

Price Policy for **Kharif Crops**

THE MARKETING SEASON 2019-20



Commission for Agricultural Costs and Prices

Department of Agriculture, Cooperation & Farmers Welfare

Ministry of Agriculture & Farmers Welfare

Government of India, New Delhi

March 2019

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सत्यमेव जयते

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Commission for Agriculture Costs and Prices
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Krishi Bhawan, New Delhi-110 001

Preface


It is a privilege and immense honour for me to submit the report of **“Price Policy for Kharif Crops: The Marketing Season 2019-20”**. The report contains recommendations on Minimum Support Prices (MSP) for the mandated kharif crops, namely, **paddy, maize, jowar, bajra, ragi, arhar (tur), moong, urad, groundnut, soybean, sunflower, sesamum, nigerseed** and **cotton** and non-price policy recommendations. I hope that these recommendations will help in achieving the goal of doubling farmers’ income by 2022 by incentivising farmers to adopt new technologies and practices, ensuring remunerative prices and improving competitiveness of Indian agriculture.

Summary of Recommendations is followed by an overview of Indian agriculture in Chapter 1. Chapter 2 of the report discusses demand-supply situation and procurement operations. Trends in productivity and input management issues are analysed in Chapter 3 and trade patterns and brief review of agricultural trade policy is presented in Chapter 4. Costs and returns and cost projections for Kharif Marketing Season 2019-20 are discussed in Chapter 5. Non-price and price policy recommendations are presented in the Chapter 6.

Many people have assisted in the preparation of this report. First and foremost, I would like to express my sincere thanks to farmers, representatives of farmers/farmers’ associations, ICAR awardee farmers, officers from Central and State Governments, representatives of various agencies/organizations/companies involved in procurement, post-harvest management, processing and marketing of agricultural commodities, and various other stakeholders for providing valuable insights and suggestions during the meetings and preparation of this report. Special thanks to the Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare for providing data on cost estimates for this report.

My sincere thanks for the excellent support provided by Governments of Odisha, Manipur, Karnataka, Rajasthan and Punjab in organizing and hosting the regional meetings with various stakeholders for the eastern States in Bhubaneswar, N-E States in Imphal, southern States in Bengaluru, western States in Jaipur and northern States in Chandigarh.

Last but not least, credit is due to the officers and staff of the commission, who contributed to this report. Sincere gratitude goes to Dr. Shailja Sharma, former Member Secretary,



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31st March, 2019

(Vijay Paul Sharma)



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Acronyms

A ₂	Actual paid out cost
A ₂ +FL	Actual paid out cost plus imputed value of family labour
ABHY	Atal Bhujal Yojana
AGMARKNET	Agricultural Marketing Network
AIBP	Accelerated Irrigation Benefit Programme
AIMS	Agricultural Market Information System
AMIF	Agri-Market Infrastructure Fund
APEDA	Agricultural and Processed Food Products Export Development Authority
APMC	Agriculture Produce Market Committee
BGREI	Bringing Green Revolution to Eastern India
C ₂	Comprehensive cost including rental value of own land (Net of land revenue) and interest on value of own fixed capital assets (excluding land)
CACP	Commission for Agricultural Costs & Prices
CEA	Central Electricity Authority
CFPI	Consumer Food Price Inflation
CIPI	Composite Input Price Index
CoC	Cost of Cultivation
CoP	Cost of Production
CPI	Consumer Price Index
CS	Comprehensive Scheme
CSO	Central Statistics Office
DAC&FW	Department of Agriculture, Cooperation and Farmers Welfare
DCP	Decentralized Procurement
DES	Directorate of Economics And Statistics
DFPD	Department of Food and Public Distribution

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DGCIS	Directorate General of Commercial Intelligence and Statistics
DIPP	Department of Industrial Policy & Promotion
DMI	Directorate of Marketing & Inspection
DTA	Domestic Tariff Area
e-NAM	electronic National Agriculture Market
EOU	Export Oriented Units
FAI	Fertilizers Association of India
FAO	Food and Agriculture Organisation
FAQ	Fair Average Quality
FCI	Food Corporation of India
FLD	Front Line Demonstration
FPI	Food Price Index
FPO	Farmer Producer Organisations
GCA	Gross Cropped Area
GIA	Gross Irrigated Area
GrAM	Gramin Agricultural Markets
GST	Goods and Service Tax
GVA	Gross Value Added
GVO	Gross Value of Output
Ha	Hectare
HSD	High Speed Diesel
ICAR	Indian Council of Agricultural Research
ICDS	Integrated Child Development Services
IGC	International Grain Council
IIMR	Indian Institute of Maize Research
KALIA	Krushak Assistance for Livelihood and Income Augmentation
KMS	Kharif Marketing Season
LCS	Land Customs Stations
MDM	Mid-Day Meal
MEIS	Merchandise Exports from India Scheme
MENA	Middle East and North Africa
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIDH	Mission for Integrated Development of Horticulture

Acronyms



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Acronyms

MSP	Minimum Support Price
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation of India Ltd
NAFIS	NABARD All-India Financial Inclusion Survey
NCT	National Capital Territory
NE	North Eastern
NFSA	National Food Security Act
NFSM	National Food Security Mission
NIA	National Insurance Academy
NMOOP	National Mission on Oilseeds and Oil Palm
NPC	National Productivity Council
OECD	Organization for Economic Cooperation and Development
OGL	Open General License
OMSS(D)	Open Market Sale Scheme (Domestic)
OWS	Other Welfare Schemes
PDPS	Price Deficiency Payment Scheme
PDS	Public Distribution System
PM-AASHA	Pradhan Mantri Annadata Aay SanraksHan Abhiyan
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMGSY	Pradhan Mantri Gram Sadak Yojana
PM-KISAN	Pradhan Mantri Kisan Samman Nidhi
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
POS	Point of Sale
PPSS	Private Procurement & Stockist Scheme
PSF	Price Stabilisation Fund
PSS	Price Support Scheme
QE	Quinquennial Ending
QPM	Quality Protein Maize
QR	Quantitative Restrictions
RBI	Reserve Bank of India
RKVY	Rashtriya Krishi Vikas Yojana
RMS	Rabi Marketing Season
RRBs	Regional Rural Banks

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SCH	Single Cross Hybrids
SFAC	Small Farmers' Agri-business Consortium
SHC	Soil Health Card
SPS	Sanitary and Phytosanitary Measure
TE	Triennium Ending
TPDS	Targeted Public Distribution System
US	United States
USDA	United States Department of Agriculture
UT	Union Territory
WPI	Wholesale Price Index
WTO	World Trade Organisation

Acronyms

Summary of Recommendations

Price Policy Recommendations

S.1 Considering the cost of production, overall demand-supply situation of various crops in domestic and world markets, domestic and international prices, inter-crop price parity, terms of trade between agriculture and non-agriculture sector, likely effect of price policy on rest of the economy and a minimum of 50 percent as the margin over the cost of production, the Commission recommends the following Minimum Support Prices (MSPs) as given in the Table S.1 below.

Table S.1: MSPs Recommended for Kharif Marketing Season (KMS), 2019-20

(₹/qtl)

Crops	Projected Cost A ₂ +FL KMS 2019-20	MSP KMS 2018-19	Recommended MSP for KMS 2019-20	MSP as percent of A ₂ +FL
Paddy (Common)	1208	1750	1815 (3.7)	150
Paddy (Grade A)	-	1770	1835 (3.7)	-
Jowar (Hybrid)	1698	2430	2550 (4.9)	150
Jowar (Maldandi)	-	2450	2570 (4.9)	-
Bajra	1083	1950	2000 (2.6)	185
Ragi	2100	2897	3150 (8.7)	150
Maize	1171	1700	1760 (3.5)	150
Tur (Arhar)	3636	5675	5800 (2.2)	160
Moong	4699	6975	7050 (1.1)	150
Urad	3477	5600	5700 (1.8)	164
Groundnut	3394	4890	5090 (4.1)	150
Sunflower Seed	3767	5388	5650 (4.9)	150
Soybean (Yellow)	2473	3399	3710 (9.1)	150
Sesamum	4322	6249	6485 (3.8)	150
Nigerseed	3960	5877	5940 (1.1)	150
Cotton (Medium Staple)	3501	5150	5255 (2.0)	150
Cotton (Long Staple)	-	5450	5550 (1.8)	-

Note: Figures in parenthesis represent increase in MSP over the previous year



Non-Price Recommendations

Managing Rice Stocks and Exports

- S.2 As on 1st March 2019, central stocks of rice were 26.39 million tonnes, almost double the buffer stock norm of 13.58 million tonnes on 1st April. In order to liquidate excess stocks, government has started sale of wheat and rice in the open market through Open Market Sale Scheme (Domestic) but off-take of rice is very low as compared to wheat. The Commission recommends that the reserve price for sale of grains in open market should not be below the economic cost as low prices discourage private players to procure directly from farmers during procurement season. The government also needs to review its open ended procurement policy.
- S.3 India's non-basmati rice exports have declined during April-December 2018 as compared to the corresponding period last year due to high prices driven by a sharp increase in MSP of paddy in KMS 2018-19 and sluggish demand from some importing countries. Depreciation of the rupee and incentive to non-basmati exports under the Merchandise Exports from India Scheme (MEIS) have helped exports. Currently, export price of Indian rice is higher than that of Pakistan and Vietnam. Therefore, special efforts are needed to increase non-basmati rice exports.

Promotion of Nutri-cereals

- S.4 The area under nutri-cereals has shrunk from about 40 million hectares during pre-green revolution period to less than 15 million hectares during recent years. Nutri-cereals being climate-resilient, environment friendly, primarily grown in rainfed areas and having much higher nutritional value, there is an urgent need to increase productivity and production of these crops. Special focus should be given on developing value-added strategies and appropriate processing technologies, which will result in several value-added and health food-products that will ultimately help in boosting demand from large urban population. In addition, the Commission recommends that nutri-cereals should be included in National Food Security Act (NFSA)/Targeted Public Distribution System (TPDS) and other welfare schemes in those States where nutri-cereals were part of their staple diet and malnutrition is commonly prevalent.

Diversification in Utilization of Maize

- S.5 Demand for maize has been historically driven by the feed and starch industries. But with changing food habits, the demand for specialty products like baby corn, sweet corn, etc. is also growing. The National Policy on Biofuels 2018 allowed use of corn for ethanol production, which will not only give boost to maize sector in the country but also help in increasing farm income. Adoption of single cross hybrids (SCH) and promoting rabi maize cultivation will help in increasing the production and productivity of maize, which is very low compared to world average.



Incentivize and Encourage Pulses Production

- S.6 Pulses have high volatility in production and productivity as these crops are grown mostly under rainfed conditions. Therefore, there is a need to improve productivity and reduce fluctuations in output through improved drought tolerant varieties, technologies and extension. Research and development activities need to be scaled up by roping in private sector and to develop better market linkages so that farmers get better prices. There is also a need to strengthen processing facilities both at farm level and in organized sector.
- S.7 The Commission recommends that pulses growers should be incentivized and ensured remunerative prices to keep them motivated to grow pulses. The Commission also suggests that pulses stocks should not be sold in the open market below the economic cost as it discourages industry and traders to procure the commodity during marketing season. Pulses should be included in PDS and other welfare schemes in at least those districts where malnutrition is a major problem.

Focus on Oilseeds

- S.8 In view of stagnant domestic production of oilseeds and high import dependence, appropriate strategies and interventions should be implemented for increasing oilseeds production and productivity. Assured and remunerative price would encourage farmers to produce more and improve productivity. However, producer prices of most oilseeds remained subdued during the last two seasons, ruling below MSP. Government procured large quantities of oilseeds during the last 2-3 years but disposal remains a challenge due to lack of assured off-take of stocks unlike rice and wheat. The Commission is of the considered view that Price Deficiency Payment Scheme (PDPS) and Private Procurement & Stockist Scheme (PPSS) in oilseeds are better options than physical procurement.

Strengthen Procurement Operations and Markets

- S.9 Although market prices of most kharif crops ruled below MSP in many States during KMS 2018-19, these prices have improved significantly compared to KMS 2017-18 level and are anticipated to improve further in the coming season. To ensure remunerative prices to the farmers for their produce, procurement operations and market infrastructure need to be strengthened. The new scheme 'Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)', linking of more APMCs with e-NAM and development and upgradation of 22,000 rural haats into Gramin Agricultural Markets (GrAMs) will go a long way in ensuring better prices to farmers.

Price Deficiency Payment Scheme (PDPS)

- S.10 The Commission recommends that PDPS should be introduced for commercial crops like oilseeds, cotton, maize, etc. which have no assured/established mechanism for liquidation of stocks. However, in view of problem of depressed prices in the



presence of PDPS and collusion between farmers and market intermediaries under Bhavantar Bhugtan Yojana (BBY) in Madhya Pradesh in kharif 2017 season, the Commission recommends that floor selling/modal price should be fixed based on price trends of last 4-5 years with strict adherence to fair average quality (FAQ) norms. In addition, farmers should be encouraged and incentivized to store their produce in accredited warehouses and provided loans against Warehouse Receipt to meet cash flow needs without selling their produce when market prices are typically low at harvest-time. This arrangement will allow the farmers to delay the sale of produce until more favourable market conditions emerge. However, such farmers should be entitled to receive the benefit of PDPS, if market prices in later months are below MSP.

Re-energising Cotton Sector

- S.11 Production of cotton has remained stagnant at 34-35 million bales during the last 5-6 year mainly due to stagnating yield. Although market prices of cotton remained above MSP during the current marketing season, prices showed declining trend during the last 3-4 months. In order to increase productivity of crop and overall competitiveness of cotton sector, it is necessary to ensure availability of quality seed, timely management and control of pests and diseases, promote cultivation under drip irrigation and encourage extra-long staple cotton cultivation.

Farm Mechanisation

- S.12 Shrinking labour availability and rising agriculture wages are leading to higher cost of cultivation. Therefore, there is a need to promote mechanization in agriculture to reduce cost of cultivation and improve efficiency. However, farm mechanisation is a challenge in small and fragmented land holdings and hence, there is a need to develop customized farm machinery and implements for land preparation, planting, harvesting, post-harvest handling and other farm operations. Higher GST on certain farm machinery and implements is one of the major constraints in promoting mechanisation. The Commission recommends that GST on farm machinery and implements should be reduced to the lowest bracket.

Improving Water Use Efficiency

- S.13 Expansion and better management of irrigation is critical for increasing agricultural production and productivity but must be sustainable and cost-effective. While efforts are needed to increase water use efficiency under conventional flood method of irrigation, micro-irrigation should be incentivized and encouraged to improve water use efficiency. Increased use of micro-irrigation along with water-soluble fertilizers holds the potential to achieve productivity at par with world average in coming years. With better water management practices and the right mix of pricing policies and incentives, vulnerability of Indian agriculture to water constraint can be managed sustainably.



Soil Health Management

- S.14 The Soil Health Card (SHC) scheme was launched to help farmers to know the health condition of soil and scheme has made good progress. However, in order to educate farmers about soil nutrient status and application of different nutrients needed, farmers' training, field demonstrations, workshops, etc. should be conducted. Soil health analysis is done every two years but as per industry experts it may be carried out once in 3-5 years as the soil profile does not undergo major changes in such a short span of time. Besides, efforts should be made to manufacture and promote customised fertilisers based on results of the soil quality under SHC scheme to rationalise fertiliser use and reduce input costs of farmers.

Managing Production Risks: PMFBY

- S.15 Though the crop insurance has made a good progress in terms of coverage, both acreage and number of farmers, after the launch of Pradhan Mantri Fasal Bima Yojana (PMFBY), more efforts are required to bring more farmers under the scheme.

Loan Waiver

- S.16 During the last five years, about 13 States/Union Territories (UTs) have announced farm loan waiver schemes. Debt waiver can bring some relief to selected group of farmers in the short run, but has negative effects on fiscal deficit of States, credit allocation and credit discipline of borrowers and also creates a moral hazard problem. Moreover, only a small proportion of farmers benefit from such schemes. It has been found that announcement of loan waivers in the past has slowed down credit flow to the sector in the States. There are no credible evidences to show that the loan waiver schemes have reduced the distress of the farmers. The Commission, therefore, is of the considered view that farm loan waiver is not a solution to address agrarian problems but need to address structural and institutional deficiencies in the sector by undertaking comprehensive reforms in agricultural marketing and trade policies, logistics and infrastructure and institutional arrangements.

Crop Residue Management

- S.17 A significant progress has been made in reducing the number of stubble burning cases through concerted efforts made by the Central and State governments. To reduce stubble burning in Punjab, Haryana and Uttar Pradesh, government should continue to provide subsidy on crop residue management machinery. Special efforts are needed to promote group based approach like custom hiring service centres to promote machines for in-situ management of crop residues. Alternative commercially viable uses of paddy straw need to be explored.



Strengthen Markets and Market Linkages

S.18 The overall volume of trade on electronic National Agriculture Market (e-NAM) has increased significantly during last two years and inter-market as well as inter-state trade on e-NAM has also started taking place. However, only eight States have participated in inter-state trade and its volume is also low. Therefore, more States and commodities need to be brought in the inter-state trade, which will provide better selling options to farmers. In order to facilitate farmers' participation in the e-NAM platform, Farmer Producer Organisations (FPOs) should be promoted and trained to trade on the e-NAM. States should be asked to adopt new Model Act "The State/UT Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017" to facilitate restriction-free trade of agricultural produce.

Bonus on MSP: Market Distortions

S.19 Some State governments have been giving bonus over and above MSP, particularly for paddy during past few years, which creates distortions in market and almost crowds out private sector. Bonus on MSP affects inter-crop parity and discourages farmers from diversification of production basket. The Commission re-iterates its earlier recommendation that such bonuses/incentives should be discouraged, particularly in surplus States.

Awareness about MSP and FAQ Norms

S.20 There is a lack of awareness among farmers about the MSP and FAQ norms and very often farm produce brought to the procurement centre is at times rejected due to subjectivity in quality assessment or the produce does not meet the FAQ norms. Therefore, there is a need to create awareness about MSP, FAQ norms, procurement systems and also develop a transparent and scientific mechanism for deciding FAQ norms for procurement operations. The Commission recommends that State governments should give wide publicity about MSP, FAQ norms and procurement mechanisms in electronic and print media in regional/vernacular languages and also through pamphlets and announcements in the villages before the procurement season starts.

Special Focus on North Eastern (NE) States

S.21 The North Eastern States produce about 7 million tonnes of rice but procurement is negligible. Therefore, market prices of paddy remain well below the MSP. Total allocation of rice under NFSA/TPDS and other welfare schemes for NE States is about 2.7 million tonnes. In order to meet the requirement, rice stocks are moved from Punjab and Haryana to the NE region, which is costly as transportation cost is extremely high. The region has great potential for increasing rice production if farmers are provided better technology and more importantly, assured remunerative price. The Commission recommends that procurement efforts need to be stepped up in the NE region and some relaxation in norms such as moisture



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content, out-turn-ratio, etc. could be considered in the initial years. It would help in ensuring better price to farmers and also saving in movement cost of Food Corporation of India (FCI) stocks from northern region.

Issues Related to Sample Size in Cost Estimation

- S.22 In certain crops and States, the sample size under the 'Comprehensive Scheme (CS) for Studying the Cost of Cultivation (CoC) of Principal Crops in India' is very small and can undermine the reliability of cost estimates. The Commission, therefore, suggests that sample size for the crops/States having significant share in all-India production or within the State in a particular crop/crop group should be increased to have reliable cost estimates.



Chapter 1

Overview

- 1.1 Indian farmers have achieved new records in 2017-18, with foodgrains production at 284.83 million tonnes (as per 4th Advance Estimates), driven primarily by a significant increase in rice, nutri-cereals and pulses production. Rice production reached a record 112.91 million tonnes for the first time, an increase of 2.9 percent over the last year production and pulses at 25.23 million tonnes in 2017-18 (9% increase over last year). For nutri-cereals as a whole, the total output of 16.50 million tonnes in 2017-18 is 2.3 percent higher than that of last year and production of total nine oilseeds is estimated at 31.31 million tonnes, a marginal increase compared to last year. Maize production also reached a new record of 28.72 million tonnes in 2017-18 while barley production was 1.77 million tonnes. Cotton registered 7.1 percent increase, from 32.58 million bales in 2016-17 to 34.89 million bales in 2017-18. As a result, the 'agriculture, forestry and fishing' sector is poised to grow at 5.0 percent during 2017-18 on top of the previous year's growth rate of 6.3 percent. However, as per Second Advance Estimates for 2018-19, total foodgrains production in the country is forecast to be slightly lower than the target and 2017-18 level. Nutri-cereals production for 2018-19 is forecast 3.98 million tonnes lower to 12.92 million tonnes, maize production is estimated at 27.80 million tonnes (3.2% lower than 2017-18), pulses production is expected to drop by about 1.2 million tonnes and cotton production by 13.8 percent, while rice production is expected to increase by 2.69 million tonnes.
- 1.2 Despite below normal rainfall during 2016 (97% of normal rainfall) and 2017 (95% of normal rainfall), two successive years, 2016-17 and 2017-18, of bumper harvest of foodgrains is a commendable achievement of Indian agriculture. This may be the result of effective government interventions like National Food Security Mission (NFSM), Rashtriya Krishi Vikas Yojana (RKVY), National Mission on Oilseeds and Oil Palm (NMOOP), Mission for Integrated Development of Horticulture (MIDH), etc. targeted at providing new technologies, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) for strengthening and improving irrigation systems, Pradhan Mantri Fasal Bima Yojana (PMFBY) for risk management, increased flow of credit, etc. and remunerative Minimum Support Prices (MSPs) and effective trade policy. For

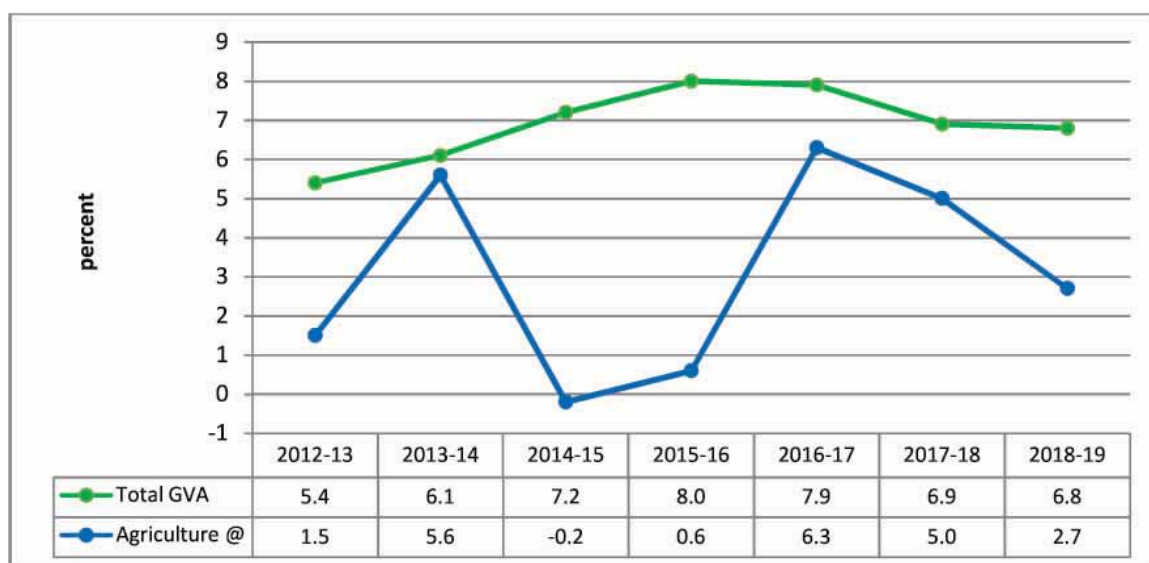


example, government procured 18.78 lakh tonnes of pulses during 2016-17 and 44.96 lakh tonnes during 2017-18. In order to provide remunerative prices to farmers, government procured 1.4 million tonnes of oilseeds during last two years under PSS. Import duties on pulses and edible oils were increased while agricultural exports were freed from restrictions to ensure better prices to farmers.

Growth in Agriculture and Allied Sectors

- 1.3 As per Second Advance Estimates of National Income released by Central Statistics Office (CSO), Gross Value Added (GVA) at Basic Constant Prices (2011-12) for 2018-19 from 'Agriculture, Forestry and Fishing' is expected to grow by 2.7 percent as compared to growth of 5.0 percent in 2017-18. The slow-down in agricultural growth is a cause for concern. The fluctuation in GVA from agriculture and allied sectors also remains an important issue (Chart 1.1).

Chart 1.1: Comparative Growth in Total GVA at Basic Price (At 2011-12 Prices) and GVA (Agriculture) during 2012-13 to 2018-19



Note: @ Agriculture includes crops, livestock, forestry & logging, and fishing & aquaculture

Source: CSO

India's Agriculture Trade Scenario

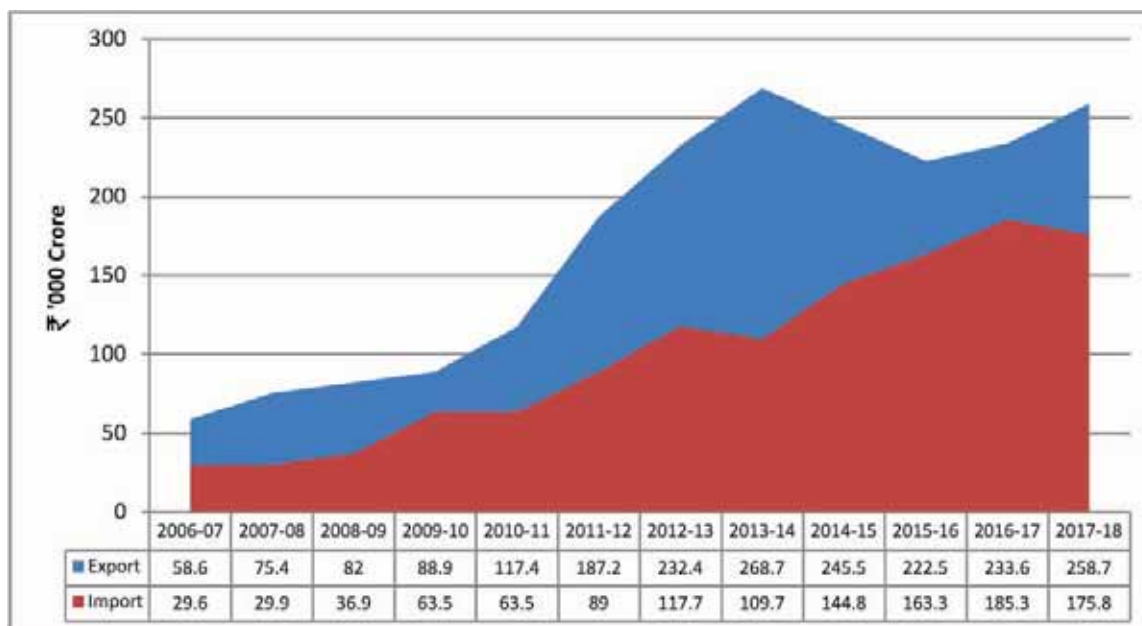
- 1.4 Indian agricultural exports during 2017-18 were ₹258.7 thousand crore against an import of agri-commodities worth ₹175.8 thousand crore with the agricultural sector being a trade surplus sector (Chart 1.2). Agricultural exports recorded 10.7 percent increase in 2017-18 compared with 2016-17 while imports declined by over 5.0 percent during the corresponding period. This increase in exports is primarily due to higher exports of rice (basmati/non-basmati), tea, coffee, cashew, oil meals, guar gum meal, marine products and raw cotton. Significant reduction in imports of pulses and wheat led to decline in imports during 2017-18.

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- 1.5 As per World Trade Organisation (WTO), India's share in total global exports of agri-products has increased from 2.1 percent in 2016 to 2.3 percent in 2017. This share is more than the share that India had in global merchandise exports (1.7%) in 2017, which is indicative of the inherent comparative advantage in agri-products. India's share in total world agri-imports in 2017 was 1.9 percent.
- 1.6 The outlook for the 2018-19 agricultural trade is more positive as India's agri-exports increased by about 6.6 percent during April-December 2018 over April-December 2017, mainly driven by exports of raw cotton, oil meals, sugar, guar gum meal and spices. However, non-basmati rice exports declined from about 6.5 million tonnes during April-December 2017 to 5.6 million tonnes during April-December 2018. High domestic prices due to sharp increase in MSP in 2017-18 led to higher export prices, but the depreciation of the rupee and incentive to non-basmati exports under the Merchandise Exports from India Scheme (MEIS) have helped to offset these forces. India's agricultural exports in 2018-19 are expected to increase due to removal of export restrictions and higher demand for agricultural commodities in global economy.

Chart 1.2: India's Exports and Imports of Agri-Commodities: 2006-07 to 2017-18



Source: DGCIS

Overview

Central Pool Stocks

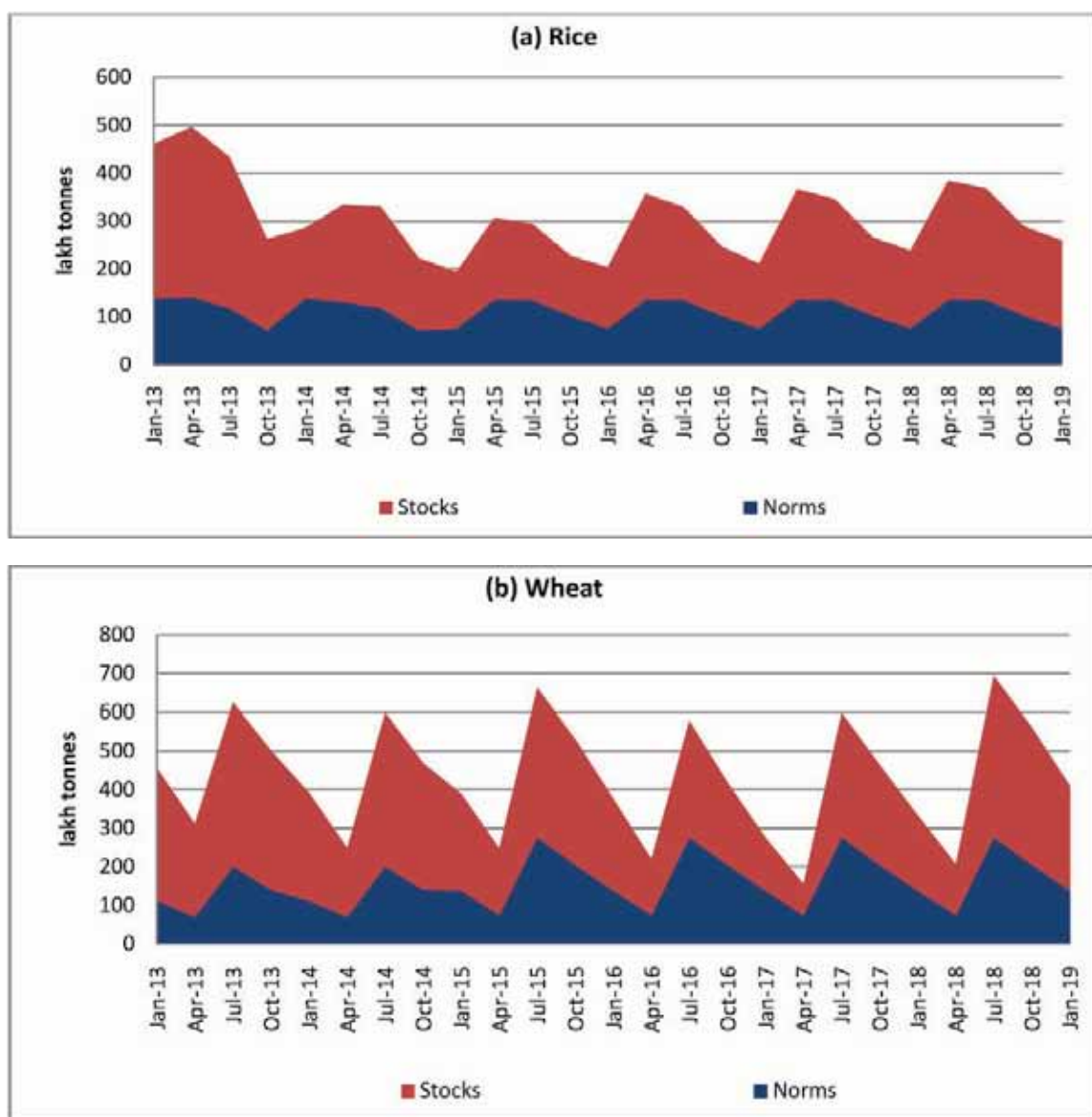
- 1.7 Two successive years of bumper production and higher procurement have led to significant increase in stocks of rice and wheat in central pool. As against the buffer stock norm of 41.12 million tonnes of rice and wheat (as on 1st July), total central pool stocks were 65.05 million tonnes (23.25 million tonnes of rice and 41.80 million tonnes of wheat) as on 1st July, 2018 (Chart 1.3). The situation is not very different as on 1st January, 2019, with 45.41 million tonnes of central pool stocks



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which are more than double the buffer stock norm of 21.41 million tonnes. Of the total stocks, wheat was 27.12 million tonnes as on January 1, 2019, 38.6 percent higher than January 1, 2018, while rice was about 18.29 million tonnes, 12.9 percent higher than the last year. It is expected that these would further increase as on 1st July, 2019 with higher procurement of rice due to higher MSP and bonus given by various State governments in KMS 2018-19 and wheat in RMS 2019-20. These excess stocks, beyond the buffer stock norms, would lead to higher storage and financing costs, which would result in higher food subsidy bill.

Chart 1.3: Central Pool Stocks with FCI, January 2013 to January 2019



Source: Department of Food and Public Distribution



- 1.8 In order to liquidate excess stock in the central pool and ensure supply of the foodgrains in the country, government has started sale of wheat and rice in the open market through Open Market Sale Scheme (Domestic) [OMSS(D)] from July 2018. As per FCI data, total quantity of wheat sold under OMSS(D) during 2018-19 (up to 2nd Tender of February 2019) was about 7 million tonnes against 9.98 million tonnes offered for sale. Out of total sales, about 5.95 million tonnes were sold to bulk consumers. In case of rice, only 6.8 lakh tonnes were sold largely to State governments while bulk consumers bought only 1300 tonnes. The reserve price for wheat for second, third and fourth quarter of 2018-19 for Madhya Pradesh, Punjab and Haryana was ₹1900, ₹1925 and ₹1950 per quintal, respectively. While, economic cost of wheat for 2018-19 (RE) is ₹2435.23 per quintal and procurement cost+procurement incidentals work out to about ₹2002 per quintal. The reserve price less than economic cost and even below procurement cost+procurement incidentals discourages private players to procure wheat directly from farmers during procurement season as they prefer to buy from government at lower price. Therefore, Commission is of the view that reserve price of grains under OMSS(D) particularly for bulk consumers should not be fixed below procurement cost+procurement incidentals.

Maize

- 1.9 Maize production in the country has more than doubled during the last two decades and reached a record high of 28.72 million tonnes in 2017-18. Improvement in productivity, from 2.69 tonnes per hectare in 2016-17 to 3.03 tonnes per hectare in 2017-18, contributed to increase in maize production during the year 2017-18. About 80 percent area under maize is during kharif season, which contributes about 70 percent of production. Kharif crop yield is significantly lower (2.7 t/ha) compared with rabi season (>4 t/ha). The demand for maize as food, feed, fodder and industrial uses has increased significantly and is expected to grow further, which implies further need to increase productivity. At the same time, maize production and productivity is constrained by various factors, including lack of access to improved seeds, inputs, abiotic and biotic stresses and low prices. Market price remain depressed during peak market arrivals when most farmers sell produce and price steadily increase thereafter. Maize price rose during October 2018 to January 2019 and saw convergence towards MSP. Since procurement of maize under MSP operations is limited as there is no assured outlet for disposal unlike rice and wheat, market prices remain below MSP. In order to address this constraint, 'Price Deficiency Payment Scheme (PDPS)', where difference between MSP and market price (with some ceiling on market price) could be paid to farmers in case market price fall below MSP, can be implemented on pilot basis in major producing regions.
- 1.10 Efforts should be made to diversify maize usage towards specialty products like quality protein maize (QPM), baby corn, sweet corn, fodder, feed, starch and ethanol. Under the National Policy on Biofuels 2018, surplus quantities of maize and millets will be used for production of ethanol. Increased ethanol production



will increase maize demand, leading to more production and income of maize growers.

- 1.11 In order to address productivity issue, promotion of single cross hybrids (SCH) at faster pace is required as about 30-35 percent area is under SCH. Both public and private sector should make efforts to increase area under SCH. The area under QPM needs to be increased and for that area-based approach can be adopted. Maize cultivation should be promoted during spring season to boost production in the country. Maize requires less water compared with other competing crops like paddy but irrigation is must during critical stages of crop growth during pollination and fertilization.

Nutri-Cereals

- 1.12 India is one of the important producer and consumer of nutri-cereals in the world. Nutri-cereals were important crops in the country occupying about 40 million hectares area in pre-green revolution period. However, in post-green revolution era, the area under nutri-cereals significantly declined and reached a level of less than 15 million hectares in the recent years. The productivity of nutri-cereals has improved during the last two decades but productivity and production are fluctuating as these crops are grown in resource poor agro-climatic regions and hilly & tribal areas under rainfed conditions.
- 1.13 Since, the nutri-cereal crops are climate-resilient and environment friendly with very less water requirement compared to other cereals along with much higher nutritional value, there is a need to increase area, production and productivity of nutri-cereals. To promote cultivation and consumption of nutri-cereals, India celebrated 2018 as the National Year of Millets and the Food and Agriculture Organisation (FAO) Council approved India's proposal to observe an International Year of Millets in 2023. Government has launched a campaign to promote millets and decided to distribute millets through Public Distribution System (PDS) in order to address problem of malnutrition. About 60 value-added products can be made from nutri-cereals but there is lack of appropriate processing technologies. With special focus on developing value-added strategies and appropriate processing technologies, the nutri-cereals can be processed into multigrain formulations and several other value-added and health food-products, which may then result in high demand from large urban population.
- 1.14 On the basis of the recommendations of NITI Aayog, NFSM-Sub Mission on Nutri-Cereals has been created in place of the existing NFSM-Coarse Cereals. Such efforts will help in creating awareness about nutritional value of such crops, which will in turn result in higher demand. However, at current productivity levels, it may be difficult to meet the growing demand for nutri-cereals and valued-added products. Therefore, to meet the growing demand, crop productivity needs to be improved, which requires significant investments in agricultural research and extension in the sector.



Pulses

- 1.15 India achieved a record production of 25.23 million tonnes in 2017-18, more than 2 million tonnes higher than achieved in 2016-17. Sustained increase in production of pulses has resulted in significant reduction in dependence on imports. Imports of pulses declined to about 1.8 million tonnes during April-December 2018, as against over 5 million tonnes during April-December 2017. However, market prices of most pulses were below the MSP during KMS 2018-19 but have improved compared to KMS 2017-18. Low market prices have resulted in significant reduction in acreage of some pulses like tur by about 17 percent in 2017-18. Therefore, the Commission is of the considered view that pulses growers should be ensured remunerative prices to keep them motivated to grow pulses. The government has taken several steps in this direction during the last 2-3 seasons. Government has stepped up procurement of pulses, increased import duty including Quantitative Restrictions (QRs) on various pulses, freed exports and distributed pulses in various schemes like Mid-Day Meal (MDM), Integrated Child Development Services (ICDS) and PDS with the central subsidy. Such initiatives will not only ensure better nutrition to people through welfare schemes but also help in liquidating surplus stocks, which would help in improving market prices of pulses. National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) has floated tenders for sale of various oilseeds and pulses procured under PSS. The Commission suggests that these stocks should not be sold below the economic cost of the commodity because selling below economic cost will discourage industry and trade to procure during marketing season and will wait for subsidised quantities from the government.
- 1.16 About 8.5 million hectares of rice-fallow lands spread across Assam (1.04 million ha), Bihar (0.05 million ha), Chhattisgarh (2.86 million ha), Jharkhand (0.48 million ha), Odisha (2.96 million ha) and West Bengal (1.16 million ha) can be utilized for pulses production. During winter season, farmers can grow lentils in upland and chickpeas in medium and lowlands using residual moisture. The utilisation of these rice-fallow lands can bring in additional 2.54 million tonnes of pulses.
- 1.17 Pulses are grown mostly under rainfed conditions and show remarkable variability in production and productivity. Improvement in productivity and reduction in crop-yield fluctuations through improved varieties, technologies and extension is necessary to enhance profitability of pulses production. The private sector participation is necessary in research and development activities and to develop better market linkages so that farmers get better prices. Pulses processing sector is unorganized with low efficiency and capacity utilization. There is a need to strengthen processing facilities both at farm level and in organized sector.

Oilseeds

- 1.18 Production of oilseeds appears to have stagnated at about 30-31 million tonnes during the last three years. Just over two-third of total oilseeds production is contributed by kharif oilseeds. The kharif oilseeds production in 2018-19 is forecast to be at 21.25 million tonnes, almost the same quantity as last year. Prices of



groundnut have remained subdued during the last two seasons and even below MSP, while in case of soybean, market prices that were lower than MSP during KMS 2017-18 showed improvement and were above MSP during KMS 2018-19. In order to provide remunerative prices to farmers, government procured 1.4 million tonnes of oilseeds during last two years under PSS. This has also resulted in improvement in market prices of oilseeds. However, disposal of stocks purchased under the PSS always remains a challenge due to absence of assured outlet for offtake of these stocks unlike rice and wheat. Selling these stocks below economic cost discourages private sector to buy commodities from farmers during procurement season and also leads to loss to the exchequer. Therefore, Commission is of the firm view that Price Deficiency Payment Scheme (PDPS) in commercial crops like oilseeds is a better option than physical procurement.

Cotton

- 1.19 World cotton production for 2018-19 is forecast up slightly, driven by higher output in China, Brazil and Australia which will more than offset lower production in Turkey, India and the U.S. Trade is projected to be up on more imports by China and Turkey.
- 1.20 Despite significant increase in cotton acreage (14.8%) in 2017-18, production has not increased much because a significant decline in yield (from 512 kg/ha in 2016-17 to 477 kg/ha in 2017-18) was witnessed. This reduction in yield was mainly due to fall in yield in Maharashtra (475 kg/ha to 265 kg/ha) due to pink bollworm attack. Market prices of cotton remained above MSP during the current marketing season but showed a declining trend during the last 3-4 months. To make Indian cotton-to-clothing sector competitive, efforts have to be made to improve crop productivity and reduce costs. Ensuring timely availability of quality seed, timely management and control of pests and diseases, promoting micro-irrigation and farm mechanization and encouraging farmers to grow extra-long staple cotton will help in improving competitiveness of cotton farmers and industry.
- 1.21 Cotton, unlike other agricultural products such as wheat, rice, etc., is not directly consumed by the end users. Therefore, direct procurement of cotton is not recommended as disposal of procured cotton is not an easy task and involves huge cost. Therefore, government should introduce the PDPS in cotton sector.

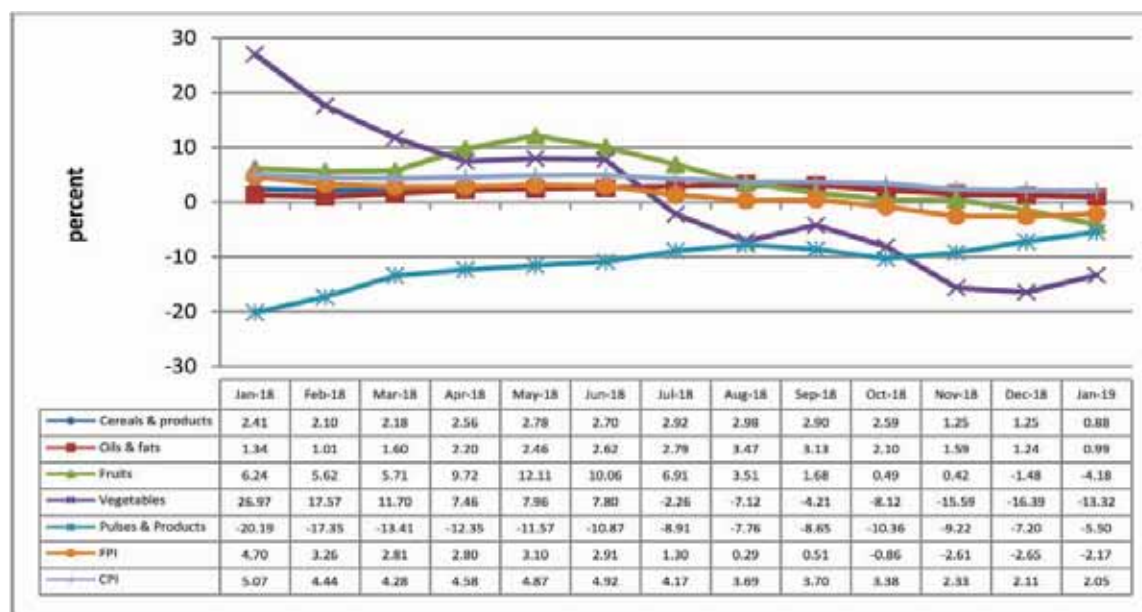
Food Inflation

- 1.22 The food price inflation in the country has been on a structural downtrend over the last few years in the face of bumper production of horticulture crops and foodgrains and large food stocks. The annual rate of inflation for food articles, based on monthly Wholesale Price Index (WPI) stood at 2.34 percent (provisional) for the month of January 2019 as compared to 3.15 percent during the corresponding month of the previous year. The cereals have shown an increasing trend in rate of inflation, based on monthly WPI, during the last 6 months.



- 1.23 The Consumer Food Price Inflation (CFPI) for the month of January 2019 was (-)2.17 percent as compared to 4.70 percent in January 2018 due to continued deflation in fruits, vegetables, pulses and products, sugar and confectionary and eggs (Chart 1.4). The CFPI averaged 0.26 percent during April-January in the current financial year and was negative during last four months. The low agricultural prices hurt producers and adversely affect farm income.

Chart 1.4: Trends in Consumer Food Price Inflation



Source: CSO

Ensuring Remunerative Price to Farmers

- 1.24 In order to ensure remunerative price to farmers, government has taken several initiatives ranging from creating a competitive national market through electronic National Agriculture Market (e-NAM) and model "The Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017", develop and upgrade existing 22,000 rural haats into Gramin Agricultural Markets (GrAMs) and umbrella scheme '**Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)**'.
- 1.25 The e-NAM has made a good progress. So far 585 mandis have been integrated on e-NAM platform and additional 415 mandis will be integrated by March 2020. The volume of trade on e-NAM has increased significantly, from less than ₹18000 crore in March 2017 to over ₹60000 crore in January 2019. Inter-market as well as inter-state trade on e-NAM has also started taking place. However, only eight states have participated in inter-state trade and its volume is also low. Therefore, efforts are needed to bring more States and commodities under inter-state trade. In order to facilitate farmers' participation in the e-NAM platform, Small Farmers' Agri-business Consortium (SFAC) has registered 634 Farmer Producer Organisations (FPOs) in 16 States and they have started selling on e-NAM. Such efforts need to be scaled up.



- 1.26 To take care of the interests of small and marginal farmers, government has decided to upgrade existing 22,000 rural haats into Gramin Agricultural Markets (GrAMs) through convergence of schemes like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Gram Sadak Yojana-III (PMGSY-III), etc. A corpus of ₹2000 crore for Agri-Market Infrastructure Fund (AMIF) has been created with National Bank for Agriculture and Rural Development (NABARD) for development and up-gradation of agricultural marketing infrastructure in GrAMs and regulated wholesale markets. The fund will provide subsidized loan to the State/Union Territory governments for developing marketing infrastructure in 585 Agriculture Produce Market Committees (APMCs) and 10,000 GrAMs.
- 1.27 The PM-AASHA scheme comprising of Price Support Scheme (PSS), Price Deficiency Payment Scheme (PDPS) and Pilot of Private Procurement & Stockist Scheme (PPSS) has been implemented by Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) in addition to existing schemes of Department of Food and Public Distribution (DFPD) for procurement of paddy, wheat and nutri-cereals/coarse grains and of Ministry of Textiles for cotton and jute. Under PSS, physical procurement of pulses, oilseeds and copra will be done by Central Nodal Agencies with proactive participation of State governments. Under PDPS, oilseeds are covered and direct payment of the difference between the MSP and the selling/modal price will be made to farmers selling their produce in the notified market yard through a transparent auction process (see Box 1). For oilseeds, states can also implement PPSS on pilot basis in selected districts with the participation of private stockist.
- 1.28 The effective participation of the State governments can bring huge gains to farmers as is evident from the number of farmers benefitted from procurement operations in many states. For example, at all-India level, number of paddy farmers benefitted from procurement operations has increased by 7.3 percent between 2017-18 and 2018-19 (as on 25.02.2019). Chhattisgarh, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal have shown good progress where number of beneficiary farmers has increased by 54.9 percent, 21.8 percent, 29.8 percent, 36.3 percent and 69.9 percent, respectively. Similarly, share of DCP States in total procurement of rice has increased from 27.8 percent in TE2008-09 to 53.2 percent in TE2017-18. However, share of DCP states saw a dip of 4.4 percent in 2017-18 compared to 2016-17 mainly because of decline in procurement triggered by significant fall in rice production in 2017-18 in Chhattisgarh, Odisha and West Bengal. Among DCP states, Chhattisgarh and Odisha have made significant progress and increased their share in total procurement over the years.
- 1.29 Though states like Uttar Pradesh and West Bengal have shown good progress in procurement operations, there is still a significant scope for expanding it. For TE2018-19, in Punjab and Haryana, more than 75 percent of paddy growers benefitted from procurement while this number is very small for Uttar Pradesh (4.8%), West Bengal (7.1%) and Odisha (19.7%).



Box 1 : Price Deficiency Payment Scheme (PDPS)

Under **Price Deficiency Payment Scheme (PDPS)** of PM-AASHA, direct payment of the difference between the MSP and the selling/modal price will be made to pre-registered farmers selling their produce in the notified market yard through a transparent auction process. The scheme does not involve any physical procurement of crops. A similar scheme **Bhavantar Bhugtan Yojana** was launched on pilot basis by Government of Madhya Pradesh in kharif 2017 season under which when prices fell below the MSP, government paid the remuneration as the difference between the MSP and the model price computed by taking average of selling price in mandis in three major producing states over a fixed period.

One of the criticisms of the Bhavantar Bhugtan Yojana was that cartelisation between farmers and traders led to distortions in the market and prices were artificially depressed. In order to address this problem, the Commission recommends that floor selling/modal price should be fixed based on price trends in last 4-5 years. This will ensure that no cartelisation takes place in the market and farmers bring Fair Average Quality (FAQ) produce to the mandi. Commission is of the view that PDPS should be implemented in commercial crops like maize, oilseeds, cotton, etc., where liquidation of stocks is a problem and the scheme should cover all major producing States.

In order to facilitate more orderly marketing of crops and stagger market arrivals beyond the procurement season, farmers should be encouraged and incentivized to store their produce in accredited warehouses and provided loans against Warehouse Receipt to meet cash flow needs without having to sell their produce when market prices are typically at harvest-time lows. This arrangement will allow the farmers to delay the sale of the produce until more favourable market conditions emerge. However, such farmers should be entitled to receive the benefit of PDPS, if market prices in later months are below MSP. In case market prices are higher than MSP, the producers can choose to sell in the open market and take advantage of high prices.

Overview

- 1.30 The Commission in its earlier reports has highlighted the issue of subjectivity in fair average quality (FAQ) norms and problems faced by farmers. Therefore, the CACP reiterates its earlier recommendation of creating awareness among farmers about FAQ norms and develop a transparent and scientific mechanism for deciding FAQ norms for procurement operations.

Assistance to Farmers

- 1.31 Investment is essential to boost agricultural productivity and enhance farm income. To provide an assured income and investment support to farmers, government has launched "**Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)**" under which direct income support of ₹6,000 per year will be provided to small and marginal farmers. Some State governments have also implemented similar programmes to enhance agriculture productivity and income, and save farmers from vicious cycle of indebtedness. Telangana has implemented "**Agriculture Investment Support**



Scheme” (Rythu Bandhu) from 2018-19 kharif season under which a grant of ₹4,000 per acre per farmer each season is provided for purchase of inputs like seeds, fertilizers, pesticides, labour and other investments.

- 1.32 Government of Odisha has implemented **“Krushak Assistance for Livelihood and Income Augmentation - KALIA Scheme”** from Rabi 2018-19 for providing financial assistance to small and marginal farmers, vulnerable agriculture households and landless labourers. Financial assistance of ₹25,000 per farm family over five seasons will be provided to small and marginal farmers for purchase of inputs like seeds, fertilizers, pesticides, labour and other investments. The landless agricultural household will be given a financial assistance of ₹12,500 for allied agricultural activities like goat rearing, poultry, duckery, fisheries, mushroom cultivation, bee-keeping, etc. In addition, vulnerable cultivator/landless agricultural labourers who are in old age, having disability/disease, etc. will get financial assistance of ₹10,000 per family per year for their sustenance.
- 1.33 In addition, Government of India gives various input subsidies like fertilizer subsidy, interest subvention, crop insurance premium subsidy, etc. For example, as per 2018-19 Budget Estimates, fertiliser subsidy is estimated at ₹70079.85 crore while interest subvention for providing short term credit to farmers is estimated at ₹15000 crore. Similarly, under crop insurance scheme, total subsidy by Central government during kharif 2017 and rabi 2017-18 was ₹9300.2 crore. The average subsidy on fertilizer, interest subvention and crop insurance premium per household¹ works out to be about ₹6477 per year. This figure may increase significantly if subsidy on irrigation and electricity is included.
- 1.34 These interventions will provide support to the farmers but other structural reforms in agri-marketing, irrigation water management, trade policy, etc. initiated by the government will ensure higher productivity and profitability in agriculture.

Water Management

- 1.35 Indian agriculture is vulnerable to the vagaries of weather, and threat of climate change adds an important layer of vulnerability and uncertainty to existing risks. Various studies have shown that climate change impacts are significantly more adverse in rainfed areas compared to irrigated areas. Therefore, government has given high priority to water conservation and its management. PMKSY has been implemented with the vision of extending the coverage of irrigation ‘Har Khet ko Pani’ and improving water use efficiency ‘More Crop Per Drop’ in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities.
- 1.36 The spectacular increase of groundwater use for irrigation has brought about significant socio-economic benefits, but unplanned use has also resulted in negative environmental and socio-economic consequences. To address such issues

¹ Number of operational holdings as per Agriculture Census, 2015-16 has been taken as a proxy for number of agricultural households



and improve groundwater management in priority areas through community participation, government has launched Atal Bhujal Yojana (ABHY), a ₹6000 crore Central Sector Scheme, to be implemented over a period of five years from 2018-19 to 2022-23, with World Bank assistance.

- 1.37 The area under micro-irrigation has increased significantly during the last few years but despite these achievements, more is needed. Large share of irrigated area is still under flood irrigation, and most farmers use non-scientific methods. With better water management practices and the right mix of pricing policies, incentives and technical support, we can reduce agriculture's vulnerability to irrigation water constraints and improve its long-term sustainability. Therefore, the Commission re-iterates its earlier recommendation of promoting and incentivising efficiency in water use in agriculture by fixing quantitative ceilings on use of water and electricity per hectare and rewarding farmers for adopting water saving technologies and practices.

Soil Health Management

- 1.38 Government of India implemented Soil Health Card (SHC) Scheme from February 2015 in order to guide farmers on judicious and economic use of fertilizer nutrients. The Scheme has achieved 100 percent target in the cycle of 2015-2017 in terms of soil samples collection & testing and distribution of SHCs. During the current cycle of 2017-2019, at all-India level, around 267.6 lakh soil samples were collected, 5.6 percent more than last cycle, and around 90 percent of the collected samples have been tested. Around 813.7 lakh SHCs have been distributed as on March 5, 2019. However, distribution of SHCs will not help in meeting the objective of the scheme unless extension services in terms of farmers' training, field demonstrations, workshops, etc. are organised on a large scale to educate farmers about use of SHCs. The National Productivity Council (NPC) study found that fertilizer application as per the recommendations of SHCs has resulted in 8-10 percent decrease in chemical fertilizers usage and 5-6 percent increase in crop yield. It is therefore, necessary that a large scale awareness campaign be launched to sensitise farmers about the usage of macro, micro and secondary nutrients as per recommendations of SHCs.
- 1.39 Various stakeholders from soil health management and fertiliser industry are of the view that government's decision to carry out the soil health analysis every two years is not needed as the soil profile does not undergo major changes in such a short span of time. Therefore, soil testing may be carried out once in 3-5 years. Apart from this, since soil profile varies from plot to plot, government in collaboration with ICAR should assess the district-wise and crop-wise requirement of nutrients, which will help in manufacturing and supply of customised fertilisers to farmers.
- 1.40 As per the government policy, fertiliser subsidy is transferred to fertiliser distributors only on the basis of sales receipt through POS machine. However, many a times these machines do not work either due to connectivity issues or machine's failure and farmers face problems in buying fertilisers. It was also reported that since there

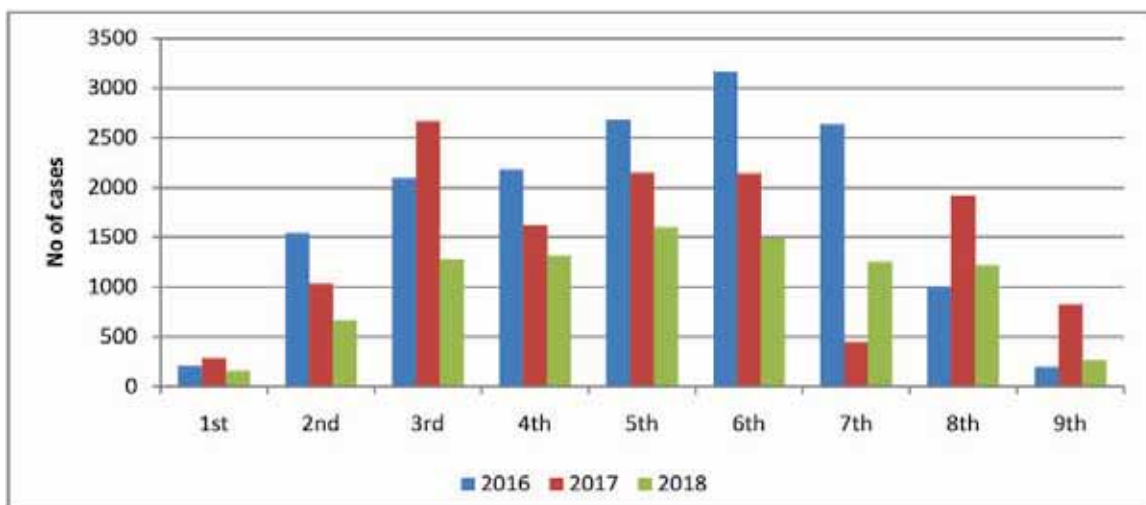


is no ceiling on quantity of fertiliser sold to a farmer, some retailers issue very large quantities of fertilisers to farmer to get fertiliser subsidy from the government. Therefore, the Commission recommends that a quick assessment of such issues should be done and necessary safeguards be put in place.

Crop Residue Management

1.41 The Central Sector Scheme on 'Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh & NCT of Delhi' was launched with the total Central funds of ₹1151.80 crore (₹591.65 crore in 2018-19 and ₹560.15 crore in 2019-20) to address air pollution and to subsidize machinery required for in-situ management of crop residue. This has resulted in reduction in paddy residue burning events by 29.5 percent, 24.5 percent and 11.0 percent in the States of Haryana, Uttar Pradesh and Punjab, respectively, compared with residue burning cases in 2017. As per data provided by State governments, in Punjab, as many as 1341 villages have become zero residue burning villages and number of stubble burning incidents has declined in 12 of 22 districts. In Haryana, active and continuous campaign over last 2-3 years has resulted in reduction in incidents of crop residue burning in major paddy growing districts in 2018 compared to 2017. The Chart 1.5 depicts the reduction in stubble burning in Haryana on weekly basis during 30th September to 30th November for last three years. Government of Uttar Pradesh has launched advertisement campaigns at block, district and State level along with audio-visual clips on television, painting competition in schools and colleges, wall paintings, etc. to make farmers and public aware about the negative impacts of crop residue burning. However, use of machines in paddy straw management is significantly less in the State as more than 90 percent farmers are small and marginal and use of machinery in such small land holdings is always a challenge. Therefore, efforts are needed to promote group based approach like custom hiring service centres to promote machines for in-situ management of crop residues.

Chart 1.5: Weekly Events of Stubble Burning Reported in Haryana during 2016 to 2018



Source: Government of Haryana



- 1.42 In order to promote alternative use of crop residue, the Ministry of Power has brought out a policy for biomass utilization for power generation through co-firing in pulverized coal fired boilers. In line with the policy, Central Electricity Authority (CEA) issued an advisory to all concerned State governments, power plants utilities, power equipment manufacturers and other stakeholders to promote use of biomass pellets. In addition, use of paddy crop residues needs to be explored for fodder, manure/compost, cardboard/packing material, etc.

Risk Management

- 1.43 According to All-India Financial Inclusion Survey (NAFIS) by NABARD, majority of agricultural households (54%) are affected by natural calamities, followed by yield loss due to insect and pest infestation (28%). To mitigate risks faced by farmers on crop losses/damages due to unforeseen events, Government of India started Pradhan Mantri Fasal Bima Yojana (PMFBY).
- 1.44 The Scheme has made a significant progress during the last 3 years. The number of farmers insured has increased by around 40 percent and sum insured has increased by 129 percent since the launch of the scheme. A significant progress has been made in expanding the scope of the scheme as percentage of non-loanee farmers has increased from around 5 percent in pre-PMFBY period to around 25 percent in post-PMFBY period. However, number of farmers and area insured has seen a negative growth both for kharif 2017 and rabi 2017-18 seasons, which need to be looked into. Though the scheme has made good progress in bringing more farmers under the umbrella of crop insurance, more need to be done as the overall percentage of farmers covered under the crop insurance is still very low. As per National Insurance Academy (NIA), only about 35 percent farmers in the country are covered under the crop insurance policy. There are also issues related to delay in claim settlements, and the government has decided to penalise the States and insurance companies for the delay in settlement of claims and interest of 12 percent will be paid to farmers if the claim settlement is delayed by more than two months. Apart from this, State governments will also have to pay 12 percent interest if the release of State share of subsidy is delayed by more than three months after the requisition is submitted by insurance companies. It will help in evaluation of insurance companies and will remove those companies from the scheme that are found to be ineffective. This will facilitate faster claim settlements and thus address farmer distress to a large extent in case of crop failure.

Market Information and Intelligence

- 1.45 Market information and intelligence play important role in developing the efficient agricultural marketing system. The Commission has recommended setting up marketing intelligence and price forecasting system in earlier reports. It is worth mentioning here that government has taken an initiative and constituted a Technical Advisory Committee on Market Intelligence (Supply Management, Price and Demand Forecasting). This will help farmers to make crop acreage decisions in line with changing demand patterns and reduce market price volatility.



Agricultural Debt Waiver

- 1.46 During the last five years, about 13 States/Union Territories (UTs) have announced farm loan waiver. The debt waiver schemes of Andhra Pradesh and Telangana were announced in 2014 and as per a Study of State Finances by RBI in July 2018, the loan waiver was to the tune of ₹24,000 crore and ₹17,000 crore, respectively. Chhattisgarh announced 25 percent debt waiver in 2015, amounting to about ₹130 crore. Tamil Nadu announced loan waiver scheme of ₹5,318 crore in 2016. In 2017, Maharashtra, Uttar Pradesh and Punjab sanctioned farm loan waivers of ₹30,500 crore, ₹36,359 crore and ₹10,000 crore respectively. Jammu & Kashmir also announced 50 percent waiver of KCC loans in 2017 to the tune of ₹244 crore. Karnataka announced farm loan waiver scheme of ₹34,000 crore in the Budget for 2018-19 presented on July 5, 2018. In 2018, Madhya Pradesh, Rajasthan, Chhattisgarh and Union Territory of Puducherry also announced agricultural loan waiver schemes.
- 1.47 Debt waiver schemes can bring some relief to farmers in the short run, but has adverse implications on fiscal deficit of States, credit allocation and economic growth. It also creates a moral hazard problem and a negative impact on the credit discipline of borrowers. Moreover, only a small proportion of farmers, who take loan from institutional sources, benefit from such schemes. More importantly, there is no empirical evidence of increase in investment and improvement in agricultural productivity and farm income. It is evident from the data on State-wise agriculture loans disbursed during 2014-15 to 2017-18 that there was a slowdown in credit flow to farmers in those States where agricultural loan waiver scheme was implemented.
- 1.48 The Commission is of the considered view that farm loan waiver is not a solution to address agrarian problems but need to address the structural and institutional deficiencies in the sector. Comprehensive reforms comprising PM-AASHA to ensure remunerative prices to farmers, PMFBY for reducing risks, investment in irrigation, warehousing and storage, market reforms, expanding the e-NAM, encouraging agricultural exports, PM-KISAN to provide income support, etc. have been initiated by the government and active participation of States is essential for effective and timely implementation on the ground.

Focus on North Eastern (NE) States

- 1.49 The North Eastern States produce about 7 million tonnes of rice, about 6.5 percent of total production, however procurement is negligible (less than 30 thousand tonnes in 2018-19). Thereby farmers do not get benefit of the MSP in the region in the absence of procurement operations. On the other hand, total allocation of rice under various schemes for NE States is about 2.7 million tonnes. In order to meet the requirement of the region, rice stocks are moved Ex-North mainly from Punjab and Haryana to the NE region, which is costly as transportation cost is very high. Rice production in the region has increased significantly after implementation of Bringing Green Revolution to Eastern India (BGREI), from about 5.5 million tonnes



in pre-BGREI period to over 7 million tonnes in the recent period. The region has great potential for increasing rice production if farmers are provided with better quality seed, irrigation and more importantly assured remunerative price.

- 1.50 The Commission had a special meeting with all the stakeholders in Imphal, Manipur to discuss issues pertaining to NE states. Lack of institutional and market infrastructure, higher moisture content than the FAQ norms due to humid weather conditions in the region, lower out-turn ratio of rice and shortage of modern rice mills are major constraints in increasing procurement operations in the region. The Food Corporation of India (FCI) has started procurement of paddy directly from farmers in Tripura, which is a welcome step. The Commission recommends that procurement efforts need to be stepped up in NE region, particularly in Assam and Tripura, and some relaxation in norms such as moisture content and out-turn-ratio could be considered in the initial years. It would help in ensuring better price to farmers and also lead to saving in movement cost of FCI stocks from northern region.

Structure of the Report

- 1.51 The report is organized as follows. Chapter 2 presents the demand-supply scenario and procurement operations. Chapter 3 discusses trends in crop productivity and related aspects. Chapter 4 presents patterns and trends in international trade and comparison of domestic prices with international prices, as well as brief review of trade policies with a view to use international trade as an expanding opportunity for domestic producers. Chapter 5 presents the cost of production and returns of different kharif crops. Finally, a summary of the discussion along with non-price policy and MSP recommendations is presented in Chapter 6.



Chapter 2

Demand-Supply Scenario and Procurement Operations

- 2.1 Trends in domestic and international prices play crucial role in taking decision on MSPs of forthcoming season. These trends indirectly indicate likely demand-supply situation in the country and world markets. The analysis of domestic price trends using market price data compiled from AGMARKNET, which reflects the ground reality of farm harvest prices, has been done. The trends in weighted average monthly market prices of mandated crops for procurement season KMS 2014-15 to KMS 2018-19 using State production shares as weights have been analysed and comparison with MSPs has been done.

World Outlook

- 2.2 As per USDA World Agricultural Supply and Demand Estimates (February 2019), global rice production for 2018-19 is forecast at 495.9 million tonnes, marginally lower than estimated production of 495.1 million tonnes for 2017-18. World ending stocks are projected to increase to a record level (167.6 million tonnes), led by China, which accounts for 69 percent of the global stocks. However, as per FAO Market Monitor (March 2019), world rice production is projected to expand by 1.6 percent in 2018-19 to 514.9 million tonnes and the ending stocks at 177.6 million tonnes, up by about 3 percent from 2017-18. Similarly, International Grain Council (IGC) forecasts show an increase in rice production and ending stocks in 2018-19 (Table 2.1).
- 2.3 As per FAO estimates, world production of maize for 2018-19 is forecast at 1074.4 million tonnes, which is 1.8 percent less than the level achieved in 2017-18. Global stocks are expected to decline in 2018-19 as compared to 2017-18. However, USDA and IGC forecast show a marginal increase in global production but lower stocks in 2018-19. Lower ending stocks of maize will have impact on world market price. Global soybean production declined in 2017-18 over 2016-17 according to the estimates of FAO, USDA and IGC. However, production is forecast to increase by



around 20 million tonnes in 2018-19 and global inventories are expected to expand in 2018-19 (Table 2.1).

- 2.4 USDA estimates show higher global oilseed production in 2018-19 at 593.3 million tonnes as compared with 575.7 million tonnes in 2017-18. Global stocks are forecast to be higher at 120.9 million tonnes in 2018-19, up by about 6 percent over 2017-18. Coarse grain production is expected to improve from 1356.8 million tonnes in 2017-18 to 1372.2 million tonnes in 2018-19. However, the global stocks of coarse grains show a decline of 9 percent. The global supply and use outlook for oilseeds and coarse grains is given in Annex Table 2.1.
- 2.5 The USDA estimates on global supply and demand of cotton for 2018-19 show a lower production but higher trade and stocks (Annex Table 2.2). Production has reduced in Turkey, India, Burkina Faso and the United States, whereas it has increased in China, Brazil, Pakistan, and Australia. In 2017-18, lower mill use in India was largely responsible for increase in world beginning stocks in 2018-19. Consumption is projected to reduce by five lakh bales in India and one million bales in China. This reduction in consumption and increased stock in 2018-19 may impact domestic market prices of cotton further.

Table 2.1: Global Supply and Demand Outlook for Rice, Maize and Soybean

(million tonnes)

Crops	FAO			USDA			IGC		
	2016-17	2017-18	2018-19*	2016-17	2017-18	2018-19\$	2016-17	2017-18	2018-19#
Rice									
Production	500.9	506.8	514.9	486.8	495.1	495.9	487.2	494.0	494.8
Supply	668.1	675.2	687.4	619.4	644.8	657.9	610.2	636.0	644.8
Utilization	497.9	504.7	509.3	482.2	482.7	490.3	487.1	486.1	491.5
Trade	47.4	48.1	47.1	46.5	47.7	47.7	45.1	46.7	47.3
Stocks	168.7	172.5	177.6	137.2	162.0	167.6	123.1	150.0	153.2
Maize									
Production	1046.3	1094.0	1074.4	1076.0	1075.6	1099.6	1088.3	1089.6	1109.0
Supply	1283.4	1394.0	1381.8	1290.9	1425.9	1440.4	1383.2	1453.6	1444.9
Utilization	1038.7	1073.0	1111.7	1061.2	1085.1	1130.6	1048.6	1117.8	1147.4
Trade	139.9	155.4	160.0	162.1	146.3	167.4	138.0	151.9	160.2
Stocks	242.9	307.5	267.0	229.8	340.8	309.8	334.6	335.8	297.4
Soybean									
Production	348.7	341.7	361.5	351.3	340.0	361.0	349.9	340.7	358.4
Supply	393.1	398.7	402.6	429.2	435.8	459.1	383.0	389.8	401.8
Utilization	340.8	349.7	353.0	330.1	338.2	349.4	337.3	346.1	352.5
Trade	149.1	153.6	151.5	147.2	153.0	154.4	147.6	152.7	153.0
Stocks	51.7	41.1	52.3	96.1	98.1	106.7	45.8	43.4	48.9

Notes: * 07.03.2019, \$Forecast 08.02.2019, #Forecast 22.02.2019

Source: AIMS-FAO Market Monitor



Domestic Scenario

- 2.6 Domestic production of rice in 2018-19 is estimated to increase by 2.5 percent, to 115.6 million tonnes (Table 2.2). Rice stocks in central pool as on 1st February 2019 stood at 22.8 million tonnes, 14.6 percent higher than last year while exports are expected to be lower than 2017-18 as leading buyer Bangladesh reduced imports due to a bumper local harvest. The domestic rice situation points towards higher availability of rice in the country, which can have bearish impact on prices.

Table 2.2: Domestic Supply of Rice in India

(million tonnes)

Particulars	2016-17	2017-18	2018-19
Production	109.7	112.8	115.6*
Stocks in Central Pool#	17.0	19.9	22.8
Exports	10.8	12.9	8.5**

Notes: * as per 2nd Advance Estimates, # as on 1st February 2017, 2018 and 2019, ** April-December 2018

Sources: DFPD, DES and DGCIS

- 2.7 The pulses production in the country is forecast to be marginally lower at 24.02 million tonnes in 2018-19 as against 25.23 million tonnes in 2017-18. As on 7th March 2019, total stock of tur, moong and urad was about 1 million tonnes, significantly lower than corresponding period last year. Imports of pulses have also witnessed a substantial decline in 2018-19 compared with the last year. Against the backdrop of tightening availability of pulses in the country, market prices are expected to rise.
- 2.8 As per 2nd advance estimates, the area under cotton cultivation is expected to be marginally lower at 123.5 lakh hectares in 2018-19, as against 124.3 lakh hectares in 2017-18, largely due to scanty rainfall during sowing time in Andhra Pradesh, Haryana, Karnataka, Maharashtra and Telangana. As a result, cotton production is forecast to fall to 300.9 lakh bales in 2018-19, 13.8 percent lower as compared to 2017-18. The Cotton Advisory Board (CAB) forecast domestic production to fall by about 9 lakh bales and consumption to increase to 317 lakh bales in 2018-19 as against 314.6 lakh bales in 2017-18. The cotton balance sheet as per CAB estimates for 2017-18 and 2018-19 is given in Table 2.3. The ending stocks are projected at 41.1 lakh bales in 2018-19, down by 6 lakh bales over 2017-18 and are expected to have bullish impact on price in the coming season.



Table 2.3: Demand-Supply Estimates of Cotton in 2017-18 and 2018-19

(lakh bales)

Particulars	2017-18 (P)	2018-19 (P)
Opening stock	43.8	47.1
Production	370.0	361.0
Imports	15.8	15.0
Total Supply	429.6	423.1
Mill Consumption	275.9	278.0
S.S.I. Consumption	27.2	27.0
Non-Textile Consumption	11.5	12.0
Total consumption	314.6	317.0
Exports	67.8	65.0
Total Demand	382.4	382.0
Closing Stock	47.1	41.1

Note: P-provisional

Source: Cotton Advisory Board

Trends in Prices

Paddy

- 2.9 The trends in market prices of paddy are shown in Chart 2.1. It shows that market prices of paddy fell below MSP in KMS 2015-16 and have been ruling below MSP since then. In KMS 2017-18, market prices were close to MSP, but the gap between the two widened in current marketing season. States like Assam, Chhattisgarh, Uttar Pradesh and West Bengal, which together contribute around 37 percent to India's total paddy production, prices ruled below MSP for 88.3 percent to 95.9 percent of days from October 2018 to January 2019 as presented in Table 2.4. This may be major reason for lower market prices at the all-India level. On the other hand, market price situation was better in Punjab and Andhra Pradesh, mainly due to good procurement system in these States. Therefore, to address the issue of low market prices, particularly in eastern State such as Assam, eastern Uttar Pradesh and West Bengal, procurement machinery needs to be strengthened.



PRICE Policy for KHARIF CROPS

Demand-Supply Scenario and Procurement Operations

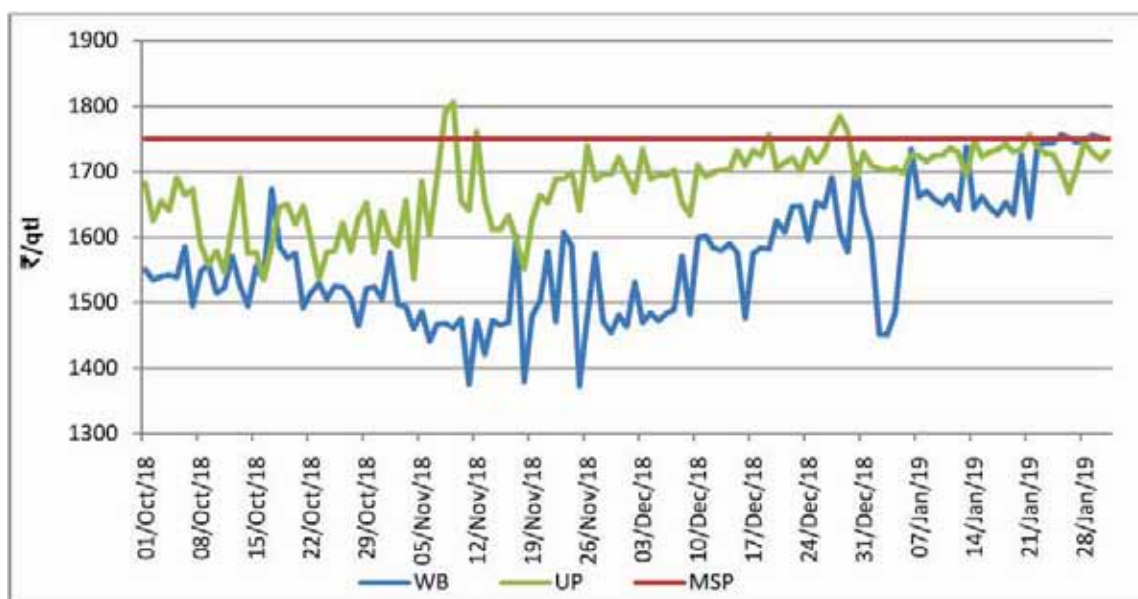
Chart 2.1: Trends in Domestic Market Prices vis-à-vis MSP of Paddy



Note: Weighted modal prices of Andhra Pradesh, Assam, Chhattisgarh, Haryana, Madhya Pradesh, Punjab, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal, which covers 72 percent of paddy production in India

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Chart 2.2: Comparison of Market Prices and MSP of Paddy in Uttar Pradesh and West Bengal during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW



Table 2.4: Market Prices vis-a-vis MSP of Paddy in Major Producing States in KMS 2018-19

States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Andhra Pradesh	28	30	30	31	4	7	8	2	17.6
Assam	19	17	21	20	16	17	15	20	88.3
Chhattisgarh	31	30	31	31	27	30	30	31	95.9
Tamil Nadu	29	26	29	30	24	21	19	17	71.1
Telangana	27	0	21	31	25	0	13	13	64.6
Punjab	24	30	2	0	1	0	0	0	1.8
Uttar Pradesh	31	30	31	31	31	27	26	30	92.7
West Bengal	31	30	31	31	31	30	30	27	95.9

Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

Maize

2.10 Maize is an important food crop, but market prices of maize were below MSP in KMS 2017-18 and KMS 2018-19 (Chart 2.3). However, the gap between MSP and market prices narrowed down in KMS 2018-19 as compared to KMS 2017-18. In KMS 2018-19, it was observed that market prices steadily increased during October 2018 to January 2019, showing a good sign of convergence with MSP. The increased production seems to be making a dent on the market prices of maize. It is important to reduce cost of cultivation and improve yield to increase profitability. In order to reduce cost of cultivation of maize, Indian Institute of Maize Research (IIMR) suggested to adopt the zero-tillage and ridge planting with permanent beds, which can reduce irrigation water requirement as compared to conventional tillage system and improve water and nutrient productivity as well.

Chart 2.3: Trends in Domestic Market Prices vis-à-vis MSP of Maize



Note: Weighted wholesale modal price of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh, which account for 74.8 percent of India's total maize production

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW



Pulses

2.11 With rising per capita income and increasing population, demand for pulses has increased over the years. However, production of pulses has shown fluctuating trend. To encourage production of pulses, MSPs were increased significantly during last three years. Market prices of tur, which were significantly higher than MSP (Chart 2.4) during procurement period of October 2014 to December 2016 mainly due to decline in production during 2014-15 and 2015-16, fell below MSP during January 2016 to January 2019, due to a record production of 4.87 million tonnes in 2016-17 and good harvest in the following years as well as large import of pulses. The wider gap between MSP and market prices in KMS 2016-17 and KMS 2017-18 was also due to significant increase in MSP, while market prices have not improved in tandem. In KMS 2018-19, market prices have shown some improvement but are still below MSP. Wholesale and retail prices of tur dal were significantly higher than MSP and market prices but declined sharply in KMS 2017-18 and KMS 2018-19. Wholesale and retail prices came closer to MSP in last two marketing seasons and showed upward movement during the current season. Market prices of tur and retail prices of tur dal show a strong positive correlation ($r = 0.91$). Despite some convergence between MSP and market prices, market prices were below MSP in major tur producing States during KMS 2018-19 (Chart 2.5 and Table 2.5).

Chart 2.4: Trends in Domestic Prices vis-à-vis MSP of Tur



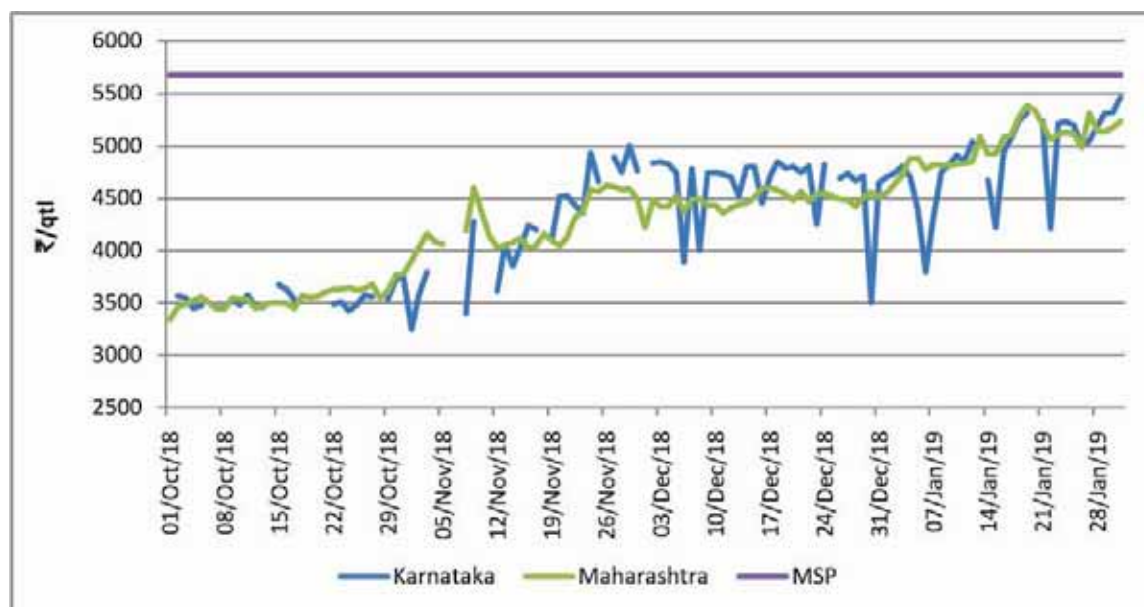
Notes: 1. Weighted wholesale modal price of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Telangana and Uttar Pradesh, which covers 83.9 percent of India's total production.

2. MSP is inclusive of bonus.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI), Ministry of Consumer Affairs, Food and Public Distribution and DES, DAC&FW



Chart 2.5: Comparison of Market Prices and MSP of Tur in Karnataka and Maharashtra during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Table 2.5: Market Prices vis-a-vis MSP of Tur in Major Producing States in KMS 2018-19

States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Gujarat	31	29	31	30	31	29	31	30	100.0
Karnataka	24	23	29	29	24	23	29	29	100.0
Madhya Pradesh	27	24	30	29	27	24	30	29	100.0
Maharashtra	31	27	31	31	31	27	31	31	100.0
Uttar Pradesh	31	29	31	31	31	29	31	31	100.0

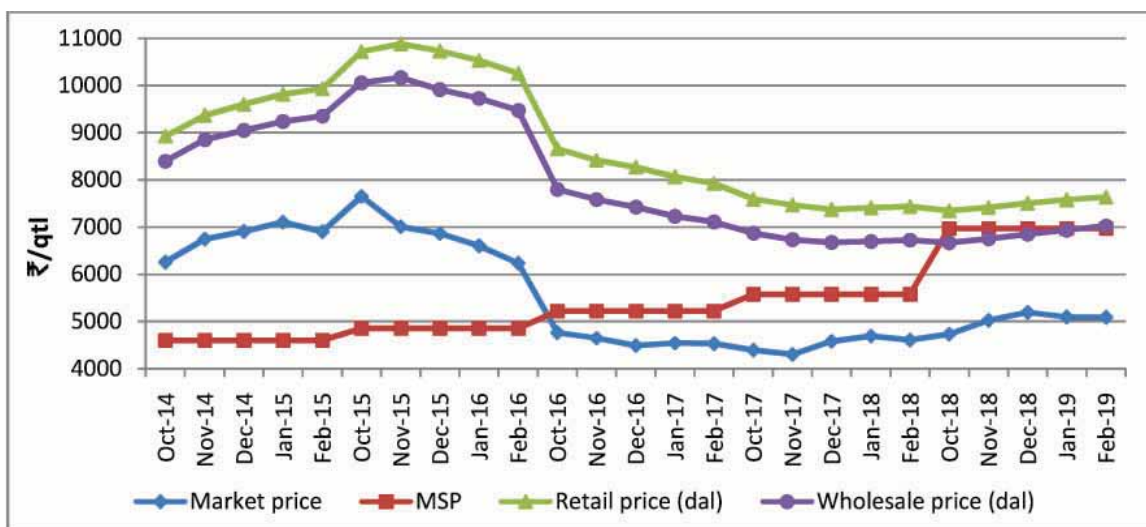
Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

2.12 Market prices of moong were substantially higher than MSP during KMS 2014-15 and KMS 2015-16, but ruled below MSP during the last three seasons (Chart 2.6). The gap between MSP and market prices was very high in KMS 2018-19 as compared to KMS 2017-18, due to very high increase in MSP (₹1400 per quintal). In the last three procurement seasons, market prices were in the range of ₹4300 per quintal to ₹5200 per quintal. During October 2018 to January 2019, even wholesale prices of moong dal were below MSP of moong. In KMS 2018-19, market prices in states like Madhya Pradesh, Maharashtra and Rajasthan remained below MSP on all the reported days (Chart 2.7 and Table 2.6).



Price Policy for KHARIF CROPS

Chart 2.6: Trends in Domestic Prices vis-à-vis MSP of Moong

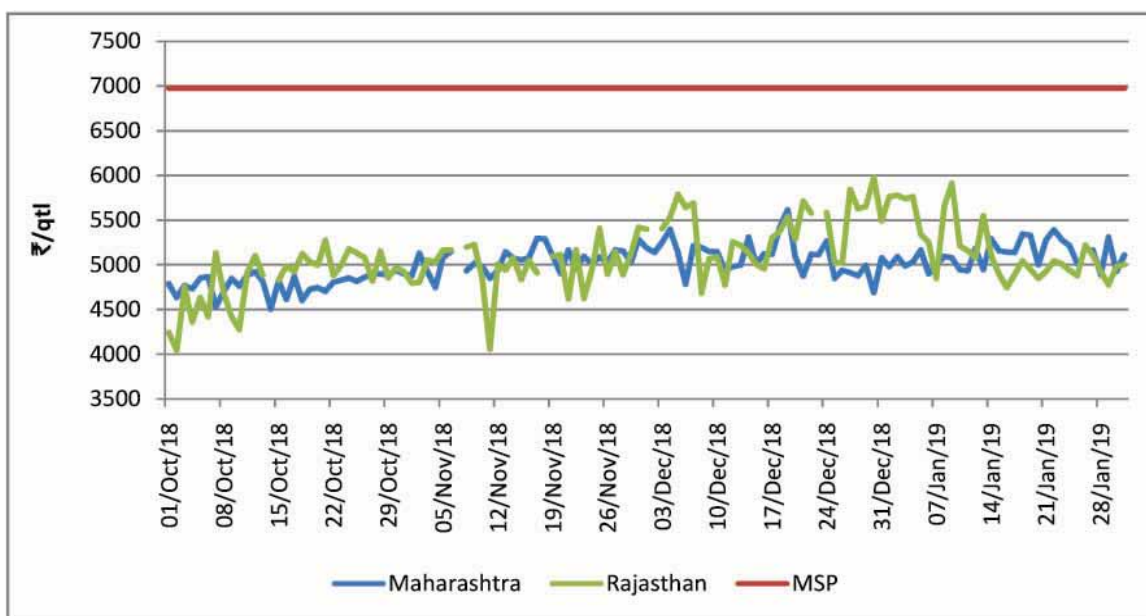


Notes: 1. Weighted wholesale price of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh, which cover 86.8 percent of total production of moong. MSPs are inclusive of bonus

2. MSP is inclusive of bonus.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI), Ministry of Consumer Affairs, Food and Public Distribution and DES, DAC&FW

Chart 2.7: Comparison of Market Prices and MSP of Moong in Rajasthan and Maharashtra during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW



Table 2.6: Market Prices vis-a-vis MSP of Moong in Major Producing States in KMS 2018-19

States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Madhya Pradesh	27	22	30	27	27	22	30	27	100.0
Maharashtra	31	29	31	30	31	29	31	30	100.0
Rajasthan	30	30	30	31	30	30	30	31	100.0

Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

2.13 Market prices of urad also recorded a decline during October 2017 to February 2019 (Chart 2.8). During this period, the gap between MSP and market prices was in the range of ₹1400 to ₹1900 per quintal. Retail prices of urad dal also showed declining trend along with market prices of urad in KMS 2017-18 and KMS 2018-19. Even though market prices marginally recovered in KMS 2018-19, but were still much below the MSP on all reported days in Madhya Pradesh, Uttar Pradesh, Maharashtra, Tamil Nadu and Rajasthan (Chart 2.9 and Table 2.7). Increased production of urad in the recent years seems to have adversely affected market prices.

Chart 2.8: Trends in Domestic Prices vis-à-vis MSP of Urad



Notes: 1. Weighted wholesale price of Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh, which cover 84.9 percent of total production of urad. MSPs are inclusive of bonus

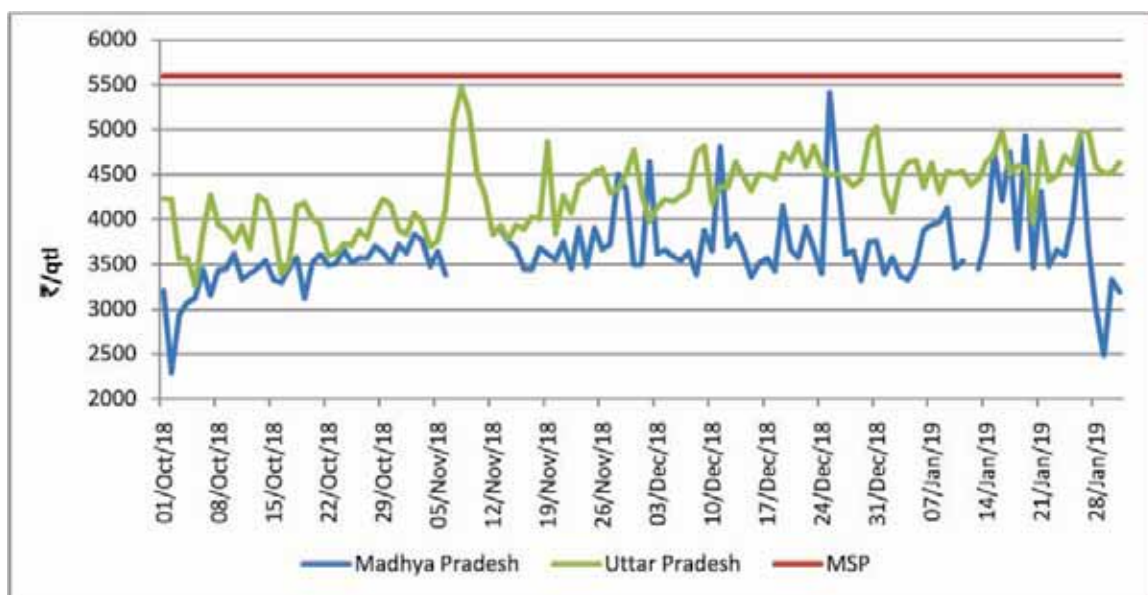
2. MSP is inclusive of bonus.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI), Ministry of Consumer Affairs, Food and Public Distribution and DES, DAC&FW



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Chart 2.9: Comparison of Market Prices and MSP of Urad in Uttar Pradesh and Madhya Pradesh during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Table 2.7: Market Prices vis-a-vis MSP of Urad in Major Producing States in KMS 2018-19

States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Madhya Pradesh	31	26	31	30	31	26	31	30	100.0
Maharashtra	31	29	31	30	31	29	31	30	100.0
Rajasthan	30	28	29	28	30	28	29	28	100.0
Tamil Nadu	22	19	20	18	22	19	20	18	100.0
Uttar Pradesh	31	30	31	31	31	30	31	31	100.0

Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

Oilseeds

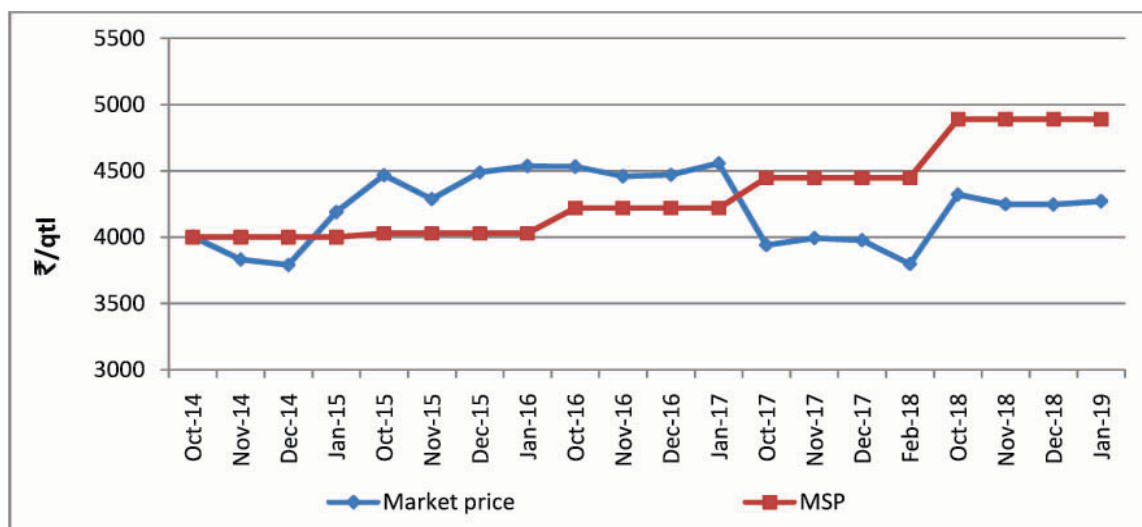
- 2.14 Market prices of groundnut were higher than MSP during procurement period of KMS 2015-16 and KMS 2016-17 (Chart 2.10). However, the situation has changed during KMS 2017-18 and KMS 2018-19, where market prices of groundnut ruled below MSP. There was an increase in MSP of groundnut by ₹440 per quintal in KMS 2018-19, but did not have much impact on market prices. Table 2.8 shows that market prices were lower than MSP on more than 70 percent of reported days in Karnataka, Rajasthan, Gujarat and Andhra Pradesh during KMS 2018-19. While low market prices of groundnut call for government intervention to help farmers, there is also a need to create more demand for groundnut and its products in domestic and global markets. Procurement under PSS may not be a viable option as groundnut

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purchased under PSS operation is liquidated in open market and generally at less than economic cost. The traders and industry prefer to buy government stocks at subsidized price and avoid direct purchase from farmers to reduce their storage and financing costs. Therefore, PDPS could be a better alternative for market intervention.

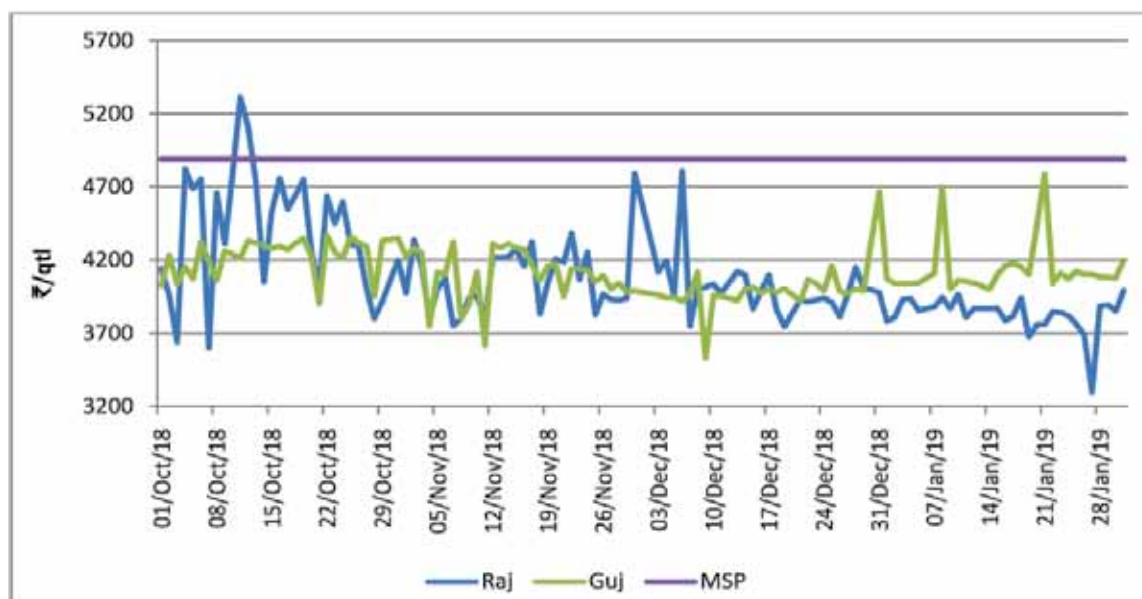
Chart 2.10: Trends in Domestic Market Prices vis-à-vis MSP of Groundnut



Notes: 1. Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh, which cover 96.8 percent of India's total production.
2. MSP is inclusive of bonus.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Chart 2.11: Comparison of Market Prices and MSP of Groundnut in Rajasthan and Gujarat during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW



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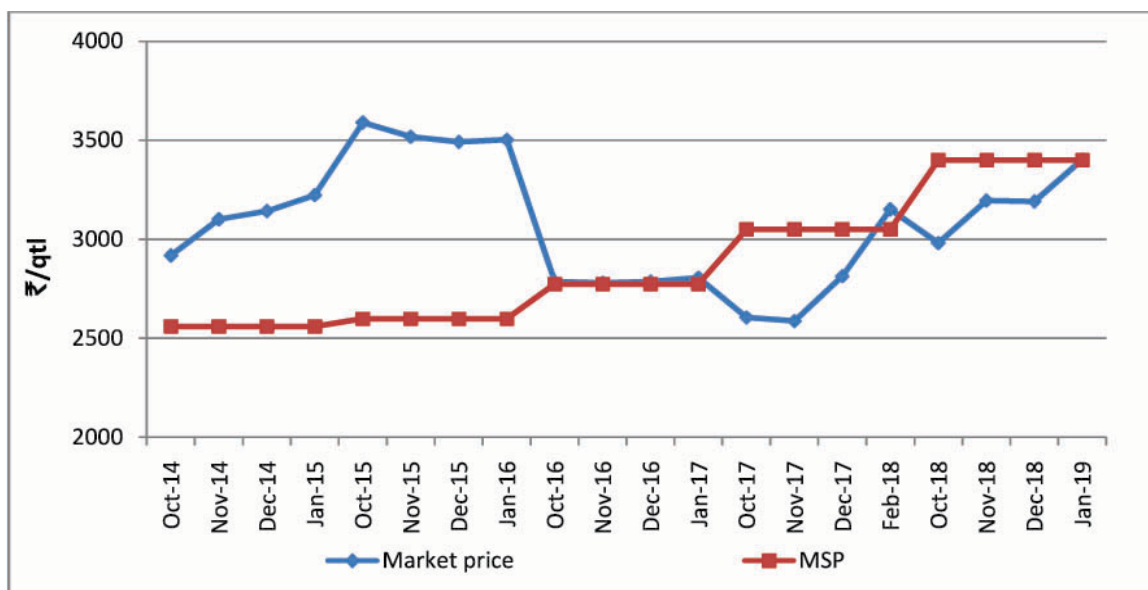
Table 2.8: Market Prices vis-a-vis MSP of Groundnut in Major Producing States in KMS 2018-19

Crop/States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Andhra Pradesh	18	22	13	19	18	22	13	0	73.6
Gujarat	28	30	26	26	28	30	26	0	76.4
Karnataka	28	27	23	24	27	27	23	2	77.5
Rajasthan	30	30	23	26	28	30	23	1	75.2
Tamil Nadu	2	7	9	19	2	6	8	0	43.2

Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

2.15 For soybean, market prices show fluctuating trend but were lower than MSP during October to December in 2017 and 2018 (Chart 2.12). In KMS 2018-19, Madhya Pradesh, Maharashtra and Rajasthan, major soybean producing States, reported market prices below MSP for more than 80 percent of days as shown in Table 2.9 and Chart 2.13. However, market prices recovered after the procurement season was over and the prices were ruling above the MSP during January 2019 in Madhya Pradesh and Maharashtra. Increased production and lower export of soybean meal were the main reasons for depressed market prices for soybean.

Chart 2.12: Trends in Domestic Prices vis-à-vis MSP of Soybean



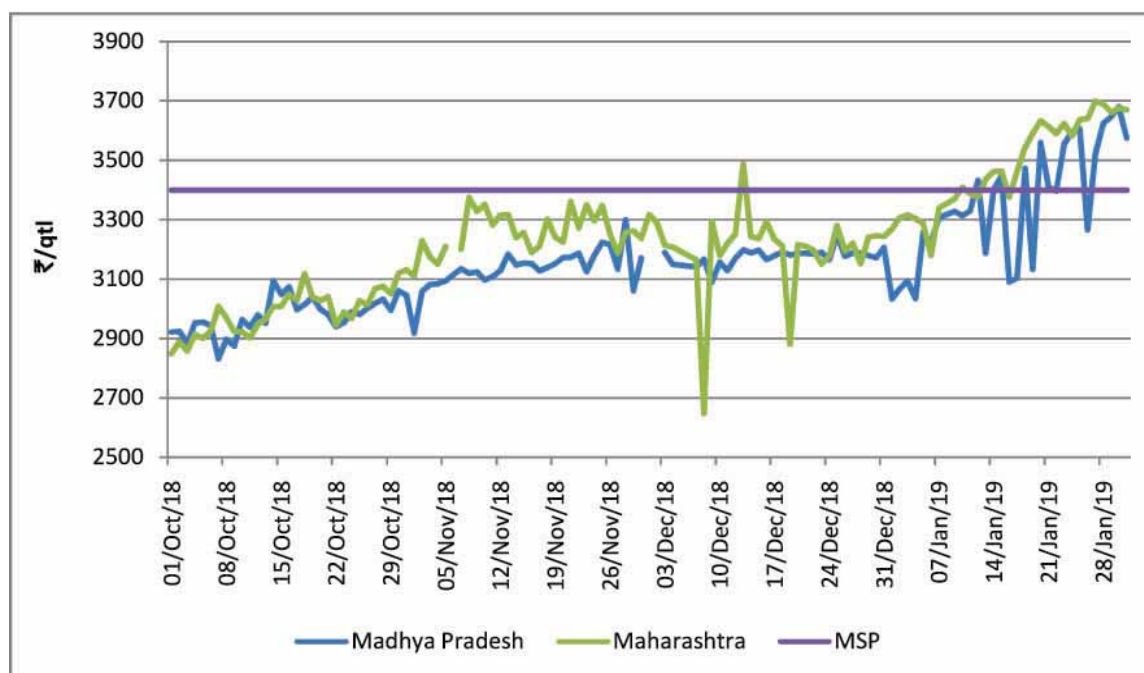
Notes: 1. Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Uttarakhand and Uttar Pradesh, which cover 99.5 percent of India's total production of soybean. MSPs are inclusive of bonus

2. MSP is inclusive of bonus.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW



Chart 2.13: Comparison of Market Prices and MSP of Soybean in Maharashtra and Madhya Pradesh during KMS 2018-19



Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Table 2.9: Market Prices vis-a-vis MSP of Soybean in Major Producing States in KMS 2018-19

Crop/States	No of days market prices reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Oct 2018	Nov 2018	Dec 2018	Jan 2019	
Madhya Pradesh	31	30	27	31	31	30	27	17	88.2
Maharashtra	31	30	29	31	31	29	28	12	82.6
Rajasthan	31	27	25	27	31	27	25	13	87.3

Source: AGMARKNET, Directorate of Marketing & Inspection (DMI)

Cotton

2.16 The movement of domestic prices depends on the demand-supply situation of cotton and demand for textile products viz., yarn, fabrics, etc in domestic and world market. With globalization, the domestic cotton prices are moving in tandem with international prices. Wholesale prices of cotton have been ruling above MSP during October 2014 to January 2019, with wide fluctuations (Chart 2.14). From November 2018 to January 2019, market prices declined a bit, but were converging towards MSP.



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Chart 2.14: Trends in Domestic Prices vis-à-vis MSP of Cotton



Note: Weighted wholesale price of Andhra Pradesh, Gujarat, Maharashtra and Telangana, which account for 71.7 percent of India's total production of cotton.

Sources: AGMARKNET, Directorate of Marketing & Inspection (DMI) and DES, DAC&FW

Procurement Policy and Operations

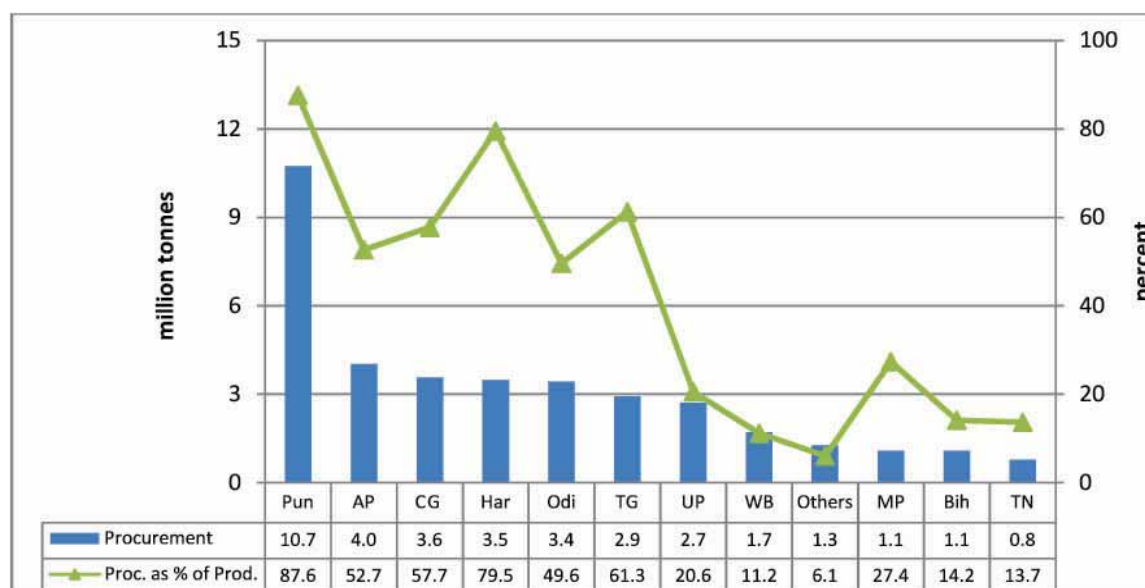
- 2.17 The price policy for agricultural commodities aims to ensure remunerative prices to the farmers with a view to encourage higher investment and production as well as to safeguard the interest of consumers. Procurement under MSP is open ended i.e. whatever foodgrains are offered by farmers, within the stipulated procurement period and conforming to the Fair Average Quality norms, are purchased at Minimum Support Price. FCI, the nodal central agency of Government of India, along with other State agencies undertakes procurement of wheat and paddy. Coarse grains are procured by State government agencies for central pool as per the direction issued by Government of India from time to time. National Agricultural Cooperative Marketing Federation of India Ltd (NAFED) undertakes procurement of oilseeds and pulses.
- 2.18 To improve efficiency of procurement, expand procurement in non-traditional States and crops thereby increasing benefits of MSP to local farmers as well as to reduce transit losses and cost, decentralized procurement (DCP) policy was introduced in 1997-98. Under DCP, the State government or its agencies procure, store and distribute (against allocation for NFSA/TPDS and OWS) within the state and the excess stocks are handed over to FCI in central pool. The expenditure incurred by the State government on procurement, storage and distribution of DCP stocks are reimbursed by Government of India on the laid down principles. At present, 17 states (9 for rice, 2 for wheat and 6 for rice/wheat) are under DCP system.



Rice

2.19 Procurement of rice showed an increasing trend over time. Rice procurement increased from 31.8 million tonnes in 2013-14 to 38.2 million tonnes in 2017-18, which is 33.8 percent of total production and 40.1 percent of marketed surplus. As on March 1, 2019, rice procurement reached 36.1 million tonnes and is expected to touch about 40 million tonnes. The stock of rice in central pool as on January 1, 2019 was 18.3 million tonnes, as against buffer norms of 7.6 million tonnes. State-wise procurement of rice in TE2017-18 is shown in Chart 2.15. Among the states, the total quantity of rice procured was highest in Punjab (10.7 million tonnes), followed by Andhra Pradesh (4 million tonnes), Chhattisgarh (3.6 million tonnes) and Haryana (3.5 million tonnes). Procurement as percent of production was highest in Punjab (87.6%) followed by Haryana (79.5%), Chhattisgarh (57.7%) and Andhra Pradesh (52.7%).

Chart 2.15: State-wise Procurement of Rice in TE2017-18



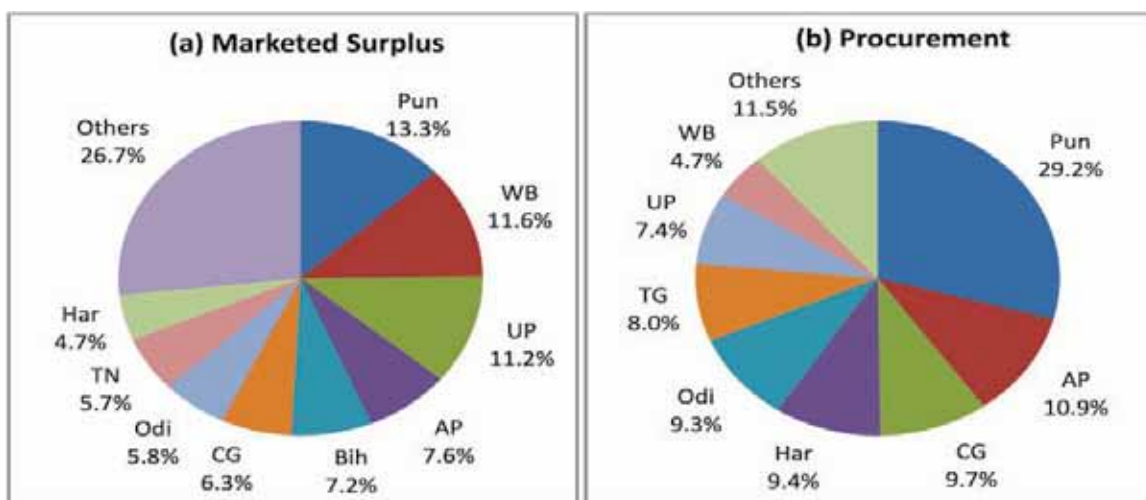
Sources: FCI and DAC&FW

2.20 Chart 2.16 shows the share of major States in marketed surplus and procurement of rice in TE2017-18. It can be seen that even though Andhra Pradesh, Tamil Nadu and Telangana are important producers of rice but due to lower marketed surplus, as these are mainly rice consuming states their share of procurement as percent of production and total procurement was lower as compared to Punjab. Bihar, Odisha, West Bengal and Assam are major producers of rice in eastern India, but procurement was almost negligible in Bihar, Assam and West Bengal. In the absence of effective procurement by the government agencies, market prices were below MSP in West Bengal and Assam as shown in Chart 2.2. Therefore, procurement needs to be strengthened in these states by opening more procurement centres to ensure remunerative prices to farmers.



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Chart 2.16: Share of Major States in Marketed Surplus and Procurement of Rice, TE2017-18

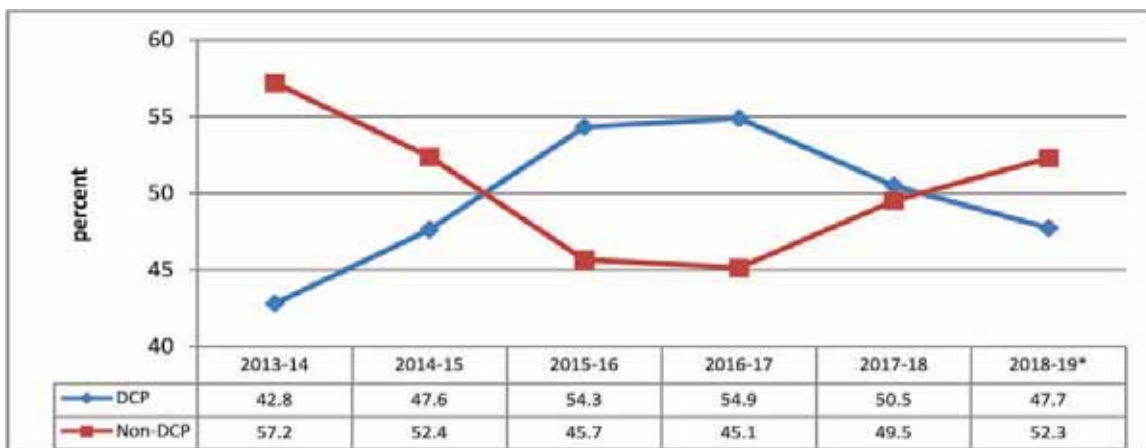


Source: DES, DAC&FW and FCI

2.21 Chart 2.17 shows the share of DCP and non-DCP States in procurement of rice. It is observed that the share of DCP States has increased from 42.8 percent in 2013-14 to 54.9 percent in 2016-17, but declined during 2017-18 mainly due to lower procurement driven by significant reduction in rice production in Chhattisgarh, Odisha, Madhya Pradesh and West Bengal. The procurement of non-DCP States such as Punjab, Haryana and Uttar Pradesh has increased in 2017-18.

2.22 Chart 2.18 shows that the number of farmers benefitted under MSP has increased significantly between 2016-17 and 2018-19. At all-India level, number of beneficiary farmers increased from 7.42 million in 2016-17 to 7.76 million in 2018-19. West Bengal, Chhattisgarh, Uttar Pradesh, Madhya Pradesh and Haryana recorded a significant increase in number of beneficiary farmers between 2016-17 and 2018-19.

Chart 2.17: Share of Procurement of Rice in DCP and Non-DCP States

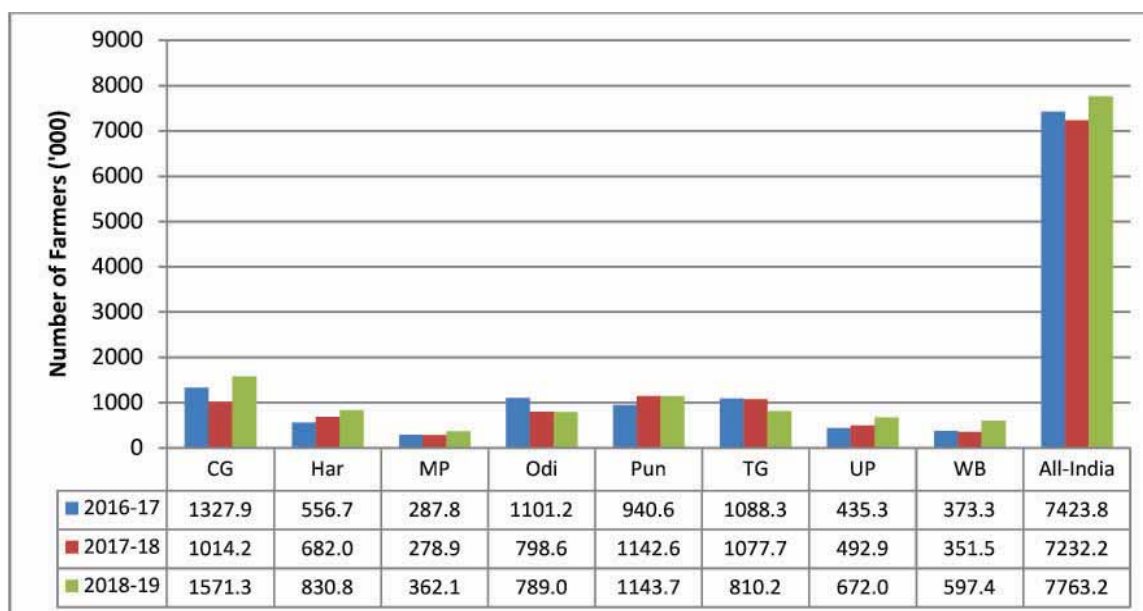


Note: * Figures reported as on 13.02.2019

Source: FCI



Chart 2.18: Number of Paddy Farmers Benefiting from the Procurement during Last Three Kharif Marketing Season



Source: FCI

- 2.23 The Commission had sought information from State governments on procurement of paddy by farm-size to examine impact of MSP on small and marginal farmers. Andhra Pradesh, Chhattisgarh, Telangana and Uttar Pradesh provided information for KMS 2017-18 and 2018-19 (Table 2.10). The share of procurement of paddy and the percentage farmers benefitted from the procurement operations have increased among the marginal and small farmers between 2017-18 and 2018-19 in Andhra Pradesh, Chhattisgarh, and Telangana. This means that more number of marginal and small farmers are benefitting from the procurement operations, which is a good sign. In case of Uttar Pradesh, this share decreased for marginal farmers between 2017-18 and 2018-19. However, data for 2018-19 is not final as procurement season is not over. By increasing awareness about FAQ norms and MSP, more farmers from marginal and small categories can be brought under the ambit of procurement operations.



Table 2.10: Procurement of Paddy by Farm-Size in Chhattisgarh Andhra Pradesh, Telangana and Uttar Pradesh in 2017-18 and 2018-19

(percent)

Particulars	Year	Marginal Farmer (<1 ha)	Small Farmer (1-2 ha)	Semi-medium Farmer (2-4 ha)	Medium (4-10 ha) & Large (>10 ha) Farmer
Chhattisgarh*					
Quantity Procured	2017-18	17.2	30.2	28.3	24.2
	2018-19	18.4	31.6	27.9	22.2
Farmers benefitted	2017-18	42.8	33.0	17.4	6.8
	2018-19	44.9	32.6	16.3	6.2
Andhra Pradesh**					
Quantity Procured	2017-18	11.9	24.9	40.2	23.1
	2018-19	16.2	31.0	43.7	9.2
Farmers benefitted	2017-18	34.2	30.0	26.7	9.1
	2018-19	42.0	31.3	23.7	3.0
Telangana***					
Quantity Procured	2017-18	8.1	16.2	26.5	49.2
	2018-19	10.6	19.9	26.6	42.9
Farmers benefitted	2017-18	16.5	24.1	29.8	29.6
	2018-19	25.8	27.8	25.3	21.2
Uttar Pradesh****					
Quantity Procured	2017-18	9.6	19.6	37.1	33.7
	2018-19	4.4	22.2	38.2	35.3
Farmers benefitted	2017-18	15.8	25.8	34.5	23.9
	2018-19	12.4	28.5	35.4	23.6

Note: 2018-19 season procurement under progress (*as on 15.01.2019, **as on 30.01.2019, ***19.01.2019 and ****as on 15.01.2019)

Source: Reply from State Governments

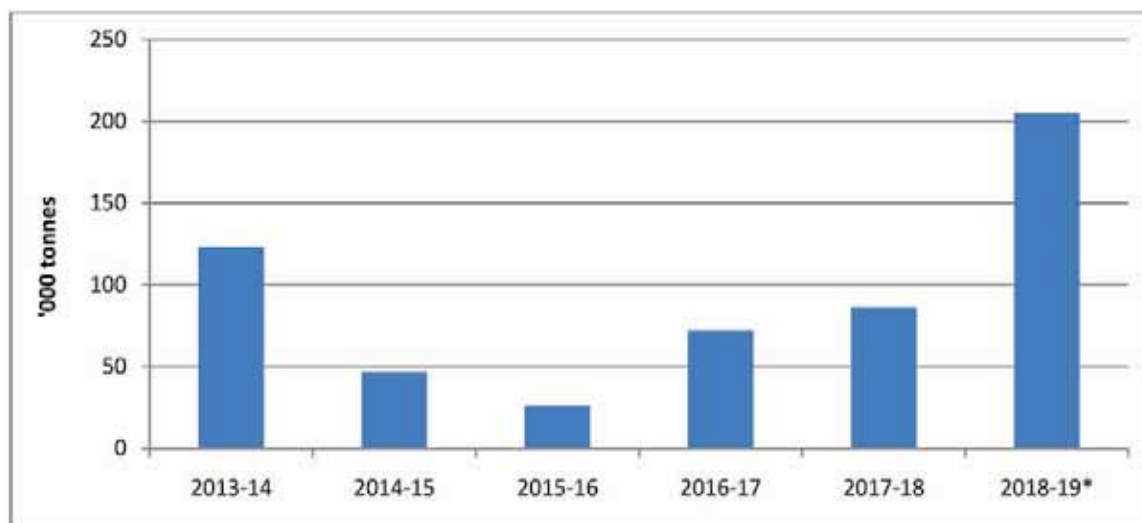
Nutri-Cereals

2.24 Because of pro-active policy initiatives by the government, the procurement of nutri-cereals and maize has increased from 0.86 lakh tonnes in KMS 2017-18 to 2.05 lakh tonnes in KMS 2018-19 (as on March 8, 2019) (Chart 2.18). Maize and bajra constituted about 55 percent and 41 percent of the procurement, respectively in KMS 2017-18, whereas bajra alone accounted for about 90 percent of procurement in KMS 2018-19 (Table 2.12). In order to make procurement operations more effective in case of nutri-cereals, States should be encouraged to include nutri-cereals in Public Distribution System, Mid-Day Meal and other welfare schemes. With changing habits of consumers towards nutri-cereals, diversified products of such grains through value-addition should be encouraged to increase its production



and ensure remunerative price to growers. Promotion of baby corn, sweet corn and other value-added products of maize are essential to enhance maize growers' income.

Chart 2.19: Procurement of Nutri-Cereals during KMS 2013-14 to KMS 2018-19



Note: *Figures reported as on 08.03.2019

Source: FCI

Table 2.11: Procurement of Nutri-Cereals and Maize in Major Producing States during KMS 2017-18 and KMS 2018-19

(tonnes)

Period	Commodity	Gujarat	Haryana	Madhya Pradesh	Maharashtra	Total
KMS 2017-18	Jowar	-	-	264	2668	2932
	Bajra	-	31347	4121	-	35468
	Maize	-	-	-	47794	47794
	Total	-	31347	4385	50462	86194
KMS 2018-19*	Jowar	-	-	135	10931	11066
	Bajra	696	180744	4099	-	185539
	Maize	1538	-	-	6987	8525
	Total	2234	180744	4234	17918	205130

Note: * Figures reported as on 08.03.2019

Source: FCI

Pulses

2.25 NAFED has stepped up procurement of pulses in the recent years. During KMS 2017-18, about 8.68 lakh tonnes of tur, 2.94 lakh tonnes of moong and 2.75 lakh tonnes of urad were procured (Table 2.13). Among major pulses growing States, Karnataka has reported largest procurement of tur followed by Maharashtra, Telangana, Gujarat



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and Andhra Pradesh (Chart 2.20(a)). Similarly, highest procurement of moong was reported in Rajasthan (2.6 lakh tonnes), followed by Karnataka and Maharashtra (Chart 2.20(b)). Procurement of urad was the highest in Rajasthan followed by Maharashtra and Uttar Pradesh (Chart 2.20(c)). With increased procurement of pulses in various States by NAFED, stocks increased at a rapid pace. It is surprising to note that, despite large procurement (>40 percent of production in some cases) in 2017-18, the market prices remained significantly below MSP.

- 2.26 As on March 7, 2019, NAFED has disposed-off 3.1 lakh tonnes of tur, 3.0 lakh tonnes of moong and 2.2 lakh tonnes of urad with balance stock of 7.2 lakh tonnes, 4.1 lakh tonnes and 5.9 lakh tonnes, respectively, which is very close to buffer stock norms of pulses. However, there is need to evolve a sustainable mechanism to liquidate the stocks, as pulses have short shelf-life. Pulses can be distributed through PDS as followed in Tamil Nadu, Himachal Pradesh and some States. It was suggested by the stakeholders that the disposal of stocks by NAFED should not coincide with the marketing season and should not be liquidated at subsidized price in open market as it brings down the market prices below MSP and discourages private trade to buy directly from farmers.

Table 2.12: Procurement of Pulses in KMS 2017-18 and KMS 2018-19

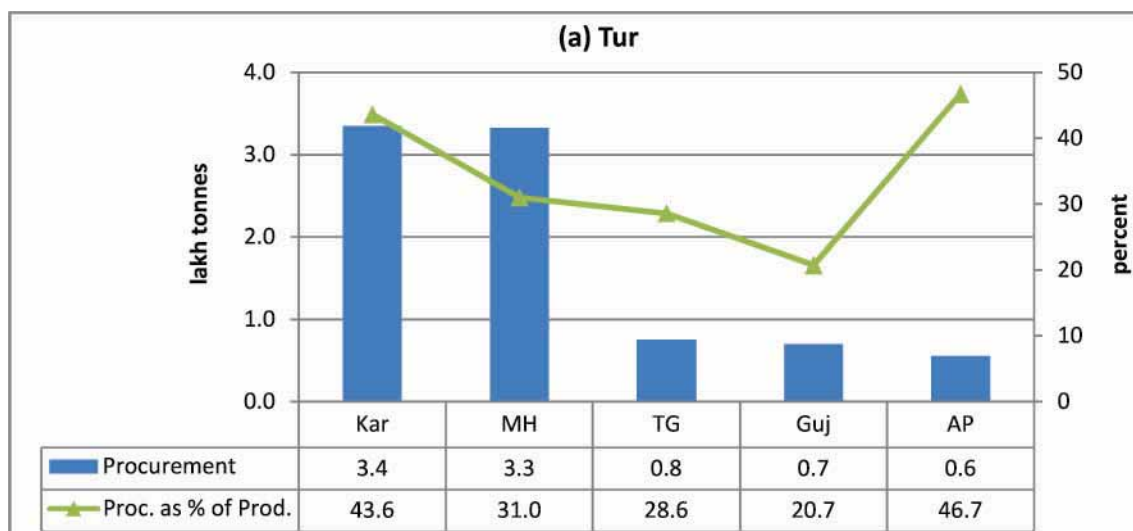
(lakh tonnes)

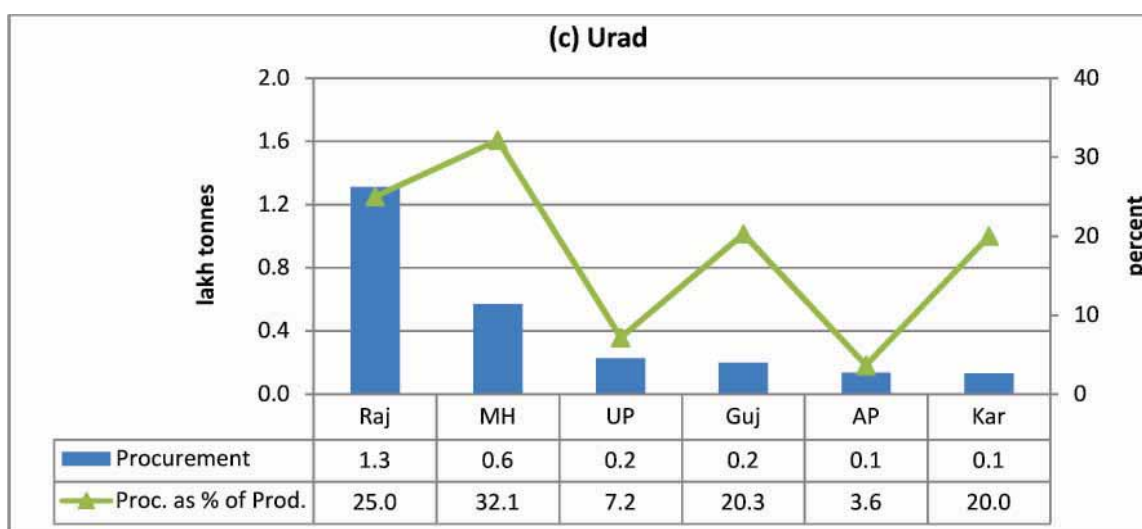
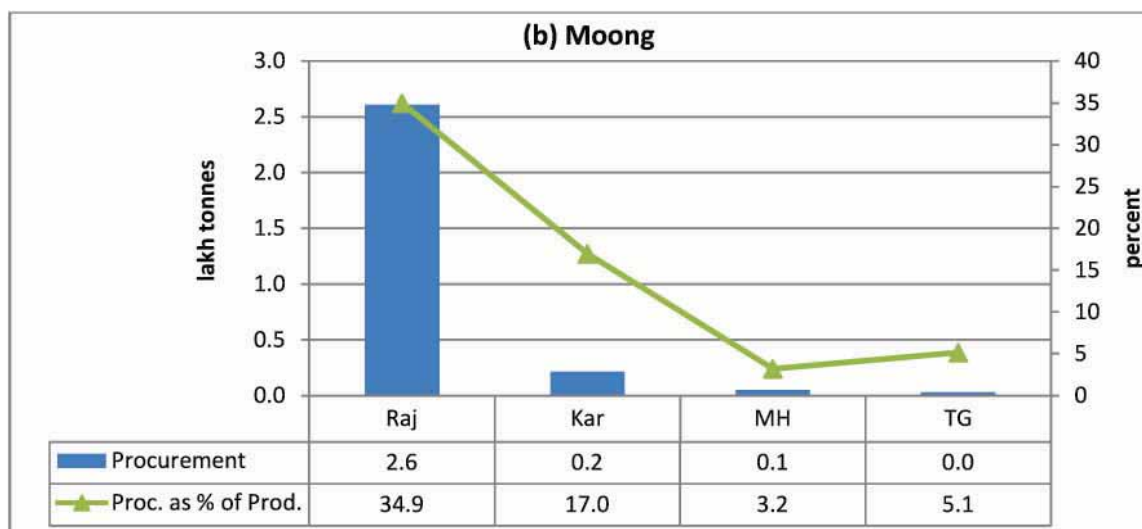
Crops	2016-17	2017-18	2018-19*
Tur	1.96	8.68	1.65
Moong	0.08	2.94	2.96
Urad	0.00	2.75	4.24

Note: *Reported as on 07.03.2019

Source: NAFED

Chart 2.20: State-wise Procurement of Pulses in KMS 2017-18





Source: NAFED

Oilseeds

2.27 Procurement of groundnut increased manifold, from 210.7 thousand tonnes in 2016-17 to a level of 1046 thousand tonnes in 2017-18, while soybean procurement increased from 0.2 thousand tonnes to 72.3 thousand tonnes during the same period (Table 2.13). Since market prices of groundnut were ruling below MSP during KMS 2017-18 and KMS 2018-19, NAFED intervened in the market and procured the commodity. As on March 7, 2019, NAFED had procured 717.4 thousand tonnes of groundnut in KMS 2018-19, which is much lower than the procurement level of 2017-18. Maximum procurement of groundnut was reported in Gujarat (8.3 lakh tonnes), followed by Rajasthan, Andhra Pradesh and Karnataka as shown in Chart 2.21(a). Procurement as percent of production of groundnut was highest (21.1%) in Gujarat followed by Rajasthan (11.5%) and Andhra Pradesh (5.9%). Largest procurement of soybean (34.6 thousand tonnes) was reported in Telangana followed by Maharashtra (26.1 thousand tonnes) and Rajasthan (11.6 thousand tonnes) in 2017-18 (Chart



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2.21(b)). There was no procurement of soybean in Madhya Pradesh in 2017-18 as Bhavantar Bhugtan Yojna was in operation in the State during 2017-18. As on March 7, 2019, NAFED has disposed-off 747.8 thousand tonnes of groundnut and 81.5 thousand tonnes of soybean with balance stock of 1011.3 thousand tonnes and 10 thousand tonnes, respectively.

Table 2.13: Procurement of Kharif Oilseeds

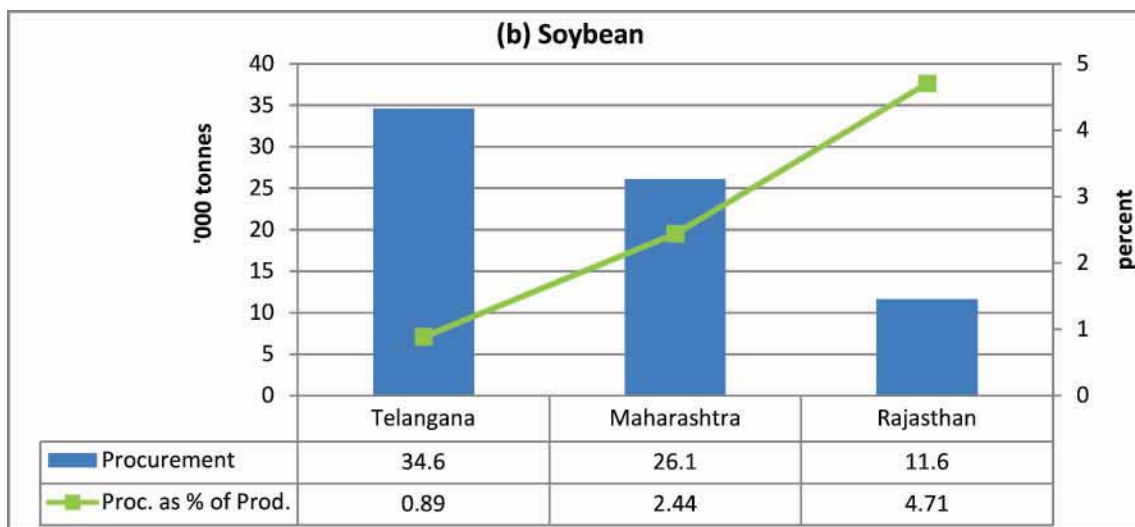
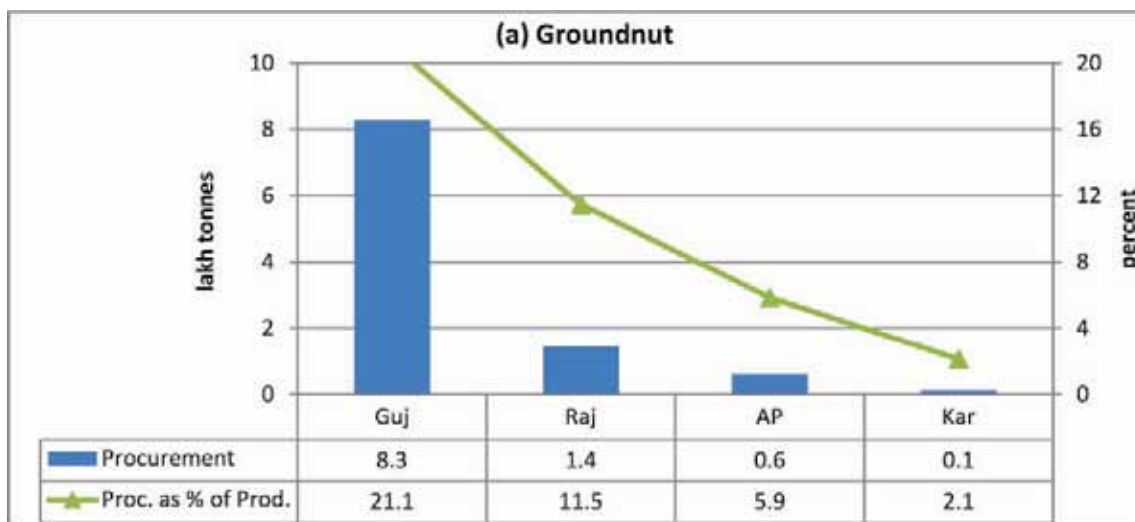
('000 tonnes)

Commodity	2016-17	2017-18	2018-19*
Groundnut	210.7	1046.0	717.4
Soybean	0.2	72.3	19.8

Note: *Reported as on 07.03.2019

Source: NAFED

Chart 2.21: Procurement of Oilseeds in Major Producing States in 2017-18



Source: NAFED



Bonus on MSP: Market Distortions

2.28 Some State governments have been giving bonus over and above MSP particularly for paddy during past few years, which creates distortions in market and almost crowds out private sector. During KMS 2017-18 and 2018-19, states like Kerala, Tamil Nadu and Chhattisgarh have declared bonus for paddy (Table 2.14). For instances, Chhattisgarh declared a bonus of ₹750 per quintal for paddy in 2018-19, which works out to about 43 percent of MSP. Similarly, Kerala paid bonus of ₹780 per quintal for common and ₹760 per quintal for Grade A paddy in 2018-19. Procurement of rice in Chhattisgarh is much higher than State requirement of rice under NFSA and other schemes. Therefore, the State will find it difficult to liquidate excess stocks. Bonus on MSP affects inter-crop parity and discourages farmers from diversification of production basket. The Commission re-iterates its earlier recommendation that such bonuses/incentives should be discouraged, particularly in surplus rice producing States.

Table 2.14: Bonus Declared by Selected States for Paddy

(₹/qtl)

States	KMS 2017-18	KMS 2018-19
Chhattisgarh	300	750
Kerala	Common=780	Common =780
	Grade A=740	A=760
Tamil Nadu	Common =50	Common = 50
	Grade A =70	Grade A = 70
Jharkhand	150	-

Sources: FCI and Reply from State Governments

Awareness about MSP and FAQ Norms

2.29 The successful implementation of a scheme can be achieved only if the targeted population is aware of most of the aspects of the scheme. Several studies have shown that there is lack of awareness among farmers about the MSP and farm produce brought to the procurement centre is at times rejected as it does not meet the FAQ norms due to low awareness about quality norms. Therefore, there is a need to create awareness about prevailing MSP, FAQ norms, process of procurement, facilities provided by the government, payment mechanism etc. It will help in improving market prices in addition to helping the beneficiaries in adopting modern technologies in farming. Hence, there is need to give wide publicity about MSP, FAQ norms and procurement agencies by the State governments in regional/vernacular, electronic and print media and also through pamphlets and announcements in the villages atleast 15 days before the procurement season starts so as to reach out to large number of farmers. In addition, farmers need to be trained on FAQ norms and post-harvest handling methods so as to minimize post-harvest losses and get better prices.



Recapitulation

- 2.30 Market prices of paddy, maize, tur, urad, moong, soybean and groundnut remained below MSP in major States during KMS 2018-19. Therefore, to ensure remunerative prices to farmers, procurement machinery needs to be strengthened and made more robust. Procurement centers should be established by FCI and NAFED on temporary basis in places where larger arrivals are expected during peak harvesting season. Procurement under PSS should be immediately started as and when market prices fall below MSP. As suggested in the PM-AASHA scheme, private companies should be encouraged and incentivized to procure farm produce at MSP to avoid distress sale by farmers.
- 2.31 NAFED has increased procurement of pulses and oilseeds in various States in the recent years, which has resulted in high stocks. As pulses have short shelf-life, mechanisms should be evolved to liquidate these stocks through PDS, other welfare schemes and other alternative channels. However, the time of disposal of stocks should not coincide with the procurement season as it adversely affects market prices. The Commission also recommends that NAFED should not dispose-off pulses and oilseeds below economic cost as it discourages private companies to buy directly from farmers during procurement season.



Chapter 3

Crop Productivity and Input Management

Chapter 3

- 3.1 Productivity of crops in India suffers from two major problems: one, productivity of many crops at all-India level is much lower than the world average and two, there are vast spatial variations in productivity of crops within India due to differences in agro-climatic conditions, adoption of recommended inputs, access to credit & technology and poor market incentives. Therefore, improving overall productivity of crops and reducing inter-State variations is critical for the development of Indian agriculture. Further, improvements in productivity of crops have the potential to drive up farm income, which can trigger rural demand and drive the Indian economy to a higher growth trajectory. This chapter discusses the recent trends in productivity of crops in Indian agriculture along with various factors which play a key role in determining productivity.

Quinquennial Productivity Growth Trends

- 3.2 The quinquennial average growth rates in the area, production and productivity of major kharif crops for Quinquennial Ending (QE) 2008-09, 2013-14 and 2018-19 are analyzed and presented in Table 3.1.

Cereals

- 3.3 Production of total cereals has witnessed the lowest growth in QE2018-19 (1.46%) during the last 15 years. This is because of a fall in area under total cereals in QE2018-19 (-0.55%) and deceleration in productivity growth (2.06%). For kharif cereals, growth in production has slowed down from 2 percent in QE2013-14 to 1.72 percent in QE2018-19 due to an decline in area by 0.71 percent in QE2018-19 and a decline in productivity growth rate from 2.80 percent in QE2013-14 to 2.43 percent in QE2018-19. All kharif cereals except paddy and maize have also witnessed a decline in production due to various reasons. In paddy there was a deceleration in productivity from 2.17 percent in QE2013-14 to 2 percent in QE2018-



19. Further, the area also declined by 0.34 percent in QE2018-19. This resulted in a deceleration in production from 1.71 percent in QE2013-14 to 1.65 percent in QE2018-19. Area under bajra has consistently declined in all three periods taken for analysis. Combined with fall in productivity in QE2018-19 (-0.74 %), production of bajra declined by 3.34 percent in QE2018-19. Increase in production of maize was the lowest in QE2018-19 (3.03%). This was due to deceleration in area growth from 2.11 percent in QE2013-14 to 0.25 percent in QE2018-19 and marginal deceleration in productivity from 2.95 percent to 2.73 percent. Although productivity of jowar has increased from 0.40 percent in QE2013-14 to 0.86 percent in QE2018-19 production has declined by 6.38 percent because of a large decline in area (-6.66%). In case of ragi too, because of negative growth in area (-1.30%) and productivity (-0.77%), production declined by 0.80 percent in QE2018-19.

Pulses

- 3.4 Performance of pulses has shown a steady improvement over the last 10 years after a slight decline in production in QE2008-09. Productivity growth for total pulses remained over 3 percent in both QE2013-14 (3.21%) and QE2018-19 (3.08%). Combined with increase in area in both the periods, production of pulses increased by 6.21 percent in QE2013-14 and 8.76 percent in QE2018-19. As regards kharif pulses, productivity growth registered 5.95 percent and 4.56 percent in QE2013-14 and QE2018-19, respectively. Although productivity growth has declined in QE2018-19 vis-à-vis QE2013-14, growth rate in production has improved from 8.64 percent in QE2013-14 to 11.85 percent in QE2018-19 due to increase in growth in area of all kharif pulses except for tur. In case of individual pulses, growth rate in production of moong has declined steeply from 25.14 percent in QE2013-14 to 9.93 percent in QE2018-19 due to a large decline in productivity growth from 16.55 percent in QE2013-14 to 4.74 percent in QE2018-19. Growth in production of tur (8.88%) and urad (15.86%) remained encouraging in QE2018-19 due to good growth in productivity as well as area.

Oilseeds

- 3.5 Although there was a growth of 2.97 percent in productivity of oilseeds in QE2018-19, production declined by 0.06 percent due to negative growth in area which was -3.08 percent. This was in sharp contrast to positive growth in production during the previous two periods. In case of kharif oilseeds, there was a decline in production by 0.10 percent in QE2018-19. This decline was triggered by negative growth in area (-1.64%). Among individual oilseeds, although decline in area was noticed in all crops in QE2018-19, it was found to be very sharp in sunflower (-15.23%). This trend has triggered a decline in production of all oilseeds in QE2018-19 except soybean and sesamum where there was an increase of 6.41 percent and 2.28 percent in production on account of good productivity growth.



Cotton

3.6 Productivity of cotton registered a growth of 6.16 percent and 5.26 percent respectively in QE2008-09 and QE2013-14. There was also significant growth in production and area during these periods. However, in QE2018-19 productivity has declined by 3.28 percent. Further, expansion in area has also decelerated to 0.96 percent in QE2018-19, from 5.04 percent in QE2013-14. This has led to a decline of 3.19 percent in cotton production in QE2018-19. The main reasons behind this fall in production are; drought and erratic rainfall, pest attacks and soil moisture stress conditions in main cotton growing States like Gujarat and Maharashtra. Therefore, it is important to address these issues to improve productivity of cotton.

Table 3.1: Quinquennial Trends in Growth Rate (%) of Major Kharif Crops

Crops	Area			Production			Productivity		
	QE 2008-09	QE 2013-14	QE 2018-19	QE 2008-09	QE 2013-14	QE 2018-19	QE 2008-09	QE 2013-14	QE 2018-19
A-Cereals*	0.16	-0.16	-0.55	2.20	2.46	1.46	1.00	2.55	2.06
Kharif Cereals	-0.65	-0.91	-0.71	0.71	2.00	1.72	1.29	2.80	2.43
Paddy	1.37	-0.53	-0.34	2.44	1.71	1.65	1.01	2.17	2.00
Bajra	-3.58	-1.77	-2.91	-4.10	4.51	-3.34	-1.17	5.86	-0.74
Maize	2.17	2.11	0.25	6.13	5.22	3.03	3.85	2.95	2.73
Jowar	-4.17	-4.84	-6.66	1.95	-4.79	-6.38	6.57	0.40	0.86
Ragi	-2.78	-2.73	-1.30	5.14	0.85	-0.80	6.48	3.15	-0.77
B-Pulses*	-1.13	2.99	4.80	-0.25	6.21	8.76	0.88	3.21	3.08
Kharif Pulses	-3.16	1.58	5.73	-3.01	8.64	11.85	-0.66	5.95	4.56
Tur	-0.68	3.56	3.07	1.47	7.31	8.88	1.49	4.24	2.80
Moong	-3.42	4.70	5.47	-5.21	25.14	9.93	-3.41	16.55	4.74
Urad	-4.51	2.96	9.82	-3.55	9.16	15.86	0.66	5.72	5.17
Food Grains*	-0.09	0.40	0.53	2.04	2.68	1.95	2.00	-0.56	1.38
C-Oilseeds*	3.32	0.46	-3.08	2.81	4.34	-0.06	-0.05	3.56	2.97
Kharif Oilseeds	4.18	1.25	-1.64	4.15	6.28	-0.10	0.10	4.86	1.70
Groundnut	1.15	-1.61	-2.01	5.82	17.31	-5.63	2.53	14.79	-3.68
Soybean	7.82	4.32	-0.64	5.90	5.05	6.41	-1.23	1.15	7.57
Sesamum	1.38	-1.19	-1.02	-3.05	4.65	2.28	-4.23	5.34	3.57
Sunflower	-1.64	-16.50	-15.23	6.49	-14.54	-13.41	8.18	3.98	2.12
Nigerseed	-1.48	-5.22	-8.78	1.73	-3.18	-6.94	3.43	2.56	2.34
D-Cotton	4.53	5.04	0.96	11.01	10.80	-3.19	6.16	5.26	-3.28

Notes: * Calculations based on 4th Advanced Estimates, 2017-18 for Total Cereals, Total Pulses, Total Food Grains and Total Oilseeds and 2nd Advanced Estimates, 2018-19 for the remaining

Growth rate is calculated as simple average of the growth rates of the constituent years

Source: Computed using data from DES, Department of Agriculture, Co-operation and Farmers Welfare.



Crop Productivity in Major Producing States

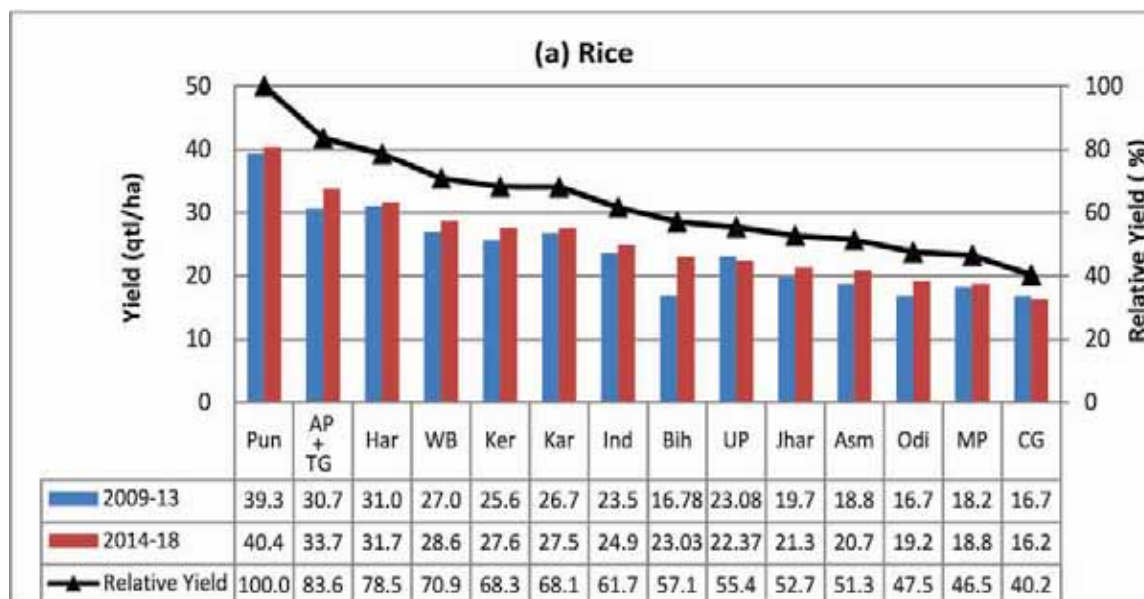
- 3.7 There are wide inter-State variations in productivity inter-alia due to variations in agro-climatic conditions and use of farm inputs. Five-year Olympic average productivity per hectare for major crops of major producing States has been analyzed to study inter-State variations in productivity for the periods: 2009-2013 and 2014-2018 [Charts 3.1 (a) to (g)]. Olympic average is calculated by dropping the highest and lowest productivity from the most-recent 5 years and average is worked out based on remaining 3 years.

Rice

- 3.8 Punjab remains the most productive State for rice cultivation with productivity of 40.4 quintals per hectare in 2014-18. However, growth rate of productivity in Punjab is an area of concern as there was only a marginal increase in productivity (2.8%) over its previous period: 2009-13. Bihar performed better in terms of percentage increase in productivity in 2014-18 over 2009-13 (37.2%); narrowing its productivity gap with Punjab. While it was ranking 12th in terms of productivity among major rice producing States in 2009-13, Bihar's rank has improved to 7th position in 2014-18. Among States having productivity greater than all-India average (24.9 quintals per hectare), Andhra Pradesh+Telangana, Haryana, West Bengal and Kerala had growth rates higher than the all-India productivity growth rate (6%). Among the States with productivity less than all-India average, Bihar has the highest productivity growth rate followed by Odisha (11.8%) and Assam (10.3%). Chhattisgarh and Uttar Pradesh were the only two States which experienced decline in productivity. Fall in productivity in Uttar Pradesh is of particular concern as it is the largest rice producer in India accounting for nearly 15 percent of total production. This fall in productivity is mainly due to various biotic and abiotic stresses as well as institutional constraints. Some of the major reasons are: a) disease and pest attacks, b) drought, salinity and nutrient deficiencies, c) poor soil health conditions due to imbalanced use of fertilizers & less use of organic manures, d) weak institutional finance system and e) problem of marketing hybrid rice.



Chart 3.1: Average Productivity of Kharif Crops in Major Producing States



Source: DES, DAC & FW

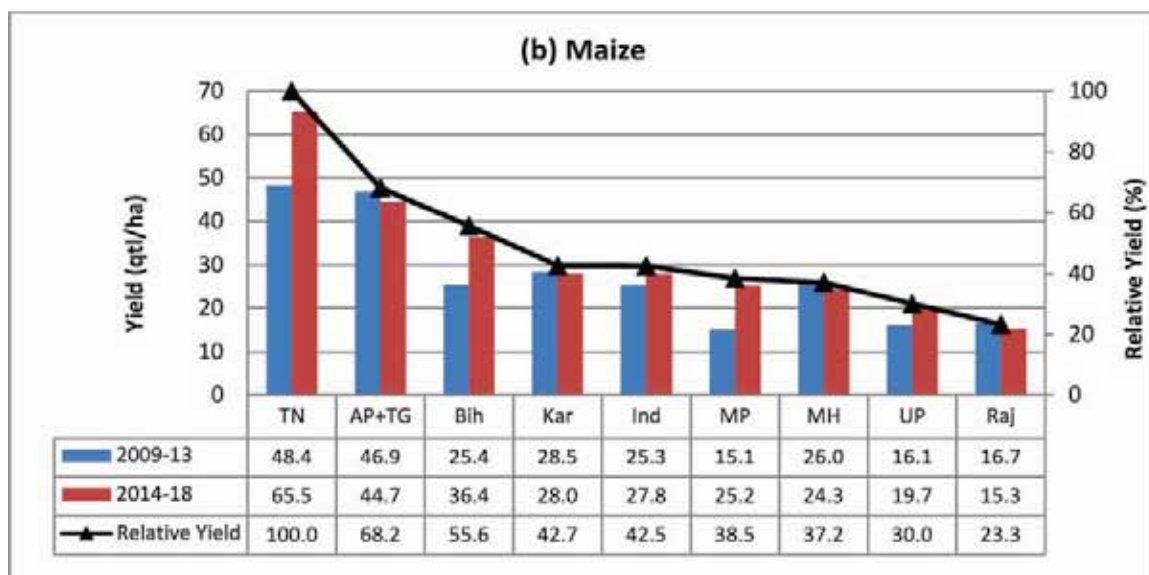
Maize

- 3.9 There are large inter-State variations in maize productivity. While Tamil Nadu was the most productive State with productivity of 65.5 quintals per hectare in 2014-18, the next most productive State was Andhra Pradesh+Telangana where productivity was only 68.2 percent of Tamil Nadu for 2014-18. This shows that there is immense untapped potential in maize productivity which needs to be tapped to ensure higher income for farmers. Productivity in Bihar stood at 36.4 quintals per hectare in 2014-18 which is a big improvement from 25.4 quintals per hectare recorded in 2009-13. At the all-India level, maize productivity was 27.8 quintals per hectare in 2014-18 which is only 42.7 percent of Tamil Nadu's productivity. Madhya Pradesh registered the biggest improvement in productivity from 15.1 quintals per hectare in 2009-13 to 25.2 quintals per hectare in 2014-18 (67.2%). Productivity in Uttar Pradesh in 2014-18 (19.7 qtl/ha) was below all-India average but there was a significant growth in its productivity as compared to 2009-13 (16.1 qtl/ha). One of the factors behind maize productivity remaining low in India is that it is generally cultivated as a secondary crop, predominantly under rainfed areas where moisture stress is very high leading to low productivity.



PRICE Policy for KHARIF CROPS

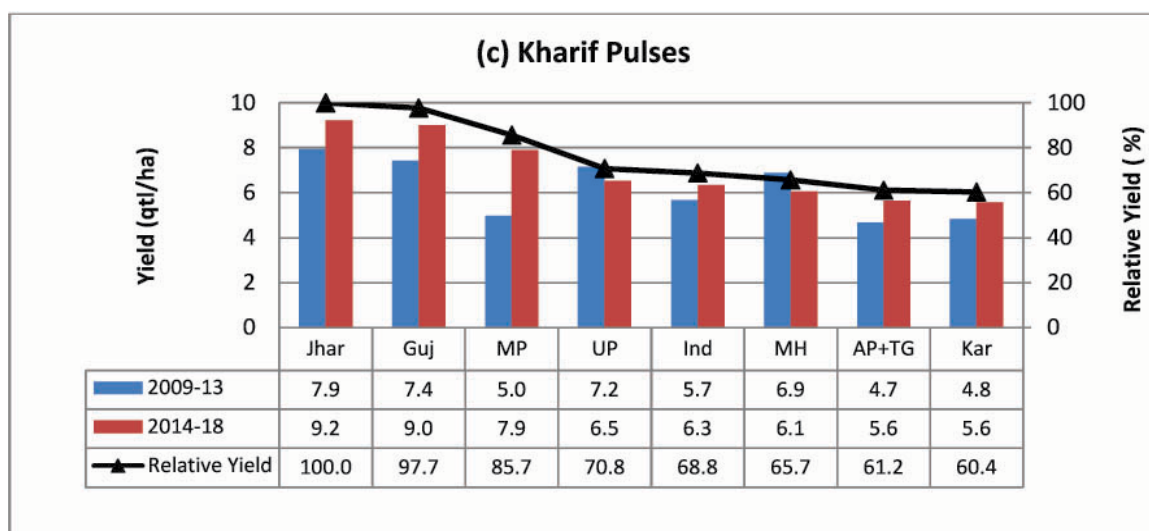
Crop Productivity and Input Management



Source: DES, DAC & FW

Pulses

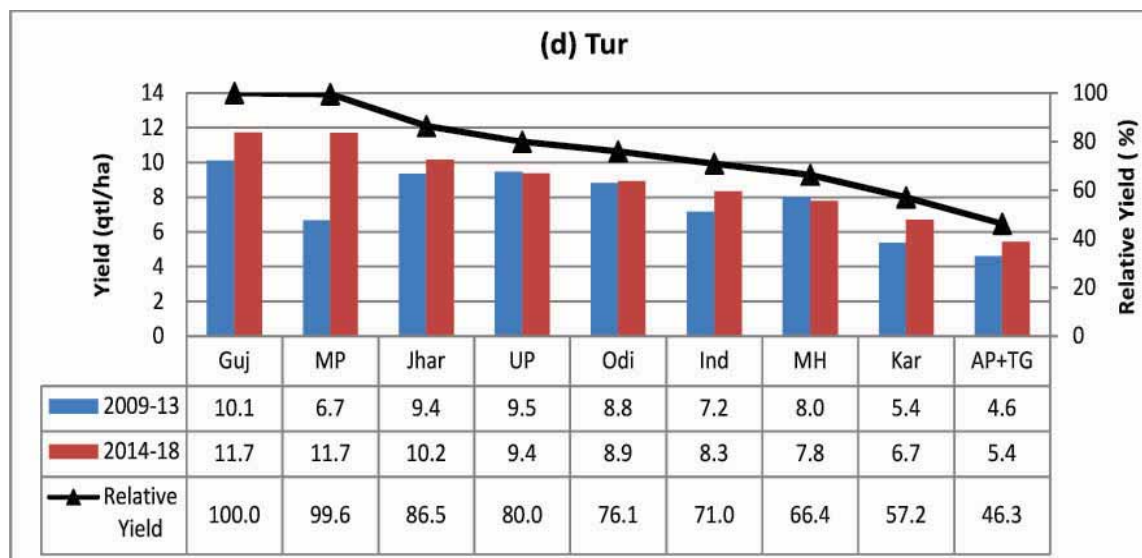
3.10 Productivity of kharif pulses has witnessed a significant jump from 5.7 quintals per hectare in 2009-13 to 6.3 quintals per hectare in 2014-18 at all-India level. All the States except Uttar Pradesh and Maharashtra have seen increase in productivity. Jharkhand has particularly performed well in productivity of kharif pulses, which maintained the highest productivity in both the periods. Similarly, Gujarat and Madhya Pradesh have also registered impressive growth in productivity; 16.3 percent and 58.5 percent, respectively. Growth rate in productivity in Karnataka and Andhra Pradesh+Telangana was 14.9 percent and 20.3 percent, respectively. This was higher than the all-India growth rate of 12 percent. Therefore, these States have started converging towards all-India level.



Source: DES, DAC & FW



- 3.11 All-India percentage productivity increase in tur was 16.4 percent. Among the States highest productivity increase was noted in Madhya Pradesh, Karnataka and Andhra Pradesh+Telangana with increases of 75.3 percent, 24.7 percent and 18.5 percent, respectively. Gujarat has achieved the highest productivity (11.7 qtl/ha) closely followed by Madhya Pradesh, but there was a decline in productivity in Uttar Pradesh (-0.9%). Apart from Uttar Pradesh, Maharashtra was the only other State where productivity growth was negative (-2.9%), which is a serious concern as it contributes close to one-fourth of India's total production of tur.



Source: DES, DAC & FW

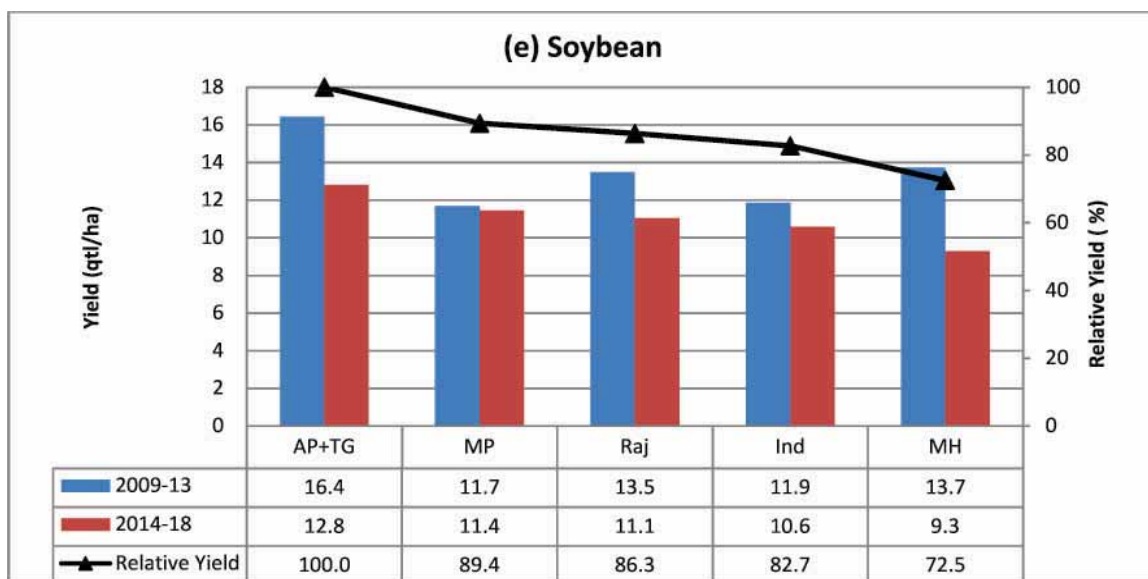
Oilseeds

- 3.12 Unlike for most crops, the inter-State variations in soybean productivity are minimal; all the major producing States being bunched together. The undivided Andhra Pradesh (AP+ TG) had the highest soybean productivity (12.8 qtl/ha) in 2014-18. But the same has fallen significantly in 2014-18 as compared to 2009-13 (16.4 qtl/ha). Although, productivity in Maharashtra was the lowest (9.3 qtl/ha), but it was still 72.5 percent of productivity of undivided Andhra Pradesh. Madhya Pradesh, which accounts for 50 percent of India's total soybean production recorded the second highest productivity (11.4 qtl/ha) in 2014-18, but the fall in productivity in comparison to 2009-13 is a cause of concern. This declining trend in productivity was also observed at all-India level, from 11.9 quintals per hectare in 2009-13 to 10.6 quintals per hectare in 2014-18.



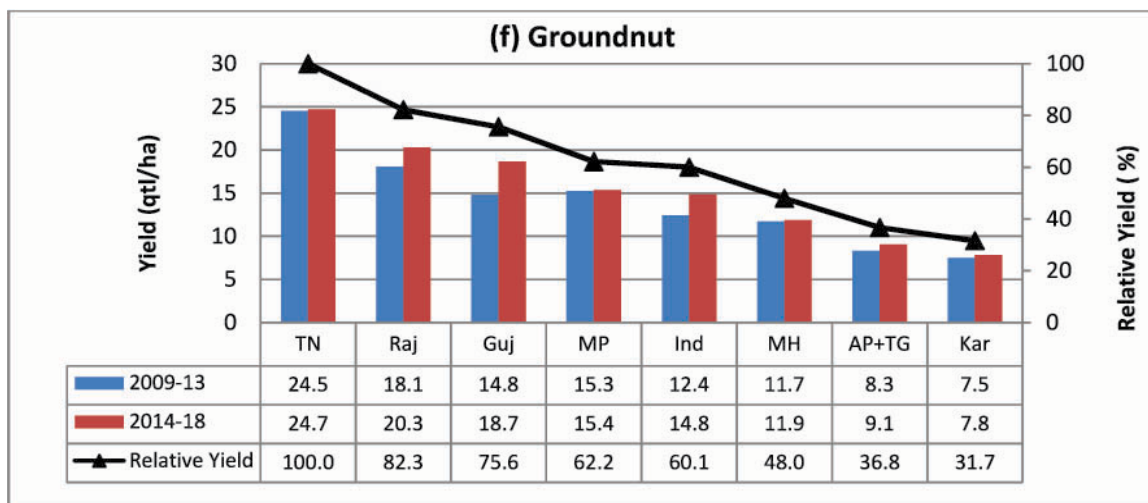
PRICE Policy for Kharif Crops

Crop Productivity and Input Management



Source: DES, DAC & FW

- 3.13 For groundnut, productivity increase was 19.4 percent at all-India level. Gujarat and Rajasthan were the major States driving this increase. Tamil Nadu had the highest productivity for groundnut (24.7 qtl/ha). However, the growth in productivity in Tamil Nadu has almost stagnated possibly because of poor incentives from market. The lowest productivity (7.8 qtl/ha) was recorded in Karnataka.



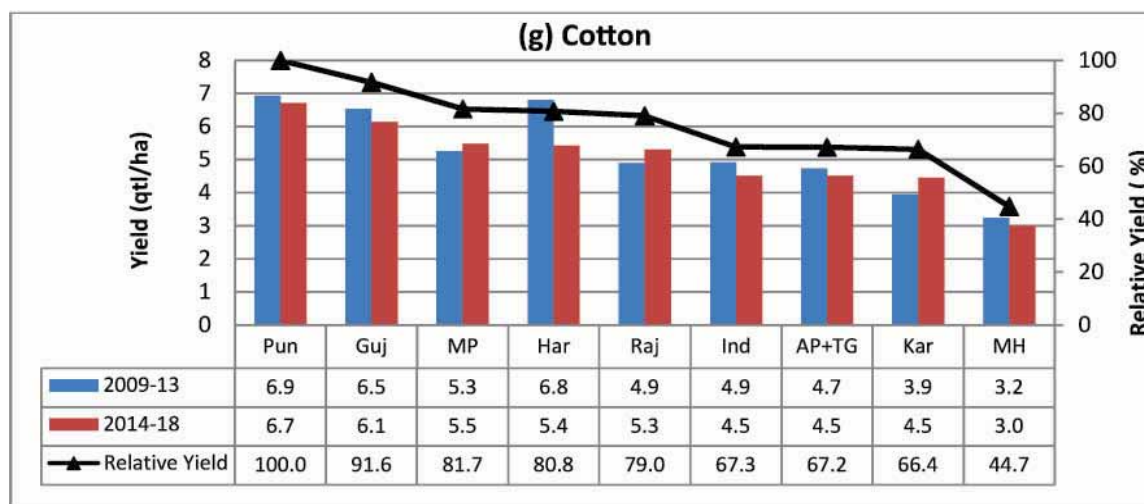
Source: DES, DAC & FW

Cotton

- 3.14 Cotton has suffered from decline in productivity from 4.9 quintals per hectare in 2009-13 to 4.5 quintals per hectare in 2014-18 at all-India level. This is mainly due to large decline in productivity of Gujarat (5.9%) and Maharashtra (7.1%), which together account for more than half of total cotton production of India. Only three States namely Madhya Pradesh, Rajasthan and Karnataka showed improvements in



productivity in 2014-18. However, since these three States account for only about 16 percent of country's total production, it was not sufficient to prevent the slide in productivity at all-India level.



Source: DES, DAC & FW

Productivity Gap between Irrigated and Unirrigated Areas

3.15 Expanding area under irrigation is important to achieve higher productivity. Indian agriculture is primarily dependent on south west monsoon for its crop cultivation. The unpredictable nature of south west monsoon in the recent years has reportedly depressed the productivity in rainfed areas. The negative effect on productivity due to rainfed condition can be illustrated through the gap between irrigated and unirrigated productivity in various States for different crops. The crop wise productivity gaps for 2017-18 for some States are as follows: a) Rice (Andhra Pradesh: 2136 kg/ha, Chhattisgarh: 1150 kg/ha, Karnataka: 1079 kg/ha), b) Maize (Karnataka: 704 kg/ha), c) Groundnut (Chhattisgarh: 121 kg/ha, Karnataka: 731 kg/ha)¹.

3.16 It is proved that irrigation is a key driver in boosting productivity of different crops. Therefore, it is necessary to give adequate attention to irrigation coverage to enhance crop productivity which can ultimately increase income of farmers. The section on irrigation given later in the chapter discusses appropriate strategies to enhance irrigation facilities in detail.

Productivity Gap Analysis

3.17 Productivity gap analysis basically measures the difference between potential and realized productivity. This helps identifying the constraints and management options to reduce the gaps. Charts 3.2 to 3.5 depict three types of productivity for major crops for TE2017-18 namely; (i) productivity achieved under Front Line Demonstration (FLD), where best scientific and management practices are

¹ Source: Reply from respective State Governments



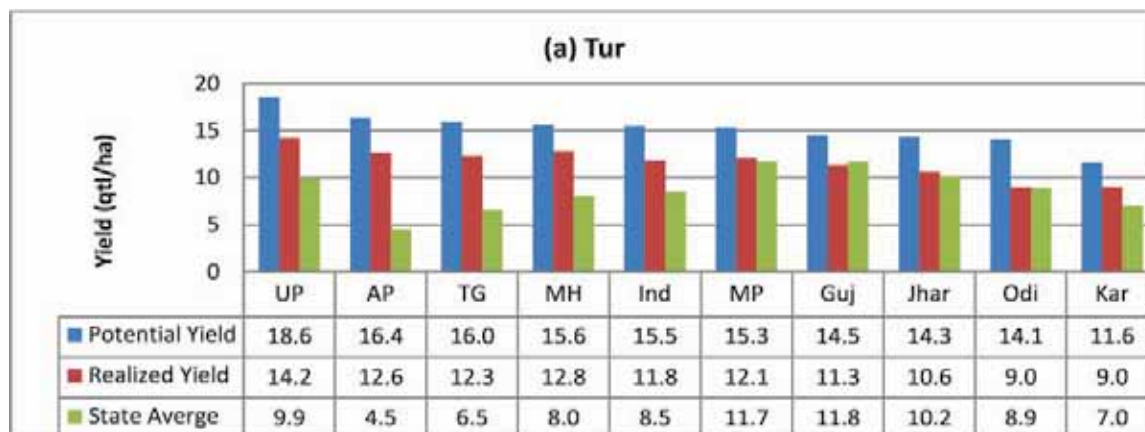
followed, (ii) realized farm productivity of improved technology under farmers' practices, and (iii) State average productivity. Based on the above, an estimated increase in production from 25 percent, 50 percent, 75 percent and 100 percent reduction in productivity gaps have been calculated and presented in Table 3.2 and Table 3.3. Two types of productivity gaps have been estimated, viz. (i) Productivity Gap (A): defined as the difference between realized productivity and State average productivity (ii) Productivity Gap (B): defined as the difference between FLD productivity i.e., potential productivity and State average productivity. Productivity gap (A) may be due to non-availability of technology, while productivity gap (B) is possibly due to combination of both biological and socio-economic constraints.

Pulses

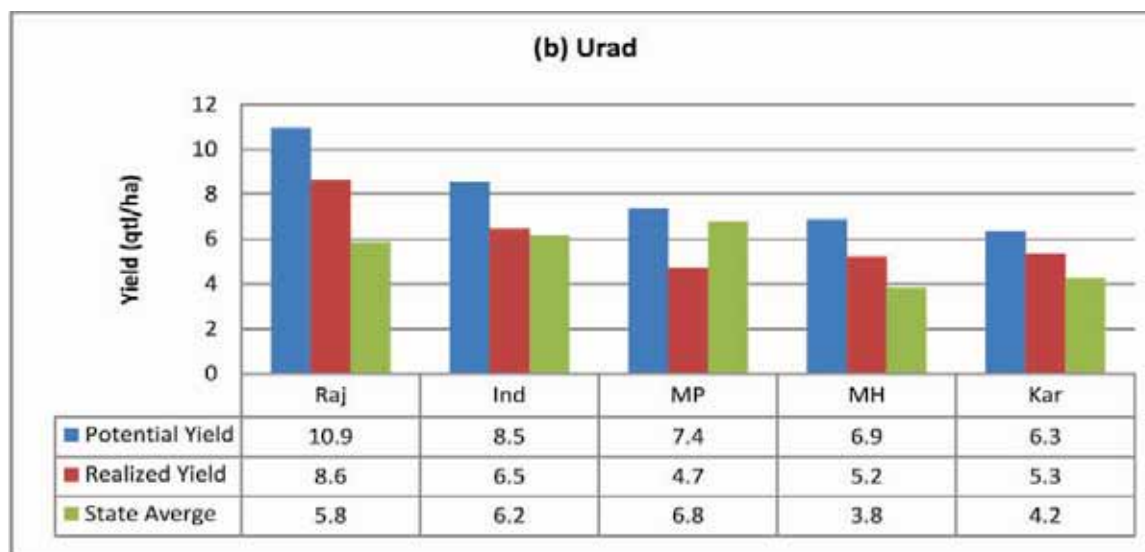
- 3.18 For tur, productivity gap (A) was the highest in Andhra Pradesh (64.2%) followed by Telangana (47.1%). Productivity gap (A) was 37.5 percent in Maharashtra which is the biggest contributor of tur. Among the major States, productivity gap (A) was the lowest in Odisha (0.7%) followed by Madhya Pradesh (2.9%) and Jharkhand (4.2%). Productivity gap (A) at all-India level was 28.2 percent in tur. Productivity gap (B) remained high for all the States under consideration. It was the highest in Andhra Pradesh (72.4%) followed by Telangana (59.2%) and Uttar Pradesh (46.6%). In view of this, productivity gap (B) at all India level remained relatively high (45%).
- 3.19 In case of urad, as an exception, State average productivity was higher than realized farm productivity through improved technology in Madhya Pradesh. As a result, productivity gap (A) was negative for Madhya Pradesh (-43.3%). For the remaining States, productivity gap (A) remained high; the highest was recorded for Rajasthan (32.4%). Productivity gap (B) was relatively low for Madhya Pradesh (8%), but it ranged from 33.2 percent in Karnataka to 46.6 percent in Rajasthan for the remaining States. At the all-India level, productivity gaps (A) and (B) were 4.5 percent and 27.9 percent, respectively.
- 3.20 For moong, State average productivity was significantly lower than potential productivity and realized productivity in all the States. As a result, productivity gap (A) and (B) at all-India level were 28.3 percent and 43.1 percent, respectively. Among individual States, Karnataka was found with the highest productivity gap (A) and productivity gap (B), 52.2 percent and 60.7 percent, respectively. In Rajasthan, which is the largest producer of moong, productivity gap (A) and (B) were 29.6 percent and 45.5 percent, respectively.



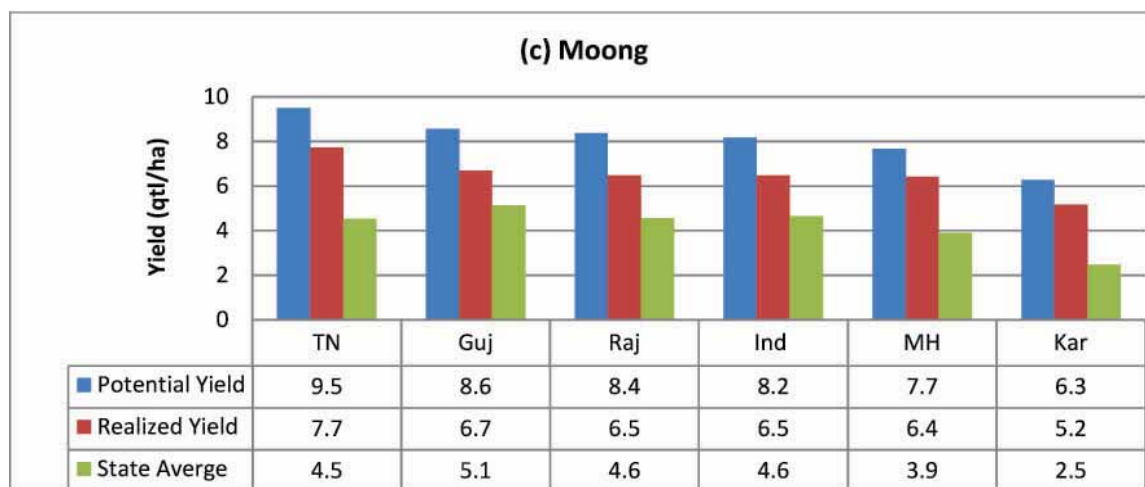
Chart 3.2: Productivity Gap for Major Pulses Producing States



Source: Indian Institute of Pulses Research, Kanpur



Source: Indian Institute of Pulses Research, Kanpur



Source: Indian Institute of Pulses Research, Kanpur



- 3.21 Given the large productivity gap in kharif pulses, CACP has estimated the increase in production that can be achieved by adopting productivity gap bridging strategies. As shown in Table 3.3, it is possible to increase production of kharif pulses by about 2.4 to 5.7 million tonnes by adopting productivity gap bridging strategies. Some of these strategies could be the adoption of suitable varieties of pulses recommended for the zone/region, adoption of recommended inputs at recommended dose and at recommended time, following improved planting methods such as sowing of pulses on ridges as crop contingency against water logging, providing irrigation at critical stages of plant growth and improved post-harvest management.

Table 3.2: Estimated Additional Production of Kharif Pulses by Bridging Productivity Gap

Crop	Likely impact of reduction in crop yield gaps on total production ('000 tonnes)							
	Productivity Gap (A)				Productivity Gap (B)			
	25%	50%	75%	100%	25%	50%	75%	100%
Tur	382	764	1146	1528	797	1593	2390	3187
Urad	33	66	99	131	268	537	805	1073
Moong	190	380	570	760	365	729	1094	1459
Total	605	1210	1815	2419	1430	2859	4289	5719

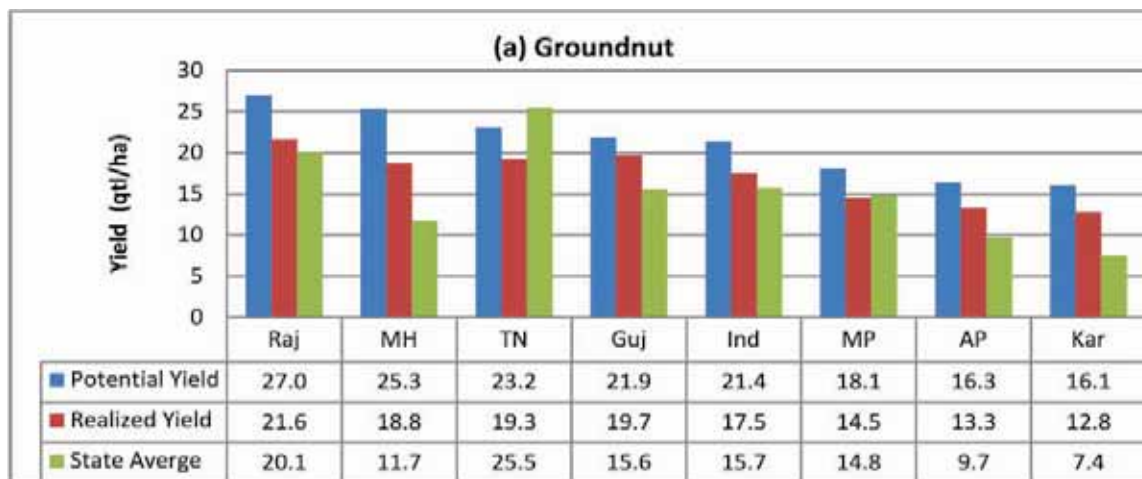
Source: Estimated using available data by CACP

Oilseeds

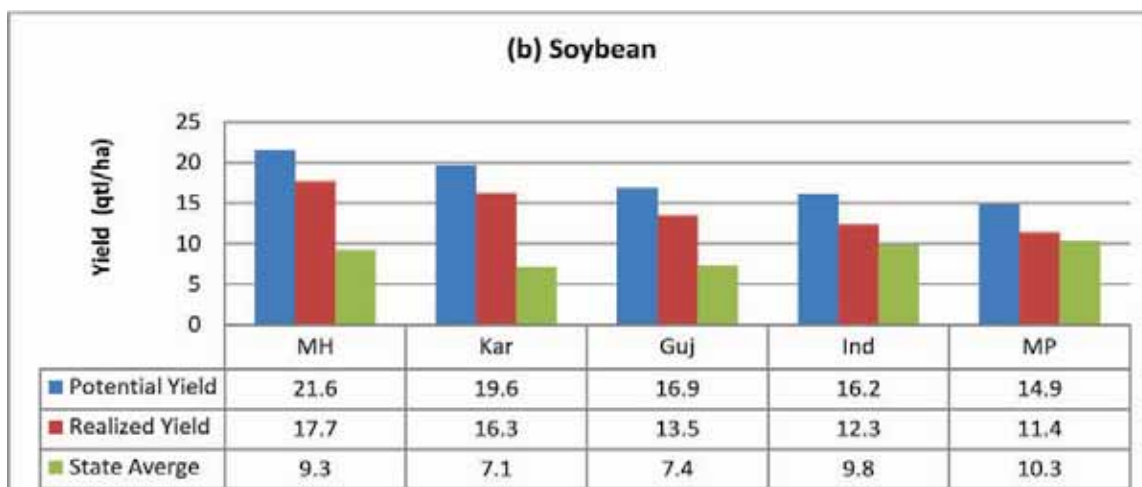
- 3.22 In case of groundnut, among the major producing States, productivity gap (A) was highest in Karnataka (42.1%) followed by Maharashtra (37.6%) and Andhra Pradesh (27.1%). Madhya Pradesh and Tamil Nadu were outliers as productivity gap (A) in these States remained negative (-1.9% and -32.2%, respectively) which shows that State average productivity exceeded realized yield in these two States. For Tamil Nadu, yield gap (B) also remained negative (-10%). In all other States potential productivity exceeded State average productivity. Among these States, highest productivity gap (B) was observed in Maharashtra (53.7%) and Karnataka (53.8%).
- 3.23 For soybean, productivity gap (A) and (B) were the lowest in Madhya Pradesh, which was 9 percent and 30.4 percent, respectively. In Karnataka, productivity gap (A) was above 50 percent. Productivity gap (B) was also above 50 percent in Karnataka, Maharashtra and Gujarat. At the all-India level productivity gap (A) and (B) were 20.3 percent and 39.2 percent, respectively.
- 3.24 For sunflower, productivity gap was very high at all-India level; productivity gap (A) was 55.2 percent and productivity gap (B) was 61.3 percent. Productivity gaps (A) and (B) were particularly high in Karnataka and Maharashtra. Since these two States account for nearly 53 percent of total production, it led to a high level of productivity gap at all-India level. However, in Bihar productivity gap (A) was negative (-11.5%), whereas productivity gap (B) was only 14.4 percent. In Punjab, productivity gap (A) and (B) were relatively small (3.9% and 9.3%, respectively).



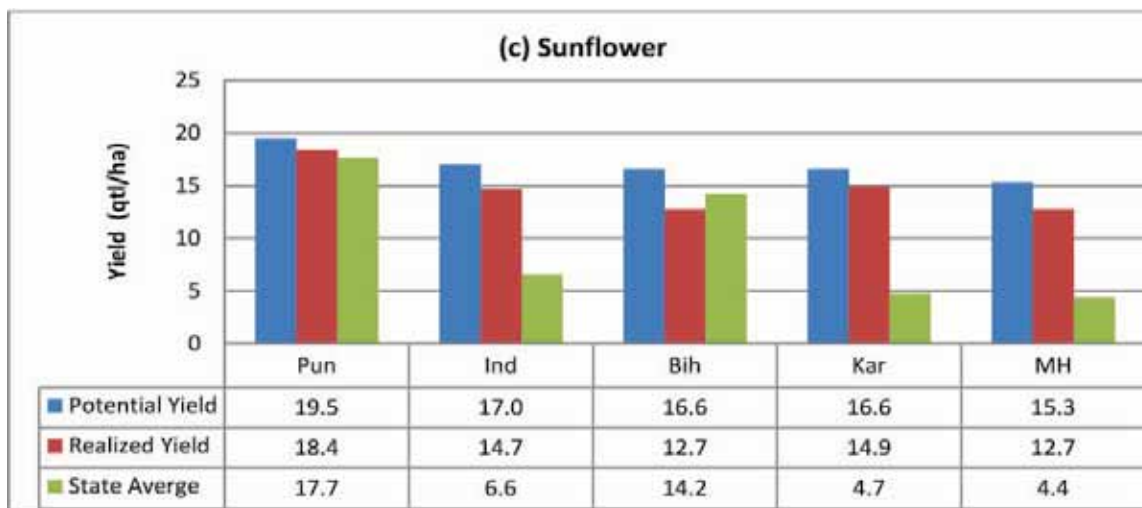
Chart 3.3: Productivity Gap for Major Oilseeds Producing States



Source: Directorate of Groundnut Research, Junagarh



Source: Indian Institute of Oilseeds Research, Hyderabad



Source: Indian Council of Agricultural Research, Delhi



PRICE Policy for Kharif Crops

Crop Productivity and Input Management

- 3.25 If average productivity of major producing States can be further improved and reach the level of potential productivity, about 10.2 million tonnes of additional oilseeds can be produced (Table 3.3). Therefore, efforts are needed to improve the availability of quality seeds along with other inputs and services like extension and credit. Low seed replacement rates and lack of protective irrigation in pulses and oilseeds are other reasons for low productivity which needs to be addressed.

Table 3.3: Estimated Additional Production of Kharif Oilseeds by Bridging Productivity Gap

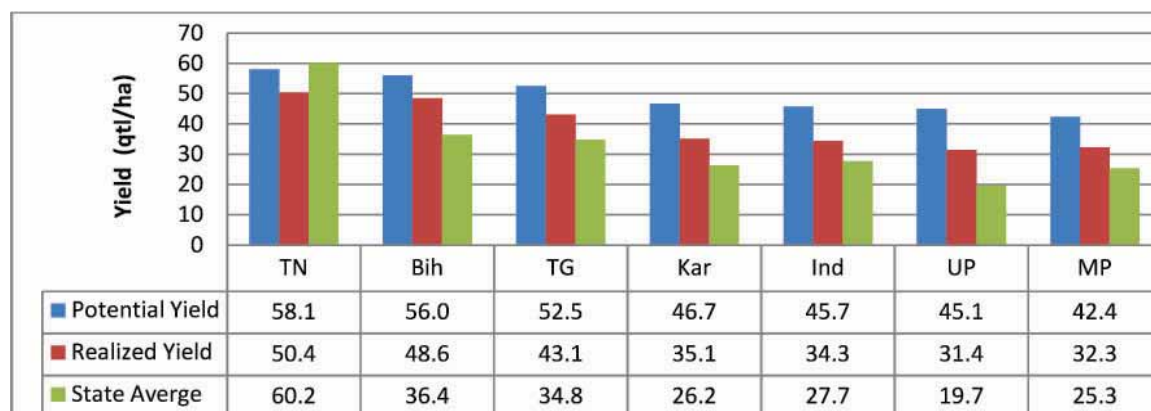
Crop	Likely Impact of Reduction in Yield Gaps on total production ('000 tonnes)							
	Productivity Gap (A)				Productivity Gap (B)			
	25%	50%	75%	100%	25%	50%	75%	100%
Soybean	696	1392	2088	2784	1755	3510	5265	7019
Groundnut	218	436	655	873	703	1407	2110	2813
Sunflower	78	156	234	312	100	200	300	401
Total	992	1984	2977	3969	2558	5117	7675	10233

Source: Estimated using available data by CACP

Maize

- 3.26 In maize, Tamil Nadu was the only State with negative productivity gaps (A) and (B). While Uttar Pradesh was having the highest yield gap in category (A) with 37.2 percent, highest yield gap in category (B) was observed in Rajasthan (60%) followed by Uttar Pradesh (54.3%). The overall average productivity gap in category (A) and (B) was 19.5 percent and 39.5 percent, respectively.

Chart 3.4: Productivity Gap for Major Maize Producing States



Source: Indian Institute of Maize Research, Ludhiana

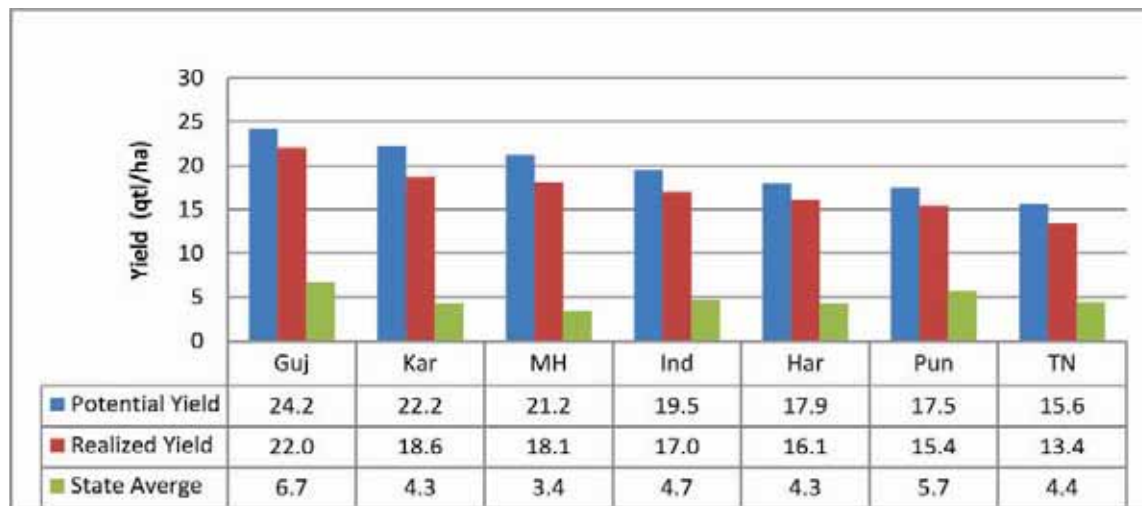
Cotton

- 3.27 For cotton, a large gap between State average productivity and potential as well as productivity realized through farmers' best practices was found. Productivity gaps (A) and (B) were more than 50 percent for all the States, whereas productivity gap (A)



was highest in Maharashtra (81%). The lowest productivity gap in category (A) was observed in Punjab (63%). Productivity gap (B) was again the highest in Maharashtra (83.8%). Under category (B) too, Punjab was found with the lowest productivity gap (67.4%). At the all-India level, productivity gap estimated by category (A) and (B) was 72.5 percent and 76.1 percent, respectively. As per our estimate, production of cotton can be increased by upto 17.6 million tonnes, if efforts are made to close the yield gap without adding any area under cotton cultivation.

Chart 3.5: Productivity Gap for Major Cotton Producing States



Source: Central Institute for Cotton Research, Nagpur

Drivers of Yield Growth

328 A large number of factors determine the productivity of crops. Among them, the important factors are fertilizers, irrigation, seed and other related technologies, better management practices and extension services. By assuring timely and proper availability of these factors, crop productivity can be enhanced significantly.

Quality Seed Production and Distribution

3.29 Production and distribution of quality seeds is essential to reduce the yield gap in different crops. Good quality seeds ensure better germination and vigor in crop growth, both of which help farmers to earn higher income. Therefore, it is imperative to ensure timely availability of quality seeds to farmers at affordable prices. Crop-wise requirement and availability of certified/quality seeds for the period 2014-15 to 2018-19 are shown in Charts 3.6 to 3.10.

3.30 For rice, availability of certified/quality seeds has been higher than the requirement throughout the period from 2014-15 to 2018-19. In 2014-15, the requirement of certified/quality seed was 84.8 lakh quintals, but it dipped by 2.28 percent in 2015-16 to 82.9 quintals. However, the requirement increased again to 87.7 lakh quintals in 2016-17, which was accompanied by an increase in availability to 100.5 lakh quintals. During 2017-18, the requirement increased by 2 percent to reach its



Price Policy for Kharif Crops

highest level of 89.5 lakh quintals. However, in 2018-19, both the requirement and availability declined to 82.6 lakh quintals and 95.8 lakh quintals, respectively. On the whole, the availability of quality seeds for rice crop is more than the requirement over the last five years.

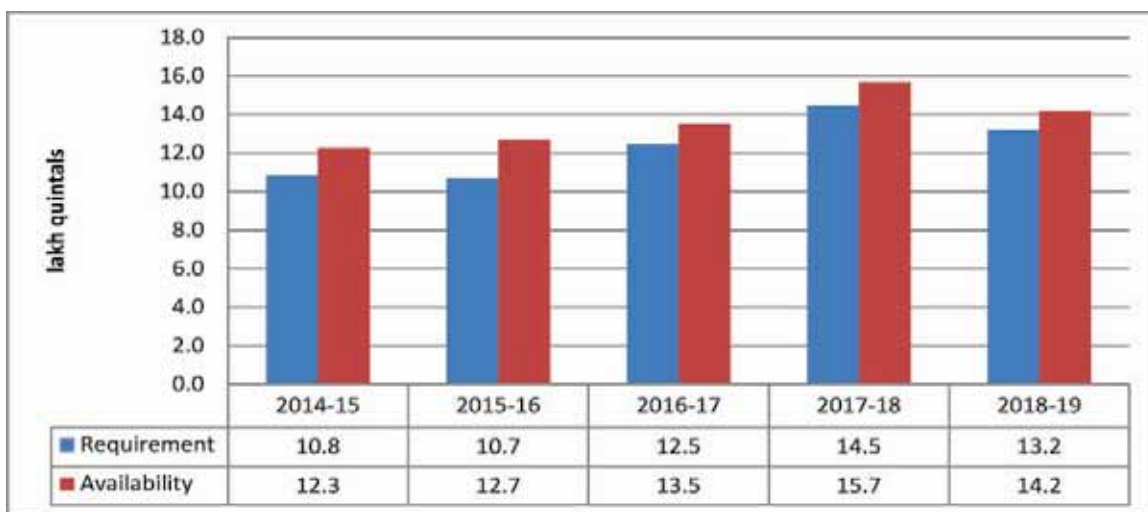
**Chart 3.6: Requirement and Availability of Certified/Quality Seed for Rice
(2014-15 to 2018-19)**



Source: DAC & FW

3.31 The requirement for certified/quality seed in maize increased from 10.8 lakh quintals in 2014-15 to 14.5 lakh quintals in 2017-18, while availability increased from 12.3 lakh quintals to 15.7 lakh quintals during the same period. In 2018-19, there was fall in both requirement (9%) and availability (9.6%) of certified/quality seed in case of maize. However, at all-India level, seed availability has been very comfortable during the last five years under consideration.

**Chart 3.7: Requirement and Availability of Certified/Quality Seed for Maize
(2014-15 to 2018-19)**

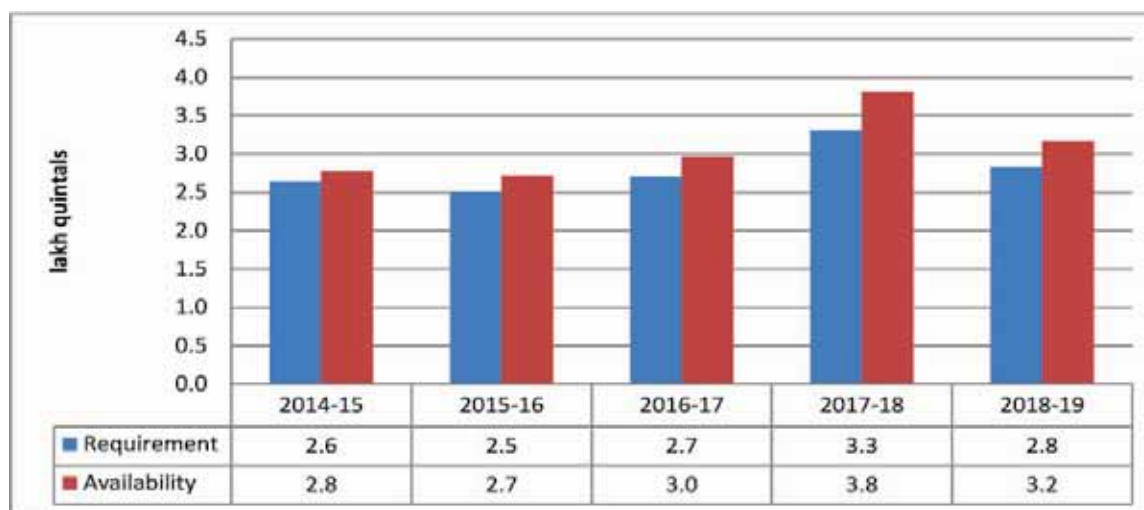


Source: DAC & FW



- 3.32 For tur, the requirement of certified/quality seed has fluctuated between 2.5 and 2.8 lakh quintals except for 2017-18 where the requirement shot up to 3.3 lakh quintals. Similar trend has been observed in availability as well. Overall seed availability has been quite comfortable during the last five years. Government initiatives like pulse seed hubs, seed mini kits, enhancing breeder seed production, incentives for production of certified seeds and seed distribution of pulses have played an important role in ensuring availability of quality seeds to farmers.

Chart 3.8: Requirement and Availability of Certified/Quality Seed for Tur (2014-15 to 2018-19)

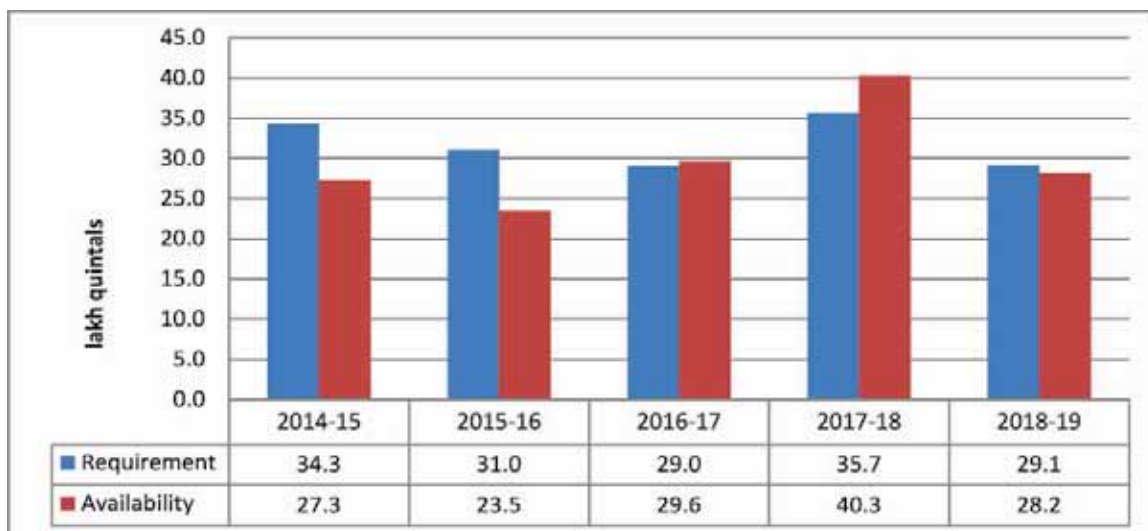


Source: DAC & FW

- 3.33 In case of soybean, the requirement of certified/quality seed was 34.3 lakh quintals in 2014-15. Thereafter, it fell for two consecutive years to reach 29 lakh quintals in 2016-17. This was followed by an increase in requirement to 35.7 lakh quintals in 2017-18, before falling again to 29.1 lakh quintals in 2018-19. While the availability was fluctuating every alternate year, the requirement of seed was more than the availability in three years out of five years considered for the analysis, which is not seen in other crops discussed earlier. Timely availability of quality seeds is very important for soybean, which is cultivated under rainfed condition, adequate arrangements should be made to increase the supply of quality seed.



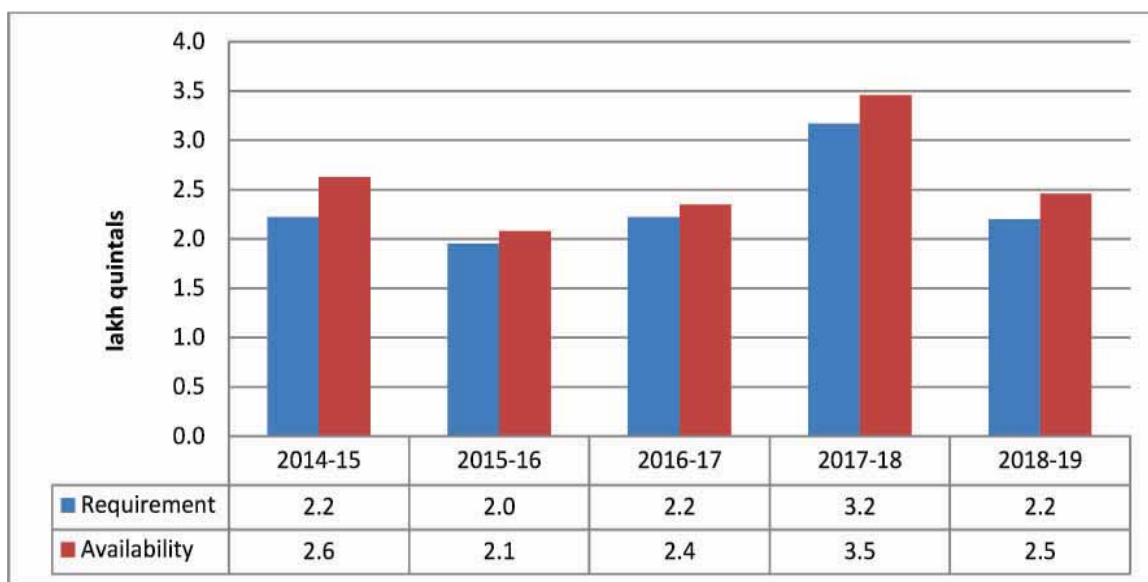
**Chart 3.9: Requirement and Availability of Certified/Quality Seed for Soybean
(2014-15 to 2018-19)**



Source: DAC & FW

3.34 In case of cotton, availability outstripped the requirement of certified/quality seed during all the years. Both the requirement (3.2 lakh quintals) and availability (3.5 lakh quintals) were the highest in 2017-18. However, this was followed by a marked decline in requirement and availability in 2018-19; the requirement fell by 30.6 percent and availability declined by 29 percent. This wide fluctuation in requirement of seed could be due to variations in rainfall pattern as cotton is predominantly cultivated under rainfed condition, similar to pulses and oilseeds.

**Chart: 3.10: Requirement and Availability of Certified/Quality Seed for Cotton
(2014-15 to 2018-19)**



Source: DAC & FW

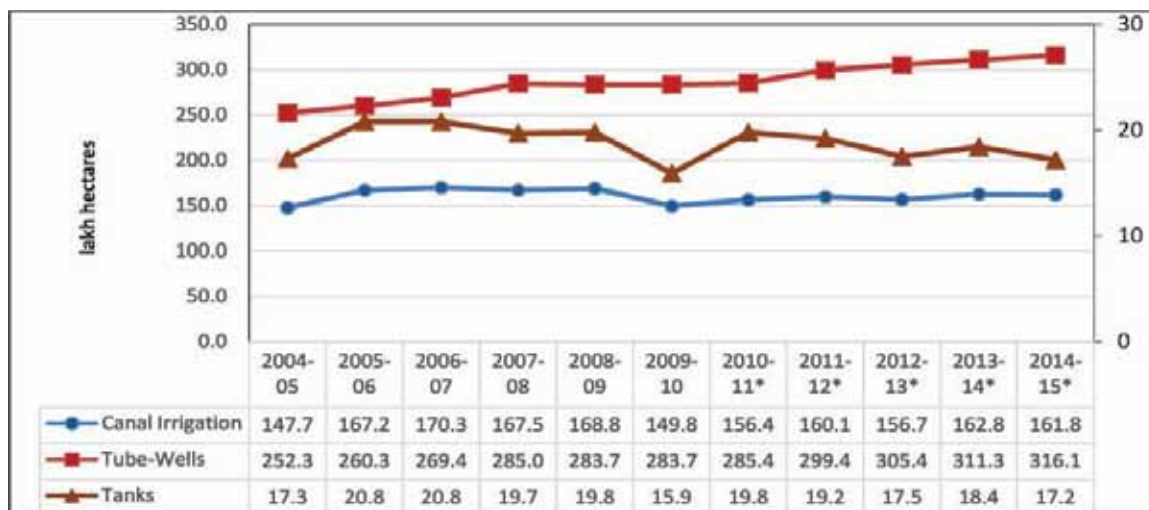


Irrigation

- 3.35 Agricultural output can be increased by expanding area or productivity or by both. But, the net area sown is almost stagnant over the last three decades. Therefore, further expansion of net area under cultivation will be very difficult. Agricultural output has to increase by expanding irrigation facility which can increase cropping intensity and enhance productivity of crops. Benefits of expanding irrigation can be assessed from the fact that irrigated crop yield is significantly higher than rainfed agriculture.
- 3.36 At present, the gross irrigated area (GIA) as a percentage of gross cropped area (GCA) is more than 50 percent only in 6 major States viz., Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal and Tamil Nadu. As per the data from Central Water Commission, there is a vast potential available for expanding area under irrigation in many States. However, it needs to be ensured that future expansion in irrigation should be made from surface irrigation sources like canal and tank irrigation or through modern methods like drip and sprinkler. This is because of the fact that indiscriminate exploitation of groundwater for both agriculture and domestic purposes has led to depletion of groundwater. Further, use of micro-irrigation techniques like drip and sprinkler not only increases water use efficiency but also improves productivity of crops substantially.
- 3.37 It needs to be underlined that despite development of canal irrigation being the focus of the government through investments in major and medium irrigation projects, total area under canal irrigation has not increased in the recent years. The area irrigated by canals was the highest in 1991-92 with 173 lakh hectares. However, it has remained below that level thereafter. Chart 3.11 shows total area irrigated by canals, tube-wells and tanks from 2004-05 to 2014-15. As can be observed, area under canal irrigation has largely followed a declining trend. In 2014-15, area under canal irrigation reached to 161.8 lakh hectares, well below the peak of 1991-92 (173 lakh hectares). On the other hand, during the same period, area irrigated by tube-wells which is a major source of ground water has shown a steady increase, from 252.3 lakh hectares in 2004-05 to 316.1 lakh hectares in 2014-15. The area under tank irrigation which is considered to be the most cost effective among all the sources of irrigation has shown stagnation around 20 lakh hectares. Misappropriation of canal water for other purposes and violation of notional cropping pattern in the canal irrigated area are the main reasons for declining area under canal irrigation.



Chart 3.11: Trends in Area under Major Sources of Irrigation in India



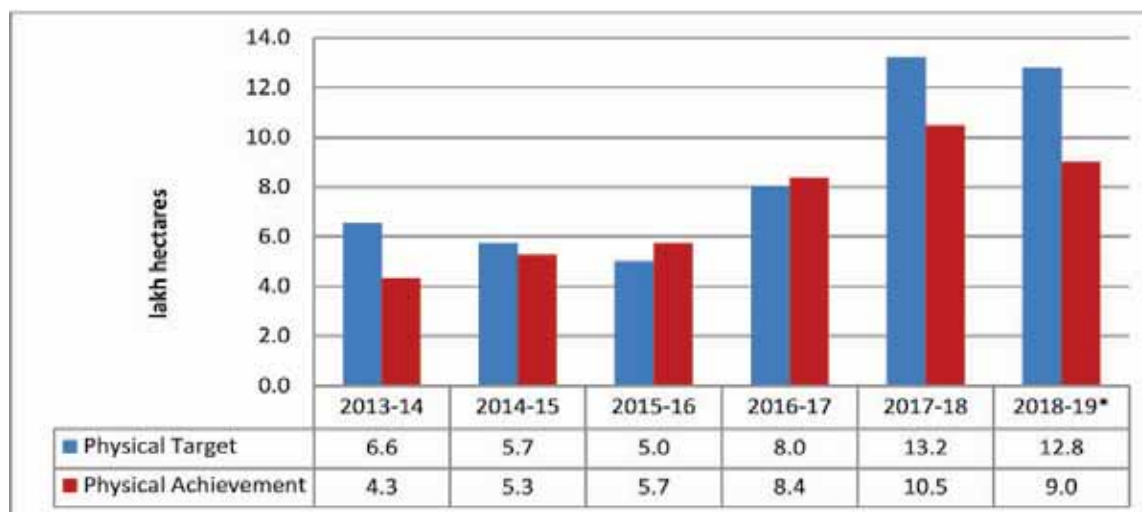
*Provisional

Source: DES, DAC&FW

- 3.38 Considering the importance of irrigation, during 2016-17, 99 on-going major and medium irrigation projects under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) – Accelerated Irrigation Benefit Programme (AIBP) having irrigation potential of 76.03 lakh hectares were identified for completion upto December, 2019. It is important that targets under the scheme may be timely achieved in order to promote canal irrigation, which will also lead to increased productivity of crops and farm income.
- 3.39 PMKSY also lays special emphasis on micro-irrigation with the motto “Per Drop More Crop”. Micro-irrigation leads to a number of benefits like saving of water, energy, fertilizers, reduced labour costs and increased productivity of crops. While water use efficiency in conventional irrigation method ranges from 30 percent to 50 percent, it goes up to 90 percent under micro-irrigation methods. Chart 3.12 presents the all-India figures for physical target and achievements of area under micro-irrigation. It can be observed that after the implementation of PMKSY in 2015, physical achievements have increased at a faster rate from 5.7 lakh hectares in 2015-16 to 10.5 lakh hectares in 2017-18. In 2018-19, as on 12.03.2018 physical achievement was 9 lakh hectares. There was a shortfall of 2.7 lakh hectares in achievement as compared to the target of 13.2 lakh hectares in 2017-18. Further, as on 12.03.2018 shortfall in achievement vis-à-vis the target was 3.8 lakh hectares in 2018-19. Since the adoption of micro-irrigation methods can also help in reducing the water scarcity problems triggered by climate change, it is important that the present thrust on micro-irrigation development under PMKSY be maintained to achieve effective utilization of scarce water resources.



Chart 3.12: Physical Targets and Achievements under Micro-Irrigation



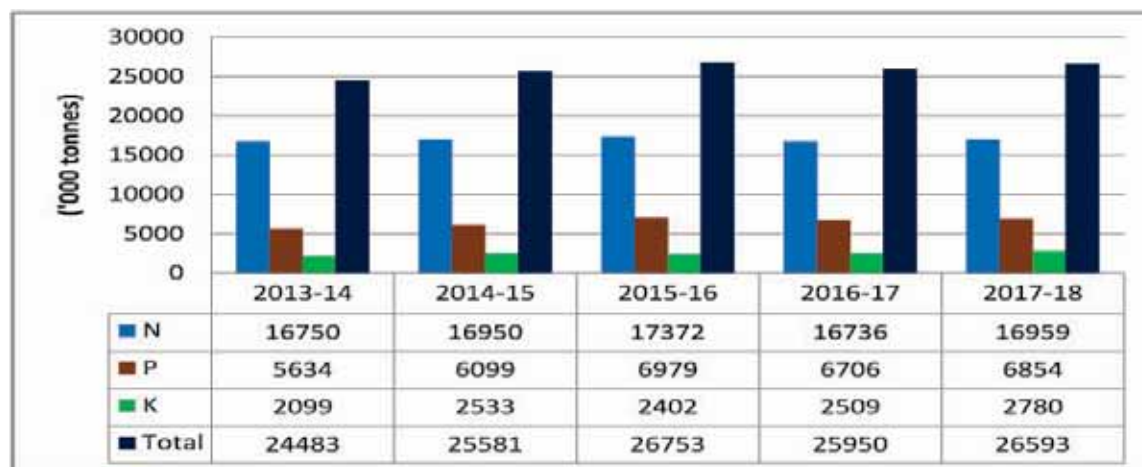
*As on 12.03.2018

Source: DAC & FW

Fertilizers

3.40 Fertilizers are the crucial productivity increasing inputs. Chart 3.13 shows fertilizer consumption for the period from 2013-14 to 2017-18. It can be observed that although the total consumption of fertilizers has increased over the last 5 years, consumption of N has almost stagnated. Both N and P consumption declined during 2016-17, but increased in 2017-18. During the last five years, consumption of P and K fertilizers has increased at an average growth rate of 5.3 percent and 7.7 percent, respectively. But consumption of N has increased only at an average of 0.3 percent. As a result, NPK ratio has improved considerably from 8:2.7:1 in 2013-14 to 6.1:2.5:1 in 2017-18. This improvement can partly be attributed to measures like neem coating of urea and soil health card scheme.

Chart 3.13: Trends in Consumption of Fertilizers

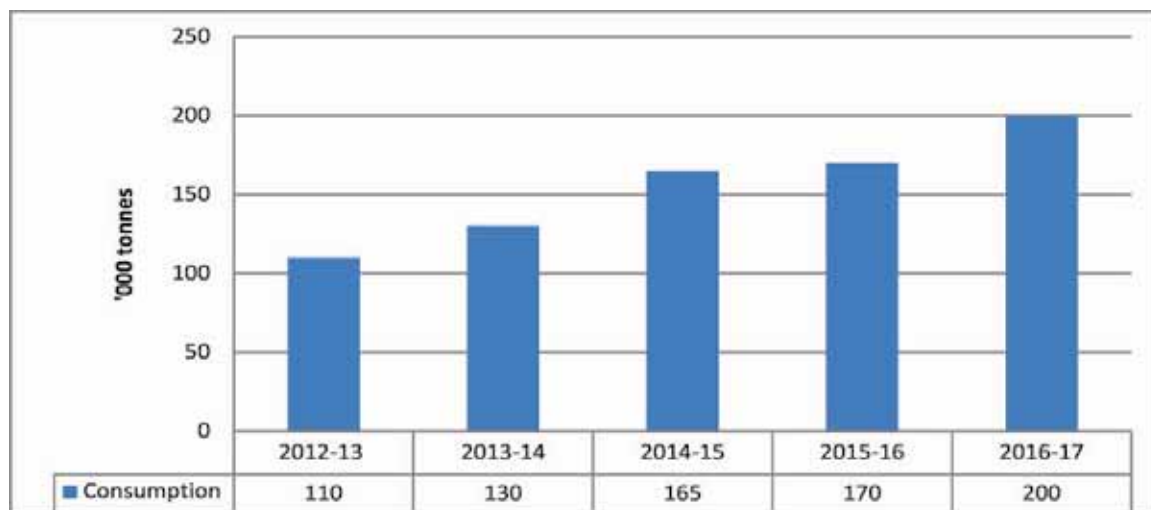


Source: Fertilizers Association of India



- 3.41 As highlighted in the section on irrigation, after the introduction of PMKSY area under micro-irrigation has increased. With more farmers adopting micro-irrigation, it is important that they be encouraged to use water soluble fertilizers (fertigation) as this can result in increased productivity of crops. Chart 3.14 shows consumption of water soluble fertilizers during the period 2012-13 to 2016-17. At present consumption of water soluble fertilizers is very low (200 thousand tonnes) in comparison to total consumption of fertilizers. However, the growth in liquid fertilizer consumption is encouraging. During the last 5 years consumption has increased by 90 thousand tonnes, from 110 thousand tonnes in 2012-13 to 200 thousand tonnes in 2016-17. Therefore, in view of the advantages of water soluble fertilizers, their use needs to be promoted with an objective to ensure continued increase in their consumption.

Chart 3.14: Consumption of Water Soluble Fertilizers



Source: Fertilizers Association of India

Mechanization

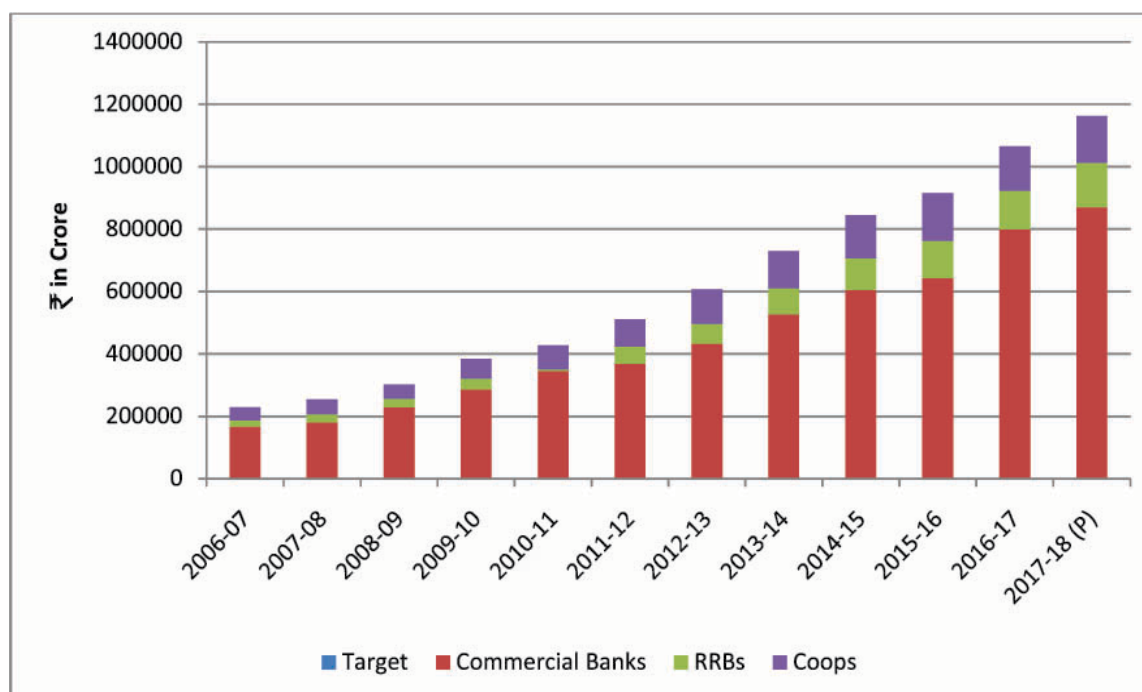
- 3.42 To address the problem of shrinking labour availability due to various reasons, there is a need to promote greater mechanization in agriculture. Further, while promoting mechanization it is important to keep in view the fragmented nature of land holdings in Indian agriculture. Therefore, there is a need to develop customized farm machinery like small farm harvesters which are capable of working in such holdings. This may be done by encouraging research and development in ICAR system and State Agricultural Universities.
- 3.43 In view of the above, it may be mentioned that the use of happy seeder in paddy harvesting has the potential to significantly reduce labour demand for paddy harvesting. Also, it can play a critical role in reducing the instances of stubble burning in winter months. Similarly, use of small harvesters for cotton picking can greatly improve the quality of Indian cotton and increase its price in the global market. In order to promote farm mechanization, GST on farm machinery & implements should be reduced to the lowest bracket.



Agricultural Credit

3.44 Though the disbursal of total agricultural credit grew by around 300 percent during last decade from ₹3.01 lakh crores in 2008-09 to ₹11.63 lakh crores in 2017-18 and is targeted at ₹12 lakh crore in 2018-19, the concern remains that majority of this growth is driven by commercial banks accounting for around 75 percent of total credit. Since around 85 percent of the farmers are marginal and small, they are often left deprived of the credit facility because of the absence of collateral. Moreover, most of the commercial banks do not have their branches in remote areas/villages. The convenient option available to these farmers is taking loans from Regional Rural Banks (RRBs) or cooperatives. However, the share of cooperatives saw a significant drop in total lending from over 50 percent in 1991 to 18.3 percent in 2012-13 and further to 12.9 percent in 2017-18, while the share of RRBs has been stagnant at around 12 percent. This seems to show that most of the benefits of formal credit lending are availed by large farmers as they have easy access to banks and collateral for availing loans. Since marginal and small farmers often do not have access to formal credit facility, they do not get any benefit from loan waiver and interest subvention schemes, which are mainly enjoyed by large farmers. Efforts should be made to ensure that the access to formal credit is assured for needy farmers, small and marginal in particular.

Chart 3.15: Agency-wise Institutional Credit to Agricultural Sector



Note: P-Provisional

Source: NABARD



Country Comparisons of Crop Productivity

- 3.45 India is among the top producers of several important crops but productivity remains well below the world average. Table 3.4 shows a comparison of Indian productivity with world productivity levels for selected crops for the year 2017. As can be observed from the Table, all-India productivity of rice and maize was well below the world average. For rice, all-India productivity (2578 kg/ha) was only 56 percent of the world average (4602 kg/ha). Punjab, the most productive State for rice also recorded productivity (4366 kg/ha), below the world average. Further, all-India productivity of rice is roughly one-third of the China (6917 kg/ha), which has the highest yield among major rice producing countries in the world. Similarly, all-India productivity of maize (3032 kg/ha) was about 52.7 percent of the world average (5755 kg/ha). Therefore, India must make efforts to increase yield of rice and maize to reach world average through various technology and policy interventions.
- 3.46 In pulses, all-India average productivity (841 kg/ha) was higher than the world average. However, in Australia, which is also a major producer of pulses, the productivity was five times of Madhya Pradesh which has the highest yield in India. Similarly, there was a large gap in productivity of tur. The average productivity of tur is highest in Madhya Pradesh (1297 kg/ha) which is higher than world average (969 kg/ha), but significantly lower than Malawi (1712 kg/ha). All-India average yield of soybean (1049 kg/ha) was less than world average (2854 kg/ha). Telangana recorded the highest productivity in soybean (1625 kg/ha), but it was well below the highest productivity which was recorded by USA (3229 kg/ha). In case of groundnut, all-India average productivity (1868 kg/ha) was marginally higher than world average (1685 kg/ha).

Table 3.4: Productivity Comparisons for Major Crops (kg/ha)

Crop	World Average*	World Highest*	All-India Average [#]	State Highest [#]
Rice (Paddy)	4602	6917(China)	2578	4366 (Pun)
Maize	5755	11084 (USA)	3032	3711(Pun)
Pulses (Total)	754	5537(Australia)	841	1084 (MP)
Tur	969	1712 (Malawi)	960	1297(MP)
Soybean	2854	3229 (USA)	1049	1625 (TG)
Groundnut	1685	4567 (USA)	1868	2914(TN)

Sources: * FAOSTAT for World Average and World Highest; # DES, Department of Agriculture, Co-operation and Farmers Welfare for All-India Average and State Highest

Linking MSP with Oil Content in Sunflower

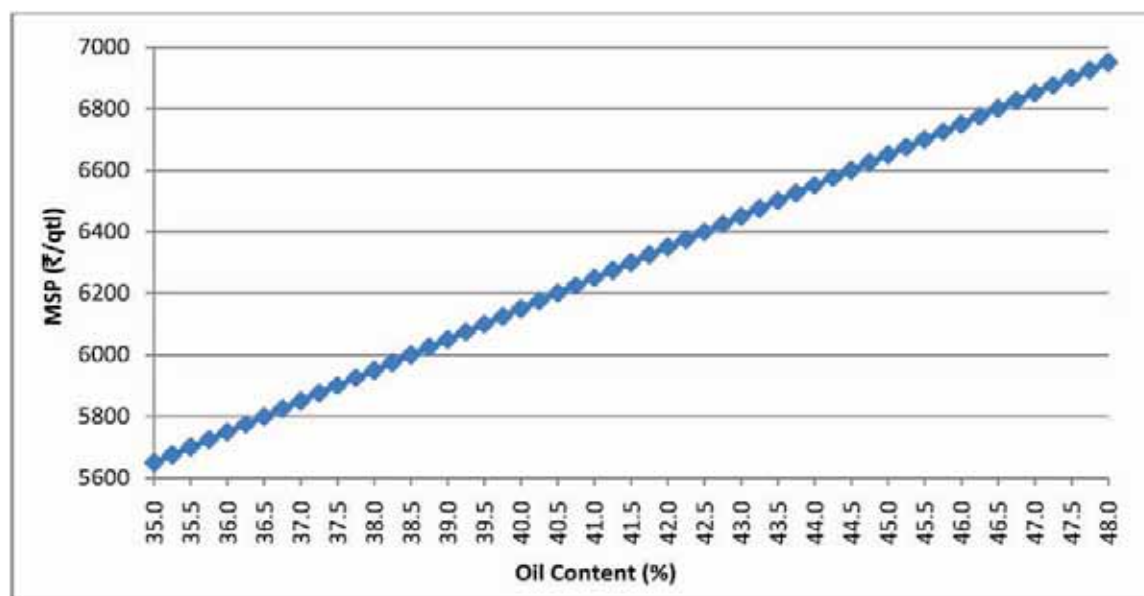
- 3.47 Area under sunflower has witnessed a marked decline in recent years. Area under sunflower cultivation was 3.81 lakh hectares in 2016-17 but shrank to 2.86 lakh



hectares in 2018-19. This decline has implications on the production of sunflower oil. In order to increase area under sunflower, farmers should be incentivized through linking MSP of sunflower seed with its oil content. There are variations in oil content of different varieties of sunflower and therefore, a uniform MSP may not be desirable. The Commission is of the opinion that farmers be incentivized for higher oil content by linking MSP with oil content. As recommended in previous reports, the Commission reiterates that the MSP of sunflower be linked to the basic 'oil content' of 35 percent in sunflower seeds and further, farmers be incentivized for every 0.25 percent point increase in its oil content.

- 3.48 To determine the incentive for higher oil content, it is considered that one quintal of sunflower seed would give 35 kg of oil and 65 kg of oil cake. Adjusting the value of cake, the cost of sunflower seed (oil without cake) would be ₹3960 (5650–1690) which will contain 35 kg of oil. Thus, the MSP will increase by ₹25.03 for every 0.25 percent point increase in oil content (Chart 3.16). Cost per unit of oil content slowly decreases with an increase in oil content (Annex Table 3.1). Taking average oil content between 35 percent and 48 percent, the average cost for every 0.25 percent point works out to be ₹25.03 per quintal. Hence, the Commission recommends that MSP of sunflower seeds should be increased by ₹25.03 per quintal for every 0.25 percent point increase in oil content over and above the base oil content of 35 percent in sunflower seed.

Chart 3.16: MSP based on Oil Content of Sunflower



Recapitulation

- 3.49 Productivity of all kharif cereal crops except jowar decelerated in QE2018-19. A similar trend was also observed in pulses and oilseeds. While all pulses witnessed deceleration in productivity growth in the latest quinquennium, only soybean recorded an increase in productivity among oilseed crops. Also, there has been



a major decline in cotton productivity in QE2018-19. This general decline in productivity growth is accompanied by large inter-State variations. The reasons for this decline range from less than desired expansion in irrigation, inadequate market incentives, hurdles in promotion of greater mechanization and inadequate access to formal credit. There are wide yield gaps between potential and actual yield particularly in pulses and oilseeds which needs to be tapped by appropriate intervention to increase the production of theses commodities, without adding additional area under cultivation.

- 3.50 NPK ratio of fertilizer consumption has improved substantially in the recent years partly due to neem coating and soil health card scheme, which is expected to have considerable impact on the productivity of crops in the future. While expansion of irrigation coverage is critical for improving agricultural productivity, it is important to create irrigation facility in a sustainable and cost effective manner. Therefore, expansion of irrigation coverage through surface water sources needs to be encouraged given the over-exploitation of groundwater. There is also a need to ensure greater use of micro-irrigation to improve water use efficiency. Enhanced use of micro-irrigation along with water soluble fertilizers holds the key to achieve productivity at par with world average in the future.



Chapter 4

Trade Competitiveness of Indian Agriculture

Chapter 4

- 4.1 The “Agriculture Export Policy, 2018”, which aims at doubling agricultural exports from US\$ 30 billion to US\$ 60 billion by 2022 and integrating Indian farmers and agricultural products with the global value chains to take advantage of export opportunities in world markets, would play a pivotal role in achieving the goal of doubling farmers’ income by 2022. The policy aims at diversifying export basket, destinations and increased exports of high-value and value-added products, organic, traditional and non-traditional agri-products. Further the policy aims at providing an institutional mechanism for improving market access and address tariff and non-tariff barriers including sanitary and phytosanitary (SPS) issues.

Trade Performance

- 4.2 As per World Trade Statistical Review 2018, India’s share in total world exports was 1.7 percent in 2017, while the share in world agri-exports was 2.3 percent, valued at US\$39 billion. India’s share in total world imports in 2017 was 2.5 percent, whereas the share in agri-imports was 1.9 percent, valued at US\$33 billion. There was a marginal increase in India’s share in world agri-exports and imports in 2017 as compared with 2016 (Annex Tables 4.1 & 4.2). As regards agri-exports, India is at 9th position whereas, for agri- imports, it stands at 7th position.
- 4.3 As per DGCIS data, India’s agri-exports increased by about 10.7 percent in 2017-18, from ₹233.6 thousand crore in 2016-17 to ₹258.7 thousand crore in 2017-18. The share of agri-exports in total exports increased from 12.6 percent in 2016-17 to 13.2 percent in 2017-18. Major agri-export commodities are rice, marine products, meat, spices and cotton (Annex Table 4.3). Exports of tea, coffee, rice, cashew, oil meals, guar gum meal, marine products and raw cotton registered an increase during 2017-18, while exports of groundnut, sugar, natural rubber, unmanufactured tobacco and vegetable oils recorded a decline. Agri-imports fell from ₹185.3 thousand crore in 2016-17 to ₹175.8 thousand crore in 2017-18



and their share in total imports declined from 7.2 percent to 5.9 percent in the corresponding period. Major agri-commodities/products imported include edible oils, wood & wood products, fresh fruits, cashew and spices. In the overall agri-imports, share of vegetable oils is largest (42.7%), followed by wood & wood products (10.8%) (Annex Table 4.4). There was a rise in imports of natural rubber, spices, vegetable oils, fresh fruits, alcoholic beverages, plywood & allied products, other wood & wood products and groundnut in 2017-18, while imports of wheat, pulses, sugar and jute (raw/yarn) showed a decline. It is evident from the data that there was continuous rise in agri-imports during 2013-14 to 2016-17 but recorded a decline in 2017-18 whereas, there was a fall in agri-exports during 2013-14 and 2015-16 but increased during 2016-17 and 2017-18. Due to this interplay of exports and imports, India's net agri-trade surplus decreased substantially from the level of ₹159 thousand crore in 2013-14 to 83 thousand crore in 2017-18.

- 4.4 During April-December 2018-19, India's agri-exports were ₹204.5 thousand crore, an increase of about 6.6 percent over April-December 2017-18, mainly due to higher exports of raw cotton (54.8%), oil meals (31.2%), sugar (36.7%), guar gum meal (16.1%) and spices (13.4%). However, non-basmati rice exports declined from about 6.5 million tonnes in April-December 2017-18 to 5.6 million tonnes in April-December 2018-19. Other major commodities that witnessed a decline in exports are cashew (-25.8%) meat & processed meat (-6.4%), and fresh vegetables (-1.4%). Agricultural imports declined from 139.2 thousand crore to 123.9 thousand crore during the corresponding period. The decline in imports is due to lower imports of pulses (-67.4%), sugar (-40.9%), raw cotton (-36.2%) and vegetable oils (-10.5%). India's agri-exports in 2018-19 are expected to increase as compared with 2017-18 mainly due to higher demand for agricultural commodities in global economy.
- 4.5 It may be relevant to underscore here, that if the objective of doubling farmers' income and improving welfare of rural masses is to be realized, improving terms of trade of agri-sector is going to be a crucial factor. Trade patterns of major kharif crops are discussed in following sections.

Rice

- 4.6 As per USDA, global production of rice was 487.4 million tonnes in TE2017-18 and about 9.3 percent of the production was traded. China is the largest producer with a share of 30.1 percent, followed by India (22.8%), Indonesia (7.5%), Bangladesh (6.6%) and Vietnam (5.8%). India is the largest exporter of rice with a share of 25.9 percent, followed by Thailand (22.2%), Vietnam (13.9%), Pakistan (8.9%) and USA (6%). China, the largest producer, is also the largest importer of rice, with a share of about 10 percent. Indonesia, Nigeria, EU and Philippines are other major importers of rice, accounting for 16.9 percent of global rice imports.
- 4.7 Rice is an important crop in the country contributing about 40 per cent of total foodgrains production and 18 percent of total agricultural exports. Ban on export of non-basmati rice in India was lifted in September 2011, following which India emerged as the largest exporter of rice since 2012-13. The country's exports of

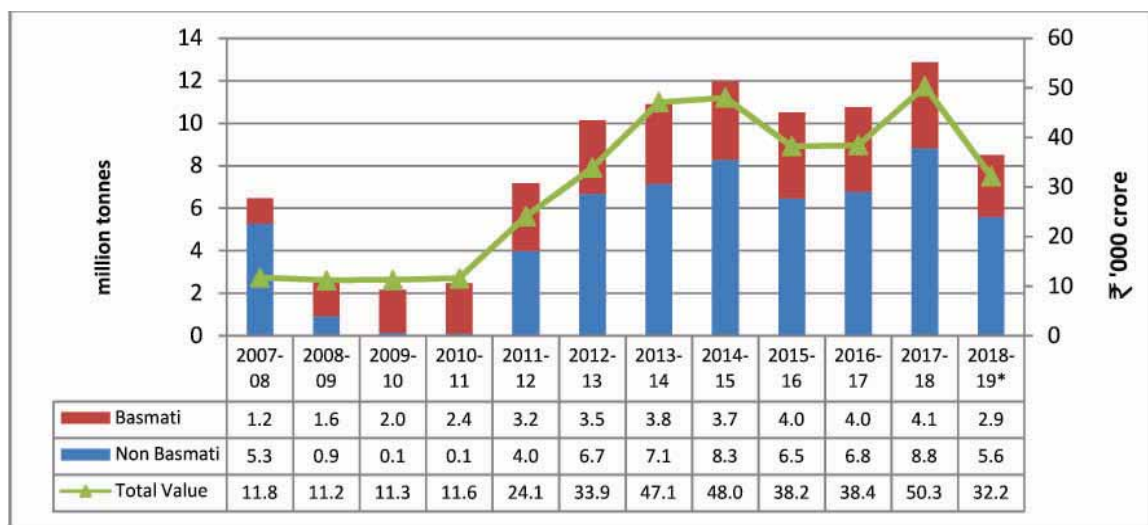


rice (basmati + non-basmati) from 2007-08 to 2018-19 are shown in Chart 4.1. Total exports of rice from India were about 7.2 million tonnes in 2011-12, which increased to 12 million tonnes in 2014-15 but declined to 10.8 million tonnes in 2016-17 mainly due to fall in non-basmati exports. However, exports increased to 12.9 million tonnes in 2017-18 due to increase in demand for non-basmati rice from Bangladesh and Sri Lanka. India exports non-basmati rice mainly to African and Asian countries and premium basmati rice to the Middle East, United States and Britain. India's exports of rice increased by 19.7 percent in 2017-18 because Bangladesh imported large quantities of non-basmati rice as the domestic crop was hit by floods. Bangladesh and Sri Lanka bought aggressively from India amid depleting inventories in Thailand. India has freight advantage over Thailand in exports to these countries.

- 4.8 Basmati rice recorded a notable increase in exports during 2015-16, from 3.7 million tonnes in 2014-15 to about 4.1 million tonnes in 2015-16, which marginally declined to 4 million tonnes in 2016-17 but increased marginally to about 4.1 million tonnes in 2017-18. India faced decline in exports of basmati rice due to strict regulations on maximum residue limits (MRLs) for fungicide (Tricyclazole) by European Union (EU) but it was compensated by strong buying by Iran. Rice exports to Iran are likely to remain unaffected due to Rupee-Iranian Rial trade arrangement between India and Iran. However, an emerging concern is of exports to Saudi Arabia as the country has decided to follow EU pesticide residue parameters. Similarly, USA does not permit the presence of residues of fungicides and insecticides like Isoprothiolane and Buprofezin beyond 0.01 mg/kg. Moreover, there is a possibility of decline in exports of rice in 2018-19 as production in Bangladesh has picked up and also due to higher domestic prices in India driven by higher MSP that would adversely affect India's export competitiveness in the global markets. Exports of non-basmati rice have witnessed a significant decline during April-December 2018-19 (5.6 million tonnes) compared with April-December 2017-18 (6.5 million tonnes). G2G arrangements with various countries for export of non-basmati rice are in the offing which is expected to improve exports of non-basmati rice from India. Effective information dissemination and capacity building programmes for farmers and other stakeholders to keep abreast with latest international regulatory and SPS requirements emerging from time to time, could help in further boosting of exports of rice.



Chart 4.1: India's Export of Rice, 2007-08 to 2018-19



Note: * For 2018-19 (April- December)

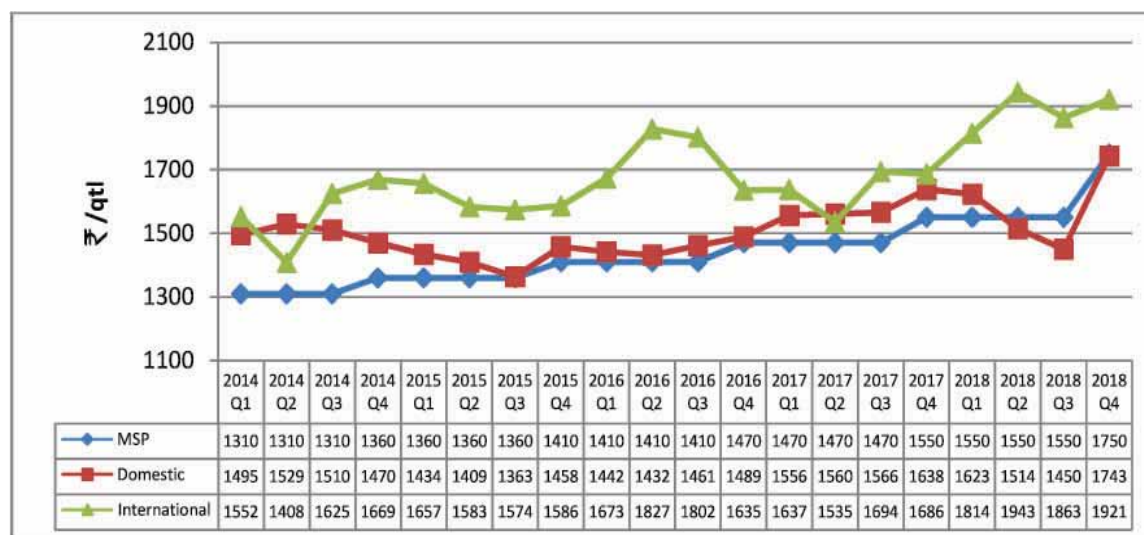
Source: DGCIS

- 4.9 Chart 4.2 reveals that domestic wholesale prices of rice were generally lower than international prices during 2014 to 2018, barring the second quarter of 2014 and 2017. This indicates that Indian rice has remained export competitive barring a few occasions between the period 2014 and 2018. Also, the domestic wholesale price of paddy has been generally higher than MSP till Q₁ of 2018 and was lower than MSP thereafter. MSP has been continuously lower than international prices during this period. However, domestic prices and MSP increased significantly during Q₄ of 2018 compared with international prices. In January 2019, Indian export price of rice was higher (US\$360/tonne, f.o.b.) than Pakistan (US\$319/tonne) and Vietnam (US\$345/tonne).
- 4.10 Export of non-basmati rice from India was banned on 15th October 2007. However, the ban on export was replaced with Minimum Export Price (MEP) of US\$425 per tonne on 31st October 2007, which was revised from time to time. Export of non-basmati rice was prohibited from Central Pool in March 2008 and also on private account in April 2008 in view of tight position of rice in the domestic market. This ban continued till July 2011 when export of one million tonnes of non-basmati rice on private account was allowed with a MEP of US\$425 per tonne. In September 2011, export of non-basmati rice was allowed under the Open General License (OGL) by private parties out of privately held stocks and this has continued thereafter. Import duty of 80 percent on husked (brown) rice and broken rice and 70 percent on milled and semi-milled rice was imposed in April 2000. In view of tight position of rice in domestic market, import of milled and semi-milled rice was allowed at zero percent import duty from 01.03.2008 to 01.04.2009. Non-basmati rice has been made eligible for Merchandise Exports from India Scheme (MEIS) benefit at the rate of 5 percent for exports made with effect from 26.11.2018 and upto 25.03.2019 vide DGFT P.N. No. 49/2015-2020 dated 22.11.2018. The export of rice of seed quality and other rice in husk (paddy) has been placed from Free



to Restricted category vide DGFT's notification No. 23/2015-20 dated 7th October 2015. With some intermittent relaxations, import duty on rice remains at 70-80 percent. Prevailing basic custom duty on rice is 80 percent with a customs cess of 3 percent since 1st July 2017.

Chart 4.2: MSP, Domestic and International Prices of Paddy, 2014 to 2018



Notes: 1. Rice (Thailand), 25 percent broken, WR, milled indicative survey price, government standard, f.o.b. Bangkok

2. International Prices of rice converted into paddy at the ratio of 0.67

3. Weighted wholesale price of Andhra Pradesh (AP), Assam, Chhattisgarh, Gujarat, Haryana, Kerala, Karnataka, Madhya Pradesh (MP), Maharashtra, Punjab, Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal (WB), which covered 77 percent of production in 2016-17

Sources: DES, DAC&FW for domestic wholesale prices and World Bank for International prices

Maize

4.11 As per USDA, global production of maize was 1070.6 million tonnes in TE2017-18, out of which about 13.6 percent was traded. USA is the largest producer of maize (corn) with a share of 34.5 percent, followed by China (24.1%), Brazil (7.6%), EU (5.8%), Argentina (3%) and India (2.7%). USA is also the largest exporter, with a share of 42.1 percent followed by Brazil (16.7%), Argentina (15.2%), Ukraine (12.3%), EU (12.2%) and Russia (3.6%). EU (12.2 %), Mexico (10.7%), Japan (10.4%), South Korea (6.6%), Vietnam (6.3%) and Egypt (6.3%) are major importers of maize, accounting for more than half of global imports.

4.12 Exports of maize from India increased substantially during 2007-08 and 2012-13 (with slight dip in 2009-10) due to increase in productivity as a result of introduction of single cross hybrid variety in 2005 (Chart 4.3). India's exports increased from 27.3 lakh tonnes in 2007-08 to about 47.9 lakh tonnes in 2012-13 and thereafter declined gradually for next two years and plunged to 7 lakh tonnes in 2015-16 and 5.7 lakh tonnes in 2016-17, mainly due to low world prices and fall in domestic production but improved marginally to 7.1 lakh tonnes in 2017-18. Exports of maize

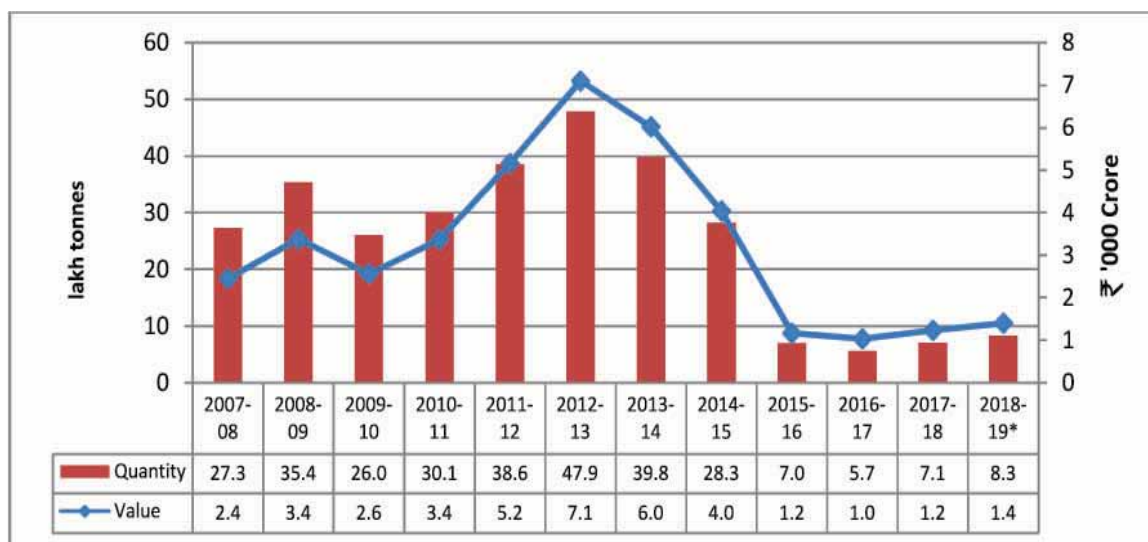


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have increased from 4.6 lakh tonnes in April-December 2017-18 to 8.3 lakh tonnes in April-December 2018-19 due to fall in domestic prices below international prices in last three quarters of 2018-19. However, in the recent months domestic prices have increased and are higher than world prices.

- 4.13 It can be seen from chart 4.4 that domestic wholesale prices of maize were almost equal to international prices in 2014 (Q_1) and thereafter the domestic prices moderately moved higher than the international prices and the trend continued resulting in increased gap between two prices till 2017 (Q_3). In 2018 (Q_2 & Q_3), domestic prices were lower than world prices and in 2018 (Q_4) both prices almost converged. Domestic prices of maize were higher than MSP from 2014 (Q_1) onwards except in 2014 (Q_4) but fell below MSP since 2017 (Q_4). In 2018 (Q_4) there was a significant increase in MSP, thus widening the gap between domestic market prices and MSP.

Chart 4.3: India's Export of Maize, 2007-08 to 2018-19

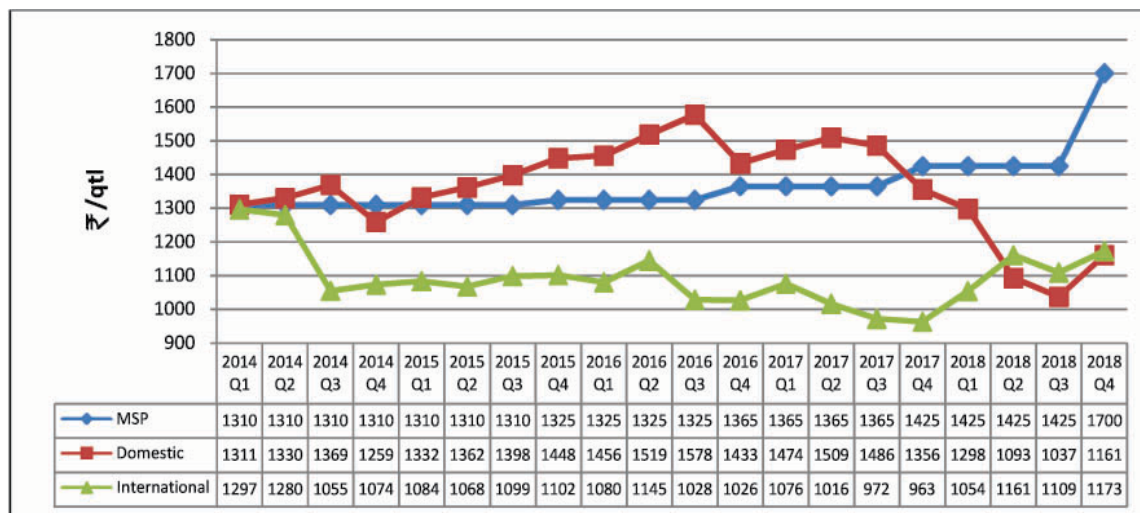


Note: * For 2018-19 (April- December)

Source: DGCIS



Chart 4.4: MSP, Domestic and International Prices of Maize, 2014 to 2018



Notes: 1. Maize (US), No. 2, yellow, f.o.b. US Gulf ports

2. Weighted wholesale price of AP, Bih, Guj, Kar, MP, MH, Pun, Raj, TN and UP, which cover 78 percent of production in 2016-17

Source: DES, DAC&FW for domestic wholesale prices and World Bank for International prices

4.14 Maize prices in domestic markets have increased and were trading at ₹2,100-2,200 per quintal in February 2019 due to supply shortage and steady buying by end-users and stockists. On the other hand, world prices of maize US No. 2, Yellow, FOB U.S. Gulf Ports were trading at about US\$167 per quintal in January 2018. It is evident from the trends that domestic prices were generally lower than MSP during peak market arrivals but increased during lean period.

4.15 Indian maize is not export competitive therefore, there is a need to find alternative uses of maize in the country for direct consumption, mainly value-added products and for industrial uses like feed, starch and ethanol. National Policy on Biofuels 2018 allows use of corn for ethanol production, which is a welcome step and would help maize farmers. Maize cultivation is more water efficient than crops like rice and sugarcane and therefore, it could be considered more suitable for cultivation in water scarce regions.

Jowar

4.16 Global production of jowar declined from 63.4 million tonnes in 2016-17 to 57.8 million tonnes in 2017-18 (USDA, 2018). USA is the largest producer with a share of 16 percent followed by Nigeria (10.9%), India (8.6%) and Mexico (7.9%). About 13 percent of world production is traded and USA is the largest exporter, with a share of 74.7 percent followed by Argentina (8.3%) and Australia (4.5%). China is the largest importer (66.8%), followed by Japan (8.9%).

4.17 Import duty of 50 percent on jowar was levied by Government of India in April 2000 and was raised to 80 percent in July 2017. Quantitative ceiling on export of jowar was removed in March 2002 and exports continue to be free. During the period

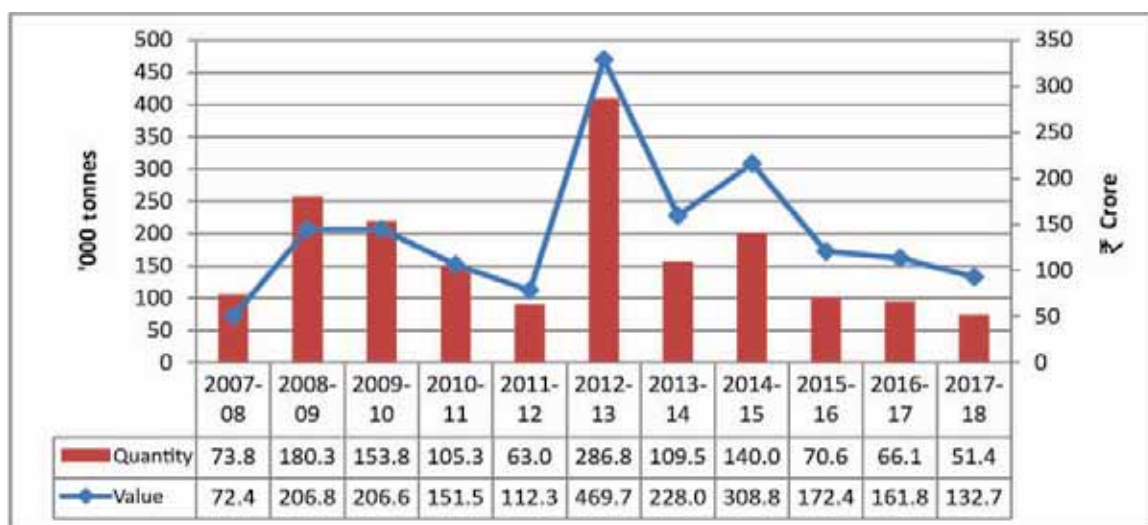


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2007-08 to 2017-18, India's exports of jowar combined have fluctuated between a low of about 51 thousand tonnes in 2017-18 to a high of 287 thousand tonnes in 2012-13 (Chart 4.5). As domestic prices increased vis-a-vis global prices, exports of sorghum & jowar have declined in last few years.

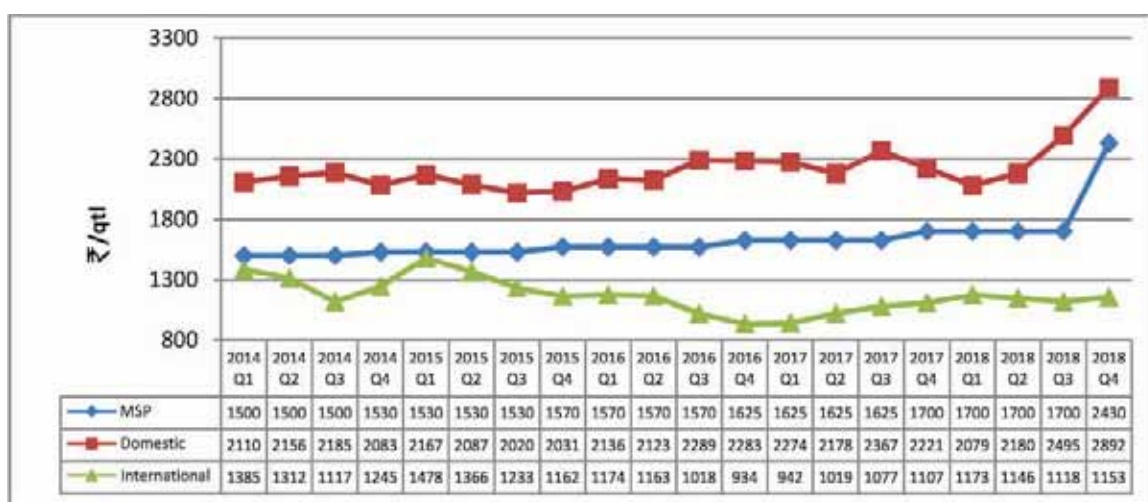
- 4.18 Domestic wholesale prices of jowar have been continuously higher than international prices during 2014 to 2018 (Chart 4.6). Freight advantage allows India to export small quantities to neighbouring countries like Pakistan, Saudi Arabia, UAE and Kenya. Domestic market prices of jowar have been higher than the MSP. However, domestic prices as well as MSP have been higher than international prices. MSP of jowar increased significantly in kharif marketing season 2018-19, which pushed up domestic prices.

Chart 4.5: India's Exports of Jowar, 2007-08 to 2017-18



Source: DGCI

Chart 4.6: MSP, Domestic and International Prices of Jowar, 2014 to 2018



Sources: DES, DAC&FW for domestic wholesale prices and World Bank for International prices

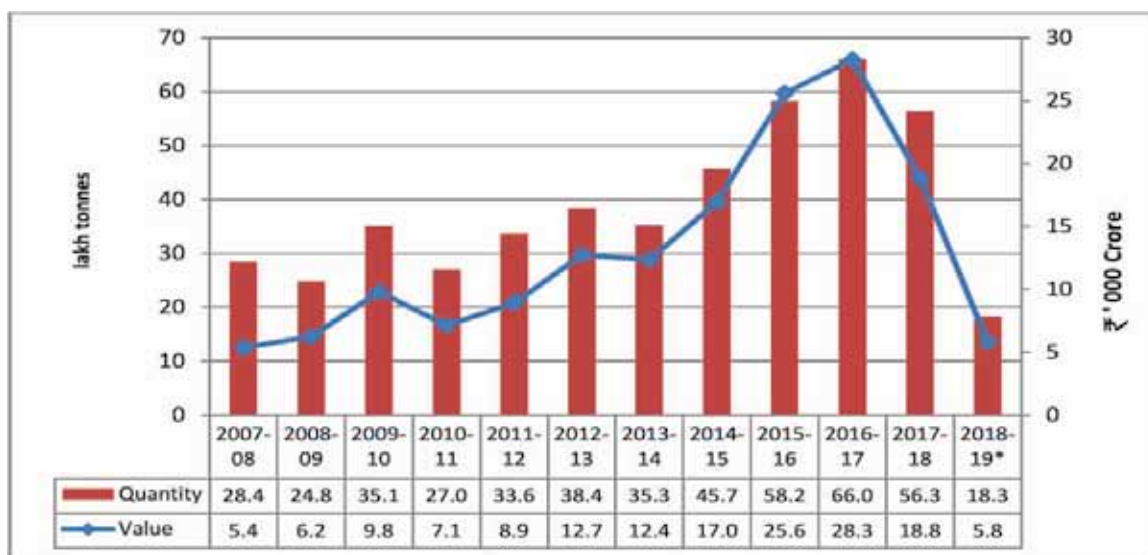


Pulses

- 4.19 Pulses are a major source of protein for a majority of Indians, particularly the vegetarian population. India is the largest producer, consumer and importer of pulses in the world. Pulses such as lentils, beans, peas and chickpeas form important part of general food basket in India. Promoting cultivation of pulses can help India overcome problem of malnutrition, improve soil fertility by nitrogen fixation and provide income support to farmers. Here we need to underline that instead of promoting exports of water-intensive crops like rice and sugarcane, it is important to promote production of pulses by encouraging farmers to grow pulses by providing better quality seeds and appropriate price support.
- 4.20 As per FAO, global production of pulses was 85.6 million tonnes in TE2017-18. India was the largest producer, with a share of 24.2 percent, followed by Canada (9.1%), Myanmar (7.3%), China (5.2%), Russian Federation (4.4%), Australia (4.3%), Nigeria (3.6%) and Brazil (3.2%). Canada (lentils & peas), Myanmar (moong/urad & tur) and Australia (chickpeas & lentils) are major exporters of pulses to India and account for about three-fourth of total imports in the country. Other importers are Russia, Mozambique, Kenya and USA.
- 4.21 As per DGCIS, imports of pulses have increased from 28.4 lakh tonnes valued at ₹5,400 crore in 2007-08 to 66 lakh tonnes valued at ₹28,300 crore in 2016-17 and dropped to 56.3 lakh tonnes valued at ₹18,800 crore due to increase in domestic production (Chart 4.7). Peas constituted a major share (51.3%) in the total import of pulses, followed by chickpea (17.5%), lentils (14.2%) and pigeon peas (7.4%) in 2017-18. Government took several initiatives to encourage domestic production and reduce dependence on imports. Imports of pulses were restricted through import duties/quantitative restrictions while export restrictions were removed to ensure remunerative prices to farmers. As a result of these measures, imports of pulses declined significantly during April-December 2018-19 to 18.3 lakh tonnes from 50.9 lakh tonnes during April-December 2017. Pulses have not been a major export commodity from India so far. However, exports of pulses from India increased from 1 lakh tonnes April-December 2017-18 to 2.3 lakh tonnes April-December 2018-19.



Chart 4.7: India's Import of Pulses, 2007-08 to 2018-19



Note: * For 2018-19 (April- December)

Source: DGCIS

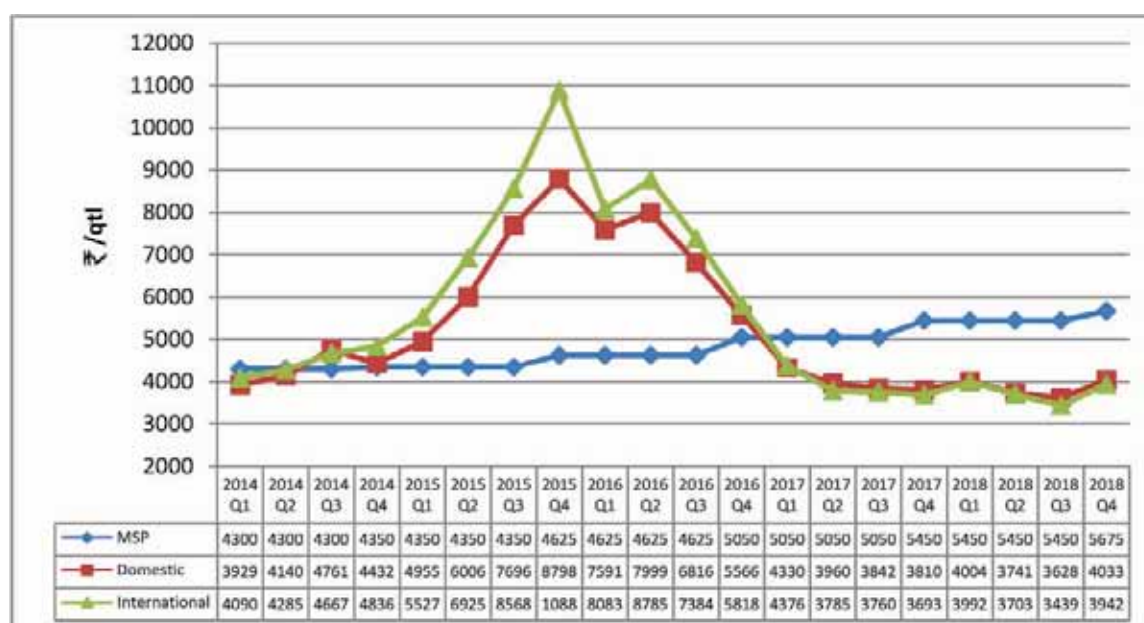
- 4.22 Import duty on pulses was brought down from 10 percent to zero percent in June 2006 but 10 percent import duty was imposed on tur (arhar) in June 2017 due to steep decline in domestic prices as a result of increased domestic production and higher imports, with a view to ensure remunerative prices to farmers. In 2017, three pulses viz. tur urad and moong were brought under quantitative restrictions for imports. On 5th August 2017, 2 lakh tonnes annual quota was imposed on tur dal, and on 21st August 2017, 3 lakh tonnes annual quota each was imposed on urad and moong. On 21st December 2017, Government imposed 30 percent import duty on chickpeas and lentils, which was further increased to 60 percent on chickpeas in March 2018 due to oversupply and depressed prices in domestic market. Government vide notification dated 25.04.2018 revised import policy of yellow peas from 'free' to 'restricted' and imposed quantitative restriction on imports with 1 lakh tonnes for the period of 01.04.2018 to 30.09.2018. Import of peas (including yellow peas, green peas, dun peas and kaspera peas) is restricted till 31.03.2019 vide Department of Commerce's notification No. S.O. 6364 (E) dated 28.12.2018. Import duty on gram was raised from zero to 30 percent on 21.12.2017, which was further raised to 40 percent on February 6, 2018 and 60 percent on March 1, 2018. MEIS benefit of 7 percent for bengal gram available upto 20.06.2018 was extended for exports up to 20.09.2018 vide DGFT public notice No.22/2015-2020 dated 13.07.2018.
- 4.23 Government lifted ban on export of tur, urad and moong dal in September 2017 but permission from Agricultural and Processed Food Products Export Development Authority (APEDA) was needed. However, in November 2017, government removed prohibition on export of all types of pulses subject to export shall be through Customs Electronic Data Interchange (EDI) Ports only. However, exports through Land Custom Stations (LCS) Indo-Bangladesh and Indo-Nepal border shall also be



allowed subject to registration of quantity with DGFT. The export of pulses to the Republic of Maldives has been permitted for the years 2014-15 to 2018-19 with pre-specified quantities.

- 4.24 The domestic wholesale prices of kharif pulses have been compared with international prices (C&F) during the period from 2014 to 2018 and are presented in Charts 4.8 to 4.10. It may be observed from the Charts that the domestic wholesale prices of arhar, urad and moong have generally followed the trend of the international prices. These trends clearly show impact of Indian imports on world markets. MSP of arhar, urad and moong are currently higher than the domestic wholesale prices and also higher than the international prices. Domestic prices of arhar and moong have marginally improved in the recent months but are still much below the MSP.

Chart 4.8: MSP, Domestic and International Prices of Arhar, 2014 to 2018

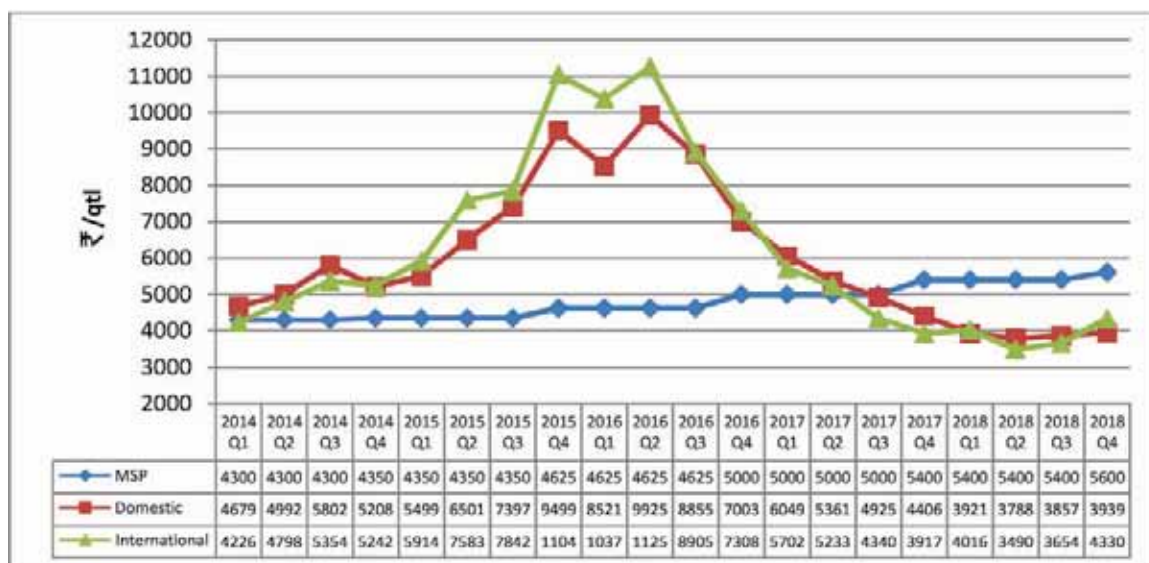


Sources: DES, DAC&FW for domestic wholesale prices. DAC&FW and NAFED for International prices



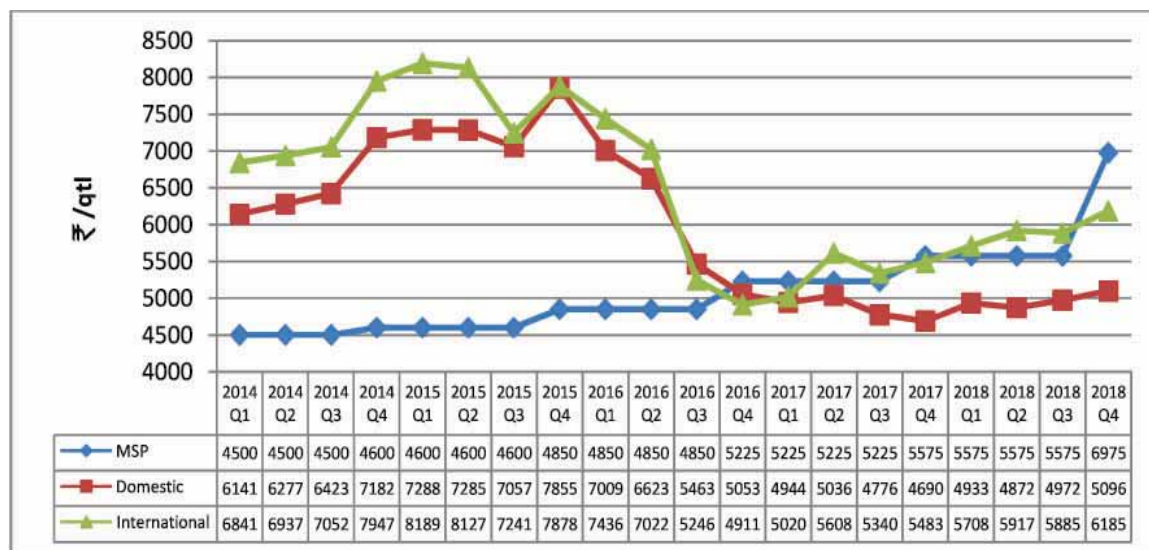
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Chart 4.9: MSP, Domestic and International Prices of Urad, 2014 to 2018



Sources: DES, DAC&FW for domestic wholesale prices. DAC&FW and NAFED for International prices

Chart 4.10: MSP, Domestic and International Prices of Moong, 2014 to 2018



Sources: DES, DAC&FW for domestic wholesale prices. DAC&FW & NAFED for International prices

Oilseeds and Edible Oils

4.25 As per USDA, global production of major oilseeds was 557.4 million tonnes in TE2017-18, out of which 29.7 percent was traded. Soybean has the largest share in total oilseeds production, with a share of 59 percent, followed by rapeseed (12.9%), sunflower seed (8.2%), peanuts (7.8%) and cottonseed (7.8%). USA is the largest producer with a share of 22.9 percent, followed by Brazil (21.6%). Other major producers are China (10.3%), Argentina (7.4%) and India (6%). USA and Brazil account for 76.8 percent of global exports, with a share of 43.3 percent and 33.5

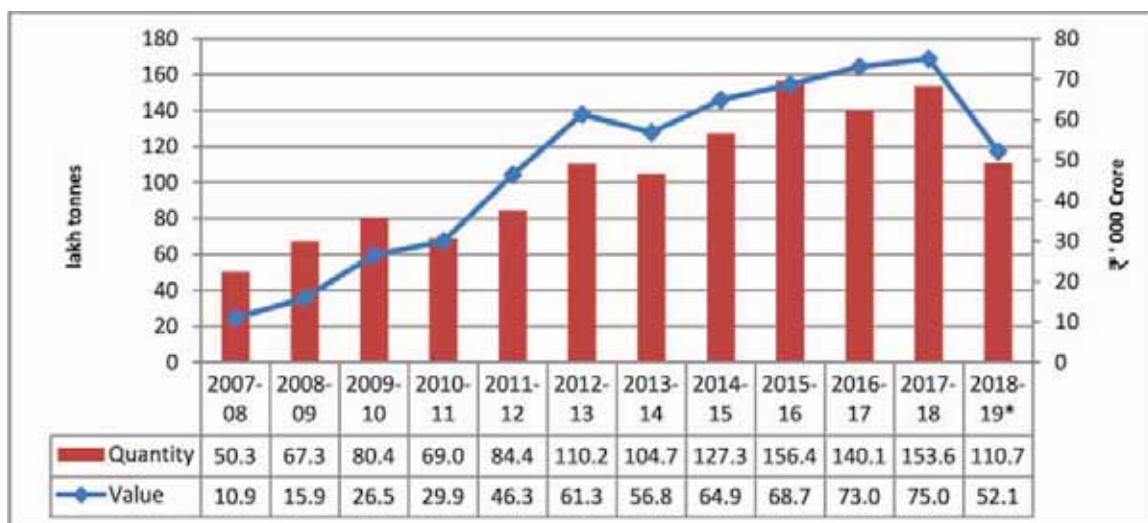


percent, respectively. China and European Union account for about 68 percent of global imports, with a share of 56.6 percent and 11.5 percent, respectively.

- 4.26 Global production of major edible oils was 187.5 million tonnes in TE2017-18, out of which 40.3 percent was traded. Palm oil has the largest share (35.5%) in total edible oils production, followed by soybean oil (27.9%), rapeseed oil (14.1%) and sunflower oil (9.2%). Indonesia is the largest producer, with a share of 22.7 percent, followed by China (14%), Malaysia (11.2%), EU (9.5%) and USA (6.1%). Indonesia and Malaysia together account for 58.9 percent of global exports with a share of 36.7 percent and 22.2 percent, respectively. India was the largest importer of edible oils with a share of 19.6 percent followed by EU (13.8%) and China (11.4%) in 2017-18. Demand for edible oils is rising in India, while domestic production is stagnant due to which dependence on imports has increased over the years. Effective measures to increase domestic production are necessary to reduce import dependency. However, for the short to medium term, appropriate tariff levels on edible oils could be considered as a useful instrument for protecting domestic oilseeds producers but these have limitations and cannot be increased beyond a level.
- 4.27 As per DGCIS data, India's imports of edible oils have increased from 50.3 lakh tonnes valued at ₹10,900 crore in 2007-08 to 153.6 lakh tonnes valued at ₹75,000 crore in 2017-18 (Chart 4.11). Imports of edible oils increased significantly during 2014-15 and 2015-16 due to fall in domestic production coupled with decline in international prices of edible oils, particularly palm oil. Import of edible oils in India was about 47.3 lakh tonnes in TE2007-08 that has increased to 150 lakh tonnes in TE2017-18. Thus, there is an overall increase of 217 percent in imports of edible oils in last decade due to stagnant oilseed production and rising demand in the country. India's dependence on imports has increased to about 70 percent of its requirements and in order to discourage imports and improve domestic oilseeds production and ensure remunerative prices to farmers, import duties were increased substantially in November 2017, which were further increased in February 2018 and revised upward in March and June 2018 (Annex Table 4.6). As a result of these measures total imports of edible oils have decreased from 118.4 lakh tonnes during April-December 2017-18 to 110.7 lakh tonnes in April-December 2018-19. However, import duty on crude palm oil and RBD palmolein was reduced to 40 percent and 45 percent, respectively for imports from Malaysia and 40 percent and 50 percent for imports from Indonesia from 1st January 2019 onwards. This has resulted in effective duty differential between crude and refined palm oil to 5 percent for imports from Malaysia and 10 percent for shipments from Indonesia. It can lead to higher import of refined palm oil and adversely affect the domestic refining industry.



Chart 4.11: India's Import of Edible Oils, 2007-08 to 2018-19



Note: * For 2018-19 (April- December)

Source: DGCIS

Soybean Complex

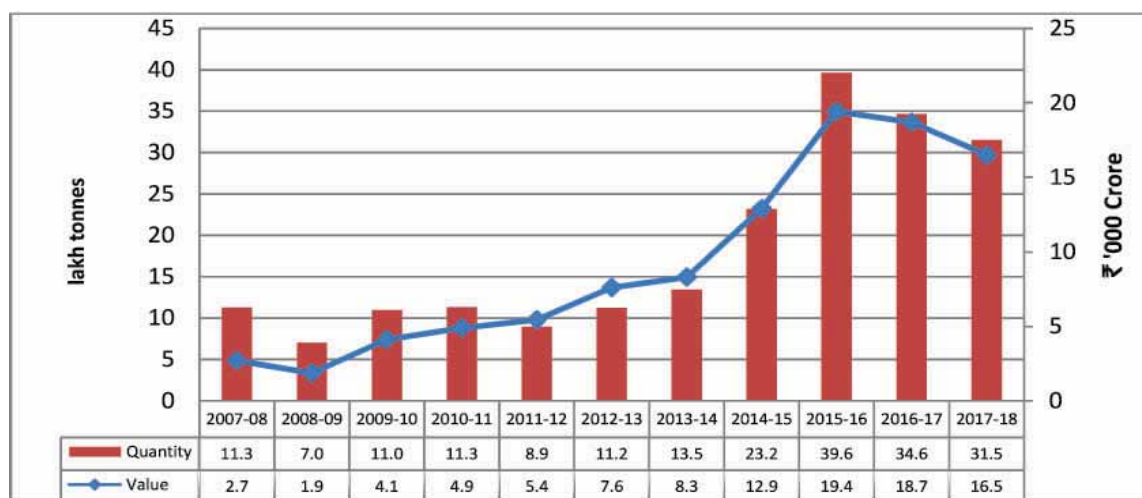
- 4.28 As per USDA, global production of soybean was 335.1 million tonnes during TE2017-18, out of which about 43 percent was traded. Global production of soybean decreased from 349.2 million tonnes in 2016-17 to 339.4 million tonnes in 2017-18. USA is the largest producer of soybean, with a share of 35.4 percent, followed by Brazil (25.4%), Argentina (11.1%) and China (4.5%). India's share in global production of soybean is only 2.5 percent. Brazil and USA contribute 87.6 percent of total world exports with a share of 49.8 percent and 37.8 percent, respectively. China (61.3%) and EU (9.5%) import about 71 percent of total world imports of soybean. World production of soybean has increased in last few years, leading to significant drop in global soybean and soybean oil prices, which are much lower than domestic prices.
- 4.29 The global production of soybean oil was 53.5 million tonnes in TE2017-18, out of which 20.5 percent was traded. China is the largest producer, with a share of 29.2 percent, followed by USA (19.5%), Brazil (15.5%) and Argentina (13.2%). These top four producers account for 77.4 percent of world production of soybean oil. India's share in global production is only 2.5 percent. Argentina, Brazil and USA account for nearly two-third of total world exports, with a share of 40 percent, 14.5 percent and 10.6 percent, respectively. India is the largest importer (30.3%), followed by Bangladesh (7.9%). Imports of soybean oil in the country have recorded the highest increase among all edible oils during last five years.
- 4.30 The global production of soybean meal was 225 million tonnes in TE2017-18, out of which 28 percent was traded. China is the largest producer of soybean meal, with a share of 30.7 percent followed by USA (19.2%), Brazil (14.8%) and Argentina (12.1%). Argentina (39%), Brazil (25%) and USA (21%) export nearly 85 percent of



total world exports. EU is the largest importer of soybean meal, with a share of 30.4 percent, followed by Vietnam (8%) and Indonesia (7.7%). Indian exports of soybean meal have picked up in last two years because of low soybean prices in India and Iranian market has opened up for Indian soybean meal. During April to December 2018, about 3 lakh tonnes of soybean meal was shipped against 23,000 tonnes in April-December 2017-18.

- 4.31 Soybean is an industrial crop and its price is linked to the prices of finished products i.e. soybean meal and oil. India is not able to export soybean as domestic prices are higher than international prices. However, country imports soybean oil to meet domestic demand. Import of soybean oil has increased from 11.3 lakh tonnes in 2007-08 to 31.5 lakh tonnes in 2017-18 (Chart 4.12). Imports of soybean oil have significantly increased in 2014-15 and 2015-16 due to decline in domestic production and international prices of soybean oil during this period. Import of soybean oil declined in 2016-17 to 34.6 lakh tonnes in comparison to 39.6 lakh tonnes in 2015-16, which further declined to 31.5 lakh tonnes in 2017-18 and is likely to decline further due to increase in import duty in June 2018. Soybean oil imported into the country is mainly GM-soybean oil as most of exporting countries grow GM soybean.

Chart 4.12: India's Import of Soybean Oil, 2007-08 to 2017-18



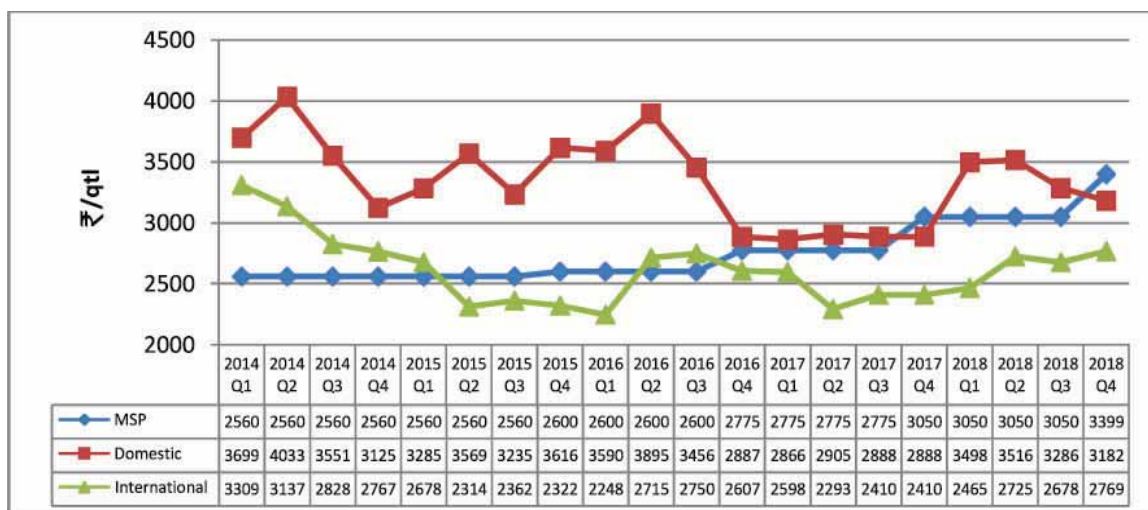
Source: DGCIS

- 4.32 Domestic wholesale prices of soybean have been continuously higher than the international prices from 2014 to 2018 (Chart 4.13). MSP of soybean has been continuously lower than domestic wholesale prices except 2017 (Q_4) and 2018 (Q_4), whereas it is currently higher than the international prices since 2016 (Q_4). Domestic wholesale prices of soybean dropped from 2016 (Q_3) onwards and were stable, slightly above MSP since 2016 (Q_4) except during peak market arrivals (October-December) in 2017 (Q_4) and 2018 (Q_4). Due to increase in world production of soybean, there is significant decline in international prices of soybean since 2016 (Q_3), but have increased since 2017 (Q_3), however, world prices have remained below India's domestic wholesale prices since 2014 (Q_1).



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Chart 4.13: MSP, Domestic and International Prices of Soybean, 2014 to 2018



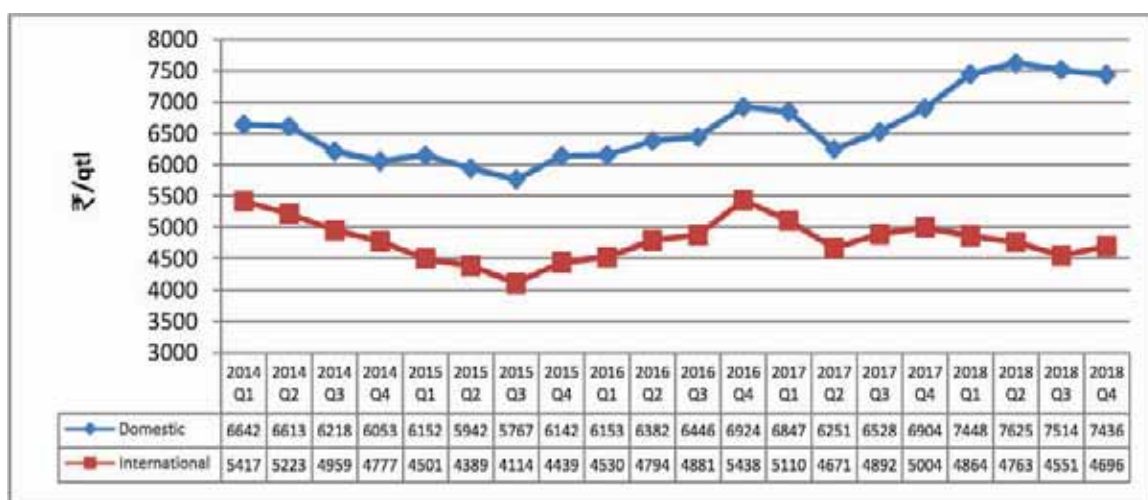
Notes: 1. Argentina Up River, FOB Crude: IGC

2. Weighted wholesale price of MP, Maharashtra, and Rajasthan, which cover 93 percent of production in 2016-17

Sources: DES, DAC&FW for domestic wholesale prices and USDA for international prices

4.33 Domestic wholesale price of soybean oil has been continuously higher than international price during 2014 to 2018 and the gap has widened since 2017 (Q₂) (Chart 4.14) due to increase in domestic prices, thereby increasing imports. Since 2017(Q₂), both domestic and international prices of soybean were moving upward till 2017(Q₄) and in 2018 the international price has declined further. However, there was a synergy in the trends of domestic and international prices till 2017(Q₄).

Chart 4.14: Domestic and International Prices of Soybean Oil, 2014 to 2018



Notes: Argentina Up River, FOB Crude: IGC

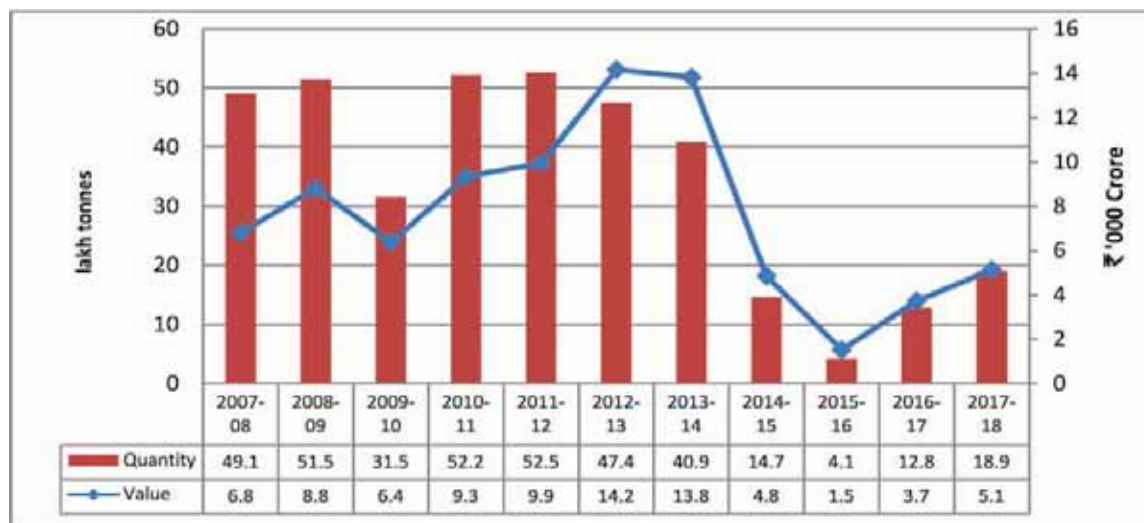
Sources: The Solvent Extractors Association of India for domestic wholesale prices and USDA for International Prices



4.34 India's exports of soybean meal have increased from 49.1 lakh tonnes in 2007-08 to a high of 52.5 lakh tonnes in 2011-12 but declined to 4.1 lakh tonnes in 2015-16 (Chart 4.15). However, exports increased to 12.8 lakh tonnes in 2016-17 and 18.9 lakh tonnes in 2017-18. Exports of soybean meal picked up in 2016-17 because of low soybean prices in India. Export incentive of 10 percent in the form of MEIS made Indian exports more competitive in the international markets and helped in increasing exports. Bangladesh, France, Nepal, Germany, Vietnam and Japan were major destinations for India's exports during 2017-18.

4.35 Domestic wholesale prices of soybean meal have been continuously higher than international prices from 2014 to 2017 except 2017 (Q₁ and Q₄) (Chart 4.16), indicating that Indian exports are not competitive in the global market. However, India should take advantage of non-GMO soybean and target niche markets. Iran is a potential market for Indian soybean meal as also are the South East Asian nations, provided India is able to offer competitive prices. Currently, Indian soybean meal is costlier compared to the other suppliers, purely because of comparatively high price of soybean itself in India. With a view to make Indian exports competitive in soybean meal, government had allowed certain incentives which include MEIS of 10 percent on export of soybean meal. However, this incentive will expire on 31st March, 2019. The MEIS benefit on export of soybean meal should be allowed beyond 31st March, 2019.

Chart 4.15: India's Export of Soybean Meal, 2007-08 to 2017-18



Source: DGCIS

Groundnut

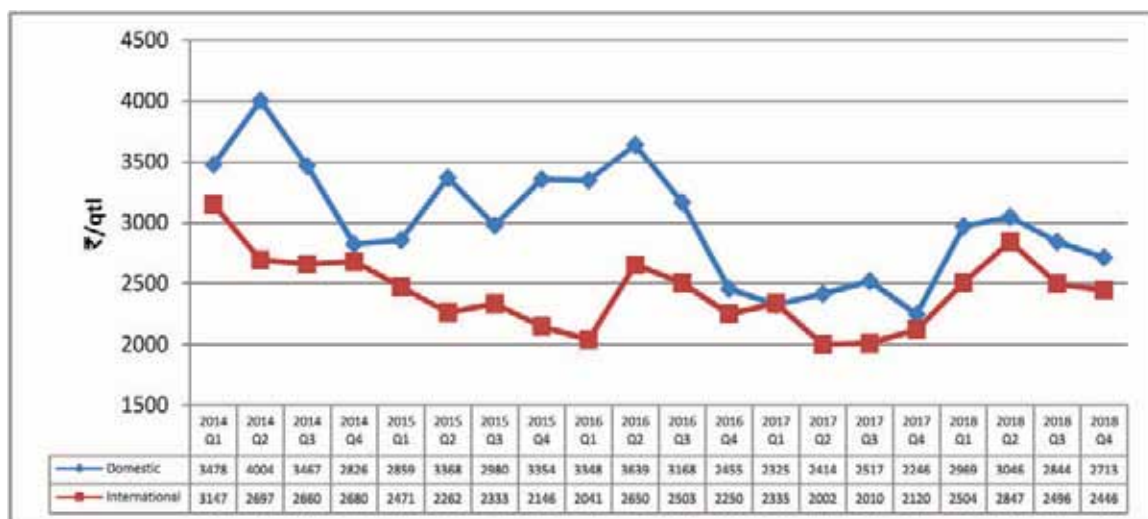
4.36 As per USDA, global production of groundnut was 43.5 million tonnes in TE2017-18, out of which less than 8 percent was traded. China, India, USA and Nigeria produce more than two-third of total world production, with a share of 38.1 percent, 14.8 percent, 7.2 percent and 7.1 percent, respectively. India's exports of groundnut showed increasing trend, from 2.7 lakh tonnes in 2007-08 to 8.3 lakh tonnes in



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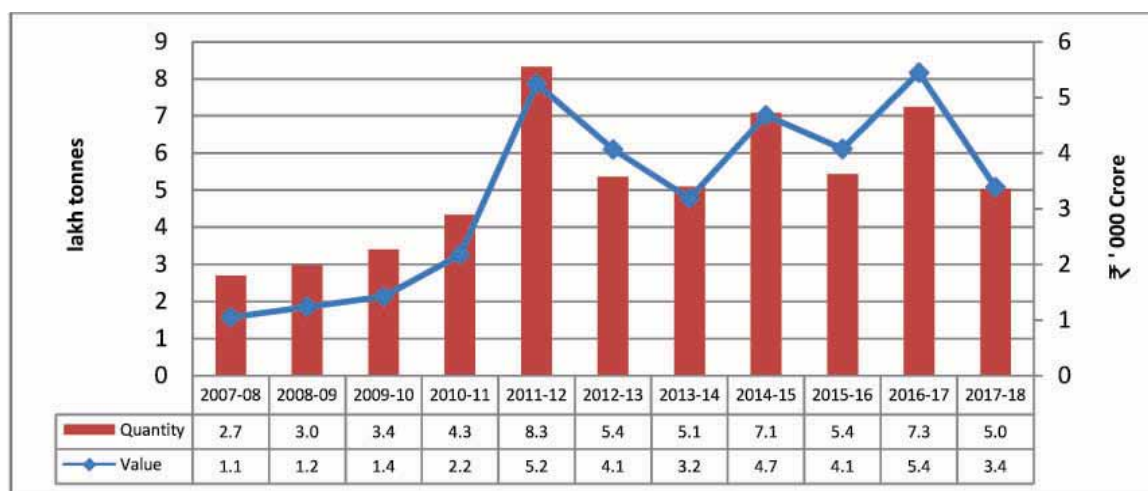
2011-12 (Chart 4.17). However, exports of groundnut declined subsequently to 5.4 lakh tonnes in 2015-16, increased to 7.3 lakh tonnes in 2016-17 but declined to 5 lakh tonnes in 2017-18. Exports of groundnut to all countries except Russia are permitted subject to compulsory registration of contracts with APEDA, along with controlled toxic compound Aflatoxin level certificate given by laboratories nominated by APEDA.

Chart 4.16: Domestic and International Prices of Soybean Meal, 2014 to 2018



Sources: The Solvent Extractors Association of India for domestic prices and USDA for international prices

Chart 4.17: India's Export of Groundnut, 2007-08 to 2017-18



Source: DGCIS

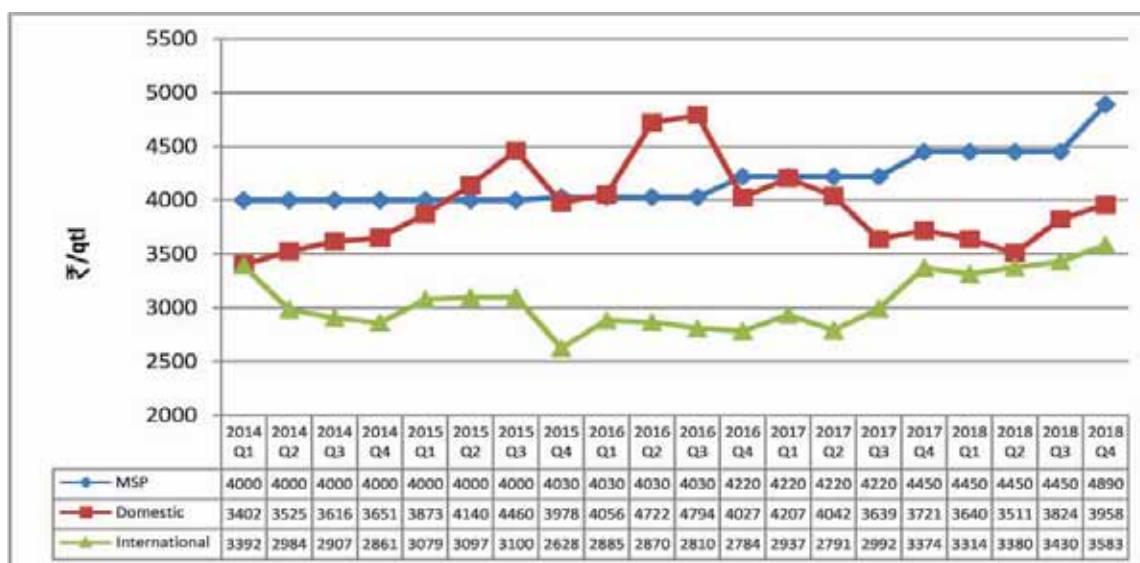
4.37 Global production of groundnut oil was 5.7 million tonnes in TE2017-18, out of which only 4.4 percent was traded. It shows that most of groundnut oil is produced for self-consumption. China (48.1%) and India (21.6%) produce nearly 70 percent of the total world production. China, EU and USA are the main importers of groundnut oil, whereas India, China, EU and USA export in small quantities.

PRICE Policy for KHARIF CROPS



4.38 During 2014 to 2018, domestic prices of groundnut have been higher than international prices (Chart 4.18). India's exports of groundnut are mainly to South-East Asian nations, Gulf countries and South Asian countries like Nepal, Pakistan and Sri Lanka, where India has freight advantage in comparison to other competitors like Argentina and USA. The MSP of groundnut was higher than domestic prices except 2015 (Q₂ & Q₃) and 2016 (Q₁, Q₂ & Q₃) and has been higher than international prices since 2014 to 2018. Domestic price of groundnut oil has also been higher than international price since 2014 Q₄, till 2017 Q₁ and has been lower than international prices since then (Chart 4.19).

Chart 4.18: MSP, Domestic and International Prices of Groundnut, 2014 to 2018



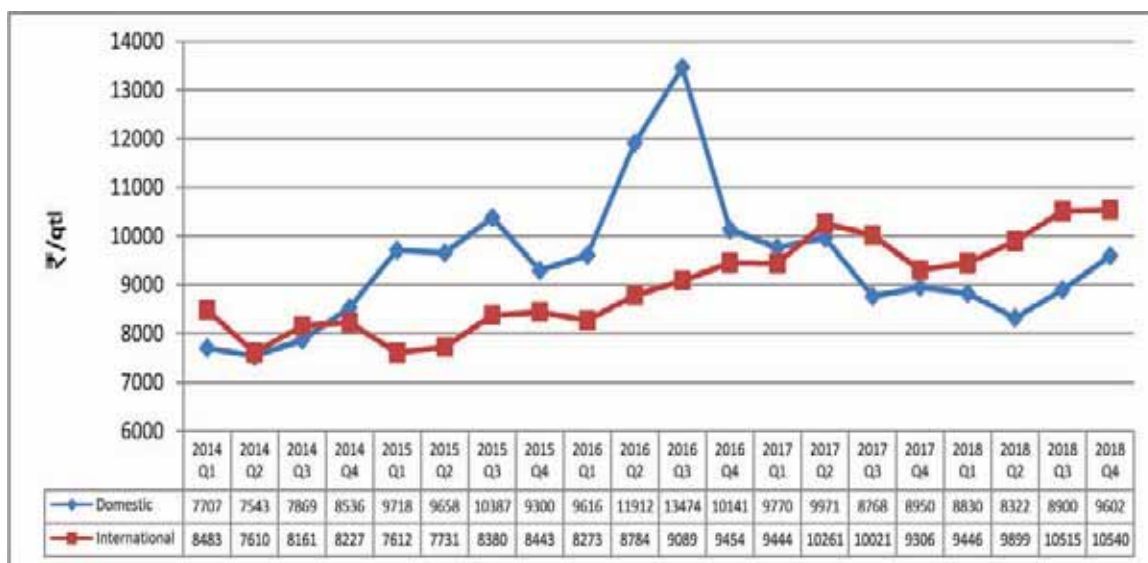
Notes: 1. US Farm Price, in Shell

2. Weighted wholesale price of AP, Gujarat, Karnataka, Rajasthan and TN, which cover 89 percent of production in 2016-17

Sources: DES for domestic wholesale prices and USDA for international prices



Chart 4.19: Domestic and International Prices of Groundnut Oil, 2014 to 2018



Notes: South East Mills FOB; Tank Cars Crude; USDA

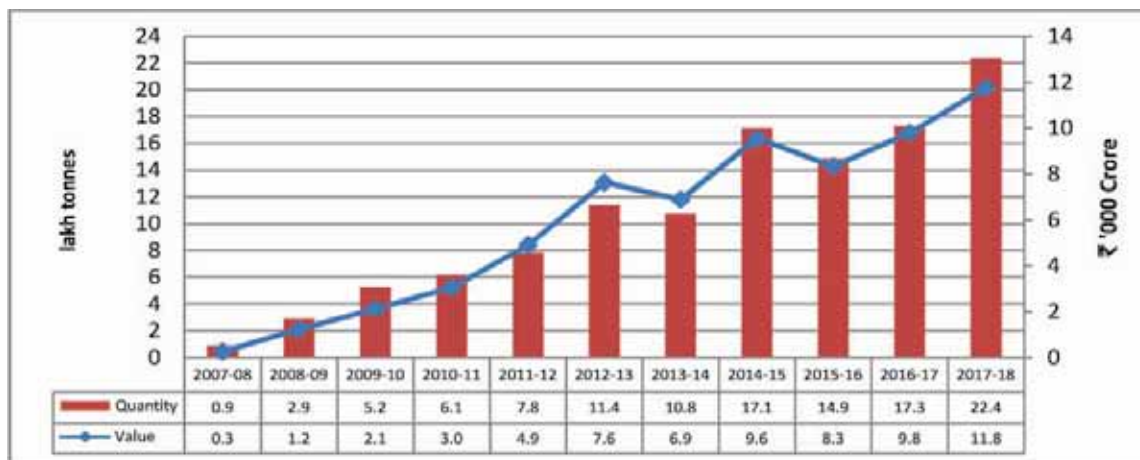
Sources: The Solvent Extractors Association of India for domestic wholesale prices and USDA for International prices

Sunflower

- 4.39 Global production of sunflower seed, as per USDA, was 45.2 million tonnes in TE2017-18, out of which only 4.8 percent was traded. Ukraine (28.9%) and Russia (21.9%) produce more than half of total world production. Other major producers are EU (20.4%) and Argentina (7.5%). As per USDA, EU is the largest exporter with a share of 25.3 percent, followed by Russia (3.8%) and Turkey (2.2%). Turkey accounted for 33.4 percent and EU for 23.7 percent of total imports.
- 4.40 Global production of sunflower oil was 17.3 million tonnes in TE2017-18, out of which 51 percent was traded. Ukraine, Russia and EU produce about three-fourth of the world production, with a share of 32.3 percent, 22.7 percent and 19.9 percent, respectively. Ukraine and Russia export about three-fourth of the global exports, with a share of 55.1 percent and 23.8 percent, respectively. EU is the largest importer with a share of 17.9 percent, followed by Turkey (5.9%).
- 4.41 As per DGCIS, India exports small quantities of sunflower seed, whereas imports are nil. However, imports of sunflower oil have increased substantially, from a small quantity of about 90 thousand tonnes in 2007-08 to 17.1 lakh tonnes in 2014-15 (Chart 4.20), before declining to 14.9 lakh tonnes in 2015-16 and again rising to 17.3 lakh tonnes in 2016-17 and 22.4 lakh tonnes in 2017-18.



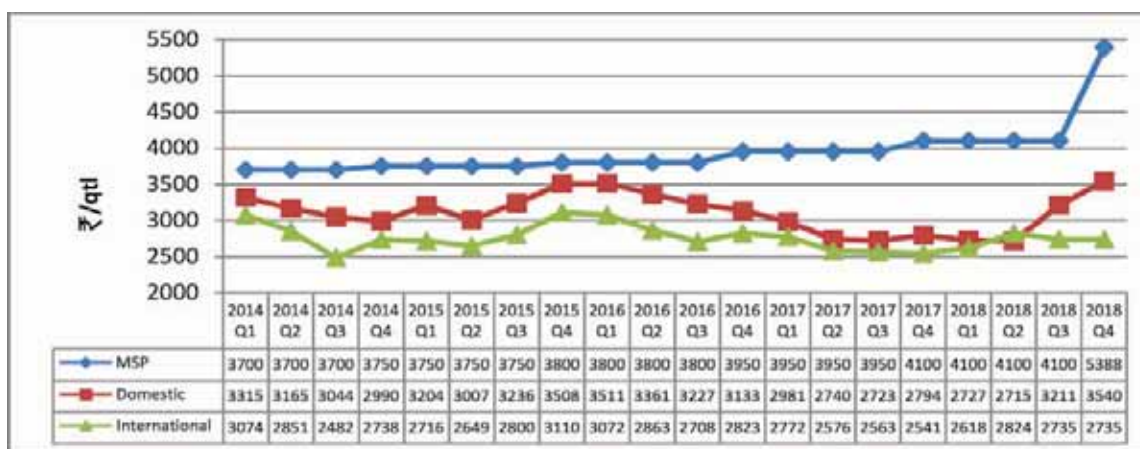
Chart 4.20: India's Import of Sunflower Oil, 2007-08 to 2017-18



Source: DGCIS

4.42 Domestic wholesale prices of sunflower seed have been continuously higher than the international prices from 2014 to 2018 except in 2018 (Q₂) and followed international price trends (Chart 4.21). However, MSP of sunflower seed is higher than the domestic as well as international prices and has been increasing gradually especially from 2016 (Q₃) onwards whereas the domestic wholesale prices and international prices have declined since 2016 (Q₁). In 2018 (Q₄), there was a significant jump in MSP of sunflower seed, which resulted in rise in domestic wholesale prices but were still lower than MSP. Domestic wholesale prices of sunflower oil have also been consistently higher than world prices during 2014 to 2018 (Chart 4.22). Production of sunflower seed/oil increased in the major producing countries, viz., Ukraine, Russia and EU due to favourable weather conditions, which led to decline in international prices.

Chart 4.21: MSP, Domestic and International Prices of Sunflower Seed, 2014 to 2018



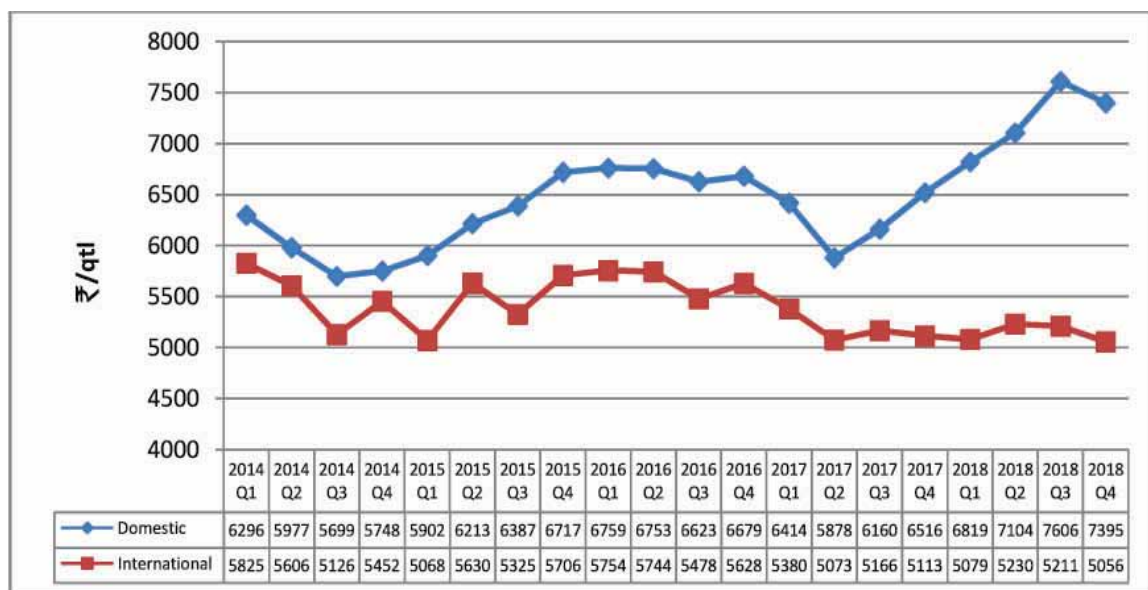
Notes: 1. Rotterdam/ Amsterdam CIF; EU; Oil World

2. Weighted wholesale price of AP, Karnataka, Maharashtra and TN, which cover 60 percent of production in 2016-17

Sources: The Solvent Extractors Association of India for domestic wholesale prices and USDA for International prices



Chart 4.22: Domestic and International Prices of Sunflower Oil, 2014 to 2018



Note: EU FOB NW Euro; Oil World

Sources: The Solvent Extractors Association of India for domestic wholesale prices and USDA for International prices.

Trade Policy of Oilseeds/Edible Oils

4.43 Oilseed exports are under 'free category' except breeder/foundation/wild variety seeds that are not allowed for export from India while imports of oilseeds are under OGL with an import duty of 30 percent since January, 2003 but on November 17, 2017, government increased import duty to 45 percent on soybean, subject to quarantine conditions. Edible oils were under negative list of imports till April 1994, when import of palmolein was placed under OGL subject to 65 percent import duty. Subsequently, imports of other edible oils were also placed under OGL and import duty was as high as 80 percent on crude oil and 90 percent on refined edible oils during early-2000s. The import duties on edible oils were reduced to zero percent on crude and 7.5 percent on refined edible oils in April 2008. Afterwards, import duty on crude edible oils was increased to 2.5 percent in January 2013, which was further increased to 7.5 percent in December 2014 and 12.5 percent in September 2015. Import duty on refined edible oils, which was at 7.5 percent in 2008, was also increased to 10 percent in January 2014, which was further increased to 15 percent in December 2014 and 20 percent in September 2015. However, in the case of palm oils, import duty that was imposed at 65 percent in 1994, was reduced on crude palm oil to 7.5 percent and on refined palm oil to 15 percent vide notification dated 30.09.2016. Government increased import duty on crude soybean oil from 12.5 percent to 17.5 percent in August 2017. Similarly, on crude palm oil import duty was raised from 7.5 percent to 15 percent and on refined palm oil from 15 percent to 25 percent.



- 4.44 In order to improve self-sufficiency in edible oils and ensure remunerative prices to oilseed farmers, changes in the import duty structure of edible oils were introduced in November 2017, wherein import duty on crude palm oil of edible grade was raised from 15 percent to 30 percent and 44 percent in March 2018 but reduced to 40 percent in January 2019. Similarly, import duty on RBD palmolein was increased from 25 percent to 40 percent in November 2017 and 54 percent in March 2018 but reduced to 45 percent for imports from Malaysia and 50 percent for shipments from Indonesia. In November 2017, import duty on crude soybean oil was increased to 30 percent from 17.5 percent and it was further increased to 35 percent in June 2018, while refined soybean oil was raised from 20 percent to 35 percent in March 2018, which was further increased to 45 percent in June 2018. Similarly, import duty on crude sunflower oil was increased from 12.5 percent to 25 percent in March 2018 and 35 percent in June 2018 while that on refined sunflower oil import duty was increased to 35 percent in March 2018 and 45 percent in June 2018. Import duty on crude cottonseed oil was raised from 30 percent to 35 percent in June 2018 and on refined cottonseed oil from 35 percent to 45 percent in June 2018. Import duty on soybean seeds has been increased to 45 percent from 30 percent in November 2017.
- 4.45 Export of edible oils was initially prohibited for a period of one year in March 2008, which was extended from time to time. However, there were certain exemptions, namely (a) castor oil, (b) coconut oil from all EDI ports and through all LCS, (c) deemed export of edible oils (as input raw material) from DTA to 100 percent Export Oriented Units (EOUs) for production of non-edible goods to be exported, (d) edible oils from DTA to Special Economic Zones (SEZs) to be consumed by SEZ Units for manufacture of processed food products, subject to applicable value addition norms, (e) edible oils produced out of minor forest produce, (f) organic edible oils subject to export contracts being registered and certified as 'Organic' by APEDA, and (g) rice bran oil in bulk (irrespective of any pack size). In April 2018, government removed prohibition on export of all varieties of edible oils except mustard oil vide DGFT notification No. 01/2015-2020 dated 06.04.2018. Mustard oil continued to be exported only in consumer packs upto 5 kg and with a minimum export price of US\$ 900 per tonne. India's trade policy for major kharif crops and palm oil is summarized in Table 4.1.



Price Policy for Kharif Crops

Table 4.1: India's Trade Policy - Kharif Crops and Palm Oil

Crop/ Commodity	Trade Policy				
	Import Policy			Export Policy	
	OGL/ Import ban	Import duty (%)	Bound Duty (%)	OGL/ Export ban	Export duty (%)
A-Cereals					
Rice	OGL	(rice in husk, Husked brown rice; Broken rice) - 80	80	OGL	Zero
		(Semi-milled or Wholly milled rice) - 70	70		
Maize	OGL	50	70	OGL	Zero
Jowar	OGL	80	80	OGL	Zero
B-Pulses					
Tur	OGL	10	100	OGL	Zero
Urad	OGL	Zero	100	OGL	Zero
Moong	OGL	Zero	100	OGL	Zero
C-Oilseeds/Edible Oils					
Soybeans	OGL	45	100	OGL	Zero
Groundnut	OGL	30	100	OGL	Zero
Sunflower seed	OGL	30	100	OGL	Zero
Soybean oil (crude)	OGL (Tariff value –US\$ 758 per metric tonne)**	35	45	Export ban removed on 06.04.2018 *	
Groundnut oil (crude)	OGL	35	300	Export ban removed on 06.04.2018 *	
Sunflower oil (crude)	OGL	35	300	Export ban removed on 06.04.2018 *	
Soybean Oil (refined)	OGL	45	45	Export ban removed on 06.04.2018 *	
Groundnut oil (refined)	OGL	45	300	Export ban removed on 06.04.2018 *	
Sunflower oil (refined)	OGL	45	300	Export ban removed on 06.04.2018 *	
Palm oil(crude)	OGL***	40	300	Export ban removed on 06.04.2018 *	
Palm oil(refined)	OGL***	40 (from Malaysia And 50 (from Indonesia)	300	Export ban removed on 06.04.2018 *	

PRICE Policy for KHARIF CROPS



Crop/ Commodity	Trade Policy				
	Import Policy			Export Policy	
	OGL/ Import ban	Import duty (%)	Bound Duty (%)	OGL/ Export ban	Export duty (%)
Soybean meal	OGL	Zero	100	OGL	Zero
D- Commercial Crops					
Cotton	OGL	Zero	100	OGL	Zero

Notes: * Export of Mustard oils in branded consumer packs up to 5 kg is permitted with MEP of US\$ 900 per MT, ** As on 15/02/2019, ***The import of all edible oils (except coconut oil, palm kernel oil, RBD palm oil, RBD palm stearin) was placed on OGL, from March, 1995

Source: CBEC/CBIC

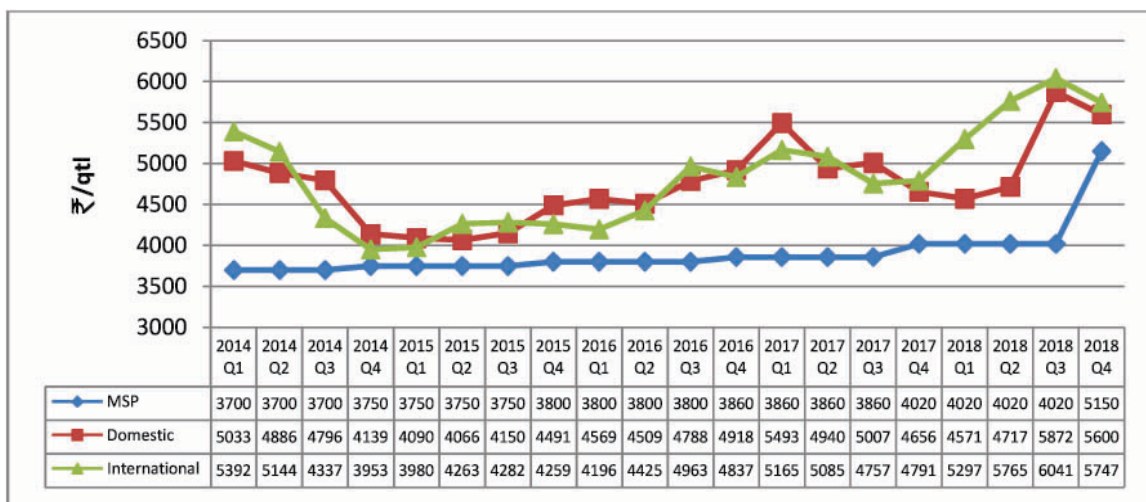
Cotton

- 4.46 Global production of cotton has increased from 23 million tonnes in 2016-17 to 27 million tonnes in 2017-18. India (23.4%) and China (22.2%) produce nearly half of total world production of cotton. Other major producers are USA (16.9%), Brazil (7.5%) and Pakistan (6.6%). As per USDA, about 35 percent of world cotton production was traded in TE2017-18. USA is the largest exporter with a share of 36.4 percent, followed by Brazil (13.4%), India (10.5%) and Australia (9%). Bangladesh is the largest importer with a share of 18.5 percent, followed by Vietnam (16.8%), China (14%) and Indonesia (8.5%).
- 4.47 Domestic wholesale and international prices of raw cotton have been continuously higher than MSP from 2014 onwards (Chart 4.23). However, international prices were higher than domestic prices till 2014 (Q_2) and remained below domestic prices till 2016 (Q_2) except for 2015 (Q_2 , Q_3) and kept on crossing each other till 2017 (Q_3). From 2017 (Q_4) onwards till 2018 (Q_4), international prices have been higher than domestic prices but moved towards convergence during last two quarters.
- 4.48 Quantitative restrictions (QRs) on export of cotton were removed in July 2001 and was placed under OGL. To curb rising price trend in the domestic market and avoid disruption in supply chain of cotton in the country, government imposed export duty of ₹ 2,500 per tonne on raw cotton in April 2010 till the end of cotton season 2009-10. Cotton exports were placed on restricted category in May 2010 but exports were allowed at zero export duty in August 2010 with the restriction that the contracts for exports are registered with DGFT prior to shipment. Cotton exports are currently free and the registration requirement for export has been dispensed with vide notification dated 08.12.2014. Import of cotton was placed under OGL in April 1994. Import duty of 5 percent was levied on imports of cotton in March 1999, which was increased to 10 percent in January 2002 in order to restrict import of cheaper cotton. However, import duty was reduced to zero in July 2008 and it continues to be at the same level.



PRICE Policy for KHARIF CROPS

Chart 4.23: MSP, Domestic and International Prices of Raw Cotton, 2014 to 2018



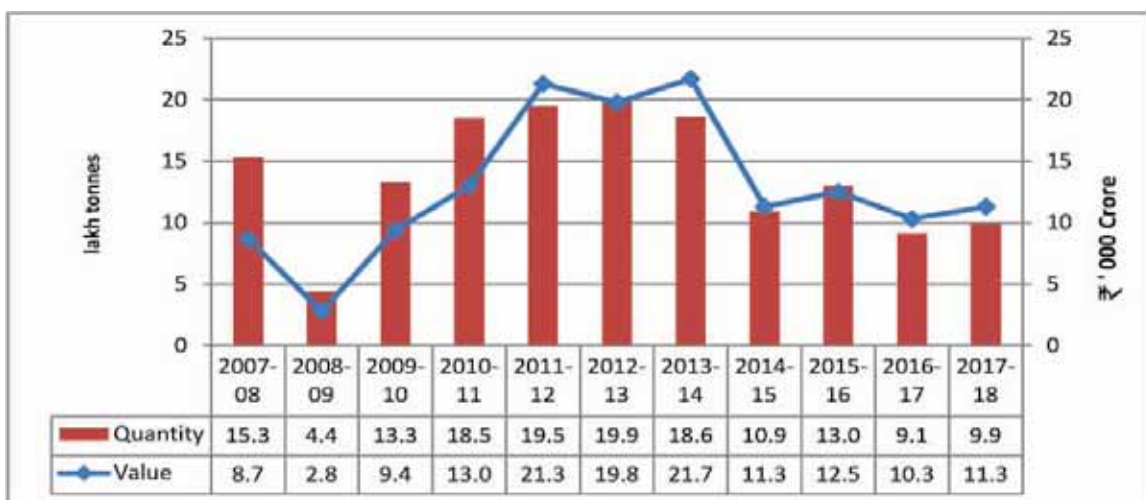
Notes: 1. Cotton (Cotton Outlook "Cotlook A index"), middling 1-3/32 inch, traded in Far East, C/F beginning 2006; previously Northern Europe, c.i.f.

2. Weighted wholesale price of AP, Gujarat, Haryana and Karnataka, which cover 50 percent of production in 2016-17

Sources: DES, DAC&FW for domestic wholesale prices and World Bank for international prices

4.49 India is the second largest exporter of cotton in the world. During the period from 2007-08 to 2017-18, India's export of cotton fluctuated between 4.4 lakh tonnes in 2008-09 to 19.9 lakh tonnes in 2012-13 (Chart 4.24). Exports of cotton declined to 18.6 lakh tonnes in 2013-14 and to 10.9 lakh tonnes in 2014-15 but increased to 13 lakh tonnes in 2015-16 and again declined in 2016-17 to 9.1 lakh tonnes but increased to 9.9 lakh tonnes in 2017-18. The main reason for decline in exports of cotton in 2014-15 was a steep decline in import demand from China due to slowdown in Chinese economy and decision to liquidate large raw cotton stocks accumulated due to policy support for domestic production.

Chart 4.24: India's Export of Cotton, 2007-08 to 2017-18



Source: DGCI



Trade Outlook

- 4.50 According to OECD-FAO Agricultural Outlook 2018-27, self-sufficiency ratio of cereals in general and coarse grains in particular is likely to deteriorate in Middle East and in North African (MENA) region over the next decade. Moreover, the outlook shows that regional trade in Sub-Saharan Africa is likely to look southwards, whereas, growth in demand for food in Sub-Saharan Africa is expected to increase after 2018. Trade concentration in cereals in the world is expected to ease out after 2018. As a whole, in the developing world trade as a percent of consumption is expected to be high for crops like maize and other coarse cereals. Growth in per capita consumption of rice is likely to be fairly high in Africa. Moreover, the outlook projections indicate stable prices in developing countries after 2018. All these trends are favourable for enhancing boundaries of trade among India, MENA and African countries.
- 4.51 Government of India has recently come up with the Agriculture Export Policy 2018, which aims at doubling agricultural exports, diversify export basket, destinations and boost high-value and value-added agricultural exports including perishables. This policy emphasises on promotion of novel, indigenous, organic, ethnic, traditional and non-traditional agricultural products export, addressing barriers and deal with SPS issues.
- 4.52 Prospects for India's agri-exports during 2018-19 remain positive as exports have increased from 191.8 thousand crore in April-December 2017-18 to 204.5 thousand crore in April-December 2018-19, mainly driven by increased exports of raw cotton, oil meals, sugar, guar gum meal and spices. Agri-imports have declined by 11.4 percent during the corresponding period, from 139.2 thousand crore to 123.9 thousand crore. Imports of pulses, vegetable oils, sugar and raw cotton recorded a decline. India's agri-exports in 2018-19 are likely to increase as compared with 2017-18 mainly due to higher demand for agricultural commodities in global economy as per OECD-FAO Agricultural Outlook 2018-27.
- 4.53 International prices being lower in the case of soybean, soybean oil & meal, groundnut, sunflower seed, sunflower oil for 2018 (Q_4) than domestic prices, export possibilities of these commodities seem to be bleak. However, the outlook may change in case India focus on modern technologies for enhancing productivity and reducing costs and take advantage of non-GM products.
- 4.54 Considering high import dependency in case of edible oils, it is high time to consider a turn-around strategy to encourage large scale cultivation of oilseeds with better technologies and assured support price incentives. Significant increase in area under oilseeds through utilisation of fallow lands and also through diversion of area under water-intensive crops like paddy and sugarcane may be a good strategy. Better price incentives offered to crops, which have high demand are likely to give right signals for crop acreage decisions and may encourage farmers to switch over to crops like oilseeds and pulses which are in short supply in the domestic market. With a view to improve India's trade advantage and also diversify domestic



PRICE Policy for **KHARIF CROPS**

food basket, production and consumption of traditional nutri-cereals could be encouraged through campaigns and appropriate incentives.

Recapitulation

- 4.55 India's trade balance in agriculture and allied products has been positive while overall trade balance is negative. However, net trade surplus in agriculture has declined significantly during recent years, therefore, efforts are needed to reverse this trend. Major agri-export commodities are rice, marine products, meat, spices, cotton and sugar, whereas the major imports consist of edible oils, pulses, wood & wood products, fresh fruits, cashew, spices and sugar. Considering India's excessive import dependence on oils and ballooning import bill, India should take concrete steps to scale up oilseeds production and productivity. Possibilities for expanding production and domestic consumption of nutri-cereals/millets and their exports need to be fully tapped to enhance farmers' income and address problems of malnutrition.



Chapter 5

Costs and Returns

Chapter 5

- 5.1 The Commission considers the cost of production and other important factors such as demand and supply situation of main product and by-products, trends in domestic and international prices, inter-crop price parity, terms of trade between agriculture and non-agriculture, likely impact of MSP on consumers, producers and overall economy along with rational utilization of land, water and other production resources, and a minimum of 50 percent as the margin over cost of production, while recommending MSPs of mandated kharif crops.
- 5.2 The Commission uses crop-wise, State-wise cost estimates provided by the Directorate of Economics & Statistics (DES), Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India compiled under 'Comprehensive Scheme (CS) for Studying the Cost of Cultivation (CoC) of Principal Crops in India'. Since CS data is generally available with a time lag of three years in case of kharif crops given the imperative of recommending pricing policy for ensuing season, cost estimates need to be projected for the crop season under consideration. Based on CS data, the Commission projects crop-wise, State-wise CoC of kharif crops for the subsequent season.
- 5.3 The projections of CoC estimates of 14 crops for KMS 2019-20 are based on actual estimates available for the latest three years from 2014-15 to 2016-17 for each State. However, CoC estimates are not projected for States where share of the state in all-India production is negligible and the crop is not important in the state or number of sample holdings under CS for the crop is very small. The projections of CoC estimates capture movement in overall input cost for the crop season 2019-20 over each of the past three years, viz., 2014-15, 2015-16 and 2016-17.
- 5.4 An assessment of likely changes in input costs for the crop season 2019-20 with reference to each of the above mentioned three consecutive years ending with 2016-17 is made by constructing the Composite Input Price Indices (CIPIs) (base 2011-12=100) based on latest prices of major inputs like human labour, bullock labour, machine labour, fertilisers, manures, seeds, pesticides and irrigation



based on the latest data available from different sources like Labour Bureau, Ministry of Labour and Employment, State Governments and Office of Economic Adviser, Ministry of Commerce and Industry. Based on CIPIs thus constructed, the Commission projects crop-wise, State-wise CoC A_2 , A_2+FL and subsequently C_2 .

- 5.5 Crop-wise, State-wise cost of production (CoP) A_2 , A_2+FL and C_2 are then derived from these projected CoCs using projected yield. Subsequently, all-India estimates of CoP A_2 , A_2+FL , C_2 are derived based on crop-wise, State-wise projected CoPs and their production shares. These projected all-India estimates of CoP are considered by the Commission while formulating price policy recommendations.
- 5.6 The Commission has undertaken cost projection exercise based on latest three years' actual cost estimates for each State under certain implicit assumptions. One, fixed cost components would not, in all likelihood, undergo any major change in the short run. Two, since yield varies from year to year due to multiplicity of factors, three-year average has been taken to smoothen out fluctuations in yield and hence in CoP. However, in cases where there are wide fluctuations in the yield, olympic average yield (Olympic average is calculated by dropping the highest and the lowest yield from latest five year yields and calculating the average of the remaining 3 year yield) has been used.

Costs and Returns of Kharif Crops during TE2016-17

- 5.7 The costs and returns of kharif crops during 2014-15 to 2016-17, the latest three years for which actual cost estimates are available from DES, have been analysed and are given in Table 5.1. It is pertinent to mention that the gross value of output (GVO) is estimated at the prevailing market prices of main-product and by-products during harvest season in the village/cluster of villages where crops are grown and harvested. At all-India level, per hectare gross returns, i.e., returns on A_2+FL CoC is the highest for arhar (tur) at ₹30600 per ha, followed by groundnut at ₹25050 per ha, while nigerseed has a net loss of ₹1710 per ha mainly due to low yield. Among cereals, paddy has the highest returns over CoC A_2+FL (₹17675/ha), followed by maize (₹12261/ha). Nutri-cereals have relatively lower returns largely due to low productivity. Groundnut has the highest returns (₹25050/ha) among all oilseeds, followed by sesamum (₹12671/ha) and sunflower (₹7130/ha). Cotton offers better gross returns (₹21123/ha) compared with cereals. Among pulses, moong and urad have significantly lower cost of cultivation and higher prices than tur, but have much lower returns due to low yield. The gross returns as a percentage of CoC A_2+FL ranged from 8 percent in ragi to 41 percent in paddy in case of cereals and 48 percent in moong to 104 percent in urad in pulses. While, in oilseeds, nigerseed has a negative returns (-12%) and sesamum recorded the highest returns (69%). It is evident from Table 5.1 that higher prices cannot enhance farmers' income unless crop yields improve, particularly in nutri-cereals and pulses. The details of state-wise average returns are given in Annex Table 5.1.



Table 5.1: All-India Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

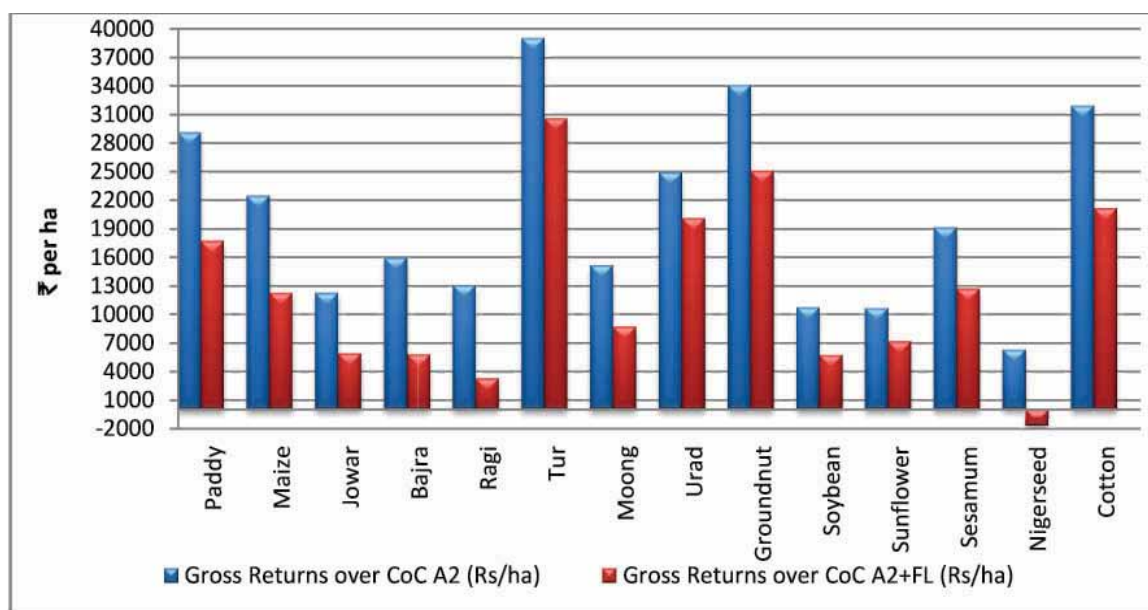
Crop	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4-Col.2)	Percent (Col.5/Col.2) *100	₹/ha (Col.4-Col.3)	Percent (Col.7/Col.3) *100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Cereals							
Paddy	32,074	43,462	61,136	29,062	91	17,675	41
Maize	26,672	36,837	49,098	22,426	84	12,261	33
Jowar	18,387	24,741	30,597	12,210	66	5,856	24
Bajra	13,473	23,643	29,401	15,928	118	5,758	24
Ragi	28,825	38,588	41,847	13,022	45	3,259	8
B. Pulses							
Arhar(Tur)	26,249	34,696	65,296	39,047	149	30,600	88
Moong	11,732	18,204	26,875	15,143	129	8,671	48
Urad	14,455	19,261	39,333	24,877	172	20,072	104
C. Oilseeds							
Groundnut	40,153	49,190	74,240	34,087	85	25,050	51
Soybean	23,662	28,652	34,366	10,704	45	5,714	20
Sunflower	17,223	20,704	27,834	10,611	62	7,130	34
Sesamum	11,989	18,412	31,083	19,094	159	12,671	69
Nigerseed	6,200	14,174	12,465	6,265	101	-1,710	-12
D. Commercial Crop							
Cotton	43,559	54,374	75,498	31,938	73	21,123	39

Source: CACP estimates using CS data

Costs and Returns



Chart 5.1: All-India Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17



Source: CACP estimates using CS Data

Movement in Agricultural Wages and Farm Input Prices

- 5.8 Growth in average daily wage rates of agricultural labour in major States and at all-India level (at current prices and constant prices 2018=100) during May-November, 2016 to May- November, 2018 are given in Table 5.2. At current prices, at all-India level, agricultural wages increased by 3.5 percent in 2016, 6.0 percent in 2017 and 6.4 percent in 2018; while at constant prices, it declined by 1.9 percent in 2016, but increased by 4.7 percent in 2017 and 5.0 percent in 2018. Chart 5.2 reflects State-wise annual average daily wages of agricultural labour in 2018 and growth in daily wages during 2018 over 2017. Rajasthan recorded the highest increase (12.4%) in wages during May-November, 2018, whereas, Odisha recorded the lowest increase (0.6%) during the same period. The average daily wage rate was the highest (₹723) in Kerala and the lowest (₹218) in Madhya Pradesh. All-India average annual daily wage rate was ₹297 and increased by 6.4 percent during May- November, 2018 over May-November, 2017. The State-wise and all-India details of monthly average daily wage rates for agricultural labour at current prices are given in Annex Table 5.2.



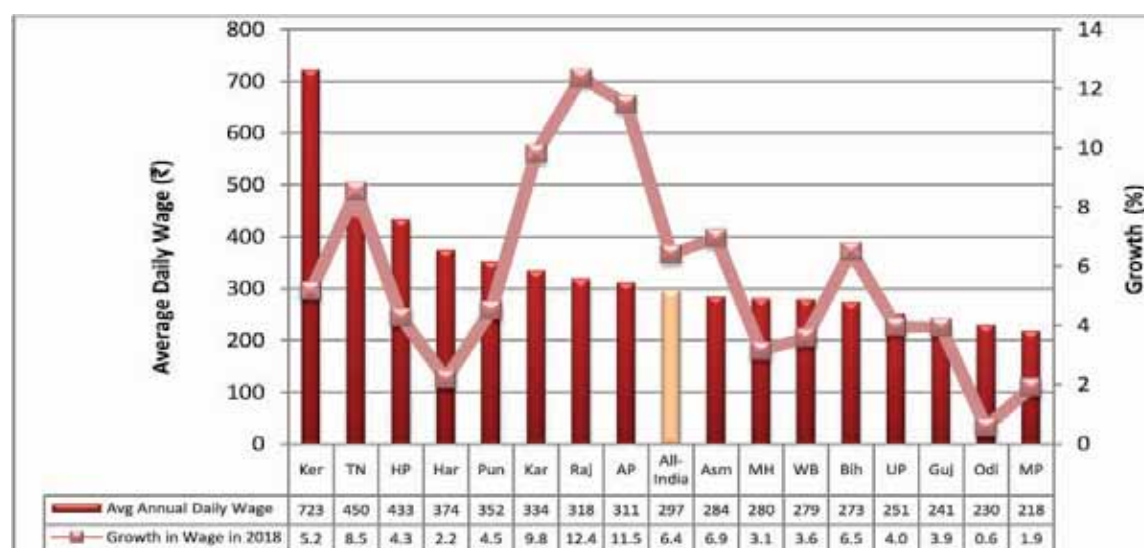
Table 5.2: Average Annual Growth in Wages of Agricultural Labour–Major States and All-India

State	Growth (%) at Current Prices			Growth (%) at Constant Prices (2018=100)		
	2016	2017	2018	2016	2017	2018
Andhra Pradesh	7.4	7.0	11.5	1.6	5.1	8.6
Assam	6.4	5.1	6.9	6.2	0.9	4.3
Bihar	3.1	3.1	6.5	2.3	3.4	5.8
Gujarat	8.1	6.5	3.9	1.1	7.9	3.3
Haryana	5.0	-0.5	2.2	-0.6	-2.1	0.4
Himachal Pradesh	3.6	9.9	4.3	-1.0	6.6	3.4
Karnataka	6.9	4.4	9.8	-1.3	-2.0	13.7
Kerala	1.1	3.3	5.2	-4.3	-3.3	2.9
Madhya Pradesh	2.9	11.4	1.9	-1.9	12.4	0.4
Maharashtra	7.1	9.9	3.1	0.3	9.0	3.5
Odisha	2.7	10.4	0.6	0.8	9.1	-3.7
Punjab	1.0	10.2	4.5	-4.1	7.3	2.1
Rajasthan	-5.4	1.5	12.4	-11.1	1.4	12.0
Tamil Nadu	2.7	2.0	8.5	-4.1	-6.1	5.7
Uttar Pradesh	5.3	8.1	4.0	0.7	14.1	-0.7
West Bengal	7.5	4.7	3.6	6.2	0.5	0.7
All-India	3.5	6.0	6.4	-1.9	4.7	5.0

Note: Average of May–November

Source: Labour Bureau, Ministry of Labour & Employment, Government of India

Chart 5.2: Average Annual Agricultural Wage and Growth, 2018



Note: Average of May–November

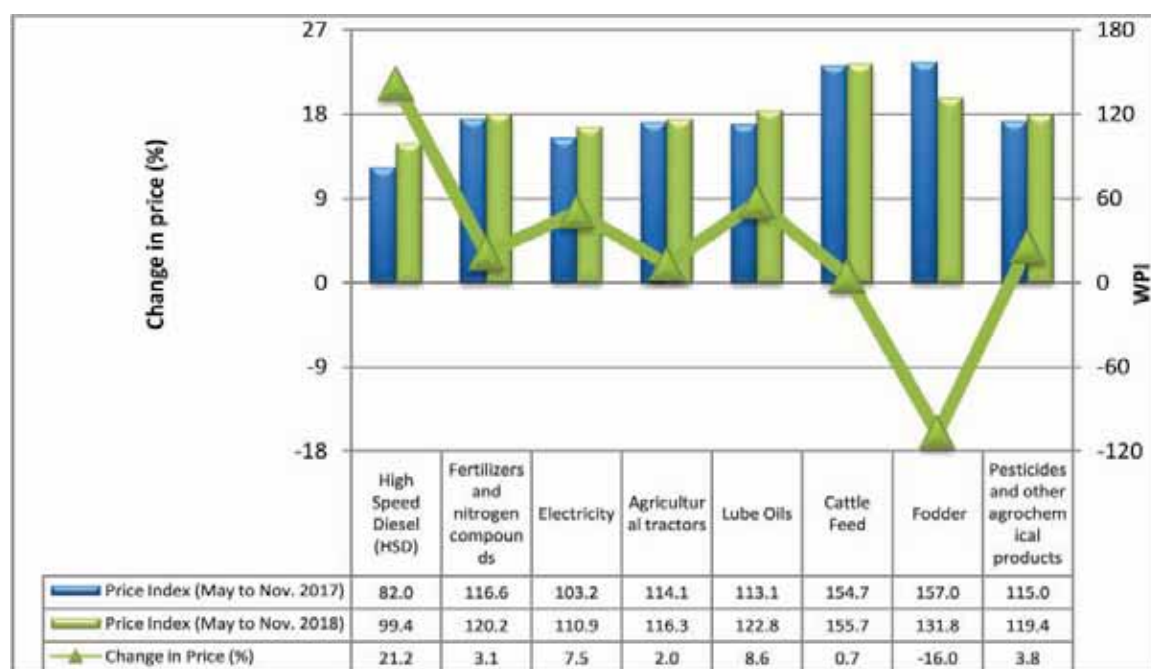
Source: Labour Bureau, Ministry of Labour & Employment, Government of India



PRICE Policy for KHARIF CROPS

- 5.9 The movement of the Wholesale Price Index (WPI) for various farm inputs (Base: 2011-12=100) during May-November, 2018 over May-November, 2017 is presented in Chart 5.3. The index for fuel for High Speed Diesel (HSD) rose from 82 in 2017 to 99.4 in 2018, registering a growth of 21.2 percent. The indices of fertilizers & nitrogen components, electricity, agricultural tractors, lube oils, cattle feed and pesticides & other agrochemical products moved up by registering growth of 3.1 percent, 7.5 percent, 2.0 percent, 8.6 percent, 0.7 percent and 3.8 percent, respectively. However, index of fodder declined by 16 percent. The month-wise indices of various farm inputs from 2012 to 2018 are given in Annex Table 5.3.

Chart 5.3: Movements in Prices of Farm Inputs



Source: Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India

Cost Projections for KMS 2019-20

- 5.10 The Commission computes all-India weighted average CIPI for years 2016-17 to 2019-20 with base 2011-12=100. For this, on the basis of State-wise CIPIs, an all-India crop-wise weighted average input price index for all inputs, with weights being relative shares of States in all-India area under the crop during TE2017-18, has been calculated. These indices are used to compute all-India weighted average composite input price index for kharif crops, with weights being relative shares of crops in total production at all-India level during TE2017-18. It may be observed from Table 5.3 that all-India CIPI for kharif crops shows an increase of 4.8 percent in 2019-20 over 2018-19.



Table 5.3: All-India Input Price Index for Kharif Crops (Base 2011-12=100)

Inputs	Weight (2016-17)	Kharif Crops Input Price Index				Percentage Change in Input Price Index 2019-20 over 2018-19
		2016-17	2017-18	2018-19	2019-20	
Human Labour (HL)	0.52	164.27	172.51	181.28	190.78	5.2
Bullock Labour (BL)	0.06	200.91	206.39	212.17	218.26	2.9
Machine Labour (ML)	0.14	118.86	126.99	135.80	145.33	7.0
Seeds	0.08	144.07	151.28	159.19	167.86	5.4
Fertilizers	0.09	149.09	153.25	157.76	162.66	3.1
Manures	0.03	160.09	162.66	165.66	168.67	1.8
Insecticides	0.03	125.29	129.20	133.25	137.49	3.2
Irrigation Charges	0.04	107.55	108.90	110.27	111.67	1.3
Composite Input Price Index (CIPI)		153.22	160.21	167.70	175.80	4.8
Percentage Change (year-on-year)		-	4.6	4.7	4.8	-

Source: CACP estimates

5.11 Based on crop-wise and State-wise actual cost estimates and CIPIs, crop-wise, State-wise estimates of CoC A_2 , A_2 +FL and C_2 of kharif crops are projected. Using these estimates of CoC and projected yields, crop-wise, State-wise estimates of CoP A_2 , A_2 +FL and C_2 are projected. Subsequently, crop-wise all-India weighted average projected CoP A_2 , A_2 +FL and C_2 , with weights being the share of the States in all-India production during TE2017-18, have been worked out. Crop-wise all-India projected CoP A_2 , A_2 +FL and C_2 for mandated kharif crops for marketing season 2019-20 are presented in Table 5.4. The changes in all-India projected CoP A_2 +FL in KMS 2019-20 over KMS 2018-19 are given in Annex Table 5.4. State-wise and all-India projected CoPs for mandated kharif crops for marketing season 2019-20 are given in Annex Table 5.5. State-wise break-up of actual cost estimates for 2015-16 and 2016-17 are given in Annex Tables 5.6a to 5.6n.

Table 5.4: Projected Cost of Production of Mandated Kharif Crops, KMS2019-20

Crops	Cost of Production (₹/qtl)		
	A_2	A_2 +FL	C_2
Paddy	894	1208	1619
Jowar	1263	1698	2324
Bajra	617	1083	1463
Maize	844	1171	1570
Ragi	1583	2100	2672
Arhar (Tur)	2677	3636	5417
Moong	2884	4699	6359



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Crops	Cost of Production (₹/qtl)		
	A ₂	A ₂ +FL	C ₂
Urad	2605	3477	5460
Groundnut	2769	3394	4352
Soybean	2027	2473	3422
Sunflower	3139	3767	4957
Sesamum	2767	4322	6125
Nigerseed	1736	3960	5913
Cotton	2781	3501	4678

Source: CACP estimates

Costs and Returns

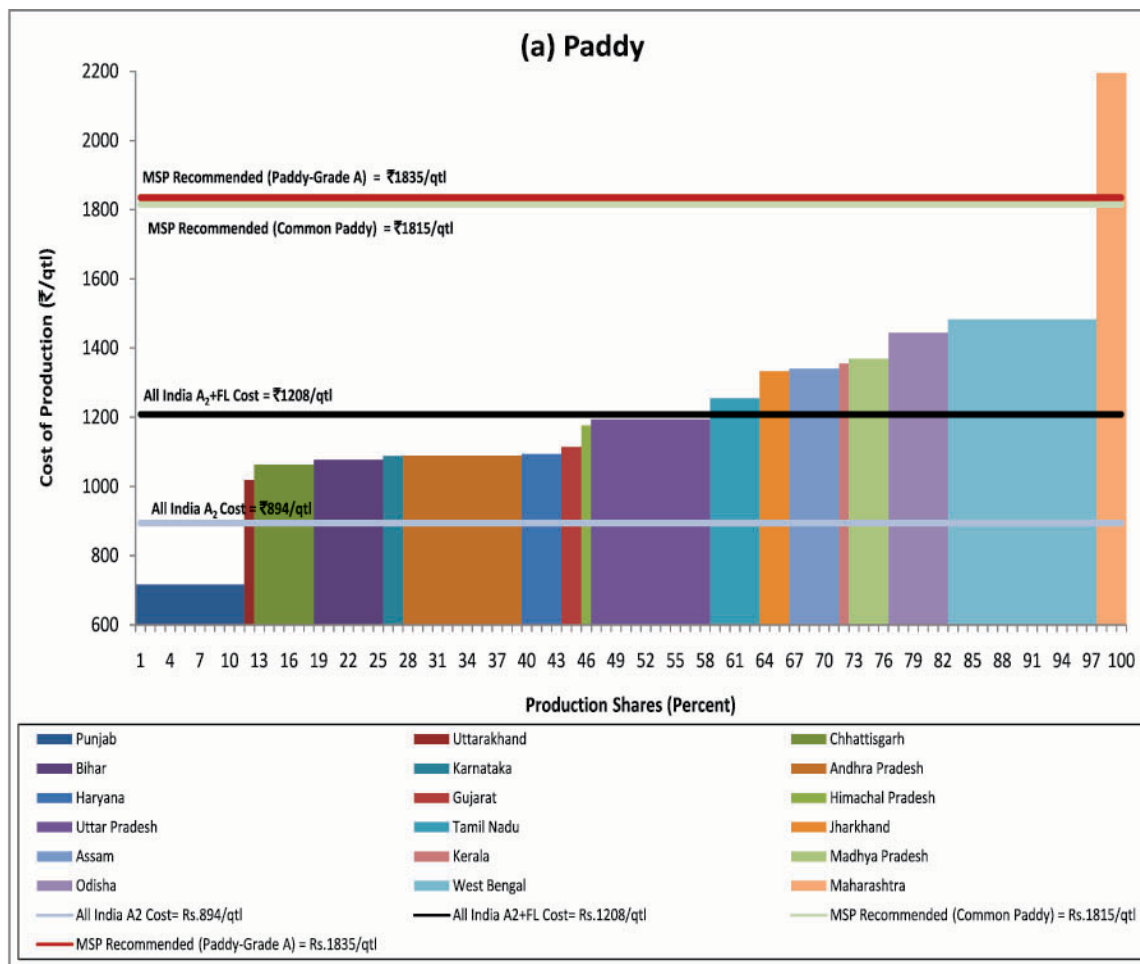
- 5.12 Charts 5.4 (a) to (m) show crop-wise supply curves of projected A₂+FL cost by States in ascending order with their corresponding shares in all-India production. Supply curve is graphical representation of CoP, which represents the quantum of production of a particular crop produced at different costs in various States.
- 5.13 As per the supply curves presented in charts 5.4 (a) to (m), CoP (A₂+FL) for paddy, is the lowest at ₹717 per qtl in Punjab and the highest at ₹2196 in Maharashtra. In case of jowar, CoP (A₂+FL) at ₹1271 per qtl is lowest in Rajasthan and highest at ₹2061 per qtl in Karnataka. In bajra, CoP (A₂+FL) ranges from ₹822 per qtl in Uttar Pradesh to ₹2210 per qtl in Maharashtra. Supply curve for maize shows that CoP (A₂+FL) at ₹839 per qtl is lowest in Andhra Pradesh and the highest at ₹1928 per qtl in Gujarat. In case of ragi, the lowest CoP (A₂+FL) is in Uttarakhand at ₹1161 per qtl.
- 5.14 As regards tur, CoP (A₂+FL) is lowest (₹2913 per qtl) in Madhya Pradesh and the highest (₹4777 per qtl) in Andhra Pradesh. In case of moong and urad, CoP (A₂+FL) at ₹4116 per qtl and ₹2018 per qtl, respectively, is lowest in Andhra Pradesh, while highest at ₹6803 per qtl and ₹6264 per qtl, in Maharashtra. In case of groundnut, CoP (A₂+FL) is lowest (₹1658 per qtl) in Rajasthan and highest at ₹5659 per qtl in Maharashtra. The supply curve of soybean shows that CoP (A₂+FL) at ₹2092 per qtl is lowest in Madhya Pradesh and the highest (₹3694 per qtl) in Andhra Pradesh. In case of sunflower, lowest CoP (A₂+FL) at ₹3766 per qtl is estimated in Karnataka. In case of sesamum, West Bengal has the lowest CoP (A₂+FL) at ₹3203 per qtl while Gujarat has the highest CoP (A₂+FL) at ₹6194 per qtl. For cotton, lowest CoP (A₂+FL) ₹2948 per qtl was estimated in Rajasthan while Tamil Nadu showed the highest CoP (₹4576 per qtl).
- 5.15 In case of paddy, 10 out of 18 states included in the analysis have lower CoP A₂+FL than all-India average; while in case of jowar, 4 out of 6 States have lower than all-India CoP A₂+FL. Similarly, in case of arhar, 3 out of 7 States and in cotton, 5 out of 9 States have lower than all-India A₂+FL CoP. Therefore, a holistic and coordinated effort is needed to reduce cost and improve productivity in high-cost States to remain competitive and profitable.

PRICE Policy for KHARIF CROPS



- 5.16 All-India weighted CoP A_2 +FL covers about 58 percent of production in case of paddy, 35 percent in jowar, 83 percent in bajra, 60 percent in maize, 12 percent in ragi, 47 percent in arhar (tur), 80 percent in moong, 66 percent in urad, 32 percent in groundnut, 54 percent in soybean, 86 percent in sunflower, 58 percent in sesamum and 52 percent in cotton. Share of production covered at MSP is 100 percent in case of jowar, ragi, tur, moong, soybean, sunflower, cotton and sesamum, 97 percent in paddy and maize, 95 percent in groundnut, 93 percent in bajra & urad.

Chart 5.4: Supply Curve and Projected CoP for KMS 2019-20

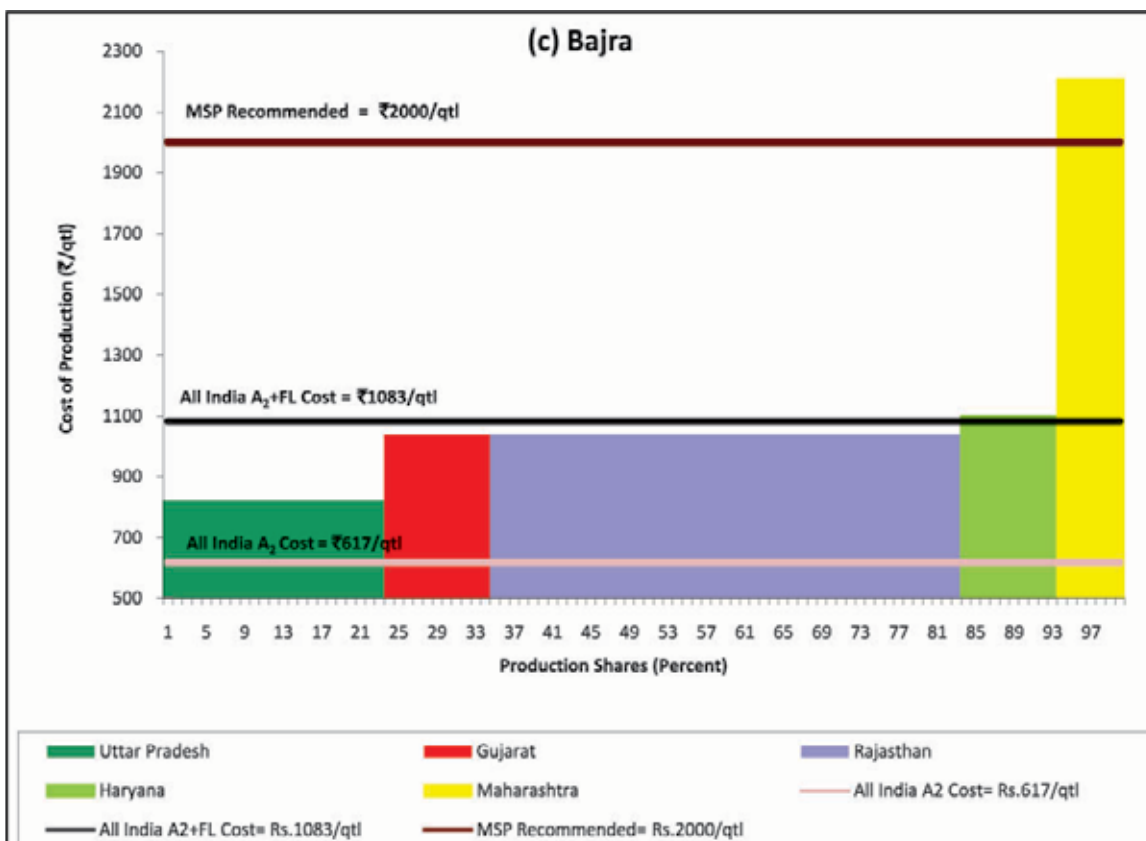
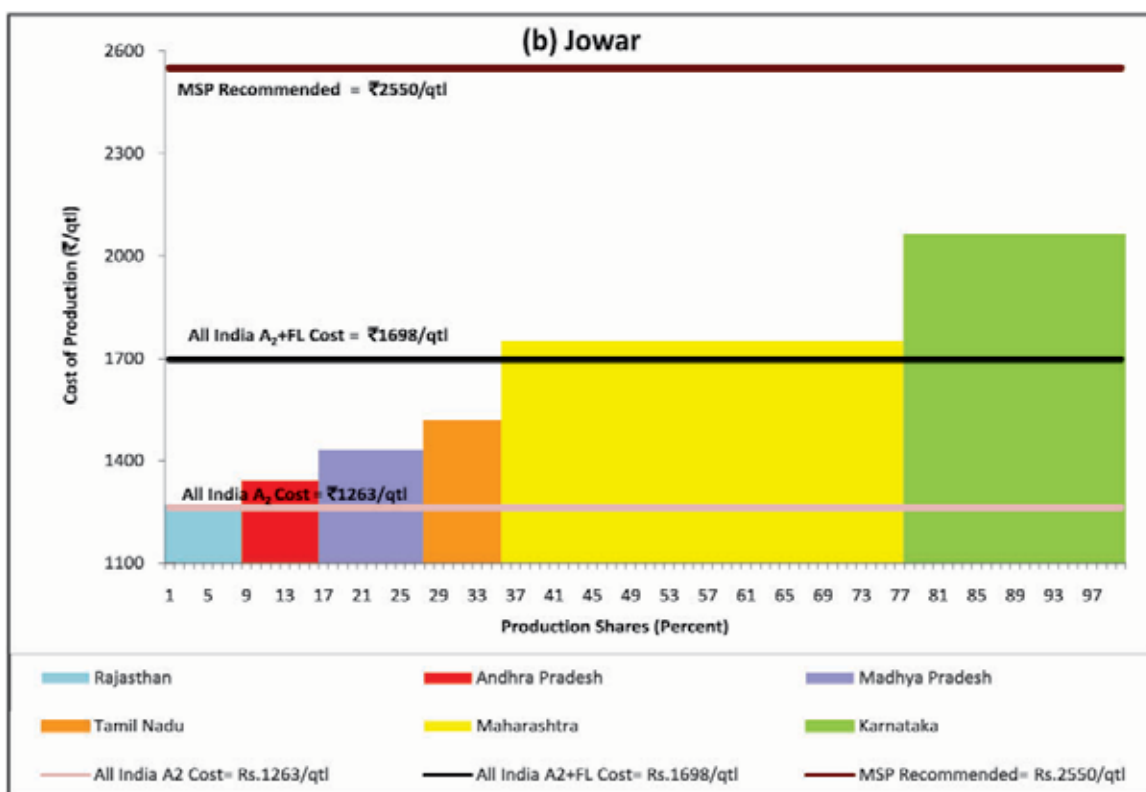


Costs and Returns

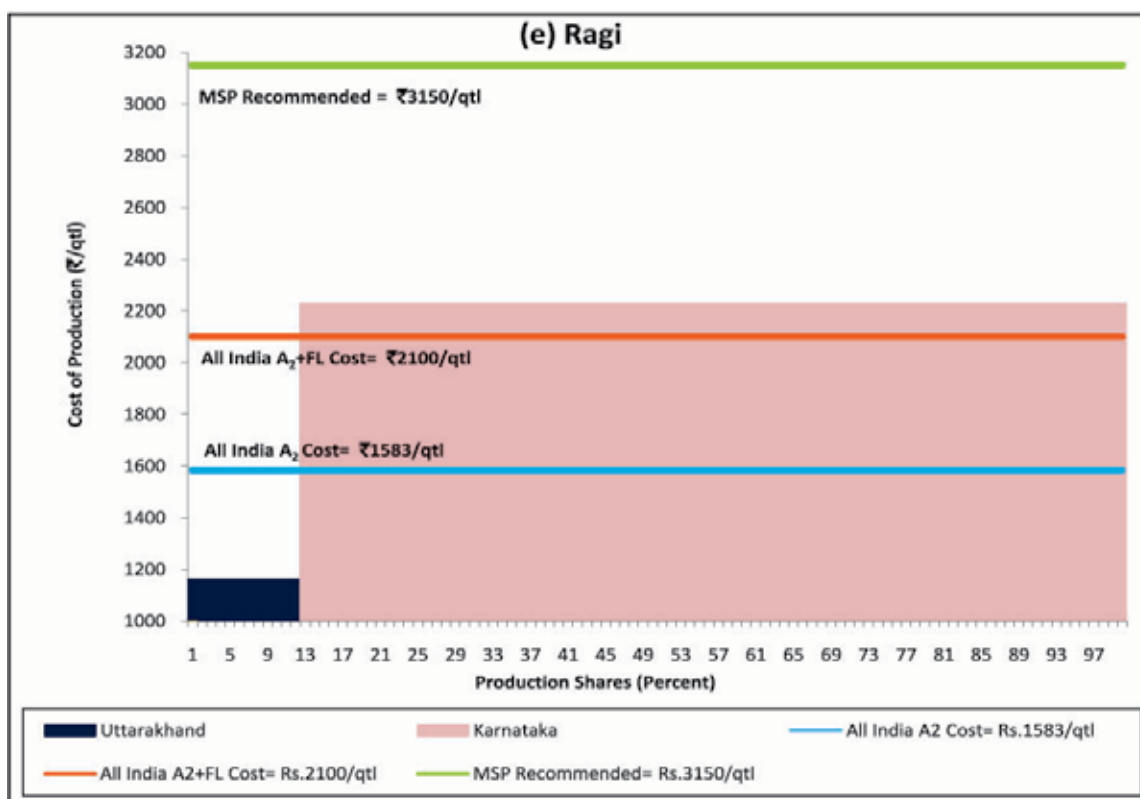
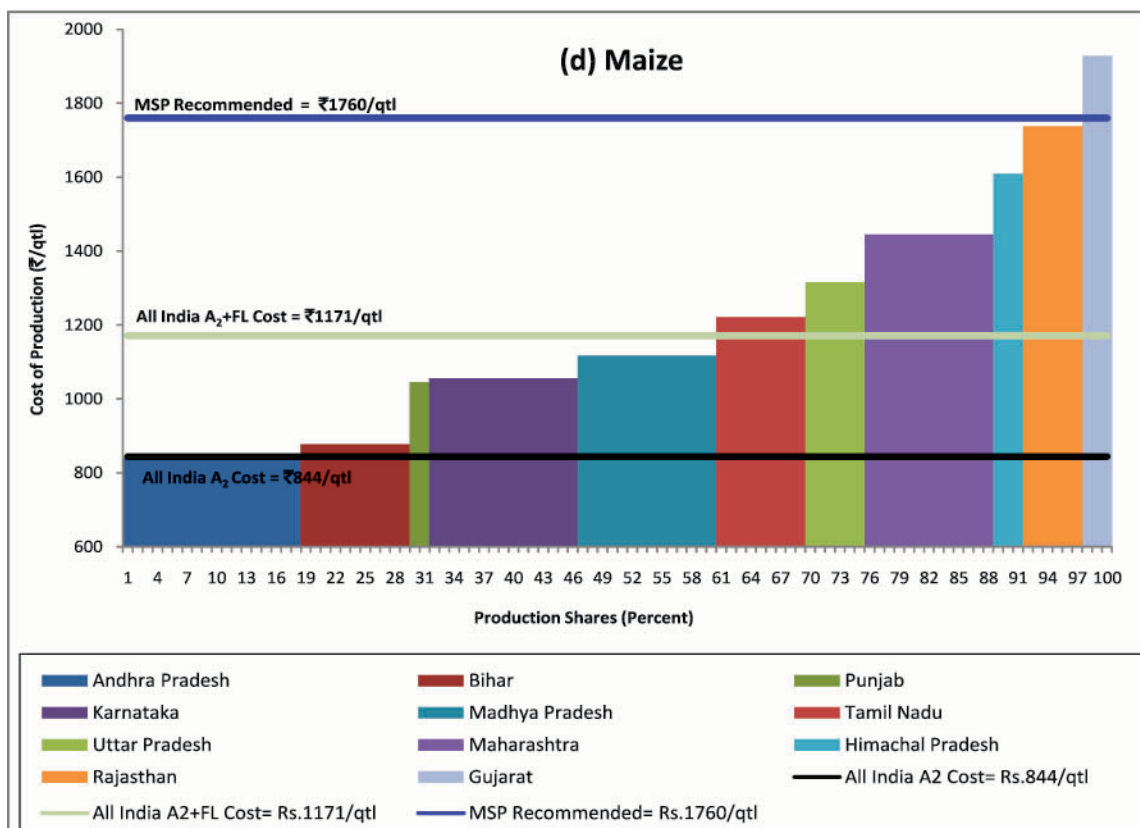


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Costs and Returns



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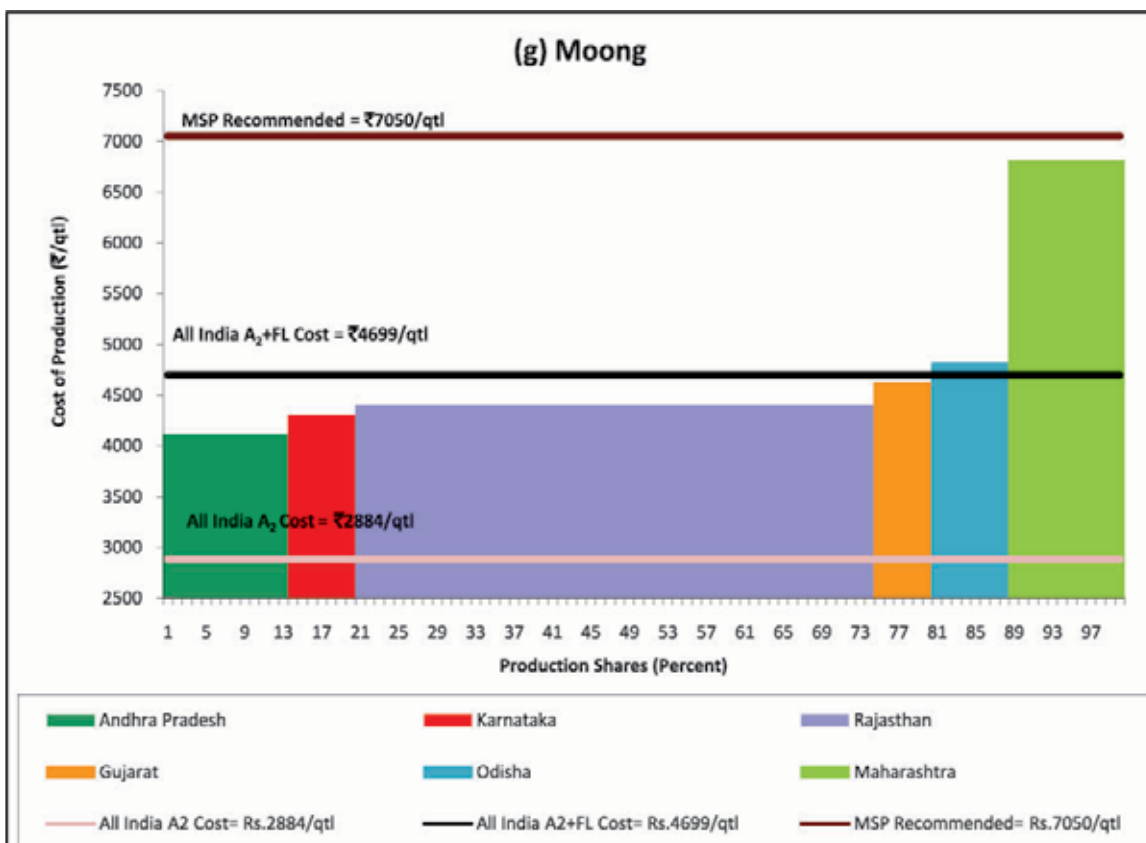
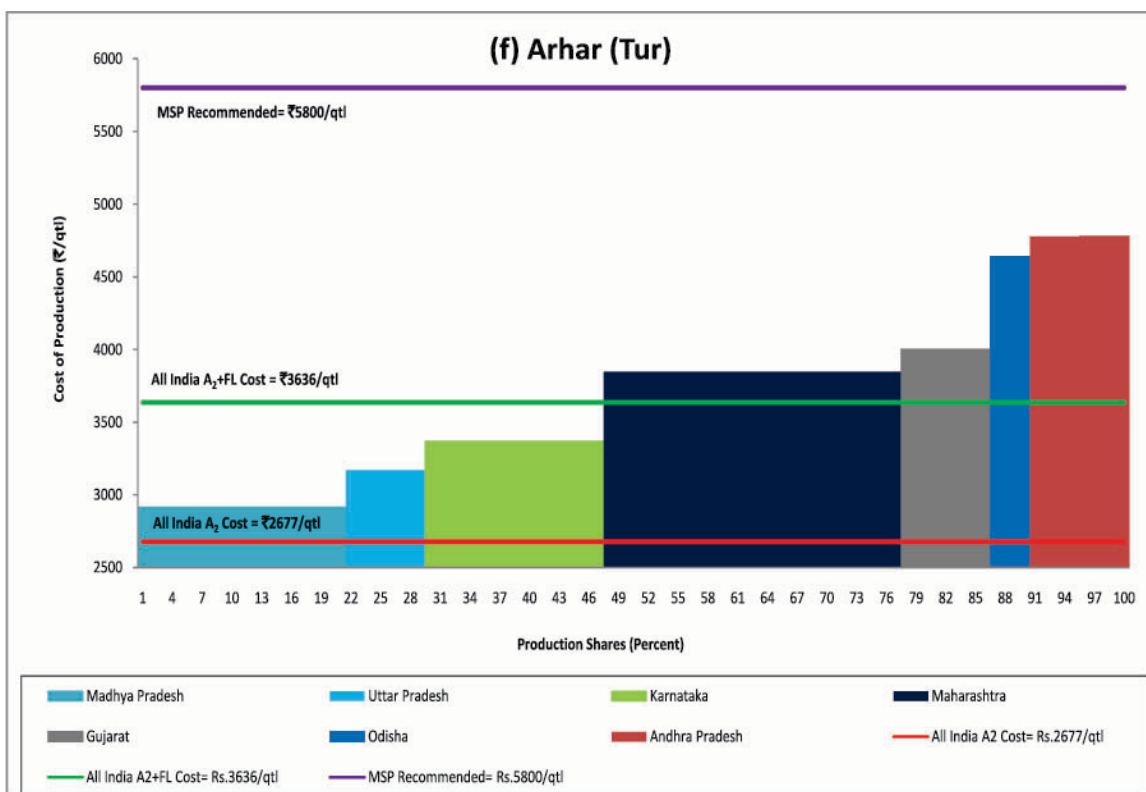


Costs and Returns

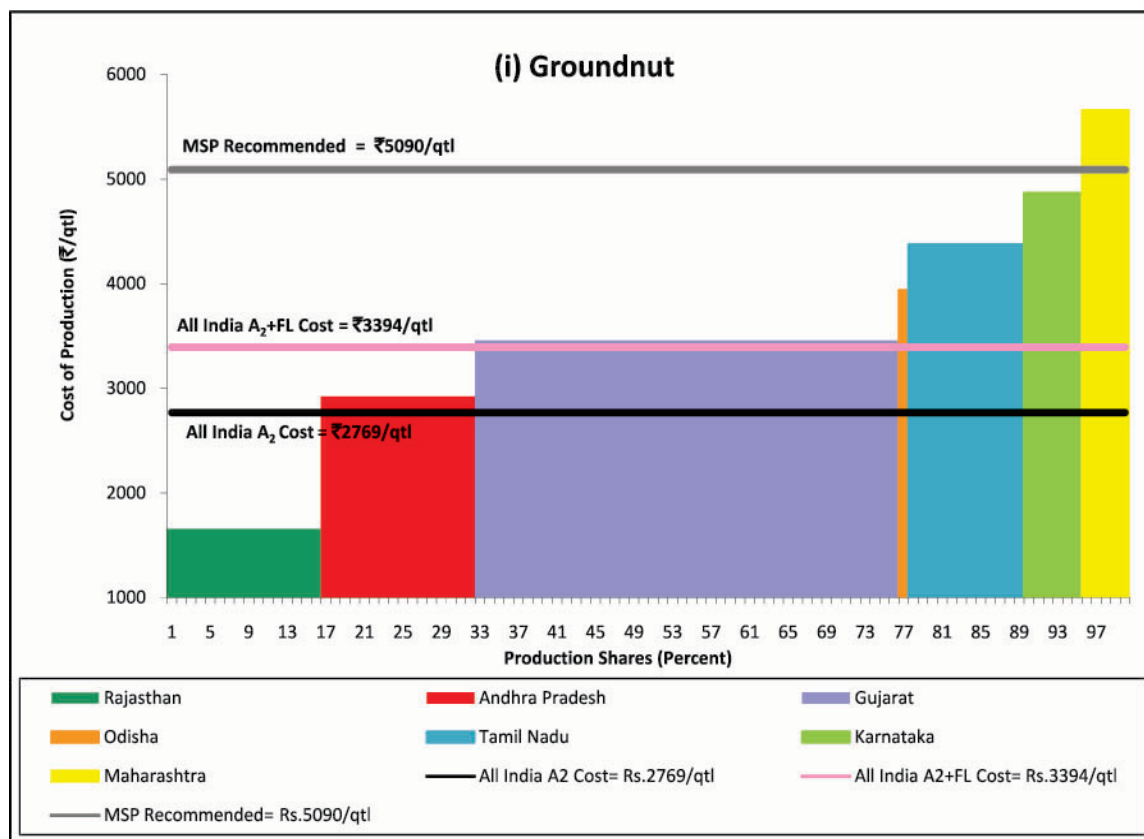
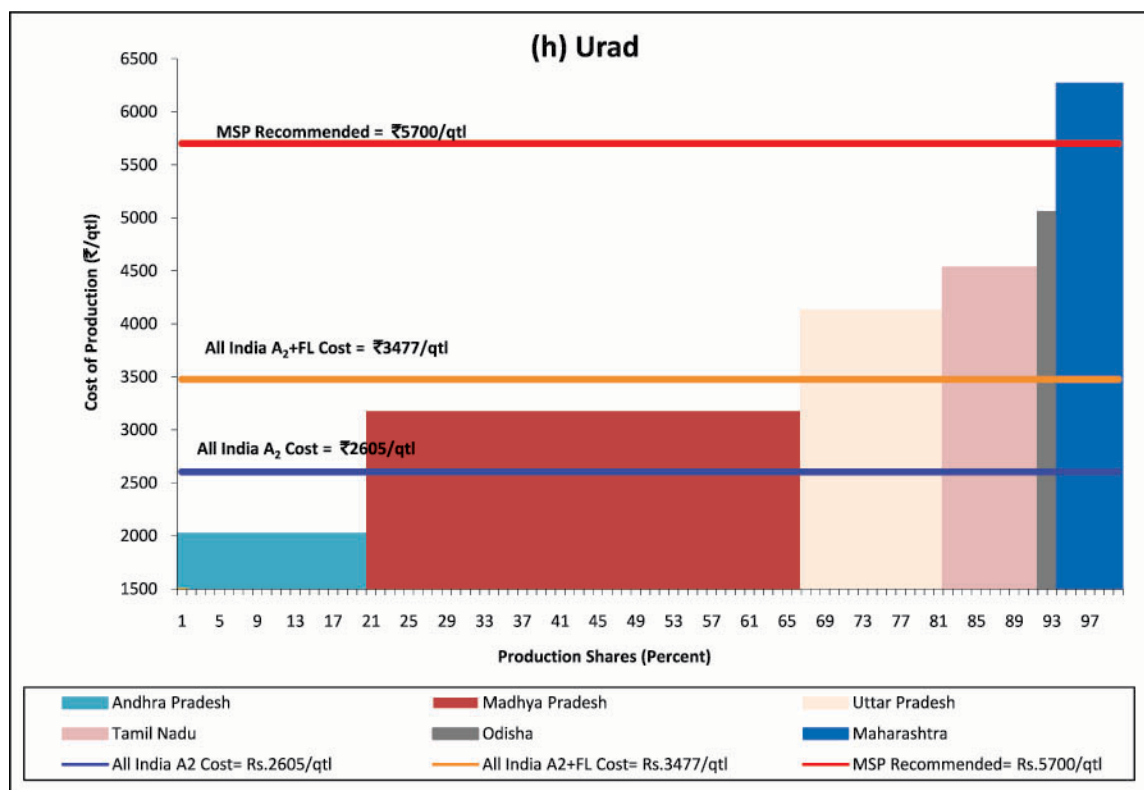


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Costs and Returns



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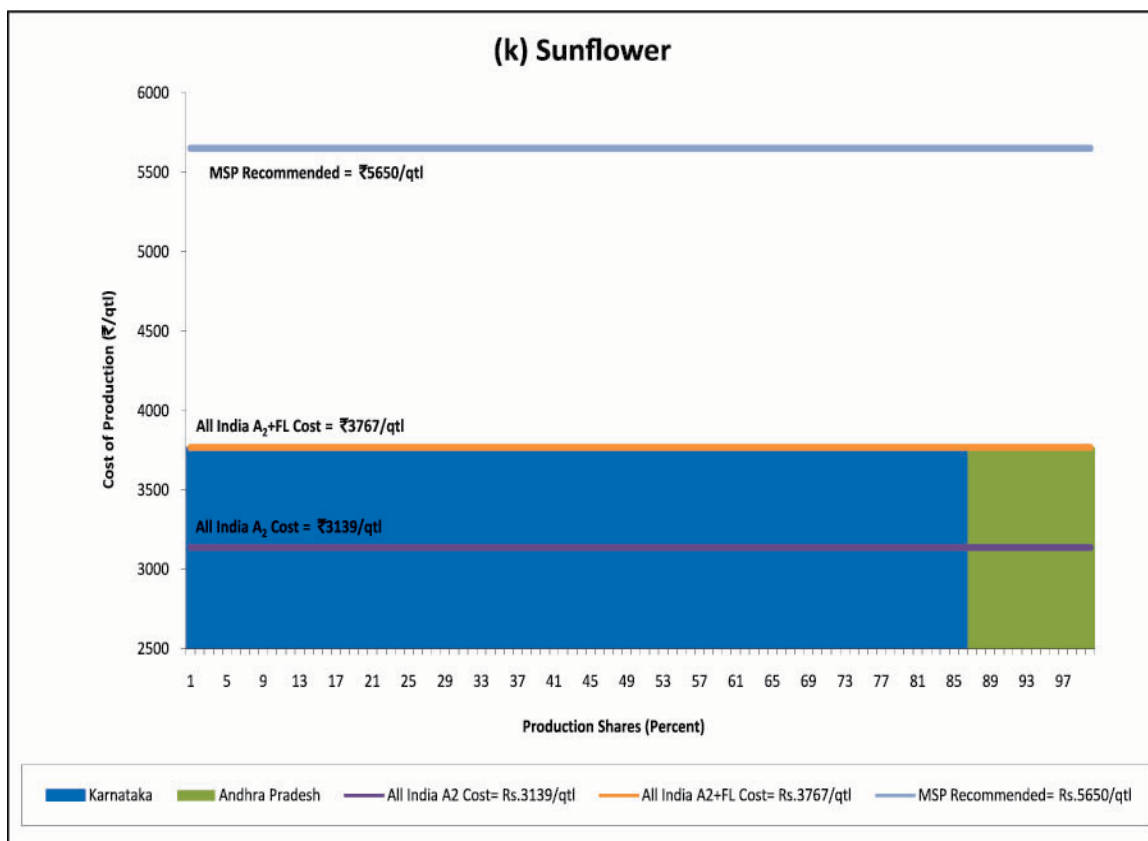
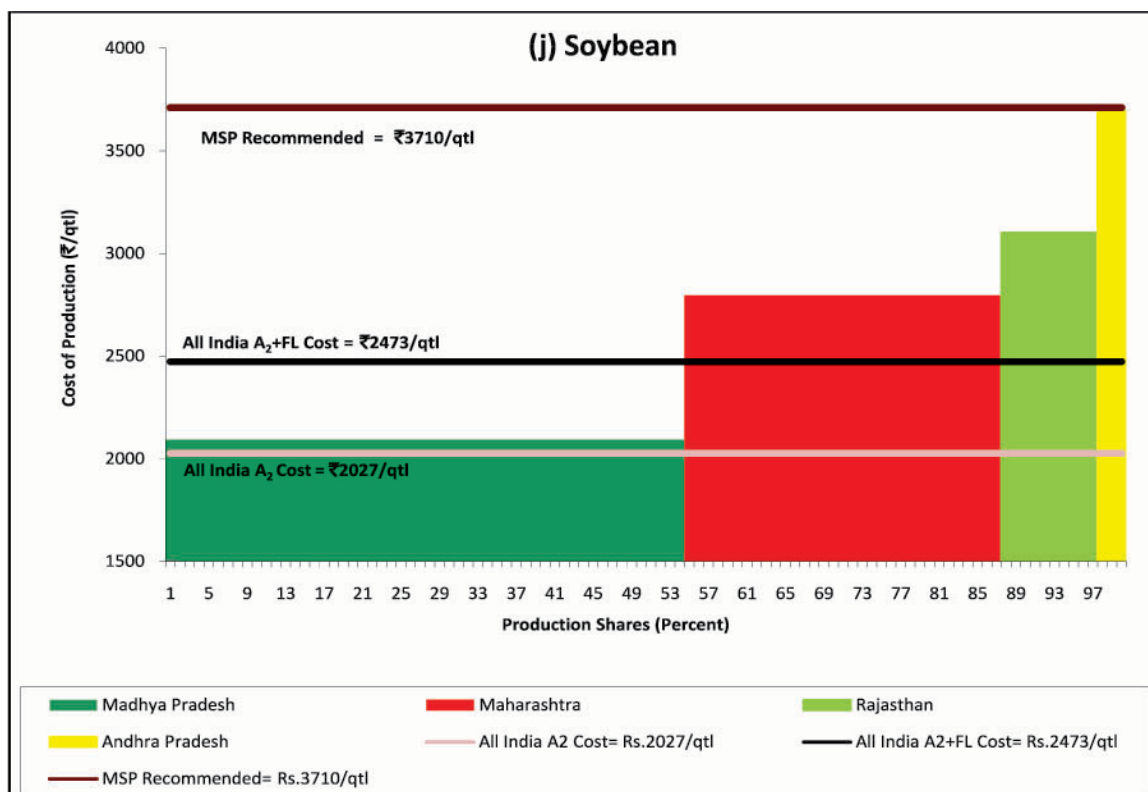


Costs and Returns

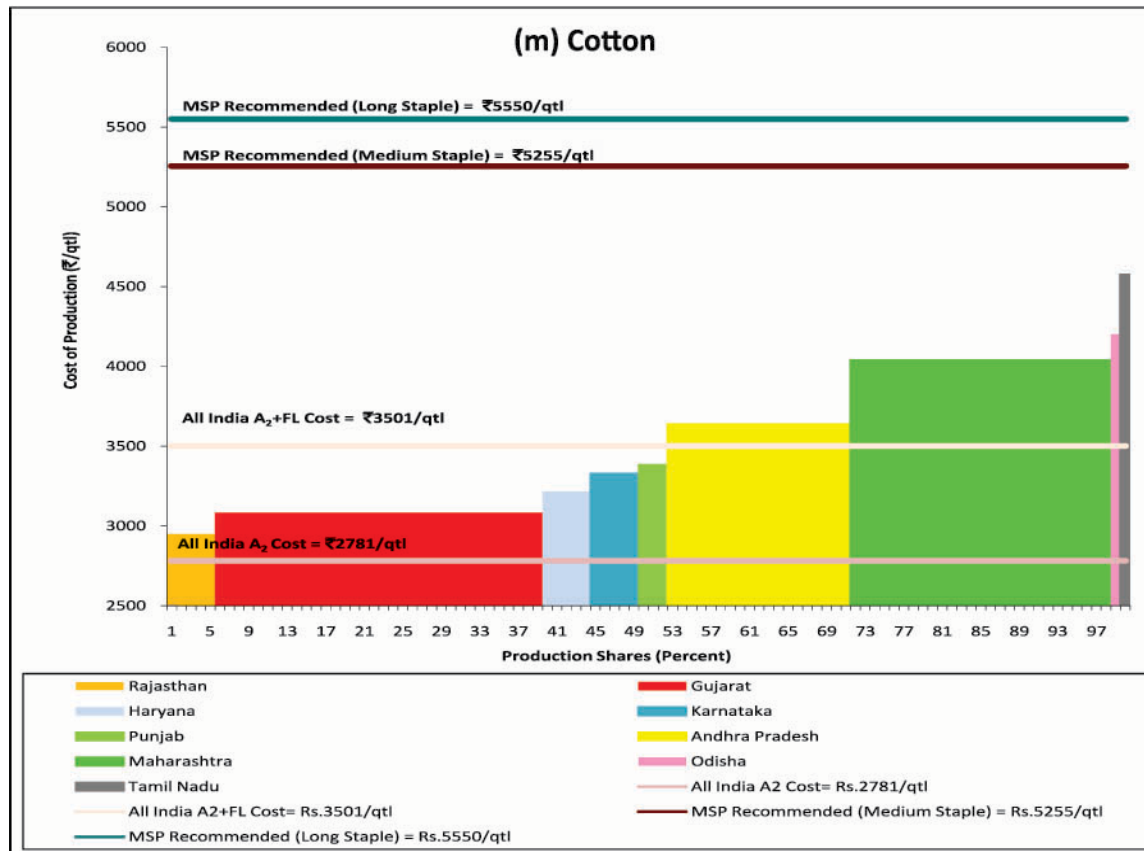
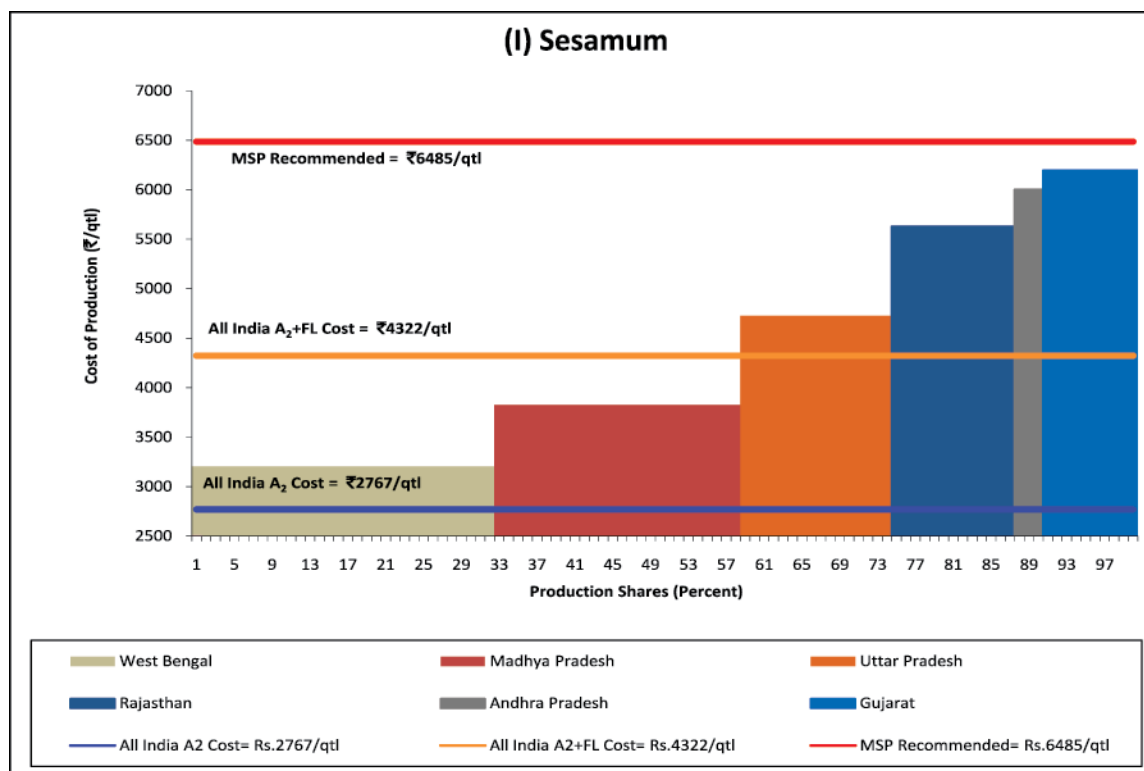


PRICE Policy for KHARIF CROPS

Costs and Returns



PRICE Policy for KHARIF CROPS



Costs and Returns



Relative Returns

5.17 Relative returns being an important factor for deciding MSPs, the Commission computes per hectare returns from different crops that may compete with each other. Table 5.5 outlines relative returns over CoC A₂+FL in percentage terms for mandated kharif crops with reference to paddy. Paddy has higher returns compared to all kharif cereals. However, tur and urad give higher returns than paddy. The returns in all oilseeds except groundnut are lower than paddy. Cotton has higher return compared with paddy. The comparison of crop-wise returns shows that paddy earns the highest returns among all cereals and significantly higher than most of the oilseeds.

Table 5.5: Crop-wise Average Relative Returns (%), TE2016-17

Crops	Relative Gross Returns over CoC A ₂ +FL with respect to Paddy
A. Cereals	
Paddy	100
Maize	69
Jowar	33
Bajra	33
Ragi	18
B. Pulses	
Arhar (Tur)	173
Moong	49
Urad	114
C. Oilseeds	
Groundnut	142
Soybean	32
Sunflower	40
Sesamum	72
Nigerseed	-10
D. Commercial Crop	
Cotton	120

Source: CACP estimates

Comparison of Cost Estimates Projected by CACP and States

5.18 The cost estimates projected by CACP and the States for mandated kharif crops for marketing season 2019-20 are given in Annex Table 5.7. The estimated CoC for recommending MSP for KMS,2019-20 has been provided by Andhra Pradesh for paddy, Jowar, bajra, maize, tur, moong, urad, groundnut, soybean, sesamum, sunflower and cotton; Bihar for paddy and maize; Kerala for paddy; Maharashtra for



paddy, jowar, bajra, maize, tur, moong, urad, groundnut, soybean, sunflower and cotton; Punjab for paddy and cotton; and Rajasthan for bajra, maize, moong, urad, soybean, sesamum and cotton. Other States have not provided cost estimates for KMS, 2019-20.

- 5.19 The main reason for variations in these two sets of estimates, i.e., State government projections and CACP projections is mainly due to different methodologies used by the States and CACP. For Andhra Pradesh, projections of State CoP for paddy, jowar, maize, urad, groundnut, sunflower and cotton are higher than CACP projections. The main reason for higher CoP projections is that State government has included additional 10 percent management cost. For Bihar, projections of State CoP for paddy and maize are higher than CACP projections because interest on land @5 percent, 10 percent risk cost, costs of treatment of grain and storage have been considered by the State, which are not part of CS estimates. For Kerala, projection of State CoP for paddy is higher than CACP projection, as State Government has taken higher rental value of owned land. For Maharashtra, projections of State CoP for paddy, jowar, bajra, groundnut, soybean and cotton are higher than CACP projections. The main reasons for higher estimates of CoP projections are higher value of interest on working capital and incidental charges. Besides, State government has taken higher values of human labour, machine labour, seed and interest on fixed capital for paddy; bullock labour and machine labour for jowar, bullock labour for bajra, groundnut and cotton; and human labour and bullock labour for soybean.
- 5.20 The projected CoP for paddy and cotton in Punjab State is higher than CACP projections. The State government has included margin of 50 percent on account of weather risk, management charges and other charges, straw management cost (₹100 per qtl) and relatively lower yield of paddy than CS estimates. In case of cotton, 50 percent margin has been included by the State in cost projections. However, State estimates are lower than CACP estimates in case of tur, moong, soybean and sesamum in Andhra Pradesh; maize, tur, moong and urad in Maharashtra; and maize, moong, soybean, sesamum and cotton in Rajasthan. The estimates of Rajasthan and CACP in respect of bajra are almost the same.

Issues Related to Sample Size

- 5.21 The Commission has made detailed analysis of actual cost estimates provided by DES for making projections for the current marketing season and observed that there are certain crops in States whose share in the all-India crop production as well as State production is very low. While, there are instances, where sample size for certain crops in a State is very small and may not be a representative sample of the population. The Commission suggests that Odisha in maize may be dropped from Comprehensive Scheme, whereas, sample size of maize in Jharkhand; urad and soybean in Chhattisgarh; sesamum in Odisha, and nigerseed and cotton in Madhya Pradesh may be increased. The sample size of ragi, sunflower and nigerseed is too small and can undermine the reliability of estimates. Therefore, sample size must be increased for these crops (details in Annex Table 5.8).



Recapitulation

- 5.22 All crops except nigerseed have positive returns but there are significant variations in returns from different crops. Among cereals, paddy has the highest return per hectare while in pulses, tur has highest returns and in oilseeds, groundnut is the most profitable crop. Efforts are needed to improve productivity and reduce cost of cultivation through rational utilization of inputs and services to improve profitability of nutri-cereals, pulses and oilseeds. As there is time lag of three years in availability of cost data, the Commission projected CoP A_2 , A_2+FL and C_2 per quintal by constructing CIPIs for mandated kharif crops for marketing season 2019-20. The growth in all-India CIPI for kharif crops during 2019-20 over 2018-19 is 4.8 percent. The projected all-India CoP A_2+FL per quintal is ₹1208 for paddy, ₹1698 for jowar, ₹1083 for bajra, ₹1171 for maize, ₹2100 for ragi, ₹3636 for tur, ₹4699 for moong, ₹3477 for urad, ₹3394 for groundnut, ₹2473 for soybean, ₹3767 for sunflower, ₹4322 for sesamum, ₹3960 for nigerseed and ₹3501 for cotton for KMS 2019-20. These projected cost estimates have been considered for formulating price policy recommendations. The increase in all-India projected CoP A_2+FL varies from 1.1 percent for moong to 9.4 percent for bajra in KMS 2019-20 over KMS 2018-19. Paddy gives comparatively higher returns than jowar, bajra, maize, ragi, moong, soybean, sunflower, sesamum and nigerseed, whereas, tur, urad, groundnut and cotton have higher returns compared to paddy.



Chapter 6

Recommendations for Price Policy

Chapter 6

- 6.1 As per the mandate of the Commission, farmers need to be incentivized for adopting new technologies, developing production patterns broadly in the light of changing national requirements and rational utilization of land, water and other production resources. While recommending price policy for kharif crops for the marketing season 2019-20, the Commission has considered cost of production, demand-supply situation and market prices in domestic and world markets, inter-crop price parity, terms of trade between agriculture and non-agriculture sector, likely effect of price policy on the economy and a minimum of 50 percent margin over cost of production. Remunerative and assured prices are essential for increasing agricultural production and productivity but agricultural markets tend to be inherently unstable and volatile which often adversely affect farmers. Therefore, it is necessary to provide remunerative and assured prices along with better markets to farmers.

Overall Demand and Supply Situation

- 6.2 In 2018-19, most kharif crops except rice are expected to show some decline in production over the previous year. India's rice production is estimated at 115.6 million tonnes in 2018-19, while rice exports are expected to be lower and stocks in central pool are higher. FAO and IGC forecast global rice production to expand and higher ending stocks due to large inventories in China and India. Both world and domestic rice situation point towards higher availability of rice, which might have adverse effect on market price.
- 6.3 Nutri-cereals production is forecast to decline significantly from 16.95 million tonnes in 2017-18 to 12.92 million tonnes in 2018-19 mainly due to drought in major producing States. Maize production is also expected to fall in 2018-19. Market prices of nutri-cereals and maize, which were much below the MSP in KMS 2018-19, saw reversal trend and were ruling well above the MSP in 2019. The trend is expected to continue in the next season as well.



- 6.4 India achieved a new record in pulses production with 25.23 million tonnes in 2017-18 but production is forecast to decline marginally (24.02 million tonnes) in 2018-19. Imports of pulses declined during 2017-18 and are expected to fall substantially in 2018-19. During April-December 2018, India imported only 1.8 million tonnes of pulses due to various import restrictions imposed by government to ensure remunerative prices to domestic growers. Market prices of pulses have improved during 2018-19 as compared to 2017-18 but were still ruling below the MSP. With lower production and stocks of pulses in the country and substantially reduced imports during 2018-19, market prices are expected to improve in the coming marketing season, which will benefit the farmers.
- 6.7 In the case of oilseeds (edible oils), India remains one of the largest importers of edible oils in the world. India imported about 15.4 million tonnes of edible oils in 2017-18 (9.6 percent jump from last year). During the first nine months of 2018-19, India has already imported about 11.1 million tonnes of edible oils. In order to incentivize farmers to grow oilseeds, government has provided them attractive price incentives through higher MSPs along with supportive procurement infrastructure but market support systems need further strengthening.
- 6.8 Cotton production in India is forecast to fall significantly in 2018-19, 13.8 percent decline over the last year. The ending stocks are projected to be down by six lakh bales in 2018-19 over 2017-18. The USDA estimates show the global cotton production to be lower by 4.2 percent from the previous year to 118.5 million bales in 2018-19, while consumption is expected to reach 123.6 million bales, to the highest level since 2007-08. World ending stocks are estimated to be the lowest in seven years at 75.5 million bales due to lower global production coupled with increased consumption. The USDA's world cotton projections for 2019-20 expect production to rise by 6.8 percent and exceed consumption, raising world stocks by one million bales.

Trade Situation

- 6.9 India's agricultural exports registered over 10 percent increase to ₹258.7 thousand crore in 2017-18 over the last year on robust demand for marine products, rice, tea, coffee, cashew, oil meals, guar gum meal and raw cotton. Agricultural imports declined from ₹185.3 thousand crore in 2016-17 to ₹175.8 thousand crore in 2017-18 and their share in total imports declined from 7.2 percent to 5.9 percent. India's net agricultural trade surplus declined substantially from the level of ₹159 thousand crore in 2013-14 to 83 thousand crore in 2017-18.
- 6.10 Agricultural exports are projected to increase during 2018-19 which is evident from the fact that India's agri-exports were ₹204.5 thousand crore during April-December 2018, an increase of about 6.6 percent over April-December 2017. However, decline in non-basmati rice exports (one of the major export commodities) by about one million tonnes to 6.5 million tonnes in April-December 2018 over April-December 2017, is a cause for concern and special efforts are needed to boost exports. Agricultural imports declined from 139.2 thousand crore in April-December 2017 to 123.9 thousand crore in April-December 2018.



Procurement Operations and Efficacy

- 6.9 Total rice procurement in 2017-18 was 38.19 million tonnes and reached 36.03 million tonnes as on March 1, 2019, and is expected to cross 2017-18 level due to higher MSP and bonus given by various State governments. Bihar, West Bengal and Assam, important producers of rice in eastern India, have low share in procurement. In the absence of effective procurement, market prices were ruling below MSP in these states. In the total procurement, the share of DCP States declined during 2017-18 mainly due to low procurement driven by significant reduction in rice production in Chhattisgarh, Odisha, Madhya Pradesh and West Bengal. The stock of rice in central pool as on January 1, 2019 was 18.29 million tonnes (against buffer norms of 7.61 million tonnes), 12.9 percent higher than the last year. These excess stocks, beyond the buffer stock norms, would lead to higher storage and financing costs, which would result in higher food subsidy bill in the near future.
- 6.10 The number of paddy farmers benefitted under MSP operations increased from 7.42 million in 2016-17 to 7.76 million in 2018-19. West Bengal, Chhattisgarh, Uttar Pradesh, Madhya Pradesh and Haryana have recorded a significant increase in number of beneficiary farmers. The share of procurement from marginal and small farmers under MSP has increased during the last 2-3 years in many States, which is a good sign of development.

Non-Price Policy Recommendations

Promotion of Nutri-Cereals and Maize

- 6.11 India is one of the important producers and consumers of nutri-cereals in the world. Unlike in the past, production and procurement of nutri-cereals and maize have increased due to pro-active policy initiatives by the government. However, farm prices of these crops remained subdued during KMS 2018-19. In order to make procurement operations more effective to ensure better prices to farmers, States should be encouraged to include nutri-cereals in PDS, MDM and other welfare schemes (OWS). In addition, with special focus on developing value-added strategies and appropriate processing technologies, the nutri-cereals can be processed into multigrain formulations and several other value-added and health food-products, which will result in high market demand from large urban population.
- 6.12 Maize prices have remained below MSP during the last 2-3 seasons and procurement of maize has been an issue due to problem in disposal of stocks. Therefore, PDPS can be more effective and should be implemented in major maize growing States with certain safeguards. Sustained promotion of value-added products of maize and its use in starch and feed industry are essential to increase demand for maize. Allowing use of corn for ethanol production under National Policy on Biofuels - 2018 will give boost to maize sector in the country and help in increasing farm income.



Incentivize Pulses Production

- 6.13 Pulses production in the country reached a record 25.23 million tonnes in 2017-18, driven by yield increase and area expansion. Sustained increase in production of pulses over the past three years has resulted in significant reduction in dependence on imports. However, low market prices have resulted in fall in acreage of some pulses in 2017-18 and 2018-19. It is important to mention that though market prices remained below MSP in KMS 2018-19, these were higher than 2017-18 level and are expected to improve further in the coming season. The Commission recommends that pulses growers should be incentivized and ensured remunerative prices to keep them motivated to grow pulses. In order to support higher producer price, the Commission suggests that pulses stocks should not be sold in the open market below the economic cost as it discourages industry and traders to procure the commodity during marketing season. Pulses can also be included in PDS and other welfare schemes in those districts where malnutrition is a major problem. State governments should also consider distributing pulses through PDS and OWS as is done in States like Himachal Pradesh, Tamil Nadu, etc. to increase demand for pulses.

Encourage Production of Oilseeds

- 6.14 Production of oilseeds appears to have stagnated at about 30-31 million tonnes during the last three years. Therefore, appropriate strategies and interventions for boosting oilseeds production and enhancing productivity and profitability of oilseeds need to be implemented. Assured and remunerative price encourages farmers to produce more and improve productivity. Prices of groundnut remained subdued during the last two seasons and were below MSP. In case of soybean, market prices were lower than MSP during KMS 2017-18 but showed improvement in KMS 2018-19. Government procured oilseeds under PSS but disposal remains a challenge due to lack of assured off-take of stocks unlike rice and wheat. Selling these stocks below economic cost discourages private sector to buy directly from farmers during procurement season. The Commission is of the considered view that PDPS and PPSS in oilseeds are better options than physical procurement by NAFED.

Cotton Sector

- 6.15 Despite significant increase in cotton acreage in 2017-18, its production did not increase much due to substantial decline in yield. Market prices of cotton remained above MSP during the current marketing season but showed a declining trend during the last 3-4 months. To make Indian cotton-to-clothing sector competitive, efforts have to be made to improve crop productivity and reduce costs. Ensuring availability of quality seed and timely management and control of pests and diseases, promoting cultivation under drip method of irrigation and encouraging extra-long staple cotton will benefit both cotton farmers and industry.



Strengthen Procurement Operations

- 6.16 Market prices of most kharif crops ruled below MSP in major States during KMS 2018-19. Therefore, to ensure remunerative and assured prices to farmers, procurement machinery needs to be strengthened and made more robust. More procurement centers should be established by FCI and NAFED on temporary basis where larger arrivals are expected during peak harvesting season. Procurement operations under PSS should be started immediately when market prices fall below MSP. As suggested in the PM-AASHA scheme, private companies should be encouraged and incentivized to procure farm produce at MSP to avoid distress sale by farmers. Procurement of pulses, oilseeds and nutri-cereals under PSS and PDPS should be strengthened to provide remunerative and assured prices. The main challenge is to ensure that farmers receive the MSP or higher price and India is able to retain its competitiveness in the world markets. To assure the benefit of increased MSP to farmers, the participation of State governments and private sector is extremely important.

PM-KISAN (Direct Income Support)

- 6.17 To provide direct income support to small and marginal farmers, government has launched Pradhan Mantri Kisan SAMman Nidhi (PM-KISAN) scheme. Some State governments have also implemented similar schemes like Rythu Bandhu Scheme of Telangana, KALIA Scheme of Odisha, Krishak Bandhu of West Bengal and Krishak Aashirwad Yojana of Jharkhand. No doubt that these interventions will provide much needed and immediate support to the farmers but simultaneously other structural reforms in agri-marketing, irrigation water management, investment in logistics and infrastructure, empowering farmers through group action, trade policy, etc. need to be undertaken to ensure higher productivity and profitability in agriculture. The government has already initiated major reforms in agricultural marketing and trade policies, managing production and market risks, investment in production and marketing infrastructure, etc. but active participation of States is essential for effective and timely implementation on the ground.

Agricultural Debt Waiver

- 6.18 During the last five years, about 13 States/Union Territories (UTs) have announced farm loan waiver schemes. Debt waiver can bring some relief to selected group of farmers in the short run, but has negative effects on fiscal deficit of States, credit allocation and credit discipline of borrowers and also creates a moral hazard problem. Moreover, only a small proportion of farmers, who take loan from formal institutional sources, benefit from such schemes. There are no credible evidences to show that the loan waiver schemes have reduced the distress of the farmers. Therefore, the Commission is of the considered view that farm loan waiver is not a solution to address agrarian problems but need to address the structural and institutional deficiencies in the sector. Comprehensive reforms comprising PM-AASHA to ensure remunerative prices to farmers, PMFBY for reducing risks, more



investment in irrigation, warehousing and storage, market reforms, expanding the e-NAM, encouraging agricultural exports, PM-KISAN to provide income support, etc. have been initiated by the government, where active participation of States is essential for effective and timely implementation of these schemes.

Soil Health Management

- 6.19 Soil Health Card (SHC) Scheme has been in vogue to guide farmers on judicious and economic use of fertilizers and other nutrients. Significant progress has been made under the scheme. Various stakeholders from soil health management and fertiliser industry suggested that soil testing may be carried out once in 3-5 years as soil profile does not undergo major changes in a short span of time. To rationalise fertiliser use and reduce input costs of farmers, efforts should be made to manufacture and promote customised fertilisers based on results of the soil quality under SHC scheme.

Improving Irrigation Water Use Efficiency

- 6.20 Expansion of irrigation coverage is critical for increasing agricultural production and productivity, but it must be created in a sustainable and cost-effective manner. Therefore, expansion of irrigation coverage through surface sources needs to be promoted but micro-irrigation methods such as drip and sprinkler should be incentivized and encouraged to improve water use efficiency. Increased use of micro-irrigation alongwith water-soluble fertilizers holds the potential to achieve productivity at par with world average in coming years. Paddy alone consumes large share of irrigation water in India and given the looming water scarcity, paddy cultivation under conventional inundation irrigation method is going to be difficult. Therefore, promotion of System of Rice Intensification (SRI) among farmers will help in achieving higher yield with less water and improve water use efficiency.

Crop Residue Management

- 6.21 In order to promote alternative use of crop residue, the Ministry of Power has brought out a policy for biomass utilization for power generation through co-firing in pulverized coal fired boilers. In addition, alternative uses of paddy crop residue as fodder, manure/compost, cardboard/packing material, etc. need to be explored. To reduce the stubble burning in Punjab, Haryana and Uttar Pradesh, government should continue to provide subsidy on crop residue management machinery preferably to farmer groups for establishing farm machinery banks for providing custom hiring services to farmers for crop residue management.

Market Information and Intelligence

- 6.22 Market information and intelligence play important role in developing the efficient agricultural marketing system. The Commission has recommended setting up marketing intelligence and price forecasting system in its earlier reports. It is worth mentioning that government has taken an initiative and constituted a Technical



Advisory Committee on Market Intelligence (Supply Management, Price and Demand Forecasting). This will help farmers to make crop acreage decisions in line with changing demand patterns and reduce market price volatility of different commodities.

Bonus over MSP and Market Distortions

- 6.23 Some State governments have been giving bonus over and above MSP particularly for paddy during past few years. This creates distortions in market and almost crowds out private sector. During KMS 2017-18 and 2018-19, States like Kerala, Tamil Nadu, Chhattisgarh and Jharkhand have declared bonus for paddy. For instance, Chhattisgarh declared a bonus of ₹750 per quintal for paddy in 2018-19, which works out to about 43 percent of MSP. Since procurement of rice in Chhattisgarh is much higher than State requirement of rice under NFSA and other welfare schemes, the State will find it difficult to liquidate excess stocks. Providing bonus above MSP affects inter-crop parity and discourages farmers from diversification of production basket as well. The Commission, therefore, re-iterates its earlier recommendation that such bonuses/incentives should be discouraged, particularly in surplus States.

Awareness about MSP and FAQ Norms

- 6.24 There is a lack of awareness among farmers about the MSP and FAQ norms. Farm produce brought to the procurement centre is at times rejected as it does not meet the FAQ norms. Therefore, there is a need to create awareness about MSP, FAQ norms, procurement system, etc. as it will help in improving market prices and increase coverage of beneficiary farmers. Hence, there is a need to give wide publicity about MSP, FAQ norms and procurement mechanisms by State governments in electronic and print media in regional/vernacular languages and also through pamphlets and announcements in the villages before the procurement season starts. In addition, farmers need to be trained on FAQ norms and post-harvest handling methods so as to minimize post-harvest losses and realize better prices.

Trade Policy

- 6.25 Agriculture Export Policy, 2018 aims at doubling agricultural exports by 2022 and integrating Indian farmers and agricultural products with the global value chains. India has trade surplus in agriculture but agri-trade surplus has declined significantly during recent years due to falling exports and rising imports. Therefore, concerted efforts are needed to reverse this trend. India's import dependence in pulses has reduced significantly through a concerted strategy of incentivizing pulses production. Considering excessive dependence on imports for meeting edible oils demand, India should take concrete steps to scale up domestic oilseeds production by increasing productivity. Possibilities for expanding domestic demand for nutri-cereals/millets and exports need to be fully tapped to enhance farmers' income. India is in a competitive position to target potential markets with non-GMO products as demand for non-GMO foods is increasing and Indian food crops are non-GMO.



Special Focus on North Eastern (NE) States

- 6.26 The North Eastern States produce about 7 million tonnes of rice but procurement is negligible, thereby farmers do not get benefit of the MSP. The total allocation of rice under NFSA/TPDS and other welfare schemes for NE States is about 2.72 million tonnes. In order to meet the requirement, rice stocks are moved Ex-North mainly from Punjab and Haryana to the NE region, which is costly as transportation cost is very high. Rice production in the region has increased significantly after implementation of Bringing Green Revolution to Eastern India (BGREI) and the region has great potential for increasing rice production if farmers are provided with better quality seed, irrigation and more importantly assured remunerative price. The Commission recommends that procurement efforts need to be stepped up in NE region and some relaxation in norms such as moisture content, out-turn-ratio, etc. could be considered in the initial years. It would help in ensuring better price to farmers and also saving in movement cost of FCI stocks from northern region.

Cost of Production and Profitability

- 6.27 Actual costs and returns for kharif crops are available for the latest three years, 2014-15, 2015-16 and 2016-17. At all-India level gross returns (profit over A_2 +FL CoC) are higher for urad, followed by arhar (tur) and sesamum. On the other extreme with negative gross returns is nigerseed. The analysis on inter-crop price parity reveals that paddy has the highest profitability over A_2 +FL CoC among cereals, though pulses, groundnut and sesamum are much more profitable than paddy, while maize, nutri-cereals, cotton, soybean, sunflower and nigerseed are less profitable in relation to paddy.
- 6.28 The projected CoP A_2 +FL of major crops in KMS 2019-20 are estimated to be ₹1208 per qtl for paddy, ₹1698 per qtl for jowar, ₹1083 per qtl for bajra, ₹1171 per qtl for maize, ₹2100 per qtl for ragi, ₹3636 per qtl for arhar (tur), ₹4699 per qtl for moong, ₹3477 per qtl for urad, ₹3394 per qtl for groundnut, ₹2473 per qtl for soybean, ₹3767 per qtl for sunflower, ₹4322 per qtl for sesamum, ₹3960 per qtl for nigerseed and ₹3501 per qtl for cotton.

Price Policy Recommendations

- 6.29 Considering all these factors, the Commission recommends the following MSPs of different kharif crops: Paddy (Common) ₹1815 per qtl; Paddy (Grade A) ₹1835 per qtl; Jowar (Hybrid) ₹2550 per qtl; Jowar (Maldandi) ₹2570 per qtl; Bajra ₹2000 per qtl; Ragi ₹3150 per qtl; Maize ₹1760 per qtl; Tur ₹5800 per qtl; Moong ₹7050 per qtl; Urad ₹5700 per qtl; Groundnut ₹5090 per qtl; Sunflower Seed ₹5650 per qtl; Soybean (Yellow) ₹3710 per qtl; Sesamum ₹6485 per qtl; Nigerseed ₹5940 per qtl; Cotton ₹5255 per qtl for medium staple and ₹5550 per qtl for long staple (Table 6.1).



Table 6.1: MSPs Recommended for KMS, 2019-20

(₹/qtl)

Crops	Projected Costs for KMS 2019-20		MSP, KMS 2018-19	Recommended MSP for KMS 2019-20	MSP as percent of A ₂ +FL
	A ₂	A ₂ +FL			
Paddy (Common)	894	1208	1750	1815 (3.7)	150
Paddy (Grade A)	-	-	1770	1835 (3.7)	-
Jowar (Hybrid)	1263	1698	2430	2550 (4.9)	150
Jowar (Maldandi)	-	-	2450	2570 (4.9)	-
Bajra	617	1083	1950	2000 (2.6)	185
Ragi	1583	2100	2897	3150 (8.7)	150
Maize	844	1171	1700	1760 (3.5)	150
Tur (Arhar)	2677	3636	5675	5800 (2.2)	160
Moong	2884	4699	6975	7050 (1.1)	150
Urad	2605	3477	5600	5700 (1.8)	164
Groundnut	2769	3394	4890	5090 (4.1)	150
Sunflower Seed	3139	3767	5388	5650 (4.9)	150
Soybean (Yellow)	2027	2473	3399	3710 (9.1)	150
Sesamum	2767	4322	6249	6485 (3.8)	150
Nigerseed	1736	3960	5877	5940 (1.1)	150
Cotton (Medium Staple)	2781	3501	5150	5255 (2.0)	150
Cotton (Long Staple)	-	-	5450	5550 (1.8)	-

Note: Figures in parenthesis represent increase in MSP over the previous year.

The Commission is of the considered opinion that these non-price and price policy recommendations would incentivise farmers to adopt new technologies and desirable production pattern in the light of changing consumer demands and achieve the objective of doubling farmers' income.

(Vijay Paul Sharma)
Chairman

(A. Narayanamoorthy)
Member (Official)

31st March, 2019



Annexures



Annex Table-1.1 : All-India Estimates of Area of Major Agricultural Crops

(million hectares)

S. No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18**	2018-19*
1	Rice	Kharif	40.81	37.62	38.05	40.14	38.91	39.45	39.83	39.66	39.85	39.35	39.42
		Rabi	4.73	4.30	4.81	3.87	3.84	4.69	4.28	3.84	4.15	4.44	3.96
		Total	45.54	41.92	42.86	44.01	42.75	44.14	44.11	43.50	43.99	43.79	43.37
2	Wheat	Rabi	27.75	28.46	29.07	29.86	30.00	30.47	31.47	30.42	30.79	29.58	29.08
3	Barley	Rabi	0.71	0.62	0.71	0.64	0.70	0.67	0.71	0.59	0.66	0.66	0.72
4	Jowar	Kharif	2.89	3.24	3.07	2.62	2.43	2.28	2.27	2.14	2.06	1.90	1.56
		Rabi	4.64	4.55	4.31	3.63	3.79	3.52	3.89	3.94	3.57	3.07	2.45
		Total	7.53	7.79	7.38	6.25	6.21	5.79	6.16	6.08	5.62	4.96	4.02
5	Bajra	Kharif	8.75	8.90	9.61	8.78	7.30	7.81	7.32	7.13	7.46	7.38	6.70
6	Maize	Kharif	6.89	7.06	7.28	7.38	7.21	7.31	7.56	7.18	7.84	7.62	7.54
		Rabi	1.28	1.20	1.27	1.40	1.46	1.76	1.62	1.63	1.79	1.85	1.59
		Total	8.17	8.26	8.55	8.78	8.67	9.07	9.19	8.81	9.63	9.47	9.13
7	Ragi	Kharif	1.38	1.27	1.29	1.18	1.13	1.19	1.21	1.14	1.02	1.20	0.95
	Nutri/ Coarse Cereals	Kharif	20.83	21.31	22.05	20.75	18.82	19.27	18.95	18.23	18.99	18.63	17.23
		Rabi	6.62	6.37	6.29	5.67	5.94	5.95	6.22	6.15	6.01	5.58	4.77
		Total	27.45	27.68	28.34	26.42	24.76	25.22	25.17	24.39	25.01	24.21	22.00
	Cereals	Kharif	61.64	58.92	60.10	60.89	57.73	58.72	58.78	57.89	58.84	57.98	56.65
		Rabi	39.10	39.13	40.17	39.40	39.78	41.11	41.97	40.42	40.95	39.59	37.81
		Total	100.74	98.05	100.27	100.29	97.52	99.83	100.75	98.31	99.79	97.57	94.46
8	Tur (Arhar)	Kharif	3.38	3.47	4.37	4.01	3.89	3.90	3.85	3.96	5.34	4.43	4.27
9	Moong	Kharif	2.24	2.46	2.85	2.61	1.97	2.34	2.03	2.76	3.37	3.29	3.31
		Rabi	0.60	0.63	0.76	0.78	0.74	1.04	0.99	1.07	0.96	0.97	0.94
		Total	2.84	3.07	3.51	3.39	2.72	3.38	3.02	3.83	4.33	4.26	4.25
10	Urad	Kharif	2.02	2.23	2.51	2.36	2.44	2.35	2.49	2.72	3.48	4.50	3.92
		Rabi	0.65	0.73	0.74	0.86	0.69	0.72	0.76	0.90	1.00	0.94	0.91
		Total	2.67	2.96	3.25	3.22	3.13	3.06	3.25	3.62	4.48	5.44	4.84
11	Gram	Rabi	7.89	8.17	9.19	8.30	8.52	9.93	8.25	8.40	9.63	10.56	9.67
12	Lentil (Masur)	Rabi	1.38	1.48	1.60	1.56	1.42	1.34	-	-	-	1.55	1.50
	Pulses	Kharif	9.81	10.58	12.32	11.19	9.95	10.33	9.99	11.31	14.36	14.08	13.21
		Rabi	12.29	12.70	14.08	13.27	13.30	14.88	13.56	13.60	15.08	15.91	15.08
		Total	22.09	23.28	26.40	24.46	23.26	25.21	23.55	24.91	29.45	29.99	28.28
	Foodgrains	Kharif	71.45	69.51	72.42	72.08	67.69	69.05	68.77	69.21	73.20	72.06	69.86
		Rabi	51.39	51.83	54.25	52.67	53.09	55.99	55.53	54.01	56.03	55.50	52.88
		Total	122.83	121.33	126.67	124.75	120.78	125.04	124.30	123.22	129.23	127.56	122.74
13	Groundnut	Kharif	5.29	4.62	4.98	4.32	3.93	4.65	4.01	3.84	4.58	4.10	4.06
		Rabi	0.88	0.86	0.88	0.95	0.79	0.86	0.76	0.76	0.76	0.81	0.79
		Total	6.16	5.48	5.86	5.26	4.72	5.51	4.77	4.60	5.34	4.91	4.85
14	Soybean	Kharif	9.51	9.73	9.60	10.11	10.84	11.72	10.91	11.60	11.18	10.47	11.28
15	Sunflower	Kharif	0.66	0.57	0.32	0.26	0.30	0.25	0.22	0.16	0.17	0.13	0.12
		Rabi	1.15	0.91	0.61	0.47	0.53	0.42	0.37	0.33	0.21	0.15	0.17
		Total	1.81	1.48	0.93	0.73	0.83	0.67	0.59	0.49	0.38	0.29	0.29
16	Sesamum	Kharif	1.81	1.94	2.08	1.90	1.71	1.68	1.75	1.95	1.67	1.56	1.56
17	Nigerseed	Kharif	0.39	0.38	0.37	0.36	0.31	0.30	0.23	0.25	0.26	0.22	0.18
18	Rapeseed/ Mustard	Rabi	6.30	5.59	6.90	5.89	6.36	6.65	5.80	5.75	6.07	5.96	6.24
19	Safflower	Rabi	0.29	0.29	0.24	0.25	0.18	0.18	0.17	0.13	0.17	0.07	0.04
	Nine Oilseeds	Kharif	18.53	17.97	18.23	18.42	18.32	19.65	18.21	18.86	18.67	17.32	17.98
		Rabi	9.03	7.99	9.00	7.89	8.16	8.40	7.39	7.22	7.51	7.33	7.55
		Total	27.56	25.96	27.22	26.31	26.48	28.05	25.60	26.09	26.18	24.65	25.53
20	Cotton		9.41	10.13	11.24	12.18	11.98	11.96	12.82	12.29	10.83	12.43	12.35
	Jute		0.79	0.81	0.77	0.81	0.78	0.76	0.75	0.73	0.71	0.68	0.68
	Mesta		0.12	0.09	0.10	0.10	0.09	0.08	0.06	0.05	0.06	0.06	0.05
21	Jute & Mesta		0.90	0.91	0.87	0.90	0.86	0.84	0.81	0.78	0.76	0.74	0.73
22	Sugarcane		4.42	4.17	4.88	5.04	5.00	4.99	5.07	4.93	4.44	4.73	5.06

Note: *Second Advance Estimates (2018-19)

** Fourth Advance Estimates (2017-18)

Source: DES



Price Policy for KHARIF CROPS

Annex Table-1.2 : All-India Estimates of Production of Major Agricultural Crops

(million tonnes)

S. No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18**	2018-19*
1	Rice	Kharif	84.91	75.92	80.65	92.78	92.37	91.50	91.39	91.41	96.30	97.50	101.96
		Rabi	14.27	13.18	15.33	12.52	12.87	15.15	14.09	13.00	13.40	15.41	136.34
		Total	99.18	89.09	95.98	105.30	105.24	106.65	105.48	104.41	109.70	112.91	115.60
2	Wheat	Rabi	80.68	80.80	86.87	94.88	93.51	95.85	86.53	92.29	98.51	99.70	99.12
3	Barley	Rabi	1.69	1.35	1.66	1.62	1.75	1.83	1.61	1.44	1.75	1.77	1.92
4	Jowar	Kharif	3.05	2.76	3.44	3.29	2.84	2.39	2.30	1.82	1.96	2.10	1.92
		Rabi	4.19	3.94	3.56	2.69	2.44	3.15	3.15	2.42	2.60	2.85	1.84
		Total	7.25	6.70	7.00	5.98	5.28	5.54	5.45	4.24	4.57	4.95	3.75
5	Bajra	Kharif	8.89	6.51	10.37	10.28	8.74	9.25	9.18	8.07	9.73	9.13	7.46
6	Maize	Kharif	14.12	12.29	16.64	16.49	16.20	17.14	17.01	16.05	18.92	20.24	20.22
		Rabi	5.61	4.43	5.09	5.27	6.05	7.11	7.16	6.51	6.98	8.47	7.58
		Total	19.73	16.72	21.73	21.76	22.26	24.26	24.17	22.57	25.90	28.72	27.80
7	Ragi	Kharif	2.04	1.89	2.19	1.93	1.57	1.98	2.06	1.82	1.39	1.98	1.32
	Nutri/Coarse Cereals	Kharif	28.54	23.83	33.08	32.44	29.80	31.20	30.94	28.15	32.44	33.89	31.30
		Rabi	11.49	9.72	10.32	9.58	10.25	12.09	11.92	10.37	11.33	13.10	11.34
		Total	40.04	33.55	43.40	42.01	40.04	43.29	42.86	38.52	43.77	46.99	42.64
	Cereals	Kharif	113.49	99.78	113.77	125.22	122.16	122.70	122.34	119.56	128.74	131.38	133.26
		Rabi	106.40	103.65	112.48	116.98	116.63	123.09	112.53	115.66	123.24	128.21	124.09
		Total	219.89	203.44	226.24	242.20	238.78	245.79	234.87	235.22	251.98	259.59	257.35
8	Tur (Arhar)	Kharif	2.27	2.46	2.86	2.65	3.02	3.17	2.81	2.56	4.87	4.25	3.68
9	Moong	Kharif	0.78	0.44	1.53	1.24	0.79	0.96	0.87	1.00	1.64	1.44	1.84
		Rabi	0.26	0.25	0.27	0.40	0.40	0.65	0.64	0.59	0.52	0.57	0.57
		Total	1.03	0.69	1.80	1.63	1.19	1.61	1.50	1.59	2.17	2.01	2.41
10	Urad	Kharif	0.84	0.81	1.40	1.23	1.43	1.15	1.28	1.25	2.18	2.84	2.68
		Rabi	0.33	0.43	0.36	0.53	0.47	0.55	0.68	0.70	0.66	0.73	0.69
		Total	1.17	1.24	1.76	1.77	1.90	1.70	1.96	1.95	2.83	3.56	3.36
11	Gram	Rabi	7.06	7.48	8.22	7.70	8.83	9.53	7.33	7.06	9.38	11.23	10.32
12	Lentil (Masur)	Rabi	0.95	1.03	0.94	1.06	1.13	1.02	-	-	-	1.61	1.53
	Pulses	Kharif	4.69	4.20	7.12	6.06	5.92	5.99	5.73	5.53	9.58	9.34	9.01
		Rabi	9.88	10.46	11.12	11.03	12.43	13.25	11.42	10.82	13.55	15.89	15.02
		Total	14.57	14.66	18.24	17.09	18.34	19.25	17.15	16.35	23.13	25.23	24.02
	Foodgrains	Kharif	118.14	103.95	120.85	131.27	128.07	128.69	128.06	125.09	138.33	140.73	142.27
		Rabi	116.33	114.15	123.64	128.01	129.06	136.35	123.96	126.47	136.78	144.10	139.11
		Total	234.47	218.11	244.49	259.29	257.13	265.04	252.02	251.57	275.11	284.83	281.37
13	Groundnut	Kharif	5.62	3.85	6.64	5.13	3.19	8.06	5.93	5.37	6.05	7.54	5.44
		Rabi	1.55	1.58	1.62	1.84	1.51	1.66	1.47	1.37	1.41	1.64	1.53
		Total	7.17	5.43	8.26	6.96	4.69	9.71	7.40	6.73	7.46	9.18	6.97
14	Soybean	Kharif	9.91	9.96	12.74	12.21	14.67	11.86	10.37	8.57	13.16	10.98	13.69
15	Sunflower	Kharif	0.36	0.21	0.19	0.15	0.19	0.15	0.11	0.07	0.10	0.08	0.10
		Rabi	0.80	0.64	0.46	0.37	0.36	0.35	0.32	0.23	0.15	0.13	0.13
		Total	1.16	0.85	0.65	0.52	0.54	0.50	0.43	0.30	0.25	0.21	0.23
16	Sesamum	Kharif	0.64	0.59	0.89	0.81	0.69	0.71	0.83	0.85	0.75	0.75	0.78
17	Nigerseed	Kharif	0.12	0.10	0.11	0.10	0.10	0.10	0.08	0.07	0.09	0.07	0.07
18	Rapeseed/ Mustard	Rabi	7.20	6.61	8.18	6.60	8.03	7.88	6.28	6.80	7.92	8.32	8.40
19	Safflower	Rabi	0.19	0.18	0.15	0.15	0.11	0.11	0.09	0.05	0.09	0.05	0.02
	Nine Oilseeds	Kharif	17.81	15.73	21.92	20.69	20.79	22.62	19.22	16.70	21.53	21.00	21.25
		Rabi	9.91	9.15	10.56	9.11	10.15	10.13	8.29	8.55	9.75	10.31	10.25
		Total	27.72	24.88	32.48	29.80	30.94	32.75	27.51	25.25	31.28	31.31	31.50
20	Cotton\$		29.00	30.50	33.90	36.70	37.00	39.80	38.60	33.20	34.50	37.00	36.10
	Cotton\$\$		22.28	24.02	33.00	35.20	34.22	35.90	34.81	30.01	32.58	34.89	30.09
	Jute#		9.63	11.23	10.01	10.74	10.34	11.08	10.62	9.94	10.43	9.63	9.56
	Mesta#		0.73	0.59	0.61	0.66	0.59	0.61	0.51	0.58	0.53	0.51	0.51
21	Jute & Mesta#		10.37	11.82	10.62	11.40	10.93	11.69	11.13	10.52	10.96	10.14	10.07
22	Sugarcane		285.03	292.30	342.38	361.04	341.20	352.14	362.33	348.45	306.07	376.90	380.83

Note: *Second Advance Estimates (2018-19)

** : Fourth Advance Estimates (2017-18)

\$: CAB estimates of Million bales of 170 kgs each

\$\$: DES estimates of Million bales of 170 kgs each

: Million bales of 180 kgs each

Sources: DES and Cotton Advisory Board

Price Policy for Kharif Crops



Annex Table 1.3 : All-India Estimates of Yield of Major Agricultural Crops

(kg/ha)

S.No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18**	2018-19*
1	Rice	Kharif	2081	2018	2120	2311	2374	2319	2295	2305	2417	2477	2587
		Rabi	3019	3064	3185	3238	3353	3232	3291	3382	3230	3474	3445
		Total	2178	2125	2239	2393	2462	2416	2391	2400	2494	2578	2665
2	Wheat	Rabi	2907	2839	2989	3177	3117	3145	2750	3034	3200	3371	3408
3	Barley	Rabi	2394	2172	2357	2516	2521	2718	2280	2439	2663	2679	2654
4	Jowar	Kharif	1055	853	1119	1257	1171	1050	1014	849	954	1106	1228
		Rabi	904	865	827	741	644	896	808	615	730	931	748
		Total	962	860	949	957	850	957	884	697	812	998	935
5	Bajra	Kharif	1015	731	1079	1171	1198	1184	1255	1132	1305	1237	1114
6	Maize	Kharif	2048	1740	2285	2234	2246	2346	2249	2236	2413	2656	2682
		Rabi	4387	3694	4003	3765	4152	4050	4414	4006	3896	4583	4777
		Total	2414	2024	2540	2478	2566	2676	2632	2563	2689	3032	3046
7	Ragi	Kharif	1477	1489	1705	1641	1396	1661	1706	1601	1363	1649	1393
	Nutri/Coarse Cereals	Kharif	1371	1119	1500	1563	1583	1619	1633	1544	1708	1819	1816
		Rabi	1735	1525	1641	1689	1725	2034	1915	1686	1885	2350	2380
		Total	1459	1212	1531	1590	1617	1717	1703	1579	1750	1941	1938
	Cereals	Kharif	1841	1693	1893	2056	2116	2089	2081	2065	2188	2259	2352
		Rabi	2721	2649	2800	2969	2931	2995	2681	2862	3010	3240	3282
		Total	2183	2075	2256	2415	2449	2462	2331	2393	2525	2657	2725
8	Tur (Arhar)	Kharif	671	711	655	662	776	813	729	646	913	960	861
9	Moong	Kharif	348	180	538	475	398	410	428	363	488	438	557
		Rabi	423	397	354	508	539	620	640	554	546	587	602
		Total	364	226	514	483	436	475	498	416	500	472	567
10	Urad	Kharif	419	363	557	523	586	490	516	459	626	631	682
		Rabi	506	587	489	621	679	768	891	773	656	768	754
		Total	440	418	542	549	606	555	604	537	632	655	696
11	Gram	Rabi	895	915	895	928	1036	960	889	840	974	1063	1067
12	Lentil (Masur)	Rabi	693	697	591	678	797	758	-	-	-	1034	1023
	Pulses	Kharif	478	397	578	541	594	580	573	489	667	664	682
		Rabi	804	823	790	831	934	891	842	796	898	999	996
		Total	659	630	691	699	789	763	728	656	786	841	849
	Foodgrains	Kharif	1654	1496	1669	1821	1892	1864	1862	1808	1890	1953	2037
		Rabi	2264	2203	2279	2430	2431	2435	2232	2342	2441	2596	2631
		Total	1909	1798	1930	2078	2129	2120	2028	2042	2129	2233	2292
13	Groundnut	Kharif	1063	835	1335	1188	811	1735	1478	1399	1321	1838	1339
		Rabi	1764	1830	1846	1938	1908	1926	1948	1801	1861	2016	1934
		Total	1163	991	1411	1323	994	1764	1552	1465	1398	1868	1436
14	Soybean	Kharif	1041	1024	1327	1208	1353	1012	951	738	1177	1049	1213
15	Sunflower	Kharif	540	378	608	566	622	621	512	420	567	617	836
		Rabi	696	700	748	783	674	826	866	698	737	845	790
		Total	639	576	701	706	655	750	736	608	660	738	809
16	Sesamum	Kharif	354	303	429	426	402	426	474	436	448	481	502
17	Nigerseed	Kharif	297	266	290	269	325	328	328	295	332	329	362
18	Rapeseed/ Mustard	Rabi	1143	1183	1185	1121	1262	1185	1083	1183	1304	1397	1346
19	Safflower	Rabi	642	621	617	580	591	638	515	416	567	633	527
	Nine Oilseeds	Kharif	961	875	1203	1123	1135	1151	1054	884	1153	1212	1182
		Rabi	1097	1146	1174	1155	1244	1207	1126	1186	1300	1408	1358
		Total	1006	958	1193	1133	1168	1168	1075	968	1195	1270	1234
20	Cotton \$		524	512	513	512	525	566	512	459	542	506	497
		Cotton\$\$	403	403	499	491	486	510	462	415	512	477	414
			2207	2492	2329	2389	2396	2639	2549	2457	2660	2556	2522
	Mesta		1141	1122	1115	1248	1237	1338	1525	1945	1664	1601	1816
21	Jute & Mesta		2071	2349	2192	2268	2281	2512	2473	2421	2585	2481	2473
22	Sugarcane		64553	70020	70091	71667	68254	70520	71512	70720	69001	79650	75260

Note: * Second Advance Estimates (2018-19)

** : Fourth Advance Estimates (2017-18)

\$: CAB estimates

\$\$: DES estimates

Sources: DES and Cotton Advisory Board

Annexures



PRICE Policy for Kharif Crops

**Annex Table 1.4 : Share of Kharif Crops (under MSP) in
Major Producing States in Total Production, TE2018-19**

Rice		Jowar		Bajra		Maize		Ragi		Tur		Urad	
States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)
WB	13.2	MH	35.0	Raj	42.4	MP	14.3	Kar	62.4	MH	28.7	MP	36.1
UP	12.6	Kar	21.6	UP	20.1	Kar	13.3	TN	14.5	Kar	17.8	Raj	14.0
Pun	11.2	MP	9.6	Har	9.4	MH	10.8	UK	8.7	MP	17.1	AP	10.3
Bih	7.1	Raj	9.4	Guj	8.0	TG	9.6	MH	6.4	Guj	8.3	UP	10.2
AP	7.0	TN	8.4	MP	7.8	Bih	8.7	AP	2.4	UP	7.5	TN	9.1
Odi	6.7	AP	6.1	MH	7.1	TN	7.1	Odi	1.9	TG	5.6	MH	4.6
CG	5.7	UP	4.4	Kar	2.8	AP	6.9	Jhar	1.1	Jhar	5.4	Jhar	3.9
TG	5.3	Guj	2.9	TN	1.4	UP	5.6	Guj	1.0	AP	2.9	Guj	2.8
Asm	4.5	TG	1.6	Oth*	1.0	Raj	5.1	Oth*	1.5	Odi	2.9	WB	1.9
TN	4.4	Oth*	1.1			WB	3.8			TN	1.0	Kar	1.6
Har	4.0					HP	2.7			Oth*	2.8	Asm	1.3
MP	3.8					Guj	2.7					TG	1.0
Jhar	3.2					Jhar	2.0					Odi	1.0
MH	2.7					JK	2.0					Oth*	2.2
Kar	2.6					Pun	1.5						
Guj	1.7					CG	1.1						
Oth*	4.2					Oth*	2.9						

(Contd.)



Annex Table 1.4 : Share of Kharif Crops (under MSP) in Major Producing States in Total Production, TE2018-19

Moong		Groundnut		Sesamum		Nigerseed		Soybean		Sunflower		Cotton	
States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)
Raj	42.5	Guj	38.7	WB	29.4	Odi	30.0	MP	50.7	Kar	46.1	MH	25.7
MP	11.5	Raj	17.1	MP	24.1	MP	29.4	MH	33.8	Odi	11.2	Guj	25.6
MH	8.5	TN	10.3	Raj	13.0	CG	13.2	Raj	8.9	MH	8.5	TG	14.0
Kar	6.0	AP	9.0	UP	10.3	Jhar	5.7	Kar	2.2	AP	6.6	Har	6.6
Bih	5.3	Kar	6.6	Guj	8.0	Asm	4.6	TG	2.1	Pun	5.1	MP	5.9
Odi	4.6	MP	4.6	Kar	3.1	WB	4.1	Guj	1.0	WB	5.1	AP	5.8
AP	3.7	MH	4.6	TN	2.5	MH	4.0	Oth*	1.3	Bih	4.9	Raj	5.6
TN	3.5	TG	4.0	AP	1.8	Guj	3.9			TG	3.1	Kar	4.0
Guj	3.4	WB	2.2	TG	1.3	AP	3.0			Har	3.1	Pun	3.7
TG	3.0	UP	1.2	CG	1.2	Kar	1.3			TN	2.1	Odi	1.3
UP	2.2	Oth*	1.7	Asm	1.1	Oth*	0.8			MP	1.4	TN	1.3
WB	1.7			Oth*	4.2					UP	1.4	Oth*	0.5
Jhar	1.1									Oth*	1.4		
Har	1.0												
Pun	1.0												
Oth*	1.0												

Note: *States having less than 1 percent share in total production have been clubbed as others

Source: DES



Annex Table 1.5: Progress of Crop Insurance Scheme under Kharif and Rabi for Last Three Seasons

Particulars	Kharif			Rabi		
	2015	2016	2017	2015-16	2016-17	2017-18
Total No. of Farmers Insured ('000)	30909	40436	34920	17645	17273	17164
Loanee ('000)	29290	30227	24240	16484	13807	13861
Non-Loanee ('000)	1620	10208	10680	1161	3466	3303
Area Insured ('000 ha)	33853	38215	34283	18533	18511	17653
Sum Insured (Amount in ₹ Crore)	69401	130947	129292	46271	72464	78086
Sum Insured per Farmer	22453	32384	37025	26223	41953	45495
Area Insured per Farmer (ha)	20501	34266	37713	24966	39147	44235
Gross Premium Received (₹ Crore)	3612	16015	18990	1994	5931	6496
Estimated Claims (₹ Crore)	-	10525	17697	-	5857	3040
Claims Paid (₹ Crore)	17086	10522	17549	3247	5758	1953

Source: DAC&FW



Annex Table 2.1: World Supply and Use of Rice, Coarse Grains and Oilseeds

(million tonnes)

Crop	Year	Output	Total Supply	Trade	Total Use	Ending Stocks
Coarse Grains	2016-17	1413.7	1763.2	198.6	1378.7	384.5
	2017-18 (Est.)	1356.8	1741.3	183.0	1371.3	370.1
	2018-19 (Proj)	1372.1	1742.2	201.0	1405.2	337.0
Oilseeds	2016-17	572.9	666.7	170.6	467.5	109.5
	2017-18 (Est.)	575.7	685.3	176.6	483.2	114.1
	2018-19 (Proj)	593.3	707.3	178.3	495.4	120.9
Rice, milled	2016-17	490.9	633.5	47.3	483.8	149.7
	2017-18 (Est.)	495.1	644.8	47.7	482.7	162.0
	2018-19 (Proj)	495.9	657.9	47.7	490.3	167.6

Source: USDA

Annex Table 2.2: World Supply and Use of Cotton

(million 480-pound bales)

Crop	Year	Production	Imports	Domestic Feed	Domestic Total	Exports	Ending Stocks
Cotton	2016-17	106.7	37.7	116.2	37.9	0.2	80.4
	2017-18 (Est.)	123.7	40.9	122.6	40.9	0.5	81.1
	2018-19 (Proj)	118.5	42.3	123.6	42.3	0.4	75.5

Source: USDA



Price Policy for KHARIF CROPS

Annex Table 3.1: Simulation-Impact of Oil Content on MSP of Sunflower

Sl. No.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from oil cake on processing of 1 quinal of oilseeds, assuming price of cake/q= 2600	Cost of Oil Content i.e. oilseeds without cake (₹/qtl.), assuming MSP/qtl=5650	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (₹/qtl.) {col(5)/col(2)}*0.25	MSP at Oil Content given in col.(2) [MSP+{Average of col. (6)* percent points of oil content that is over & above 35%}]/(0.25)
			{col(3)*Price of Oil cake}/100	MSP-Col(4)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	35.00	65.00	1690	3960	28.29	5650
2	35.25	64.75	1684	3967	28.13	5678
3	35.50	64.50	1677	3973	27.98	5706
4	35.75	64.25	1671	3980	27.83	5734
5	36.00	64.00	1664	3986	27.68	5762
6	36.25	63.75	1658	3993	27.53	5790
7	36.50	63.50	1651	3999	27.39	5817
8	36.75	63.25	1645	4006	27.25	5845
9	37.00	63.00	1638	4012	27.11	5872
10	37.25	62.75	1632	4019	26.97	5899
11	37.50	62.50	1625	4025	26.83	5926
12	37.75	62.25	1619	4032	26.70	5953
13	38.00	62.00	1612	4038	26.57	5980
14	38.25	61.75	1606	4045	26.43	6006
15	38.50	61.50	1599	4051	26.31	6033
16	38.75	61.25	1593	4058	26.18	6059
17	39.00	61.00	1586	4064	26.05	6085
18	39.25	60.75	1580	4071	25.93	6111
19	39.50	60.50	1573	4077	25.80	6137
20	39.75	60.25	1567	4084	25.68	6163
21	40.00	60.00	1560	4090	25.56	6189
22	40.25	59.75	1554	4097	25.44	6214
23	40.50	59.50	1547	4103	25.33	6240
24	40.75	59.25	1541	4110	25.21	6265
25	41.00	59.00	1534	4116	25.10	6290
26	41.25	58.75	1528	4123	24.98	6315
27	41.50	58.50	1521	4129	24.87	6340
28	41.75	58.25	1515	4136	24.76	6365
29	42.00	58.00	1508	4142	24.65	6390
30	42.25	57.75	1502	4149	24.55	6415
31	42.50	57.50	1495	4155	24.44	6439
32	42.75	57.25	1489	4162	24.34	6464
33	43.00	57.00	1482	4168	24.23	6488
34	43.25	56.75	1476	4175	24.13	6512
35	43.50	56.50	1469	4181	24.03	6536
36	43.75	56.25	1463	4188	23.93	6560
37	44.00	56.00	1456	4194	23.83	6584
38	44.25	55.75	1450	4201	23.73	6608
39	44.50	55.50	1443	4207	23.63	6632
40	44.75	55.25	1437	4214	23.54	6655
41	45.00	55.00	1430	4220	23.44	6679
42	45.25	54.75	1424	4227	23.35	6702
43	45.50	54.50	1417	4233	23.26	6726
44	45.75	54.25	1411	4240	23.17	6749
45	46.00	54.00	1404	4246	23.08	6772
46	46.25	53.75	1398	4253	22.99	6795
47	46.50	53.50	1391	4259	22.90	6818
48	46.75	53.25	1385	4266	22.81	6841
49	47.00	53.00	1378	4272	22.72	6864
50	47.25	52.75	1372	4279	22.64	6887
51	47.50	52.50	1365	4285	22.55	6909
52	47.75	52.25	1359	4292	22.47	6932
53	48.00	52.00	1352	4298	22.39	6954
Average increase in MSP with 0.25 percent increase in oil content					25.03	

Source: CACP Calculations



Annex Table 4.1: Leading Exporters and Importers in World Merchandise Trade, 2017

(Billion dollars and percentage)

Rank	Exporters	Value	Share	Annual Percentage Change from 2016	Rank	Importers	Value	Share	Annual Percentage Change from 2016
1	China	2263	12.8	8	1	USA	2410	13.4	7
2	USA	1547	8.7	7	2	China	1842	10.2	16
3	Germany	1448	8.2	9	3	Germany	1167	6.5	11
4	Japan	698	3.9	8	4	Japan	672	3.7	11
5	Netherlands	652	3.7	14	5	United Kingdom	644	3.6	1
6	South Korea	574	3.2	16	6	France	625	3.5	9
7	Hong Kong, China	550	3.1	6	7	Hong Kong, China	590	3.3	8
	Domestic exports	18	0.1	-28		Retained Imports (1)	138	0.8	6
	Re-exports	532	3	8					
8	France	535	3	7	8	Netherlands	574	3.2	14
9	Italy	506	2.9	10	9	South Korea	478	2.7	18
10	United Kingdom	445	2.5	9	10	Italy	453	2.5	11
11	Belgium	430	2.4	8	11	India	447	2.5	24
12	Canada	421	2.4	8	12	Canada	442	2.5	7
13	Mexico	409	2.3	10	13	Mexico	432	2.4	9
14	Singapore	373	2.1	10	14	Belgium	403	2.2	8
	Domestic exports	188	1.1	16					
	Re-exports	185	1	5					
15	United Arab Emirates (1)	360	2	20	15	Spain	351	1.9	13
16	Russian Federation	353	2	25	16	Singapore	328	1.8	12
						Retained Imports	142	0.8	23
17	Spain	321	1.8	11	17	Switzerland	269	1.5	0
18	Chinese Taipei	317	1.8	13	18	United Arab Emirates (1)	268	1.5	-1
19	Switzerland	300	1.7	-1	19	Chinese Taipei	259	1.4	13
20	India	298	1.7	13	20	Russian Federation (2)	238	1.3	24
21	Thailand	237	1.3	10	21	Turkey	234	1.3	18
22	Poland	231	1.3	14	22	Poland	230	1.3	17
23	Australia	231	1.3	20	23	Australia (1)	229	1.3	17
24	Saudi Arabia (1)	218	1.2	19	24	Thailand	223	1.2	15

(Contd.)

Annexures



Annexures

Annex Table 4.1: Leading Exporters and Importers in World Merchandise Trade, 2017

(Billion dollars and percentage)

Rank	Exporters	Value	Share	Annual Percentage Change from 2016	Rank	Importers	Value	Share	Annual Percentage Change from 2016
25	Malaysia	218	1.2	15	25	Viet Nam	212	1.2	21
26	Brazil	218	1.2	18	26	Malaysia	195	1.1	16
27	Viet Nam	214	1.2	21	27	Austria	176	1	11
28	Czech Republic	180	1	11	28	Czech Republic	162	0.9	13
29	Indonesia	169	1	16	29	Brazil	157	0.9	10
30	Austria	168	0.9	10	30	Indonesia	157	0.9	16
31	Turkey	157	0.9	10	31	Sweden	154	0.9	9
32	Sweden	153	0.9	10	32	Saudi Arabia (1)	131	0.7	-7
33	Ireland	137	0.8	5	33	Hungary	107	0.6	14
34	Hungary	114	0.6	11	34	South Africa (1)	101	0.6	11
35	Denmark	103	0.6	8	35	Philippines	98	0.5	10
36	Norway	102	0.6	14	36	Denmark	93	0.5	9
37	Iran (1)	92	0.5	26	37	Ireland	87	0.5	7
38	South Africa	89	0.5	18	38	Romania	85	0.5	14
39	Slovakia	85	0.5	9	39	Slovakia	83	0.5	10
40	Romania	71	0.4	11	40	Norway	83	0.5	14
41	Chile	68	0.4	13	41	Portugal	78	0.4	15
42	Finland	68	0.4	18	42	Israel (1)	72	0.4	4
43	Qatar (1)	67	0.4	18	43	Finland	70	0.4	15
44	Philippines	63	0.4	10	44	Argentina	67	0.4	20
45	Portugal	62	0.4	12	45	Chile	65	0.4	11
46	Israel	61	0.3	1	46	Egypt	62	0.3	10
47	Argentina	58	0.3	1	47	Pakistan	58	0.3	23
48	Kuwait (1)	56	0.3	21	48	Greece	57	0.3	16
49	Kazakhstan	48	0.3	32	49	Bangladesh	53	0.3	18
50	Nigeria (1)	47	0.3	34	50	Ukraine	49	0.3	26
	Total of above (3)	16585	93.5			Total of above (3)	16519	91.6	
	World (3)	17730	100	11		World (3)	18024	100	11

Notes: (1) Secretariat estimates

(2) Imports are valued at f.o.b.

(3) Includes significant re-exports or imports for re-export

Source: WTO



Annex Table 4.2: Top 10 Exporters and Importers of Agricultural Products, 2017

(Billion dollars and percentage)

	Value	Share in world exports/imports				Annual percentage change in value			
	2017	2000	2005	2010	2017	2010-17	2015	2016	2017
Exporters									
European Union (28)	647	42	44.4	39.4	37.4	3	-13	2	8
Extra-EU(28) exports	173	10.1	9.7	9.4	10	4	-12	2	9
United State of America	170	13	9.8	10.5	9.8	3	-10	-1	5
Brazil	88	2.8	4.1	5.1	5.1	4	-9	-4	14
China	79	3	3.4	3.8	4.6	6	-2	4	5
Canada	67	6.3	4.9	3.8	3.9	4	-7	-1	6
Indonesia	49	1.4	1.7	2.6	2.8	4	-10	-2	24
Thailand	43	2.2	2.1	2.6	2.5	3	-8	1	18
Australia	40	3	2.5	2	2.3	6	-7	-6	17
India	39	1.1	1.2	1.7	2.3	8	-19	-4	16
Argentina	36	2.2	2.3	2.6	2.1	0	-9	7	-4
Top 10	1258	77	76.3	74.1	72.6	-	-	-	-

Importers									
European Union (28)	649	42.7	45.3	40.3	36.6	2	-12	2	7
Extra-EU(28) imports	177	13.2	12.6	11.1	10	2	-9	0	7
China	183	3.3	5	7.8	10.3	8	-6	-3	18
United State of America	161	11.6	10.6	8.4	9.1	5	0	2	1
Japan	79	10.4	7.3	5.6	4.4	0	-10	1	7
Canada (1)	39	2.6	2.4	2.3	2.2	3	-5	-1	3
South Korea	35	2.2	1.9	1.9	2	4	-6	-2	8
India	33	0.7	0.8	1.3	1.9	9	1	5	13
Russian Federation (1)	30	1.3	1.9	2.6	1.7	-3	-33	-6	16
Mexico (1)	29	1.8	1.8	1.7	1.6	3	-8	0	6
Hong Kong, China	29	-	-	-	-	5	-6	3	2
Retained imports (2)	18	1.1	0.8	1	1	4	-9	2	-1
Top 10	1257	77.5	77.9	72.8	70.8	-	-	-	-

Notes: (1) Imports are valued at f.o.b

(2) Secretariat estimates

Source: WTO



Annex Table 4.3: India's Agricultural Exports of Major commodities

(₹ '000 Crore)

Sl. No.	Commodity	Apr-Dec 2017	Apr-Dec 2018(P)	Percent increase/decrease over previous year	Share in Total Agri Export
1	Marine Products	38.0	37.8	-0.5	18.5
2	Rice	36.1	36.7	1.8	18.0
3	Meat & Processed Meat	21.4	20.0	-6.4	9.8
4	Spices	14.7	16.7	13.4	8.1
5	Cotton (Raw)	6.7	10.4	54.8	5.1
6	Oilseeds	5.8	6.0	3.9	2.9
7	Oil Meals	5.4	7.1	31.2	3.5
8	Cashew	4.8	3.6	-25.8	1.7
9	Sugar	4.4	6.0	36.7	2.9
10	Fresh Vegetables	4.0	4.0	-1.4	1.9
11	Guargum Meal	3.0	3.4	16.1	1.7
12	Others	47.6	52.9	11.1	25.9
	Total	191.8	204.5	6.6	100.0

Source: DGCIS

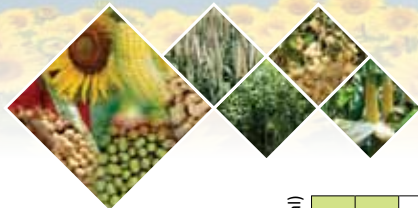


Annex Table 4.4: India's Agricultural Imports of Major commodities

(₹ '000 Crore)

Sl. No.	Commodity	Apr-Dec 2017	Apr-Dec 2018(P)	Percent increase/decrease over previous year	Share in Total Agri Import
1	Vegetable Oils	58.2	52.1	-10.5	42.2
2	Pulses	17.3	5.6	-67.4	4.6
3	Wood And Wood Products	13.3	13.3	0.0	10.8
4	Fresh Fruits	9.4	10.5	11.6	8.5
5	Cashew	7.5	10.4	37.9	8.4
6	Cotton (Raw)	5.5	3.5	-36.2	2.8
7	Sugar	5.1	3.0	-40.9	2.4
8	Spices	4.5	5.5	21.4	4.5
9	Others	18.3	19.4	5.8	15.7
	Total	139.2	123.4	-11.4	100.0

Source: DGCIS



Annexures

Annex Table 4.5: Quarterly Domestic and International Prices of Kharif Crops

S.No.	Quarter	Paddy*		Maize		Jowar		Arhar		Urad		Moong		Cotton**	
		D	I	D	I	D	I	D	I	D	I	D	I	D	I
1	2014 Q1	1495	1552	1311	1297	2110	1385	3929	4090	4679	4226	6141	6841	5033	5392
2	2014 Q2	1529	1408	1330	1280	2156	1312	4140	4285	4992	4798	6277	6937	4886	5144
3	2014 Q3	1510	1625	1369	1055	2185	1117	4761	4667	5802	5354	6423	7052	4796	4337
4	2014 Q4	1470	1669	1259	1074	2083	1245	4432	4836	5208	5242	7182	7947	4139	3953
5	2015 Q1	1434	1657	1332	1084	2167	1478	4955	5527	5499	5914	7288	8189	4090	3980
6	2015 Q2	1409	1583	1362	1068	2087	1366	6006	6925	6501	7583	7285	8127	4066	4263
7	2015 Q3	1363	1574	1398	1099	2020	1233	7696	8568	7397	7842	7057	7241	4150	4282
8	2015 Q4	1458	1586	1448	1102	2031	1162	8798	10884	9499	11040	7855	7878	4491	4259
9	2016 Q1	1442	1673	1456	1080	2136	1174	7591	8083	8521	10374	7009	7436	4569	4196
10	2016 Q2	1432	1827	1519	1145	2123	1163	7999	8785	9925	11254	6623	7022	4509	4425
11	2016 Q3	1461	1802	1578	1028	2289	1018	6816	7384	8855	8905	5463	5246	4788	4963
12	2016 Q4	1489	1635	1433	1026	2283	934	5566	5818	7003	7308	5053	4911	4918	4837
13	2017 Q1	1556	1637	1474	1076	2274	942	4330	4376	6049	5702	4944	5020	5493	5165
14	2017 Q2	1560	1535	1509	1016	2178	1019	3960	3785	5361	5233	5036	5608	4940	5085
15	2017 Q3	1566	1694	1486	972	2367	1077	3842	3760	4925	4340	4776	5340	5007	4757
16	2017 Q4	1638	1686	1356	963	2221	1107	3810	3693	4406	3917	4690	5483	4656	4791
17	2018 Q1	1623	1814	1298	1054	2079	1173	4004	3992	3921	4016	4933	5708	4571	5297
18	2018 Q2	1514	1943	1093	1161	2180	1146	3741	3703	3788	3490	4872	5917	4717	5765
19	2018 Q3	1450	1863	1037	1109	2495	1118	3628	3439	3857	3654	4972	5885	5872	6041
20	2018 Q4	1743	1921	1161	1173	2892	1153	4033	3942	3939	4330	5096	6185	5600	5747

(Contd.)



Annex Table 4.5: Quarterly Domestic and International Prices of Kharif Crops

(₹/Quintal)

S.No.	Quarter	Soybean		Soybean Oil		Soybean Meal		Groundnut		Groundnut Oil		Sunflower Seed		Sunflower Oil	
		D	I	D	I	D	I	D	I	D	I	D	I	D	I
1	2014 Q1	3699	3309	6642	5417	3478	3147	3402	3392	7707	8483	3315	3074	6296	5825
2	2014 Q2	4033	3137	6613	5223	4004	2697	3525	2984	7543	7610	3165	2851	5977	5606
3	2014 Q3	3551	2828	6218	4959	3467	2660	3616	2907	7869	8161	3044	2482	5699	5126
4	2014 Q4	3125	2767	6053	4777	2826	2680	3651	2861	8536	8227	2990	2738	5748	5452
5	2015 Q1	3285	2678	6152	4501	2859	2471	3873	3079	9718	7612	3204	2716	5902	5068
6	2015 Q2	3569	2314	5942	4389	3368	2262	4140	3097	9658	7731	3007	2649	6213	5630
7	2015 Q3	3235	2362	5767	4114	2980	2333	4460	3100	10387	8380	3236	2800	6387	5325
8	2015 Q4	3616	2322	6142	4439	3354	2146	3978	2628	9300	8443	3508	3110	6717	5706
9	2016 Q1	3590	2248	6153	4530	3348	2041	4056	2885	9616	8273	3511	3072	6759	5754
10	2016 Q2	3895	2715	6382	4794	3639	2650	4722	2870	11912	8784	3361	2863	6753	5744
11	2016 Q3	3456	2750	6446	4881	3168	2503	4794	2810	13474	9089	3227	2708	6623	5478
12	2016 Q4	2887	2607	6924	5438	2455	2250	4027	2784	10141	9454	3133	2823	6679	5628
13	2017 Q1	2866	2598	6847	5110	2325	2335	4207	2937	9770	9444	2981	2772	6414	5380
14	2017 Q2	2905	2293	6251	4671	2414	2002	4042	2791	9971	10261	2740	2576	5878	5073
15	2017 Q3	2888	2410	6528	4892	2517	2010	3639	2992	8768	10021	2723	2563	6160	5166
16	2017 Q4	2888	2410	6904	5004	2246	2120	3721	3374	8950	9306	2794	2541	6516	5113
17	2018 Q1	3498	2465	7448	4864	2969	2504	3640	3314	8830	9446	2727	2618	6819	5079
18	2018 Q2	3516	2725	7625	4763	3046	2847	3511	3380	8322	9899	2715	2824	7104	5230
19	2018 Q3	3286	2678	7514	4551	2844	2496	3824	3430	8900	10515	3211	2735	7606	5211
20	2018 Q4	3182	2769	7436	4696	2713	2446	3958	3583	9602	10540	3540	2735	7395	5056

Notes : * International Prices of Rice converted into paddy at the ratio of 0.67.

** International Prices of Cotton (lint) converted into Kapas at the ratio of 0.41.

D: Domestic, I: International

Sources: 1. DES for domestic wholesale prices for Paddy, Maize, Jowar, Arhar, Urad, Moong, Cotton, Soybean, Groundnut and Sunflower Seed.

2. The Solvent Extractors Association of India for domestic prices for Soybean Oil, Soybean Meal, Groundnut Oil and Sunflower Oil.

3. World Bank for International Prices of Paddy*, Maize, Jowar, Cotton**, Soybean, Soybean Oil, Soybean Meal, Groundnut Oil, Sunflower seed and Sunflower Oil

4. NAFED for International Prices of Pulses viz. Arhar, Urad & Moong.

Annexures



PRICE Policy for **KHARIF CROPS**

Annex Table 4.6: Import Duty on Edible Oils

(percent)

Products	11.09.2017	17.11.2017	01.02.2018	01.03.2018	14.06.2018	01.01.2019
Malaysia						
Crude Palm Oil	15.0	30.0	30.0	44.0	44.0	40.0
RBD Palmolin	25.0	40.0	40.0	54.0	54.0	45.0
Indonesia	0.0	0.0	0.0	0.0	0.0	0.0
Crude Palm Oil	15.0	30.0	30.0	44.0	44.0	40.0
RBD Palmolin	25.0	40.0	40.0	54.0	54.0	50.0
Crude Soyabean Oil	12.5	12.5	30.0	30.0	35.0	35.0
Crude Sunflower Oil	12.5	25.0	25.0	25.0	35.0	35.0
Refined Soyabean Oil	20.0	35.0	35.0	35.0	45.0	45.0
Refined Sunflower Oil	20.0	35.0	35.0	35.0	45.0	45.0
Crude Groundnut Oil	12.5	12.5	30.0	30.0	35.0	35.0
Refined Groundnut Oil	20.0	20.0	35.0	35.0	45.0	45.0

Source: CBEC/CBIC



Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4 -Col.2)	Percent (Col.5/Col.2) *100	₹/ha (Col.4- Col.3)	Percent (Col.7/Col.3) *100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paddy							
Andhra Pradesh	42477	51624	89068	46592	110	37444	73
Assam	22780	39353	37982	15202	67	-1371	-3
Bihar	22101	28860	42254	20152	91	13393	46
Chhattisgarh	26008	33946	46559	20551	79	12613	37
Gujarat	38484	43456	74058	35574	92	30601	70
Haryana	35014	46714	104695	69682	199	57981	124
Himachal Pradesh	9463	28467	43510	34047	360	15043	53
Jharkhand	18207	25471	37178	18971	104	11707	46
Kerala	52351	56750	94073	41723	80	37323	66
Karnataka	40003	49262	97937	57934	145	48674	99
Madhya Pradesh	22217	31331	41163	18946	85	9832	31
Maharashtra	47710	58901	55411	7701	16	-3490	-6
Odisha	27466	45102	46604	19138	70	1502	3
Punjab	34641	41005	106892	72251	209	65886	161
Tamilnadu	47071	55339	77931	30860	66	22591	41
Uttarakhand	21317	32146	63512	42195	198	31365	98
Uttar Pradesh	29692	41052	49589	19897	67	8537	21
West Bengal	38777	57064	61712	22935	59	4649	8
ALL-INDIA	32074	43462	61136	29062	91	17675	41

(Contd.)



PRICE Policy for KHARIF CROPS

Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4- Col.2)	Percent (Col.5/ Col.2)*100	₹/ha (Col.4- Col.3)	Percent (Col.7/ Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Maize							
Andhra Pradesh	34481	42034	77811	43329	126	35777	85
Bihar	22522	31189	46555	24034	107	15367	49
Gujarat	23284	34513	35903	12618	54	1390	4
Himachal Pradesh	10937	26140	27071	16134	148	931	4
Karnataka	26726	31583	47318	20592	77	15735	50
Madhya Pradesh	19781	27241	33236	13456	68	5995	22
Maharashtra	44374	56020	65211	20837	47	9191	16
Punjab	32386	39551	50656	18270	56	11105	28
Rajasthan	15849	35358	38731	22882	144	3373	10
Tamilnadu	49618	63962	80384	30766	62	16422	26
Uttar Pradesh	15507	26339	31653	16146	104	5313	20
ALL-INDIA	26672	36837	49098	22426	84	12261	33
Jowar							
Andhra Pradesh	17747	24364	35197	17450	98	10833	44
Karnataka	12486	15761	22257	9771	78	6496	41
Madhya Pradesh	14371	22198	28039	13668	95	5841	26
Maharashtra	22550	29194	33295	10745	48	4101	14
Rajasthan	10180	20240	28415	18234	179	8175	40
Tamilnadu	17049	22565	35001	17952	105	12436	55
ALL-INDIA	18387	24741	30597	12210	66	5856	24

(Contd.)



Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4- Col.2)	Percent (Col.5/ Col.2)*100	₹/ha (Col.4- Col.3)	Percent (Col.7/ Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bajra							
Gujarat	28472	36876	56743	28271	99	19867	54
Haryana	15611	26403	30612	15001	96	4208	16
Maharashtra	26195	36399	31926	5731	22	-4473	-12
Rajasthan	8312	19030	23207	14895	179	4178	22
Uttar Pradesh	16048	24520	38858	22811	142	14338	58
ALL-INDIA	13473	23643	29401	15928	118	5758	24
Ragi							
Karnataka	32740	41555	43733	10993	34	2178	5
Uttarakhand	5112	20710	30341	25229	494	9631	47
ALL-INDIA	28825	38588	41847	13022	45	3259	8
Arhar (Tur)							
Andhra Pradesh	23892	29642	42884	18992	79	13242	45
Gujarat	23866	32574	59511	35645	149	26937	83
Karnataka	18857	23115	47951	29094	154	24837	107
Madhya Pradesh	16224	23944	48197	31972	197	24253	101
Maharashtra	41815	54002	100063	58249	139	46061	85
Odisha	6945	14701	23545	16600	239	8843	60
Uttar Pradesh	14535	24070	57561	43025	296	33491	139
ALL-INDIA	26249	34696	65296	39047	149	30600	88

(Contd.)



Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4- Col.2)	Percent (Col.5/ Col.2)*100	₹/ha (Col.4- Col.3)	Percent (Col.7/ Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Moong							
Andhra Pradesh	15078	17761	24517	9438	63	6756	38
Gujarat	18238	23784	38323	20085	110	14539	61
Karnataka	12680	14915	24061	11381	90	9146	61
Maharashtra	21936	27910	28035	6100	28	125	0.4
Odisha	6287	13844	18489	12203	194	4645	34
Rajasthan	7718	16335	28736	21018	272	12401	76
ALL-INDIA	11732	18204	26875	15143	129	8671	48
Urad							
Andhra Pradesh	15580	17142	60029	44449	285	42887	250
Madhya Pradesh	14715	19528	40273	25558	174	20745	106
Maharashtra	19032	26503	33677	14645	77	7174	27
Odisha	6493	14849	25436	18943	292	10588	71
Tamilnadu	19107	23675	45771	26664	140	22096	93
Uttar Pradesh	9236	14441	25187	15951	173	10746	74
ALL-INDIA	14455	19261	39333	24877	172	20072	104

(Contd.)



Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4- Col.2)	Percent (Col.5/ Col.2)*100	₹/ha (Col.4- Col.3)	Percent (Col.7/ Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Groundnut							
Andhra Pradesh	35313	41506	56229	20916	59	14722	35
Gujarat	47702	57993	92538	44836	94	34544	60
Karnataka	32082	38298	45506	13424	42	7208	19
Maharashtra	48197	62343	53579	5382	11	-8764	-14
Odisha	24017	40575	51376	27359	114	10801	27
Rajasthan	29866	39346	110435	80569	270	71089	181
Tamilnadu	47109	58644	74778	27669	59	16134	28
ALL-INDIA	40153	49190	74240	34087	85	25050	51
Soybean							
Andhra Pradesh	29028	34382	35739	6711	23	1357	4
Madhya Pradesh	20141	24988	33041	12901	64	8053	32
Maharashtra	31096	35701	38640	7544	24	2939	8
Rajasthan	16503	23515	26261	9758	59	2746	12
ALL-INDIA	23662	28652	34366	10704	45	5714	20
Sunflower							
Andhra Pradesh	22477	28035	25797	3320	15	-2238	-8
Karnataka	16215	19345	28172	11957	74	8827	46
ALL-INDIA	17223	20704	27834	10611	62	7130	34
Sesamum							
Andhra Pradesh	16895	19935	26743	9848	58	6808	34
Gujarat	21543	28813	55835	34292	159	27022	94
Madhya Pradesh	12231	17849	35381	23149	189	17532	98
Rajasthan	4767	12860	19726	14959	314	6866	53
Uttar Pradesh	7629	11893	23603	15974	209	11710	98
West Bengal	20787	30448	36774	15987	77	6326	21
ALL-INDIA	11989	18412	31083	19094	159	12671	69

(Contd.)



Annex Table 5.1: State-wise Average Gross Returns over Actual Cost of Cultivation of Kharif Crops, TE2016-17

Crop/State	CoC A ₂	CoC A ₂ +FL	GVO	Gross Returns over CoC A ₂		Gross Returns over CoC A ₂ +FL	
	₹/ha			₹/ha (Col.4- Col.2)	Percent (Col.5/ Col.2)*100	₹/ha (Col.4- Col.3)	Percent (Col.7/ Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nigerseed							
Odisha	6200	14174	12465	6265	101	-1710	-12
ALL-INDIA	6200	14174	12465	6265	101	-1710	-12
Cotton							
Andhra Pradesh	45658	54402	71885	26226	57	17482	32
Gujarat	44237	55532	84756	40519	92	29224	53
Haryana	28967	44844	55527	26560	92	10682	24
Karnataka	37701	43985	70175	32474	86	26190	60
Maharashtra	47335	57121	73848	26513	56	16727	29
Odisha	24547	43912	50887	26340	107	6975	16
Punjab	42552	51395	76820	34268	81	25425	49
Rajasthan	25317	49842	90787	65470	259	40944	82
Tamilnadu	52723	73259	93313	40590	77	20054	27
ALL-INDIA	43559	54374	75498	31938	73	21123	39

Source: CACP estimates using CS data



Annex Table 5.2: State-wise Average Monthly Wage Rates for Agricultural Labour (Man)

Year/Month	AP	Asm	Bih	Guj	Har	HP	Kar	Ker	MP	MH	Odi	Pun	Raj	TN	UP	WB	All-India
2015																	
January	246	235	219	194	338	363	254	643	178	225	201	286	298	430	200	241	249
February	250	234	221	194	335	363	252	643	179	225	202	290	287	440	202	241	249
March	245	226	228	194	341	363	253	642	179	226	202	281	284	429	205	242	248
April	245	225	230	195	340	363	253	652	182	231	201	277	291	403	209	242	249
May	235	231	231	196	345	362	260	652	183	232	200	292	279	405	208	242	249
June	239	239	237	196	346	351	260	664	188	228	203	311	282	399	207	240	250
July	229	236	242	203	350	361	269	664	186	234	206	311	295	393	211	240	253
August	241	238	246	203	355	366	277	653	188	233	202	304	300	404	214	239	257
September	241	239	246	203	354	372	278	656	190	228	196	303	304	394	214	241	256
October	240	236	244	203	354	367	279	656	189	233	200	298	298	392	215	237	256
November	276	243	243	203	351	374	285	657	182	228	204	301	303	382	216	237	259
December	278	241	245	203	361	379	286	657	180	229	200	301	302	383	219	248	260
2016																	
January	276	235	248	206	354	371	285	664	183	231	199	288	276	381	218	251	256
February	254	233	248	206	359	371	281	666	182	229	195	300	270	383	217	252	253
March	250	234	246	213	359	371	280	670	186	231	206	292	277	406	217	254	256
April	272	240	246	214	362	395	278	670	188	232	198	310	260	406	223	254	257
May	256	241	248	214	368	369	283	665	186	247	199	312	266	400	223	256	258
June	254	255	249	214	368	370	288	665	190	249	210	321	265	396	222	259	260
July	257	255	251	219	368	373	295	665	189	238	207	313	289	408	225	259	264
August	262	253	252	219	368	379	293	665	188	246	213	296	283	411	225	258	264
September	263	254	247	219	368	379	293	665	192	248	209	288	284	412	221	254	263
October	263	254	247	219	368	391	290	665	199	249	203	306	284	409	221	257	265
November	271	254	247	219	368	387	297	665	199	255	207	307	281	406	227	260	267
December	284	259	247	219	368	387	298	665	201	255	217	305	279	406	225	263	269

(Contd.)

Annexures



Annexures

Annex Table 5.2: State-wise Average Monthly Wage Rates for Agricultural Labour (Man)

Year/Month	AP	Asm	Bih	Guj	Har	HP	Kar	Ker	MP	MH	Odi	Pun	Raj	TN	UP	WB	All-India
2017																	
January	286	259	249	225	362	417	303	675	204	255	222	321	272	412	226	265	271
February	286	261	251	227	363	387	302	675	207	259	220	318	281	413	229	264	273
March	290	256	250	227	363	417	300	675	208	262	223	318	293	413	231	264	276
April	291	257	251	229	361	408	300	682	210	269	227	326	283	413	270	232	280
May	288	256	251	229	363	406	301	687	214	275	229	335	266	413	232	265	275
June	269	256	251	229	363	404	300	687	215	280	227	335	281	410	233	264	276
July	281	252	255	230	373	425	301	687	217	277	235	327	288	415	241	268	280
August	276	258	258	230	365	423	305	687	216	271	231	327	290	412	247	268	280
September	280	272	260	234	365	429	306	687	215	265	227	345	287	416	248	270	281
October	277	282	259	234	367	399	306	687	211	265	226	348	279	416	246	275	279
November	282	281	261	234	367	423	310	687	208	269	222	342	289	417	244	277	281
December	291	275	262	234	367	419	315	687	209	268	225	349	291	417	243	279	282
2018																	
January	312	277	264	236	367	439	321	691	212	268	226	349	267	424	243	275	283
February	308	278	269	236	367	439	322	691	214	267	225	341	283	444	243	277	286
March	320	278	270	238	368	445	320	698	216	273	223	332	279	445	240	278	287
April	321	280	271	238	367	445	322	698	217	272	223	341	294	445	239	277	290
May	327	279	269	238	368	410	324	698	220	277	229	339	315	445	240	276	294
June	294	282	270	239	368	439	329	719	216	276	227	351	311	440	242	278	291
July	305	289	271	241	376	436	333	719	219	280	229	355	325	440	249	280	297
August	308	289	274	241	383	451	336	726	217	282	231	355	326	449	258	278	299
September	309	291	275	241	380	454	336	726	220	284	230	353	312	452	257	278	298
October	316	277	276	241	373	418	339	735	218	282	231	355	315	460	257	281	299
November	318	280	276	242	371	425	341	735	215	281	230	358	322	460	254	283	300

Note: Daily Wage rate - Average of five operations i.e. Ploughing, Sowing, Weeding, Transplanting and Harvesting
Source: Labour Bureau, Ministry of Labour & Employment, Government of India



Annex Table 5.3: Farm Inputs - Wholesale Price Index (Base 2011-12=100)

Year/Month	High Speed Diesel (HSD)	Fertilizers and nitrogen compounds	Electricity	Agricultural tractors	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products
2012								
April	111.9	108.1	97.4	103.9	106.0	106.7	107.9	105.9
May	111.5	109.7	100.8	103.9	106.0	109.8	105.3	106.4
June	109.6	111.8	102.5	104.1	110.3	112.6	101.7	106.1
July	108.5	113.5	101.8	103.8	110.3	118.3	107.0	106.5
August	111.0	113.6	98.5	104.2	110.3	123.3	111.3	107.9
September	114.3	114.5	97.4	104.0	110.3	128.7	118.6	109.1
October	108.4	114.6	101.4	104.7	110.3	131.1	122.8	108.3
November	108.0	115.4	101.6	104.6	110.3	131.9	125.0	108.9
December	108.1	114.9	101.3	104.7	110.3	130.9	124.9	108.1
2013								
January	112.0	114.6	104.5	104.7	110.3	129.7	121.9	107.5
February	117.6	114.9	100.6	104.9	110.3	130.5	127.4	107.3
March	118.4	116.1	98.2	105.1	110.3	133.8	128.9	107.5
April	114.6	115.3	101.1	105.9	112.1	138.2	126.3	109.1
May	112.1	115.4	101.0	103.6	112.1	139.5	124.7	105.4
June	117.1	116.2	101.5	104.1	112.1	140.0	131.9	107.0
July	123.4	116.7	102.3	104.1	112.1	140.2	136.2	109.7
August	126.3	116.5	103.1	103.9	115.3	140.4	137.1	111.1
September	132.8	116.7	104.6	104.3	115.3	142.0	138.2	112.3
October	130.1	116.4	103.3	104.7	115.3	142.8	138.6	113.0
November	130.3	116.8	103.1	104.6	115.3	143.4	140.2	113.1
December	132.5	116.6	105.6	104.1	115.3	142.3	141.6	113.8
2014								
January	131.8	116.7	105.8	104.3	115.3	140.6	144.3	113.2
February	131.6	117.0	105.9	104.4	115.3	140.8	149.5	110.9
March	133.1	117.7	106.4	104.8	115.3	141.8	156.0	115.1
April	130.0	116.9	106.0	106.3	117.0	144.0	147.5	118.6
May	131.2	117.8	102.7	106.7	117.0	147.5	139.3	118.6
June	129.0	118.6	101.9	106.4	117.0	146.6	142.3	120.7
July	131.6	118.6	102.7	107.0	117.0	146.0	142.0	120.3
August	130.9	118.6	106.1	106.8	117.0	144.2	145.5	118.3
September	129.6	118.8	104.9	106.9	120.0	141.5	154.1	124.0
October	125.8	119.1	104.3	107.1	120.0	138.9	155.0	121.9
November	112.7	119.4	106.5	107.1	120.0	137.1	156.1	121.9
December	103.5	119.6	108.4	107.6	120.0	137.2	156.9	118.6

(Contd.)



Price Policy for Kharif Crops

Annex Table 5.3: Farm Inputs - Wholesale Price Index (Base 2011-12=100)

Year/Month	High Speed Diesel (HSD)	Fertilizers and nitrogen compounds	Electricity	Agricultural tractors	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products
2015								
January	87.9	119.0	109.1	108.0	120.0	138.4	155.8	122.9
February	79.1	119.5	107.8	108.1	120.0	139.0	150.8	122.5
March	86.6	120.3	107.5	108.1	120.1	138.7	143.1	119.6
April	83.3	120.5	108.0	111.0	120.8	140.8	139.5	121.6
May	91.7	120.9	106.1	110.9	120.8	143.5	138.4	122.9
June	92.7	120.7	105.9	111.0	120.8	144.8	142.8	122.7
July	86.5	120.9	106.5	111.3	120.8	145.0	150.5	124.9
August	73.1	121.7	105.4	110.9	120.8	147.2	165.9	122.7
September	71.3	122.3	106.3	110.7	120.8	148.8	166.6	123.6
October	73.8	122.1	103.1	111.8	120.8	150.6	168.7	124.1
November	74.2	121.4	104.5	111.9	120.8	150.4	172.9	123.1
December	72.3	121.4	104.9	111.9	120.8	150.3	176.2	121.6
2016								
January	57.1	121.6	105.9	111.7	120.8	151.3	173.3	122.6
February	50.3	121.6	103.5	111.7	120.8	153.8	170.3	121.8
March	54.9	121.3	102.9	111.9	120.8	154.4	171.6	119.5
April	59.1	121.3	101.1	113.7	120.8	155.4	167.1	116.7
May	66.5	121.1	102.2	113.0	120.8	155.9	161.4	118.8
June	75.0	121.0	102.8	113.0	120.8	158.9	170.2	117.7
July	74.7	120.3	102.7	113.1	120.8	161.3	170.1	117.1
August	67.0	119.1	103.2	113.6	114.8	161.8	162.7	116.0
September	70.7	118.3	103.8	113.9	114.8	160.9	162.9	116.5
October	72.6	118.3	103.9	113.8	114.8	159.0	165.4	115.3
November	76.5	117.8	105.9	113.8	114.8	158.6	163.5	115.3
December	77.3	116.7	106.2	113.5	114.8	157.9	163.5	115.5
2017								
January	83.4	117.0	107.9	113.8	114.8	157.3	163.0	117.9
February	85.0	116.7	107.4	114.2	114.8	157.6	165.9	117.0
March	84.9	116.8	102.7	113.3	114.8	155.2	159.8	117.2
April	81.5	117.1	103.3	114.0	114.8	155.7	159.5	116.8
May	81.3	117.2	102.8	114.0	114.0	156.4	157.4	117.2
June	80.0	116.4	102.0	114.3	113.3	155.4	157.2	116.9
July	78.8	116.0	102.0	113.5	112.9	154.5	162.4	115.3
August	80.9	116.5	100.6	114.1	112.9	154.6	163.1	114.9
September	82.5	116.5	106.1	114.5	112.9	154.9	160.2	113.7
October	84.5	116.8	106.1	114.3	112.9	154.0	154.7	112.9
November	85.8	116.7	102.7	114.0	112.9	152.9	143.9	114.0
December	87.1	116.8	102.4	113.8	112.9	151.2	132.7	114.8
2018								
January	89.5	117.4	105.0	114.4	114.0	150.6	132.3	115.3
February	91.3	118.6	105.4	114.3	117.3	154.3	134.3	114.8
March	90.1	118.9	105.4	115.3	117.3	154.4	136.3	117.0
April	92.5	118.3	104.9	115.4	117.3	154.7	137.0	118.2
May	95.4	118.8	110.7	114.8	117.3	154.8	135.2	118.2
June	97.5	118.7	109.6	115.6	117.3	154.9	134.6	117.9
July	96.8	119.3	109.6	116.0	117.3	154.5	128.8	119.1
August	97.0	120.0	109.4	116.5	117.3	156.1	131.0	119.1
September	100.8	120.5	112.4	117.1	130.2	155.1	131.7	120.4
October	104.9	121.6	112.4	116.9	130.2	155.2	130.8	119.9
November	103.1	122.8	112.4	117.4	130.2	159.3	130.5	121.0

Source : Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India



**Annex Table 5.4: All-India Projected Costs of Production of Kharif Crops
for marketing season 2019-20 over marketing season 2018-19**

Crops	Cost of Production (₹/qtl)				Percentage Change in Projected Cost (2019-20 over 2018-19)	
	2018-19		2019-20			
	A ₂ +FL	C ₂	A ₂ +FL	C ₂	A ₂ +FL	C ₂
Paddy	1,166	1,560	1,208	1,619	3.60	3.78
Jowar	1,619	2,183	1,698	2,324	4.88	6.46
Bajra	990	1,324	1,083	1,463	9.39	10.50
Maize	1,131	1,480	1,171	1,570	3.54	6.08
Ragi	1,931	2,370	2,100	2,672	8.75	12.74
Arhar (Tur)	3,432	4,981	3,636	5,417	5.94	8.75
Moong	4,650	6,161	4,699	6,359	1.05	3.21
Urad	3,438	4,989	3,477	5,460	1.13	9.44
Groundnut	3,260	4,186	3,394	4,352	4.11	3.97
Soybean	2,266	2,972	2,473	3,422	9.14	15.14
Sunflower	3,592	4,501	3,767	4,957	4.87	10.13
Sesamum	4,166	6,053	4,322	6,125	3.74	1.19
Nigerseed	3,918	5,135	3,960	5,913	1.07	15.15
Cotton	3,433	4,514	3,501	4,678	1.98	3.63

Source: CACP estimates using CS data



Price Policy for Kharif Crops

Annex Table 5.5: Projected Cost of Production (A_2 , A_2+FL & C_2) for Kharif Crops during Marketing Season 2019-20 and Production Shares during TE2017-18

States	Cost of Production (₹/qtl)			Shares in Production (%)
	A ₂	A ₂ +FL	C ₂	
Paddy				
A.P.	896	1089	1550	11.87
Assam	780	1341	1697	4.74
Bihar	826	1077	1441	7.25
Chhattisgarh	815	1063	1445	5.86
Gujarat	986	1114	1367	1.79
Haryana	819	1093	1753	4.14
H.P.	393	1177	1564	0.12
Jharkhand	952	1333	1721	3.41
Karnataka	882	1088	1501	2.66
Kerala	1251	1355	1767	0.47
M.P.	971	1369	1762	3.76
Maharashtra	1783	2196	2652	2.66
Odisha	881	1444	1773	6.55
Punjab	606	717	1204	11.62
Tamil Nadu	1067	1255	1633	5.42
U.P.	863	1194	1648	12.48
Uttarakhand	677	1018	1326	0.61
W.B.	1009	1483	1813	14.60
All India Wtd. Avg.	894	1208	1619	100.00
Jowar				
Andhra Pradesh	981	1342	2026	8.56
Karnataka	1621	2061	2843	23.03
Madhya Pradesh	921	1432	1834	10.59
Maharashtra	1349	1753	2309	41.83
Rajasthan	641	1271	1735	7.81
Tamil Nadu	1145	1515	2446	8.18
All India Wtd. Avg.	1263	1698	2324	100.00

(Contd.)



Annex Table 5.5: Projected Cost of Production (A_2 , A_2 +FL & C_2) for Kharif Crops during Marketing Season 2019-20 and Production Shares during TE2017-18

States	Cost of Production (₹/qtl)			Shares in Production (%)
	A ₂	A ₂ +FL	C ₂	
Bajra				
Gujarat	801	1037	1321	11.24
Haryana	650	1100	1601	9.96
Maharashtra	1592	2210	2702	7.45
Rajasthan	454	1038	1410	48.74
Uttar Pradesh	540	822	1182	22.62
All India Wtd. Avg.	617	1083	1463	100.00
Maize				
Andhra Pradesh	688	839	1297	18.03
Bihar	634	877	1222	11.14
Gujarat	1301	1928	2278	2.98
Himachal Pradesh	679	1609	2090	3.15
Karnataka	894	1056	1432	14.85
Madhya Pradesh	813	1117	1487	13.81
Maharashtra	1143	1445	1798	12.88
Punjab	855	1045	1373	1.89
Rajasthan	777	1737	2163	6.11
Tamil Nadu	948	1221	1642	8.88
Uttar Pradesh	778	1315	1789	6.29
All India Wtd. Avg.	844	1171	1570	100.00
Ragi				
Karnataka	1758	2228	2842	88.05
Uttarakhand	295	1161	1415	11.95
All India Wtd. Avg.	1583	2100	2672	100.00
Arhar (Tur)				
Andhra Pradesh	3862	4777	7259	9.60
Gujarat	2926	4000	5071	9.44
Karnataka	2747	3369	4973	18.20
Madhya Pradesh	1990	2913	4662	21.30
Maharashtra	2935	3847	5546	29.65
Odisha	2205	4638	7051	3.47
Uttar Pradesh	1910	3170	5446	8.33
All India Wtd. Avg.	2677	3636	5417	100.00

(Contd.)



Price Policy for Kharif Crops

Annex Table 5.5: Projected Cost of Production (A_2 , A_2+FL & C_2) for Kharif Crops during Marketing Season 2019-20 and Production Shares during TE2017-18

States	Cost of Production (₹/qtl)			Shares in Production (%)
	A ₂	A ₂ +FL	C ₂	
Moong				
Andhra Pradesh	3513	4116	6301	12.90
Karnataka	3648	4305	6088	7.21
Gujarat	3569	4621	5818	5.94
Maharashtra	5389	6803	8698	12.34
Odisha	2186	4810	6687	7.65
Rajasthan	2083	4402	5887	53.96
All India Wtd. Avg.	2884	4699	6359	100.00
Urad				
Andhra Pradesh	1857	2018	4353	20.07
Madhya Pradesh	2399	3176	4757	45.77
Maharashtra	4540	6264	7963	7.20
Odisha	2210	5052	7304	1.68
Tamil Nadu	3705	4530	6327	9.71
Uttar Pradesh	2637	4125	7058	15.56
All India Wtd. Avg.	2605	3477	5460	100.00
Groundnut				
Andhra Pradesh	2492	2919	4252	15.71
Gujarat	2848	3458	4212	44.31
Karnataka	4079	4869	6087	6.45
Maharashtra	4421	5659	6979	5.10
Odisha	2329	3940	5388	0.69
Rajasthan	1265	1658	2540	16.20
Tamil Nadu	3517	4376	5377	11.53
All India Wtd. Avg.	2769	3394	4352	100.00
Soybean				
Andhra Pradesh	3149	3694	4837	2.63
Madhya Pradesh	1686	2092	3002	53.68
Maharashtra	2441	2796	3816	33.51
Rajasthan	2175	3102	3973	10.18
All India Wtd. Avg.	2027	2473	3422	100.00
Sunflower				
Andhra Pradesh	3047	3769	5247	13.60
Karnataka	3153	3766	4911	86.40
All India Wtd. Avg.	3139	3767	4957	100

(Contd.)



Annex Table 5.5: Projected Cost of Production (A_2 , A_2 +FL & C_2) for Kharif Crops during Marketing Season 2019-20 and Production Shares during TE2017-18

States	Cost of Production (₹/qtl)			Shares in Production (%)
	A ₂	A ₂ +FL	C ₂	
Sesamum				
A.P.	5086	6000	8385	3.23
Gujarat	4633	6194	7788	10.31
M.P.	2620	3823	5660	25.61
Rajasthan	2095	5626	7909	13.29
West Bengal	2198	3203	4226	31.78
Uttar Pradesh	3022	4724	7654	15.77
All India Wtd. Avg.	2767	4322	6125	100.00
Nigerseed				
Odisha	1736	3960	5913	100.00
All India Wtd. Avg.	1736	3960	5913	100.00
Cotton				
Andhra Pradesh	3047	3639	5103	18.98
Gujarat	2454	3082	3978	33.49
Haryana	2076	3216	5094	5.10
Karnataka	2852	3327	4652	4.63
Maharashtra	3348	4039	5179	26.99
Odisha	2364	4201	5427	1.19
Punjab	2803	3382	4806	3.35
Rajasthan	1498	2948	4100	4.93
Tamil Nadu	3292	4576	5719	1.33
All India Wtd. Avg.	2781	3501	4678	100.00

Note: Production shares are related to production of projected States only

Source: CACP estimates using CS data



Annexures

Annex Table 5.6a: Paddy - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Assam		Bihar		Chhattisgarh		Gujarat		Haryana		Himachal Pradesh		Jharkhand		Karnataka	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost																		
Human Labour	52678.42	48931.76	36195.91	41819.08	29205.41	29443.36	34056.80	33747.88	41083.72	41500.67	47092.31	45841.83	27549.81	29452.84	24843.31	24564.81	52126.76	46064.80
Casual	16001.31	14737.46	4793.25	5590.30	9285.03	9517.50	6697.89	6549.09	14553.97	14807.50	11704.63	11382.89	1159.56	546.75	6923.56	6545.91	15012.79	10517.69
Attached	599.18	535.42	167.16	139.89	40.56	60.73	16.15	10.50	108.41	241.49	401.14	302.10	0.00	0.00	1.18	0.68	0.00	0.00
Family	10047.05	8118.24	15777.49	18302.00	6726.21	6908.38	8331.80	8370.54	4971.96	4653.56	11938.68	12312.47	18275.32	21294.86	7226.58	7877.11	7319.10	9828.63
Total	26647.54	23391.12	20737.90	24032.19	16051.80	16486.61	15045.84	14930.13	19634.34	19702.55	24044.45	23997.46	19434.88	21841.61	14151.32	14423.70	22331.89	20346.32
Bullock Labour																		
Hired	191.14	295.20	120.82	133.23	0.00	0.00	303.86	503.55	27.11	1.50	0.00	0.00	351.31	492.31	31.26	6.24	807.18	541.12
Owned	308.32	469.81	8246.89	9899.92	80.85	111.73	2999.10	2468.09	229.28	237.21	11.64	20.96	1991.48	1849.13	1696.34	1065.22	1040.15	4172.48
Total	499.46	765.01	8367.71	10033.15	80.85	111.73	3302.96	2971.64	256.39	238.71	11.64	20.96	2342.79	2341.44	1727.60	1071.46	1847.33	4713.60
Machine Labour																		
Hired	9399.22	9758.82	2788.70	3121.11	3776.56	3926.31	5948.45	6654.60	4495.19	5056.78	4572.81	4729.28	1811.24	1854.35	2996.09	3383.40	7808.07	4556.58
Owned	106.15	195.17	655.35	731.77	24.47	88.73	187.29	172.68	841.03	1238.27	988.46	1202.69	53.39	69.01	42.81	123.96	862.36	585.91
Total	9505.37	9953.99	3444.05	3852.88	3801.03	4015.04	6135.74	6827.28	5336.22	6295.05	5561.27	5931.97	1864.63	1923.36	3038.90	3507.36	8670.43	5142.49
Seed	2004.99	1994.75	1096.93	1118.49	1802.55	1946.01	1809.04	1700.57	4651.27	4919.70	1207.57	1369.02	2066.39	1950.33	2094.84	2003.66	2968.38	3010.00
Fertilisers and Manure																		
Fertilisers	7289.75	7113.67	740.93	840.21	2820.69	2980.83	3453.37	3288.17	5188.29	4634.96	4579.24	4663.03	390.43	310.56	2728.64	2633.94	8200.57	6430.14
Manure	928.40	544.82	685.01	745.29	304.48	244.67	1407.62	1495.38	598.95	985.57	2.64	42.36	582.78	333.51	483.30	401.23	3539.96	2010.42
Total	8218.15	7658.49	1425.94	1585.50	3125.17	3225.50	4860.99	4783.55	5787.24	5620.53	4581.88	4705.39	973.21	644.07	3211.94	3035.17	11740.53	8440.56
Other Inputs																		
Insecticides	3102.19	2722.20	36.38	43.42	38.00	21.17	1008.24	1041.78	772.73	1051.15	2564.32	2290.73	403.50	449.88	0.00	0.00	2098.04	2278.71
Irrigation charges	1312.95	1144.88	468.26	440.81	3624.82	2954.42	723.76	413.47	3543.43	2542.01	8050.50	6413.58	183.37	54.94	84.87	17.77	1112.35	1025.79
Interest on working capital	1291.86	1236.77	618.74	712.64	681.19	682.88	779.55	769.01	1094.30	1116.57	1065.26	1016.04	281.04	247.21	533.84	505.69	1357.81	1098.07
Miscellaneous	95.91	64.55	0.00	0.00	0.00	0.00	390.68	310.45	7.80	14.40	5.42	96.68	0.00	0.00	0.00	0.00	0.00	9.26
Fixed Cost	29132.98	31371.96	13601.32	14372.40	13480.44	14047.92	15258.54	15477.48	15137.04	15664.92	35334.64	36576.91	11838.05	12892.21	12174.53	12467.75	23570.55	27933.24
Rental value of owned land	26348.62	27952.17	8764.60	9318.42	10484.52	11278.24	11131.36	11079.48	10626.38	10988.99	29079.05	30851.36	9096.85	10134.39	9389.68	9913.93	20482.41	23944.95
Rent paid for leased-in land	121.23	411.78	348.08	464.62	0.00	0.00	0.00	0.00	1849.30	2298.42	0.00	158.12	231.03	206.75	210.22	143.71	0.00	0.00
Land revenue, cesses & taxes	2.35	0.83	49.74	49.97	65.03	63.91	2.64	2.59	8.37	9.50	0.00	0.00	7.36	8.40	55.55	52.81	16.52	16.14
Depreciation on implements & Farm buildings	306.28	327.98	836.58	879.72	520.73	419.97	1100.12	1246.22	187.07	127.87	618.44	398.03	520.48	530.05	839.02	705.61	249.58	608.47
Interest on fixed capital	2354.50	2679.20	3602.32	3659.67	2410.16	2285.80	3024.42	3149.19	2465.92	2240.14	5637.15	5169.40	1982.33	2012.62	1680.06	1651.69	2822.04	3363.68
Total Cost	81811.40	80303.72	49797.23	56191.48	42685.85	43491.28	49315.34	49253.36	56220.76	57165.59	82426.95	82418.74	39387.86	42345.05	37017.84	37032.56	75697.31	73998.04
Yield	58.63	60.02	32.82	32.69	27.49	30.81	31.88	34.42	43.17	44.02	52.27	50.97	20.34	21.22	21.77	24.71	51.88	52.64
A₂ + FL/Qtl	857.79	782.52	1052.18	1210.62	887.27	796.77	981.00	916.23	848.67	851.06	892.95	890.87	1067.11	1098.71	945.30	825.89	938.51	813.86
C₂/Qtl	1321.55	1264.33	1399.64	1575.00	1271.13	1157.31	1374.79	1292.49	1097.31	1106.85	1543.66	1582.47	1483.01	1536.19	1349.11	1202.02	1339.42	1266.88

(Contd..)



Annex Table 5.6a: Paddy - Break-up of Cost of Cultivation

Cost Items	Kerala		Madhya Pradesh		Maharashtra		Odisha		Punjab		Tamil Nadu		Uttar Pradesh		Uttarakhand		West Bengal	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost	58767.16	57001.22	30620.93	32068.74	57681.26	62247.30	43863.39	46558.84	34807.69	35944.21	54944.90	54010.78	40095.90	39023.35	31485.63	33804.79	54122.24	58456.47
Human Labour																		
Casual	29209.19	27157.85	3509.03	3897.22	20526.09	21089.25	11572.62	12504.18	7255.78	7598.15	14740.30	14678.69	8463.63	7852.77	3228.30	5631.00	16917.97	17844.93
Attached	0.00	0.00	77.93	77.40	134.47	299.13	39.10	42.39	2038.17	1754.20	116.28	206.98	13.21	11.87	22.37	31.35	0.82	0.65
Family	4826.64	4891.69	9610.99	9412.10	11011.98	10720.30	17635.55	18381.08	6518.79	6712.05	7919.02	7512.45	11415.79	11420.73	11878.12	9941.06	17469.22	19548.88
Total	34035.83	32049.54	13197.95	13386.72	31672.54	32108.68	29247.27	30927.65	15528.77	16348.37	22775.60	22398.12	19892.63	19285.37	15128.79	15603.41	34388.01	37394.46
Bullock Labour																		
Hired	70.94	17.10	178.75	203.65	3381.93	3402.44	538.49	420.09	0.45	0.81	104.50	82.94	100.23	49.78	0.00	0.00	291.17	412.73
Owned	0.00	0.00	3961.38	2698.13	3802.21	2874.39	2617.85	2888.28	41.37	37.30	58.22	19.60	893.87	591.86	3015.45	3589.99	1486.87	1145.05
Total	70.94	17.10	4140.13	2901.78	7184.14	6276.83	3156.34	3308.37	41.82	38.11	162.72	102.54	994.10	641.64	3015.45	3589.99	1778.04	1557.78
Machine Labour																		
Hired	10534.28	11128.67	4566.39	5802.03	4241.57	6641.03	4412.16	5177.50	3777.23	3956.71	9635.54	9056.04	4081.26	4171.82	3267.69	3524.01	4205.49	4507.58
Owned	77.77	52.58	183.69	343.56	609.47	168.09	66.33	93.38	2242.81	2403.06	981.71	775.67	232.86	296.87	1097.55	1379.17	14.41	402.44
Total	10612.05	11181.25	4750.08	6145.59	4851.04	6809.12	4478.49	5270.88	6020.04	6359.77	10617.25	9831.71	4314.12	4468.69	4365.24	4903.18	4219.90	4910.02
Seed	3342.47	3214.08	2051.77	1920.82	2777.47	3023.29	1195.62	1219.39	1838.03	1716.39	6968.77	6883.96	3919.33	4071.44	3040.14	3710.98	2055.04	2020.86
Fertilisers and Manure																		
Fertilisers	5464.29	4731.45	2715.34	3017.03	2304.93	3753.18	2953.37	2802.86	3223.42	3294.67	6023.73	5809.99	4636.31	4499.37	3259.49	3385.26	4831.02	5204.33
Manure	2236.63	2252.55	1154.00	2005.63	3945.06	5046.04	1449.50	1595.96	424.97	422.45	2428.05	2033.89	109.02	71.02	539.70	457.89	1271.55	1456.10
Total	7700.92	6984.00	3869.34	5022.66	6249.99	8799.22	4402.87	4398.82	3648.39	3717.12	8451.78	7843.88	4745.33	4570.39	3799.19	3843.15	6102.57	6660.43
Other Inputs																		
Insecticides	1279.43	1854.26	745.15	1110.16	392.16	593.73	298.80	365.41	4458.79	4426.05	1558.70	1486.73	300.38	350.07	849.30	794.88	1500.40	1685.57
Irrigation charges	88.71	118.46	1062.36	739.17	2230.55	1638.53	164.45	162.20	2399.72	2418.90	2977.63	4011.25	5060.65	4798.24	693.35	636.06	2941.82	2985.18
Interest on working capital	1634.56	1579.08	636.67	686.56	1414.22	1561.42	794.78	853.86	857.24	885.82	1425.03	1409.04	869.09	836.44	594.17	723.14	1110.70	1179.03
Miscellaneous	2.25	3.45	167.48	155.28	909.15	1436.48	124.77	52.26	14.89	33.68	7.42	43.55	0.27	1.07	0.00	0.00	25.76	63.14
Fixed Cost	20178.66	20272.51	12318.11	12683.44	15217.12	15855.70	13580.29	14946.87	39814.01	40135.33	19777.12	21481.84	19320.54	19405.95	15818.13	15990.41	18113.20	19171.33
Rental value of owned land	19144.58	19314.06	8472.29	9572.75	9184.98	10398.24	10823.49	12063.04	29900.67	30582.13	14564.96	16401.54	12408.20	13384.65	13926.31	14392.48	14692.45	15757.51
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	155.94	163.59	5993.03	5974.50	151.58	168.63	681.93	498.57	0.00	0.00	554.08	395.71
Land revenue, cesses & taxes	218.00	201.11	3.40	3.50	22.86	24.24	21.09	21.70	0.00	0.00	7.00	7.52	2.84	2.43	3.41	3.48	65.69	53.74
Depreciation on implements & Farm buildings	341.75	329.27	1063.90	945.14	745.36	720.90	669.78	699.83	336.66	328.85	347.44	601.89	996.42	878.42	228.87	177.95	971.48	825.05
Interest on fixed capital	474.33	428.07	2778.52	2162.05	5263.92	4712.32	1909.99	1998.71	3583.65	3249.85	4656.14	4302.26	5231.15	4641.88	1659.54	1416.50	1829.50	2139.32
Total Cost	78945.82	77273.73	42939.04	44752.18	72898.38	78103.00	57443.68	61505.71	74621.70	76079.54	74672.02	75492.62	59416.44	58429.30	47303.76	49795.20	72235.44	77627.80
Yield	43.48	40.88	22.02	32.75	24.00	30.39	35.28	38.55	69.89	69.38	49.13	47.29	35.85	37.31	47.24	45.76	44.91	45.81
A+FL/Qtl	1258.43	1274.53	1267.42	886.88	2038.93	1781.72	1129.28	1100.97	585.28	606.17	1067.90	1105.63	1080.57	1017.88	629.58	690.38	1100.50	1153.80
C₁/Qtl	1669.81	1705.04	1709.98	1204.10	2468.55	2199.02	1450.32	1426.87	1061.66	1091.67	1435.17	1523.54	1541.04	1475.90	935.36	1013.02	1423.29	1497.01

Source: DES



Annexures

Annex Table 5.6b: Jowar - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Karnataka		Madhya Pradesh		Maharashtra		Rajasthan		Tamil Nadu	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost												
Human Labour	19908.79	28265.49	15276.85	14041.11	19685.82	21624.34	23499.28	30031.23	18784.16	23087.75	21212.50	24938.28
Casual	3631.23	5892.39	5144.77	4333.46	4218.96	1977.54	5994.38	8679.79	3215.14	3986.11	8369.75	9636.86
Attached	0.00	268.13	12.29	21.96	0.00	0.00	344.52	639.62	0.00	0.00	38.75	119.42
Family	3187.54	8477.59	3071.16	3327.01	7094.06	10545.63	6388.52	6616.62	9184.75	13346.18	6122.91	6514.75
Total	6818.77	14638.11	8228.22	7682.43	11313.02	12523.17	12727.42	15936.03	12399.89	17332.29	14531.41	16271.03
Bullock Labour												
Hired	470.47	917.00	1165.51	758.60	16.57	17.18	1671.52	675.62	108.15	72.27	0.00	0.00
Owned	836.40	4772.96	1639.98	1778.13	0.00	2778.75	1878.01	3482.26	66.69	36.17	0.00	0.00
Total	1306.87	5689.96	2805.49	2536.73	16.57	2795.93	3549.53	4157.88	174.84	108.44	0.00	0.00
Machine Labour												
Hired	6506.64	1621.63	1890.59	1872.90	3276.24	2300.71	3227.21	5159.61	3081.27	2846.37	2798.89	2747.13
Owned	78.68	16.79	121.11	135.49	174.80	92.54	442.31	278.40	530.28	351.25	24.14	137.37
Total	6585.32	1638.42	2011.70	2008.39	3451.04	2393.25	3669.52	5438.01	3611.55	3197.62	2823.03	2884.50
Seed	765.92	1412.17	452.26	422.12	1360.99	1281.77	518.22	549.77	1343.44	1065.13	990.20	1146.73
Fertilisers and Manure												
Fertilisers	2144.96	3338.03	1281.68	914.21	1628.91	1775.62	1766.86	2325.29	745.61	1035.83	1081.61	1020.53
Manure	574.21	0.00	45.97	0.00	507.17	290.02	77.83	38.85	69.97	0.00	0.00	819.78
Total	2719.17	3338.03	1327.65	914.21	2136.08	2065.64	1844.69	2364.14	815.58	1035.83	1081.61	1840.31
Other Inputs												
Insecticides	1149.88	102.83	0.00	2.93	0.00	161.43	1.92	26.92	0.00	0.00	23.99	41.60
Irrigation charges	56.16	846.34	81.66	148.36	928.59	0.00	641.79	824.74	147.97	53.24	1305.00	2195.82
Interest on working capital	506.70	599.63	369.87	324.67	381.57	335.72	518.51	709.52	290.89	295.20	457.26	558.29
Miscellaneous	0.00	0.00	0.00	1.27	97.96	67.43	27.68	24.22	0.00	0.00	0.00	0.00
Fixed Cost	15376.88	11506.39	6709.14	7079.77	13848.70	11412.66	9385.55	10786.32	6759.58	9274.78	12690.88	18018.72
Rental value of owned land	12237.28	7332.59	4711.45	5180.78	9382.58	7223.50	4090.88	6499.20	3649.27	4956.59	8636.83	13655.90
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	0.47	0.89	12.54	6.54	3.35	1.67	22.97	28.03	9.08	10.25	17.78	23.59
Depreciation on implements & Farm buildings	762.26	844.00	237.35	194.72	280.37	1197.29	653.52	611.99	439.15	533.89	401.75	338.87
Interest on fixed capital	2376.87	3328.91	1747.80	1697.73	4182.40	2990.20	4618.18	3647.10	2662.08	3774.05	3634.52	4000.36
Total Cost	35285.67	39771.88	21985.99	21120.88	33534.52	33037.00	32884.83	40817.55	25543.74	32362.53	33903.38	42957.00
Yield	19.65	10.53	5.98	5.84	21.40	19.21	8.00	12.22	4.93	9.14	8.96	6.61
A₂+FL/Qtl	907.32	1982.41	1850.16	1880.12	577.16	856.00	1761.00	1539.18	1502.44	1291.88	1235.30	2290.56
C₂/Qtl	1556.83	2864.57	2628.41	2795.49	969.15	1266.74	2383.76	2037.93	2000.70	1782.99	1925.12	3885.11

Source: DES



Annex Table 5.6c: Bajra - Break-up of Cost of Cultivation

Cost Items	Gujarat		Haryana		Maharashtra		Rajasthan		Uttar Pradesh	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost										
Human Labour	36750.78	36710.99	27035.60	24731.17	32625.16	39675.96	17250.11	20886.24	20982.30	21498.63
Casual	8312.73	8967.25	3893.55	7010.94	4873.65	11818.57	2398.39	3146.81	5740.64	4427.20
Attached	77.39	20.11	57.12	74.92	120.59	400.96	29.29	15.83	2.53	6.42
Family	9063.13	8197.58	12593.63	7519.89	12538.07	7067.51	10069.13	12403.30	7938.54	10380.39
Total	17453.25	17184.94	16544.30	14605.75	17532.31	19287.04	12496.81	15565.94	13681.71	14814.01
Bullock Labour										
Hired	368.06	276.98	68.43	5.83	1062.63	1154.17	0.62	1.21	0.00	0.00
Owne	348.22	496.09	26.09	75.51	2383.98	1831.57	35.68	80.65	107.70	212.52
Total	716.28	773.07	94.52	81.34	3446.61	2985.74	36.30	81.86	107.70	212.52
Machine Labour										
Hired	3914.97	4556.83	5133.29	5341.23	5704.93	8699.15	2337.83	2939.20	3926.33	3165.59
Owne	1035.57	998.89	765.38	963.12	538.29	310.46	432.76	274.38	185.92	572.22
Total	4950.54	5555.72	5898.67	6304.35	6243.22	9009.61	2770.59	3213.58	4112.25	3737.81
Seed	1944.69	1941.10	911.97	932.46	998.77	1022.61	753.65	831.59	1108.14	1179.91
Fertilisers and Manure										
Fertilisers	3317.13	3046.80	1646.12	1954.62	1493.08	1674.47	384.99	455.62	790.82	851.04
Manure	1801.51	977.61	0.00	0.00	239.19	3220.23	237.42	299.03	0.00	24.82
Total	5118.64	4024.41	1646.12	1954.62	1732.27	4894.70	622.41	754.65	790.82	875.86
Other Inputs										
Insecticides	18.15	41.54	16.59	121.86	0.00	0.00	64.44	79.10	0.00	5.57
Irrigation charges	5710.20	6226.16	1485.79	209.24	2057.22	1485.20	288.30	102.46	786.41	336.03
Interest on working capital	839.03	864.05	437.64	521.55	608.70	988.13	217.61	257.06	395.27	336.92
Miscellaneous	0.00	1.00	0.00	0.00	6.06	2.93	0.00	0.00	0.00	0.00
Fixed Cost	11731.03	11570.30	11885.32	16154.53	9177.23	12635.43	7174.08	8080.41	14493.43	18728.87
Rental value of owned land	9322.80	8761.23	8082.38	11222.73	4185.50	7623.23	3093.41	4801.07	9856.00	9159.42
Rent paid for leased-in land	563.71	484.96	0.00	0.00	0.00	0.00	50.08	41.91	2041.88	6551.61
Land revenue, cesses & taxes	2.13	2.96	0.00	0.00	23.00	19.22	6.15	6.36	4.68	6.14
Depreciation on implements & Farm buildings	108.98	83.52	521.30	714.02	730.89	500.46	525.45	433.99	335.43	316.31
Interest on fixed capital	1733.41	2237.63	3281.64	4217.78	4237.84	4492.52	3498.99	2797.08	2255.44	2695.39
Total Cost	48481.81	48281.29	38920.92	40885.70	41802.39	52311.39	24424.19	28966.65	35475.73	40227.50
Yield	25.30	23.39	16.37	22.10	13.17	23.09	7.58	11.52	24.61	28.80
A₁+F₁/Q₁	978.87	1025.93	1249.26	885.81	2154.05	1465.25	1231.54	966.02	744.95	786.81
C₁/Q₁	1270.11	1322.87	1763.76	1423.25	2702.56	1906.63	1654.55	1290.01	1129.53	1116.88

Source: DES

Annexures



Annexures

Annex Table 5.6d: Maize - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Bihar		Gujarat		Himachal Pradesh		Jharkhand		Karnataka	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost	42634.46	41187.77	29563.31	32262.35	36171.74	29757.73	26759.06	28093.44	28803.46	24716.31	35084.99	28220.93
Human Labour												
Casual	10482.21	11219.20	4821.62	4921.59	7980.12	5680.75	424.42	632.41	5118.18	6898.25	10129.49	7556.02
Attached	741.07	238.49	43.08	58.94	0.00	0.00	161.47	75.37	521.58	457.02	0.00	0.00
Family	7181.06	6221.55	8555.74	9545.09	11808.62	9366.89	15766.55	16843.82	8734.44	4634.38	5205.40	4308.15
Total	18404.34	17679.24	13420.44	14525.62	19788.74	15047.64	16352.44	17551.60	14374.20	11989.65	15334.89	11864.17
Bullock Labour												
Hired	1102.69	709.39	0.00	0.00	1273.33	879.32	451.94	473.28	0.00	0.00	2339.74	2121.04
Owned	2782.74	1766.45	0.00	0.00	3014.86	2215.84	1318.9	950.80	2423.20	208.28	1128.10	1724.54
Total	3885.43	2475.84	0.00	0.00	4288.19	3095.16	1770.84	1424.08	2423.20	208.28	3467.84	3845.58
Machine Labour												
Hired	5783.81	5585.42	3848.41	3739.58	3084.64	3303.12	2294.42	2654.18	388.64	946.17	5664.65	3803.00
Owned	179.84	126.30	9.26	15.58	305.71	451.53	158.26	170.88	1280.56	2636.55	488.05	243.38
Total	5963.65	5711.72	3857.67	3755.16	3390.35	3754.65	2452.68	2825.06	1669.20	3582.72	6152.70	4046.38
Seed	4387.04	5068.35	2195.27	2970.25	1874.60	1759.89	1296.17	1251.30	5636.98	6157.12	3072.17	2866.24
Fertilisers and Manure												
Fertilisers	7174.50	7039.63	3996.15	4340.82	2366.10	1908.20	810.94	863.48	2533.32	2170.00	5423.44	3875.13
Manure	353.13	585.41	857.68	521.26	1216.37	975.79	3524.52	3707.32	0.00	0.00	83.40	10.78
Total	7527.63	7625.04	4853.83	4862.08	3582.47	2883.99	4335.46	4570.80	2533.32	2170.00	5506.84	3885.91
Other Inputs												
Insecticides	789.05	829.03	0.00	0.00	108.10	178.37	218.36	129.70	0.00	0.00	48.32	219.39
Irrigation charges	574.75	681.13	4599.51	5460.84	2401.02	2420.12	0.00	0.00	1558.41	0.00	596.79	768.63
Interest on working capital	1074.35	1059.58	636.59	688.40	738.27	617.91	333.11	340.90	608.15	608.54	905.44	724.63
Miscellaneous	28.22	57.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Cost	26970.74	26097.21	13382.14	15147.03	6804.34	10242.32	9982.80	12013.18	11402.36	13624.92	13954.45	14336.21
Rental value of owned land	23644.64	23693.09	10867.34	12864.27	4529.86	6239.17	5952.06	7388.57	8848.72	10874.02	11439.87	11286.88
Rent paid for leased-in land	0.00	91.87	0.00	0.00	5.90	1215.49	19.24	10.58	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	1.06	0.65	50.84	80.85	5.82	6.87	6.30	6.55	42.08	61.73	10.45	13.07
Depreciation on implements & farm buildings	389.82	286.50	638.54	556.69	267.95	247.80	536.23	562.88	614.88	958.79	174.38	485.74
Interest on fixed capital	2935.22	2025.10	1825.42	1645.22	1994.81	2532.99	3468.97	4044.60	1896.68	1730.38	2329.75	2550.52
Total Cost	69605.20	67284.98	42945.45	47409.38	42976.08	40000.05	36741.86	40106.62	40205.82	38341.23	49039.44	42557.14
Yield	51.28	53.07	32.56	36.16	13.28	19.06	13.67	16.42	34.09	40.82	32.42	31.54
A₁ +FL/Qtl	790.01	752.91	820.87	791.60	2046.50	1241.10	1463.84	1238.51	756.48	497.24	1007.33	841.48
C₁/Qtl	1275.29	1218.28	1164.76	1133.84	2393.22	1586.58	1956.84	1728.13	1022.03	749.02	1399.57	1251.72

(Contd..)



Annex Table 5.6d: Maize - Break-up of Cost of Cultivation

Cost Items	Madhya Pradesh		Maharashtra		Odisha		Punjab		Rajasthan		Tamil Nadu		Uttar Pradesh	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost														
Human Labour	27044.39	28940.00	56378.08	51408.43	39671.47	46489.26	36738.98	33144.30	35922.62	34106.17	64263.40	65437.51	27848.47	29497.81
Casual	4050.99	4897.74	10024.94	9371.08	5269.64	7002.00	7136.67	8367.27	1502.20	2742.38	15412.51	18301.45	3563.46	5802.16
Attached	260.04	326.64	1034.09	412.44	24.92	22.62	454.42	212.37	4.48	1.33	75.39	155.63	0.00	0.00
Family	8025.12	8256.61	11173.76	8502.69	17634.80	19941.91	8327.29	5809.31	21640.58	19509.65	16870.27	14654.91	11978.92	11188.81
Total	12336.15	13480.99	22232.79	18286.21	2929.36	26966.53	15918.38	14388.95	23147.26	22253.36	32358.17	33111.99	15542.38	16990.97
Bullock Labour														
Hired	421.70	475.03	504.85	1256.53	355.21	278.66	271.95	267.47	855.97	845.15	0.00	10.82	227.40	57.50
Owned	2432.92	2134.13	8594.79	3824.21	3580.63	4008.81	65.22	41.47	1560.68	1747.40	85.29	30.19	875.37	1181.46
Total	2854.62	2609.16	9099.64	5080.74	3935.84	4287.47	337.17	308.94	2416.65	2592.55	85.29	41.01	1102.77	1238.96
Machine Labour														
Hired	3990.82	4538.69	4969.94	9235.61	1993.09	2055.83	4859.32	4489.55	4213.86	4611.02	8636.93	7873.29	3928.44	3887.34
Owned	221.11	440.90	1198.06	961.52	0.00	0.00	1769.84	1690.31	116.58	89.64	126.19	198.18	73.89	232.84
Total	4211.93	4979.59	6168.00	10197.13	1993.09	2055.83	6629.16	6179.86	4330.44	4700.66	8763.12	8071.47	4002.33	4120.18
Seed	2757.91	2765.06	4479.76	5001.81	3696.90	5383.75	4014.98	3673.33	1892.38	1716.48	4636.57	4408.63	2400.47	2626.83
Fertilisers and Manure														
Fertilisers	1889.70	2119.17	7626.07	6561.53	4030.16	4202.42	4503.04	4597.51	2395.36	2398.40	6555.19	5774.99	1908.41	2191.27
Manure	2035.45	1892.63	612.31	752.94	1928.29	2153.65	2218.84	950.51	248.68	0.00	5612.64	7610.27	373.55	6.44
Total	3925.15	4011.80	8238.38	7314.47	5958.45	6356.07	6721.88	5548.02	2644.04	2398.40	12167.83	13385.26	2281.96	2197.71
Other Inputs														
Insecticides	145.62	368.29	294.83	126.33	307.98	355.42	1449.13	1808.40	0.00	0.00	734.34	566.74	74.22	30.98
Irrigation charges	194.07	0.00	4494.85	4101.57	182.07	279.73	807.32	408.47	1059.06	2.40	4044.56	4216.73	1963.44	1736.64
Interest on working capital	576.34	626.77	1369.83	1300.17	667.78	804.46	860.96	828.33	432.79	442.32	1436.16	1538.87	480.90	554.82
Miscellaneous	42.60	98.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.36	96.81	0.72	0.72
Fixed Cost														
Rental value of owned land	9198.02	9320.91	15969.04	21464.84	13447.83	14968.25	17139.86	19919.75	11466.73	9624.45	25160.98	27272.57	11754.02	13097.24
Rent paid for leased-in land	7368.36	7621.23	9820.27	13086.99	11124.17	12783.48	10999.73	9594.02	5887.83	5250.15	16332.44	18499.25	9143.17	10798.48
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	2546.85	6736.14	38.86	848.09	688.48	0.00	128.84	0.00
Land revenue, cesses & taxes	2.69	2.41	27.75	23.19	24.34	24.59	0.00	0.00	10.36	10.61	8.32	7.52	4.14	5.12
Depreciation on implements & Farm buildings	462.84	468.45	439.64	551.68	558.33	558.72	470.13	591.12	570.84	855.80	504.77	529.10	571.72	479.85
Interest on fixed capital	1364.13	1228.82	5681.38	7802.98	1740.99	1601.46	3123.15	2998.47	4958.84	2659.80	7626.97	8236.70	1906.15	1813.79
Total Cost														
	36242.41	38260.91	72347.12	72873.27	53119.30	61457.51	53878.84	53064.05	47389.35	43730.62	89424.38	92710.08	39602.49	42595.05
Yield														
	17.74	23.40	43.00	55.06	37.94	42.08	35.46	35.90	17.14	17.51	59.84	44.66	22.93	24.43
A₂+FL/Qtl														
	1334.26	1063.76	1181.93	839.49	1032.59	1089.66	1024.58	1052.76	1665.63	1603.49	1045.86	1412.24	1054.45	1064.16
C₂/Qtl														
	1738.12	1388.84	1502.64	1173.99	1360.93	1422.10	1390.44	1380.65	2097.41	1932.19	1431.30	1981.82	1455.40	1508.90

Source: DES

Annexures



Annexures

Annex Table 5.6e: Ragi - Break-up of Cost of Cultivation

Cost Items	Karnataka		Uttarakhand	
	2015-16	201617	2015-16	201617
Operational Cost				
Human Labour	46390.08	33526.20	21619.03	25370.93
Casual	17094.39	10776.52	200.37	539.77
Attached	0.00	0.00	0.00	0.00
Family	10413.57	7103.75	16544.44	19739.73
Total	27507.96	17880.27	16744.81	20279.50
Bullock Labour				
Hired	4740.85	3386.18	0.00	0.00
Owned	1386.16	415.26	3357.27	4418.80
Total	6127.01	3801.44	3357.27	4418.80
Machine Labour				
Hired	3835.18	5588.72	0.00	0.00
Owned	19.92	11.69	0.00	0.00
Total	3855.10	5600.41	0.00	0.00
Seed	429.72	433.95	368.74	441.38
Fertilisers and Manure				
Fertilisers	3692.90	2518.42	0.00	0.00
Manure	2548.43	2120.97	994.43	60.61
Total	6241.33	4639.39	994.43	60.61
Other Inputs				
Insecticides	0.00	81.80	0.00	0.00
Irrigation charges	1138.76	288.26	0.00	0.00
Interest on working capital	1090.20	800.68	153.78	170.64
Miscellaneous	0.00	0.00	0.00	0.00
Fixed Cost	13451.84	13192.71	5519.35	6090.44
Rental value of owned land	9917.53	11513.64	5066.12	5117.90
Rent paid for leased-in land	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	27.18	24.07	0.89	1.00
Depreciation on implements & Farm buildings	516.82	759.18	48.39	139.84
Interest on fixed capital	2990.31	895.82	403.95	831.70
Total Cost	59841.92	46718.91	27138.38	31461.37
Yield	16.89	19.01	18.78	18.80
A₂ +FL/Qtl	2344.35	1620.17	1018.06	1201.58
C₂/Qtl	2919.09	2186.14	1274.74	1482.00

Source: DES



Annex Table 5.6f: Arhar (Tur) - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Karnataka		Gujarat		Madhya Pradesh		Maharashtra		Odisha		Uttar Pradesh	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost														
Human Labour	25786.10	35994.04	26490.32	19686.40	31925.45	28366.31	24012.78	25018.89	55949.03	61519.58	13772.18	15797.09	23565.82	23642.25
Casual	6328.20	8590.48	6328.67	4652.76	6602.34	7262.77	3404.76	2822.77	9411.88	12393.51	1310.46	2080.36	4921.93	7062.06
Attached	620.00	1484.71	7.60	53.19	0.00	0.00	229.09	285.50	659.36	1227.78	0.00	449.22	44.50	0.00
Family	4992.70	7396.65	6511.29	2698.92	10500.18	7199.57	8074.42	7681.59	16313.08	11277.33	7962.58	8154.44	9207.02	8490.20
Total	11940.90	17471.84	12847.56	7404.87	17102.52	14462.34	11708.27	10789.86	26384.32	24898.62	9273.04	10684.02	14173.45	15552.26
Bullock Labour														
Hired	1283.38	1373.38	1270.56	930.29	351.75	857.82	24.22	80.13	1626.94	1524.03	49.79	59.35	0.00	0.00
Owned	2570.86	4024.42	2154.44	1675.66	2372.63	490.09	4191.57	3764.06	4712.92	4049.97	2025.56	2642.60	2225.07	32.37
Total	3854.24	5397.80	3425.00	2605.95	2724.38	1347.91	4215.79	3844.19	6339.86	5574.00	2075.35	2701.95	2225.07	32.37
Machine Labour														
Hired	3703.41	4666.60	3040.63	4149.20	3795.65	2514.05	1358.10	2759.97	7032.81	8937.86	860.13	722.24	2767.50	2777.48
Owned	71.40	81.24	7.64	38.36	940.81	1179.55	275.70	405.51	362.77	1725.29	0.00	7.32	709.59	941.76
Total	3774.81	4747.84	3048.27	4187.56	4736.46	3693.60	1633.80	3165.48	7395.58	10663.15	860.13	729.56	3477.09	3719.24
Seed	1334.74	1577.48	1238.42	1395.15	825.35	1867.69	2850.13	3270.19	2262.69	2725.94	1387.61	1449.96	2214.36	2402.45
Fertilisers and Manure														
Fertilisers	2051.08	3006.27	2475.23	1462.26	2052.24	1755.00	1081.64	1057.96	3939.93	5291.89	0.00	0.00	15.18	479.69
Manure	331.96	288.23	1683.94	138.26	537.72	493.36	753.44	1085.17	727.52	1268.75	0.00	0.00	0.00	0.00
Total	2383.04	3294.50	4159.17	1600.52	2589.96	2248.36	1835.08	2143.13	4667.45	6560.64	0.00	0.00	15.18	479.69
Other Inputs														
Insecticides	1630.21	2430.50	883.14	1898.95	1864.90	2712.96	1067.76	1077.51	5166.65	6113.28	0.00	0.00	0.00	5.47
Irrigation charges	158.26	163.56	283.33	78.63	1316.72	1370.74	216.68	160.59	2384.52	3365.23	0.00	0.00	1025.55	991.61
Interest on working capital	630.10	866.59	605.43	514.77	649.25	641.42	482.98	525.37	1201.09	1522.50	176.05	231.60	435.12	459.16
Miscellaneous	79.80	43.93	0.00	0.00	115.91	21.29	2.29	42.57	146.87	96.22	0.00	0.00	0.00	0.00
Fixed Cost	19234.94	16059.23	12040.74	14266.05	16039.87	14032.41	18443.92	16201.37	30294.16	33714.24	9053.28	9398.55	28816.68	25397.30
Rental value of owned land	15977.34	12961.09	10133.55	12379.98	10667.32	8024.91	14166.70	11826.00	21912.45	18748.66	5833.87	6131.90	21274.30	19438.78
Rent paid for leased-in land	0.00	626.48	0.00	0.00	1991.02	2406.33	0.00	0.00	0.00	0.00	0.00	0.00	604.92	119.33
Land revenue, cesses & taxes	0.12	0.04	17.18	11.43	53.66	50.38	7.09	11.46	43.44	46.72	15.87	19.01	21.54	20.43
Depreciation on implements & Farm buildings	450.36	529.22	334.46	278.01	263.73	156.94	1085.98	1391.66	978.62	1155.53	759.61	731.39	1248.01	1036.10
Interest on fixed capital	2807.12	1942.40	1555.55	1596.63	3064.14	3393.85	3184.15	2972.25	7359.65	13763.33	2443.93	2516.25	5667.91	4782.66
Total Cost	45021.04	52053.27	38531.06	33952.45	47965.32	42398.72	42456.70	41220.26	86243.19	95233.82	22825.46	25195.64	52382.50	49039.55
Yield	4.91	8.13	5.19	10.23	10.55	11.54	7.84	10.21	14.08	22.16	3.29	3.80	8.33	9.68
A ₂ +F ₁ /Q ₁	5233.87	4442.21	5017.97	1888.92	3171.14	2500.02	3046.44	2412.47	3956.18	2743.93	4297.02	4252.97	2625.13	2184.08
C ₂ /Q ₁	8938.88	6242.39	7187.47	3210.39	4437.12	3476.11	5144.44	3739.43	5983.90	4166.22	6723.38	6471.39	5391.53	4324.60

Source: DES



Annexures

Annex Table 5.6g: Moong - Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Andhra Pradesh		Gujarat		Karnataka		Maharashtra		Odisha		Rajasthan	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost												
Human Labour												
Casual	5374.33	4404.43	5807.24	7080.47	4630.52	4677.67	5996.04	7769.33	671.47	779.55	2364.09	1715.60
Attached	28.38	165.75	20.61	0.00	36.21	6.97	192.41	565.45	8.92	32.90	0.00	0.00
Family	2214.59	2799.64	5659.03	7213.83	2253.95	1785.43	7255.79	5083.14	7799.29	7961.40	8496.64	9145.74
Total	7617.30	7369.82	11486.88	14294.30	6920.68	6470.07	13444.24	13417.92	8479.68	8773.85	10860.73	10861.34
Bullock Labour												
Hired	1673.55	1180.07	608.36	519.75	202.11	523.67	721.20	714.16	179.61	178.40	0.00	0.00
Owned	286.68	240.96	260.47	386.88	1726.62	829.46	2874.02	3436.80	1358.09	1645.30	135.19	117.42
Total	1960.23	1421.03	868.83	906.63	1928.73	1353.13	3595.22	4150.96	1537.70	1823.70	135.19	117.42
Machine Labour												
Hired	4154.20	3771.53	3699.40	4692.08	1862.56	2934.63	4107.87	5249.90	1513.19	1403.17	2308.74	2512.41
Owned	0.00	338.58	775.31	887.90	538.30	462.79	233.09	319.35	8.98	24.54	625.52	309.50
Total	4154.20	4110.11	4474.71	5579.98	2400.86	3397.42	4340.96	5569.25	1522.17	1427.71	2934.26	2821.91
Seed	2382.44	1729.25	2014.75	1896.12	1240.69	1214.25	2146.06	1991.58	1704.76	1606.27	1573.47	1614.95
Fertilisers and Manure												
Fertilisers	2162.80	1083.06	762.67	1234.71	1040.65	1193.54	1940.50	3697.08	3.62	10.68	215.35	393.10
Manure	0.00	180.55	204.98	1247.09	0.00	175.75	205.77	754.51	0.00	0.00	321.25	610.38
Total	2162.80	1263.61	967.65	2481.80	1040.65	1369.29	2146.27	4451.59	3.62	10.68	536.60	1003.48
Other Inputs												
Insecticides	1318.20	1269.82	698.51	954.17	75.42	342.35	422.62	650.71	0.93	0.00	154.81	224.92
Irrigation charges	0.00	0.00	791.39	751.48	14.38	5.42	206.65	8.62	77.92	0.89	15.58	184.43
Interest on working capital	543.14	448.87	488.87	614.07	355.23	386.45	595.20	786.77	172.73	177.55	241.06	240.08
Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.96	0.00	0.00	0.00	0.00
Fixed Cost	7948.16	6269.40	8661.02	9965.61	7160.43	7083.00	8659.62	9881.85	6318.69	5707.36	8158.87	7083.18
Rental value of owned land	7631.81	5297.68	7456.52	8042.11	5172.27	5072.78	4093.13	5870.95	4702.01	4040.40	5430.37	4613.31
Rent paid for leased-in land	0.00	0.00	290.90	725.69	0.00	0.00	0.00	0.00	45.35	29.18	0.00	26.66
Land revenue, cesses & taxes	0.00	0.00	6.67	4.20	4.19	5.36	26.34	22.48	8.89	8.76	5.96	5.84
Depreciation on implements & Farm buildings	99.15	247.88	128.88	101.95	119.93	112.90	600.66	536.56	436.78	409.20	323.01	314.97
Interest on fixed capital	217.20	723.84	778.05	1091.66	1864.04	1891.96	3939.49	3451.86	1125.66	1219.82	2399.53	2122.40
Total Cost	28086.47	23881.91	30452.61	37444.16	21137.07	21621.38	35556.84	40928.21	19818.20	19528.01	24610.57	24151.71
Yield	3.14	2.66	5.99	9.42	3.12	4.96	3.11	7.35	2.65	2.83	3.99	4.99
A ₁ +FL/Qtl	6389.13	6626.39	3482.36	2753.98	4415.21	2844.70	8767.69	4249.56	5076.75	4804.53	3840.28	2998.40
C ₁ /Qtl	8883.35	8895.60	4774.29	3608.27	6610.05	4176.62	11332.97	5503.75	7188.79	6555.15	5617.11	4125.32

Source: DES



Annex Table 5.6h: Urad - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Chhattisgarh		Madhya Pradesh		Maharashtra		Odisha		Tamil Nadu		Uttar Pradesh	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost	17550.56	18831.91	19997.84	27383.96	20845.23	19705.36	26728.05	30657.90	13577.83	15261.04	24982.07	27488.77	13809.27	14370.30
Human Labour														
Casual	7686.18	7768.15	67.84	1549.53	3143.05	3796.41	3599.63	8075.25	543.06	1297.40	8792.42	9265.84	2124.88	2031.33
Attached	372.69	418.14	0.00	0.00	57.75	109.84	111.84	345.45	47.40	15.95	99.09	108.87	0.00	0.00
Family	1496.32	1654.89	8772.29	9448.85	5759.37	3741.12	10256.10	4939.86	8203.16	8495.98	4271.79	5710.54	4991.64	4598.23
Total	9555.19	9841.18	8840.13	10998.38	8960.17	7647.37	13967.57	13360.56	8793.62	9809.33	13163.30	15085.25	7116.52	6629.56
Bullock Labour														
Hired	91.30	195.53	0.00	68.15	8.27	4.86	357.92	847.43	171.55	165.97	1.04	1.42	8.56	17.26
Owned	186.69	145.09	7402.76	4512.14	1052.43	640.13	3699.50	1551.37	1711.67	1754.69	0.00	0.00	90.57	167.97
Total	277.99	340.62	7402.76	4580.29	1060.70	644.99	4057.42	2398.80	1883.22	1920.66	1.04	1.42	99.13	185.23
Machine Labour														
Hired	1378.87	1399.15	0.00	4243.13	4045.61	4726.05	3530.53	5842.56	472.45	621.78	2916.14	2681.12	2897.27	3946.60
Owned	37.65	52.76	0.00	153.34	102.96	279.56	344.99	1381.13	15.76	131.40	296.33	531.41	435.76	431.01
Total	1416.52	1451.91	0.00	4396.47	4148.57	5005.61	3875.52	7223.69	488.21	753.18	3212.47	3212.53	3333.03	4377.61
Seed	4638.96	4056.24	3414.78	2022.14	2683.30	3053.92	1884.80	3094.76	2249.91	2478.78	3364.24	3519.41	1899.10	1983.29
Fertilisers and Manure														
Fertilisers	376.21	518.52	0.00	1293.31	1520.00	1657.52	1680.73	2276.55	0.00	0.00	1360.26	1455.68	0.00	66.78
Manure	25.41	43.02	0.00	18.17	1127.04	394.50	0.00	593.26	0.00	5.70	1202.98	1219.75	0.00	0.00
Total	401.62	561.54	0.00	1311.48	2647.04	2052.02	1680.73	2869.81	0.00	5.70	2563.24	2675.43	0.00	66.78
Other Inputs														
Insecticides	748.42	2058.43	0.00	921.05	880.49	804.04	624.55	743.89	0.00	0.00	1126.74	1025.36	515.03	484.19
Irrigation charges	0.00	0.00	0.00	2610.66	0.00	0.00	73.99	163.66	0.00	84.50	887.10	1293.15	569.55	346.13
Interest on working capital	486.49	520.52	340.17	543.49	457.15	483.77	499.15	779.33	162.87	208.89	627.58	659.96	267.20	296.12
Miscellaneous	25.37	1.47	0.00	0.00	7.81	13.64	64.32	23.40	0.00	0.00	36.36	16.26	9.71	1.39
Fixed Cost	28863.34	9170.18	4867.90	9343.61	12877.82	9164.57	7918.98	11557.39	9065.23	7986.67	11830.82	10419.35	10911.75	10246.89
Rental value of owned land	28325.21	7732.66	3644.38	7304.93	11457.21	8095.10	5249.51	7900.33	7018.06	6229.88	9570.04	8313.41	8048.50	7523.05
Rent paid for leased-in land	152.80	68.81	0.00	0.00	0.00	0.00	0.00	0.00	23.58	21.14	37.65	10.38	0.00	25.89
Land revenue, cesses & taxes	0.21	0.37	2.72	2.58	3.03	1.82	22.17	25.97	10.40	12.43	4.73	4.82	4.37	3.42
Depreciation on implements & Farm buildings	93.05	118.27	365.00	369.45	473.51	370.53	452.57	430.64	454.34	331.65	264.40	225.62	341.01	330.13
Interest on fixed capital	292.07	1250.07	855.80	1666.65	944.07	697.12	2194.73	3200.45	1558.85	1391.57	1954.00	1865.12	2517.87	2364.40
Total Cost	46413.90	28002.09	24865.74	36727.57	33723.05	28869.93	34647.03	42215.29	22643.06	23247.71	36812.89	37908.12	24721.02	24617.19
Yield	9.37	4.23	2.13	7.53	5.25	6.59	3.55	7.21	2.88	3.55	5.83	5.45	2.16	4.32
A₂ + FL/Qtl	1878.13	4374.96	9147.84	3554.45	3964.80	2940.19	7582.32	4253.65	4739.28	4226.96	4301.13	5025.86	6439.74	3358.19
C₂/Qtl	4898.37	6435.08	11176.81	4705.82	6259.63	4212.45	9643.64	5773.25	7631.26	6294.08	6249.98	6860.81	11257.55	5599.50

Source: DES

Annexures



Price Policy for KHARIF CROPS

Annexures

Annex Table 5.6i: Groundnut - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Gujarat		Karnataka		Maharashtra		Odisha		Rajasthan		Tamil Nadu	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost														
Human Labour														
Casual	41908.80	42592.70	56707.44	59673.10	40614.43	35825.69	70721.43	70799.35	39125.16	39635.83	38442.15	42951.30	57624.94	60120.20
Attached	9709.94	10757.24	10531.49	10306.78	11393.17	9454.98	13006.48	13491.77	6952.43	7489.30	1893.01	1605.64	18422.32	18734.09
Family	6602.38	6787.49	10541.69	10108.45	7345.34	5663.85	14375.29	18625.74	15684.82	17089.09	7959.20	10569.68	11007.21	12136.44
Total	16312.32	17544.73	21095.19	20478.73	18738.51	15118.83	27670.75	32147.03	23123.05	24730.83	11790.85	13861.51	29440.93	30927.54
Bullock Labour														
Hired	640.22	437.14	649.44	723.45	2904.28	3877.75	548.79	589.95	695.50	766.07	39.63	25.41	604.30	426.63
Owned	779.49	2099.98	2851.15	3399.15	2021.46	1715.84	2355.57	3285.76	1989.07	1532.07	149.03	47.03	203.33	167.65
Total	1419.71	2537.12	3500.59	4122.60	4925.74	5593.59	2904.36	3875.71	2684.57	2298.14	188.66	72.44	807.63	594.28
Machine Labour														
Hired	3954.58	3321.23	4969.15	5222.86	2590.17	2807.87	9207.67	8137.57	1575.47	1738.17	5822.74	5792.10	4084.73	3934.43
Owned	134.93	262.20	1723.19	1597.60	137.04	239.72	2284.65	803.06	73.66	171.46	769.90	694.95	79.93	681.44
Total	4089.51	3583.43	6692.34	6820.46	2727.21	3047.59	11492.32	8940.63	1649.13	1909.63	6592.64	6487.05	4164.66	4615.87
Seed	10773.83	10876.38	10735.25	13921.19	7966.82	7605.25	7585.39	8935.06	8496.94	7962.06	9432.68	11511.94	8690.00	9569.38
Fertilisers and Manure														
Fertilisers	4539.81	3516.35	2759.52	2816.13	3227.44	2786.52	2222.25	2050.65	2162.33	1877.55	1724.48	2426.32	3945.45	3982.88
Manure	1708.57	1478.09	4062.52	3504.26	1271.14	159.31	15121.89	8066.83	175.67	0.00	682.96	630.63	5297.48	5211.95
Total	6248.38	4994.44	6822.04	6320.39	4498.58	2945.83	17344.14	10117.48	2338.00	1877.55	2407.44	3056.95	9242.93	9194.83
Other Inputs														
Insecticides	1019.07	919.94	3574.82	4029.49	240.45	222.93	458.33	407.28	0.00	0.00	2609.97	2796.10	664.31	520.10
Irrigation charges	812.50	1046.99	2807.99	2083.72	508.97	377.67	1558.68	4795.13	123.16	174.38	4496.18	4184.05	3201.82	3244.15
Interest on working capital	1069.89	1085.01	1398.96	1501.96	1008.15	914.00	1707.46	1581.03	710.31	683.24	923.73	981.26	1412.66	1454.05
Miscellaneous	163.59	4.66	80.26	394.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Cost	20262.60	17247.89	18559.31	19755.54	10900.99	14463.04	14171.81	14198.42	14439.69	14186.58	24394.23	25437.16	19935.90	23360.62
Rental value of owned land	17126.77	13425.80	13840.49	15812.16	8143.57	11929.72	9974.62	9099.19	11729.53	11734.54	19215.89	19069.03	15134.07	17275.41
Rent paid for leased-in land	795.68	1712.30	1460.93	933.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.20	12.65
Land revenue, cesses & taxes	0.00	0.00	7.71	6.79	16.53	14.40	22.09	26.92	17.22	14.89	8.99	11.44	8.36	15.18
Depreciation on implements & Farm buildings	231.34	338.77	197.52	151.55	423.10	633.05	387.20	603.10	492.66	449.43	293.15	221.64	463.05	307.76
Interest on fixed capital	2108.81	1771.02	3052.66	2851.77	2317.79	1885.87	3787.90	4469.21	2200.28	1987.72	4876.20	6135.05	4275.22	5749.62
Total Cost	62171.40	59840.59	75266.75	79428.64	51515.42	50288.73	84893.24	84997.77	53564.85	53822.41	62836.38	68388.46	77560.84	83480.82
Yield	14.03	10.29	18.53	21.10	7.99	9.36	11.10	8.43	8.86	9.03	24.58	24.30	18.32	19.03
A₂ + FL/Qtl	2794.16	3792.07	2550.25	2456.62	4674.65	3493.55	6070.64	7930.56	4379.15	4347.52	1431.54	1578.15	2994.61	3006.02
C₂/Qtl	4058.00	5019.01	3288.94	3212.08	5851.58	4694.71	7243.58	9355.86	5918.02	5828.67	2316.16	2495.15	4003.67	4122.00

Source: DES



Annex Table 5.6j: Soybean - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Chhattisgarh		Madhya Pradesh		Maharashtra		Rajasthan	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost										
Human Labour	32559.47	41445.96	20388.21	17868.55	24119.25	25774.36	31677.48	38038.97	23328.76	23273.64
Casual	3519.87	7763.81	3256.25	2415.81	2818.06	3239.01	6308.45	9223.85	3093.27	3249.48
Attached	1063.03	2267.94	0.00	0.00	79.96	92.52	402.09	570.91	250.26	437.78
Family	6515.66	5498.72	5988.07	4201.87	4907.61	5228.37	5150.35	4333.06	7253.49	8115.71
Total	11098.56	15530.47	9244.32	6617.68	7805.63	8559.90	11860.89	14127.82	10597.02	11802.97
Bullock Labour										
Hired	112.73	66.82	71.19	453.53	66.01	16.28	1045.22	1387.91	188.85	139.96
Owned	2849.38	4959.02	1001.84	0.00	621.03	528.87	2668.12	2296.94	686.69	851.05
Total	2962.11	5025.84	1073.03	453.53	687.04	545.15	3713.34	3684.85	875.54	991.01
Machine Labour										
Hired	3906.11	5779.47	3830.27	5387.23	4528.22	5312.17	4535.80	5900.26	3252.74	3128.34
Owned	398.49	498.86	0.00	0.00	337.89	508.17	682.35	753.99	938.78	795.92
Total	4304.60	6278.33	3830.27	5387.23	4866.11	5820.34	5218.15	6654.25	4191.52	3924.26
Seed	3853.61	3776.23	4319.51	3453.27	4425.95	4615.22	4636.33	5206.24	5099.31	5057.27
Fertilisers and Manure										
Fertilisers	6565.00	6004.11	573.06	1149.88	1922.99	1927.93	2713.43	3051.41	577.63	377.66
Manure	374.66	295.03	0.00	0.00	1490.85	1633.86	1259.72	2002.23	0.00	0.00
Total	6939.66	6299.14	573.06	1149.88	3413.84	3561.79	3973.15	5053.64	577.63	377.66
Other Inputs										
Insecticides	2565.21	3446.64	911.65	392.82	1772.87	1748.33	825.35	1800.88	1238.32	585.64
Irrigation charges	46.51	0.00	0.00	0.00	85.13	0.00	527.88	390.01	262.29	75.50
Interest on working capital	789.21	1089.31	436.37	414.14	582.17	622.61	803.85	1021.38	487.13	459.33
Miscellaneous	0.00	0.00	0.00	0.00	480.51	301.02	118.54	99.90	0.00	0.00
Fixed Cost	9722.41	19086.85	5818.20	8533.63	6818.31	10816.94	11564.08	18270.64	7469.30	6833.70
Rental value of owned land	6934.63	15085.82	4443.58	7930.08	4439.29	8722.88	5520.54	8446.55	4363.14	4444.32
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.78	95.90
Land revenue, cesses & taxes	1.18	0.00	2.26	3.27	3.40	3.05	26.76	32.08	7.71	8.76
Depreciation on implements & Farm buildings	498.43	618.12	407.61	232.80	552.69	540.65	623.36	650.26	363.31	367.56
Interest on fixed capital	2288.17	3382.91	964.75	367.48	1822.93	1550.36	5393.42	9141.75	2653.36	1917.16
Total Cost	42281.88	60532.81	26206.41	26402.18	30937.56	36591.30	43241.56	56309.61	30798.06	30107.34
Yield	7.07	18.93	5.09	9.99	4.97	13.69	8.96	17.70	6.27	8.18
A₂ + FL/Qtl	4636.52	2185.50	3893.52	1710.99	4658.21	1815.46	3519.99	2116.89	3541.25	2671.77
C₂/Qtl	5928.34	3145.02	4904.62	2495.31	5845.28	2519.01	4709.72	3079.08	4530.73	3363.61

Source: DES

Annexures



Annexures

Annex Table 5.6k: Sunflower - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Karnataka	
	2015-16	2016-17	2015-16	2016-17
Operational Cost				
Human Labour	32886.34	24214.98	19845.76	18008.65
Casual	6820.77	4093.11	5870.55	5417.98
Attached	0.00	0.00	0.00	0.00
Family	8908.34	5549.33	3186.40	3179.68
Total	15729.11	9642.44	9056.95	8597.66
Bullock Labour				
Hired	333.60	998.96	822.04	827.66
Owned	3230.82	4257.19	1774.94	899.17
Total	3564.42	5256.15	2596.98	1726.83
Machine Labour				
Hired	3216.80	2545.92	1447.21	2762.65
Owned	23.79	17.51	1311.51	0.00
Total	3240.59	2563.43	2758.72	2762.65
Seed	3665.99	2501.97	2155.70	2260.94
Fertilisers and Manure				
Fertilisers	4644.39	3514.37	1816.22	1570.49
Manure	602.61	0.00	654.67	0.00
Total	5247.00	3514.37	2470.89	1570.49
Other Inputs				
Insecticides	388.40	0.00	229.52	139.80
Irrigation charges	252.48	170.99	72.17	500.92
Interest on working capital	726.61	565.63	504.83	449.36
Miscellaneous	71.74	0.00	0.00	0.00
Fixed Cost	12844.17	10418.43	6662.71	10574.01
Rental value of owned land	6824.09	7112.50	3700.48	9546.86
Rent paid for leased-in land	2760.81	0.00	0.00	0.00
Land revenue, cesses & taxes	0.00	1.25	12.71	6.12
Depreciation on implements & Farm buildings	102.35	291.61	119.87	129.24
Interest on fixed capital	3156.92	3013.07	2829.65	891.79
Total Cost	45730.51	34633.41	26508.47	28582.66
Yield	9.44	7.72	3.91	11.69
A₂+FL/Qtl	3746.27	3160.52	4921.63	1538.37
C₂/Qtl	4793.03	4465.41	6534.37	2422.65

Source: DES



Annex Table 5.6I: Sesamum - Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Gujarat		Madhya Pradesh		Odisha		Rajasthan		Uttar Pradesh		West Bengal	
	2015-16	2016-17	2015-16	2014-15	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost														
Human Labour	23211.36	16899.85	25441.30	25728.95	18653.09	17760.98	18146.48	17052.40	11974.03	15422.99	9056.99	10275.42	26274.58	34681.66
Casual	8206.08	8554.17	5866.98	6707.47	5070.12	5057.65	4301.59	5283.17	1362.86	1455.59	2494.11	3344.12	8850.53	9372.63
Attached	0.00	0.00	0.00	0.00	12.10	0.00	0.00	0.00	32.23	0.00	0.00	0.00	4.52	0.00
Family	3150.08	1759.29	7838.12	7404.51	5073.59	4788.10	7919.03	5327.92	7437.85	10620.26	3447.06	3823.40	7942.82	13187.10
Total	11356.16	10313.46	13705.10	14111.98	10155.81	9845.75	12220.62	10611.09	8832.94	12075.85	5941.17	7167.52	16797.87	22559.73
Bullock Labour														
Hired	353.47	0.00	121.75	211.11	22.89	27.83	0.00	0.00	0.00	0.00	0.00	0.00	350.00	869.65
Owned	169.58	0.00	494.21	409.50	61.41	274.10	1859.80	1505.68	26.37	56.27	0.78	0.00	298.37	187.06
Total	523.05	0.00	615.96	620.61	84.30	301.93	1859.80	1505.68	26.37	56.27	0.78	0.00	648.37	1056.71
Machine Labour														
Hired	3931.56	2543.46	1419.93	1594.09	4085.81	3136.27	1521.85	3200.32	1416.56	2218.79	1875.89	1089.56	3670.87	3158.92
Owned	107.35	0.00	1578.89	1412.11	122.53	389.27	0.00	0.00	567.20	253.02	361.72	1531.78	23.06	25.06
Total	4038.91	2543.46	2998.82	3006.20	4208.34	3525.54	1521.85	3200.32	1983.76	2471.81	2237.61	2621.34	3693.93	3183.98
Seed	1165.08	1127.97	1087.47	880.83	1375.11	978.82	779.68	761.14	675.12	456.78	356.90	276.79	457.72	621.95
Fertilisers and Manure														
Fertilisers	3420.15	890.44	2611.67	2476.91	1772.47	1615.50	220.62	31.34	174.30	204.74	43.15	0.00	2922.85	3368.30
Manure	587.97	0.00	1107.32	461.12	417.00	821.98	0.00	0.00	8.06	0.00	0.00	0.00	358.99	1212.06
Total	4008.12	890.44	3718.99	2938.03	2189.47	2437.48	220.62	31.34	182.36	204.74	43.15	0.00	3281.84	4580.36
Other Inputs														
Insecticides	1150.44	1439.82	1077.90	1302.96	72.90	139.15	0.00	0.00	120.81	12.00	37.02	14.25	190.63	378.04
Irrigation charges	291.58	75.16	1703.62	2313.06	0.00	0.00	1233.99	587.55	15.21	0.00	268.97	0.00	648.71	1649.54
Interest on working capital	607.92	458.80	533.44	555.28	411.50	393.12	309.92	355.28	137.46	145.54	170.00	195.52	555.51	651.35
Miscellaneous	70.10	50.74	0.00	1.00	155.66	139.19	0.00	0.00	0.00	0.00	1.39	0.00	0.00	0.00
Fixed Cost														
Rental value of owned land	8051.85	7549.25	12343.44	13177.96	8459.05	6665.08	9101.27	9174.66	4866.27	6744.93	9210.42	9249.59	10319.58	10257.16
Rent paid for leased-in land	7386.48	6797.49	9177.78	6296.01	7215.87	5535.00	7185.81	7118.66	2650.28	3147.45	5147.27	7355.21	8577.99	8251.64
Land revenue, cesses & taxes	0.00	0.00	1286.31	4750.17	0.00	0.00	136.55	388.74	0.00	27.40	1971.72	0.00	0.00	0.00
Depreciation on implements & farm buildings	0.00	0.00	3.42	2.59	7.36	2.49	8.66	10.58	8.24	10.53	3.74	5.70	42.51	42.98
Interest on fixed capital	152.87	258.80	93.71	77.75	243.22	153.27	332.89	324.99	303.40	371.26	340.73	175.55	539.38	494.09
Total	512.50	492.96	1782.22	2051.44	992.60	974.32	1437.36	1331.69	1904.35	3188.29	1746.96	1713.13	1159.70	1468.45
Total Cost	31263.21	24449.10	37784.74	38906.91	27112.14	24426.06	27247.75	26227.06	16840.30	22167.92	18267.41	19525.01	36594.16	44938.82
Yield	3.38	3.13	6.06	6.85	4.35	4.35	5.09	5.66	1.99	2.78	2.70	3.37	9.04	8.87
A ₁ +FL/QtI	6836.89	5482.00	4374.51	4353.88	4206.83	3942.55	3613.87	3096.36	5946.44	5502.40	4052.46	3000.86	2830.84	3794.20
C ₁ /QtI	9155.86	7800.68	6160.14	5557.20	6023.24	5376.56	5283.25	4569.80	8066.09	7703.96	6484.48	5599.17	3866.22	4857.77

Source: DES

Annexures



Annexures

Annex Table 5.6m: Nigerseed - Break-up of Cost of Cultivation

Cost Items	Madhya Pradesh		Odisha	(₹/ha)
	2015-16	2016-17	2015-16	2016-17
Operational Cost				
Human Labour	16494.07	16049.39	13720.67	15224.22
Casual	1851.31	2498.88	0.00	0.00
Attached	577.83	641.37	0.00	0.00
Family	5623.96	5452.17	8052.05	9210.31
Total	8053.10	8592.42	8052.05	9210.31
Bullock Labour				
Hired	449.54	477.20	0.00	0.00
Owned	2713.52	883.21	4896.84	5228.33
Total	3163.06	1360.41	4896.84	5228.33
Machine Labour				
Hired	2752.04	3518.63	0.00	0.00
Owned	0.00	0.00	0.00	0.00
Total	2752.04	3518.63	0.00	0.00
Seed	551.16	540.49	600.00	603.33
Fertilisers and Manure				
Fertilisers	397.67	631.00	0.00	0.00
Manure	1247.64	1085.31	0.00	0.00
Total	1645.31	1716.31	0.00	0.00
Other Inputs				
Insecticides	0.00	0.00	0.00	0.00
Irrigation charges	0.00	0.00	0.00	0.00
Interest on working capital	329.40	321.13	171.78	182.25
Miscellaneous	0.00	0.00	0.00	0.00
Fixed Cost				
Rental value of owned land	6661.02	5322.31	5860.15	5803.21
Rent paid for leased-in land	5932.34	4545.46	3543.62	3262.24
Land revenue, cesses & taxes	0.00	0.00	0.00	0.00
Depreciation on implements & Farm buildings	1.23	1.27	10.00	10.00
Interest on fixed capital	270.23	303.55	422.82	793.58
Total Cost	457.22	472.03	1883.71	1737.39
Yield	23155.09	21371.70	19580.82	21027.43
A₂+FL/Qtl	3.31	3.34	2.32	2.33
C₂/Qtl	4995.91	4789.73	5998.11	6758.06
	6904.46	6258.85	8288.48	8862.81

Source: DES



Annex Table 5.6n: Cotton -- Break-up of Cost of Cultivation

Cost Items	Andhra Pradesh		Gujarat		Haryana		Karnataka		Madhya Pradesh		Maharashtra		Odisha		Punjab		Rajasthan		Tamil Nadu	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Operational Cost	52279.97	53243.64	53472.88	53168.49	42392.66	45862.49	44417.53	43930.68	61398.05	60706.63	56863.51	58031.17	46874.77	47772.26	42691.03	49680.46	48589.43	50412.00	77233.58	70827.02
Human Labour																				
Casual	18157.96	18520.28	15488.84	15378.89	5256.79	11177.99	16002.90	15545.08	9121.26	11664.12	14492.86	17053.20	8045.56	7802.69	7593.87	14867.30	5059.29	5631.26	31073.93	24695.68
Attached	516.24	1614.88	142.35	24.56	538.82	509.14	0.00	793.64	525.50	688.45	1078.66	0.00	216.25	1691.73	2354.04	1451.63	394.74	7.35	14.99	
Family	7325.88	7824.76	11059.91	11307.04	17019.06	15360.53	6758.39	5612.96	19499.97	10783.92	9629.80	9115.14	23504.87	22986.71	8550.11	9115.14	23504.87	23468.22	19827.67	20133.06
Total	26000.08	27959.92	26691.10	26710.49	22814.67	27047.66	22761.29	21158.04	29758.82	31689.59	25965.32	27761.66	29601.10	31005.65	17835.71	26336.48	30015.79	29494.22	50908.95	44843.73
Bullock Labour																				
Hired	1938.91	1639.02	572.84	600.49	28.63	33.59	1221.54	1456.28	314.38	0.00	1431.74	1710.57	143.04	139.79	0.00	0.00	102.63	450.11	110.50	0.00
Owned	4839.98	3814.92	1154.14	1113.41	878.92	287.83	2111.07	1826.97	7371.16	7537.34	5396.58	4849.12	3302.02	2760.02	218.68	204.03	473.07	857.62	933.29	977.10
Total	6778.89	5453.94	1726.98	1713.90	907.55	321.42	3332.61	3283.25	7685.54	7537.34	6828.32	6559.69	3445.06	2899.81	218.68	204.03	575.70	1307.73	1043.79	977.10
Machine Labour																				
Hired	3919.02	4384.67	4135.07	4157.94	1633.27	2182.05	3474.57	3890.50	1887.33	3359.30	3658.45	4090.91	2171.57	2977.38	1273.08	1072.24	1866.24	1847.91	4077.74	4528.77
Owned	157.80	250.57	1626.29	1812.78	2386.55	2502.00	468.55	709.64	168.36	76.48	718.77	515.56	0.00	0.00	4358.16	4683.77	981.72	921.70	50.90	258.33
Total	4076.82	4635.24	5761.36	5970.72	4019.82	4684.05	3943.12	4600.14	2055.69	3435.78	4377.22	4606.47	2171.57	2977.38	5631.24	5756.01	2847.96	2769.61	4128.64	4787.10
Seed	4193.44	3670.89	3365.75	2766.25	4221.40	4116.27	3878.73	3232.68	2424.44	2186.35	3982.20	3690.32	3096.56	1333.62	5754.13	5135.23	5713.21	4963.94	4040.12	3468.66
Fertilisers and Manure																				
Fertilisers	6251.83	6484.81	5137.41	4821.00	3246.86	3304.29	5095.77	4701.38	3818.47	3206.26	6301.37	6032.68	5322.80	2734.89	3659.45	3615.19	2683.66	2525.00	8408.69	7525.24
Manure	608.62	440.37	2681.63	3246.29	0.00	0.00	1553.40	1392.32	4681.87	3792.57	2302.19	2468.41	1479.86	652.21	104.43	6.93	2143.16	5468.84	3073.33	3500.70
Total	6860.45	6925.18	7819.04	8067.29	3246.86	3304.29	6649.17	6093.70	8500.34	6998.83	8603.56	8501.09	6802.66	3387.10	3763.88	3622.12	4826.82	7993.84	11482.02	11025.94
Other Inputs																				
Insecticides	2806.99	2871.65	3428.20	3611.63	2763.31	2241.42	2537.55	2615.81	5943.60	4622.07	2455.87	2399.10	990.57	246.74	7696.37	6745.38	1287.81	1200.39	3118.13	2481.16
Irrigation charges	187.10	349.05	3367.76	3047.83	3637.59	3223.08	173.87	1785.92	1518.99	1576.48	2801.58	2521.42	0.00	0.00	610.75	524.68	2549.40	1850.00	622.33	1638.18
Interest on working capital	1362.25	1376.33	1285.24	1268.53	768.90	924.30	1141.19	1161.14	1259.22	1248.69	1396.35	1466.71	767.25	379.52	1034.57	1229.25	760.14	816.48	1739.57	1536.18
Miscellaneous	13.95	1.44	27.45	11.85	12.56	0.00	0.00	0.00	2251.41	1411.50	453.18	524.71	0.00	0.00	145.70	127.28	12.60	15.79	150.03	68.97
Fixed Cost	21381.75	29873.44	17775.46	19985.39	20641.70	28247.10	17302.08	25805.31	20415.29	22039.97	18998.19	23033.26	15152.16	8525.25	15599.23	38684.70	19396.16	21562.09	20520.57	27849.21
Rental value of owned land	18023.71	26670.33	12072.81	14375.33	11697.56	22673.30	14107.61	21607.56	14081.63	14114.30	11341.08	15351.66	12825.47	7049.57	9600.14	30128.70	14170.59	17107.76	14892.05	18256.64
Rent paid for leased-in land	38.33	21.65	1343.35	1044.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.50	3120.04	5205.18	396.72	0.00	0.00	22.11
Land revenue, cesses & taxes	0.05	0.04	15.52	16.80	0.00	0.00	7.78	8.13	2.58	1.96	30.43	34.27	17.24	7.30	0.00	0.00	7.41	11.91	7.09	7.30
Depreciation on implements & Farm buildings	470.04	422.32	250.01	214.91	784.58	397.44	251.73	447.93	1397.03	1687.59	755.90	761.30	731.03	398.33	237.51	327.42	390.40	399.30	777.85	988.03
Interest on fixed capital	2849.62	2759.10	4093.77	4333.36	8159.56	5176.36	2934.96	3741.69	4934.05	6236.12	6870.78	6886.03	1578.42	890.55	2641.54	3023.40	4431.04	4043.12	4843.58	8575.13
Total Cost	73661.72	83117.08	71248.34	73153.88	63034.36	74109.59	61719.61	69735.99	81813.34	82746.60	75861.70	81064.43	62026.93	25758.86	58290.26	88365.16	67985.59	71974.09	97754.15	98676.23
Yield	14.52	18.29	18.24	18.26	8.39	15.20	12.29	16.56	13.63	14.62	16.29	18.43	12.17	15.74	6.97	21.04	15.71	14.62	24.68	14.63
A₁+P/Q₁	3633.23	2935.34	2968.58	2929.12	4815.55	2860.92	3548.52	2632.12	4285.65	3983.84	3497.79	3159.79	3805.49	3006.75	5900.93	2492.41	2929.17	3168.62	3148.33	4885.75
C₁/Q₁	5067.31	4544.69	3839.79	3933.80	7053.70	4587.28	4895.39	4134.33	5585.01	5282.97	4603.47	4354.92	4957.41	4287.24	7469.96	3988.15	4070.84	4570.06	3946.15	6707.83

Source: DFS

Annexures



**Annex Table 5.7: Comparison of Cost Projections (C₂) of
Kharif Crops during Marketing season 2019-20**

Crop/State	State Projections		CACP Projections on the basis of CS data	
	Yield (qtl/ha)	Cost of Production (₹/qtl)	Yield (qtl/ha)	Cost of Production (₹/qtl)
Paddy				
Andhra Pradesh	60.00	1895	58.99	1550
Bihar	38.00	1656	29.66	1441
Kerala	38.00	2549	42.67	1767
Maharashtra	28.56	2984	29.58	2652
Punjab	60.53	2744	68.02	1204
Jowar				
Andhra Pradesh	16.00	2141	18.46	2026
Maharashtra	14.50	2746	11.33	2309
Bajra				
Andhra Pradesh	17.00	1935	NP	NP
Maharashtra	15.32	3046	16.49	2702
Rajasthan	-	1388	9.96	1410
Maize				
Andhra Pradesh	49.00	1751	53.34	1297
Bihar	32.00	1615	33.56	1222
Maharashtra	37.06	1467	43.59	1798
Rajasthan	-	1767	18.72	2163
Ragi				
Andhra Pradesh	12.00	2403	NP	NP
Tur				
Andhra Pradesh	6.00	6069	6.93	7259
Maharashtra	16.18	4716	15.45	5546
Moong				
Andhra Pradesh	6.00	5996	4.34	6301
Maharashtra	5.47	7692	4.79	8698
Rajasthan	-	5734	4.15	5887
Urad				
Andhra Pradesh	7.00	5221	9.76	4353
Maharashtra	6.48	6611	5.10	7963
Rajasthan	-	2807	NP	NP
Groundnut				
Andhra Pradesh	10.00	5190	13.78	4252
Maharashtra	8.53	7297	10.87	6979
Soyabean				
Andhra Pradesh	19.00	3071	12.12	4837
Maharashtra	11.43	4417	13.35	3816
Rajasthan	-	2604	7.20	3973
Sesamum				
Andhra Pradesh	4.50	6580	3.52	8385
Rajasthan		6566	2.34	7909
Sunflower				
Andhra Pradesh	7.50	5510	8.22	5247
Maharashtra	9.22	5804	NP	NP
Cotton				
Andhra Pradesh	20.00	5355	16.63	5103
Maharashtra	14.10	5906	16.68	5179
Punjab	20.40	7161	18.05	4806
Rajasthan	-	3520	16.78	4100

Note: NP-Not Projected due to non-availability of CS estimates

Source: Replies from State governments



Annex Table 5.8: Crop-wise States not included in Projection of Kharif Crops for Marketing Season 2019-20

Crop	State	Reasons for Non-Inclusion in Projection
Maize	Jharkhand	Thin sample, as out of 984 sample holdings at all-India level, only 11 sample holdings pertain to Jharkhand.
	Odisha	Area and Production shares at national level are 0.69 percent and 0.62 percent respectively, which are less than 1 percent of national area and production. Simultaneously, shares of area and production of maize in total area and production of cereals in Odisha are only 1.55 percent and 2.28 percent respectively, which are negligible.
Urad	Chhattisgarh	Thin sample, as out of 436 sample holdings at all-India level, only 5 sample holdings pertain to Chhattisgarh.
Soybean	Chhattisgarh	Thin sample, as out of 616 sample holdings at all-India level, only 5 sample holdings pertain to Chhattisgarh.
Sesamum	Odisha	Thin sample, as out of 257 sample holdings at all-India level, only 4 sample holdings pertain to Odisha.
Nigerseed	Madhya Pradesh	Thin sample, only, 3 sample holdings pertain to Madhya Pradesh.
Cotton	Madhya Pradesh	Thin sample, as out of 1052 sample holdings at all-India level, only 13 sample holdings pertain to Madhya Pradesh.

Annexures

Commission for Agricultural Costs and Prices

List of Officers

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Shri D. K. Pandey

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Shri Raj Kumar

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