ground/canal irrigation supplies, interest from urban developers and other non-agricultural businesses is leading to increasing diversion of acreage out of prime wheat cultivation area. In northern India soil salinity issues (due to the over-exploitation of ground water and flood irrigation) and a declining water table may cause farmers to switch to less water intensive crops like corn, pulses and oilseeds.

Vulnerability of the wheat crop to changing climatic conditions, particularly the 'earlier-than-normal' rise in temperatures at the grain filling stage (March/April) is a major concern among policy makers and researchers. Of the 31 million hectares under wheat cultivation, researchers estimate that about 10-12

million hectares are prone to terminal heat stress. According to local research, a one-degree Celsius rise in temperature during the growing season can result in a 3-to-7 percent decrease in grain yields. Indian Council of Agricultural Research (ICAR) and other State Agricultural Universities (SAU) are developing appropriate response mechanisms through agronomic management (early planting) and technologies (short duration varieties) to mitigate potential climate risks. Recent incidences of untimely heavy rains during critical stages (harvest), which may be related to global warming/climate change, is also a growing concern for the policy makers on future wheat cultivation.

Most commonly sown wheat varieties are showing signs of fatigue due to continuous reuse of seeds (seed replacement rate of 25 percent). The ICAR, India's apex agriculture research agency, and SAUs are involved in developing improved wheat varieties with higher yield potential and better grain qualities, largely through traditional breeding methods. Given that wheat seed production and marketing is mostly administered by public sector institutions, the new wheat varieties have been slow to make sufficient inroads due to inadequate seed multiplication, distribution, and extension facilities. Biotechnology applications in wheat are limited to experimental marker-assisted breeding in order to develop resistance to biotic and abiotic stresses.

Ug99, a wheat rust of global concern, may also emerge as concern in the near future, although there have not been any known incidences till date. Agricultural scientists assert that the agro-climatic conditions in northern India's wheat belt are not conducive to Ug99. However, some reports suggest that about 60-70 percent of India's wheat acreage is under varieties/cultivars susceptible to the disease. The National Agriculture Research System (NARS), constituting research institutes under the Indian Council of Agricultural Research and various State Agriculture Universities, survey and monitor the wheat crop, and newly developed varieties, for various rusts, including Ug99. The GOI has been also encouraging the state governments to replacing the susceptible varieties with Ug99-resistant varieties screened by NARS.

**Consumption:**

Wheat consumption (FSI) in MY 2017/18 is forecast at 94 MMT, nearly same as last year, on forecast sufficient domestic supplies and continued imports of expected 'cheap' international wheat. The government is likely to continue selling wheat at subsidized prices through the public distribution system (PDS), and smaller quantities to local millers through the Open Market Sales Scheme (OMSS) to contain domestic prices. Assuming no significant changes in the international wheat prices and import policy, south India millers are likely to continue to augment their wheat requirements through imports. The private millers near the Ports find imported wheat more economical due to the lower shipment costs compared to the inland transport cost from the wheat growing areas in north/central India even at the MSP. Wheat use for feed consumption and residual is forecast higher at 4.8 MMT on steady demand from the dairy feed sector.

Wheat (FSI) consumption in MY 2016/17 is estimated at 93.6 MMT, more than 10 percent higher than MY 2015/16 (84.8 MMT), wherein consumption declined due to lower domestic supplies. MY 2016/17 wheat consumption for feed and residual is also estimated higher at 4.5 MMT. High domestic prices forced the government to continue to release significant quantities of government wheat through the OMSS to contain domestic prices. The removal of import duties and consequent imports of relatively 'cheap' imported wheat further boosted domestic supplies, particularly to the mills near the Ports.

Consequently, MY 2016/17 is estimated to have recovered from the previous year's drop despite the strong domestic prices. However, MY 2017/18 consumption is estimated to increase marginally to 94 MMT on expected firm domestic prices and inelastic demand. However, any change in the existing import policy (duty free) for wheat and consequent change in the imports can affect wheat consumption forecast.

Wheat is the staple food for most Indians in the wheat growing areas (North, West and Central India) consumed in the form of homemade *chapattis* or *rotis* (unleavened flat bread) using custom milled *atta* (whole wheat flour). Some wheat is also used for various wheat-based processed products like raised breads, "biscuits" (cookies) and other bakery items. Typically, about 55 percent of the wheat is marketed, and the balance is used by the farmer for food, feed and seed use. About 27 to 40 percent of the total production is procured by the government agencies under the government's MSP program. The balance is procured by the private sector for milling, processing and other uses.

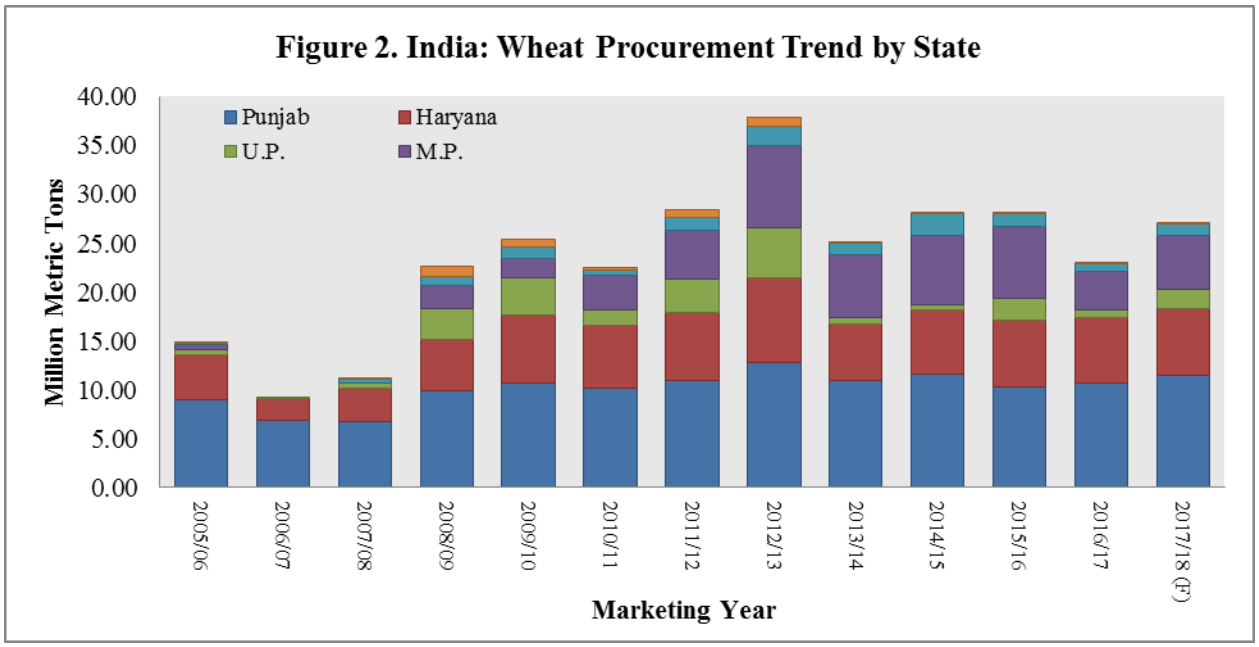
Most of wheat in the marketing system is procured whole wheat and distributed through the open market and public distribution system (PDS) to be subsequently custom milled by the household for home use. A lot of wheat retained by farmers (40 to 45 percent) is also custom-milled, mostly in the *chakkies* (small flour mills) for home consumption; however, small quantities are also milled for feed use (mainly for lactating cows and buffaloes). Some wheat is procured by organized mills for producing wheat flour and *atta* for the hotels, restaurants, and institutional (HRI) sector, and a small share distributed for consumers in branded packs. Market sources report that the market for packaged and brand flour is growing at about 10-12 percent per annum on growing demand from the urban consumers due to the convenience factor. There is a small but growing market for high quality wheat for the growing baking and confectionary food market which has been growing at 12-15 percent per annum over the last few years.

Most commercial feed caters to poultry and aquaculture farms, which largely uses corn, oil meals, and other coarse grains including small quantities of spoiled/inferior quality wheat. There is very limited use of wheat by the organized feed sector as the dairy industry is highly unorganized. With the average dairy herd size estimated around 2 to 3 animals per farm, feed use is typically restricted to lactating animals, and includes some oil cakes, household food waste, and other grain mixes. Market sources report that the recent trend of replacement of local low-yielding dairy animals by higher yielding cross-bred cows and '*murrah*' breed buffaloes has increased the demand for commercial dairy feed by about 12-15 percent per annum supporting higher wheat usage in dairy feed sector. The spoiled and inferior quality wheat, both government-held and open market, is used for animal feed. Market sources believe that the current tight government-held wheat stocks will limit diversion of government-held wheat to animal feed.

The organized milling sector is relatively small, about 1,200 medium to large flourmills with aggregate milling capacity of 24 to 25 MMT, which mill mostly *maida* (flour) and semolina to cater to HRI sector demand, and produce bran flakes for the mixed feed industry. Market sources report that the most mills are operating at 50-60 percent of their capacity, and process about 12-14 MMT of wheat per annum.

**Government Procurement and Offtake for Programs**

Speculation on domestic production and consequent strong open market prices during the peak marketing period (April-July) resulted in low government wheat procurement in MY 2016/17, estimated at 22.9 MMT against the initial target of 30 MMT (revised lower to 28 MMT later). Buoyed by the prospects for a bumper harvest and necessity to replenish the current low wheat stock, government has set up a procurement target of 33 MMT for MY 2017/18. Given the current high domestic prices in the major producing states compared to the government's MSP, procurement is likely to reach about 27 MMT, significantly short from the government target. Most of the wheat is likely to come from the wheat surplus states of Punjab, Haryana, Madhya Pradesh, Uttar Pradesh and Rajasthan. Most of wheat marketed in Punjab and Haryana is procured by the government as high local taxes compared to other states preclude market purchase by private trade in these states. With the central government's directive against offering additional state bonuses, private sector is likely to compete with the government procurement program in the other states (Madhya Pradesh, Rajasthan, and Uttar Pradesh) due to high open market prices.




Source: Food Corporation of India, GOI, FAS/New Delhi for MY 2017/18

**Table 1. India: Government Wheat Procurement and PDS Operation**

| Marketing Year | Production | GOI Procurement[1] | MSP | GOI Economic Cost[/3] | Offtake from GOI Stocks | PDS Issue Price | | |
|---|---|---|---|---|---|---|---|---|
| (Apr–Mar) | (Million Tons) | (Million Tons) | Rs. per Ton | Rs. Per Ton | (Million Tons) | Rs. per ton | | |
| | | | | | | APL | BPL | AAY/NFSA |
| 2005/06 | 68.64 | 14.79 (21.6) | 6,400 | 10,419 | 16.71 | 6,100 | 4,150 | 2,000 |
| 2006/07 | 69.35 | 9.23 (13.3) | 7,000 | 11,778 | 11.88 | 6,10 | 4,15 | 2,000 |

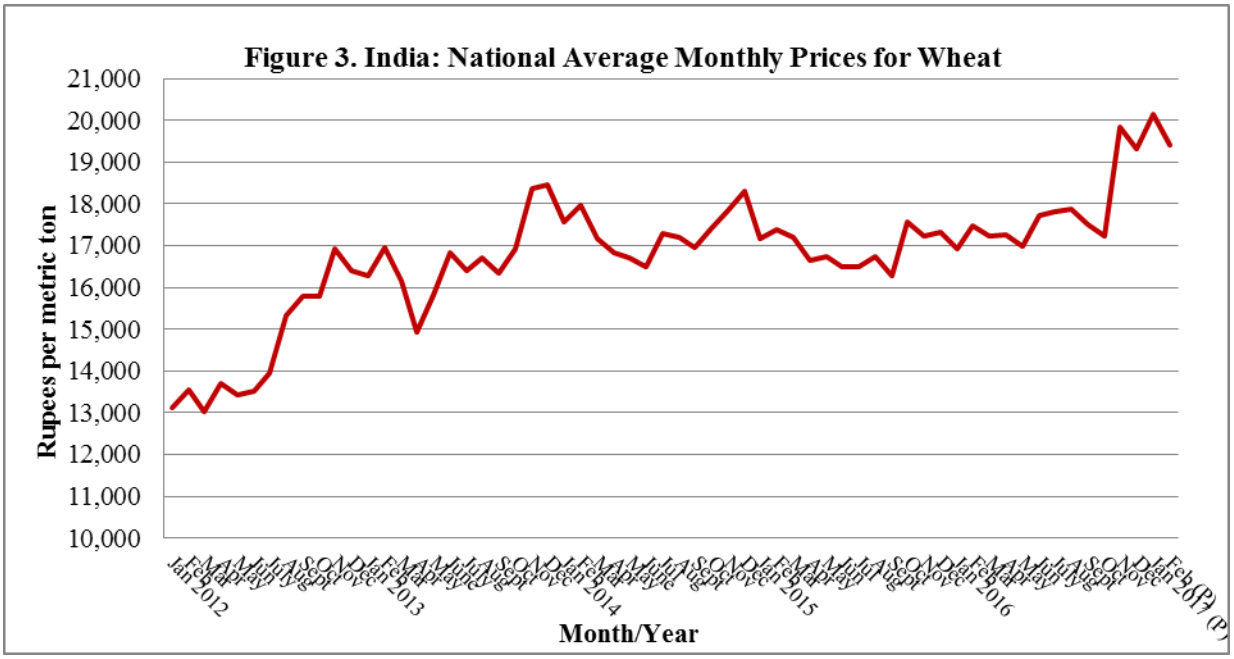
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 0 | 0 | |
| 2007/08 | 75.81 | 11.13 (14.6) | 8,500 | 13,118 | 12.25 | 6,100 | 4,150 | 2,000 |
| 2008/09 | 78.57 | 22.69 (28.9) | 10,000 | 13,806 | 14.89 | 6,100 | 4,150 | 2,000 |
| 2009/10 | 80.68 | 25.38 (31.5) | 10,800 | 14,246 | 22.38 | 6,100 | 4,150 | 2,000 |
| 2010/11 | 80.80 | 22.51 (27.8) | 11,000 | 14,944 | 23.03 | 6,100 | 4,150 | 2,000 |
| 2011/12 | 86.87 | 28.34 (32.6) | 11,700 | 15,953 | 24.27 | 6,100 | 4,150 | 2,000 |
| 2012/13 | 94.88 | 37.92(40.0) | 12,850 | 17,526 | 33.67 | 6,100 | 4,150 | 2,000 |
| 2013/14 | 93.51 | 25.09(26.8) | 13,500 | 19,083 | 31.46 | 6,100 | 4,150 | 2,000 |
| 2014/15 | 95.85 | 28.02(29.2) | 14,000 | 20,512 | 28.66 | 6,100 | 4,150 | 2,000 |
| 2015/16 | 86.53 | 28.09(32.5) | 14,500 | 21,274 | 30.77 | 6,100 | 4,150 | 2,000 |
| 2016/17[2] | 87.00 | 22.96(26.4) | 15,250 | 22,424 | 30.90 | 6,100 | 4,150 | 2,000 |
| 2017/18[2] | 95.00 | 27.00(28.4) | 16,250 | na | na | 6,100 | 4,150 | 2,000 |

Sources: Ministry of Agriculture, Food Corporation of India.
Notes: Exchange rate INR 66.75 = US$ 1 on February 15, 2017
[1] Figure in parentheses is GOI procurement as percentage of total production
[2] FAS/New Delhi estimate
[3] Economic cost includes cost of procurement (MSP), handling, storage, transport, interest, etc.
PDS - Public Distribution System
APL - Above Poverty Line
BPL - Below Poverty Line
AAY -*Antyodaya Anna Yojana* (Poorest of the Poor)
NFSA-National Food Security Act

Over the last decade, the cost of wheat under the MSP program has more than doubled due to the steady increase in MSP and high overheads of the government procurement, storage and management system. The government has kept the wheat sales price under various food security programs unchanged since 2002. The enactment of the National Food Security Act (NFSA) 2013 creates an entitlement for eligible beneficiaries (50% and 75% of the urban and rural populations accounting for about 2/3$^{rd}$ of the population) to receive 5 kilograms of rice, wheat, or coarse grain (millet) at subsidized prices of INR 3, 2 and 1 per kilogram, respectively. While most states are at varying stage of implementing the NFSA, increasing quantities of wheat are now being distributed through the public distribution system (PDS) at the 'lowest' price slab of INR 2000/MT. The government distributes about 24-25 MMT of wheat under the NFSA and other food security programs. Additionally, government also sells wheat under the OMSS to the private trade to contain domestic prices, estimated at 7 MMT in MY 2015/16 and estimated to be more than 6 MMT in MY 2016/17.

**Prices**

Due to tight domestic supplies, domestic wheat prices ruled firm from the beginning of the MY 2016/17, and galloping higher in the second half to reach a record high in January 2017.




Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI

Prices have eased in February with the increase in imports, and the spot prices in February 2017 ranged between INR 17,500 ($260) to INR 21,000 ($315) per MT in major producing states. Expected bumper domestic harvest and higher imports on weak international prices are likely to pressure new crop domestic prices for the upcoming marketing year (April-July). However, prices have to come down by 12 to 22 percent to the MSP to support strong government procurement in the producing states like Madhya Pradesh and Uttar Pradesh. Future prices after the procurement season (April-July) is over will be influenced by the international price movement and government policies, both import and domestic wheat offtake under OMSS.

**Trade:**

After nearly a decade of exporting wheat, India turned into a net importer in MY 2016/17 on relatively weak international market prices. India's MY 2017/18 imports are forecast at 5 MMT, assuming weak international prices and no changes in the existing import policy (zero import duty and unchanged SPS requirements). Despite forecast near-record production, import of wheat in the forecast year 2017/18 will continue to sustain the consumption demand, contain domestic prices and help government to augment the declining wheat stocks above the buffer stock norms. MY 2017/18 wheat and wheat product exports are forecast at 500,000 MT, mostly to Nepal and wheat products to African and middles east markets, as Indian wheat is likely to remain uncompetitive even in the major neighboring markets.

After the removal of the import duty in December 2016, there has been a strong surge in wheat imports, mostly on weak international prices, particularly for the millers near the Ports due to lower ocean

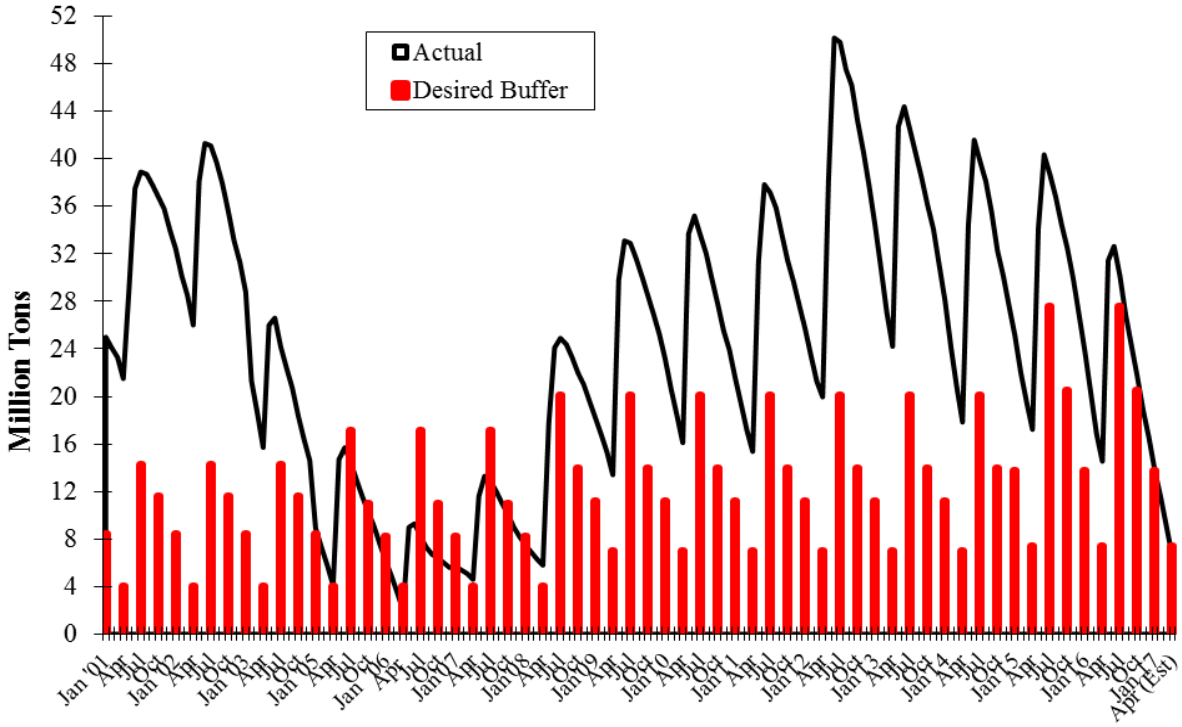
freights compared to the inland transportation costs. Provisional official figures for MY 2016/17 estimate imports during April through December, 2016, at 1.9 MMT, mostly from Ukraine (1.1 MT), Australia (644,000 MT), France (108,000 MT), Russia, and Bulgaria. Market sources report than an additional 1.1 to 1.2 MMT arrived in January 2017. Continued strong domestic prices and depleting government wheat stocks raised the expectation of a delay in any import policy change till the arrival of new crop begins from April onwards, resulting in a strong surge in import contracts for imports in February-March, 2017, estimated at about 1.6-1.8 MMT. Consequently, MY 2016/17 wheat imports are likely to reach 5.0 MMT assuming no changes in the price parity and import policy in the next two months.

Based on the provisional official figures through November 2016 from the Global Trade Atlas, MY 2016/17 wheat and wheat product exports are estimated to reach 400,000 MT.

**Stocks:**

MY 2016/17 ending stocks are estimated at 8.0 MMT, which includes 6.5 MMT government stocks and 1.5 MMT imported wheat with private trade. Assuming government makes effort to augment the government wheat stocks to the buffer norms, and some importer wheat stocks, MY 2017/18 ending stocks are forecast higher at 8.7 MMT.

**Figure 4 . India: Govt Wheat Stocks-Actual Vs. Desired Buffer**




Source: Food Corporation of India, GOI

The government wheat stocks on February 1, 2017, are officially reported at 11.15 MMT compared to 20.34 MMT same time last year. Sources report that the government will limit the wheat offtake in the

next two months to cover the essential requirement for food security programs and some open market sales. Assuming a lower monthly offtake in the last two months, MY 2016/17 government wheat ending stocks are estimated to decline to 6.5 MMT, nearly one MMT below the government's desired minimum buffer stock norms of 7.5 MMT.

Market sources report that an additional 1.5 MMT of imported wheat is also likely to be held with the importers and private millers, beyond their 'normal' pipeline stocks. Estimates of privately-held wheat stocks are not available, but are expected to be minimal due to provisions in the Essential Commodities Act. The PS&D table does not include privately held stocks except for the estimated imported wheat in the last month of the marketing year.

**Policy:**

Research & Development:

Production of the two major food crops - rice and wheat- has been cornerstone of India's agricultural and food security policies and programs since the onset of the famous "Green Revolution' in the mid-1960's. The GOI and various state governments support research, development, and extension activities for new varieties and improved production technologies (e.g., pest management) of wheat to farmers. ICAR conducts wheat research and development at the national level, which is complemented by SAUs, regional research institutions, and state agricultural extension agencies at the regional and state levels. The central and state governments also support farmers by subsidizing input supplies and agricultural credit at affordable prices for various crops including wheat. However, a crop wise breakup on government's budgetary allocation for agriculture is not available.

Price Support:

The GOI's market intervention programs - MSP for select agricultural crops, and procurement of food grain for distribution through the food security programs - have the twin objectives of ensuring remunerative prices to the farmers and ensuring food at affordable prices to the to the Indian population. The Commission for Agricultural Costs and Prices (CACP) recommends the MSP for several agricultural products including wheat. Government-owned enterprises like the Food Corporation of India (FCI) and various state marketing agencies procure wheat at the MSP for central government stocks, and make arrangements for storage and distribution. Subsequently, the government allocates wheat for distribution through the PDS and other welfare schemes at a subsidized price. The government also sells wheat in the open market to the private trade under OMSS to stabilize open market prices.

Trade Policy:

Currently, India allows duty free import of wheat and there are no restrictions on exports of wheat. Due to the escalating wheat prices, government lowered the import duty from 25 percent to 10 percent in September 2016; and further to zero duty for indefinite period in December 2016 (See IN6160). Recently, the MoA has notified disallowing fumigation of grains, including wheat, by Methyl Bromide (MB) on arrival from March 31, 2017. Market sources report that most of the current wheat suppliers to

India can fumigate wheat with MB at origin, but the policy change of MB at origin may potentially increase the cost of imported wheat.

India's phytosanitary requirement (i.e., a wheat sample drawn from a single consignment should not contain more than 100 quarantine seeds (31 quarantine seeds have been specified) per 200 kg) and other SPS issues have effectively barred U.S. wheat shipments to India.

**Marketing:**

India is likely to continue to import wheat on 'weak' international prices and rising domestic demand. While current import demand is largely driven on relatively 'weak' international prices, there is a growing demand for high-protein wheat for the growing bakery/confectionary industry and western style fast food sector. The rapidly growing fast food industry and modernizing bakery/confectionary industry generate demand for specialty flours (used in pizzas and burger buns) that require different wheat classes that are not produced in India. The steady decline in acreage under local durum and 'high protein/hard' wheat varieties like *Sharbati* and *Lok-1*, is likely to create a steady import market for 'high protein' hard wheat for blending to produce specialty flour. However, U.S. wheat continues to be denied market access to India despite numerous discussions at the technical levels in the past.

**Production, Supply and Demand Data Statistics:**

**Table 2. India: Commodity, Wheat, PSD**
(Area in Thousand Hectares, Quantity in Thousand Metric Tons, Yield in MT/Hectare)

| Wheat | 2015/2016 | | 2016/2017 | | 2017/2018 | |
|---|---|---|---|---|---|---|
| Market Begin Year | Apr 2015 | | Apr 2016 | | Apr 2017 | |
| India | USDA Official | New Post | USDA Official | New Post | USDA Official | New Post |
| Area Harvested | 31470 | 31470 | 30220 | 30410 | 0 | 31750 |
| Beginning Stocks | 17220 | 17220 | 14540 | 14540 | 0 | 8000 |
| Production | 86530 | 86530 | 87000 | 87000 | 0 | 95000 |
| MY Imports | 471 | 535 | 3700 | 5000 | 0 | 5000 |
| TY Imports | 300 | 425 | 3700 | 5000 | 0 | 5000 |
| TY Imp. from U.S. | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Supply | 104221 | 104285 | 105240 | 106540 | 0 | 108000 |
| MY Exports | 1130 | 1130 | 400 | 400 | 0 | 500 |
| TY Exports | 873 | 873 | 400 | 400 | 0 | 500 |
| Feed and Residual | 4200 | 4200 | 4500 | 4500 | 0 | 4800 |
| FSI Consumption | 84351 | 84415 | 92340 | 93640 | 0 | 94000 |
| Total Consumption | 88551 | 88615 | 96840 | 98140 | 0 | 98800 |
| Ending Stocks | 14540 | 14540 | 8000 | 8000 | 0 | 8700 |
| Total Distribution | 104221 | 104285 | 105240 | 106540 | 0 | 108000 |

**Table 3. India: Commodity, Wheat, Prices Table**

| Prices In | Rupees | per uom | metric tons | %Change |
|---|---|---|---|---|
| Year | 2014 | 2015 | 2016 | |
| | | | | |
| January | 17,582 | 17,153 | 16,914 | -1.4 |
| February | 17,961 | 17,397 | 17,472 | 0.4 |
| March | 17,170 | 17,204 | 17,242 | 0.2 |
| April | 16,838 | 16,646 | 17,257 | 3.7 |
| May | 16,714 | 16,734 | 16,979 | 1.5 |
| June | 16,481 | 16,485 | 17,725 | 7.5 |
| July | 17,301 | 16,495 | 17,804 | 7.9 |
| August | 17,186 | 16,739 | 17,863 | 6.7 |
| September | 16,938 | 16,272 | 17,513 | 7.6 |
| October | 17,425 | 17,562 | 17,214 | -2.0 |
| November | 17,839 | 17,217 | 19,849 | 15.3 |
| December | 18,309 | 17,316 | 19,316 | 11.6 |
| | | | | |
| Exchange Rate | 66.75 | Local Currency/US$ | | |
| Date of Quote | 02/15/2017 | MM/DD/YYYY | | |

National Average Monthly Wholesale Prices of Wheat
Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI.

**Table 4. India: Commodity, Wheat[1], Import Trade Matrix**

| **Time Period** | April-March | **Units** | Tons |
|---|---|---|---|
| **Exports for** | MY 2015/16 | | MY 2016/17[2] |
| U.S. | 0 | U.S. | 0 |
| **Others** | | **Others** | |
| Australia | 462,602 | Ukraine | 1,067,159 |
| France | 52,500 | Australia | 644,091 |
| Bangladesh | 1,500 | France | 107,910 |
| Russia | 1,065 | Russia | 47,952 |
| | | Bulgaria | 19,937 |
| | | Moldova | 5,659 |
| | | Lithuania | 2,175 |
| **Total for Others** | **517,667** | **Total for Others** | **1,894,883** |
| Others not Listed | 0 | Others not Listed | 0 |
| **Grand Total** | **517,667** | **Grand Total** | **1,894,883** |

Source: Directorate General of Commercial Intelligence and Statistics (DGCIS), GOI

[1] Trade figures in the table includes only wheat; figures in PSD include wheat products also.

[2] Provisional data for the period April through December 2016

**Table 5. India: Commodity, Wheat[1], Export Trade Matrix**

| **Time Period** | April-March | **Units** | Tons |
|---|---|---|---|
| **Exports for** | MY 2015/16 | | MY 2016/17[2] |
| U.S. | 10 | U.S. | 3 |
| **Others** | | **Others** | |
| Bangladesh | 378,600 | Nepal | 152,755 |
| Nepal | 129,649 | UAE | 22,340 |
| UAE | 99,722 | Bangladesh | 19,973 |
| Taiwan | 14,591 | U.K. | 3,011 |
| Malaysia | 7,282 | Taiwan | 2,047 |
| Philippines | 7,099 | Somalia | 1,708 |
| Sri Lanka | 4,589 | Sri Lanka | 1,304 |
| Jordan | 3,903 | Jordan | 995 |
| China | 3,644 | Malaysia | 853 |
| U.K. | 3,442 | Bahrain | 218 |
| Indonesia | 3,038 | Uganda | 207 |
| Oman | 3,026 | Kuwait | 157 |
| **Total for Others** | **658,585** | **Total for Others** | **205,568** |
| Others not Listed | 8,080 | Others not Listed | 779 |
| **Grand Total** | **666,675** | **Grand Total** | **206,350** |

Source: Directorate General of Commercial Intelligence and Statistics (DGCIS), GOI

[1] Trade figures in the table includes only wheat; figures in PSD includes wheat products also

[2] Provisional data for the period April through December 2016

**Commodities:**

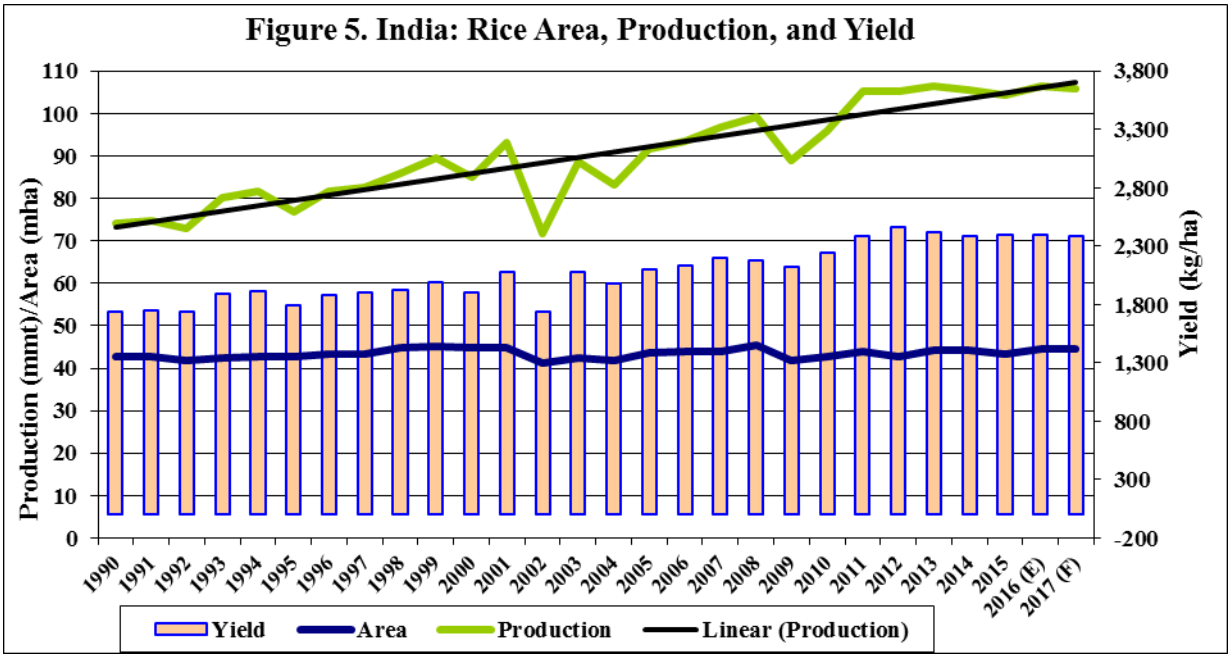
Rice, Milled

**Production:**

Assuming normal southwest 2017 monsoon (June to September) and overall weather conditions, MY 2017/18 (October/September) rice production is forecast at 106 MMT from 44.5 million hectares; marginally lower than the estimated MY 2016/17 near-record production of 106.5 MMT. Normal 2016 southwest monsoon supported good yields and lowered cost of cultivation providing good profit margins to farmers. Weakening of global demand/prices may affect end-season prices for the MY 2016/17 *rabi* (winter planted) rice harvest, but the expectations of 'regular' annual increase in the government's MSP should continue to support planting intentions for rice in the upcoming marketing year. With about 40 percent of the rice crop taken under unirrigated conditions, performance of the 2017 south west monsoon will be critical for realization of the forecast planted area and production. A poor and erratic monsoon in 2017 can potentially bring down production by 5-8 MMT from the forecast level, while adequate and well distributed rains can augment forecast production by 2-3 MMT.

Due to the normal 2016 monsoon and higher *kharif* (fall planted) rice planting, MY 2016/17 rice production is estimated at a near-record 106.5 MMT (44.5 million hectares), marginally lower than the record harvest of 106.7 MMT in MY 2013/14. However, relatively weak southwest monsoon and northeast monsoon (October-December) in some southern states affected planting and production prospects for *rabi* rice. Latest official *rabi* crop condition report indicates that planting of *rabi* rice is currently lagging behind last year's level. Lower planting, coupled with current dry conditions and irrigation water stress in the southern states, will likely affect the overall *rabi* rice harvest prospects. Consequently, Post continues to estimate MY 2016/17 rice production at 106.5 MMT compared to the government's 'highly optimistic' second advance estimate of 108.9 MMT (typically subject to future revisions).

Rice is the most important food crop in India, cultivated and consumed across the country, accounting for more than 40 percent of total grain production. Although about 60 percent of the area is irrigated, rice is predominantly a rainfed *kharif* season crop with the planting closely riding on the onset and progress of the south-west monsoon rains during June through September. There is a small *rabi* crop, mostly irrigated, planted in the eastern and southern states of West Bengal, Odisha, Andhra Pradesh, Telangana and Tamil Nadu.




Source: Ministry of Agriculture, GOI; and FAS/New Delhi (MY 2016/17 and 2017/18).

India's rice production shows a steady upward trend, with lower fluctuations in the recent years. Experts report that rice area has plateaued around 44.5 million hectares in recent years. India's overall rice yields are well below the world average, and there are wide variations in rice productivity among the various producing states in the country depending on the irrigation water availability and adoption of technology. Consequently, there is scope for increasing productivity by expanding irrigation facilities and adopting technology. The government's program to "Bring the Green Revolution to Eastern India (BGREI)" by promoting the Green Revolution and other improved technologies to the eastern region of the country launched in 2010 has realized significant productivity gains in the states of Bihar,

Chhattisgarh, Jharkhand, eastern Uttar Pradesh, West Bengal, and Odisha. However, most of the rice growing states continue to depend on southwest and northeast monsoon that ensures soil moisture and irrigation water availability critical for planting and production prospects.

Agricultural policy makers and experts are increasingly concerned about the sustainability of the current rice production system. Surplus rice growing states like Punjab, Haryana, Uttar Pradesh, Andhra Pradesh and West Bengal, Orissa and other eastern states follow intensive rice-wheat or rice-rice cropping systems, and are facing severe environmental issues, including declining water tables, deteriorating soil health, and emergence of resistant disease/pests. The GOI and several state governments are promoting crop diversification by moving area out from the rice-wheat rotation to lower water intensive crops like corn, pulses and other horticultural crops. However, relatively stable yield and prices for rice compared to the alternate crops discourages farmers to shift out of rice to other potentially risky crops. Due to the government's continued emphasis on supporting rice-wheat production for food security and lack of more profitable and lower risk crop rotation alternatives, a significant cropping shift out of rice is not imminent in the near future.

Indian rice cultivation also faces the challenge of global warming and climate change. Climate change issues like glacier melting (and its impact on water supply through perennial rivers) and aberrations in the monsoon rain patterns may affect rice cultivation in the country. A significant share of the rice crop is produced in the coastal regions that are susceptible to the global warming induced rise in the sea levels.

*Basmati* (long grain) Rice: India's long-grain *Basmati* rice is grown in Punjab, Haryana, western Uttar Pradesh, Uttarakhand and Himachal Pradesh. *Basmati* rice production has been growing strongly after the introduction of higher yielding *PUSA Basmati 1121* variety in 2003 and shorter duration semi-dwarf *PUSA Basmati 1509* variety in 2013. The new variety is being increasingly adopted by farmers due to shorter duration, lower irrigation requirement and higher yields compared to PUSA 1121 and other traditional varieties. *Basmati* rice production is estimated to have declined to 8.0 MMT (1.7 million hectares) compared to 9.8 MMT (2.1 million hectares) last year due to low *Basmati* prices in MY 2015/16. With the market prices improving in MY 2016/17, *Basmati* rice production is forecast to recover in MY 2017/18 to 9 MMT from 2.0 million hectares, assuming normal 2017 monsoon and weather conditions.

Hybrid Rice: Most of the hybrid rice is cultivated in eastern India (eastern Uttar Pradesh, Bihar, Jharkhand, and Chhattisgarh). There are over 50 hybrids, of which about 50 are popular, mostly developed by private seed companies, although public research organizations have some hybrids. Despite sustained government efforts to attain the National Food Security Mission target of 3 million hectares, area under hybrid rice continue to range from 1.8 to 2.0 million hectares in the last few years. Growth of area under hybrid rice is severely hampered by (i) the inability to cater to different consumer quality preferences, (ii) low incremental yield realization, and (iii) poor milling quality over traditional varieties. Nevertheless, several private seed companies and public sector institutions are developing improved hybrid rice varieties that have higher quality and yields.

Biotechnology: Efforts are underway, mostly by the private sector, to develop transgenic rice varieties to incorporate resistance to various pests, diseases, and abiotic stresses. However, approvals and commercialization of transgenic rice are still years away. Most public sector rice research organizations

are working on marker assisted breeding of rice for resistance to biotic and abiotic stresses and incorporating quality traits.

**Consumption:**

Rice is the major staple food for more than 70 percent of the Indian population. Due to the forecast sufficient domestic supplies, MY 2017/18 consumption is forecast to increase by over 2 percent to 99 MMT to sustain the growing population. Rice consumption in MY 2016/17 is estimated at 97 MMT compared to 93.6 MMT last year, increasing by over 3.6 percent on sufficient domestic supplies and continued higher supplies of government rice under the National Food Security Act and other food security programs (see table 6).

More than 4,000 varieties of rice are grown throughout the country to meet varied consumer preferences. While most of the common 'coarse grain' rice is procured by the government, the other locally preferred rice varieties are procured by the private millers for marketing to the consumers, mostly unbranded/packaged and small but growing segment of branded/packaged rice. The farmers, mostly small and marginal farmers, retain a significant share of the crop (40 to 45 percent) for own consumption (locally milled) and seed use.

The livestock feed industry uses deoiled rice bran and broken rice. Small quantities of inferior quality and damaged rice also get used as fillers in the poultry and livestock feed sectors. However, there are no official or industry estimates available for rice for feed consumption.

**Government Procurement and Supplies for Food Programs**

Besides wheat, rice is the other important food grain for the government's PDS and other food security programs. For government procurement purposes, rice is classified into two categories - Common (length to breadth ratio less than 2.5) and Grade A (length to breadth ratio more than 2.5). Historically, most rice under the government procurement program came through a mandatory levy on local millers. Depending on the state, local rice millers must sell to the government a fixed portion of their milled rice at pre-established rates, called the "levy price," which are linked to the MSP of paddy rice plus milling costs. With the government's raising the MSP significantly in recent years, the government has been largely procuring paddy rice bought at the support price, which is subsequently custom-milled for the government by private millers at the government expense for storage and distribution through the PDS.

**Table 6. India: Government's Rice Procurement and PDS Operation**

| Marketing Year | Production | GOI Procurement[1] | MSP for Paddy (Unmilled Rice Common variety) | GOI Economic Cost[3] | Offtake from GOI Stocks | PDS Issue Price | | |
|---|---|---|---|---|---|---|---|---|
| (Oct-Sept) | (Million Tons) | (Million Tons) | Rs. per ton | Rs. Per ton | (Million Tons) | Rs. per ton | | |
| | | | | | | APL | BPL | AAY/NFSA |
| 2005/06 | 91.79 | 27.58 (30.0) | 5,700 | 13,036 | Na | 7,950 | 5,650 | 3,000 |
| 2006/07 | 93.35 | 25.11 (26.9) | 6,200 | 13,912 | Na | 7,950 | 4,150 | 3,000 |
| 2007/08 | 96.69 | 28.74 (29.7) | 7,450 | 15,499 | Na | 7,950 | 4,150 | 3,000 |
| 2008/09 | 99.18 | 34.10 (34.4) | 9,000 | 17,407 | 25.69 | 7,950 | 4,150 | 3,000 |
| 2009/10 | 89.09 | 32.03 (36.0) | 10,000 | 18,201 | 28.36 | 7,950 | 4,150 | 3,000 |
| 2010/11 | 95.98 | 34.20 (35.6) | 10,000 | 19,831 | 31.97 | 7,950 | 4,150 | 3,000 |
| 2011/12 | 105.30 | 35.04 (33.3) | 10,800 | 21,229 | 32.02 | 7,950 | 4,150 | 3,000 |
| 2012/13 | 105.24 | 34.04 (32.3) | 12,500 | 23,049 | 34.25 | 7,950 | 4,150 | 3,000 |
| 2013/14 | 106.65 | 31.85 (29.9) | 13,100 | 26,155 | 36.55 | 7,950 | 4,150 | 3,000 |
| 2014/15 | 105.48 | 32.17(30.5) | 13,600 | 29,436 | 36.63 | 7,950 | 4,150 | 3,000 |
| 2015/16 | 104.32 | 34.21(32.8) | 14,100 | 31,255 | 32.50 | 7,950 | 4,150 | 3,000 |
| 2016/17[2] | 106.50 | 36.50(34.3) | 14,700 | 31,916 | 35.40 | 7,950 | 4,150 | 3,000 |
| 2017/18[2] | 106.00 | na | na | na | Na | 7,950 | 4,150 | 3,000 |

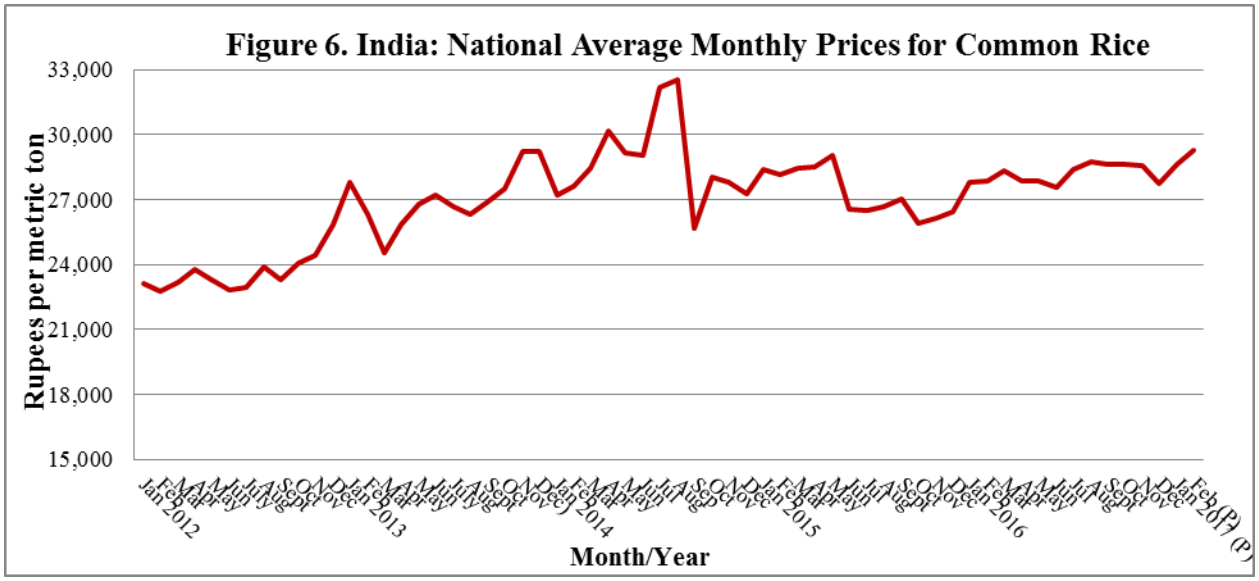
Sources: Ministry of Agriculture, Food Corporation of India.
Notes: Exchange rate INR 66.75 = US$ 1 on February 15, 2017
[1] Figure in parentheses is GOI procurement as percentage of total production
[2] FAS/New Delhi estimate
[3] Economic cost includes cost of procurement (MSP), handling, storage, transport, interest, etc.
PDS - Public Distribution System
APL - Above Poverty Line
BPL - Below Poverty Line
AAY -*Antyodaya Anna Yojana* (Poorest of the Poor)
NFSA-National Food Security Act

Riding on a near-record domestic harvest and weak export demand, the government rice procurement under the MSP program has been very strong in MY 2016/17. Official sources estimate rice procurement on February 15, 2017, at 29.2 MMT compared to 26.5 MMT by the same time last year. Although procurement in the second half of the MY 2016/17 is likely to be affected by expected lower *rabi* rice production, overall MY 2016/17 procurement is likely to reach 36.5 MMT compared to 34.2 MMT last year.

Government offtake of rice during MY 2016/17 has also been strong compared to last year on sufficient supplies and higher offtake to meet the estimated annual requirement under the expanding NFSA and other food security programs. As in the case of wheat, there has been no increase in the retail price of

rice distributed through the PDS since July 1, 2002, while the MSP has more than doubled over the last decade.

**Prices**

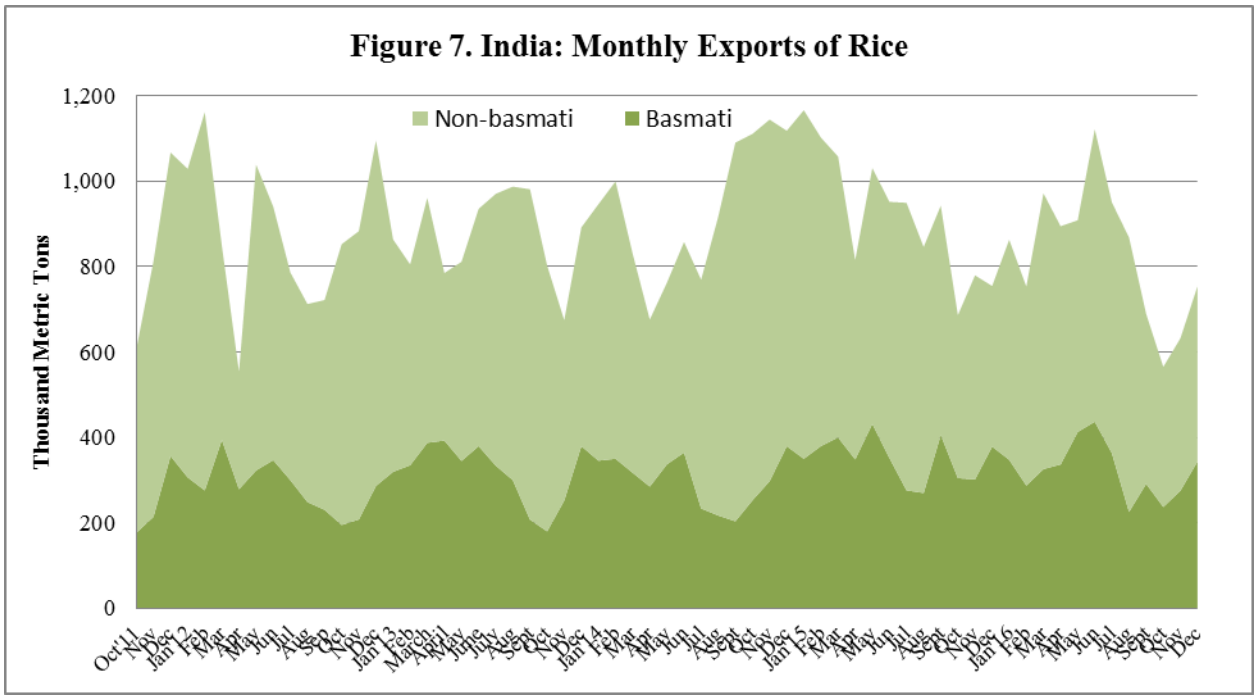



Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI.

Domestic prices during the MY 2016/17 have fluctuated in a narrow range on sufficient domestic supplies, higher offtake of government rice and relatively weak export demand. Speculation on the upcoming rabi harvest and a recovery in pace of exports have supported prices in the last two months. However, prices are likely to come down with the arrival of the upcoming *rabi* rice crop. Market prices during the balance of season are likely to remain steady but may respond to changes in international prices.

**Trade:**

India has emerged as one of the world's leading rice exporters after the removal of the export ban on coarse (non-*Basmati*) rice in 2011. India's rice exports in MY 2017/18 are forecast lower at 8.5 MMT (4.5 MMT coarse rice and 4.0 MMT *Basmati* rice) on relatively tight exportable supplies and expected weak international demand. However, export prospects can be affected by the increase in the government MSP for the upcoming season, value of Indian Rupee vis-à-vis other currencies and international price movements. Government is unlikely to impose any export restrictions on rice exports due to sufficient domestic supplies.




Source: Monthly exports through Oct 2016 from Directorate General of Commercial Intelligence (DGCIS), GOI.

Rice exports have slowed down significantly since September 2016 on relatively weak export demand. Assuming no significant change in export competitiveness of Indian rice and stable value of India rupee vis-a-vis US Dollar, MY 2016/17 rice export is estimated at 9 MMT, which includes 5.2 MMT of coarse rice and 3.8 MMT of *Basmati* rice. Basmati rice is mostly exported to Middle East countries and Europe, while coarse rice is mostly exported to African and neighboring countries.

Preliminary CY 2016 export figures from official data indicate export sales totaling 10.04 MMT. Major export destinations were Middle East countries (Saudi Arabia, U.A.E., Iraq, Iran), African countries (Benin, Senegal, Guinea, Cote D' Ivoire, Somalia, South Africa) and neighboring Nepal.

**Stocks:**

Due to the strong rice procurement, government-held rice stocks on February 1, 2017, were estimated at 29.3 MMT compared to 28.9 MMT at the same time last year. Assuming normal offtake in the remaining marketing season, MY 2016/17 government rice ending stocks are estimated to increase to 17 MMT compared to 15.9 MMT last year, and significantly higher than the GOI's desired buffer stocks of 10.3 MMT.

There is no published information, official or industry, about privately held rice stocks. Despite sufficient domestic supplies, weak export demand is likely to draw down the privately held MY 2016/17 ending stocks to1.9 MMT compared to 2.5 MMT same time last year. The rice PS&D table includes both government stocks and estimated privately held stocks.

**Policy:**

Production and Market Support:

The GOI and various state governments follow the same production policy for both wheat and rice. Given the wider coverage of rice compared to wheat, the GOI and various state governments, have undertaken various rice-specific development schemes like the Special Rice Development Program (SRDP) and Promotion of Hybrid Rice (price subsidies on seed).

Same as in case of wheat, the government has an effective domestic price support, procurement, and distribution program for rice. The GOI has banned futures trading in rice since September 2007 on price inflation concerns as policy makers believe that futures trading may lead to speculation.

Trade:

India existing trade policy imposes no export restrictions on rice. On September 9, 2011, the government lifted the export ban on non-Basmati rice, which had been in effect since September 2007 (with *ad hoc* humanitarian exports exempted from time to time). However, exports of Basmati rice continued without quantitative restriction throughout the period, subject to a minimum export price (MEP), which changed from time to time. On July 4, 2012, the government removed the MEP requirement on exports of Basmati rice.

In March 2008, the GOI removed the import duty on rice, but there have been no imports due to uncompetitive pricing and consumer preference for local varieties.

**Marketing:**

Indian high-quality Basmati and select premium coarse grain varieties compete against U.S. rice in several markets, including the Middle East and European Union. India exports Basmati rice and other specialty/fragrant rice to the United States, which mostly caters to consumers coming from India, Middle East and South Asia.

**Production, Supply and Demand Data Statistics:**

**Table 7. India: Commodity, Rice, Milled, PSD**
(Area in thousand hectares and quantity in thousand metric tons, Yield in MT/Hectare)

| Rice, Milled | 2015/2016 | | 2016/2017 | | 2017/2018 | |
|---|---|---|---|---|---|---|
| Market Begin Year | Oct 2015 | | Oct 2016 | | Oct 2017 | |
| India | USDA Official | New Post | USDA Official | New Post | USDA Official | New Post |
| Area Harvested | 43479 | 43499 | 44500 | 44500 | 0 | 44500 |
| Beginning Stocks | 17800 | 17800 | 18400 | 18400 | 0 | 18900 |
| Milled Production | 104320 | 104408 | 106500 | 106500 | 0 | 106000 |
| Rough Production | 156496 | 156628 | 159766 | 159766 | 0 | 159016 |
| Milling Rate (.9999) | 6666 | 6666 | 6666 | 6666 | 0 | 6666 |
| MY Imports | 0 | 0 | 0 | 0 | 0 | 0 |
| TY Imports | 0 | 0 | 0 | 0 | 0 | 0 |
| TY Imp. from U.S. | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Supply | 122120 | 122208 | 124900 | 124900 | 0 | 124900 |
| MY Exports | 10240 | 10240 | 10200 | 9000 | 0 | 8500 |
| TY Exports | 10200 | 10040 | 10300 | 9000 | 0 | 8500 |
| Consumption and Residual | 93480 | 93568 | 97000 | 97000 | 0 | 99000 |
| Ending Stocks | 18400 | 18400 | 17700 | 18900 | 0 | 17400 |
| Total Distribution | 122120 | 122208 | 124900 | 124900 | 0 | 124900 |

**Table 8. India: Commodity, Rice, Milled, Prices Table**

| Prices In | Rupees | per uom | metric tons | %Change |
|---|---|---|---|---|
| Year | 2014 | 2015 | 2016 | |
| | | | | |
| January | 27,198 | 28,400 | 27,827 | -2.0 |
| February | 27,612 | 28,149 | 27,876 | -1.0 |
| March | 28,462 | 28,463 | 28,343 | -0.4 |
| April | 30,162 | 28,497 | 27,836 | -2.3 |
| May | 29,162 | 29,036 | 27,856 | -4.1 |
| June | 29,020 | 26,582 | 27,541 | 3.6 |
| July | 32,165 | 26,495 | 28,393 | 7.2 |
| August | 32,539 | 26,673 | 28,761 | 7.8 |
| September | 25,697 | 27,061 | 28,610 | 5.7 |
| October | 28,014 | 25,888 | 28,652 | 10.7 |
| November | 27,792 | 26,136 | 28,599 | 9.4 |
| December | 27,258 | 26,451 | 27,765 | 5.0 |
| | | | | |
| Exchange Rate | 66.75 | Local Currency/US$ | | |
| Date of Quote | 02/15/17 | MM/DD/YYYY | | |

National Average Monthly Wholesale Price of Common Rice

Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI

**Table 9. India: Commodity, Rice, Milled, Export Trade Matrix**

| **Time Period** | Jan-Dec | **Units** | Tons |
|---|---|---|---|
| **Exports for** | CY 2015 | | CY 2016[1] |
| U.S. | 150,575 | U.S. | 147,608 |
| **Others** | | **Others** | |
| Saudi Arab | 1,207,701 | Saudi Arab | 925,228 |
| Senegal | 935,009 | UAE | 916,511 |
| Iran | 838,785 | Iraq | 691,127 |
| UAE | 774,797 | Benin | 688,236 |
| Bangladesh | 626,713 | Iran | 663,713 |
| Nepal | 577,330 | Nepal | 550,443 |
| Benin | 548,131 | Senegal | 547,699 |
| Iraq | 474,522 | Guinea | 515,725 |
| Cote D' Ivoire | 417,624 | Cote D' Ivoire | 353,079 |
| Guinea | 396,868 | Somalia | 320,179 |
| South Africa | 287,618 | South Africa | 287,136 |
| Liberia | 260,368 | Turkey | 249,525 |
| **Total for Others** | **7,345,466** | **Total for Others** | **6,708,601** |
| Others Not Listed | 3,762,180 | Others Not Listed | 3,180,691 |
| **Grand Total** | **11,258,221** | **Grand Total** | **10,036,900** |

Source: Directorate General of Commercial Intelligence and Statistics (DGCIS), GOI

[1] Provisional data for the period January through December 2016

**Commodities:**

Corn

Sorghum

Millet

Barley

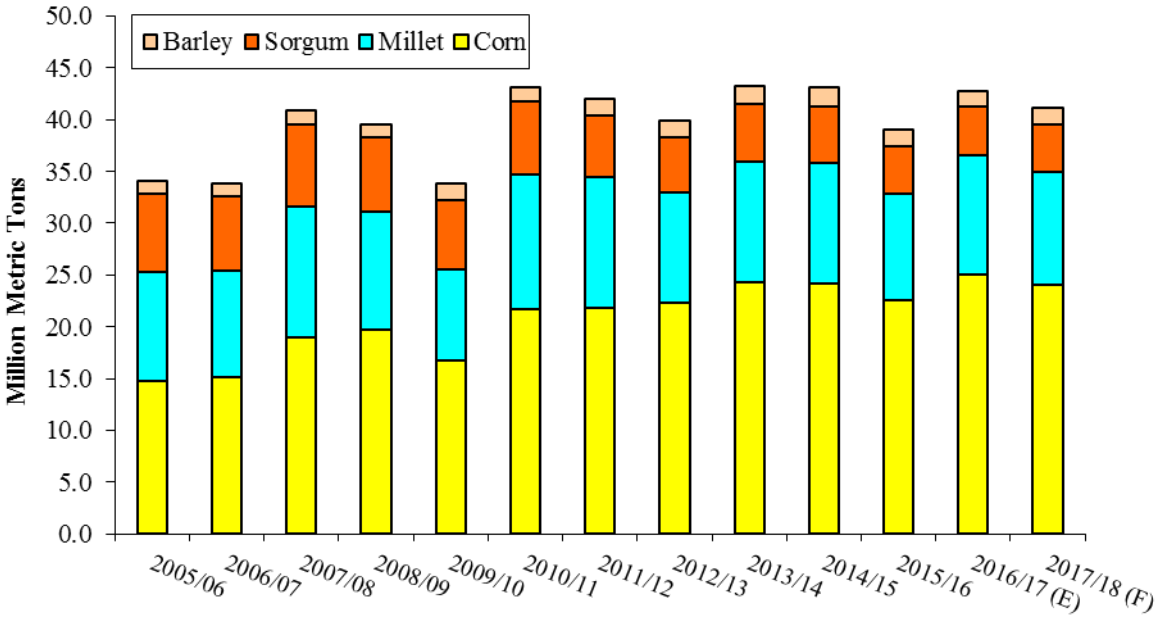
**COARSE GRAINS**

**Production:**

Coarse grain production in India critically depends on the performance of monsoon as only about 15 percent of the cultivated area is under irrigation. Assuming a normal 2017 monsoon and overall weather conditions, MY 2017/18 coarse grain production is forecast lower at 41.2 MMT (from 24.2 million hectares) than MY 2016/17 production of 42.7 MMT on expected lower planting, particularly corn and millet. Forecast coarse grain production includes 24 MMT of corn, 11 MMT of millets, 4.5 MMT of sorghum and 1.7 MMT of barley. More than 75 percent of coarse grains are cultivated during

the *kharif* season, while some corn and sorghum, and barley crops are produced during the *rabi* season.

**Figure 8. India: Coarse Grain Production Trend**




Source: Ministry of Agriculture, GOI; and FAS/New Delhi estimates for MY 2016/17 and 2017/18.

MY 2016/17 total coarse grain production is estimated higher at 42.7 MMT (record 25 MMT of corn, 11.5 MMT of millet, 4.8 MMT of sorghum, and 1.4 MMT of barley), nearly 10 percent increase over last year's drought affected harvest. The timely and normal 2016 southwest monsoon, coupled with relatively high MY 2015/16 end-season (July/Aug) prices supported record planting of corn (10.2 million hectares) and higher planting of millet compared to the previous 'drought' affected MY 2015/16 crop. Planting of sorghum is estimated lower due to deficient rains during July 2016 which affected planting in some parts of southern and western India and some area shift from sorghum to pulses in other states.

The favorable 2016 monsoon provided adequate soil moisture supporting higher yields of most coarse grain. However, the corn crop in parts of Karnataka, Andhra Pradesh and Telangana got affected due to deficit rainfall and prolonged dry spells during July-August 2016, which adversely affected the crop at critical stages. Consequently, Post estimates MY 2016/17 corn production at a record 25 MMT, marginally higher than the previous record of 24.3 MMT in MY 2013/14, but lower than the government's 'optimistic' second advance estimate of 26.2 MMT. Trade sources estimate the crop in the more modest range of 21 to 24 MMT.

MY 2015/16 corn, millet and sorghum and MY 2016/17 barley area and production estimates in the PSDs have been revised marginally based on recent release of the final official estimates (February 15, 2017).

Corn accounts for the major share of the coarse grain production; showing a steady upward trend over the last decade on growing demand (poultry feed and industrial use) and increasing productivity (better hybrid seeds). Increasing adoption of improved hybrids, particularly single cross hybrids, has encouraged farmers to bring more area under corn cultivation. Consequently, area under corn has gone up from 6.6 million hectares in early 2000's to a record 10.2 million hectares in MY 2016/17. MY 2017/18 corn acreage is likely to come down to 9.5 million on expected steady prices compared to the last year's 'record' MY 2015/16 end season prices.

Market sources report planting of hybrid corn at about 65-70 percent, most of which accounts for feed/industrial grade corn, while food grade corn is produced using traditional cultivars. In the last few years, relatively weak international prices have rendered Indian corn uncompetitive in the international market. Despite the slowdown in corn exports, growing demand from the rapidly expanding local poultry, starch, and commercial animal feed industries supported domestic production. Expansion of hybrids has also slowed down in the recent years, although farmers continue to replace traditional cultivars/old hybrids with the newer higher-yielding hybrid varieties. India's weak intellectual property regulations (IPR) and slow agriculture biotechnology regulatory system has precluded major technological breakthrough for productivity gains.

Sorghum and millet cultivation has slowed down in the recent years on weakening demand and profitability compared to other competing crops. Absence of any significant major productivity enhancing technological (varietal or agronomic) breakthrough, a lack of industrial sector demand and growing consumer preference for wheat/rice have influenced farmer planting decisions for sorghum and millet. Over the last two decades, traditional cultivated area under sorghum and millet has shifted to commercially viable crops like corn, cotton, soybean and other commercial crops. Since sorghum and millet is cultivated largely under unirrigated conditions, production fluctuates year to year depending on the performance of the monsoon.

Production of barley, a relatively small winter crop in north India, has been relatively steady at around 1.7-1.8 MMT on demand from the malting and brewing industry. Barley production in MY 2016/17 declined to 1.4 MMT due to significant crop damage from untimely rains during harvest (March-April, 2016). Traditionally barley production in India consists of feed quality, six-row varieties, unsuitable for malting and mostly used for food and animal feed purposes. Recently, a few new, high quality malting grade barley varieties have been developed through public-private breeding programs, and these varieties are steadily replacing older varieties. Trade sources report that some malting and brewing companies are promoting the cultivation of the malting grade barley varieties under contract farming (buy-back arrangement) in the traditional growing areas of Rajasthan, Punjab, and Haryana.

**Consumption:**

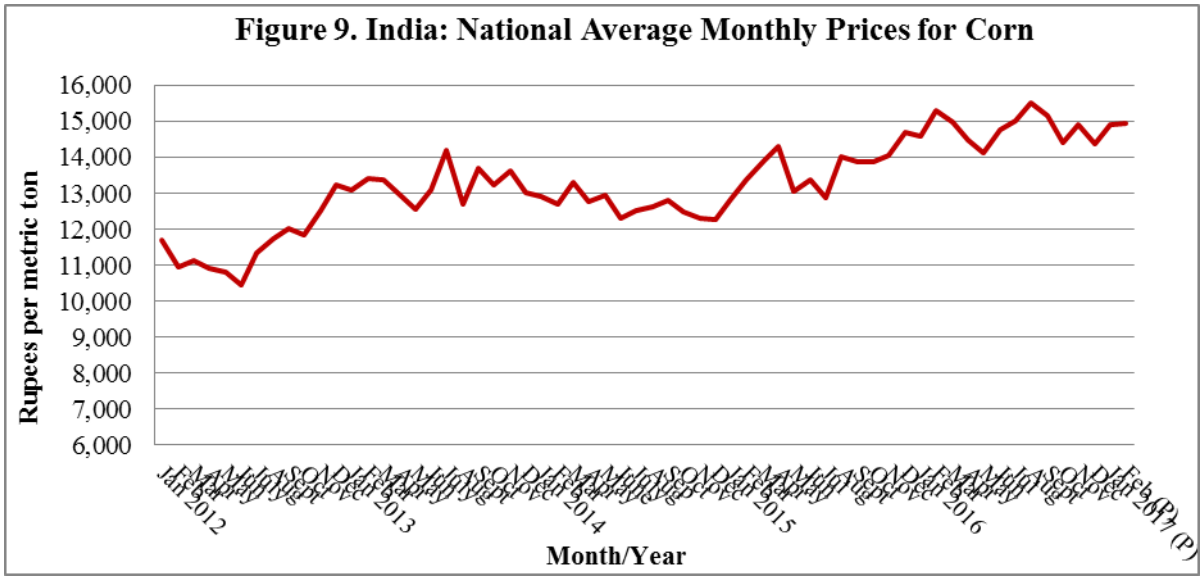
Despite forecast tight supplies, MY 2017/18 total coarse grain consumption is forecast to increase to 42.2 MMT on continued steady demand from animal feed and industrial users. Since early 2014, relatively weak domestic prices and growing consumer demand have fueled corn and other coarse grain purchases by the poultry and animal feed sector and other industrial users (e.g., starch and ethanol).

Traditionally, coarse cereals were the staple diet of Indians, especially for rural and lower income households. Coarse grains have been increasingly replaced by rice and wheat since the 1960's driven

by the relatively high productivity gains (Green Revolution) and government's food security strategy focusing on these crops compared to coarse grains. The recent productivity gain in corn through hybrid varieties has mostly been realized for feed/industrial grade corn, with limited varietal improvement in food grade corn. Although there has not been any published national consumption survey since National Sample Survey - Household Consumption of Good and Services in India, 2011/12 (see Table 10 of IN4005), changing consumer preferences driven by the strong economic growth continues to fuel a steady shift away from coarse grains. However, coarse grains are still an important cereal supplement in the staple diet for a large section of subsistence farmers and the rural poor that are not appropriately covered under the government food security programs. Sources report a growing 'new market' for coarse grains among "health conscious" urban Indian consumers, including Indians suffering from diabetes and other life style diseases for their higher fiber and nutrient content compared to rice/wheat.

Over the last two decades, corn is increasingly being used for feed and industrial use, particularly poultry feed and starch. Poultry industry has been growing by about 4-5 percent per annum on higher consumer demand for animal proteins due to a growing economy and expanding middle class. The starch industry, largely catering to textile production, is growing at 3-4 percent on domestic and export demand. There is small but growing use of corn for ethanol production, mostly for use by the potable liquor industry for blended whisky and other liquor. Other corn is used to produce traditional foods, snacks, and savories.

Despite estimated record production, relatively firm corn prices has slowed down the growth in consumption in MY 2016/17 as users supplement their requirement with cheaper alternatives like broken rice.




Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI.

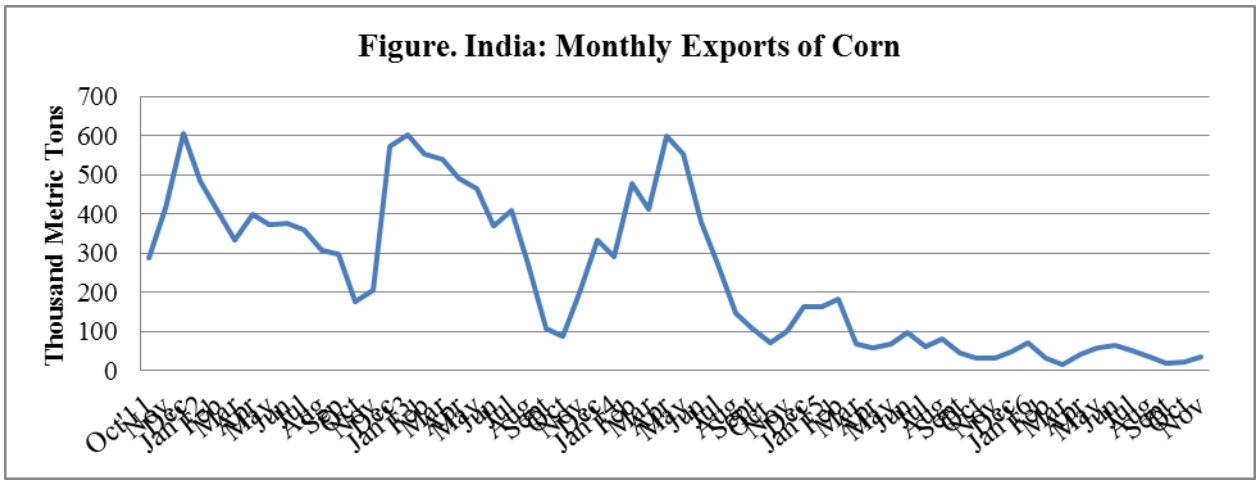
MY 2016/17 corn consumption is estimated to increase by two percent over previous year to 24 MMT, which includes 13.5 MMT for poultry feed, 1.8 MMT for starch, 1.2 MMT for ethanol, and balance for food, seed and other uses. Despite forecast tight supplies, MY 2017/18 corn consumption is forecast to grow by over 3 percent to 24.8 MMT, with poultry feed, starch and ethanol accounting for most of the increase.

Food use accounts for a major share of sorghum, millet, and barley consumption. Some poor quality (largely weather and rain damaged) grains are also fed to cattle. The new malting barley varieties are being used for brewing (650,000-700,000 metric tons). Indian sorghum is not traditionally fed to chickens due to its high tannins (poor taste), but is reportedly increasingly incorporated in the production of spirits, industrial alcohol, and starch.

India's domestic ethanol program for fuel does not affect the domestic and export market demand for cereal grains and its byproducts. The domestic ethanol program uses molasses (a sugar industry byproduct) as feed stock, and does not utilize cereal grains for producing ethanol for "fuel". The ethanol produced from lower quality coarse grains is used for potable liquor and other industrial uses, and none for 'fuel' use.

**Trade:**

Indian corn is uncompetitive in the international market due to relatively weak international prices. Post forecasts MY 2017/18 corn exports at 500,000 MT, mostly to neighboring markets and some seed exports. MY 2017/18 imports are forecast to increase to 400,000, mostly imports under the existing tariff rate quota of 500,000 MT.




After four consecutive years of bumper exports, Indian corn exports have slowed down significantly since MY 2015/16 on uncompetitive prices. Domestic prices have remained firm on strong demand, rising MSPs, and tariff and non-tariff barriers to import. MY 2016/17 exports are estimated at 500,000 MT, mostly to neighboring Nepal and seed exports. Market sources report that Indian corn is currently about $30 per MT more expensive than competing corn from other origins. Owing to the continued firm domestic prices, market sources report some enquiries for import corn by industrial users under the TRQ. Assuming higher end-season prices on tight supplies, there may be import of about 100,000 MT towards the end of the MY 2016/17.

India exports small quantities of sorghum and barley, largely to neighboring countries and the Middle East. Strong prices due to tight supplies resulted in India turning into net importer of barley in MY 2016/17, with imports estimated at 150,000 MT.

**Policy:**

Production:

The GOI production policy and program for coarse grains is significantly weaker on coverage and budgetary support compared to rice/wheat. The government's MSP procurement program and food distribution program through the PDS for coarse grains are restricted to few states, limited to procurement of food grade grains strictly for NFSA and other food security programs.

Unlike wheat and rice, the government does not have any buffer stock commitments for coarse grains. The GOI does not allow the use of food grains, including coarse cereals, to produce biofuels. However, grains certified not fit for human consumption can be used to produce ethanol for industrial use, including use for blending for potable liquor. Efforts to produce ethanol from other feed stocks like sweet sorghum stover and crop waste are still at research stage.

India has not commercialized any genetically engineered (GE) coarse grain crops. Some corn events from the private sector are going through the regulatory approval process, but are progressing slow and several years away from commercialization. Several Indian seed companies and public sector research institutions are developing various GE crops including corn and sorghum, but it may take several years before it can be commercialized. Most biotech events in other coarse grains (sorghum and millet) are still at the developmental stage, and have not been submitted for regulatory approval.

Trade:

Currently, the GOI imposes no restrictions on exports of corn, millet, sorghum, and barley. Imports of these commodities are also allowed by private trade subject to the effective import duty and phytosanitary conditions specified in the Plant Quarantine (Regulation of Imports into India) Order 2003.

India imposes a basic import duty of 50 percent on sorghum and millet, while the import duty for barley is zero. India allows corn imports under a tariff rate quota (TRQ) of 500,000 MT with a zero percent duty. Imports of corn outside the TRQ are subject to a 50 percent import duty. To import corn under the TRQ, the importer must obtain a Tariff Rate Quota Allocation Certificate issued by the Directorate General of Foreign Trade (DGFT). This certificate is issued in accordance with procedures developed by the EXIM Facilitation Committee.

The GOI's phytosanitary requirements for weed seeds, ergot, and other SPS issues, including no approvals to date for any GE corn events, have effectively banned U.S. coarse grain exports to India. Imports of any GE product, including GE corn and food products derived from GE crops are subject to approval by India's biotech regulatory agency, the Genetic Engineering Appraisal Committee (GEAC). To date, the GEAC has not approved any GE coarse grains or byproducts for import.

**Marketing:**

Owing to domestic shortages, India imported corn and barley in significant quantities since MY 2015/16. Growth of the poultry and starch industries and consequent demand from these sectors is

likely to outstrip domestic production of corn in near future, eventually creating steady demand for imported corn in the next three to five years. Growth in the brewing industry may fuel demand for malting grade barley in near future. India is likely to continue to import small quantities of food grade corn (e.g., sweet corn etc.,) and popcorn for the food processing industry due to growing consumer demand and low domestic supplies.

**Production, Supply and Demand Data Statistics:**

**Table 10. India: Commodity, Corn, PSD**
(Area in Thousand Hectares, Quantity in Thousand Metric Tons, Yield in MT/Hectare)

| Corn | 2015/2016 | | 2016/2017 | | 2017/2018 | |
|---|---|---|---|---|---|---|
| Market Begin Year | Nov 2015 | | Nov 2016 | | Nov 2017 | |
| India | USDA Official | New Post | USDA Official | New Post | USDA Official | New Post |
| Area Harvested | 8690 | 8806 | 9500 | 10200 | 0 | 9500 |
| Beginning Stocks | 2179 | 2179 | 1025 | 1010 | 0 | 1610 |
| Production | 21800 | 22570 | 24500 | 25000 | 0 | 24000 |
| MY Imports | 246 | 246 | 100 | 100 | 0 | 400 |
| TY Imports | 246 | 246 | 100 | 100 | 0 | 400 |
| TY Imp. from U.S. | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Supply | 24225 | 24995 | 25625 | 26110 | 0 | 26010 |
| MY Exports | 550 | 485 | 600 | 500 | 0 | 500 |
| TY Exports | 550 | 485 | 600 | 500 | 0 | 500 |
| Feed and Residual | 13050 | 13500 | 13600 | 13800 | 0 | 14300 |
| FSI Consumption | 9600 | 10000 | 9800 | 10200 | 0 | 10500 |
| Total Consumption | 22650 | 23500 | 23400 | 24000 | 0 | 24800 |
| Ending Stocks | 1025 | 1010 | 1625 | 1610 | 0 | 710 |
| Total Distribution | 24225 | 24995 | 25625 | 26110 | 0 | 26010 |

**Table 11. India: Commodity, Corn, Prices Table**

| Prices In | Rupees | per uom | Metric tons | %Change |
|---|---|---|---|---|
| Year | 2014 | 2015 | 2016 | |
| | | | | |
| January | 12,908 | 12,829 | 14,600 | 13.8 |
| February | 12,704 | 13,385 | 15,286 | 14.2 |
| March | 13,311 | 13,865 | 14,982 | 8.1 |
| April | 12,768 | 14,302 | 14,501 | 1.4 |
| May | 12,944 | 13,062 | 14,129 | 8.2 |
| June | 12,325 | 13,390 | 14,762 | 10.2 |
| July | 12,522 | 12,888 | 15,015 | 16.5 |
| August | 12,615 | 14,010 | 15,505 | 10.7 |
| September | 12,815 | 13,878 | 15,169 | 9.3 |
| October | 12,468 | 13,875 | 14,411 | 3.9 |
| November | 12,291 | 14,073 | 14,901 | 5.9 |
| December | 12,261 | 14,687 | 14,381 | -2.1 |
| | | | | |
| Exchange Rate | 66.75 | Local Currency/US$ | | |
| Date of Quote | 02/15/17 | MM/DD/YYYY | | |

National Average Monthly Wholesale Prices of Corn
Source: Agmarket News (http://agmarkweb.dacnet.ic.in), Ministry of Agriculture, GOI.

**Table 12. India: Commodity, Sorghum, PSD**
(Area in Thousand Hectares, Quantity in Thousand Metric Tons, Yield in MT/Hectare)

| **Sorghum** | **2015/2016** | | **2016/2017** | | **2017/2018** | |
|---|---|---|---|---|---|---|
| **Market Begin Year** | **Nov 2015** | | **Nov 2016** | | **Nov 2017** | |
| **India** | **USDA Official** | **New Post** | **USDA Official** | **New Post** | **USDA Official** | **New Post** |
| **Area Harvested** | 5575 | 6077 | 5800 | 5100 | 0 | 5000 |
| **Beginning Stocks** | 588 | 588 | 93 | 151 | 0 | 101 |
| **Production** | 4410 | 4238 | 5500 | 4800 | 0 | 4500 |
| **MY Imports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **TY Imports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **TY Imp. from U.S.** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Supply** | 4998 | 4826 | 5593 | 4951 | 0 | 4601 |
| **MY Exports** | 85 | 75 | 50 | 50 | 0 | 0 |
| **TY Exports** | 85 | 75 | 50 | 50 | 0 | 0 |
| **Feed and Residual** | 520 | 500 | 750 | 600 | 0 | 500 |
| **FSI Consumption** | 4300 | 4100 | 4600 | 4200 | 0 | 4000 |
| **Total Consumption** | 4820 | 4600 | 5350 | 4800 | 0 | 4500 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Ending Stocks** | 93 | 151 | 193 | 101 | 0 | 101 |
| **Total Distribution** | 4998 | 4826 | 5593 | 4951 | 0 | 4601 |

**Table 13. India: Commodity, Millet, PSD**
(Area in Thousand Hectares, Quantity in Thousand Metric Tons, Yield in MT/Hectare)

| **Millet** | **2015/2016** | | **2016/2017** | | **2017/2018** | |
|---|---|---|---|---|---|---|
| **Market Begin Year** | **Nov 2015** | | **Nov 2016** | | **Nov 2017** | |
| **India** | **USDA Official** | **New Post** | **USDA Official** | **New Post** | **USDA Official** | **New Post** |
| **Area Harvested** | 8840 | 8916 | 8715 | 9100 | 0 | 9000 |
| **Beginning Stocks** | 507 | 507 | 227 | 287 | 0 | 587 |
| **Production** | 10220 | 10280 | 10750 | 11500 | 0 | 11000 |
| **MY Imports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **TY Imports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **TY Imp. from U.S.** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Supply** | 10727 | 10787 | 10977 | 11787 | 0 | 11587 |
| **MY Exports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **TY Exports** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feed and Residual** | 1150 | 1150 | 1150 | 1400 | 0 | 1300 |
| **FSI Consumption** | 9350 | 9350 | 9500 | 9800 | 0 | 9900 |
| **Total Consumption** | 10500 | 10500 | 10650 | 11200 | 0 | 11200 |
| **Ending Stocks** | 227 | 287 | 327 | 587 | 0 | 387 |
| **Total Distribution** | 10727 | 10787 | 10977 | 11787 | 0 | 11587 |

**Table 14. India: Commodity, Barley, PSD**
(Area in Thousand Hectares, Quantity in Thousand Metric Tons, Yield in MT/Hectare)

| **Barley** | **2015/2016** | | **2016/2017** | | **2017/2018** | |
|---|---|---|---|---|---|---|
| **Market Begin Year** | **Apr 2015** | | **Apr 2016** | | **Apr 2017** | |
| **India** | **USDA Official** | **New Post** | **USDA Official** | **New Post** | **USDA Official** | **New Post** |
| **Area Harvested** | 708 | 708 | 590 | 590 | 0 | 650 |
| **Beginning Stocks** | 231 | 231 | 246 | 246 | 0 | 229 |
| **Production** | 1613 | 1613 | 1510 | 1438 | 0 | 1700 |
| **MY Imports** | 3 | 3 | 120 | 150 | 0 | 100 |
| **TY Imports** | 119 | 119 | 100 | 150 | 0 | 0 |
| **TY Imp. from U.S.** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Supply** | 1847 | 1847 | 1876 | 1834 | 0 | 2029 |
| **MY Exports** | 81 | 81 | 70 | 5 | 0 | 50 |
| **TY Exports** | 5 | 5 | 70 | 5 | 0 | 50 |
| **Feed and Residual** | 200 | 200 | 220 | 250 | 0 | 300 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **FSI Consumption** | 1320 | 1320 | 1350 | 1350 | 0 | 1400 |
| **Total Consumption** | 1520 | 1520 | 1570 | 1600 | 0 | 1700 |
| **Ending Stocks** | 246 | 246 | 236 | 229 | 0 | 279 |
| **Total Distribution** | 1847 | 1847 | 1876 | 1834 | 0 | 2029 |