

# Price Policy for **Rabi Crops**

THE MARKETING SEASON 2020-21



**Commission for Agricultural Costs and Prices**

Department of Agriculture, Cooperation & Farmers Welfare

Ministry of Agriculture & Farmers Welfare

Government of India, New Delhi

August 2019



Price Policy for

# Rabi Crops

THE MARKETING SEASON 2020-21



**Commission for Agricultural Costs and Prices**  
Department of Agriculture, Cooperation and Farmers Welfare  
Ministry of Agriculture and Farmers Welfare  
Government of India  
August, 2019





**Vijay Paul Sharma**  
Chairman  
Tel : 011-23385216  
Fax : 011-23383848



Commission for Agriculture Costs and Prices  
Department of Agriculture, Cooperation  
and Farmers Welfare  
Ministry of Agriculture and Farmers Welfare  
Krishi Bhawan, New Delhi-110 001

## Preface and Acknowledgements

It is a great honour and privilege for me to submit the report of “**Price Policy for Rabi Crops: The Marketing Season 2020-21**”. The report contains the recommendations on Minimum Support Prices (MSP) for the mandated Rabi crops, namely, **wheat, barley, gram, lentil, rapeseed & mustard and safflower**, and a set of non-price policy recommendations. I hope that these recommendations will encourage and incentivise farmers to adopt new technologies and practices to increase farm income and improve 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 outlook and procurement operations. Trends in productivity and input management issues are analysed in Chapter 3. Trade patterns and comparison of domestic and world prices are presented in Chapter 4. Costs and returns and cost projections for Rabi Marketing Season 2020-21 including inter-crop profitability are discussed in Chapter 5. Non-price and price policy recommendations are given 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, farmers’ representatives/associations, officers from Central and State Governments, representatives of various agencies/organizations/departments 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 in preparation of this report. I would like to express my special appreciation and thanks to Government of Bihar, Government of Haryana, Government of Madhya Pradesh, Government of Telangana and Government of Tripura for organizing regional meetings of the Commission with farmers, government officials and other stakeholders. Special thanks to the Directorate of Economics and Statistics (DES), Ministry of Agriculture & Farmers Welfare for providing key data on cost estimates for this report. However, due to migration to new software (FARMAP 2.0) for data collection/entry, there was delay in providing cost data by the DES (final dataset received by CACP on 19<sup>th</sup> August against the due date of 15<sup>th</sup> June) and resulted in delay in submission of the report.

Last but not least, credit is due to the officers and staff of the Commission, who contributed to this report. Special thanks to Mr. Nikhil Kumar Agarwal and Dr. Harish Kumar Kallega for their contribution and excellent support in preparation and timely completion of the report. The report would not have been possible without active support of Mr. K. M. Alimalmigothi, (Adviser), Mr. D. K. Pandey (Adviser), Mr. Amit Sahu, Ms. Sutapa Ghosh, Mr. Ayush Punia, Mr. Raj Kumar, Mr. Sube Singh, Dr. S. K. Gupta, Mrs. Shilpa Taneja, Mr. Md. Abdul Aleem, Dr. Bhavik Lukka, Mr. S. K. Srivastava, Mr. Mohd Shoeb, Dr. Surendra Singh, Mr. Chandra Kumar and Mr. Vedprakash Meena, who worked tirelessly in preparation of this report. I would like to thank them all for their excellent contribution and support.



# CONTENTS

## Contents

Chapter No.	Description	
	Acronyms	xv
	<b>Summary of Recommendations</b>	xviii
	Price Policy Recommendations	xviii
	Non-Price Policy Recommendations	xix
1	<b>Overview</b>	1
	Agricultural Trade Performance	2
	Food Inflation	3
	Central Pool Stocks	5
	Benefits of Procurement Operations	7
	Remunerative Prices to Farmers: PM-AASHA	8
	Market Infrastructure	9
	Strengthening Farmer Producer Organizations (FPOs)	10
	Direct Income Support to Farmers	10
	Investment in Agriculture	11
	Storage and Warehousing	11
	Farm Labour Shortage	12
	Climate Change and Agriculture	12
	Crop Production Risk Management: PMFBY	13
	Management of Wild/Stray Animals	13
	Structure of the Report	13
2	<b>Supply-Demand Scenario and Procurement Operations</b>	14
	World Outlook	14
	Domestic Market Scenario	15
	Trends in Prices	17
	Wheat	17
	Barley	18
	Pulses	19
	Oilseeds	22



## Contents

Chapter No.	Description	
	Procurement Policy and Operations	24
	Wheat	25
	Pulses	27
	Oilseeds	28
	Economic Cost of Wheat	29
	Market Distortions: Bonus and Market Fees	30
	Bonus on MSP	30
	High State Taxes	30
	Review Essential Commodities Act (ECA)	31
	Promote Producer Organizations	31
	Awareness about MSP and FAQ Standards	31
	Recapitulation	32
3	<b>Crop Productivity and Input Management</b>	33
	Productivity Growth Trends	33
	Country Comparisons of Crop Productivity	35
	Crop Productivity and Yield Gap Analysis in Major Producing States	36
	Wheat	37
	Barley	38
	Gram	39
	Lentil	40
	R&M	42
	Safflower	42
	District Level Productivity of Major Rabi Crops	43
	Wheat	43
	Gram	44
	R&M	45
	Drivers of Productivity Growth	46
	Seed Availability and Seed Replacement Rates	46
	Fertilizer Use	48
	Irrigation	50
	Linking MSP with Oil Content in Rapeseed and Mustard	52
	Recapitulation	52

Chapter No.	Description	
4	<b>Trade Performance and Competitiveness of Indian Agriculture</b>	54
	Cereals: Wheat	55
	Nutri/Coarse Cereals: Barley	58
	Pulses	59
	Gram (Chickpea)	62
	Lentil	63
	Edible Oils and Oilseeds Complex	65
	Rapeseed and Mustard (R&M) Seed	68
	Rapeseed and Mustard (R&M) Oil	69
	Trade Policy	72
	Trade Outlook	74
5	<b>Costs and Returns</b>	76
	Costs and Returns of Rabi Crops during TE2017-18	77
	Movement in Agricultural Labour Wages and Prices of Farm Inputs	79
	Cost Projections for Rabi Marketing Season, 2020-21	81
	Relative Returns of Crops	87
	Comparison of CACP Cost Estimates and State Estimates	87
	Inadequate Sample Size	88
	Recapitulation	88
6	<b>Considerations and Recommendations for Price Policy</b>	90
	Global Outlook	90
	Domestic Demand and Supply	91
	Domestic and International Price Scenario	91
	Non-Price Policy Recommendations	91
	Ensure Remunerative Prices to Farmers	91
	Review Essential Commodities Act (ECA) and Agricultural Produce Market Committee (APMC) Act	92
	Liquidate Excess Stocks	92
	Review Open-Ended Procurement Policy	92
	Reserve Price for Disposal of Stocks	92
	Storage and Warehousing Capacity	93





Chapter No.	Description	
	Negotiable Warehouse Receipt Financing	93
	Review of Number of Crops under Mandate of the Commission and Sample Size	93
	Emphasis on Improving Productivity	94
	Promote Oilseeds Cultivation	94
	Investment in Agriculture	94
	Market Infrastructure	94
	Awareness about MSP and FAQ Standards	95
	Reduce Market Distortions: Bonus and State Taxes/Charges	95
	Strengthen Farmer-Market Linkages: Farmer Producer Organizations	95
	Trade Policy	95
	Wild/Stray Animals	96
	Price Policy Recommendations	96
	Incentivising Efficiency: Linking MSP with Oil Content	96



## LIST OF CHARTS

### List of Charts

Chart No.	Title	
Chart 1.1	India's Exports and Imports of Agri-Commodities (2007-08 to 2018-19)	3
Chart 1.2a	Trends in CPI based Food Inflation	4
Chart 1.2b	Retail vis-à-vis Wholesale Inflation of Wheat	4
Chart 1.2c	Retail vis-à-vis Wholesale Inflation of Gram	5
Chart 1.3	Central Pool Stocks of foodgrains with FCI, January 2013 to July 2019	6
Chart 1.4	Trends in Number of Farmers Benefitted from Wheat Procurement Operations during last four Rabi Marketing Seasons	8
Chart 1.5	Trends in Total GCF in Agri & Allied Sectors during 2011-12 to 2017-18	11
Chart 2.1	Trends in Domestic Market Prices vis-à-vis MSP of Wheat	17
Chart 2.2	Comparison of Market Prices and MSP of Wheat in Uttar Pradesh and Madhya Pradesh during RMS 2019-20	18
Chart 2.3	Trends in Domestic Market Prices vis-à-vis MSP of Barley	19
Chart 2.4	Trends in Domestic Prices vis-à-vis MSP of Gram	20
Chart 2.5	Comparison of Market Prices and MSP of Gram in Madhya Pradesh, Maharashtra and Rajasthan during RMS 2019-20	20
Chart 2.6	Trends in Domestic Market Prices vis-à-vis MSP of Lentil	21
Chart 2.7	Trends in Domestic Market Prices vis-à-vis MSP of R&M	22
Chart 2.8	Comparison of Market Prices and MSP of R&M in Rajasthan and Haryana during RMS 2019-20	23
Chart 2.9	Trends in Domestic Market Prices vis-à-vis MSP of Safflower	24



## List of Charts

Chart No.	Title	
Chart 2.10	Share of Procurement of Wheat in DCP and Non-DCP States	25
Chart 2.11	Share of Major States in Marketed Surplus and Procurement of Wheat, TE2018-19	26
Chart 2.12	State-wise Procurement of Gram in RMS 2018-19	28
Chart 2.13	Average Rate of Disposal vs MSP of Kharif and Rabi Pulses	28
Chart 2.14	Procurement of Mustard in Major Producing States in RMS 2018-19	29
Chart 2.15	Economic Cost of Wheat and Share of Different Components of Economic Cost	30
Chart 3.1	Productivity Trends in Major Wheat Growing States	37
Chart 3.2	Yield Gap in Major Wheat Growing States, TE2017-18	38
Chart 3.3	Productivity Trends in Major Barley Growing States	39
Chart 3.4	Productivity Trends in Major Gram Growing States	39
Chart 3.5	Yield Gap in Major Gram Growing States, TE2017-18	40
Chart 3.6	Productivity Trends in Major Lentil Growing States	41
Chart 3.7	Yield Gap in Major Lentil Growing states, TE2017-18	41
Chart 3.8	Productivity Trends in Major R&M Growing States	42
Chart 3.9	Productivity Trends in Major Safflower Growing States	43
Chart 3.10	Trend in Fertilizer Consumption during Rabi Season	49
Chart 3.11	Prices of N, P <sub>2</sub> O <sub>5</sub> and K <sub>2</sub> O Nutrient in Urea, DAP and MOP, respectively	50
Chart 3.12	Cumulative Irrigation Potential Created and Utilized	51
Chart 3.13	Financial and Physical Achievement under PMKSY – Per Drop More Crop	51
Chart 3.14	MSP based on Oil Content of R&M	52
Chart 4.1	Share of Major Agri-Commodities in Total Agri-Exports and Agri-Imports in 2018-19	55
Chart 4.2	India's Exports of Wheat, 2008-09 to 2018-19	56
Chart 4.3	India's Imports of Wheat, 2008-09 to 2018-19	57
Chart 4.4	MSP, Domestic and International Prices of Wheat, 2014 (Q <sub>1</sub> ) to 2019 (Q <sub>2</sub> )	57
Chart 4.5	India's Exports of Barley, 2008-09 to 2018-19	58
Chart 4.6	MSP, Domestic and International Prices of Barley, 2014(Q <sub>1</sub> ) to 2019(Q <sub>2</sub> )	59

Chart No.	Title	
Chart 4.7	India's Imports of Pulses, 2008-09 to 2018-19	60
Chart 4.8	Trends in Exports of Pulses from India, 2008-09 to 2018-19	61
Chart 4.9	Month-wise Imports of Pulses during 2017-18 and 2018-19	62
Chart 4.10	India's Exports of Gram (Chickpea), 2008-09 to 2018-19	63
Chart 4.11	India's Imports of Gram (Chickpea) & Yellow Peas, 2008-09 to 2018-19	63
Chart 4.12	India's Imports of Lentil, 2008-09 to 2018-19	64
Chart 4.13	MSP, Domestic and International Prices of Gram, 2014(Q <sub>1</sub> ) to 2019(Q <sub>2</sub> )	65
Chart 4.14	MSP, Domestic and International Prices of Lentil, 2014 (Q <sub>1</sub> ) to 2019 (Q <sub>2</sub> )	65
Chart 4.15	India's Imports of Edible Oils, 2008-09 to 2018-19	67
Chart 4.16	India's Imports of Palm oil and Soybean Oil, 2008-09 to 2018-19	68
Chart 4.17	MSP, Domestic and International Prices R&M Seed, 2014(Q <sub>1</sub> ) to 2019(Q <sub>2</sub> )	69
Chart 4.18	India's Imports of R&M Oil, 2008-09 to 2018-19	70
Chart 4.19	Domestic and International Prices of R&M Oil, 2014 to 2018 (Q <sub>2</sub> )	70
Chart 4.20	Trends in Imports and Import Duties of Crude Palm Oil and Fractions, 2004 to 2018	71
Chart 4.21	Trends in Imports and Import Duties of Refined Palm Oil and Fractions, 2004 to 2018	71
Chart 4.22	Trends in Imports and Import Duties of w/n De-Gummed Soy Oil, 2004 to 2018	72
Chart 5.1	Average Gross Returns of Rabi Crops, TE2017-18	79
Chart 5.2	State-wise Average Daily Wage Rates and Growth in Rabi Season during 2018-19	80
Chart 5.3	Movements in Farm Input Price Indices during Rabi Season	81
Chart 5.4	Supply Curve and Projected CoP for Mandated Crops; RMS, 2020-21	84
Chart 5.5	Crop-wise Average Relative Gross Returns (%), TE2017-18	87

## List of Charts





# LIST OF TABLES

## List of Tables

Tables No.	Title	Page No.
Table S.1	MSPs Recommended for RMS 2020-21	xviii
Table 2.1	Global Supply and Demand Outlook for Wheat	15
Table 2.2	Domestic Supply Situation of Wheat in India	16
Table 2.3	Procurement of Pulses under Prices Support Scheme (PSS)	16
Table 2.4	Market Prices vis-a-vis MSP of Wheat in Major Producing States in RMS 2019-20	18
Table 2.5	Market Prices vis-a-vis MSP of Gram in Major Producing States in RMS 2019-20	21
Table 2.6	Market Prices vis-a-vis MSP of R&M in Major Producing States in RMS 2019-20	23
Table 2.7	State-wise Procurement of Wheat	27
Table 3.1	Quinquennial Average Annual Growth Rate of Area, Production and Productivity of Major Rabi Crops	34
Table 3.2	Productivity Comparisons for Major Crops in 2017	36
Table 3.3	District-level Productivity Trends in Wheat	44
Table 3.4	District Level Productivity Trends in Gram	45
Table 3.5	District Level Productivity Trends in R&M	46
Table 3.6	SRR for Wheat in Major Producing States	47
Table 3.7	SRR for Gram in Major Producing States	48
Table 3.8	SRR for R&M in Major Producing States	48
Table 4.1	Share and Key Originating Countries of India's Pulses Imports, TE 2018-19	60
Table 4.2	India's Trade Policy - Rabi Crops	73



Tables No.	Title	Page No.
Table 5.1	Average Gross Returns of Rabi Crops, TE2017-18	78
Table 5.2	State-wise Changes in Average Daily Wage Rates of Agricultural Labour during Rabi Season	80
Table 5.3	Trends in all-India Farm Input Price Indices (base 2011-12=100)	82
Table 5.4	Projected CoP of Mandated Rabi Crops, RMS 2020-21	83
Table 5.5	Crop-wise Average Relative Gross Returns (%), TE2017-18	87
Table 6.1	MSPs Recommended for RMS 2020-21	96

## List of Tables

## ANNEX TABLES

### List of Annex Tables

Table No.	Title	Page No.
Table 1.1	All India Estimates of Area of Agricultural Commodities	99
Table 1.2	All India Estimates of Production of Agricultural Commodities	100
Table 1.3	All India Estimates of Yield of Agricultural Commodities	101
Table 1.4	Share of Rabi Crops (under MSP) in Major Producing States in Total Production, TE2018-19	102
Table 2.1	Procurement and Procurement as Percent of Production of Wheat in Major Wheat Producing States	103
Table 3.1	Production of Breeder, Foundation and Certified Seeds	104
Table 3.2	State-wise N,P and K Fertilizers Consumption ratio	105
Table 3.3	Simulation-Impact of Oil Content on MSP of R&M	106
Table 4.1	India's Agricultural Exports of Major Commodities	108
Table 4.2	India's Agricultural Imports of Major Commodities	109
Table 4.3	Quarterly Domestic and International Prices of Rabi Crops	110
Table 4.4	Share of Soft Oils and Palm oil in India's Import of Edible Oil	111
Table 5.1	State-wise Average Gross Returns of Rabi Crops, TE2017-18	112
Table 5.2	Month-wise and State-wise Average Daily Wage Rates for Agricultural Labour (Man)	114
Table 5.3	Farm Inputs - Wholesale Price Index (Base 2011-12=100)	116
Table 5.4	State-wise Projected Cost of Production for Rabi Crop Season 2019-20 and Production Shares	120
Table 5.5	Break-up of Cost of Cultivation	121
Table 5.6	All-India Projected Costs of Production of Rabi Crop season for 2019-20 over 2018-19	131
Table 5.7	Comparison of Cost Projections of Rabi Crops, RMS 2020-21	132
Table 5.8	Updating States under Comprehensive Scheme for Rabi Crops	133



## ACRONYMS

A <sub>2</sub>	Actual paid out cost
A <sub>2</sub> +FL	Actual paid out cost plus imputed value of family labour
AAY	Antyodaya Anna Yojana
ABHY	Atal Bhujal Yojana
AGMARKNET	Agricultural Marketing Network
AMIF	Agri-Market Infrastructure Fund
APEDA	Agricultural and Processed Food Products Export Development Authority
APMC	Agricultural Produce Market Committee
C <sub>2</sub>	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 and Prices
CAP	Cover and Plinth
CCE	Crop Cutting Experiments
CECA	Comprehensive Economic Cooperation Agreement
CIP	Central Issue Price
CIPI	Composite Input Price Index
CNA	Central Nodal Agency
CoC	Cost of Cultivation
CoP	Cost of Production
CPI	Consumer Price Index
CPO	Crude Palm Oil
CS	Comprehensive Scheme
DAY	Deendayal Antayodaya Yojana

Acronyms



## Acronyms

DCP	Decentralized Procurement
DES	Directorate of Economics and Statistics
DFPD	Department of Food and Public Distribution
DGCIS	Directorate General of Commercial Intelligence and Statistics
DIPP	Department of Industrial Policy & Promotion
DTA	Domestic Tariff Area
ECA	Essential Commodities Act
EDI	Electronic Data Interchange
EU	European Union
FAI	Fertilizers Association of India
FAO	Food and Agriculture Organisation
FAQ	Fair Average Quality
FCI	Food Corporation of India
FLD	Front Line Demonstration
FPCs	Farmer Producer Companies
FPOs	Farmer Producer Organizations
GCF	Gross Capital Formation
GrAMs	Gramin Agricultural Markets
GST	Goods and Service Tax
GVA	Gross Value Added
GVO	Gross Value of Output
HSD	High Speed Diesel
ICAR	Indian Council of Agricultural Research
IMD	Indian Meteorological Department
IPC	Irrigation Potential Created
IPU	Irrigation Potential Utilized
KALIA	Krushak Assistance for Livelihood and Income Augmentation
KMS	Kharif Marketing Season
LCS	Land Custom Stations
LPA	Long Period Average
MEP	Minimum Export Price
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MKSP	Mahila Kisan Sashaktikaran Pariyojana



MoA&FW	Ministry of Agriculture and Farmers Welfare
MSP	Minimum Support Price
MT	Metric Tonnes
NAFED	National Agricultural Cooperative Marketing Federation of India Ltd
NFSA	National Food Security Act
NMOOP	National Mission on Oilseeds and Oil Palm
NRLM	National Rural Livelihood Mission
NUE	Nitrogen Use Efficiency
OGL	Open General License
OMSS	Open Market Sale Scheme
OWS	Other Welfare Schemes
PDPS	Price Deficiency Payment Scheme
PEG	Private Entrepreneur Guarantee
PHH	Priority Households
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
PSF	Price Stabilization Fund
PSS	Price Support Scheme
QE	Quinquennial Ending
R&M	Rapeseed and Mustard
RMS	Rabi Marketing Season
SAUs	State Agricultural Universities
SEZ	Special Economic Zone
SRR	Seed Replacement Rate
TE	Triennium Ending
TPDS	Targeted Public Distribution System
USDA	United States Department of Agriculture
VAT	Value Added Tax
WPI	Wholesale Price Index





## Summary of Recommendations

### Price Policy Recommendations

S.1 The Commission has considered cost of production, situation and outlook for supply and demand of various crops, especially high stocks of wheat in domestic and world markets, price situation in domestic and international markets along with trade outlook, inter-crop price parity, terms of trade between agriculture and non-agriculture sector, likely effect of the price policy on rest of the economy, rational utilization of land, water and other production resources and a minimum of 50 percent as the margin over the cost of production. Based on these factors, the Commission recommends the following MSPs as given in the Table S.1 below.

**Table S.1: MSPs Recommended for RMS 2020-21**

(₹/qtl)

Crops	Projected Costs for RMS 2020-21		MSP for RMS 2019-20	Recommended MSP for RMS 2020-21	MSP as percent of $A_2$ +FL
	$A_2$	$A_2$ +FL			
Wheat	724	923	1840	1925 (4.6)	209
Barley	585	919	1440	1525 (5.9)	166
Gram	2267	2801	4620	4875 (5.5)	174
Lentil	2034	2727	4475	4800 (7.3)	176
R&M	1495	2323	4200	4425 (5.4)	190
Safflower	2951	3470	4945	5215 (5.5)	150

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

## Non-Price Policy Recommendations

### Emphasis on Improving Productivity

- S.2 Given limited availability of land and other production resources, the possibility of bringing more land under agriculture is limited and therefore, improving yields and bridging gaps between potential and actual yields should be given priority through new technological interventions, research & development, quality seed and other inputs, better utilization of irrigation resources and scientific management practices along with addressing institutional and socio-economic constraints.

### Promote Oilseeds Production

- S.3 Increasing demand for edible oils, steeply rising imports and stagnant domestic production of oilseeds warrant a rethinking of the strategy for oilseeds sector. The Commission recommends that a National Mission on Edible Oils should be launched to increase production and productivity of oilseeds and exploit untapped potential of non-traditional edible oils. To fund the mission, a cess on imports of edible oils should be imposed.
- S.4 For creating favourable and stable conditions for promoting domestic production and providing remunerative prices to oilseeds farmers, appropriate tariffs are needed to maintain a price differential between domestic prices and international prices. To safeguard interest of domestic oilseed farmers and refining industry, Comprehensive Economic Cooperation Agreement between India and Malaysia should be reviewed and duty differential between crude and refined oil should be raised to about 15 percent.

### Attract Private Corporate Investment in Agriculture

- S.5 Private corporate investment in agriculture is about 3 percent and concerted efforts are needed to attract more private investment by creating an enabling environment through necessary changes in the regulatory and institutional frameworks. Household sector, which has the largest share in agricultural investment, must remain central to any strategy for increasing investment in agriculture.

### Improve Market Infrastructure and Institutions

- S.6 Poor market infrastructure and inefficient markets are major constraints faced by farmers. The government has taken several initiatives to develop and strengthen market infrastructure and institutions. Development and upgradation of rural haats into Gramin Agricultural Markets (GrAMs) and linking these markets with e-NAM will strengthen farmer-market linkages and result in better price discovery. However, issues related to unified single trading license, single point levy of market fee and direct payment to farmers need to be addressed on priority.



### Storage and Warehousing Facilities

- S.7 In India, the current storage facilities, either on-farm or off-farm, are either insufficient or unscientific. This leads to distress sale by farmers and acts as major impediment towards increasing income of farmers. It is, therefore, necessary that additional storage and warehousing facilities should be created and existing storage systems be upgraded. Creation of additional storage facilities at farm gate will help farmers to store their produce and sell at later period when market prices improve. However, farmers should be provided loans against Warehouse Receipt to meet cash flow needs to avoid distress sale of produce. The Commission recommends that special efforts should be made to create awareness and promote negotiable warehouse receipt financing scheme among farmers.

### Strengthen Farmer Producer Organizations (FPOs)

- S.8 To ensure better price discovery to farmers, it is necessary to improve their bargaining power and increase the marketability of the produce. Organizing farmers into groups will improve their bargaining power. The commodity specific FPOs should be promoted and encouraged to take up functions of aggregation, sorting/grading and direct marketing of produce. Such groups will create more competition in the market, improve bargaining power and ensure better prices to member producers.

### Ensure Remunerative Prices to Farmers

- S.9 To attract and retain people in agriculture and improve the income and well-being of farmers, efforts are needed to ensure that farmers are provided assured remunerative price for their produce. The government has taken a number of initiatives such as Pradhan Mantri Annadata Aay Sanrakshhan Abhiyan (PM-AASHA), e-NAM, new agriculture export policy, etc. that are aimed towards ensuring remunerative prices to farmers. During RMS 2019-20, market prices of all rabi crops improved compared with RMS 2018-19 but were still below MSP in many crops. Therefore, an effective market intervention mechanism is needed to check market prices falling below MSP. For commodities like rice and wheat, which are required for NFSA and other welfare schemes, procurement system is quite effective. However, for other crops such as nutri-cereals, pulses, oilseeds and other commercial crops, which have no assured offtake, differentiated policy is needed as proposed under PM-AASHA.
- S.10 The Commission suggests that millets growing States should develop effective mechanism of procurement of nutri-cereals and distribute under NFSA and other welfare schemes to ensure remunerative prices to farmers and better nutrition to consumers. Pulses, which are main source of protein in the country, should be distributed to consumers in the selected aspirational/malnourished districts to address the problem of malnutrition in these areas and financial burden can be shared between the State Governments and Central Government. This would also ensure remunerative prices to pulses growers and keep them motivated to produce more.

- S.11 In case of commercial crops, oilseeds and maize, Price Deficiency Payment Scheme (PDPS) and Private Procurement and Stockist Scheme (PPSS) could be better options. The Commission recommends that PDPS should be implemented on a pilot basis for R&M in all major producing States in the next rabi marketing season. However, strict adherence to FAQ standards, capping on difference between MSP and market price and a transparent price discovery mechanism are essential for the success of PDPS.
- S.12 Role of private sector in agricultural marketing cannot be ignored. Therefore, efforts should be made to attract organized private sector agri-business companies in agricultural trade through appropriate incentives and enabling policy environment.

### **Awareness about MSP and FAQ**

- S.13 Lack of awareness about MSP and FAQ standards hurt farmers. The Commission recommends that Central/State Governments should make adequate publicity of MSP, procurement operations including procurement centers, agencies and period as well as FAQ norms in regional/vernacular languages in electronic and print media and public announcement in the villages. There is also a need to develop transparent and scientific system of determining quality of produce to reduce subjectivity.

### **Remove Market Distortions: Bonus and Statutory Charges**

- S.14 Announcement of bonus over and above MSP by some State Governments leads to market distortion, thereby affecting inter-crop price parity and restricting crop diversification and private sector participation. In addition, the statutory and other charges levied by APMCs in some States are still very high (8.5% in Punjab and 6.5% in Haryana). The Commission recommends that State Governments should stop giving bonus, particularly in case of rice and wheat in surplus States and a uniform fee of 1-2 percent should be levied at all-India level to increase private sector participation, promote inter-state trade and achieve the objective of national agricultural market.

### **Review ECA and APMC Act**

- S.15 To promote private sector participation in agricultural marketing, ECA and APMC Act need to be amended/modified as these are perceived to be major impediments. The Commission recommends that renewal of licensing under ECA should be removed/simplified and States/UTs should be persuaded to adopt Model Agricultural Produce & Livestock Marketing (Promotion & Facilitation) Act, 2017.

### **Review Open-Ended Procurement Policy**

- S.16 The open-ended procurement policy for rice and wheat has led to mounting food stocks and adversely affected crop diversification. These excess stocks create storage problems and also high storage and financing costs leading to high food subsidy burden. The Commission recommends that open-ended procurement policy should be reviewed.





### Management of Excess Stocks

- S.17 As against the buffer stock norm of 41.1 million tonnes of grains as on 1<sup>st</sup> July, total Central Pool stocks were 74.4 million tonnes on 1<sup>st</sup> July 2019, out of which at least 15-20 million tonnes need to be liquidated. The Government has taken some steps by announcing a decision to liquidate about 15 million tonnes of rice and wheat stocks but actual liquidation has been very low. The Commission suggests that in order to liquidate surplus stocks, additional allocation under National Food Security Act (NFSA), Antyodaya Anna Yojana (AAY) and other welfare schemes should be made.
- S.18 In order to support pulses growers and ensure remunerative price for their produce, government should continue to distribute surplus stocks of pulses to States/UTs with subsidy under various welfare schemes.

### Reserve Price for Open Market Disposal

- S.19 Liquidation of stocks of pulses and oilseeds by NAFED below MSP depresses market prices and discourages direct procurement by private trade. The Commission recommends that government should not sell these stocks in open market below the MSP and particularly during the procurement season. The reserve price linked to MSP should be fixed for disposal of pulses and oilseeds as is being done for wheat and rice under Open Market Sales Scheme (Domestic).

### Wild Life Management

- S.20 Crop damage by wildlife invasions has increased particularly in areas close to forests. Therefore, there is a need to look into permanent measures to prevent crop damages caused by wild animals. The Commission reiterates its recommendation of developing support programmes for fencing on community-based approach and allowing use of funds under MGNREGA and other schemes.

### Review of Number of Crops under Mandate of the Commission and Sample Size

- S.21 The Commission believes that some of the crops can be excluded from the mandate of MSP. For example, safflower production has declined from over 5 lakh tonnes in early-1980s to about 22 thousand tonnes in 2018-19 and nigerseed from about 1.9 lakh tonnes in 1985-86 to 63 thousand tonnes in 2018-19. Apart from this, in some crops and States, sample size under the Comprehensive Scheme is inadequate, which can undermine the reliability of cost estimates. Therefore, the Commission recommends that the number of crops under the MSP regime should be reviewed and issue of inadequate sample size need to be addressed by the Directorate of Economics & Statistics.

\*\*\*\*\*





# Chapter 1

## Overview

- 1.1 India achieved record production of foodgrains in 2017-18, producing 285 million tonnes, about 3.6 percent higher than 2016-17 and 9.5 percent higher than the 5-year average of 260.2 million tonnes. However, as per Third Advance Estimates, foodgrains production in 2018-19 is expected to decline marginally (0.6%) and is estimated at 283.4 million tonnes, 2.4 percent lower than the target of 290.3 million tonnes. The lower foodgrains production in 2018-19 is attributed to shortfall in production of nutri/coarse cereals (3.6 million tonnes) and pulses, mainly rabi pulses by about 1.4 million tonnes compared with last year's record production.
- 1.2 The estimated production of rabi foodgrains for 2018-19 is also lower at 140.6 million tonnes, about 3.9 million tonnes lower than 2017-18 and 5.1 million tonnes lower than the target for 2018-19. However, the country is set to achieve third consecutive record wheat production of 101.2 million tonnes in 2018-19 driven by higher yield due to favourable weather conditions in wheat growing regions. Production of two major rabi pulses, viz., gram and lentil, is expected to be lower at 10.1 million tonnes and 1.6 million tonnes, respectively in 2018-19 compared with 2017-18. The production of nine oilseeds in the country has remained almost stagnant at around 31.5 million tonnes during the last three years. Rabi oilseeds production recorded a significant increase (7.2%) in 2017-18 and is expected to be at the same level (10.4 million tonnes) in 2018-19. The target for total foodgrains production for 2019-20 is set at 291.1 million tonnes, while target for wheat production is 100.5 million tonnes, rabi pulses at 16.2 million tonnes, rabi oilseeds at 10.3 million tonnes and total nutri/coarse cereals at 48.3 million tonnes. The cumulative rainfall at all-India level during the southwest monsoon season (from June 1 to July 31, 2019) was below Long Period Average (LPA) by 9 percent while current years' storage available in reservoirs was 33 percent of total live storage capacity of the reservoirs as on 31<sup>st</sup> July 2019, which was 74 percent of last year's storage and 80 percent of the average of last 10 years. Due to deficient monsoon rainfall and low availability of water in reservoirs, area sown under kharif crops



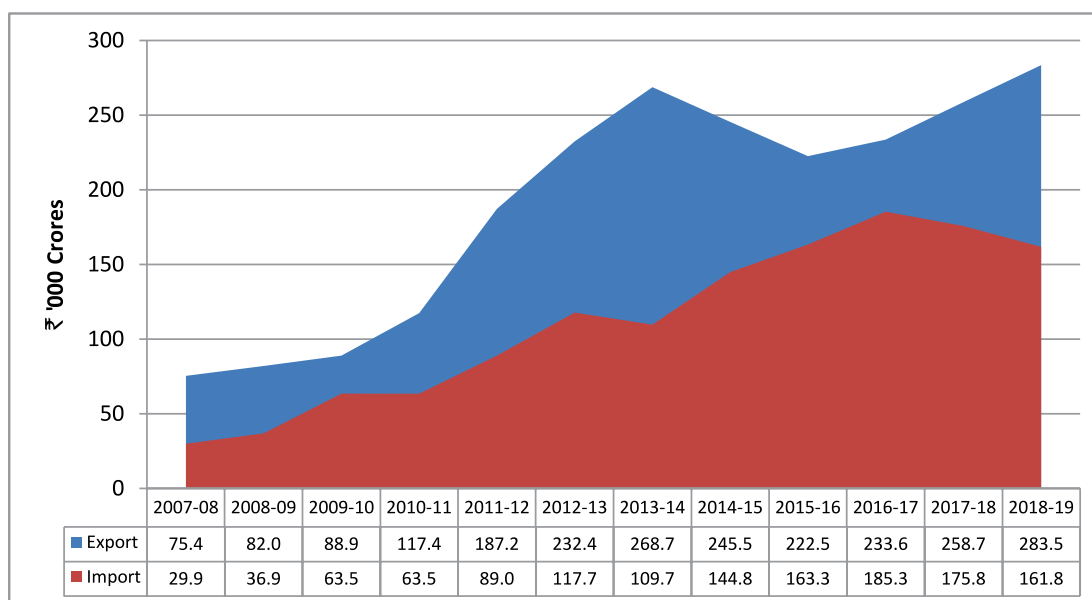
on July 31, 2019 was down by 5.4 percent at 78.9 million ha compared to normal of corresponding week (83.3 million ha) and 6.6 percent down over 2018 (84.4 million tonnes). Pulses acreage recorded an increase of 2.2 percent over normal of corresponding week but was lower by 7.6 percent over 2018. Oilseeds area was down by 3.5 percent over normal of corresponding week and 5.1 percent over 2018 while nutri/coarse cereals planting was down by 7 percent and 6.2 percent over normal of corresponding week and 2018, respectively. However, sowing operations are expected to pick-up in the coming days as the Indian Metereological Department (IMD) has projected the rainfall during the second half of the season to be 100 percent of long period average with a model error of  $\pm 8$  percent.

- 1.3 As per provisional estimates of National Income, the growth rate of Gross Value Added (GVA) at basic constant (2011-12) prices for 'agriculture, forestry and fishing' for the year 2018-19 is estimated at 2.9 percent as against 5 percent in 2017-18 and 6.3 percent in 2016-17. The 'agriculture, forestry and fishing' sector has recorded a continuous deceleration in growth rate for last five consecutive quarters and is a cause of concern as large proportion of population is still dependent on the sector. The quarterly estimate of GVA growth rates for the sector declined from 6.5 percent in Q<sub>4</sub> of 2017-18 to (-)0.1 percent in Q<sub>4</sub> of 2018-19.

### Agricultural Trade Performance

- 1.4 The value of Indian agricultural exports increased during last two years and reached a record high of ₹ 283.5 thousand crore in 2018-19, about 10 percent higher than 2017-18. Meanwhile, agricultural imports declined by 7.9 percent from ₹ 175.8 thousand crore in 2017-18 to ₹ 161.8 thousand crore in 2018-19. Export growth was driven by gains in basmati rice (22.1%), spices (15.6%), cotton (19.9%), oil meals (50.2%) and sugar (82.2%), which together constituted around 32 percent of total agricultural exports. However, non-basmati rice, one of the major export commodity, recorded a significant decline (-9.6%) in 2018-19 relative to 2017-18 due to the higher domestic prices and lower demand in some importing countries, mainly Bangladesh. Imports of vegetable oils, which constitute over 40 percent of total agricultural imports, declined by about 8 percent in 2018-19 due to increase in import tariff on edible oils. In addition, lower imports of pulses (-57.1%) contributed to decline in agricultural imports. Indonesia and Malaysia have the maximum share in India's agricultural imports due to palm oil, which accounts for about 35 percent and 15 percent of total vegetable oil imports, respectively. Excellent performance in agricultural exports and decline in imports of agricultural products led to 46.7 percent increase in agricultural trade surplus, from ₹ 82.9 thousand crore in 2017-18 to ₹ 121.7 thousand crore in 2018-19 (Chart 1.1).

**Chart 1.1: India's Exports and Imports of Agri-Commodities (2007-08 to 2018-19)**



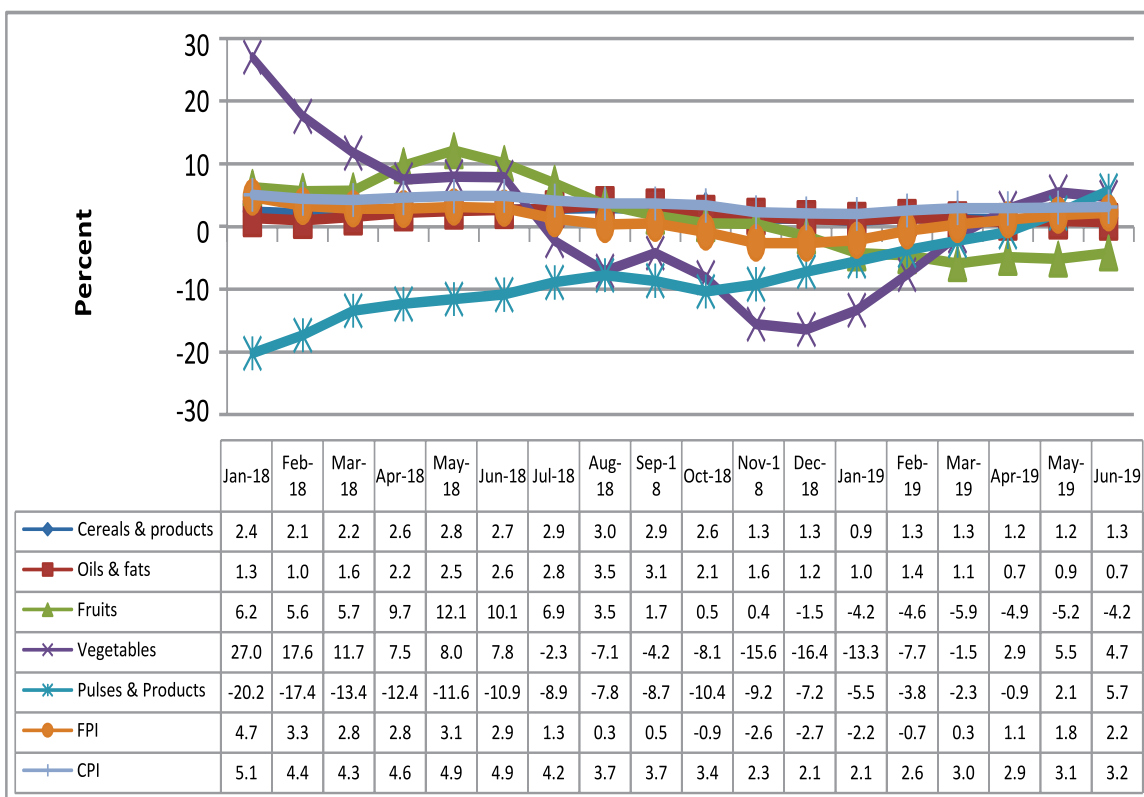
Source: Directorate General of Commercial Intelligence and Statistics (DGCIIS)

## Food Inflation

- 1.5 Food price inflation - around 52.9 percent of consumption expenditure in rural sector and 42.6 percent in urban sector and the largest component (39.1%) in the CPI basket - has moved from negative zone during October 2018 to positive zone in March 2019 and was 2.2 percent in June 2019. Rise in inflation in vegetables at 4.7 percent, pulses at 5.7 percent and cereals and products at 1.3 percent have led to increase in food inflation. Abundant food stocks, record production in the country and depressed global food prices have kept domestic food prices low. While low food prices are generally good for consumers, the adverse impact on the incomes of farmers can be significant and result in lower investments in production, infrastructure and inputs and services.
- 1.6 The annual rate of inflation for wheat, based on monthly WPI, which witnessed an increasing trend from January 2018 to February 2019, showed a declining trend during March-June 2019 and stood at 5.4 percent for the month of June 2019 (over June 2018). On the other hand, annual rate of inflation for wheat, based on monthly CPI, showed an increasing trend from February 2018 to June 2019. Due to record production of wheat and high stocks, it is expected that inflation for wheat, based on monthly CPI, will also follow a declining trend in the coming months.
- 1.7 In case of gram, a major rabi pulses crop, annual rate of inflation, based on monthly WPI, which remained negative up to December 2018 showed a significant increase during 2019 and reached 20.5 percent in June 2019 (over June 2018). The annual rate of inflation for gram, based on monthly CPI, showed an increasing trend since October 2018 but was below WPI based rate of inflation. The rising trend in annual rate of inflation for gram, mainly due to rise in farm prices, is expected to increase the acreage and production of the crop in coming season.

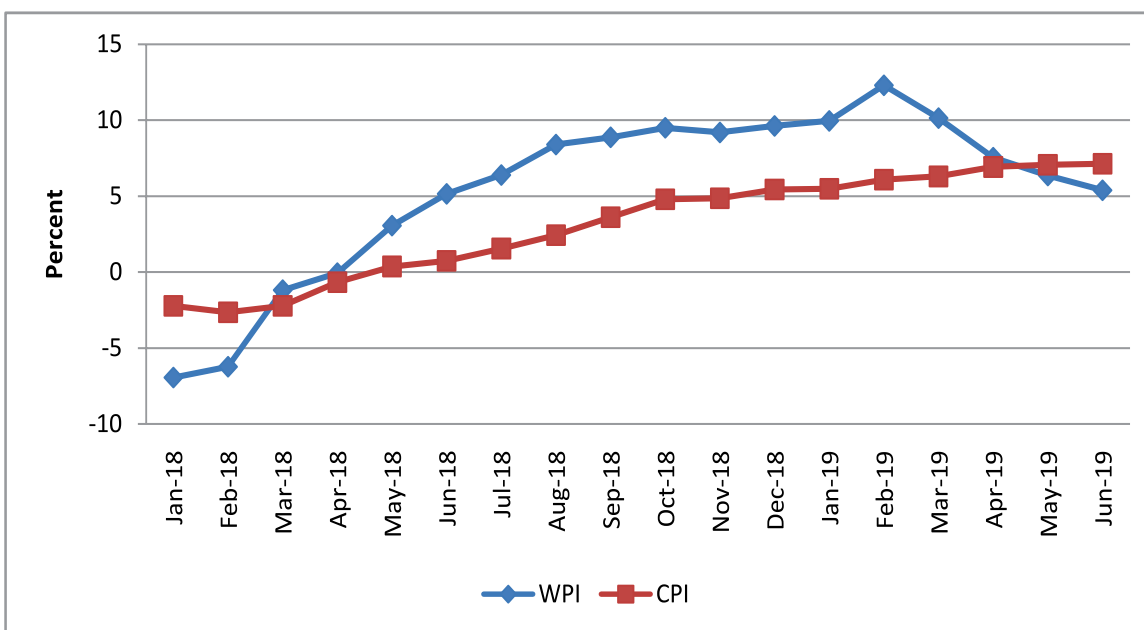


**Chart 1.2 (a): Trends in CPI based Food Inflation**



Source: Ministry of Statistics and Programme Implementation, Government of India

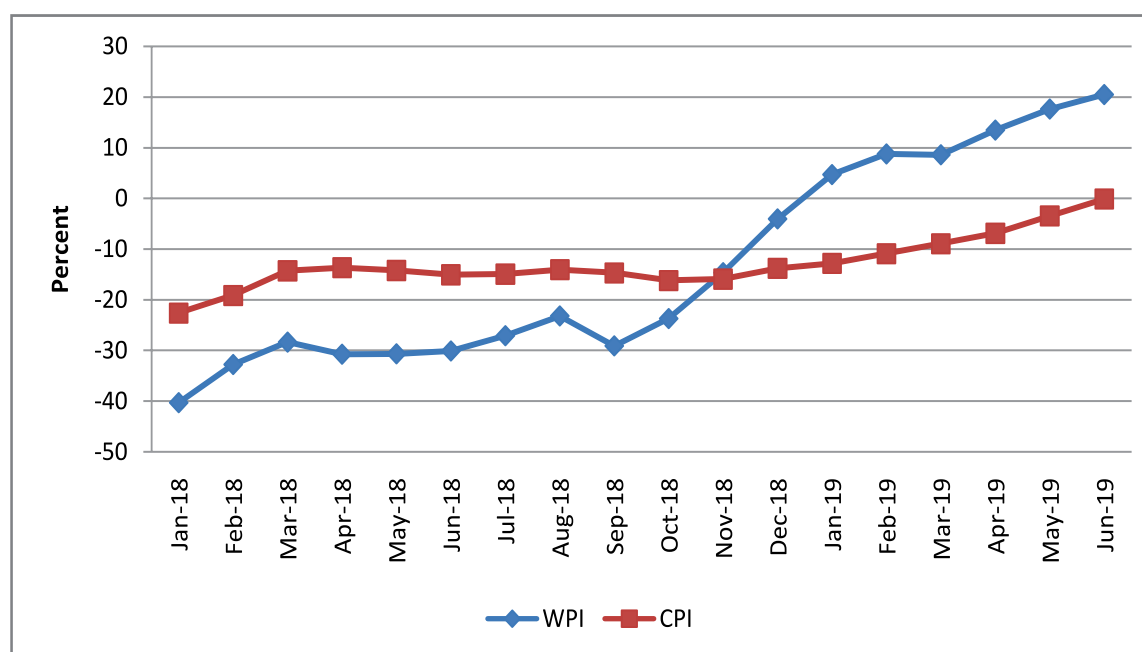
**Chart 1.2 (b): Retail vis-à-vis Wholesale Inflation of Wheat**



Sources: Ministry of Statistics and Programme Implementation, Government of India and Office of Economic Adviser, Government of India



**Chart 1.2 (c): Retail vis-à-vis Wholesale Inflation of Gram**



Sources: Ministry of Statistics and Programme Implementation, Government of India and Office of Economic Adviser, Government of India

## Central Pool Stocks

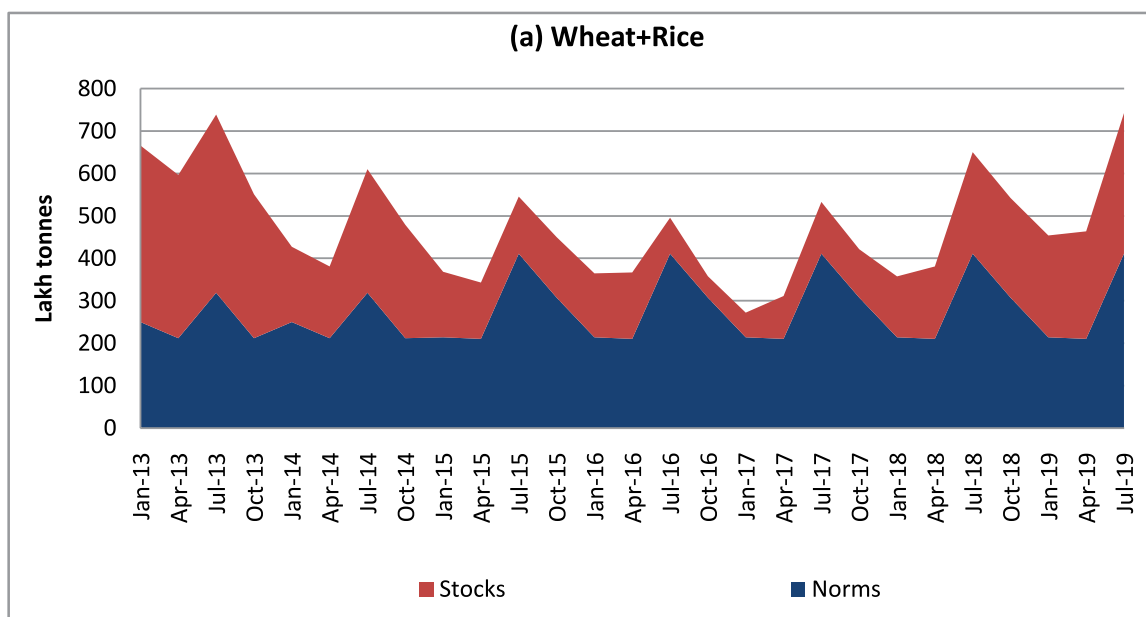
- 1.8 Trends in wheat and rice stocks during January 2016 to June 2019 are given in Chart 1.3. The total stocks (wheat+rice) with the central pool have been significantly higher than foodgrains stocking norms. As on July 1, 2019, total stocks (wheat+rice) were about 74.3 million tonnes (33.1 million tonnes higher than stocking norms of 41.1 million tonnes on July 1, 2019).
- 1.9 Total stocks of wheat in July 2019 were 45.8 million tonnes, marginally down from 46.6 million tonnes in June 2019 but still 66.2 percent higher than the stocking norms of 27.6 million tonnes as on July 1, 2019 and have been on increasing trend since June 2016 where the total stocks of wheat were 32.6 million tonnes.
- 1.10 As per Food Corporation of India (FCI) estimates, assuming likely procurement during Kharif Marketing Season (KMS) 2019-20 and Rabi Marketing Season (RMS) 2020-21 to be at the same level as last year (79.2 million tonnes) and anticipated offtake of 63 million tonnes during July 2019 to June 2020, the stock position as on July 1, 2020 is anticipated at 87.4 million tonnes, 46.3 million tonnes more than stocking norms.
- 1.11 It may be noted from Chart 1.3(b) that stocks of wheat have been much higher than the buffer stock norms and had reached the level of 46.6 million tonnes in June 2019 (highest during the last seven years). The current storage capacity in the country is around 85.5 million tonnes comprising about 73.5 million tonnes in covered and 12 million tonnes in Cover and Plinth (CAP). Currently, the Government has a huge stock of foodgrains of over about 74 million tonnes, which will create storage



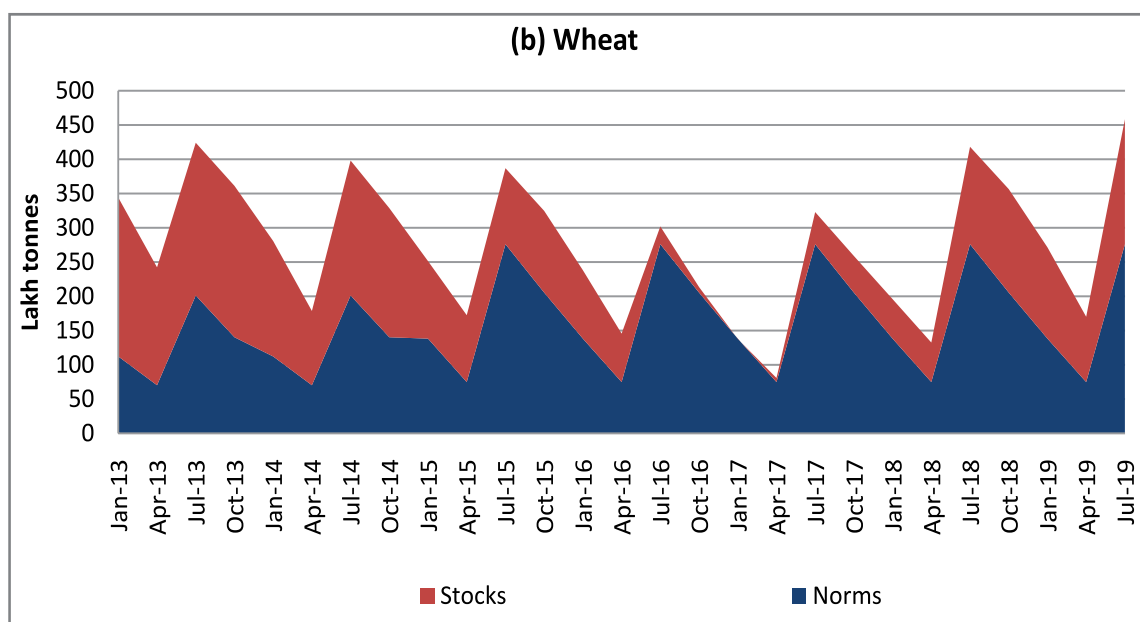
problem and high storage and financing costs. The Government has announced Open Market Sale Scheme (Domestic) [OMSS(D)] policy 2019-20 for sale of wheat and rice in open market. The quantity for sale of wheat has been fixed at 10 million tonnes at a reserve price of ₹ 2080 per quintal for first quarter, ₹ 2135 for second, ₹ 2190 for third and ₹ 2245 for fourth quarter and 5 million tonnes for Grade 'A' rice at ₹ 2785 per quintal up to September 30, 2019 and ₹ 2785 or Minimum Support Price (MSP) derived price (1.5 times MSP of Grade 'A' paddy), whichever is higher from October 1, 2019 for 2019-20. The Commission is happy to note that the reserve price is linked to MSP, which will not depress open market prices and encourage private players to procure directly from farmers during procurement season. The offtake of wheat has been only 2.4 lakh tonnes against 2 million tonnes offered for sale during 2019-20. Therefore, in order to liquidate excess stocks, additional allocation of foodgrains under Public Distribution Scheme (PDS) to beneficiaries of Antyodaya Anna Yojana (AAY) households and Priority Households (PHH), especially in view of drought conditions in some States could be made.

- 1.12 The Commission recommends that open ended procurement policy needs to be reviewed in view of mounting stocks and the absence of liquidation policy.

**Chart 1.3: Central Pool Stocks of foodgrains with FCI, January 2013 to July 2019**



Source: Department of Food and Public Distribution



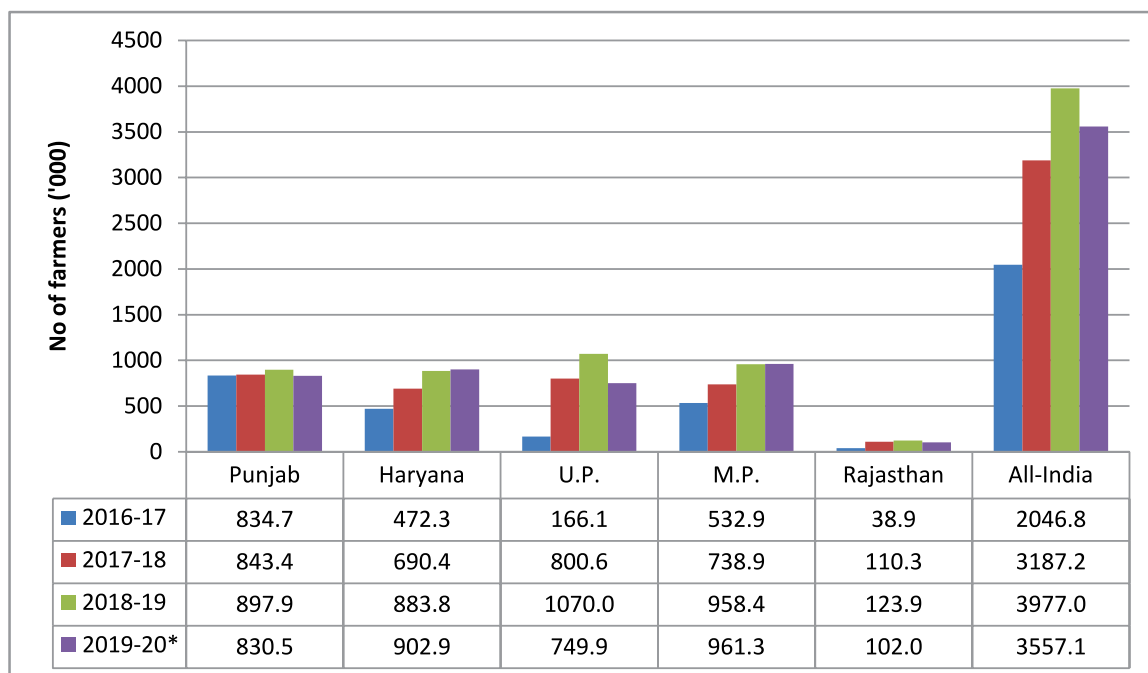
Source: Department of Food and Public Distribution

## Benefits of Procurement Operations

- 1.13 At all-India level, the number of farmers benefitted from MSP and procurement operations has increased significantly, from 20.5 lakh farmers in RMS 2016-17 to 39.8 lakh farmers in RMS 2018-19, but declined to 35.6 lakh farmers in RMS 2019-20. Uttar Pradesh, Rajasthan, Haryana and Madhya Pradesh witnessed significant increase in coverage of farmers under procurement operations. In Uttar Pradesh, number of farmers benefitted increased from about 1.7 lakh in 2016-17 to 10.7 lakh in 2018-19 while in Rajasthan it increased from about 39 thousand to 1.2 lakh, in Haryana from about 4.7 lakh to 8.8 lakh and in Madhya Pradesh from 5.3 lakh to 9.6 lakh between 2016-17 and 2018-19. However, there is a scope for increasing coverage of procurement operations in States like Uttar Pradesh and Rajasthan as coverage is still very low and market prices for wheat were ruling below MSP. For example, in Uttar Pradesh, the largest producer of wheat in the country, only about 7 percent of wheat growers are covered under procurement operations and in Rajasthan about 4 percent farmers are covered. On the other hand, more than 80 percent of wheat growers in Punjab are getting benefit of procurement while the State accounts for around 3 percent of total wheat growers in the country.
- 1.14 Apart from this, there is a need to cover more small and marginal farmers under procurement operations as they form the major part of farming community. As indicated by data received from some states, medium and large farmers occupy a major share in total procurement in the State and share of small and marginal farmers, though improved during last few years, remain low, which need to be addressed on priority.



**Chart 1.4: Trends in Number of Farmers Benefitted from Wheat Procurement Operations during last four Rabi Marketing Seasons**



Note: \* RMS 2019-20 is under progress (as on 05.07.2019)

Source: Food Corporation of India (FCI)

## Remunerative Prices to Farmers: PM-AASHA

- 1.15 To ensure remunerative prices to farmers, government has taken several initiatives such as umbrella scheme 'Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)', national e-market platform (e-NAM) for transparent and better price discovery, the Model "The State/UT Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017" and development and upgradation of existing 22,000 rural haats into Gramin Agricultural Markets (GrAMs).
- 1.16 The PM-AASHA scheme comprises of Price Support Scheme (PSS) for pulses, oilseeds and copra, Price Deficiency Payment Scheme (PDPS) for oilseeds and Pilot of Private Procurement & Stockist Scheme (PPSS) for oilseeds in selected districts to be implemented by Department of Agriculture, Cooperation & Farmers Welfare, MSP operations for wheat, paddy and nutri/coarse cereals by Department of Food and Public Distribution (DFPD) and cotton and jute operations by Ministry of Textiles.
- 1.17 Under the PSS, maximum of 25 percent of production of a commodity in the State/UTs can be procured by Central Nodal Agency (CNA) through State level agency and supported by Government of India and 25 to 40 percent of the procurement can be done by the CNA but the State Government need to bear the expenditure and use the commodity for PDS /Welfare Schemes. Under PSS, sanctioned orders were issued for procurement of 35.2 lakh tonnes of pulses and oilseeds during KMS 2018-



19. Various State Governments suggested enhancing procurement limit supported by Government of India from 25 percent to 40 percent.

- 1.18 Although, PDPS and Pilot of PPSS have not made much progress, the schemes have the potential to ensure remunerative prices to farmers without physical procurement and increase private sector participation in agricultural marketing. The Commission reiterates its earlier recommendation that PDPS should be implemented in commercial crops like maize, oilseeds, cotton, etc., where liquidation of stocks is a problem and should cover all major producing States. The Commission also recommends that floor selling/modal price should be based on past price trends and Fair Average Quality (FAQ) norms be strictly adhered. In order to facilitate more orderly marketing of crops, farmers need to be 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 prices are at harvest-time lows. 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. In case market prices are higher than MSP, the producers can sell in the open market and take advantage of high prices.
- 1.19 It is also important that procurement operations be expanded and strengthened for other crops like in case of wheat and paddy. Extension of procurement operations to other crops will also assist in much needed crop diversification and will help in optimal utilisation of farm resources. Also, starting procurement activities at right time is the key to ensure remunerative returns to farmers and prevent them from distress sale.

## Market Infrastructure

- 1.20 The decision of the Government to develop and upgrade existing 22,000 rural haats into GrAMs is a welcome step as average area served by a regulated market in the country is about 500 km<sup>2</sup> as against 80 km<sup>2</sup> recommended by National Commission for Farmers (2006). Development of rural haats will reduce the average area served by one market (both regulated and rural haats) from 500 km<sup>2</sup> to 112 km<sup>2</sup>. However, development and up-gradation of physical and market infrastructure of mandis and haats through convergence of schemes like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Gram Sadak Yojana (PMGSY), Agri-Market Infrastructure Fund (AMIF) and other government schemes need to be given top priority.
- 1.21 The e-NAM has made a good progress and 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 ₹ 70000 crore in June 2019. However, most of the trades are still being done by traders within the same mandis due to individual licencing system adopted by each Agricultural Produce Market Committee (APMC). Adoption of common licence valid across all e-NAM APMCs under certain guidelines will help in increasing the number of buyers and meeting the objective of better price to



farmers. Further, an idea of sample based sales be explored wherein farmer only need to bring a sample of his produce, along with the relevant quality certification documents, to the mandi. This will help in saving the transportation cost on part of farmers and traders both. Efforts are also needed to train farmers/farmer groups to trade on the platform and increase inter-market and inter-state trade to fully realise the benefits of national market. Apart from this, existing infrastructure in the APMCs needs to be strengthened further so as to ensure quality control during peak arrivals of foodgrains in mandis.

## Strengthening Farmer Producer Organizations (FPOs)

- 1.22 Farmer producer organisations (FPOs) can play a critical role in linking small and marginal farmers with agricultural market system. According to NABARD, about 5000 FPOs including Farmer Producer Companies (FPCs) have been formed in the country under various initiatives of the Govt. of India, State Governments, NABARD and other organizations. The government plans to form 10,000 new farmer producer organisations (FPOs) in the next five years. In addition, Ministry of Rural Development is promoting and facilitating scaling-up successful small-scale projects that enhance womens' participation and productivity in agriculture and allied activities through Mahila Kisan Sashaktikaran Pariyojana (MKSP) under Deendayal Antayodaya Yojana (DAY-NRLM). About 63.4 lakh mahila kisans have been supported under the programme and about 33.6 lakh mahila kisans will be supported during 2019-20. Since majority of the FPOs are small and at a nascent stage of their operations, it is important to provide professional managerial support and adequate access to capital and infrastructure facilities for strengthening market linkages and sustaining their business operations. Efforts should be made towards forming commodity-specific groups to improve both backward and forward linkages and convergence of FPOs being promoted by various organizations.

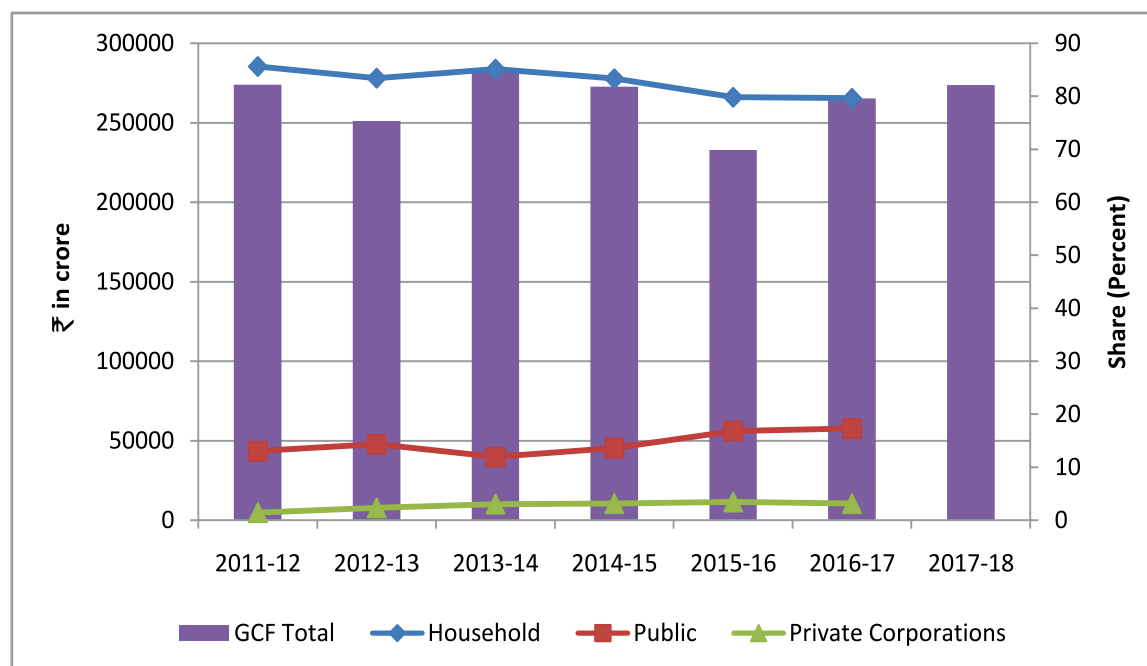
## Direct Income Support to Farmers

- 1.23 With a view to augment the income of farmers, the Government has launched a new Central Sector Scheme, namely, **"Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)"** to provide investment support from December 1, 2018. Under the Scheme, a direct payment of ₹ 6000 per year will be transferred in three 4-monthly instalments of ₹ 2000 each. The Scheme, which was restricted to small and marginal farmers, was expanded to cover all farmers in May 2019 and is expected to cover around 14.5 crore beneficiaries. First instalment to 3.1 crore beneficiaries and second instalment to 2.7 crore beneficiaries have been credited to the bank accounts of the farmers and estimated expenditure by Central Government is ₹ 87,217.5 crores for year 2019-20. In addition, similar schemes have been implemented by various State Governments, such as "Agriculture Investment Support Scheme" ("Rythu Bandhu") by Telangana, "Krushak Assistance for Livelihood and Income Augmentation - KALIA Scheme" by Odisha, Mukhyamantri Krishi Aashirvad Yojna of Jharkhand, Krishak Bandhu Scheme of West Bengal, etc. Direct income support and other initiatives like reforms in agri-marketing, high priority to water conservation and management, trade policy, etc. taken by the government will ensure higher productivity and profitability in agriculture.

## Investment in Agriculture

1.24 The role and importance of investment for productivity and growth cannot be understated and relationship between capital formation and agricultural growth is well established. Gross capital formation (GCF) in agriculture and allied sectors in the country witnessed an increasing trend during the last three years and was 15.2 percent of GVA of agriculture and allied sectors in 2017-18. The share of public investment has increased from 11.9 percent in 2013-14 to 17.3 percent in 2016-17, while share of household sector declined from 85.1 percent to 79.6 percent during the corresponding period. The share of private corporations has increased marginally but is only 3 percent. Therefore, there is an urgent need to attract more corporate private sector investment in agriculture by creating an enabling environment and making necessary changes in the regulatory and institutional frameworks such as APMC Act, ECA, land tenure, contract farming, etc.

**Chart 1.5: Trends in Total GCF in Agri & Allied Sectors during 2011-12 to 2017-18**



Source: Ministry of Statistics & Programme Implementation, Government of India

## Storage and Warehousing

1.25 The grain storage capacities, both on-farm and off-farm, have increased over the last decade in the country. The storage capacity for central pool stocks has increased from 60.7 million tonnes in 2010-11 to 84.3 million tonnes in 2017-18. About 14.2 million tonnes of capacity has been created under Private Entrepreneur Guarantee (PEG) scheme as on April 30<sup>th</sup>, 2019. However, in order to discourage distress sale by farmers and stagger procurement to enable them to get remunerative prices, improved storage facilities at farm level need to be created and promote warehouse receipt financing.



- 1.26 Various State Governments have been implementing and incentivizing scheme of pledge loan for the benefit of farmers. For example, Government of Karnataka is providing subsidized transportation and free warehousing to their farmers along with interest subvention on pledge loan on farmers' produces. Andhra Pradesh and Telangana have introduced Rythu Bandhu Pathakam, under which financing against pledge of stock with no interest up to 180 days is made available to farmers. There is a strong need to create awareness and promote the pledge financing scheme among farmers.

### Farm Labour Shortage

- 1.27 Shortage of labour and high wages are the most pressing risks facing Indian agriculture and major constraint on both agricultural growth and competitiveness. The sector is facing unique challenges due to seasonality in labour demand, migration to urban areas and MGNREGA. The gap between the sector's labour requirements and the availability is expected to widen in the coming years and would impede the sector's growth potential. The Commission is of the view that convergence of MGNREGA with agriculture and promotion of different forms of mechanization could help in overcoming labour shortage problem.

### Climate Change and Agriculture

- 1.28 Indian agriculture is highly exposed to the vagaries of weather, and threat of climate change adds an important layer of vulnerability and uncertainty to existing risks. Evidence on climate change shows that it will affect agriculture due to changing rainfall patterns, rising temperatures, variability and seasonality as well as extreme events such as heatwaves, droughts, storms and floods. Mitigation strategies have the potential to reduce climate change impacts, and adaptation can reduce the losses of those impacts. Increasing the production and creating demand for millets can to a large extent address the future risk of food security as these crops are climate resilient and require much less water.
- 1.29 It is worth mentioning that Government has taken several innovative initiatives to address the problem. For example, Jal Shakti Abhiyan campaign with the theme of *Sanchay Jal, Behtar Kal*, will focus on water conservation and rainwater harvesting, renovation of traditional and other water bodies/tanks, watershed development, afforestation, etc. 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 will improve groundwater management in priority areas through community participation. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) aims to extend coverage of irrigation 'Har Khet ko pani' and improve water use efficiency 'More crop per drop'. Mitigation and adaptation strategies can contribute to climate-resilient agriculture and reduce the threat of climate change. The Commission re-iterates its earlier recommendation of promoting efficiency in water use in agriculture by appropriate pricing of irrigation water and electricity and incentivising farmers for adopting water conserving technologies and practices.



## Crop Production Risk Management: PMFBY

- 1.30 Pradhan Mantri Fasal Bima Yojana (PMFBY), which has entered the fourth year of implementation, has made significant progress but some operational issues need to be addressed. The insured area has increased from 20 percent of gross cropped area to 30 percent, voluntary coverage from 5 percent to 34 percent and sum insured from ₹1.4 lakh crore to ₹2.1 lakh crore. However, there was decline in number of farmers and area insured in 2017-18 compared to 2016-17, but number of farmers benefitted and admissible claims have increased during the corresponding years. Issues of timely release of State share of subsidy, process of conducting Crop Cutting Experiments (CCEs) and farmers' grievances on pending claims need to be addressed to make the scheme attractive to farmers.

## Management of Wild/Stray Animals

- 1.31 Over the last few years, crop damage by wild/stray animals has constantly been growing particularly in areas close to forests and farmers have stopped cultivation of crops in some areas. The problem needs to be addressed on priority as farmers are facing serious problem of crop losses due to wild/stray animals. To address the issue, Commission in its earlier reports had suggested exploring feasibility of installing electric/solar fencing or digging trenches near farmlands on community based approach as well as possibility of using funds under MGNREGA and other schemes.

## Structure of the Report

- 1.32 The report is organized as follows. Chapter 2 discusses the supply and demand situation and prospects and procurement operations. Trends in crop productivity and related aspects are discussed in Chapter 3. Chapter 4 provides an overview of trade patterns and performance, comparison of domestic prices with international prices and brief review of trade policies with a view to use international trade as an expanding opportunity for domestic producers. Chapter 5 analyses cost of production, returns and profitability of different rabi crops. Finally, a summary of the discussion along with non-price policy and MSP recommendations is presented in Chapter 6.

\*\*\*\*\*



## Chapter 2

# Supply-Demand Scenario and Procurement Operations

## Chapter 2

- 2.1 Prices are determined by the interaction of the supply and demand functions, which are influenced by various factors including domestic and world agricultural policies. The trends in domestic and international prices, which indirectly indicate likely demand-supply situation of a commodity in the domestic and world markets, are important determinants of the minimum support price (MSP). This chapter provides information regarding supply and demand factors, outlook for major commodities and procurement operations of main rabi crops. Analysis of domestic price trends using market price data compiled from AGMARKNET that reflect farm harvest price situation in the country has been done. The trends in weighted average monthly prices of mandated crops for procurement season RMS 2015-16 to RMS 2019-20 using State production shares as weights have been analysed and market prices have been compared with MSPs.

### World Outlook

- 2.2 As per United States Department of Agriculture (USDA) World Agricultural Supply and Demand Estimates (June 2019), global wheat production for 2019-20 is forecast to increase to 777.5 million tonnes, 45.9 million tonnes higher than estimated production of 731.6 million tonnes for 2018-19 (Table 2.1). As a result, world-ending stocks are projected to rise to 293 million tonnes, largely on higher inventories in China and European Union (EU). Food and Agriculture Organisation (FAO) Market Monitor and International Grain Council (IGC) also forecast a similar trend in production and ending stocks for 2019-20. According to Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) world wheat production is forecast to reach a record high of around 770 million tonnes in 2019-20, 5 percent increase from 2018-19. Forecast of higher production in major exporting and importing countries will increase supply of wheat in world markets and wheat stocks are also expected to rise.

- 2.3 USDA estimates show marginal decline in global oilseed production in 2019-20 at 597.8 million tonnes as compared to 601.4 million tonnes in 2018-19. Global stocks of oilseeds are forecast to be at 130.3 million tonnes in 2019-20. The ABARES June 2019 Outlook for oilseeds forecast global oilseed production at 586 million tonnes in 2019-20, 3 million tonnes lower than 2018-19. Near-record soybean harvests are expected in South America due to strong Chinese demand, while production in major canola exporting countries is also forecast to remain high, with increased production in Australia and Ukraine. World oilseed imports are forecast to fall significantly due to lower Chinese demand while global consumption is expected to increase. In 2019-20, oilseeds prices are forecast to fall due to lower Chinese demand for pig feed and higher production.

**Table 2.1: Global Supply and Demand Outlook for Wheat**

(Million tonnes)

Crops	USDA			FAO-AMIS			IGC		
	2017-18	2018-19	2019-20 <sup>\$</sup>	2017-18	2018-19	2019-20 <sup>*</sup>	2017-18	2018-19	2019-20 <sup>#</sup>
Production	763.1	731.6	777.5	759.9	730.4	769.5	763.5	733.1	765.8
Supply	1024.0	1012.9	1052.5	1022.0	1012.3	1037.9	1011.8	1003.5	1028.5
Utilisation	744.4	737.9	759.5	739.5	746.4	755.0	741.1	740.7	752.6
Trade	181.2	177.9	184.6	176.8	168.4	174.0	175.2	171.3	173.6
Stocks	279.6	275.0	293.0	280.9	268.4	280.8	270.7	262.7	276.0

Note: \* Forecast 06.06.2019, \$ Forecast 10.05.2019, #Forecast 30.05.2019

Source: AIMS-FAO Market Monitor

## Domestic Market Scenario

- 2.4 Wheat is the major foodgrain in India and throughout the world. India is the second largest producer of wheat in the world, averaging 95.7 million tonnes in 2014-18, accounting for about 13 percent of world production. Wheat production in India increased from 99.9 million tonnes in 2017-18 to 101.2 million tonnes in 2018-19 (Table 2.2). Wheat stocks in central pool as on 1<sup>st</sup> July 2019 were 45.8 million tonnes, 9.6 percent higher than last year and 66.2 percent more than stocking norms. The unprecedented high stocks are largely due to increased production, large-scale open-ended procurement and low exports due to lower world prices. The trends in both domestic and world wheat markets point towards higher availability of wheat in 2019-20, which can have adverse impact on wheat prices. The world wheat price (US No. 2 hard red winter, fob gulf) is forecast to be about 4.4 percent lower in 2019-20.





**Table 2.2: Domestic Supply Situation of Wheat in India**

(Million tonnes)

Particulars	2016-17	2017-18	2018-19
Production	98.5	99.9	101.2
Stocks in Central Pool*	32.3	41.8	45.8
Exports	0.3	0.3	0.2
Imports	5.7	1.6	0.0

Note: \* as on 1<sup>st</sup> July 2017, 2018 and 2019

Sources: FCI, DGCIIS and DES, MoA&FW

- 2.5 The pulses production in the country is estimated to be marginally lower at 23.2 million tonnes in 2018-19 as against 25.4 million tonnes in 2017-18. About 63.3 percent of total production is contributed by rabi pulses, mainly gram and lentil. Production of gram and lentil is also expected to fall by 11 percent and 4 percent, respectively in 2018-19. Procurement of pulses witnessed a decline of about 58 percent, from 45 lakh tonnes during RMS 2018-19 to 18.6 lakh tonnes during RMS 2019-20. This steep decline is mainly due to lower procurement of gram, where procurement fell from 27.2 lakh tonnes in RMS 2018-19 to just 7.7 lakh tonnes during this season. Procurement of tur, important kharif pulse, declined from 8.7 lakh tonnes in KMS 2017-18 to 2.8 lakh tonnes during KMS 2018-19. Almost a similar pattern was observed in other pulses like lentil, moong and urad (Table 2.3). Total procurement of pulses during this season was significantly lower than the sanctioned quantity.
- 2.6 Total stocks of pulses with National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) as on July 1, 2019 was 27.58 lakh tonnes, which is 39 percent lower than stock of July 1, 2018. In case of oilseeds, total stocks of oilseeds with NAFED as on July 1, 2019 were 15.35 lakh tonnes, about 16 percent lower than stocks of July 1, 2018. Lower production, reduced stocks and other market trends point towards tight supply situation of pulses and firming of market prices in the coming season.

**Table 2.3: Procurement of Pulses under Prices Support Scheme (PSS)**

(Lakh tonnes)

Pulses	Kharif 2017-18 and Rabi 2018-19		Kharif 2018-19 and Rabi 2019-20*	
	Sanctioned Quantity	Procurement	Sanctioned Quantity	Procurement
Gram	31.9	27.2	23.6	7.7
Lentil	3.9	2.4	2.8	0.6
Tur	10.8	8.7	8.0	2.8
Moong	4.2	3.0	4.4	3.2
Urad	4.1	3.6	7.1	4.4
Total	54.9	45.0	45.9	18.6

Note: \*Reported as on 25.06.2019

Source: NAFED

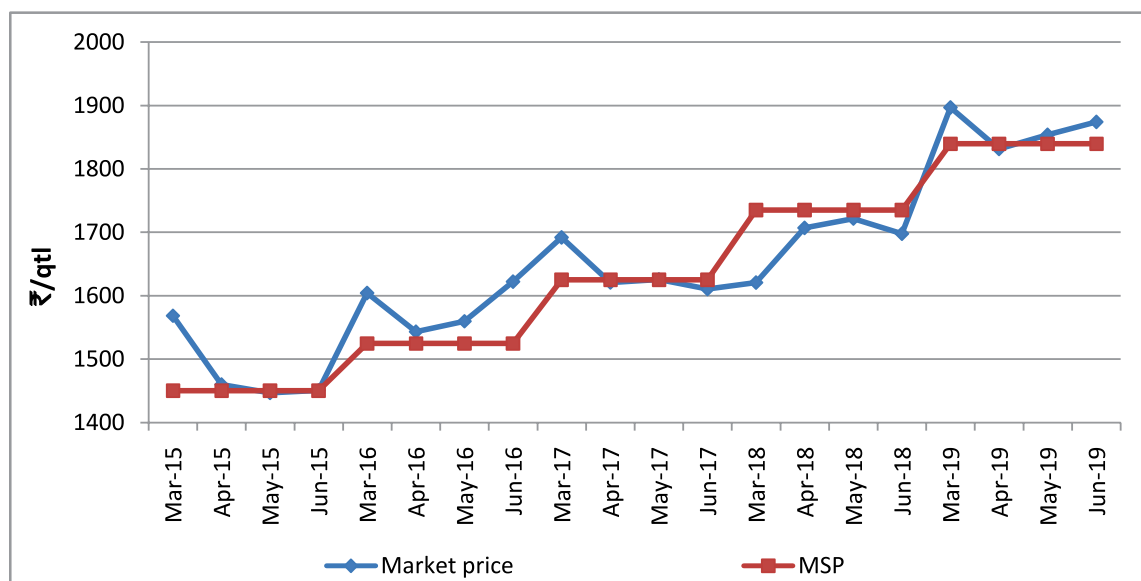


## Trends in Prices

### Wheat

- 2.7 Trends in weighted average monthly market prices of wheat using State production shares as weights during last five marketing seasons are shown in Chart 2.1. It is evident from the chart that market prices of wheat were below MSP during RMS 2018-19 and recovered during RMS 2019-20. The average market price of wheat during RMS 2018-19 was 2.9 percent lower than MSP, while market prices were 1.3 percent higher than the MSP in RMS 2019-20.
- 2.8 State-level analysis shows that market prices improved in RMS 2019-20 in Uttar Pradesh and Rajasthan, which contribute about 41 percent to country's wheat production. For example, during RMS 2019-20, market prices in Uttar Pradesh remained below MSP for about 56 percent of days compared to 98.9 percent days for which prices were reported during RMS 2018-19. In Rajasthan, during RMS 2019-20, about 42 percent of days recorded market prices ruling below MSP compared to 84.1 percent days during RMS 2018-19 (Table 2.4). Lower market prices in some of major producing States call for timely intervention by procurement agencies to check market prices falling below the MSP. Therefore, to address the issue of low market prices, procurement machinery needs to be strengthened and provide timely and targeted intervention to check falling prices.

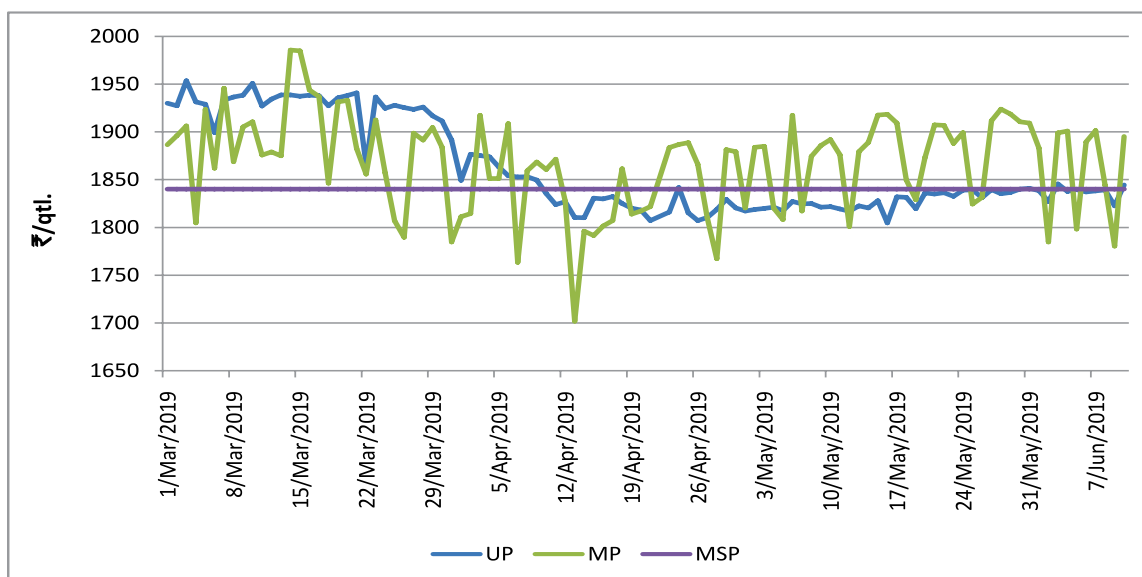
**Chart 2.1: Trends in Domestic Market Prices vis-à-vis MSP of Wheat**



Note: Weighted modal prices of Haryana, Madhya Pradesh, Punjab, Rajasthan and Uttar Pradesh, which covers 86 percent of wheat production in India  
Sources: AGMARKNET and DES, MoA&FW



**Chart 2.2: Comparison of Market Prices and MSP of Wheat in Uttar Pradesh and Madhya Pradesh during RMS 2019-20**



Sources: AGMARKNET and DES, MoA&FW

**Table 2.4: Market Prices vis-a-vis MSP of Wheat in Major Producing States in RMS 2019-20**

States	No of days market prices were reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Mar	April	May	June	Mar	April	May	June	
Haryana	4	20	31	10	4	0	4	0	12.3
Madhya Pradesh	31	29	31	10	3	14	8	3	27.7
Rajasthan	31	29	31	10	8	27	6	1	41.6
Uttar Pradesh	31	29	31	10	0	19	30	8	56.4

Source: AGMARKNET

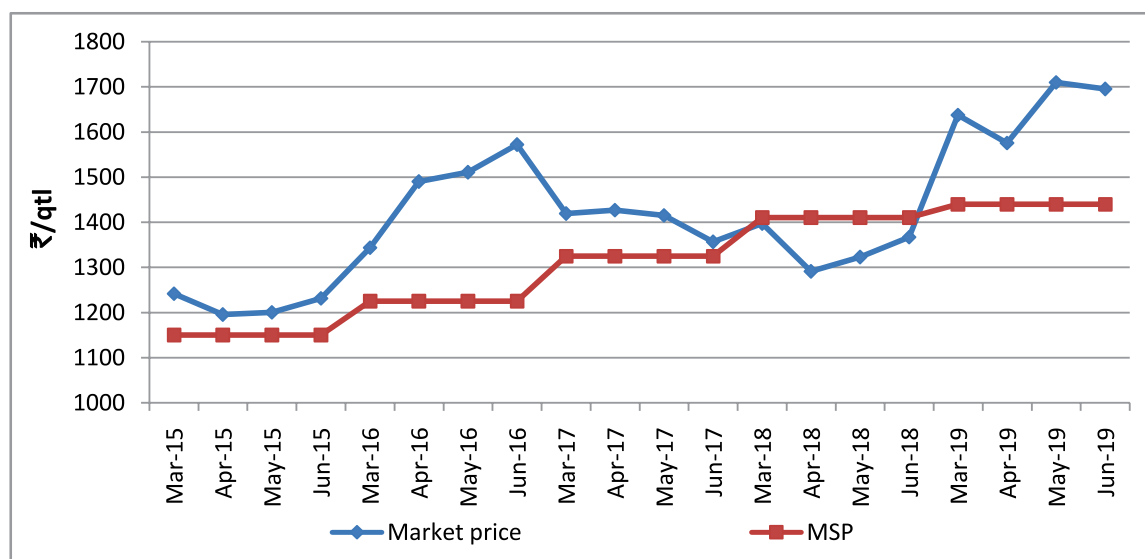
## Barley

2.9 Barley is an important rabi crop of northern plains of India. Rajasthan, Uttar Pradesh and Madhya Pradesh contribute nearly 90 percent of country's production. Barley production in the country has been stagnant at around 1.8 million tonnes in the last three years. Barley, which was mainly cultivated and used for human food consumption, is nowadays being used for industrial purpose like brewing, malting, etc., animal feed and human food.

2.10 Market prices of barley remained below MSP during RMS 2018-19 but recovered and were above MSP during RMS 2019-20 (Chart 2.3). The average market price of barley was ₹1654 per quintal against the MSP of ₹1440 per quintal in RMS 2019-20.

During March to June 2019, market prices in major producing States, namely, Uttar Pradesh and Rajasthan, which contribute three-fourth of total production, ruled well above the MSP.

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



*Note: Weighted wholesale modal price of Haryana, Madhya Pradesh, Rajasthan, and Uttar Pradesh, which account for 92 percent of India's total barley production*

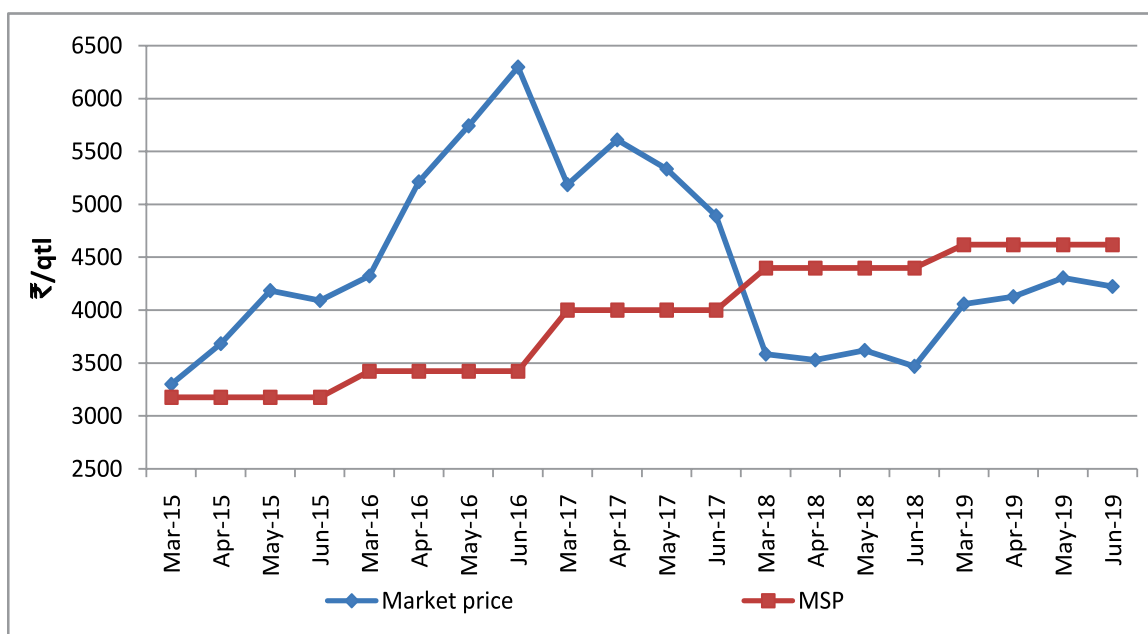
*Sources: AGMARKNET and DES, MoA&FW*

## Pulses

- 2.11 India achieved record production of pulses in 2017-18, making the country self-sufficient in pulses. Rabi pulses contribute around 63 percent of total production of pulses and gram alone accounts for nearly 70 percent of rabi pulses output. Gram production recorded a significant increase during 2016-17 and 2017-18, but India also imported large quantities of yellow peas, a close substitute for gram, during 2016-17 (3.2 million tonnes) and 2017-18 (2.9 million tonnes). High production and large imports led to steep fall in domestic market prices during RMS 2017-18 and 2018-19 and prices were much below (about 20%) MSP during RMS 2018-19. During RMS 2019-20, market prices showed improvement due to lower production and reduced imports (Chart 2.4). The gap between MSP and market price reduced from about 20 percent in RMS 2018-19 to about 10 percent in RMS 2019-20, which was a significant development as market prices were converging towards MSP. The low market prices during RMS 2019-20 were mainly due to depressed prices in Madhya Pradesh, Maharashtra and Rajasthan during March-June 2019 (Chart 2.5).
- 2.12 Farmers have to sell their produce immediately after harvest to meet immediate cash needs to purchase inputs for the next sowing season. During this period, due to large arrivals in mandi, prices generally rule below MSP. Distress sale of produce can be avoided by providing storage and warehousing facilities and financing against warehouse receipts to meet immediate cash requirements.



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

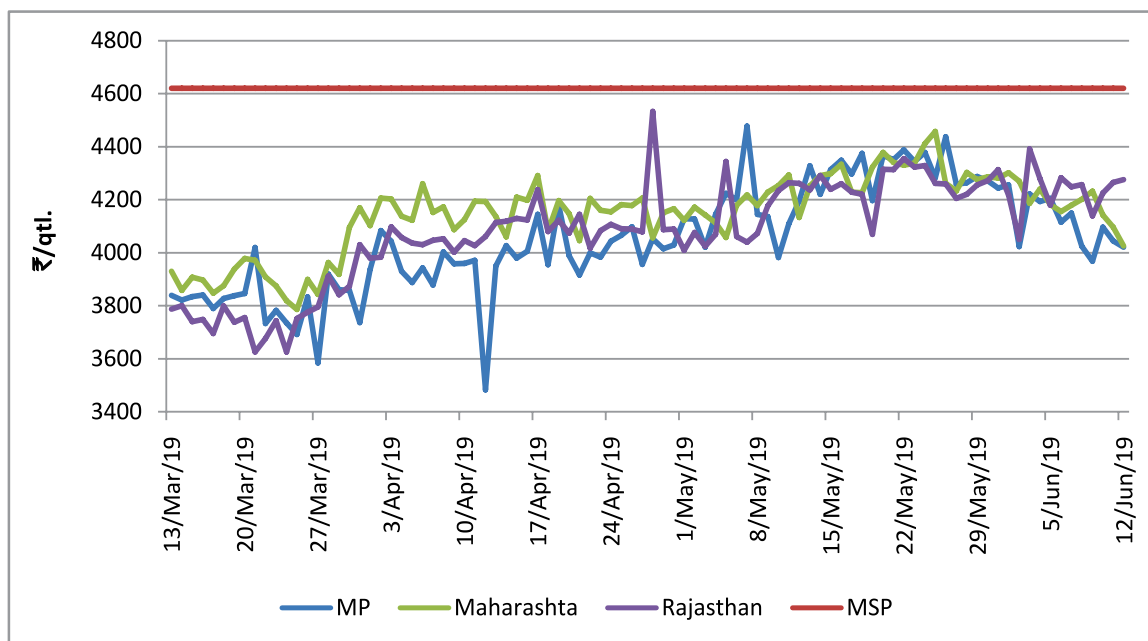


Note: 1. Weighted wholesale modal price of Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh, which covers 93.2 percent of India's total production.

2. MSP is inclusive of bonus.

Sources: AGMARKNET and DES, MoA&FW

**Chart 2.5: Comparison of Market Prices and MSP of Gram in Madhya Pradesh, Maharashtra and Rajasthan during RMS 2019-20**



Sources: AGMARKNET and DES, MoA&FW



**Table 2.5: Market Prices vis-a-vis MSP of Gram in Major Producing States in RMS 2019-20**

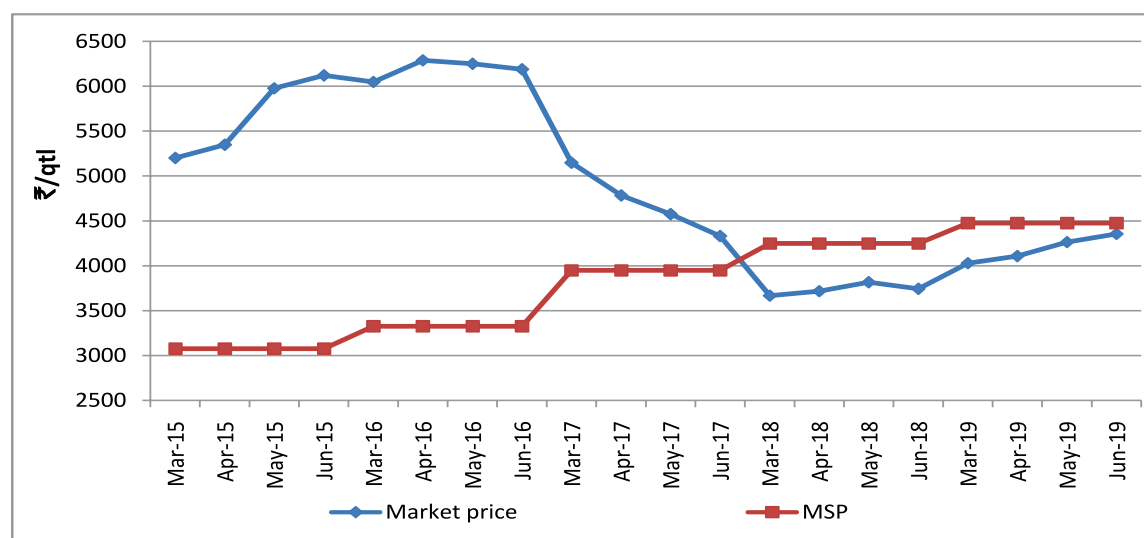
States	No of days market prices were reported				No. of days market prices were below MSP				Days (percent) when market prices were below MSP
	Mar	April	May	June	Mar	April	May	June	
Karnataka	28	26	29	9	23	22	12	3	65.2
Madhya Pradesh	30	30	31	12	30	30	31	12	100.0
Maharashtra	29	30	31	12	24	30	31	12	95.1
Rajasthan	23	30	31	12	23	30	31	12	100.0
Uttar Pradesh	31	30	31	12	4	24	26	7	58.6

Source: AGMARKNET

2.13 Lentil is the second most important rabi pulse in the country. Market prices of lentil, which were substantially higher than MSP during RMS 2015-16 and 2016-17, witnessed a declining trend during RMS 2017-18 and fell below MSP in RMS 2018-19 and remained lower than MSP during RMS 2019-20 (Chart 2.6). However, during RMS 2019-20, market prices showed an upward trend and moved closer to the MSP.

2.14 Gram and lentil prices showed an increasing trend over last few months, driven by a steady decline in imports and lower production during 2018-19. After nearly two years of record-low prices, pulses growers are witnessing rising trend in market prices and upward trend is also reflected in wholesale and retail prices. The recovery in market prices of pulses during RMS 2019-20 will encourage farmers to increase output.

**Chart 2.6: Trends in Domestic Market Prices vis-à-vis MSP of Lentil**



Note: 1. Weighted wholesale price of Chhattisgarh, Jharkhand, Madhya Pradesh, Uttar Pradesh and West Bengal, which cover 71.8 percent of total production.

2. MSP is inclusive of bonus.

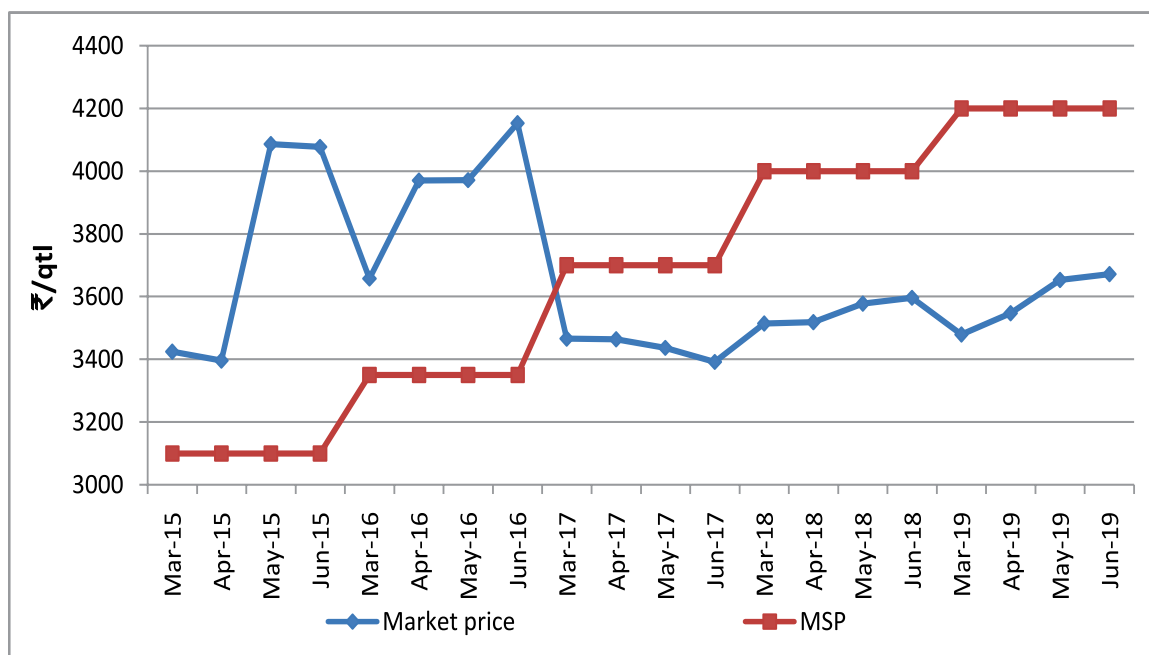
Sources: AGMARKNET and DES, MoA&FW



## Oilseeds

- 2.15 Rapeseed & mustard (R&M) is the most important rabi oilseed crop accounting for more than 80 percent of rabi oilseeds production and about 27 percent of total oilseeds production in the country. Safflower has the lowest share in total production of oilseeds and its production has witnessed a steady decline over the last two decades. Safflower production is estimated at about 22 thousand tonnes in 2018-19.
- 2.16 Market prices of R&M, which were significantly higher than MSP during RMS 2015-16 and 2016-17, dropped below MSP in RMS 2018-19 and remained well below the MSP during RMS 2019-20 as well (Chart 2.7). The MSP of R&M was raised from ₹3700 per quintal in RMS 2017-18 to ₹4000 per quintal in RMS 2018-19 to ₹4200 per quintal in RMS 2019-20, but did not have the desired impact on market prices. Market prices were 7 percent lower than MSP in RMS 2017-18 and the gap increased to 11 percent in RMS 2018-19 and 15 percent in RMS 2019-20. Widening gap between MSP and market prices calls for strategic intervention to ensure remunerative price to farmers. Table 2.6 shows that R&M market prices were consistently lower than MSP in Chhattisgarh, Gujarat, Madhya Pradesh, Rajasthan and Uttar Pradesh during RMS 2019-20. Low market prices of R&M call for government intervention to help farmers but there is also a need to create more demand for mustard cake in domestic and global markets to ensure better value realization to farmers.

**Chart 2.7: Trends in Domestic Market Prices vis-à-vis MSP of R&M**

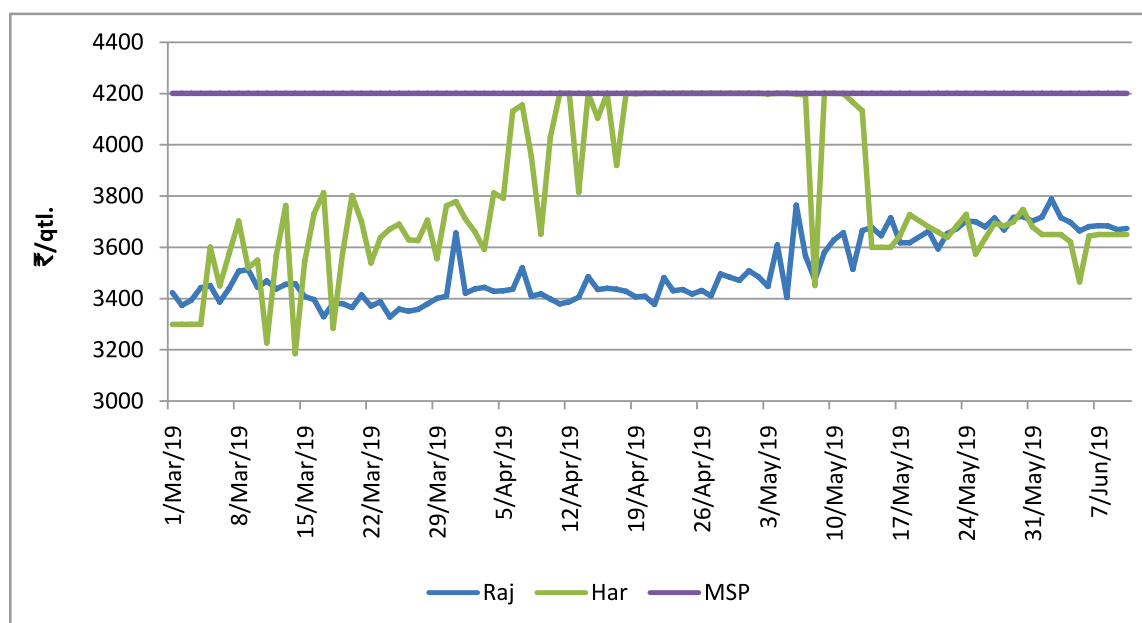


Note: 1. Chhattisgarh, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal, which cover 90.7 percent of India's total production.

2. MSP is inclusive of bonus.

Sources: AGMARKNET and DES, MoA&FW

**Chart 2.8: Comparison of Market Prices and MSP of R&M in Rajasthan and Haryana during RMS 2019-20**



Sources: AGMARKNET and DES, MoA&FW

**Table 2.6: Market Prices vis-a-vis MSP of R&M in Major Producing States in RMS 2019-20**

States	No of days market prices were reported				No of days market prices were below MSP				Days (percent) when market prices were below MSP
	Mar	April	May	June	Mar	April	May	June	
Chhattisgarh	23	23	15	7	23	23	15	7	100.0
Gujarat	27	25	17	8	27	25	17	8	100.0
Madhya Pradesh	31	30	19	10	31	30	19	10	100.0
Rajasthan	31	30	19	10	31	30	19	10	100.0
Uttar Pradesh	31	30	19	10	31	30	19	10	100.0
West Bengal	31	30	19	10	21	29	19	10	87.8
Haryana	27	29	17	4	27	16	12	4	76.6

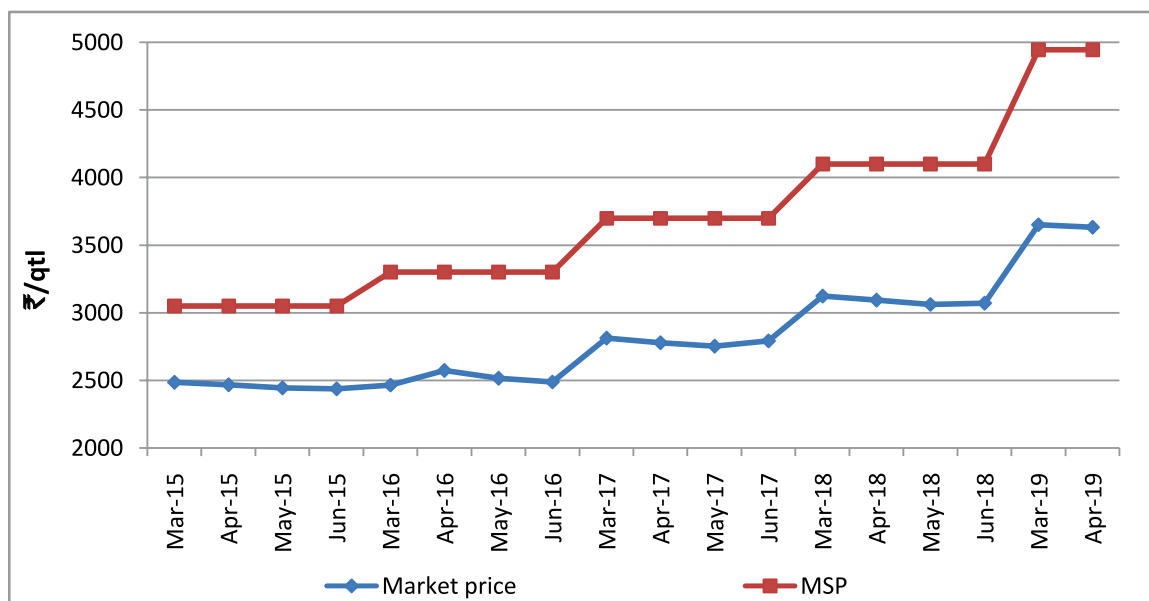
Source: AGMARKNET

2.17 The safflower production declined from a peak of 5.2 lakh tonnes in 1984-85 to the lowest level of about 22 thousand tonnes in 2018-19. Low prices and market demand, more remunerative alternative crops, mainly gram and sorghum, and low oil content compared to other oilseed crops are major reasons for decline in safflower production. It is evident from Chart 2.9 that market prices of safflower seeds were much lower than MSP during last five procurement seasons from 2015 to 2019. Though market prices have improved in RMS 2019-20, gap between market prices and MSP has increased from about 19 percent in 2015 to about 26 percent



in 2019. Since production of safflower has declined substantially, the Commission recommends that the crop should be excluded from the MSP scheme.

**Chart 2.9: Trends in Domestic Market Prices vis-à-vis MSP of Safflower**



Source: DES, MoA&FW

## Procurement Policy and Operations

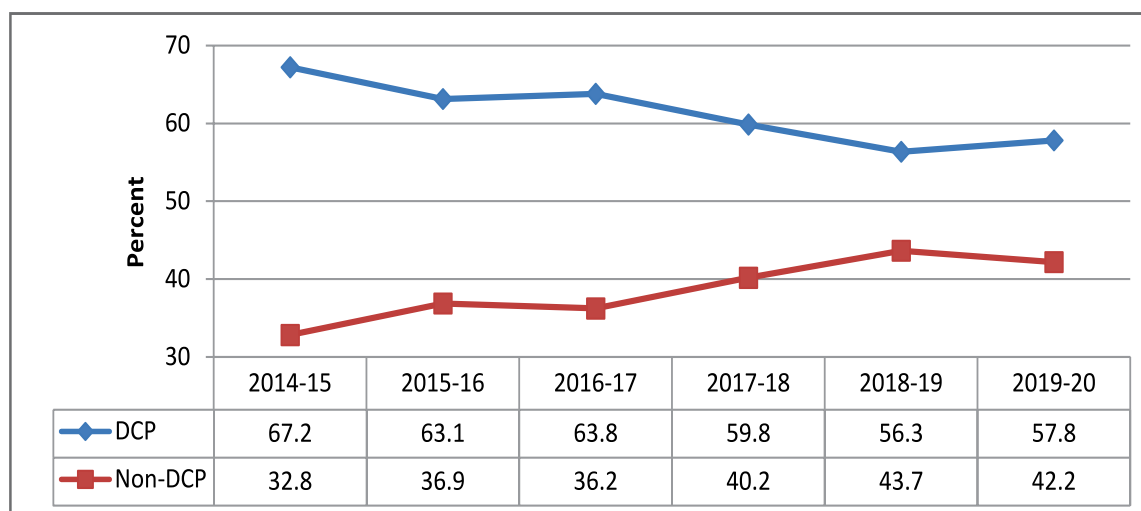
- 2.18 The Government policy of procurement of foodgrains has broad objectives of ensuring MSP to farmers and availability of foodgrains to the consumers at affordable prices. It also ensures effective market intervention thereby keeping the prices under check and ensuring overall food security of the country. 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 (FAQ) norms, are purchased at MSP. FCI, the nodal central agency of Government of India, along with other State agencies undertakes procurement of wheat and paddy. Procurement of nutri/coarse cereals is done by State government agencies for central pool as per the directions issued by Government of India from time to time. National Agricultural Cooperative Marketing Federation of India Ltd (NAFED) undertakes procurement of oilseeds and pulses.
- 2.19 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 excess stocks are then 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, 15 States for rice and 7 States for wheat are under the DCP system.



## Wheat

- 2.20 Procurement of wheat increased from 30.8 million tonnes in RMS 2017-18 to 35.8 million tonnes in RMS 2018-19, which accounted for 35.8 percent of total production and 48.6 percent of marketed surplus. However, in RMS 2019-20, procurement of wheat witnessed a marginal decline and was 34.1 million tonnes as on July 5, 2019. The trends in procurement of wheat and its share in production in major States for last 10 years are given in Annex Table 2.1.
- 2.21 Storage capacity requirement of FCI depends upon the procurement level, buffer stocking and PDS requirements of the consuming States. The available storage capacity was 38.8 million tonnes with FCI and 46.7 million tonnes with State agencies as on 31<sup>st</sup> March 2019, whereas stocks of grains in the central pool were about 74.4 million tonnes in July 2019, so available storage capacity with FCI and State agencies is just adequate for existing stocks in central pool. However, out of 85.5 million tonnes of existing total storage capacity, about 14 percent is under Cover and Plinth (CAP) structure and the grain stocks are more vulnerable to the risk of deterioration in quality under CAP structure.
- 2.22 Chart 2.10 shows the share of DCP and non-DCP States in total procurement of wheat. It is observed that share of non-DCP States, Haryana and Uttar Pradesh, has increased from 32.8 percent in 2014-15 to 43.7 percent in 2018-19, which is mainly due to increase in procurement of wheat in Uttar Pradesh. States of Bihar, Chhattisgarh, Madhya Pradesh, Uttarakhand, West Bengal, Gujarat and Punjab were under DCP system during RMS 2019-20. Even though share of DCP States in total procurement is higher than non-DCP states, it has declined in recent years.

**Chart 2.10: Share of Procurement of Wheat in DCP and Non-DCP States**



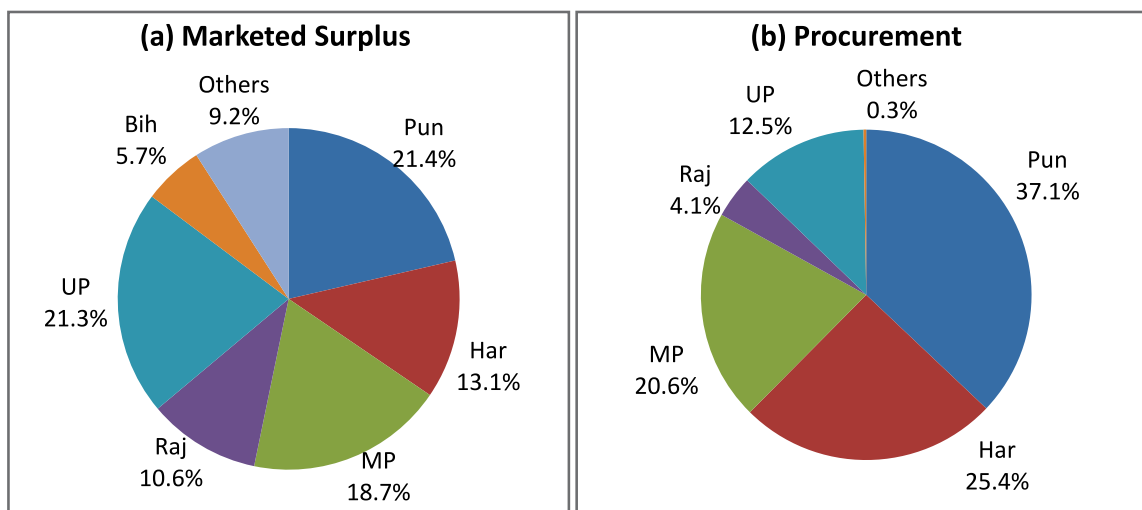
Note: Figures reported as on 18.06.2019 for RMS 2019-20

Source: FCI



2.23 Chart 2.11 shows the share of major States in marketed surplus and procurement of wheat in TE2018-19. Uttar Pradesh and Punjab are major producers of wheat contributing 31.4 percent and 17.4 percent of total production, respectively. However, the share of Uttar Pradesh (12.5%) in total procurement of wheat was much lower compared to Punjab (37.1%), while both the States have equal share in marketed surplus (around 21%). Other two main contributors to the Central Pool are Madhya Pradesh and Haryana. Madhya Pradesh has higher share in total production and marketed surplus than Haryana, but share in procurement is lower than that of Haryana.

**Chart 2.11: Share of Major States in Marketed Surplus and Procurement of Wheat, TE2018-19**



Sources: DES, MoA&FW and FCI

2.24 State-wise procurement of wheat during RMS 2017-18 to RMS 2019-20 is given in Table 2.7. Among the major States, total quantity of wheat procured was highest in Punjab (129.1 lakh tonnes), followed by Haryana (93.2 lakh tonnes), Madhya Pradesh (67.3 lakh tonnes) and Uttar Pradesh (36.4 lakh tonnes) during RMS 2019-20. Procurement as percent of production was highest in Haryana (80%) followed by Punjab (72.6%), Madhya Pradesh (38.8%) and Rajasthan (14.6%). During RMS 2019-20, total quantity of wheat procured for central pool at all-India level declined by about 1.7 million tonnes. Madhya Pradesh and Rajasthan recorded a decline in procurement while Punjab and Haryana reported an increase in procurement during RMS 2019-20.

**Table 2.7: State-wise Procurement of Wheat**

(Lakh tonnes)

States	RMS 2017-18		RMS 2018-19		RMS 2019-20*	
	Procure- ment	Proc. as % of Production	Procure- ment	Proc. as % of Production	Procure- ment	Proc. as % of Production
Punjab	117.1	71.2	126.9	71.2	129.1	72.6
Haryana	74.3	64.4	87.8	81.6	93.2	80.0
MP	67.3	37.5	73.1	46.0	67.3	38.8
UP	37.0	12.3	52.9	16.6	36.4	11.3
Rajasthan	12.5	13.9	15.3	16.4	14.0	14.6
Bihar	0.0	0.0	0.2	0.3	0.0	0.0
Others	0.2	0.2	1.6	2.0	0.6	0.9
All India	308.2	31.3	358.0	35.8	340.6	33.7

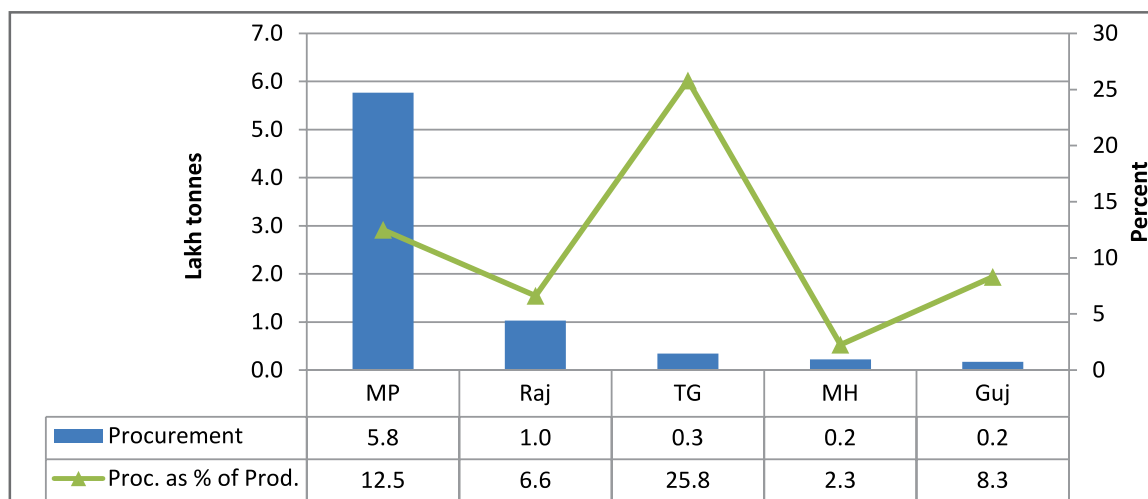
Note: \*Reported as on 18.06.2019

Source: FCI

## Pulses

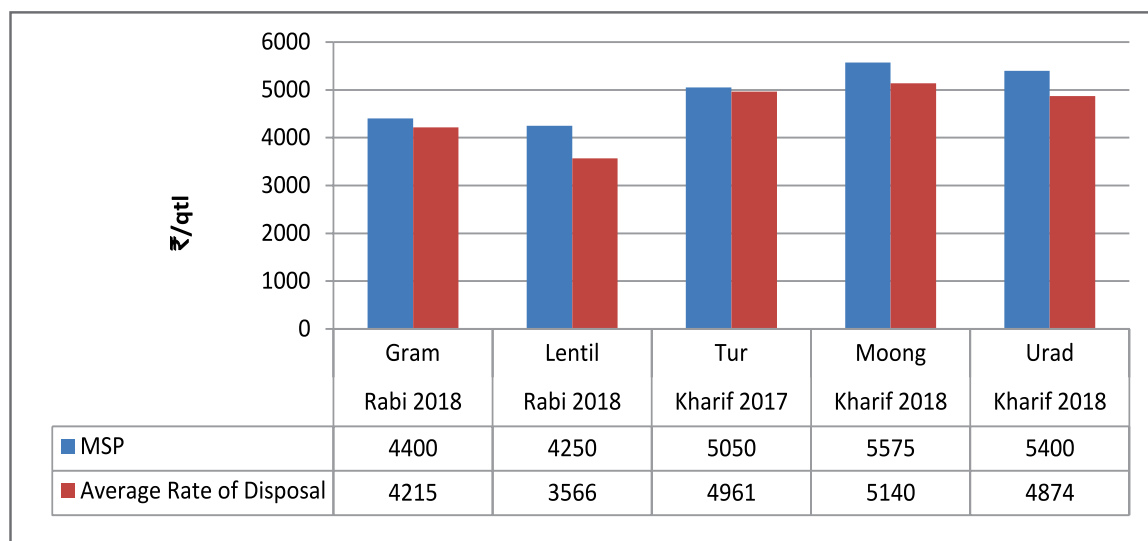
- 2.25 NAFED procured 45 lakh tonnes of pulses in kharif 2017-18 and rabi 2018-19 against sanctioned quantity of 54.9 lakh tonnes. In kharif 2018-19 and rabi 2019-20, only 40.5 percent of sanctioned quantity was procured by NAFED as on 25.06.2019. The recommended buffer stock norms of pulses were 15.76 lakh tonnes for 2018-19 and 16.15 lakh tonnes for 2019-20. NAFED procured 27.2 lakh tonnes of gram in RMS 2018-19, out of which 14.4 lakh tonnes have been liquidated with balance stock of 12.8 lakh tonnes. At the same time, procurement of lentil was 2.4 lakh tonnes, out of which 1.8 lakh tonnes have been disposed off with balance stock of 0.6 lakh tonnes.
- 2.26 Among major pulses growing States, Madhya Pradesh had the highest procurement of gram, followed by Rajasthan and Telangana (Chart 2.12). Even though market prices of gram improved in RMS 2019-20 but remained below MSP and hence, NAFED intervened in market for procurement operations. The NAFED procured about 7.7 lakh tonnes of gram during RMS 2019-20, which was about 67.4 percent less than the sanctioned quantity and 71.7 percent lower than last year's procurement.
- 2.27 Chart 2.13 shows average price per quintal of pulses liquidated by NAFED during kharif and rabi seasons. It is evident from the Chart that pulses were sold in the open market at a price lower than MSP, which discouraged private trade to buy during procurement season. The Commission strongly recommends that government should avoid offloading stocks in open market during the procurement season and not sell below MSP including storage and finance costs. The reserve price linked to MSP should be fixed for disposal of pulses as is being done for wheat and rice. The government should continue distribution of surplus pulses to States/UTs with subsidy under various welfare schemes to improve nutrition and sustain market prices.

**Chart 2.12: State-wise Procurement of Gram in RMS 2018-19**



Source: NAFED

**Chart 2.13: Average Rate of Disposal vs MSP of Kharif and Rabi Pulses**



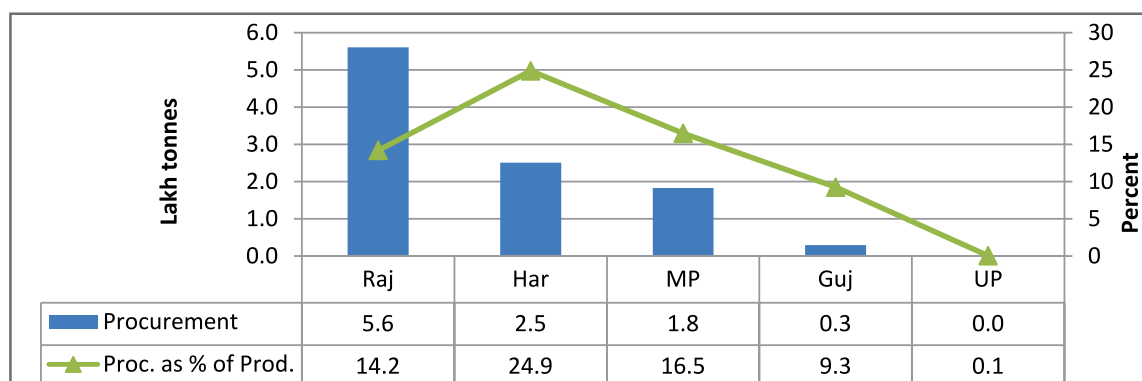
Source: NAFED

## Oilseeds

- 2.28 The market prices of R&M ruled below MSP in major producing States like Rajasthan, Madhya Pradesh and Haryana during RMS 2019-20 and the gap between MSP and market prices widened during the season compared with RMS 2018-19. The NAFED entered the market for procurement operations, which led to significant increase in procurement from 0.4 lakh tonnes in RMS 2017-18 to 8.7 lakh tonnes in RMS 2018-19 and 10.7 lakh tonnes in RMS 2019-20 (as on 25.06.2019). The highest procurement of mustard was reported in Rajasthan (5.6 lakh tonnes), followed by Haryana (2.5 lakh tonnes) and Madhya Pradesh (1.8 lakh tonnes) as shown in Chart 2.14. Procurement as percent of production was the highest (24.9%) in Haryana, followed by Madhya Pradesh (16.5%) and Rajasthan (14.2%).



**Chart 2.14: Procurement of Mustard in Major Producing States in RMS 2018-19**



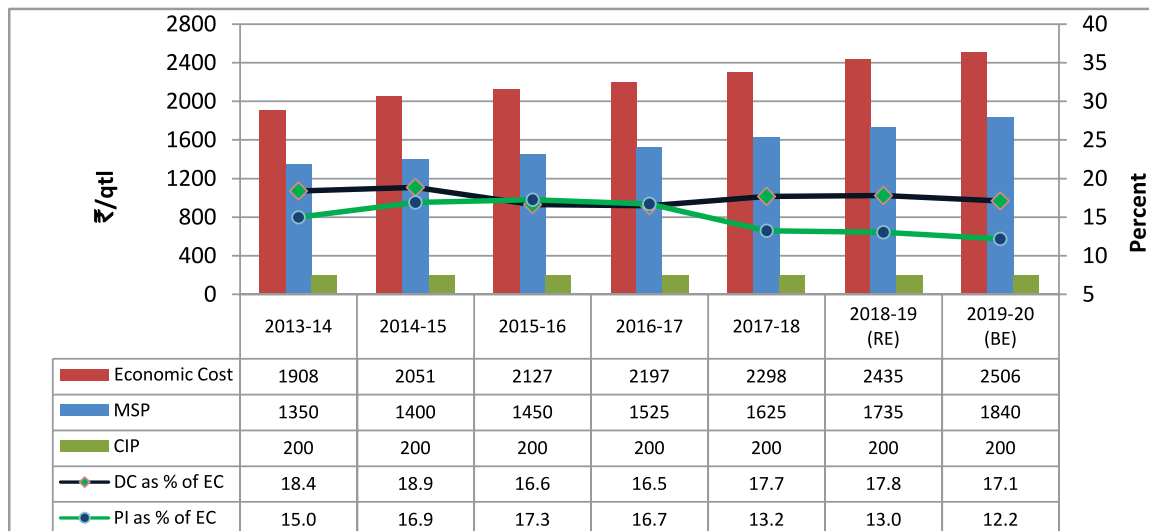
Source: NAFED

## Economic Cost of Wheat

- 2.29 Economic cost has three main components - pooled cost of grains, procurement incidentals and distribution costs. Procurement incidentals and distribution costs together accounted for about 25 percent of economic cost during last three years. Procurement incidentals decreased from ₹367 per quintal in RMS 2015-16 to ₹305 per quintal in 2019-20 primarily due to exemption of agricultural commodities from VAT after introduction of Goods and Service Tax (GST). The share of procurement incidentals in total economic cost has declined during the last five years from 17.3 percent in 2015-16 to 12.2 percent in 2019-20. The share of distribution cost in total economic cost has marginally increased from 16.6 percent in 2015-16 to 17.1 percent in 2019-20 (Chart 2.15).
- 2.30 The economic cost of wheat has increased from ₹1908 per quintal in 2013-14 to ₹2506 per quintal in 2019-20, an increase of about 31.3 percent. On the other hand, Central Issue Price (CIP) of wheat has remained unchanged at ₹200 per quintal from July 2013, which has led to significant increase in food subsidy. The food subsidy has increased from ₹92000 crore in 2013-14 to ₹171298 crore in 2018-19(RE) and ₹184220 crore in 2019-20(BE). Rising economic cost due to increase in MSP and open-ended procurement policy and low CIP of grains has led to the phenomenal increase in food subsidy bill. Therefore, the Commission recommends that open ended procurement policy need to be reviewed.



**Chart 2.15: Economic Cost of Wheat and Share of Different Components of Economic Cost**



Note: EC- Economic Cost, CIP-Central Issue Price, PI-Procurement Incidentals, DC-Distribution Cost  
Source: FCI

## Market Distortions: Bonus and Market Fees

2.31 Distortions in markets adversely affect competitiveness and efficiency of markets leading to poor price discovery for producers. Various forms of controls ranging from domestic marketing to stocking, movement restrictions, trade, etc. plague Indian agriculture. Reforming these distortions will create competitive markets and promote efficiency, thus should be given high priority.

### Bonus on MSP

2.32 State governments had stopped giving bonus over MSP for wheat since RMS 2016-17. However, in RMS 2019-20, Madhya Pradesh announced bonus of ₹160 per quintal. Madhya Pradesh is a DCP State for wheat, hence procurement over and above the State requirement may lead to excess stocks and State will find it difficult to liquidate excess stocks due to high price. Crop-specific bonus also affects the inter-crop parity as it influences farmer's decision to grow a particular crop at the cost of other crops and thus distorts the production basket. High prices, bonus and assured procurement of rice and wheat have restricted crop diversification process and lead to more production of rice and wheat with adverse impact on soil health and water resources. It will also discourage production of oilseeds and pulses, which the country needs. Hence, the Commission re-iterates its earlier recommendation that such bonuses/incentives should be discouraged, particularly in case of rice and wheat in surplus States.

### High State Taxes

2.33 After the introduction of GST, rates of statutory levies and other taxes imposed by States have come down but still remain main contributors of procurement

incidentals to FCI. The statutory taxes (mandi tax/APMC cess + arthiya commission) levied on wheat in Punjab and Haryana are still high at 5.5 percent and 4.5 percent, respectively in RMS 2019-20, while in other States like Uttar Pradesh (2.5%) and Madhya Pradesh (2%), rates are much lower. In addition to mandi tax, rural development, infrastructure development cesses, commission to society, nirashrit shulk, mopari charges are also levied in many States, which increase cost of procurement and restrict inter-state trade. Since such taxes/levies are main source of revenue to State governments, it is, therefore, expected that State governments will not be willing to abolish such taxes/cesses. The Commission suggests that a uniform mandi fee of 1-2 percent should be levied at all-India level and the consequent losses to APMC mandis can be compensated by the Centre and State governments. In order to promote inter-state trade and achieve the objective of national agricultural market, mandi fees and other taxes/cesses on inter-state trade should be abolished.

### Review Essential Commodities Act (ECA)

- 2.34 In order to increase participation of private sector in agricultural marketing and make agricultural markets more efficient and competitive, it is essential to have major policy reforms including ECA and APMC Act. In view of record agricultural production, liberalised trade and low food inflation, requirements of licensing, restrictions on stocking, movement and export of agricultural products have become redundant. The removal/relaxation of such controls under ECA and other regulations would help expand private trade in agricultural markets and lead to better price discovery for farmers. The Commission recommends that the ECA should be reviewed and create favorable enabling environment for private sector participation in agricultural markets.

### Promote Producer Organizations

- 2.35 More than 86 percent of Indian farmers are small and marginal and thus, are unable to get good markets and value for their produce. Organizing them into groups will help them to benefit from economies of scale and scope in sourcing of inputs, marketing and value-addition of their produce. Commodity-specific Farmer Producer Organisations/Companies should be promoted and encouraged to take up functions of aggregation, sorting/grading and direct marketing of produce to traders, large buyers and processors. Such organizations will create more competition in the market, improve their bargaining power and ensure better prices to member producers.

### Awareness about MSP and FAQ Standards

- 2.36 Various studies have shown that there is a lack of awareness about MSP and FAQ norms among farmers. Farm produce brought to the APMC mandis/procurement centre is often rejected as it fails to meet the FAQ requirements. Therefore, there is a need to create awareness about MSP, FAQ standards, system of procurement, etc. Grading and sorting facilities should be created near the farm gate and quality



testing laboratories should be set up in the APMC mandis to reduce subjectivity in quality assessment and rejection of produce. There is need to give wide publicity about MSP, FAQ standards and procurement agencies by the State governments in regional/vernacular languages in electronic and print media, through pamphlets and announcements in the villages at least 2-3 weeks before the start of procurement season so as to reach out to large number of farmers.

### Recapitulation

- 2.37 Global wheat production is forecast to increase, leading to increase in supply of wheat in world markets in 2019-20. Wheat stocks in major exporting countries are also forecast to increase in 2019-20. World wheat prices are forecast to be lower due to increased global supplies. World oilseed production is forecast to remain high in 2019-20 while world imports are forecast to fall significantly due to lower Chinese demand but global consumption is expected to increase. Global prices of oilseeds are expected to be lower in 2019-20 due to lower demand in China.
- 2.38 India's wheat production is estimated to reach a new record of 101.2 million tonnes in 2018-19 and a target for 2019-20 is 100.5 million tonnes. Wheat stocks with the government are also very high, 45.8 million tonnes in July 2019. Pulses production is expected to be marginally lower in 2018-19, while oilseeds production has remained almost stagnant during the last three years.
- 2.39 Market prices of most of rabi crops, particularly pulses, improved in RMS 2019-20 compared to RMS 2018-19 but remained below the MSP in major States. Low market prices of pulses and oilseeds in major producing States call for timely intervention by procurement agencies to ensure remunerative prices to farmers. Therefore, to address the issue of low market prices, adequate procurement centers should be established by procurement agencies on temporary basis in places where larger arrivals are expected during peak harvesting season and government should intervene in the market at appropriate time.
- 2.40 Open-ended procurement, rising MSP and low CIP have led to significant increase in food subsidy. Therefore, there is a need to review open-ended procurement policy and rationalize statutory levies and other taxes.
- 2.41 Disposal of stocks of pulses and oilseeds by NAFED at prices below MSP discourages private trade during procurement season. Hence, Government should not liquidate stocks below the MSP and during the procurement season. The reserve price linked to MSP should be fixed for disposal of pulses stocks as is being done for wheat and rice. The government should continue distribution of surplus pulses to States/UTs with subsidy under various welfare schemes to improve nutrition and sustain market prices to help farmers.

\*\*\*\*\*





## Chapter 3

# Crop Productivity and Input Management

## Chapter 3

- 3.1 Productivity growth in agriculture is essential for meeting the growing demand, improving access to affordable food for the poor, raising rural incomes and making agriculture globally competitive. Over the last few decades, agricultural productivity in India has improved significantly, although levels and pace differ across regions and crops. However, productivity levels in India are still low compared with world levels and large inter-state and economically exploitable yield gaps remain in many crops. Lack of access to assured irrigation, new technologies, quality inputs and services including institutional credit, poor production and post-harvest management and unorganized marketing systems still remain prominent constraints in Indian agriculture. Solutions lie with public and private sector investments in infrastructure and institutions, and stable policies to promote adoption of technologies that reduce costs as well as improve productivity and marketing efficiency, thus increasing agricultural incomes. In view of the above, this chapter reviews performance of productivity situation in Indian agriculture both at the national and State level and the challenges it faces.

### Productivity Growth Trends

- 3.2 The quinquennial average annual growth rates of area, production and productivity of rabi crops for Quinquennial Ending (QE) 2008-09, QE2013-14 and QE2018-19 are given in Table 3.1. It is evident from the Table that growth rate in productivity of wheat has shown a steadily rising trend during the last three quinquennials. As a result, despite fall in area under wheat cultivation (-0.6%) in QE2018-19, production has risen by 1.3 percent. However, this rate of increase in production has been the lowest in last 15 years. Therefore, there is a need to further improve productivity of wheat.



- 3.3 There was a decline in productivity of barley (-0.3%) in QE2018-19, which is in sharp contrast to productivity increase of 4.3 percent and 2.8 percent in QE2008-09 and QE2013-14, respectively. At the same time, fall in productivity of barley has not been compensated by an increase in area. Therefore, production of barley has declined by 0.4 percent in QE2018-19. Overall, productivity of rabi cereals was 2.2 percent during the last 15 years. The highest productivity growth was observed in QE2008-09 (2.5%), which fell to 2 percent in QE2013-14 and improved marginally to 2.2 percent in QE2018-19.
- 3.4 In case of gram, highest productivity growth rate (2.8%) was observed in QE2018-19 during the last 15 years. However, due to a fall in area (-0.4%) in QE2018-19, growth rate of production in QE2018-19 remained lower (3.2%) than the previous two quinquennials. Production of lentil increased by 10 percent during the latest quinquennial. This was due to the combined effect of large increase in productivity (7%) and area (2.8%). On account of improvement in productivity growth of both gram and lentil in QE2018-19, productivity of rabi pulses improved from 2.3 percent in QE2013-14 to 2.8 percent in QE2018-19.
- 3.5 Productivity growth of rapeseed and mustard (R&M) has shown a consistent increase during the last 15 years. In QE2008-09, productivity growth of R&M was only 0.2 percent, which increased to one percent in QE2013-14 and further to 3.9 percent in QE2018-19. However, both area and production of R&M witnessed a decelerating trend during the last three quinquennials. In fact, there was a fall in growth rate (-1.1%) of area under R&M cultivation in the latest quinquennial. For safflower, productivity has fallen during the last two quinquennials. Also, fall in productivity has been accompanied by a large decline in area. Consequently, in QE2018-19 production of safflower fell by 17.3 percent mainly driven by reduction in acreage. In case of rabi oilseeds, productivity growth rate was the highest (3.7 %) in QE2018-19 during the last 15 years. As a result, despite a fall in area (-2.6%), production of rabi oilseeds increased by 1.2 percent.

**Table 3.1: Quinquennial Average Annual Growth Rate of Area, Production and Productivity of Major Rabi Crops**

(Percent)

Crop/Year	QE2008-09	QE2013-14	QE2018-19	All Period
<b>Area</b>				
Wheat	0.9	1.9	-0.6	0.7
Barley	1.8	-0.5	0.1	0.5
<b>Rabi Cereals</b>	<b>1.6</b>	<b>1.0</b>	<b>-1.4</b>	<b>0.4</b>
Gram	2.4	5.0	-0.4	2.3
Lentil	-0.1	-0.3	2.8	0.8
<b>Rabi Pulses</b>	<b>0.9</b>	<b>4.1</b>	<b>-0.1</b>	<b>1.7</b>
<b>Rabi Foodgrains</b>	<b>1.4</b>	<b>1.8</b>	<b>-1.1</b>	<b>0.7</b>
R & M	4.3	2.0	-1.1	1.7
Safflower	-3.9	-9.0	-21.3	-11.4

Crop/Year	QE2008-09	QE2013-14	QE2018-19	All Period
<b>Rabi Oilseeds</b>	<b>1.9</b>	<b>-1.0</b>	<b>-2.6</b>	<b>-0.6</b>
<b>Production</b>				
Wheat	2.4	3.6	1.3	2.4
Barley	6.9	2.6	-0.4	3.0
<b>Rabi Cereals</b>	<b>4.0</b>	<b>3.0</b>	<b>0.6</b>	<b>2.6</b>
Gram	5.0	6.4	3.2	4.9
Lentil	-1.2	1.7	10.0	3.5
<b>Rabi Pulses</b>	<b>3.0</b>	<b>6.2</b>	<b>3.3</b>	<b>4.1</b>
<b>Rabi Foodgrains</b>	<b>4.0</b>	<b>3.3</b>	<b>0.8</b>	<b>2.7</b>
R &M	4.2	3.2	3.0	3.5
Safflower	8.6	-9.1	-17.2	-5.9
<b>Rabi Oilseeds</b>	<b>3.8</b>	<b>1.0</b>	<b>1.2</b>	<b>2.0</b>
<b>Productivity</b>				
Wheat	1.4	1.7	2.0	1.7
Barley	4.3	2.8	-0.3	2.3
<b>Rabi Cereals</b>	<b>2.5</b>	<b>2.0</b>	<b>2.2</b>	<b>2.2</b>
Gram	2.4	1.6	2.8	2.2
Lentil	-1.1	2.6	7.0	2.8
<b>Rabi Pulses</b>	<b>2.0</b>	<b>2.3</b>	<b>2.8</b>	<b>2.4</b>
<b>Rabi Foodgrains</b>	<b>2.5</b>	<b>1.5</b>	<b>2.0</b>	<b>2.0</b>
R &M	0.2	1.0	3.9	1.7
Safflower	12.7	0.0	-0.6	4.0
<b>Rabi Oilseeds</b>	<b>1.8</b>	<b>2.0</b>	<b>3.7</b>	<b>2.5</b>

*Note: Growth rates have been calculated as a simple average of the growth rates of constituent years.*

*Source: CACP using data from DES, MoA&FW*

## Country Comparisons of Crop Productivity

3.6 Table 3.2 shows a comparison of Indian productivity with world productivity for major rabi crops in 2017. It may be noted that except for gram and R&M, all-India productivity for all major rabi crops is much below the world average. The largest difference between all-India average and world average (14%) was observed in barley. This was closely followed by safflower where the gap was 13.7 percent. Further, all-India productivity comparisons with major producing countries points to significant shortfalls in productivity of major rabi crops in India. In case of wheat, France had the highest productivity among major producing countries (6757 kg/ha), which is nearly double than all-India average (3424 kg/ha). Even in Punjab, which has the highest productivity in the country, wheat yield was about two-third of the world highest. Similarly, large productivity differences were observed in case of barley. While productivity in Germany was 6930 kg/ha, all-India average and State highest were only 2695 kg/ha and 3880 kg/ha, respectively. Similar trends



were observed in lentil and safflower. In case of gram and R&M, although all-India average was higher than world average but it fell significantly short of productivity registered in the most productive countries for these crops.

- 3.7 There are various reasons for low productivity levels of various crops in India. These range from weather dependency, lack of access to modern technologies, quality inputs, formal credit, weak extension services, etc. Therefore, there is a need to undertake various technological, institutional and policy interventions to improve productivity and reduce the above mentioned productivity gaps.

**Table 3.2: Productivity Comparisons for Major Crops in 2017**

(kg/ha)

Crop	World Average*	World Highest*	All-India Average#	State Highest#
Wheat	3531	6757 (France)	3424	5077 (Pun)
Barley	3136	6930 (Germany)	2695	3880 (Pun)
Gram	1015	2038 (Ethiopia)	1078	1280 (MP)
Lentil	1153	1513 (Canada)	1047	1139 (MP)
R&M	915	1229 (Canada)	1410	1602 (Raj)
Safflower	822	1565 (Mexico)	699	818 (Kar)

Sources: \*FAOSTAT; # DES, MoA&FW

### Crop Productivity and Yield Gap Analysis in Major Producing States

- 3.8 To analyze inter-state productivity trends during last 10 years, 5-year olympic average yield per hectare in major producing states has been compared for the period 2009-2013 and 2014-2018 in this section. Olympic average is calculated by excluding the highest and lowest yield from the most-recent 5-year period and averaging the remaining 3 values. There exist a vast potential to improve crop-productivity because there are large intra-state and inter-state yield differences and yields are well below potential yield levels. Therefore, this section also analyses State-wise yield gaps for selected rabi crops in major producing States. Both State-wise productivity trends and yield gaps are presented in Charts 3.1 to 3.9. Yield gaps have been analyzed using Front Line Demonstration (FLD) data provided by various ICAR research institutes. For this analysis, three kinds of yield gaps have been considered namely, Yield Gap (A), Yield Gap (B) and Yield Gap (C).

- Yield Gap (A) is the difference between potential farm yield (yield achieved under FLD where best scientific and management practices are followed) and realized farm yields of improved technology under farmers' practices.
- Yield Gap (B) compares State average yield with realized farm yield of improved technology under farmers' practices.
- Yield Gap (C) compares State average yield with potential yield achieved under FLD.

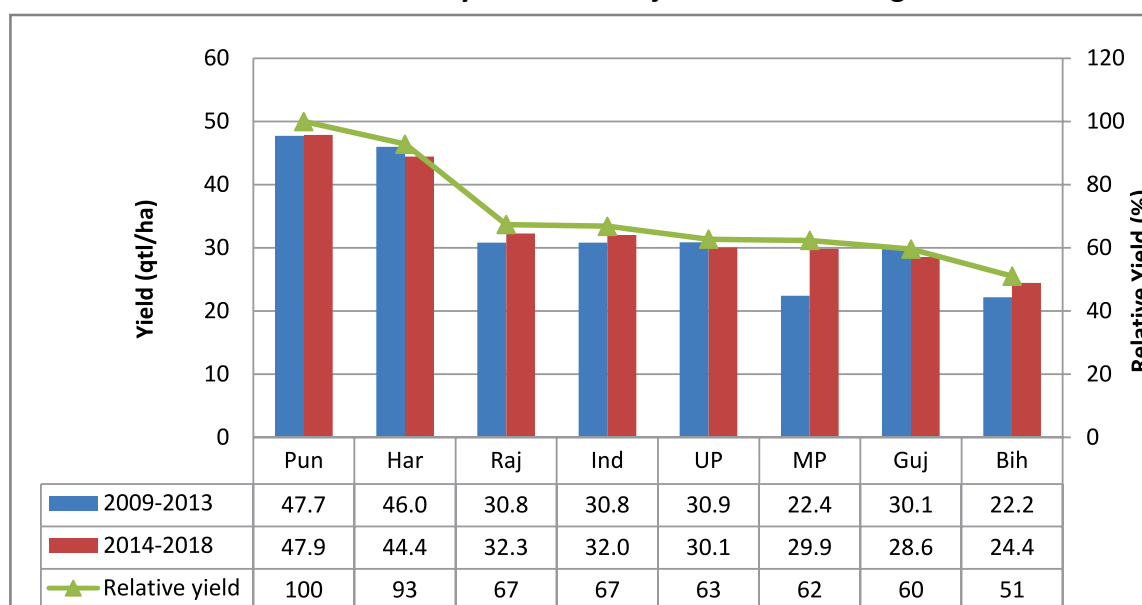


Yield Gap (A) is due to various socio-economic constraints like input availability, credit, knowledge and weak institutions while, Yield Gap (B) is due to non-availability of technology. Yield Gap (C) is due to combination of both biological and socio-economic constraints. Larger the yield gap more is the potential of the State to improve its yields.

## Wheat

- 3.9 Chart 3.1 shows State-wise productivity trends of wheat in major States. Punjab recorded the highest productivity in both the periods. However, there has been a near stagnation in productivity in Punjab. Further, there was a decline in productivity in 2014-18 for Haryana and Uttar Pradesh. Wheat yield declined by 3.4 percent in Haryana and 2.7 percent in Uttar Pradesh between 2009-2013 and 2014-2018, which is a matter of great concern as these States account for around 40 percent of total wheat production. Madhya Pradesh showed the biggest improvement in productivity during the two periods. Productivity in Madhya Pradesh increased by 33.1 percent, from 22.4 qtl/ha in 2009-2013 to 29.9 qtl/ha in 2014-2018. Improvement in productivity has also witnessed in Bihar (10.3%) and Rajasthan (4.8%). Still productivity levels in Madhya Pradesh, Uttar Pradesh, Gujarat and Bihar are less than two-third of Punjab yield. Therefore, there exists a scope for improving wheat yields in these States.

**Chart 3.1: Productivity Trends in Major Wheat Growing States**



Source: DES, MoA&FW

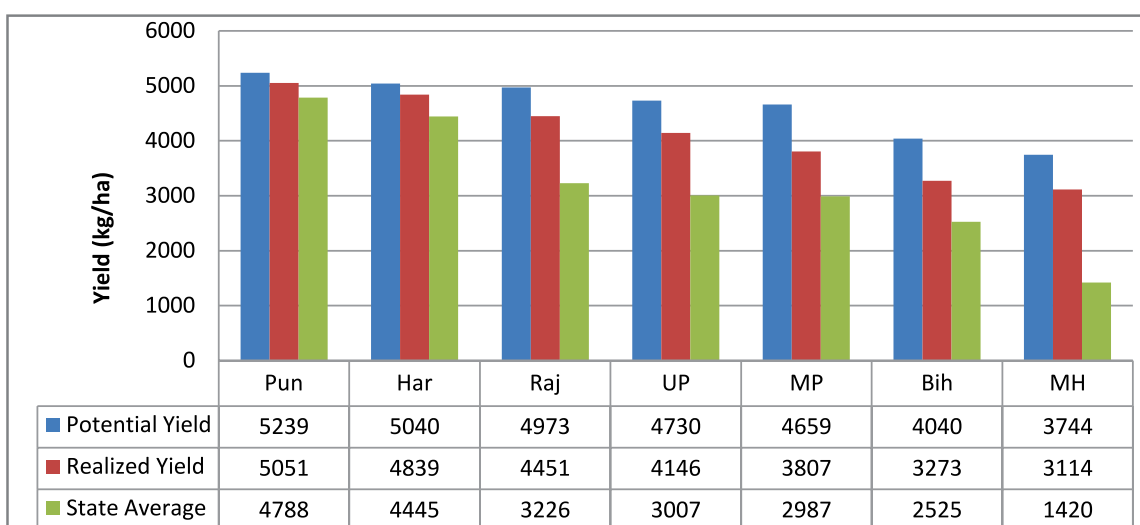
- 3.10 Chart 3.2 below shows the yield gap analysis for wheat. As can be seen from the chart, although Yield Gap (A) was marginal for high-yielding States like Haryana (4%) and Punjab (3.6%) but for Bihar, which is a traditionally low-yielding state, Yield Gap (A) was the highest (19%). Even though Madhya Pradesh experienced impressive increase in productivity in recent years, there still exist large yield gaps. Yield Gap (A) and Yield Gap (B) were 18.3 percent and 21.5 percent, respectively for



Madhya Pradesh whereas, Yield Gap (C) was at 35.9 percent. Therefore, it indicates that Madhya Pradesh has potential for further improvement in productivity if suitable interventions are carried out. As far as other States are concerned, the gap between realised yield and State average yield (Yield Gap (B)) exceeded 50 percent in Maharashtra. Yield Gap (B) was the lowest in Punjab (5.2%) while Yield Gap (C) was 8.6 percent in Punjab but for Maharashtra it was the highest (62.1%).

- 3.11 The above trends clearly indicate that new technological interventions are needed to improve wheat productivity in Punjab and Haryana, while in other States there is a need to address institutional and socio-economic constraints to reduce yield gap and improve productivity.

**Chart 3.2: Yield Gap in Major Wheat Growing States, TE2017-18**

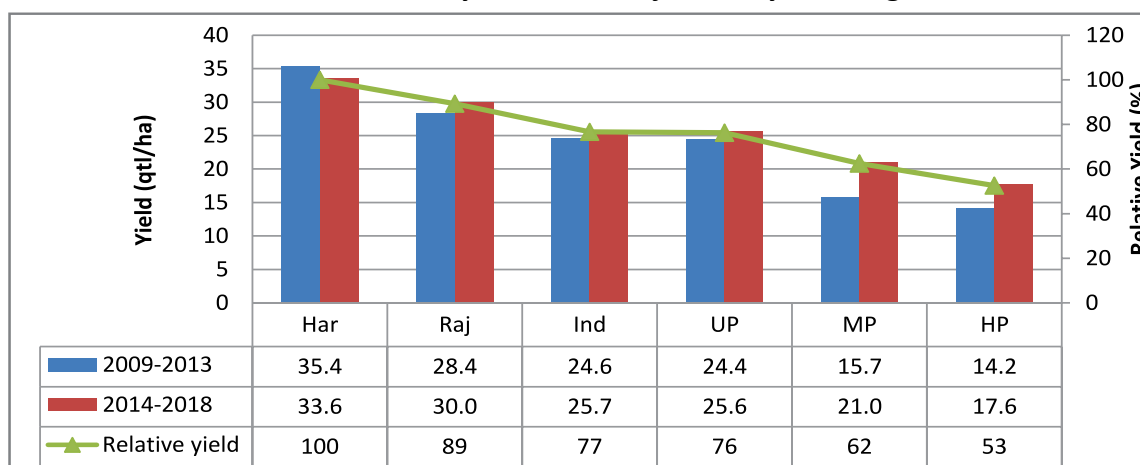


Sources: Indian Institute of Wheat and Barley Research, Karnal; DES, MoA&FW

## Barley

- 3.12 State-wise productivity trends of barley are presented in Chart 3.3. Productivity of barley witnessed increasing trend in all States (except Haryana) in the last 10 years. Haryana, which has the highest yield, recorded a decline of 5.1 percent in productivity in 2014-2018 vis-à-vis 2009-2013. Productivity in Rajasthan, which accounts for nearly half of total barley production, increased by 5.5 percent during the period under consideration. The highest increase in productivity was observed in Madhya Pradesh (33.1%), followed by Himachal Pradesh (24.6%). This is an encouraging sign as Madhya Pradesh and Himachal Pradesh contribute around 57 percent of total barley production. However, yields in Madhya Pradesh and Himachal Pradesh are currently much below the all-India average.

**Chart 3.3: Productivity Trends in Major Barley Growing States**

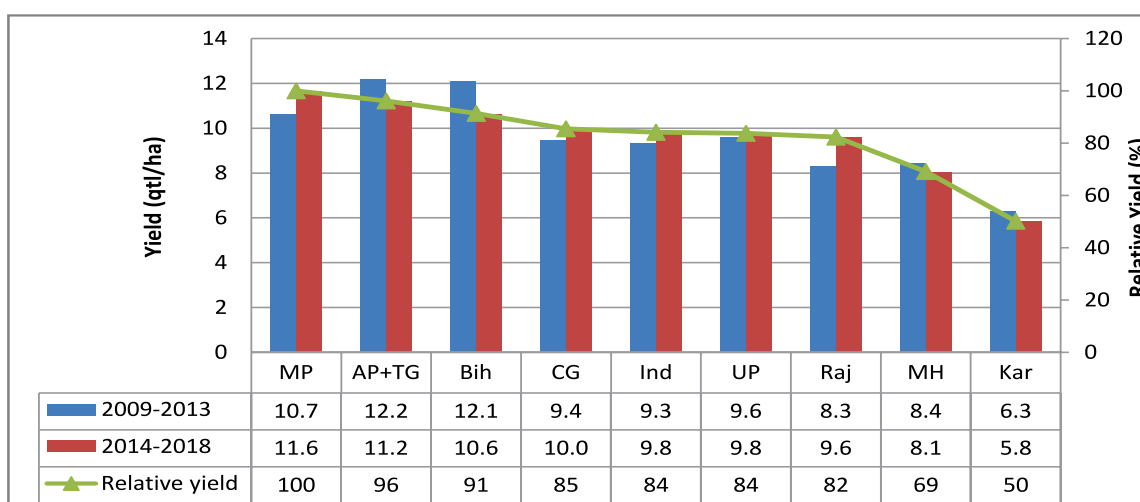


Source: DES, MoA&FW

## Gram

3.13 State-wise gram productivity trends are presented in Chart 3.4. The all-India productivity of gram increased by 4.9 percent during last 10 years, from 9.3 qtl/ha in 2009-13 to 9.8 qtl/ha in 2014-2018. It may be noted that, Madhya Pradesh and Rajasthan, major producers of gram, recorded a substantial improvement in productivity, 9.4 percent and 15.5 percent, respectively. However, a decline in productivity was observed in Andhra Pradesh+Telangana (-8.2%) and Bihar (-12%), which have traditionally been high-yielding States. Among States with productivity levels below all-India average, Karnataka (-7.3%) and Maharashtra (-4.5%) showed significant decline in productivity in 2014-2018 vis-à-vis 2009-2013. As a result, the gap between productivity of these States and all-India average and best performing States productivity has widened and is a matter of concern as Maharashtra and Karnataka produce about 20 percent of gram output.

**Chart 3.4: Productivity Trends in Major Gram Growing States**

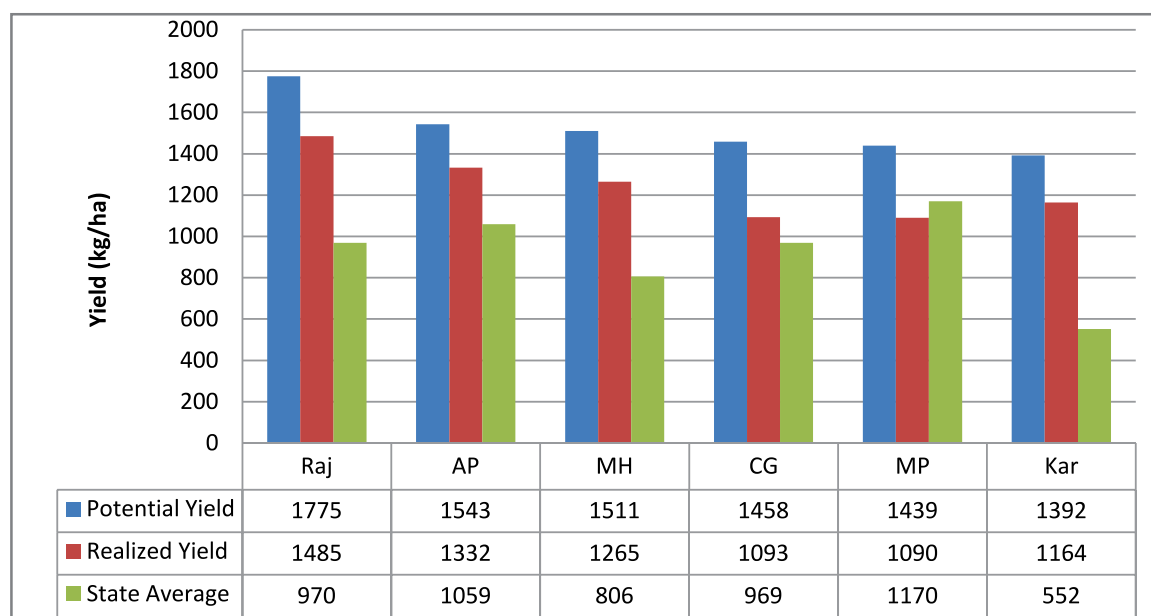


Source: DES, MoA&FW



- 3.14 Chart 3.5 shows the yield gaps in major gram growing States. Yield Gap (A) for gram varied from 13.6 percent in Andhra Pradesh to 25.1 percent in Chhattisgarh. Variations in Yield Gap (B) were comparatively larger. While Yield Gap (B) was negative in Madhya Pradesh (-7.3%), it was as high as 52.6 percent in Karnataka. Yield Gap (C), which measures the difference between potential yield and State average yield remained on the higher side for most of the States. Among the major producers, Yield Gap (C) was highest in Karnataka (60.3%). High magnitude of Yield Gap (B) and Yield Gap (C) in Karnataka indicates that State average yields can be improved significantly by suitably addressing the socio-economic constraints faced by the farmers and making technologies more accessible.

**Chart 3.5: Yield Gap in Major Gram Growing States, TE2017-18**



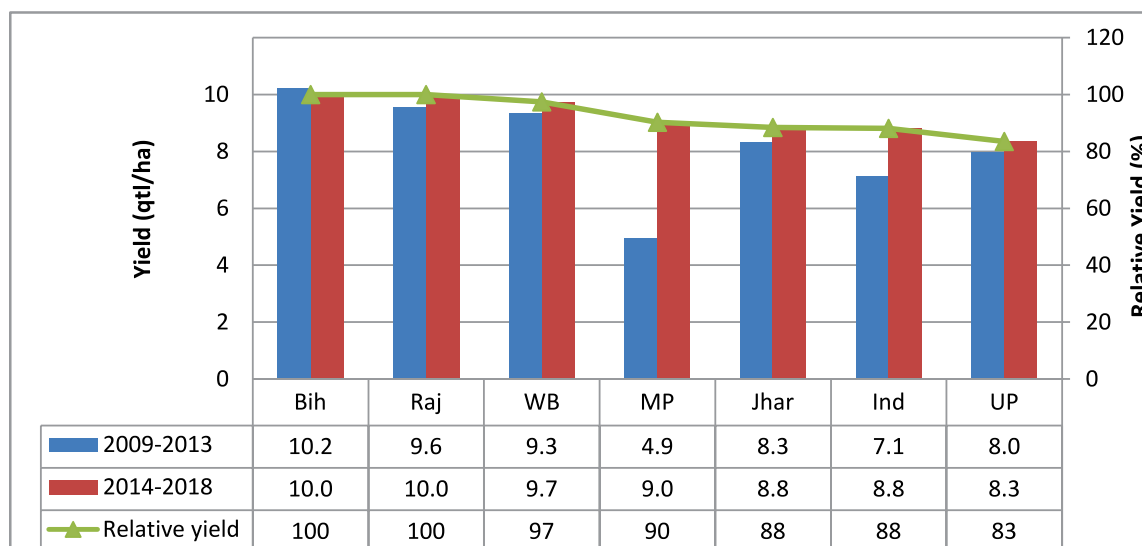
Sources: Indian Institute of Pulses Research, Kanpur; DES, MoA&FW

## Lentil

- 3.15 State-wise productivity trends for lentil are given in Chart 3.6. Except for Bihar, which has the highest yield, all other States have shown significant improvement in lentil productivity in the recent period. This has led to an increase in productivity at the all-India level from 7.1 qtl/ha in 2009-13 to 8.8 qtl/ha in 2014-2018. It may be noted that in 2009-2013 lentil productivity in Madhya Pradesh (4.9 qtl/ha) was below all-India average but in 2014-2018 it increased by 82.6 percent to reach 9 qtl/ha. Due to this improvement, productivity in Madhya Pradesh is higher than all-India average. This augurs well for Indian pulses sector as Madhya Pradesh produces nearly 40 percent of total lentil production. Uttar Pradesh, which is the second largest producer of lentil, registered a marginal improvement in productivity from 8 qtl/ha in 2009-2013 to 8.3 qtl/ha in 2014-2018. Uttar Pradesh still remains at the bottom among major lentil producing States, so there is a need to further improve lentil productivity in the State.



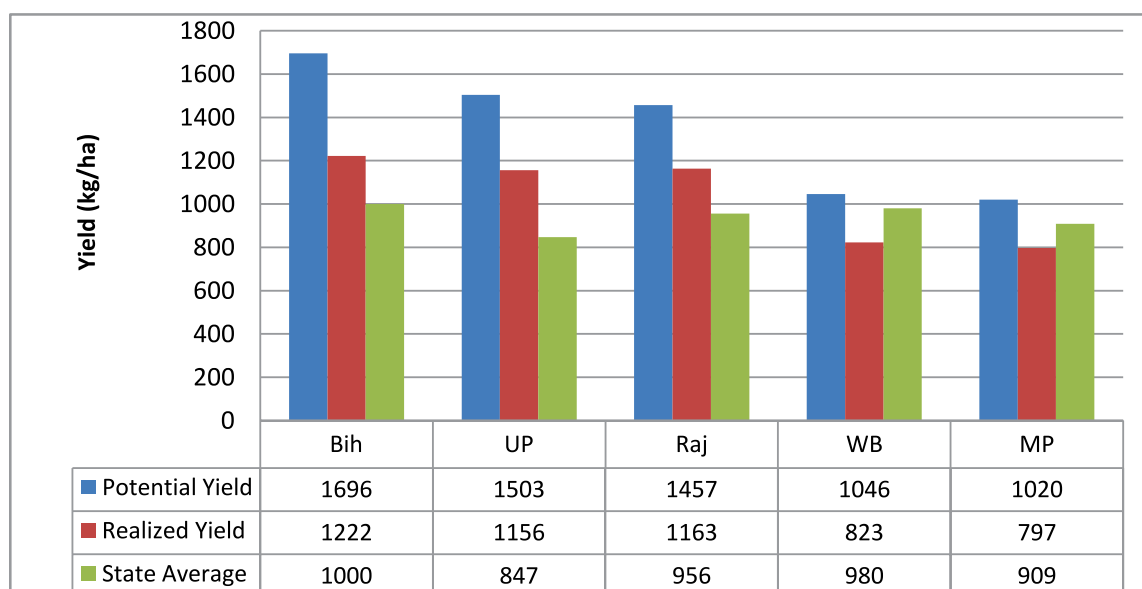
**Chart 3.6: Productivity Trends in Major Lentil Growing States**



Source: DES, MoA&FW

3.16 Yield Gap analysis for lentil is presented in Chart 3.7. Yield Gap (A), which shows difference between potential yield and realized yield, varied from 20.2 percent in Rajasthan to 27.9 percent in Bihar. The variations were much larger in Yield Gap (B), the difference between realized yield and state average yield. Other States with significant difference between realized yield and State average yield were Rajasthan (17.8%) and Bihar (18.2%). Since Uttar Pradesh, Rajasthan and West Bengal account for nearly 40 percent of India's lentil production, the above analysis clearly shows that there is a vast potential to increase pulses production in the country, especially lentil by appropriate interventions in these States.

**Chart 3.7: Yield Gap in Major Lentil Growing states, TE2017-18**



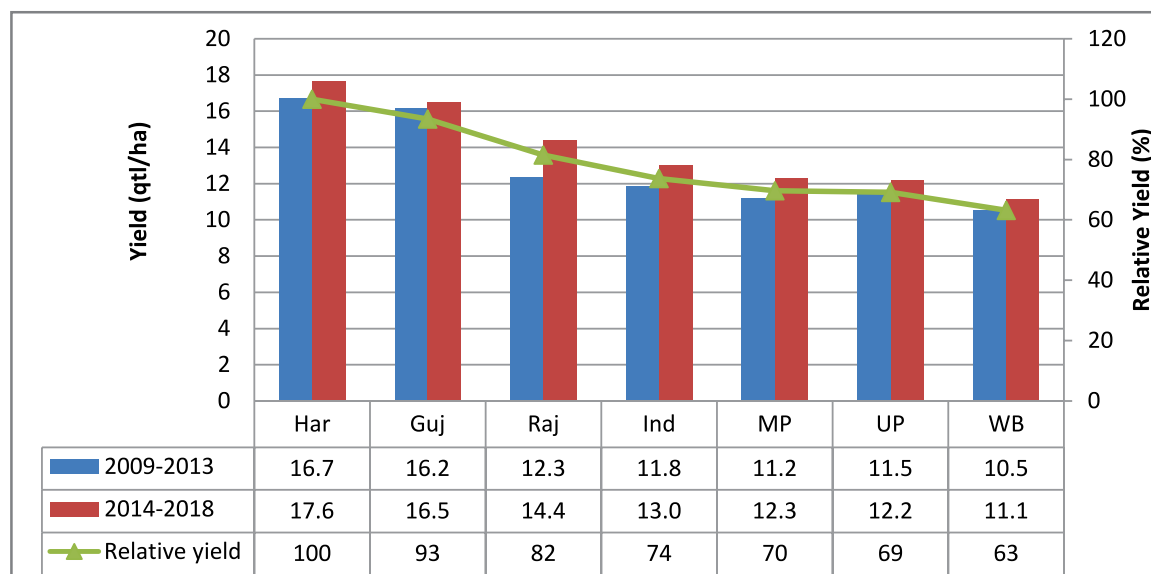
Sources: Indian Institute of Pulses Research, Kanpur; DES, MoA&FW



## R&M

- 3.17 In case of R&M, a marginal improvement in productivity was observed in all the major producing States (Chart 3.8). At the all-India level, productivity increased by 9.7 percent during last 10 years, from 11.8 qtl/ha in 2009-13 to 13 qtl/ha in 2014-18. This improvement was primarily driven by Rajasthan, where productivity increased by 16.5 percent. In Haryana, productivity increased by more than 5 percent during the period 2009-13 and 2014-18.

**Chart 3.8: Productivity Trends in Major R&M Growing States**

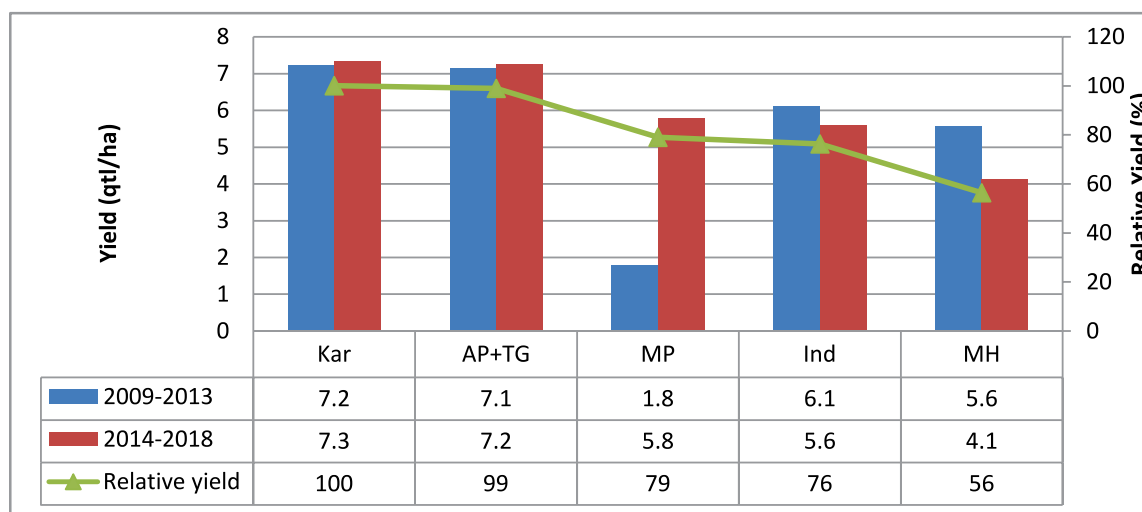


Source: DES, MoA&FW

## Safflower

- 3.18 Productivity changes in major safflower producing States during the last 10 years are presented in Chart 3.9. Safflower productivity has fallen at all-India level, from 6.1 qtl/ha in 2008-12 to 5.7 qtl/ha in 2014-18. Even though productivity has risen significantly in Madhya Pradesh during 2014-18 but it has not proved sufficient to arrest an overall fall in productivity growth of safflower because Madhya Pradesh contributes about 10 percent of total production in the country. There was a decline in safflower productivity by 15 percent in Maharashtra, the largest producer of safflower in TE2017-18, and is a matter of concern.

**Chart 3.9: Productivity Trends in Major Safflower Growing States**



Source: DES, MoA&FW

## District Level Productivity of Major Rabi Crops

3.19 In order to assess performance of productivity at district level at different time periods (TE2007-08 and TE2016-17), number of districts and area under different productivity bands for major crops in main producing States for which data were available is analyzed. In this analysis, districts having at least one percent share in total production in the respective State have been considered. The changes in number of districts and area under different yield bands for various rabi crops in TE2007-08 and TE2016-17 are presented in Tables 3.3(a) to 3.3 (c).

## Wheat

3.20 For wheat, four yield bands have been considered viz., <2 t/ha, 2-3 t/ha, 3-4 t/ha and >4 t/ha. It is evident from the Table 3.3 that except for Uttar Pradesh, the number of districts and share of area in the highest band of >4 t/ha has increased in all the major wheat growing States, whereas, number of districts and share of area in the lowest band (<2 t/ha) has declined in all the States except Uttar Pradesh. In Punjab, there is no district in the yield band of <3 t/ha. In Madhya Pradesh the highest share of area is under yield band of 2-3 t/ha. Further, it is important to note that in Madhya Pradesh number of districts with yield <2 t/ha has fallen drastically in the last 10 years (from 21 to 0). Irrigation development and effective procurement policy in the State have driven this growth. In Rajasthan, there was an increase in area under the 3-4 t/ha yield band from 56.4 percent in TE2007-08 to 66.3 percent in TE2016-17 and only one district registered productivity of >4 t/ha in TE2016-17. Increase in number of districts and share of area in higher yield bands in all major producing States is a positive trend. However, special attention needs to be paid to improve yields in Uttar Pradesh, the largest producer of wheat in the country.



**Table 3.3: District-level Productivity Trends in Wheat**

State/Year	<2 tonnes/ha		2-3 tonnes/ha		3-4 tonnes/ha		> 4 tonnes/ha	
	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)
<b>Punjab</b>								
TE2007-08	0	0	0	0	3	7.3	17	92.7
TE2016-17	0	0	0	0	1	4.2	20	94.6
<b>Madhya Pradesh*</b>								
TE2007-08	21	55.4	15	34.2	0	0	0	0
TE2016-17	0	0	17	33.6	24	51.7	3	8.6
<b>Rajasthan</b>								
TE2007-08	3	8.1	10	29.7	13	56.4	0	0
TE2016-17	0	0	9	22.1	16	66.3	1	5.1
<b>Uttar Pradesh</b>								
TE2007-08	0	0	30	56.1	18	25.6	0	0
TE2016-17	1	1.3	32	54.6	17	26.0	0	0

*Note: \*Data for Madhya Pradesh for 2015-16 and 2016-17 not available*

*Source: Computed by CACP using data of DES, MoA&FW*

## Gram

3.21 In case of gram, yield bands considered were <0.5 t/ha, 0.5-1 t/ha and >1 t/ha. The leading gram growing States are Madhya Pradesh, Maharashtra, Rajasthan and Karnataka. It can be observed from Table 3.4 that in all the States except Karnataka, the number of districts and share of area under higher yield bands has increased between TE2007-08 and TE2016-17. For Karnataka, there was a rise in the number of districts with yield less than 0.5 t/ha from 5 to 6. At the same time, a reduction in the area under the medium yield band (0.5-1 t/ha) was observed in Karnataka. Further, no district recorded >1 t/ha yield in Karnataka in both the periods. In case of Maharashtra there was an increase in the number of districts in the highest band (0 to 3) and the lowest band (0 to 1). This increase in the number of districts under both bands was a direct result of the reduction in the area under the medium yield band from 97.5 percent in TE2007-08 to 82.6 percent in TE2016-17.



**Table 3.4: District Level Productivity Trends in Gram**

State/Year	<0.5 tonnes/ha		0.5- 1 tonnes/ha		>1 tonnes/ha	
	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)
<b>Karnataka</b>						
TE2007-08	5	20.1	9	76.7	0	0
TE2016-17	6	58.8	7	40.3	0	0
<b>Rajasthan</b>						
TE2007-08	2	42.1	15	50.4	3	3.3
TE2016-17	1	14.7	8	56.3	12	25.3
<b>Maharashtra</b>						
TE2007-08	0	0	25	97.5	0	0.0
TE 2016-17	1	5.4	21	82.6	3	9.7
<b>Madhya Pradesh*</b>						
TE2007-08	1	3.7	19	64.0	10	23.4
TE2016-17	0	0	12	27.8	21	56.8

*Note: \*Data for Madhya Pradesh for 2015-16 and 2016-17 not available,*

*Source: Computed by CACP using data of DES, MoA&FW*

## R&M

3.22 For R&M, an increase in share of area under the highest yield band (>1 t/ha) has been observed for all major producing States except Uttar Pradesh (Table 3.5). In Rajasthan, which is the largest producer of R&M, area under the highest yield band increased from 72.1 percent in TE2007-08 to 94.3 percent in TE2016-17. This is a direct result of a shift in number of districts from the medium yield band (0.5-1 t/ha) to the highest yield band (>1 t/ha) in TE2016-17 in Rajasthan. Similar trend was observed in Madhya Pradesh. There was 9.7 percent reduction in area under medium yield band in Madhya Pradesh in TE2016-17 compared to TE2007-08. This fall in area under medium yield band was matched by 11 percent increase in area under highest yield band in Madhya Pradesh in TE2016-17. As a result, the number of districts under the highest yield band in Madhya Pradesh increased from four in TE2007-08 to nine in TE2016-17. West Bengal was the only state among major producers, where one district was in the lowest yield band (<0.5 t/ha) in TE2007-08. About 75 percent area in West Bengal was under the medium yield band in TE2007-08. But, as result of recent productivity improvements, area under lowest and medium yield band has significantly reduced. This has led to increase in area under the highest yield band in West Bengal, from 17.2 percent in TE2007-08 to 60.9 percent in TE2016-17. However, in Uttar Pradesh a negative shift in area from the higher yield band to lower yield band has been observed. In TE2007-08, the area under the highest yield band in Uttar Pradesh was 53.2 percent, which reduced



to 44.4 percent in TE2016-17. At the same time area under medium yield band increased from 28.3 percent in TE2007-08 to 34 percent in TE2016-17.

**Table 3.5: District Level Productivity Trends in R&M**

State/Year	<0.5 tonnes/ha		0.5- 1 tonnes/ha		>1 tonnes/ha	
	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)
<b>Rajasthan</b>						
TE2007-08	0	0	7	23.4	17	72.1
TE2016-17	0	0	2	3.6	24	94.3
<b>Madhya Pradesh*</b>						
TE2007-08	0	0	7	32.8	4	52.4
TE2016-17	0	0	5	23.1	9	63.4
<b>Uttar Pradesh</b>						
TE2007-08	0	0	12	28.3	16	53.2
TE2016-17	0	0	13	34.0	17	44.4
<b>West Bengal</b>						
TE2007-08	1	4.2	9	75.1	2	17.2
TE2016-17	0	0	8	38.9	5	60.9

Note: \* Data for Madhya Pradesh for 2015-16 and 2016-17 not available.

Source: Computed by CACP using data of DES, MoA&FW

## Drivers of Productivity Growth

3.23 Good quality seed, fertilizer, irrigation, and better management practices are important drivers of productivity growth. By assuring timely availability of these inputs and better extension services, crop productivity can be enhanced significantly. Crop productivity is also affected by external factors such as weather conditions, government policy, market conditions, etc. that are not under the control of farmers. However, the major driver of long run productivity growth in agriculture is technological development.

## Seed Availability and Seed Replacement Rates

3.24 Timely availability of quality seeds suitable for different agro-climatic conditions and at affordable prices is critical for realizing higher productivity. However, lack of quality seeds continues to be one of the greatest impediments to raise productivity level in many crops and regions. Therefore, production and distribution of quality seeds is essential to realize higher yields. Production of breeder seed has increased marginally in 2017-18 over 2016-17 while, production of foundation seed has witnessed a decline (Annex Table 3.1). This is in sharp contrast to the situation in 2016-17 wherein production of all three types of seeds, breeder, foundation

and certified had increased manifold. Overall, the data for last 5 years depicts a fluctuating trend in production of breeder, foundation and certified seeds. Therefore, there is an urgent need to maintain a sustained increase in production and timely availability of quality seeds to improve agricultural productivity.

- 3.25 With availability of quality seeds, Seed Replacement Rate (SRR) has improved in major crops but is still low in some crops and regions. Therefore, there is a need to improve SRR with appropriate varieties. Tables 3.6 to Tables 3.8 show the SRR trends for wheat, gram and R&M in the major States during last four years.
- 3.26 It is quite evident from the data that there is a positive relationship between SRR and productivity level. For example, as shown in Table 3.6, Punjab recorded the highest (45%) SRR in wheat in 2018-19 and had the highest productivity level. It may be observed that Bihar has the lowest wheat productivity among major producing States and the lowest SRR in the range of 20.3 percent to 30.8 percent during 2015-16 to 2018-19. Uttar Pradesh had SRR of 43.8 percent in 2018-19, however, its average yield is lower than all-India level. Therefore, in order to give a boost to wheat productivity in Uttar Pradesh and Bihar, efforts are needed to enhance availability of quality seed and improve SRR to achieve higher yield. Further, attention also needs to be given towards improvement of all-India SRR which was relatively lower (36.5%) in 2017-18 compared with 2016-17.

**Table 3.6: SRR for Wheat in Major Producing States**

(Percent)

States	2015-16	2016-17	2017-18	2018-19
Uttar Pradesh	35.8	36.3	43.0	43.8
Maharashtra	43.5	37.0	37.1	41.0
Punjab	39.4	49.0	46.7	45.0
Gujarat	34.0	36.0	39.0	40.0
Rajasthan	32.5	30.8	31.4	33.6
Bihar	27.1	20.3	30.8	28.8
<b>All-India</b>	<b>35.1</b>	<b>40.3</b>	<b>36.5</b>	-

Source: MoA&FW

- 3.27 In some states, new initiatives such as seed hubs, seed village programme, have increased availability of breeder seed through ICAR/SAUs, etc. which has resulted in better SRR and higher productivity of pulses during the last few years. As shown in Table 3.7, gram SRR in Andhra Pradesh has increased from 65 percent in 2015-16 to 85 percent in 2018-19. SRR in Maharashtra also showed an increase from 30.1 percent in 2015-16 to 37.9 percent in 2018-19. In case of Karnataka, SRR improved marginally from 35.1 percent in 2015-16 to 39.1 percent in 2018-19. However, there exists a large scope for further improvement of SRR in Rajasthan, Uttar Pradesh, Maharashtra and Karnataka as these States recorded lower SRR and yield level were lower than all-India level. All-India SRR has remained almost stagnant during 2016-17 to 2017-18.



**Table 3.7: SRR for Gram in Major Producing States**

(Percent)

States	2015-16	2016-17	2017-18	2018-19
Andhra Pradesh	65.0	65.0	85.0	85.0
Karnataka	35.1	-	36.6	39.1
Gujarat	35.0	38.0	41.0	42.0
Maharashtra	30.1	36.0	33.1	37.9
Rajasthan	17.8	11.3	18.4	17.8
Uttar Pradesh	29.9	29.6	35.9	30.8
<b>All-India</b>	<b>27.6</b>	<b>31.8</b>	<b>30.9</b>	-

Source: MoA&FW

3.28 Table 3.8 shows SRR in major R&M producing states. While SRR was the highest (74.8%) in Rajasthan in 2015-16 but declined to 63 percent in 2018-19. The falling SRR in Rajasthan is a matter of concern since it is the largest producer of R&M in India. On the other hand, SRR has witnessed an impressive growth in Bihar, rising from 36.3 percent in 2015-16 to 65.8 percent in 2016-17 but declined to 60 percent in 2018-19. In case of Uttar Pradesh, SRR significantly declined from 63.7 percent in 2016-17 to 22.5 percent in 2018-19. At all-India level, SRR showed a significant decline in 2017-18 (54.9%) as compared to 2016-17 (68%).

**Table 3.8: SRR for R&M in Major Producing States**

(Percent)

State	2015-16	2016-17	2017-18	2018-19
Rajasthan	74.8	70.7	71.1	63.0
Bihar	36.3	65.8	31.6	60.0
Assam	40.0	42.0	43.0	44.0
Uttar Pradesh	56.4	63.7	20.7	22.5
West Bengal	51.1	52.0	52.9	52.8
Chhattisgarh	32.0	32.1	51.1	36.6
<b>All-India</b>	<b>62.2</b>	<b>68.0</b>	<b>54.9</b>	-

Source: MoA&FW

## Fertilizer Use

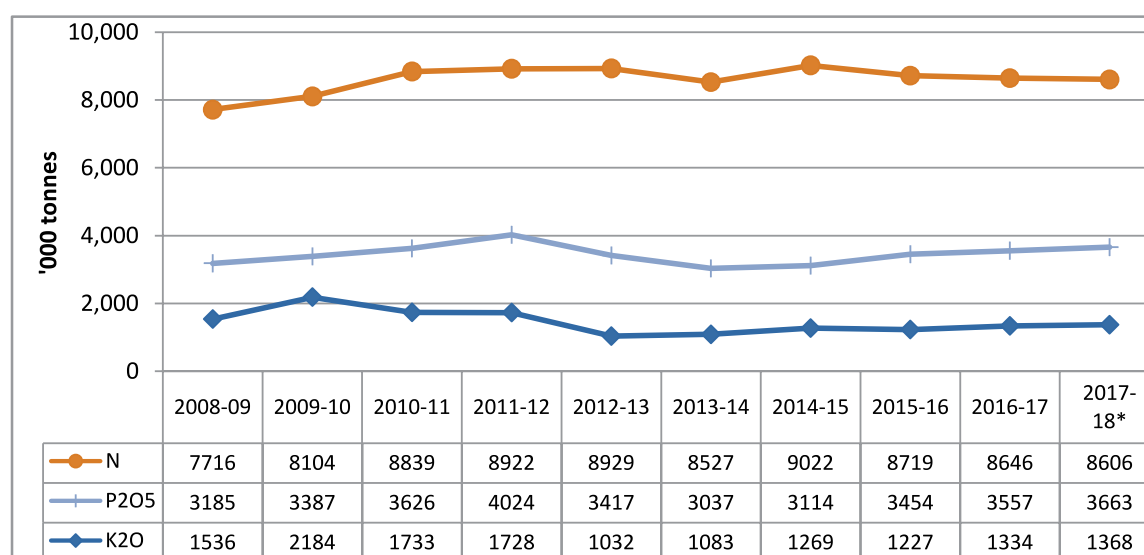
3.29 Nutrient management is the key issue in sustainable soil fertility and crop productivity. Therefore, there is a pertinent need to ensure proper usage of primary, secondary and micro-nutrients to enhance productivity. The trends in fertilizer consumption for all-India in the rabi season for the last 7 years are given in Chart 3.10.

3.30 Government of India introduced Nutrient Based Subsidy (NBS) scheme for decontrolled phosphatic and potassic fertilizers from April 1, 2010 but urea remained



under control and is sold to farmers at a statutorily notified Maximum Retail Price (MRP). This led to significant increase in prices of Di-ammonium Phosphate (DAP) and Murate of Potash (MOP) and as a result consumption of phosphatic and potassic fertilizers reduced in subsequent periods compared to 2011-12. For instance, consumption of  $P_2O_5$  fertilizers decreased by 15 percent in 2012-13, 25 percent in 2013-14 and 9 percent in 2017-18 compared to 2011-12, whereas consumption of  $K_2O$  fertilizer decreased by 40 percent in 2012-13, 37 percent in 2013-14 and 21 percent in 2017-18 compared to 2011-12. Consumption of nitrogenous fertilizer was almost stagnant during 2011-12 to 2017-18, with marginal decline in consumption during 2013-14. After introduction of 100 percent neem-coating of urea from 25<sup>th</sup> May 2015 diversion of urea for non-agriculture uses and Nitrogen Use Efficiency (NUE) has improved.

**Chart 3.10: Trend in Fertilizer Consumption during Rabi Season**



Note: \* Provisional

Source: Fertilizers Association of India

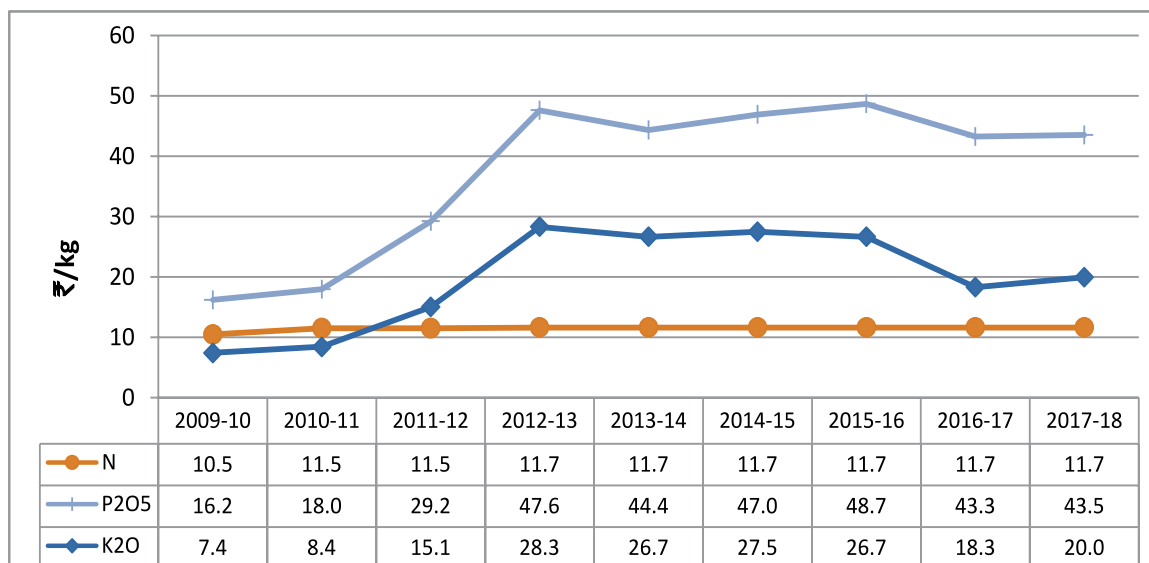
3.31 Chart 3.11 indicate price of N,  $P_2O_5$  and  $K_2O$  nutrient in Urea, DAP and MOP, respectively. It shows that price of  $P_2O_5$  was around 2.5 times higher than urea and price of  $K_2O$  was about 1.3 times higher than urea in 2011-12. Due to almost no change in urea price and significant increase in  $P_2O_5$  and  $K_2O$  fertilizers, ratio of  $P_2O_5$  and urea price increased to 4.1 in 2012-13 and reached 4.2 in 2015-16 while in case of  $K_2O$  it increased to 2.4 in 2012-13 and 2.3 in 2015-16. This led to consumption of fertilizers skewed towards N compared to P and K and NPK ratio at all-India level deteriorated from 4.7:2.3:1 in 2010-11 to 7.1:2.8:1 in 2015-16. However, due to moderation in prices of P and K during 2016-17 and 2017-18, NPK ratio improved and reached 6.5:2.7:1 in 2017-18, which is still skewed towards N due to high price difference between P&K fertilizers and urea. States of Punjab (45.7:10.8:1), Haryana (35.5: 8.7:1) and Rajasthan (47.2:14.5:1) recorded higher level of imbalance in fertilizer consumption (Annex Table 3.2). Therefore, there is a need to review fertiliser pricing policy to promote more balanced use of fertiliser nutrients. There



are also large inter-State variations in NPK ratio. The situation in northern States particularly needs greater attention as these States suffer from very high imbalance in nutrient use ratio. Among the major States, Karnataka and Andhra Pradesh have NPK ratio close to the ideal usage ratio.

- 3.32 Imbalanced use of fertilizer nutrients can cause widespread adverse effects on soil health, crop productivity and environment. In view of this, urgent steps are needed to correct the NPK ratio in Indian farms. Some of the steps that may be taken to achieve this include bringing urea under NBS policy, strengthen soil testing facilities, promote practice of fertigation and customised fertilisers.

**Chart 3.11: Prices of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O Nutrient in Urea, DAP and MOP, respectively**



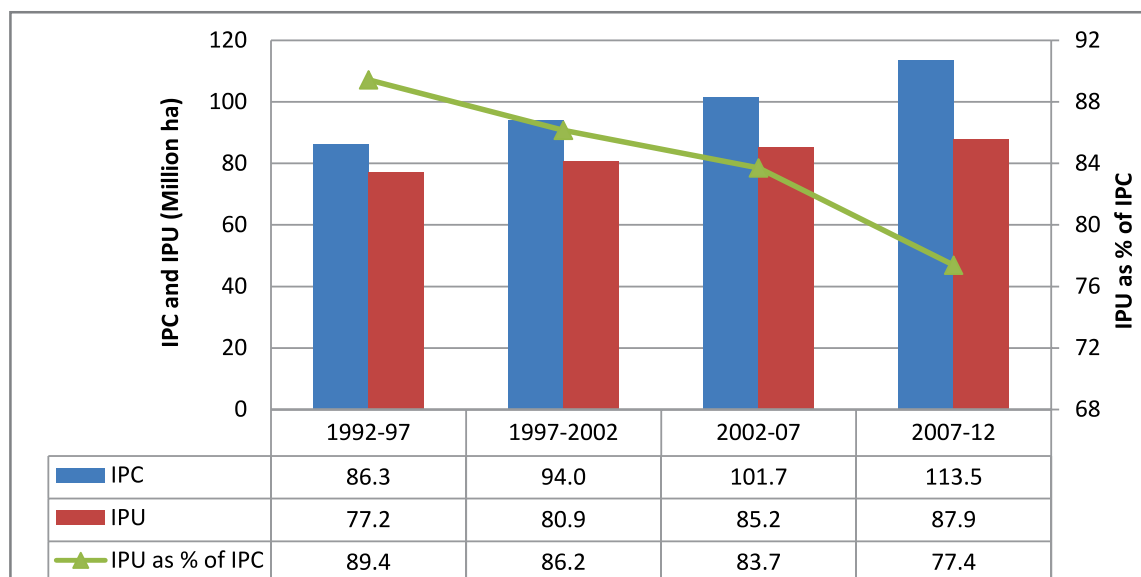
*Note: Under NBS, retail prices are market determined, hence are indicative average prices*

*Source: Fertilizers Association of India*

## Irrigation

- 3.33 Substantial gains in productivity can be made by enhancing area under irrigation. However, it is also important to fully utilize the existing irrigation potential. The extent of utilisation of existing irrigation sources can be analysed by comparing it with the irrigation potential created. Chart 3.12 below shows the cumulative irrigation potential created (IPC) and cumulative irrigation potential utilized (IPU) during the last four 5-year plans. Cumulative IPC has increased from 86.3 million hectares in 1992-97 to 113.5 million hectares in 2007-12, an increase of 31.2 percent. However, the growth in IPU has only been 13.9 percent during the same period. As a result, over the last 20 years gap between IPC and IPU has widened as IPU as percent of IPC decreased from 89.4 percent in 1992-97 to 77.4 percent in 2007-12. Therefore, efforts are needed to reduce this gap in order to reduce dependence on rainfall.

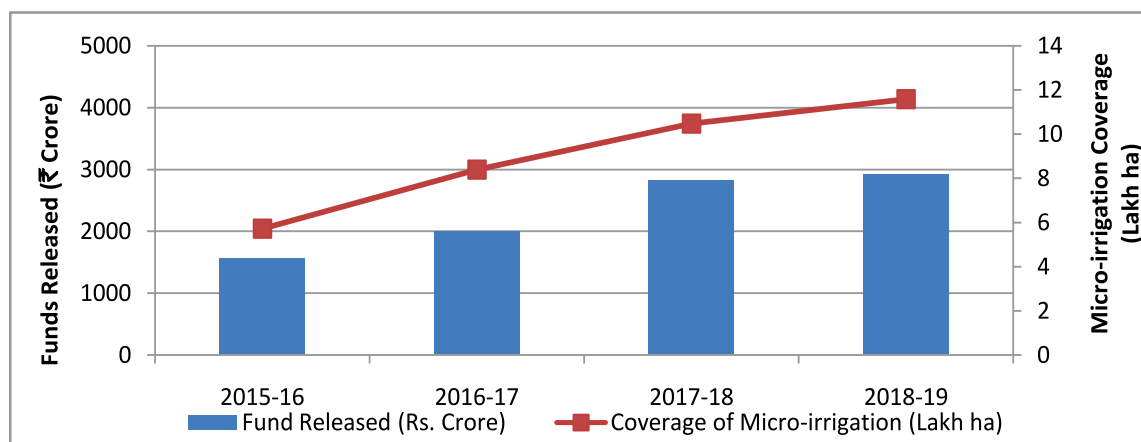
**Chart 3.12: Cumulative Irrigation Potential Created and Utilized**



Source: Central Water Commission

3.34 Indian agriculture is highly dependent on the performance of the south-west monsoon as India's net irrigated area is less than 50 percent of net sown area. This is one of the major reasons for low and fluctuating productivity levels in India vis-à-vis other countries. In order to improve irrigation coverage, Government of India launched "Pradhan Mantri Krishi Sinchayee Yojana" (PMKSY) on 1<sup>st</sup> July 2015 with the vision of extending the coverage of irrigation under 'Har khet ko pani' and improving water use efficiency through 'More crop per drop'. Under PMKSY- Per drop more crop, area under micro-irrigation has increased from 5.7 lakh hectare in 2015-16 to 11.6 lakh hectare in 2018-19. Also, allocation for the Scheme has increased as is evident from Chart 3.13. This Scheme mainly focuses on improving water use efficiency at farm level through micro-irrigation. Besides promoting precision agriculture, this component also supports micro-level water storage activities to supplement source creation.

**Chart 3.13: Financial and Physical Achievement under PMKSY – Per Drop More Crop**



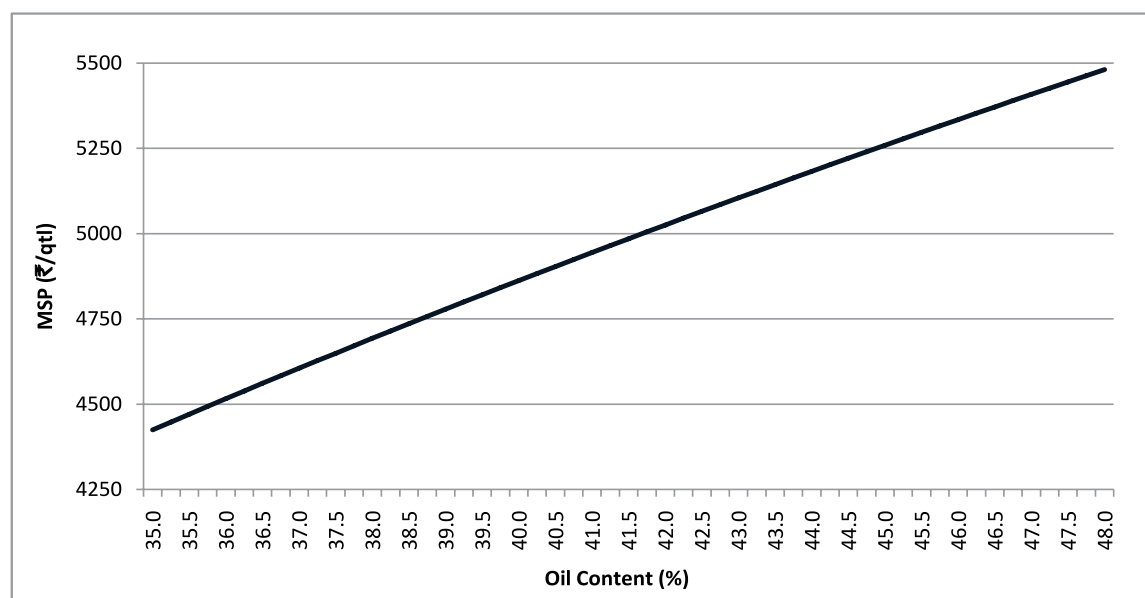
Source: MoA&FW



## Linking MSP with Oil Content in Rapeseed and Mustard

- 3.35 The oil content in R&M seed from different varieties varies widely and therefore uniform MSP is not desirable. Thus, in order to increase area under high oil-yielding varieties of R&M and incentivise farmers, MSP of R&M seed should be linked to the oil content. The Commission suggests that farmers should be incentivized for higher 'oil content'. On the basis of detailed discussions held with various stakeholders such as R&M cultivators, processors, scientists, the Commission recommends that the MSP of R&M be linked to the basic 'oil content' of 35 percent in R&M seed and farmers be incentivized for every 0.25 percent point increase in 'oil content' beyond this level.
- 3.36 To determine the incentive for higher 'oil content', one quintal of R&M seed will give 35 kg of oil and 65 kg of oil cake. Adjusting the value of cake, the cost of R&M seed (oil without cake) would be ₹3223 which will contain 35 kg of oil. Thus, the MSP will increase by ₹20.27 per quintal for every 0.25 percent point increase in oil content (Chart 3.14). Cost per unit of oil content slowly decreases with increase in 'oil content' (Annex Table 3.3). Taking average oil content between 35 percent and 48 percent, the average cost for every 0.25 percent point works out to ₹20.27 per quintal. Hence Commission recommends that MSP of R&M seeds should be increased by ₹20.27 per quintal for every 0.25 percent point increase in 'oil content' over and above the base oil content of 35 percent in R&M seed.

**Chart 3.14: MSP based on Oil Content of R&M**



## Recapitulation

- 3.37 After a significant fall in QE2013-14, productivity of most rabi crops has shown some improvement in QE2018-19. This is an encouraging trend for Indian agriculture. However, despite improvement, productivity levels in India remain much lower than productivity in other leading countries and world average. Further, at the sub-



national level as well, there are large variations in productivity, which are largely due to widespread variations in rainfall, soil type, use of modern agricultural methods, availability of quality inputs, extension services, etc.

- 3.38 The yield gap analysis reveals that there is large gap between potential yield and actual yields in wheat, gram and lentil in many States. Therefore, new technological interventions are needed to improve crop productivity along with addressing institutional and socio-economic constraints to bridge the yield gaps.

\*\*\*\*\*



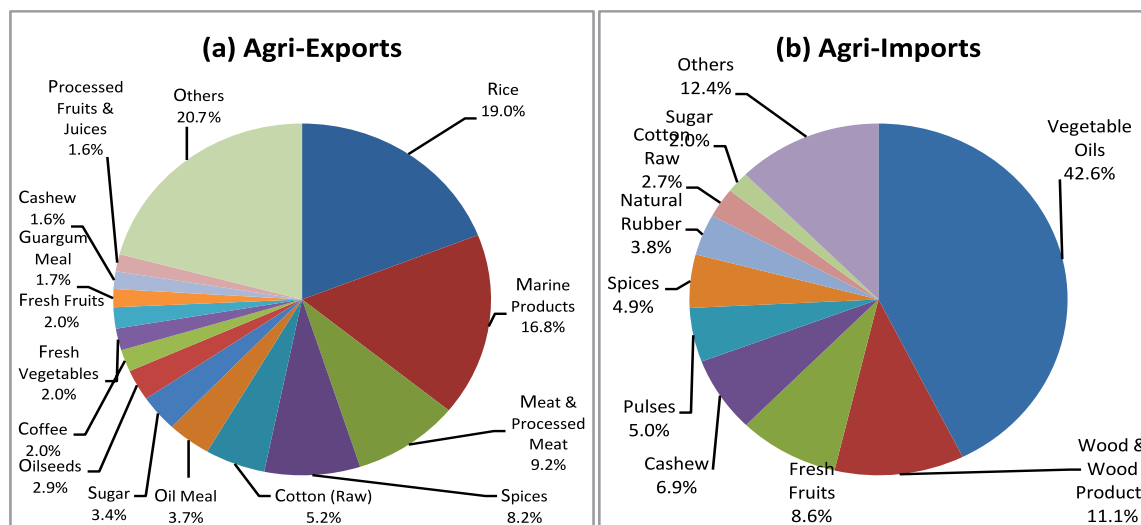
## Chapter 4

# Trade Performance and Competitiveness of Indian Agriculture

## Chapter 4

- 4.1 As per World Trade Statistical Review 2018, an analysis of share of India's agri-exports and imports in global agri-exports and imports showed an improvement of 1.2 percent each, during 2000 to 2017. Share of agri exports increased from 1.1 percent to 2.3 percent during 2000 to 2017 while share of agri-imports increased from 0.7 percent to 1.9 percent during the same period. In 2017, India's total agri-exports stood at US\$ 39 billion and agri-imports were US\$ 33 billion. As per DGCIS, share of India's agri-exports in total exports of the country increased from 12.6 percent in 2016-17 to 13.2 percent in 2017-18 but declined to 12.3 percent in 2018-19 due to larger increase in total exports compared with agri-exports. The share of agri-imports in total imports declined from 7.2 percent in 2016-17 to 5.9 percent in 2017-18 and 4.5 percent in 2018-19, due to decline in imports of pulses, vegetable oils, wheat and cotton (raw). Growth in agri-exports was lower than overall exports during 2018-19, wherein total merchandise exports increased by 17.9 percent but agri-exports increased by 9.6 percent. Rice is the leading agricultural export product with a share of 19 percent, followed by marine products (16.8%), meat and processed meat (9.2%), spices (8.2%) and raw cotton (5.2%). Top ten products/product groups account for more than 70 percent of total agri-exports (Chart 4.1(a)). The main commodities that India imports include vegetable oils (42.6%), wood & wood products (11.1%), fresh fruits (8.6%), cashew (6.9%), and pulses (5.0%). Top five products account for nearly three-fourths of total agri-imports (Chart 4.1(b)). India continues to be a net exporter of agri-commodities and trade surplus has increased from ₹48 thousand crore in 2016-17 to ₹83 thousand crore in 2017-18 and reached ₹122 thousand crore in 2018-19 due to decline in agri-imports by 8 percent combined with impressive increase in agri-exports by 9.6 percent. This chapter discusses trade patterns and price trends in domestic and world markets of mandated major rabi crops viz. wheat, barley, gram, lentil, rapeseed & mustard.

**Chart 4.1: Share of Major Agri-Commodities in Total Agri-Exports and Agri-Imports in 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics

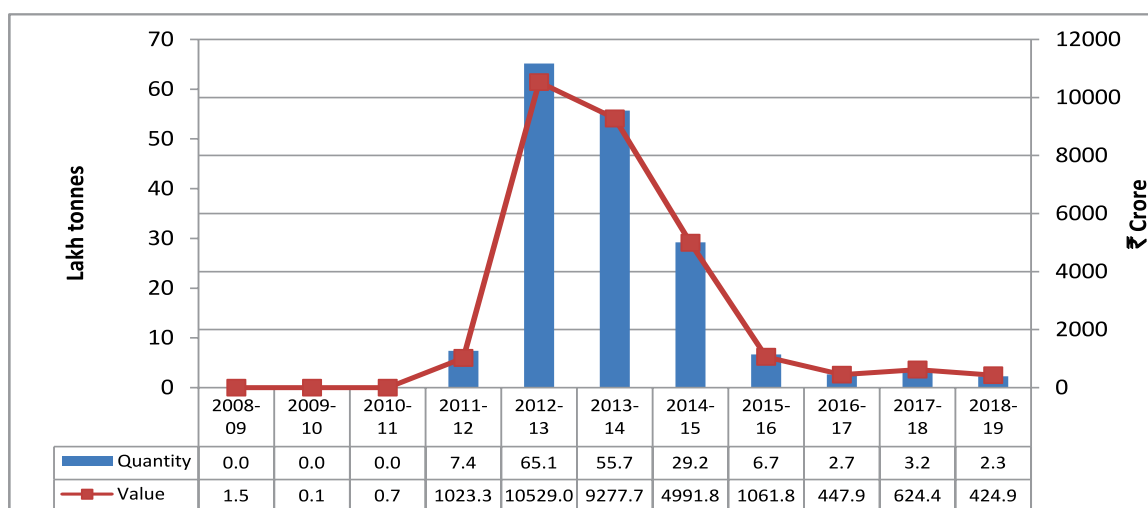
## Cereals: Wheat

- 4.2 As per USDA, global production of wheat was 750 million tonnes in TE2018-19, out of which about 24 percent was traded. European Union (EU) is the largest producer with a share of 18.8 percent, followed by China (18.0%) and India (13.6%). Russia is the fourth major producer but the largest exporter of wheat with a share of 20.2 percent, followed by Canada (13.6%), EU (13.5%) and Ukraine (9.1%). Egypt is the largest importer with a share of 7.1 percent, followed by Indonesia (6.3%), Brazil (4.4%), Philippines (4.0%) and Algeria (4.0%). Wheat exports are more concentrated than imports, as share of top five exporters is 63.4 percent while top five importers account for only about one-fourth of total imports. In 2018-19, Southeast Asia was top wheat importing region mainly driven by strong demand in Indonesia and the Philippines. Southeast Asia is expected to remain the world's largest importing region in 2019-20, with Indonesia and the Philippines to be the driving forces. The wheat demand in the region is likely to be high due to a shift in consumption pattern from rice to wheat-based food items mainly driven by lower wheat prices due to higher global wheat supplies.
- 4.3 India is not a major player in global wheat market and has been an occasional importer/exporter of wheat depending upon the domestic demand and supply situation. The Government of India had prohibited exports of wheat from Central Pool on August 11, 2003 because of significant fall in wheat production in 2002-03. Exports on private account were also prohibited on February 9, 2007, so there were no exports of wheat from India during 2007-08 to 2010-11. The ban on exports was lifted on September 9, 2011 when export of 20 lakh tonnes of wheat was allowed under Open General License (OGL) by private parties from privately held stocks through Electronic Data Interchange (EDI) enabled ports. From 7<sup>th</sup> February 2012, unrestricted exports of wheat under OGL have been allowed. India's exports of wheat were at a record level of 65.1 lakh tonnes during 2012-13. However, thereafter

exports witnessed a steady decline due to stiff competition from Australian and Ukrainian wheat. Other factors that contributed to the decline in wheat exports were higher domestic prices, lower production in the country during 2014-15 and falling global prices (from about US\$350/MT in November 2012 to below US\$200/MT in April 2019). There was a marginal increase in wheat exports in 2017-18 but exports declined in 2018-19. Despite a third consecutive record wheat harvest in the country and high stocks, wheat exports have not increased as Indian wheat exports are not competitive due to higher domestic prices compared to world prices (Chart 4.2).

- 4.4 Government imported 60.8 lakh tonnes of wheat during 2006-07 and 17.9 lakh tonnes during 2007-08 when wheat stocks with the Central Pool went below the minimum buffer norm in 2006-07. However, no imports of wheat have been made for the Central Pool thereafter but 5.2 lakh tonnes of wheat were imported by private traders mainly from Australia during 2015-16. In order to control prices and to meet domestic demand, the Government reduced import duty on wheat from 25 percent to 10 percent on 23<sup>rd</sup> September 2016 and thereafter to zero percent on 8<sup>th</sup> December 2016. During 2016-17, India imported over 57.5 lakh tonnes of wheat valued at ₹8,509 crore, the highest quantity during last 10 years (Chart 4.3). However, due to record production in 2016-17 and to protect interest of wheat growers, government imposed 10 percent import duty in March, 2017, which was further raised to 20 percent in November, 2017. In 2017-18, India imported around 16.5 lakh tonnes of wheat valued at ₹2,358 crore mainly from Australia, Russia and Ukraine. Although India was a net importer of wheat for two consecutive years (2016-17 and 2017-18) imports have come to a halt since 23<sup>rd</sup> May 2018, after import duty was raised to 30 percent. The import duty on wheat was increased to 40 percent in April 2019 in order to restrict cheaper imports of wheat to protect domestic wheat growers as wheat production is expected to cross 101 million tonnes in 2018-19. However, government is sitting on huge wheat stocks and special efforts are needed to liquidate these stocks.

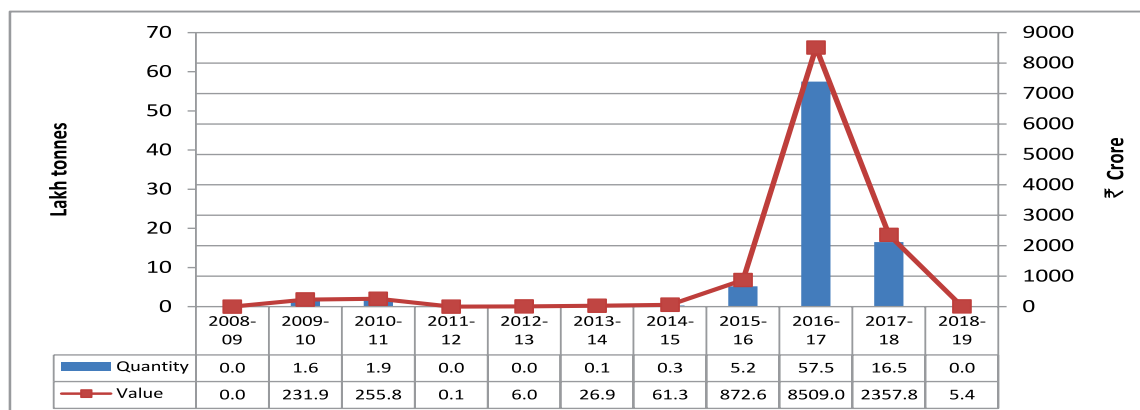
**Chart 4.2: India's Exports of Wheat, 2008-09 to 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics



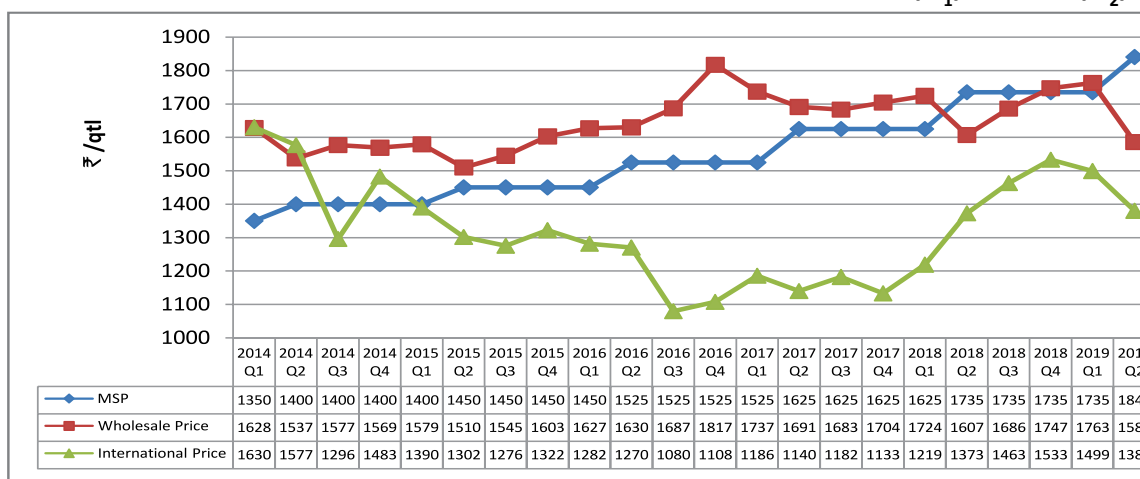
**Chart 4.3: India's Imports of Wheat, 2008-09 to 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics

4.5 India benefitted from higher international prices of wheat and exported record quantity of 65.1 lakh tonnes in 2012-13 and 55.7 lakh tonnes in 2013-14. However, during the period from 2015(Q<sub>1</sub>) to 2019(Q<sub>2</sub>), domestic prices as well as MSP of wheat were higher than international prices, which resulted in decline in wheat exports during this period. It may be seen from the Chart 4.4 that from 2019(Q<sub>1</sub>) onwards international as well as domestic wholesale prices of wheat have fallen due to record production of wheat leading to a glut in international market. Global wheat prices, which increased during 2018, witnessed a declining trend during 2019. However, due to higher MSP, domestic prices of wheat have remained firm up to 2019(Q<sub>1</sub>) but declined during 2019(Q<sub>2</sub>), peak market arrivals period. The higher domestic prices have made Indian wheat non-competitive in world markets.

**Chart 4.4: MSP, Domestic and International Prices of Wheat, 2014 (Q<sub>1</sub>) to 2019 (Q<sub>2</sub>)**



Note: 1. International prices are of the variety (US), No. 2, Soft Red Winter, export price delivered at the US Gulf port for prompt or 30 days shipment.

2. Wholesale prices are weighted average wholesale price of Bihar, Haryana, MP, Punjab, Rajasthan and UP, which cover 97 percent of production.

3. International prices of quarter 2019 (Q<sub>2</sub>) are of April & May months only.

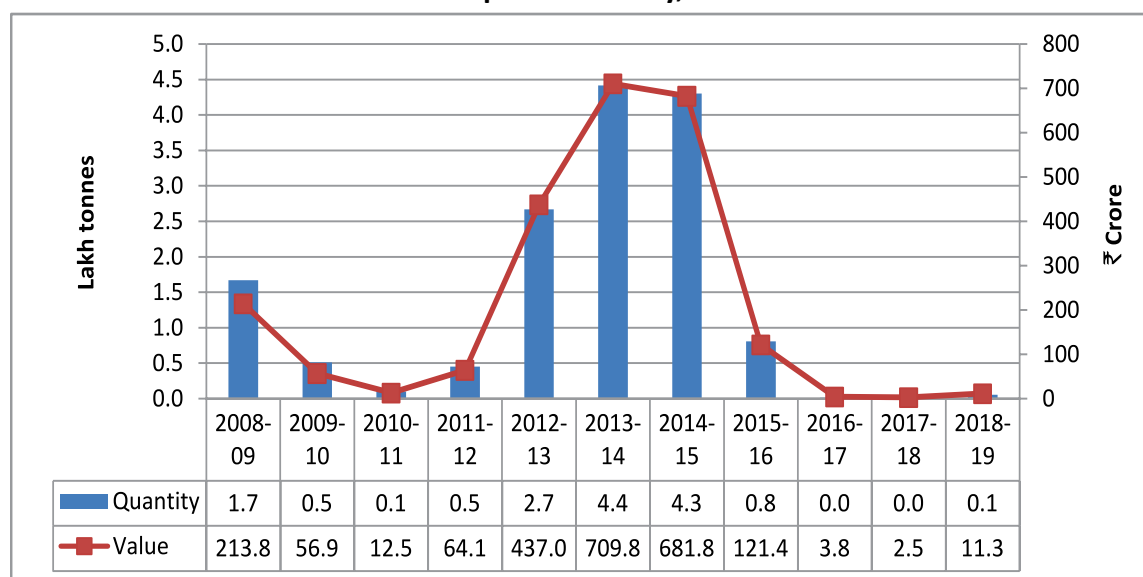
Sources: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and World Bank for international prices.



## Nutri/Coarse Cereals: Barley

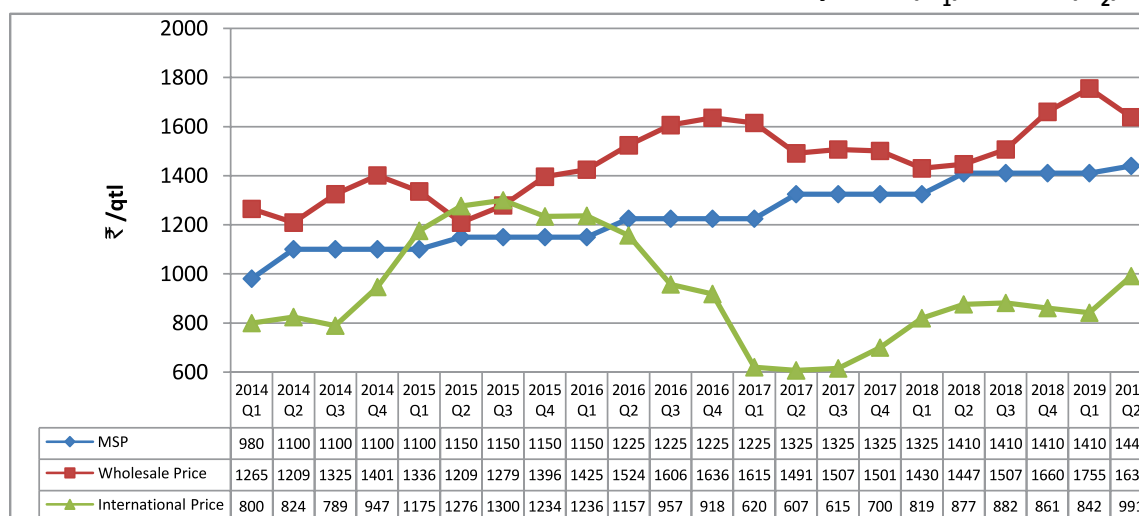
- 4.6 As per USDA, the global production of barley was 144 million tonnes in TE2018-19, out of which 19.2 percent was traded. EU is the largest producer of barley (56 million tonnes) with a share of 39.9 percent, followed by Russia (11.9%), Canada (6.0%) and Ukraine (5.4%). EU is also the largest exporter of barley with a share of 19 percent, followed by Russia (18.2%) and Australia (17.4%). Saudi Arabia (28.8%) and China are the largest importers of barley (24.7%), followed by Iran (11.4%) and Japan (4.7%). Top three exporters and importers account for about 55 percent and 65 percent of world exports and imports, respectively.
- 4.7 As per Third Advance Estimates, barley production in India in 2018-19 is likely to be 17.3 lakh tonnes. India is not a major player in world barley market and during last 10 years the highest exports (4.4 lakh tonnes) were in 2013-14. India's exports of barley have been very negligible during the last three years (Chart 4.5). Imports of barley in India have also been negligible so far. Quantitative restrictions on exports of barley were removed in March 2002 while import restrictions were removed in November 2002. Trends in MSP, domestic wholesale prices, and international prices of barley are presented in Chart 4.6. The domestic wholesale prices are significantly higher than international prices. India exports small quantities of barley to countries like UAE, Bahrain, Bhutan, Nepal, Vietnam, Jordan and Libya where it enjoys freight advantage over major barley exporting countries like EU, Australia and Russia. Malting industry in India requires about 5-6 lakh tonnes of barley for beer and distilled beverages but these Industries import barley mainly from Argentina due to lower domestic production of required quality. Barley is also used in malted beverages in the country. Thus, there is a need to increase barley production and grow required varieties as it has good demand from domestic FMCG sector and malting industry.

**Chart 4.5: India's Exports of Barley, 2008-09 to 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.6: MSP, Domestic and International Prices of Barley, 2014(Q<sub>1</sub>) to 2019(Q<sub>2</sub>)**



*Note: 1. International prices are of the variety (US) feed, No. 2, spot, 20 days To-Arrive, delivered Minneapolis from May 2012 onwards; during 1980-2012 April Canadian, feed, Western No. 1, Winnipeg Commodity Exchange, spot, World Bank wholesale farmers' price.*

*2. Wholesale prices are weighted average wholesale price of Haryana, Rajasthan and UP, which cover 79 percent of production.*

*3. International prices of quarter 2019 (Q<sub>2</sub>) are of April & May months only.*

*Sources: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and World Bank for international prices.*

## Pulses

4.8 According to the UN Comtrade data, Canada was the largest exporter of pulses in 2018 with a share of about 51 percent, followed by Argentina (10.5%), India (7.1%), Mexico (6.7%) and Egypt (3.9%). India is the largest importer with a share of 35.2 percent, followed by Pakistan (15.2%), Egypt (10.5%) and Mexico (6.5%). As per DGCIS trade data, pulses imports in the country have significantly increased during last 10 years, from 24.8 lakh tonnes in 2008-09 to 66 lakh tonnes in 2016-17 (Chart 4.7). However, imports recorded a steady decline during last two years and were 56.3 lakh tonnes in 2017-18 and 25.7 lakh tonnes in 2018-19 due to record production in the country and other interventions such as import tariffs and quantitative restrictions (QRs) to safeguard interest of Indian farmers. Despite record production of pulses (25.4 million tonnes) in 2017-18 and estimated production of 23.2 million tonnes in 2018-19, India still imported about 2.6 million tonnes in 2018-19, which had some adverse impact on domestic market prices. India imported 8.5 lakh tonnes of peas, mainly from Canada and Ukraine, 5.3 lakh tonnes of tur/arhar from Mozambique, Myanmar and Tanzania, 4.9 lakh tonnes of urad from Kenya, Mozambique and Tanzania, 2.5 lakh tonnes of lentil mainly from Canada, Myanmar and Tanzania and 1.9 lakh tonnes of gram from Sudan, Myanmar and Tanzania. During TE2018-19, peas constituted the largest share (46.6%) in total imports of pulses, followed by chickpea (15.2%) and lentil (12.8%) (Table 4.1). Canada, Australia and Myanmar were major exporters of pulses to India and accounted for nearly two-third of total imports in the country in TE2018-19. Other

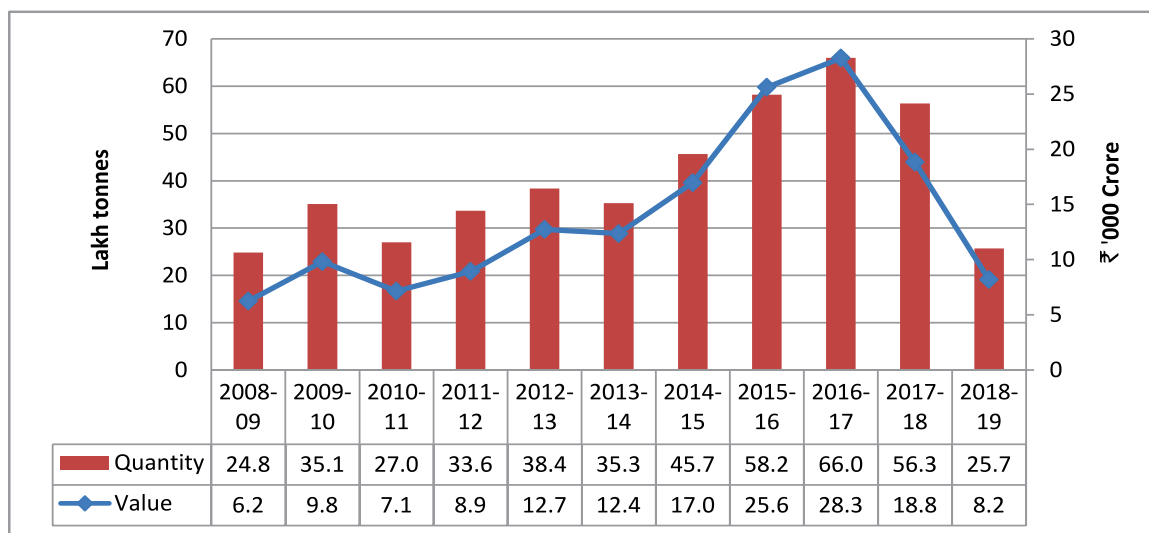
important suppliers were Russia, USA, Tanzania, Mozambique and Sudan. The share of Myanmar in total imports has declined from 28.7 percent in TE2008-09 to 15.6 percent in TE2018-19. On the other hand, share of Australia has increased from 7.3 percent to 19.9 percent in the corresponding period. Canada is the largest exporter of peas and lentils to India, while Australia supplies 79.3 percent of chickpeas and Myanmar supplies more than two-third of urad and moong.

**Table 4.1: Share and Key Originating Countries of India's Pulses Imports, TE 2018-19**

Name	Imports (Lakh tonnes)	Share (%) in total pulses imports	Key Origin (percent)
Peas	23	46.6	Canada (46.6), Russia (16.2), Ukraine (11)
Chickpea	7.5	15.2	Australia (79.3), Tanzania (4.7), Sudan (4.1)
Lentil	6.3	12.8	Canada (72.6), Australia (19.2), USA (7)
Tur	5.5	11.1	Myanmar (35.8), Mozambique (29.9), Tanzania (17.6)
Urad & Moong	5.0	10.1	Myanmar (74), Tanzania (6.9), Australia (5.3)
Others	2.1	4.2	-
Total	49.4	100.0	Canada (54), Australia (19.9), Myanmar (15.6)

Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.7: India's Imports of Pulses, 2008-09 to 2018-19**



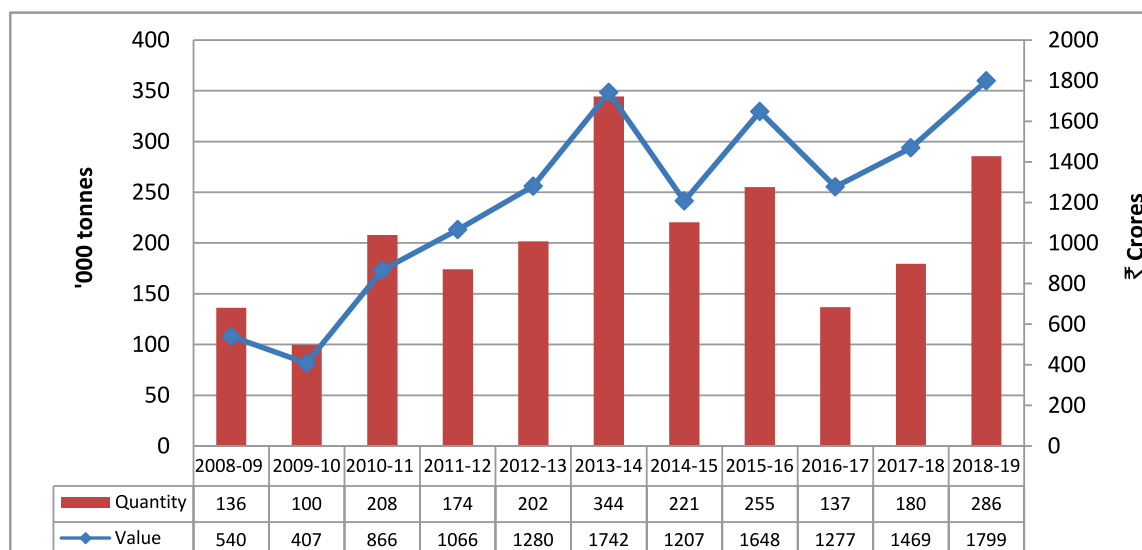
Source: Directorate General of Commercial Intelligence and Statistics

- 4.9 Imports of pulses have been under OGL for a long time as India was one of the largest importers of pulses. An import duty of 5 percent was levied on pulses on 29<sup>th</sup> June 2001, which was increased to 10 per cent on 1<sup>st</sup> March, 2003 and reduced to zero percent on 8<sup>th</sup> June, 2006. However, due to bumper production in 2016-17 and 2017-18 and high imports, domestic prices of most pulses fell below MSP in many markets. With a view to incentivise pulses production and ensure remunerative prices to farmers, government imposed import duty and quantitative restrictions



on imports of pulses. An import duty of 10 percent was imposed from 28<sup>th</sup> March 2017 on tur in a bid to check falling domestic prices and to support farmers. Government imposed quantitative restrictions on import of tur, moong and urad from 05<sup>th</sup> August 2017. In anticipation of a bumper crop of gram and falling prices, the government increased import duty on gram from 40 percent on 6<sup>th</sup> February 2018 to 60 percent on 1<sup>st</sup> March 2018. Import duty on lentil was also raised to 30 percent on 21<sup>st</sup> December 2017, which was further increased to 50 percent on 15<sup>th</sup> June 2019. Exports of pulses were prohibited on 28<sup>th</sup> June 2006, initially for a period of six months, which was extended from time to time. However, the Government revised the export policy and removed restrictions on export of all types of pulses on 22<sup>nd</sup> November 2017 to ensure that farmers have greater choice in marketing and getting better remuneration for their produce as export market would provide an alternative market for the surplus production. It is evident from data that exports of pulses received a fillip since 2017 and exports increased to about 2.9 lakh tonnes in 2018-19 (Chart 4.8)

**Chart 4.8: Trends in Exports of Pulses from India, 2008-09 to 2018-19**

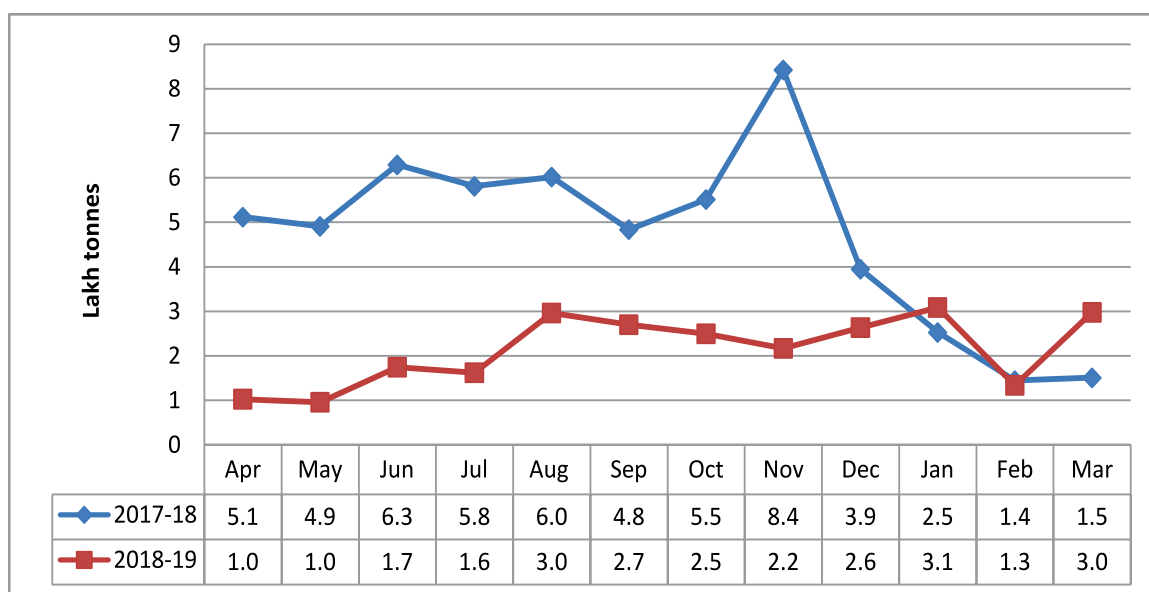


Source: Directorate General of Commercial Intelligence and Statistics

- 4.10 Chart 4.9 shows some seasonality in imports of pulses. Imports showed a rising trend from September to November in 2017-18 and from May to August in 2018-19. It is important to underline the fact that higher imports coincided with peak market arrivals in domestic market. Unrestricted imports of pulses during this period in 2017-18 and high domestic production led to fall in domestic prices. There has been considerable decline in import of pulses since December 2017, when import duties on pulses were raised. However, pulses imports showed an upward movement in June 2018 and India imported more than two lakh tonnes per month during August 2018 to March 2019, except February. The decline in import of pulses during 2018-19 compared with 2017-18 provided some relief to Indian farmers who faced subdued prices during 2017-18. Decline in imports and marginal fall in domestic production have led to improvement in domestic market prices during 2018-19, as market prices of pulses in 2018-19 were higher than in 2017-18.



**Chart 4.9: Month-wise Imports of Pulses during 2017-18 and 2018-19**

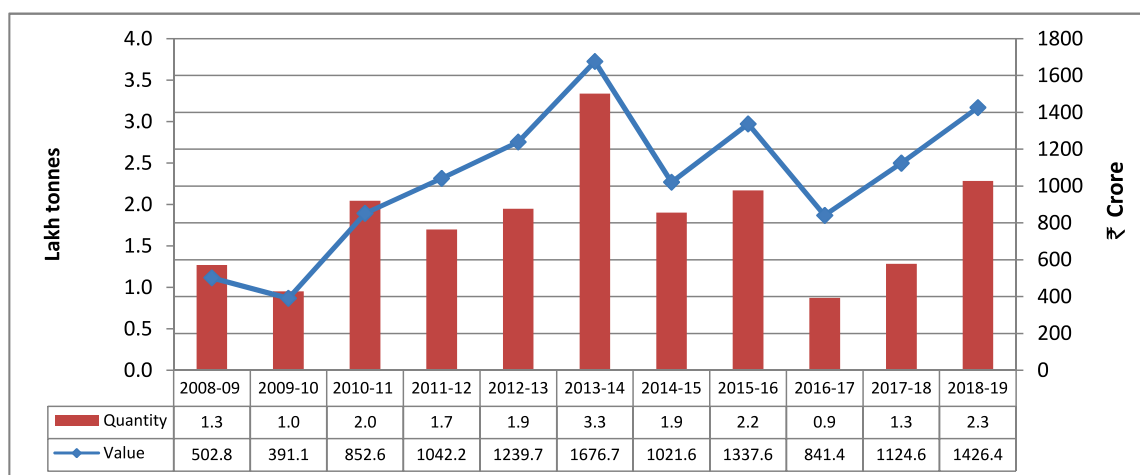


Source: Directorate General of Commercial Intelligence and Statistics

### Gram (Chickpea)

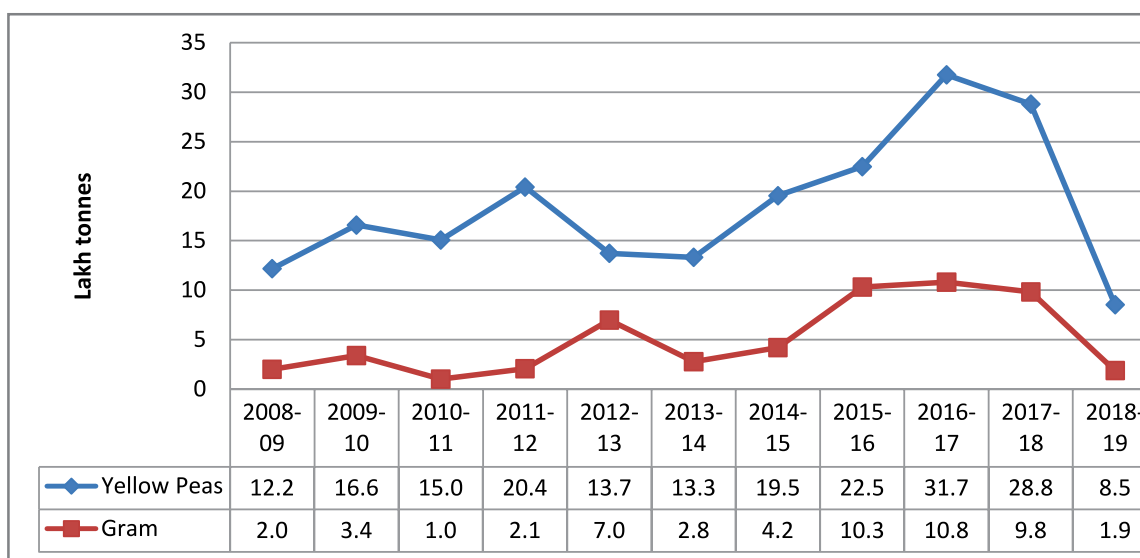
- 4.11 Gram constitutes the single largest share in India's export basket of pulses, with 64.0 percent share in total exports of pulses in 2016-17 and 71.5 percent during 2017-18. India's exports (mostly kabuli chana) increased from about one lakh tonnes in 2009-10 to 3.3 lakh tonnes in 2013-14, which declined to 1.9 lakh tonnes in 2014-15. Exports of gram were 2.2 lakh tonnes in 2015-16 and declined to 1.3 lakh tonnes in 2017-18 but increased to 2.3 lakh tonnes in 2018-19 (Chart 4.10). In order to incentivise exports and restrict imports, Government of India increased the import duty on Kabuli Chana to 60 percent and announced 7 percent export incentive for bengal gram (chana) on 1<sup>st</sup> March 2018 under the Merchandise Export from India Scheme (MEIS) for a period of three months until June 20, 2018.
- 4.12 Imports of gram increased from two lakh tonnes in 2008-09 to 7 lakh tonnes in 2012-13 before declining to 2.8 lakh tonnes in 2013-14 due to bumper production during 2013-14. Imports of gram increased to 4.2 lakh tonnes in 2014-15 and reached a peak of 10.8 lakh tonnes in 2016-17 due to unmet domestic demand. With an increase in import duty to 60 percent and higher domestic production, imports of gram declined to 1.9 lakh tonnes in 2018-19 (Chart 4.11). Yellow peas being a good substitute for gram, India imports large quantities of yellow peas that peaked at 31.7 lakh tonnes in 2016-17 and dropped to 28.8 lakh tonnes in 2017-18. In a bid to arrest declining prices of pulses, peas imports have been restricted for the period from 1<sup>st</sup> April, 2019 to 31<sup>st</sup> March 2020. During this period, total quantity of 1.5 lakh tonnes of peas shall be allowed against license as per the procedure to be notified by DGFT.

**Chart 4.10: India's Exports of Gram (Chickpea), 2008-09 to 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.11: India's Imports of Gram (Chickpea) & Yellow Peas, 2008-09 to 2018-19**



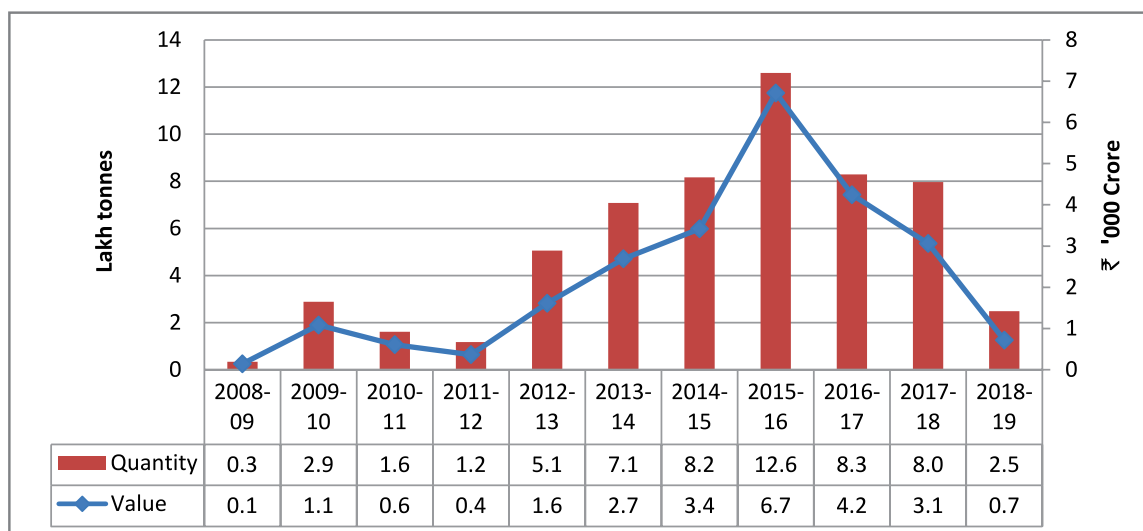
Source: Directorate General of Commercial Intelligence and Statistics

## Lentil

- 4.13 India's exports of lentil were nearly half of total pulses exports prior to 2006-07, which declined to 11.4 percent in 2016-17 and 6.5 percent in 2017-18, following restrictions imposed on its exports. Lentil imports increased from about 30 thousand tonnes in 2008-09 to 12.6 lakh tonnes (21.6 % of total pulses imports) in 2015-16 due to high domestic demand and fluctuating domestic production. However, imports declined to 8 lakh tonnes in 2017-18 due to higher domestic production and increase in import duty to 30 percent from 21<sup>st</sup> December 2017. Imports of lentil further declined to 2.5 lakh tonnes in 2018-19 (Chart 4.12).



**Chart 4.12: India's Imports of Lentil, 2008-09 to 2018-19**

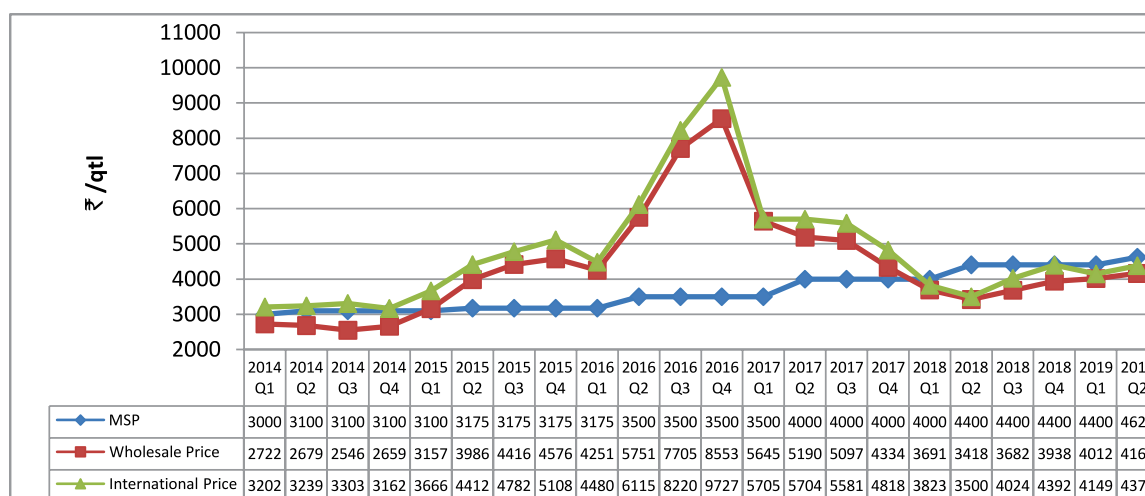


Source: Directorate General of Commercial Intelligence and Statistics

- 4.14 During the last five years, domestic wholesale prices of gram have been lower than international prices (Chart 4.13). Both domestic prices and MSP of gram were below international prices during 2014(Q<sub>1</sub>) to 2014(Q<sub>4</sub>). However, domestic and world prices moved up and were higher than MSP during 2015 Q<sub>1</sub> and 2017 (Q<sub>4</sub>). There was a continuous fall in domestic as well as international prices of gram since 2017 (Q<sub>1</sub>) and dipped below MSP in 2018. Domestic prices improved during 2018(Q<sub>3</sub>) and 2019 (Q<sub>2</sub>) but were still below MSP.
- 4.15 In case of lentil, both domestic and world prices showed an increasing trend during 2014 and 2015 but recorded steep decline during 2016 and 2017. Domestic prices which were significantly higher than MSP during 2014-2017, fell below MSP during 2018 (Q<sub>1</sub>) and remained less than MSP in 2019. However, domestic prices showed an improvement during the last four quarters.
- 4.16 In order to promote pulses production, producers need to be protected through appropriate tariff levels and other restrictions when international prices are low. On the other hand, exports should be promoted in neighbouring countries and in the Gulf countries, Europe and the USA for Indian diaspora. There is also a need to have timely and effective government interventions when market prices fall below MSP.



**Chart 4.13: MSP, Domestic and International Prices of Gram, 2014(Q<sub>1</sub>) to 2019(Q<sub>2</sub>)**



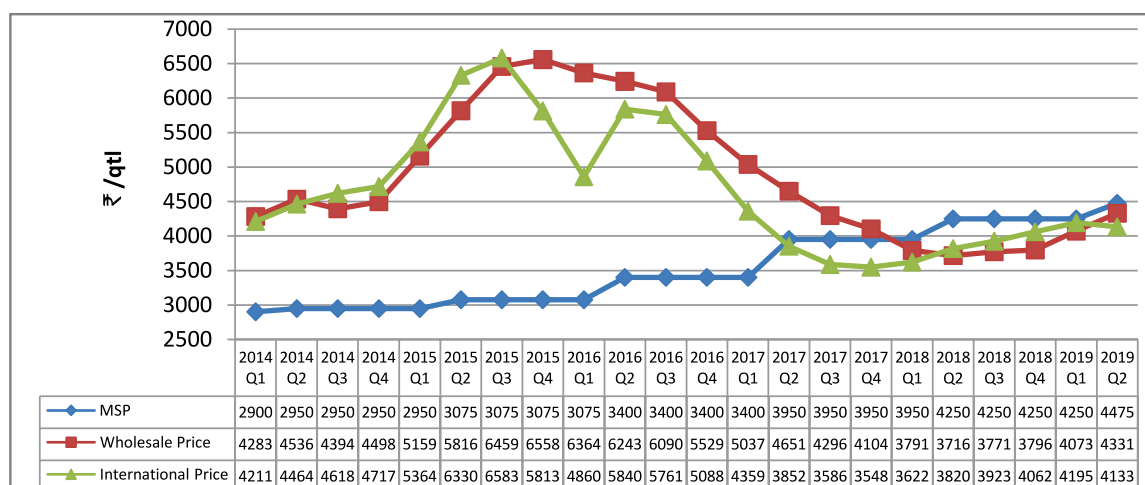
Note: 1. International prices are C&F Prices at Mumbai port.

2. Wholesale prices are weighted wholesale price of AP, Bihar, Karnataka, MP, Maharashtra, TN, UP and WB, which cover 88 percent of production. MSPs are inclusive of Bonus

3. International prices of quarter 2018 (Q<sub>2</sub>) are average prices of only two months (April & May)

Sources: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and Agriwatch for international prices.

**Chart 4.14: MSP, Domestic and International Prices of Lentil, 2014 (Q<sub>1</sub>) to 2019 (Q<sub>2</sub>)**



Note: 1. International prices are C&F Prices at Mumbai port.

2. Wholesale prices are weighted average wholesale price of Bihar, MP, UP and West Bengal, which covers 88 percent of production in 2016-17, which cover 88 percent of production, MSPs are inclusive of Bonus

3. International prices of quarter 2018 (Q<sub>2</sub>) are average prices of only two months (April & May)

Sources: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and Agriwatch for international prices.

## Edible Oils and Oilseeds Complex

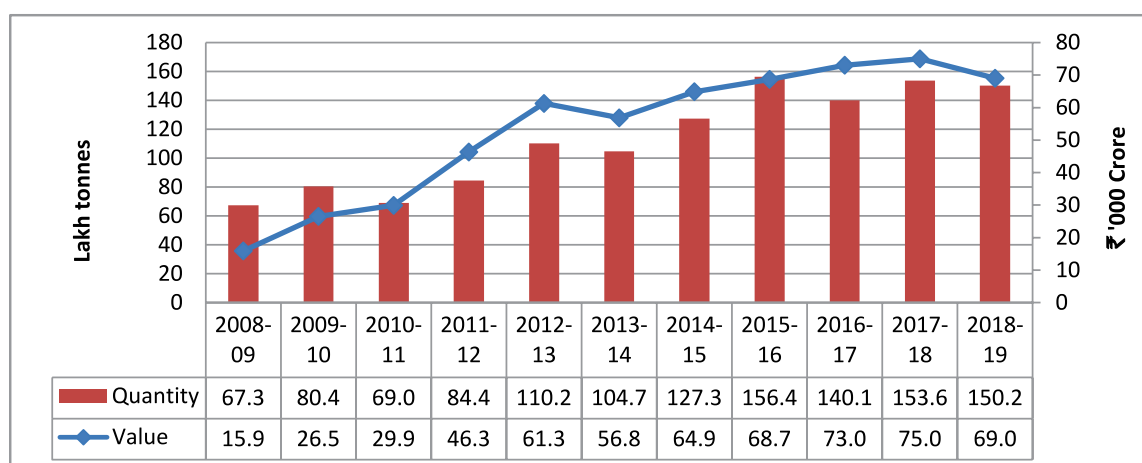
4.17 The domestic supply of edible oils falls short of demand by a huge margin and the shortfall is met through imports. The import bill has increased from ₹15.9 thousand crore in 2008-09 to ₹75.0 thousand crore in 2017-18, but declined to ₹69 thousand



crore in 2018-19 mainly due to low world prices as total quantity imported declined marginally (2.2%) in 2018-19 compared to 2017-18. There is an urgent need to shift from cereals to oilseeds as markets are glutted with wheat and rice. Prevalence of state-specific bonuses and assured procurement of wheat and paddy encourage more production of these crops and dampen the prospects of diversification towards water-efficient crops like oilseeds and pulses. Potential of tree borne oilseeds and non-traditional edible oils like rice bran oil, cottonseed oil, etc., also need to be fully exploited to reduce dependency on imports.

- 4.18 As per USDA, global production of major oilseeds was 585.7 million tonnes in TE2018-19, out of which 29.3 percent was traded. USA is the largest producer, producing 133.8 million tonnes, with a share of 22.3 percent. Other major producers are Brazil (20.3%), Argentina (10.2%) and China (10.0%). Brazil and USA account for around three-fourth of the global exports, with a share of 45.6 percent and 27.5 percent, respectively. The other major exporter is Canada (9.3%). China is the single largest importer of oilseeds (89.6 million tonnes) with a share of 52.6 percent, followed by EU (12.6%), Mexico (4.2%) and Argentina (3.7%).
- 4.19 According to USDA, global production of vegetable oils was 197 million tonnes during TE2018-19, out of which 40.3 percent was traded. Indonesia is the largest producer with 47.3 million tonnes production accounting for 23.2 percent of world production, followed by China (13.2%), Malaysia (11.3%) and EU (9.2%). Indonesia (37.1%) and Malaysia (21.9%) account for 59 percent of global exports. India is the largest importer of vegetable oils with a share of about 20.7 percent, followed by EU (13.5%) and China (12.8%).
- 4.20 As per trade data from DGCIS, India's imports of edible oils have increased from 67.3 lakh tonnes (valued at ₹15.9 thousand crore) in 2008-09 to a record of 156.4 lakh tonnes (₹68.7 thousand crore) in 2015-16. However, imports declined by about 10 percent to 140.1 lakh tonnes in 2016-17 but increased subsequently to 153.6 lakh tonnes (valued at ₹75 thousand crore) in 2017-18 and declined marginally to 150.2 lakh tonnes valued at ₹69 thousand crore in 2018-19 (Chart 4.15). International prices of edible oils particularly palm oil and soybean oil are at historic lows else import bill could have been significantly higher. During the last decade, import of edible oils has increased by more than 250 percent indicating a huge drain on foreign exchange reserves as well as adverse impact on domestic growers. In order to increase productivity and production of oilseeds, Government of India is implementing National Mission on Oilseeds and Oil Palm (NMOOP), a Centrally Sponsored Scheme since 2014-15. However, the programme needs to be scaled up and National Mission for Vegetable Oils should be launched to target traditional and non-traditional edible oils.

**Chart 4.15: India's Imports of Edible Oils, 2008-09 to 2018-19**

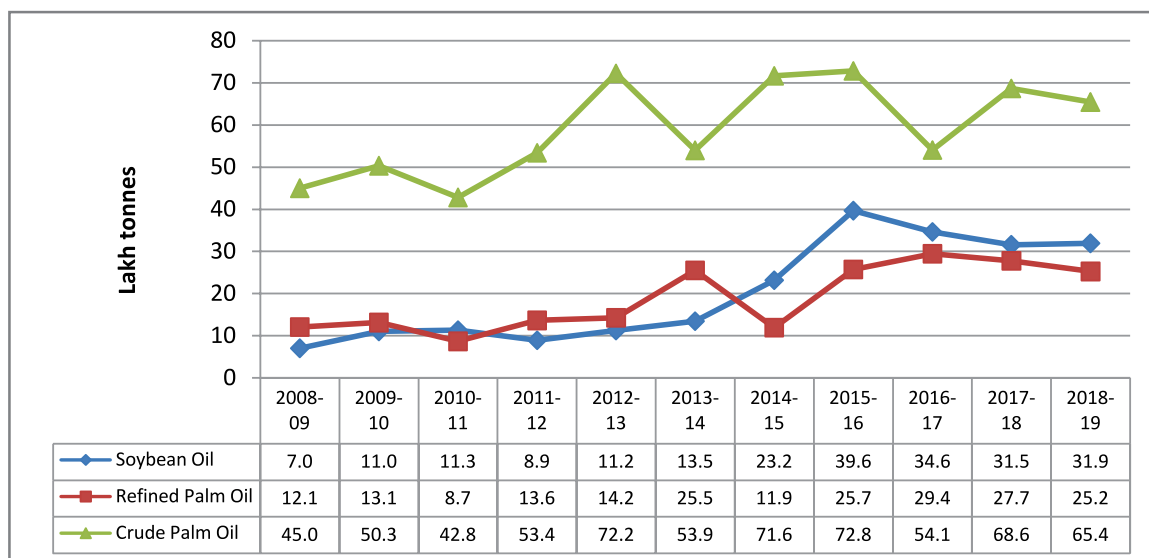


Source: Directorate General of Commercial Intelligence and Statistics

4.21 A closer look at trends in edible oil imports reveals a shift in the pattern of edible oil imports. The share of soft oils has increased from 22 percent in 2010-11 to 40 percent in 2017-18 compared to palm oil during the 2010s (Annex Table 4.4). Crude palm oil (CPO) imports have increased from 45 lakh tonnes in 2008-09 to 72.8 lakh tonnes in 2015-16 and declined to 54.1 lakh tonnes in 2016-17 and were 65.4 lakh tonnes in 2018-19. On the other hand, imports of refined palm oil have more than doubled in last decade, from 12.1 lakh tonnes to 25.2 lakh tonnes mainly due to low duty differential between crude and refined palm oil. Soybean oil imports have increased from 7 lakh tonnes in 2008-09 to 39.6 lakh tonnes in 2015-16 and were 31.9 lakh tonnes in 2018-19 (Chart 4.16). It is evident from the chart that imports of refined palm oil and soybean oil have increased faster compared with crude palm oil, which has adversely affected domestic refining industry. India signed a Comprehensive Economic Cooperation Agreement (CECA) with Malaysia on 18<sup>th</sup> February 2011 and the Agreement came into effect from 1<sup>st</sup> July 2011. Under the CECA, India offered market access for palm oil, and the basic duty on CPO imported from Malaysia was reduced to 40 percent and on Refined Bleached and Deodorized (RBD) Palmolein to 45 percent from January 1, 2019, reducing duty differential between CPO and RBD Palmolein to 5 percent. Consequently, imports of RBD Palmolein increased from 1.7 lakh metric tonnes in January 2019 to 3.7 lakh metric tonnes in May 2019, which resulted in significant reduction in capacity utilization of domestic edible oil refining industry. There is a need to renegotiate the agreement and increase duty differential to about 10-15 percent for promoting domestic refining industry.



**Chart 4.16: India's Imports of Palm oil and Soybean Oil, 2008-09 to 2018-19**



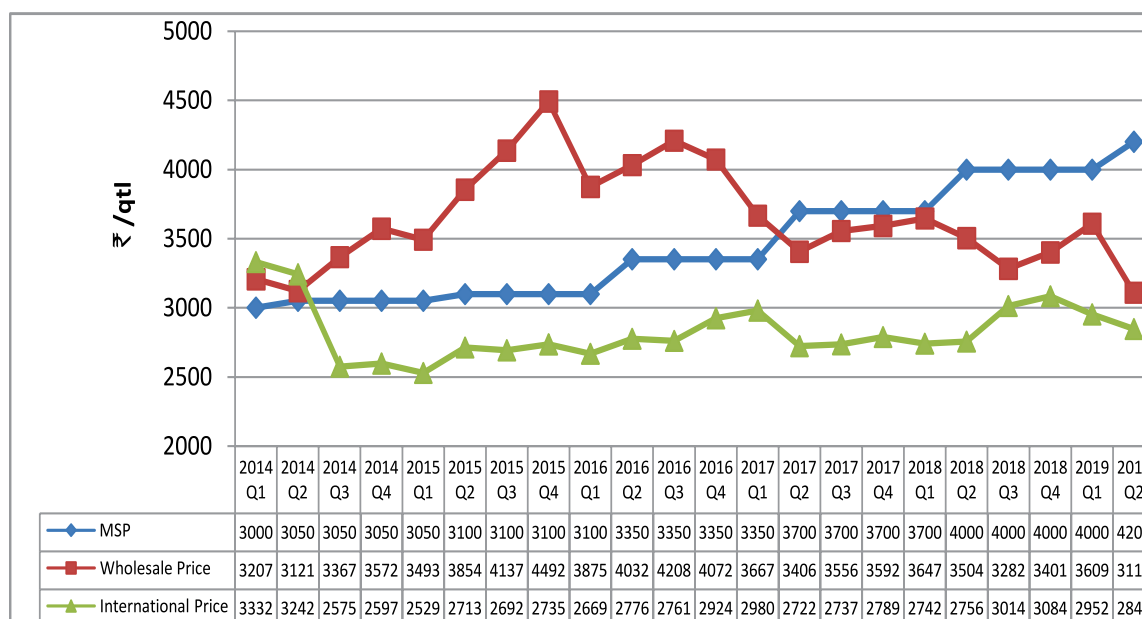
Source: Directorate General of Commercial Intelligence and Statistics

### Rapeseed and Mustard (R&M) Seed

- 4.22 As per USDA, global production of R&M was 72.3 million tonnes in TE2018-19 out of which 21.7 percent was traded. Canada is the largest producer of R&M with a share of 29 percent, followed by EU (27.6%), China (17.7%) and India (11.0%). Canada is also the largest exporter of R&M with a share of 66.1 percent, while EU is the largest importer with a share of 29.2 percent, followed by China (26.0%) and Japan (15.9%).
- 4.23 Exports and imports of R&M seed were negligible during last three years in the country. As per DGCIS, India's exports of R&M were 20.4 thousand tonnes in TE2018-19. During 2014(Q<sub>1</sub>) and 2014(Q<sub>2</sub>), domestic wholesale prices of R&M seed were lower than international prices but followed the trend of international prices. However, during the period from 2014(Q<sub>3</sub>) to 2019(Q<sub>2</sub>), domestic wholesale prices of R&M were consistently higher than international prices (Chart 4.17). The domestic wholesale prices of R&M seeds were higher than MSP till 2017(Q<sub>1</sub>) but from 2017(Q<sub>2</sub>), market prices fell below MSP. MSP was higher than international prices during the period from 2014(Q<sub>3</sub>) to 2019(Q<sub>2</sub>). One of the reasons for higher MSP of R&M is to encourage farmers to increase production of R&M to meet domestic edible oils demand.



**Chart 4.17: MSP, Domestic and International Prices R&M Seed, 2014(Q<sub>1</sub>) to 2019(Q<sub>2</sub>)**



Note: 1. International prices are R&M Oilseed, Hamburg CIF.

2. Wholesale prices are weighted average wholesale price of Gujarat, Haryana, Rajasthan, UP and West Bengal, which cover 76 percent of production, MSPs are inclusive of Bonus.

3. International prices of quarter 2018 (Q<sub>2</sub>) are of April-May month only.

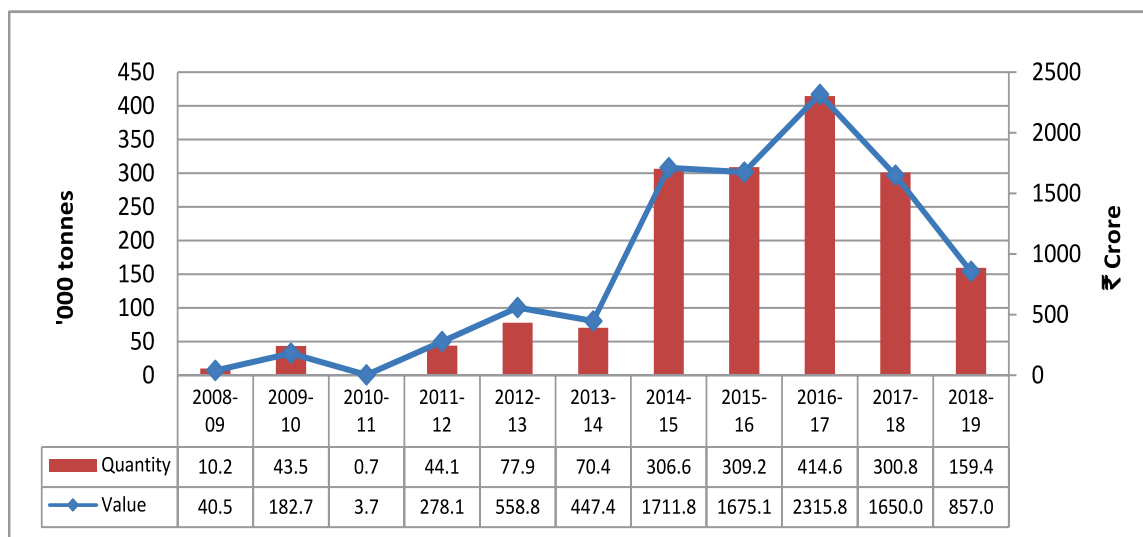
Sources: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and World Bank for international prices.

## Rapeseed and Mustard (R&M) Oil

- 4.24 According to USDA, global production of R&M oil was 27.9 million tonnes in TE2018-19, out of which about 16.6 percent was traded. EU is the largest producer of R&M oil producing 9.7 million tonnes with a share of 34.8 percent, followed by China (23.4%), Canada (14.8%) and India (9.2%). Canada is also the largest exporter of R&M oil with a share of 65.7 percent, followed by EU (4.5%). China is the largest importer of R&M oil accounting for 27.8 percent of imports, followed by India and EU (5.1% each).
- 4.25 India's exports of R&M oil are negligible but imports of R&M oil have increased substantially, from 70.4 thousand tonnes in 2013-14 to 414.6 thousand tonnes in 2016-17. However, with increase in import duty to 25 percent on 17<sup>th</sup> November 2017, imports of R&M oil fell to 159.4 thousand tonnes in 2018-19 (Chart 4.18). The domestic prices of R&M oil have continuously been higher than international prices from 2014(Q<sub>1</sub>) to 2019(Q<sub>2</sub>) (Chart 4.19). Domestic prices of R&M oil witnessed increasing trend from 2014(Q<sub>2</sub>) to 2015(Q<sub>4</sub>) and significantly declined during 2016(Q<sub>1</sub>), but again increased in the next two quarters. However, prices showed a downward trend in both domestic and world markets up to 2017 (Q<sub>2</sub>) but increased again in next two quarters. The domestic and international prices showed a declining trend from 2018(Q<sub>4</sub>) onwards till 2019(Q<sub>2</sub>).

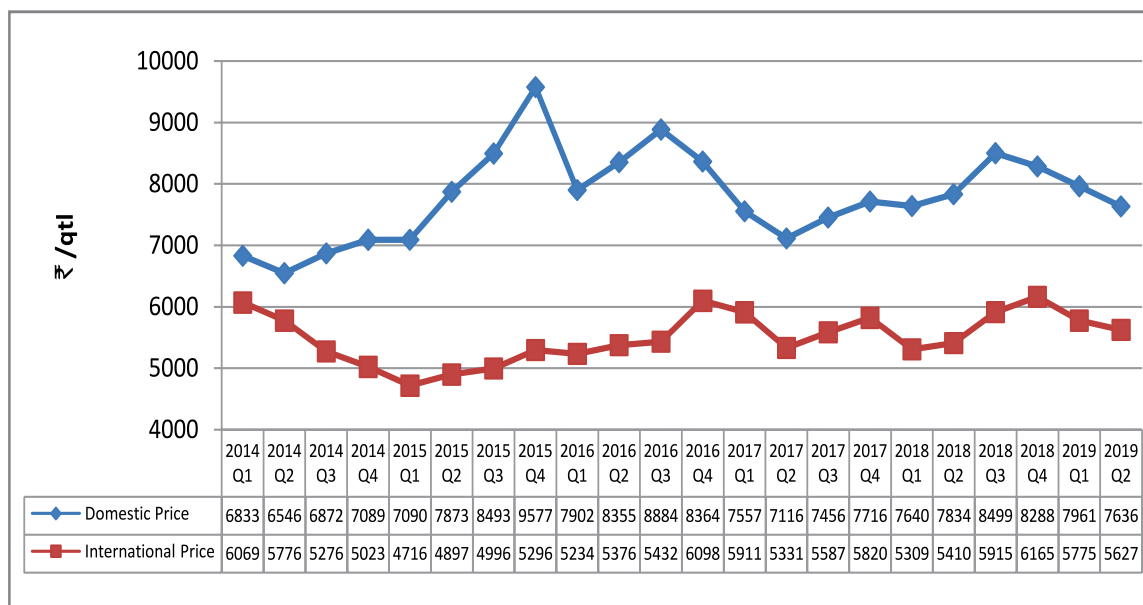


**Chart 4.18: India's Imports of R&M Oil, 2008-09 to 2018-19**



Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.19: Domestic and International Prices of R&M Oil, 2014 to 2018 (Q<sub>2</sub>)**



Note: 1. International Prices are Rotterdam, Dutch FOB Ex-Mill; Oil World.

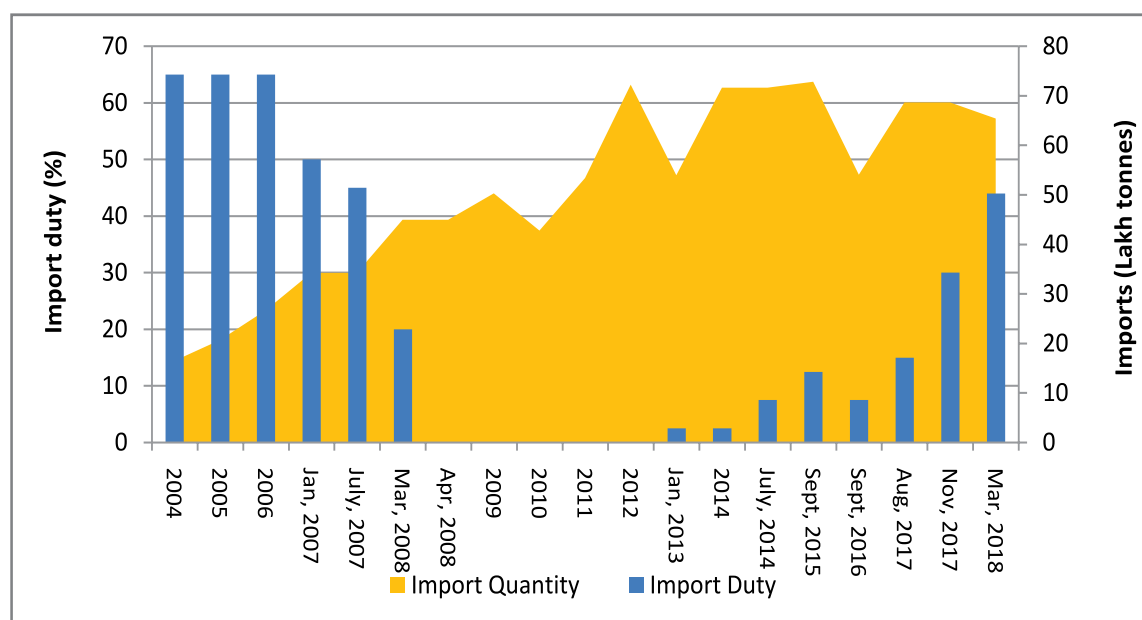
2. International prices of quarter 2018 (Q<sub>2</sub>) and wholesale prices are average prices of two months (April & May)

Sources: Solvent Extractors Association of India (SEAI) for domestic prices and World Bank for international prices

- 4.26 As discussed earlier, annual import bill of edible oils has increased manifold over the last decade, as India has not been able to increase oilseeds production to meet domestic demand, therefore, edible oils import is imperative for the near future. In this situation, it is desirable for India to import crude edible oils instead of refined edible oils. The advantage of importing crude edible oils is that it can help

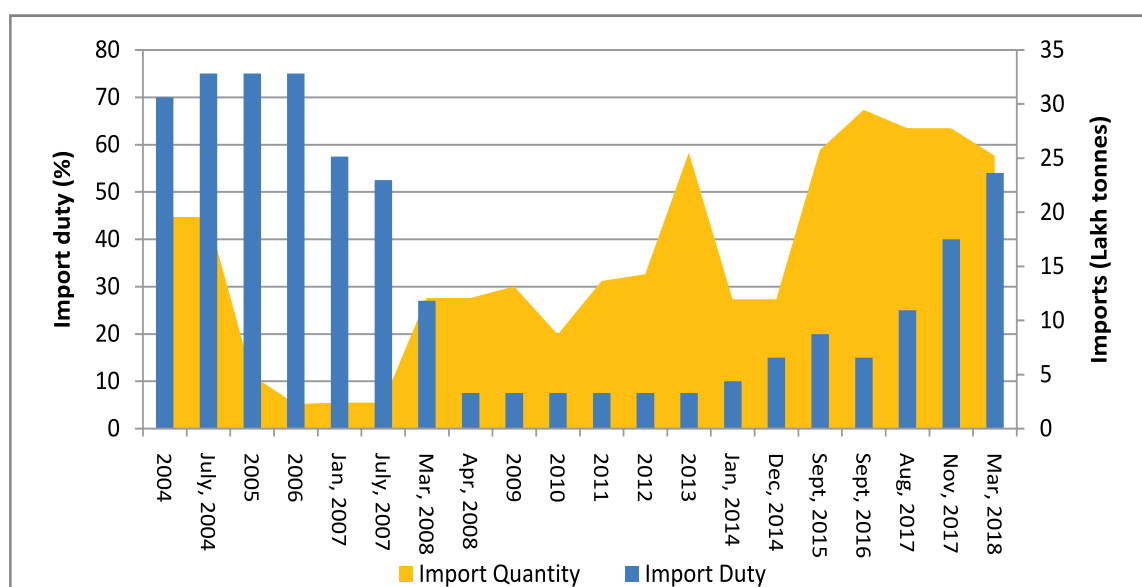
in generating domestic employment by improving capacity utilization of domestic refinery industry, which currently are under-utilised. The Commission suggests that duty differential between crude and refined oils should be sufficiently large (at least 10-15%) to encourage import of crude oil and discourage refined oil. The adverse relationship between import duties and import quantities of crude palm oil, refined palm oil and fractions are depicted in Chart 4.20, Chart 4.21, and Chart 4.22.

**Chart 4.20: Trends in Imports and Import Duties of Crude Palm Oil and Fractions, 2004 to 2018**



Sources: DGCIS for import quantity and CBEC for import duty

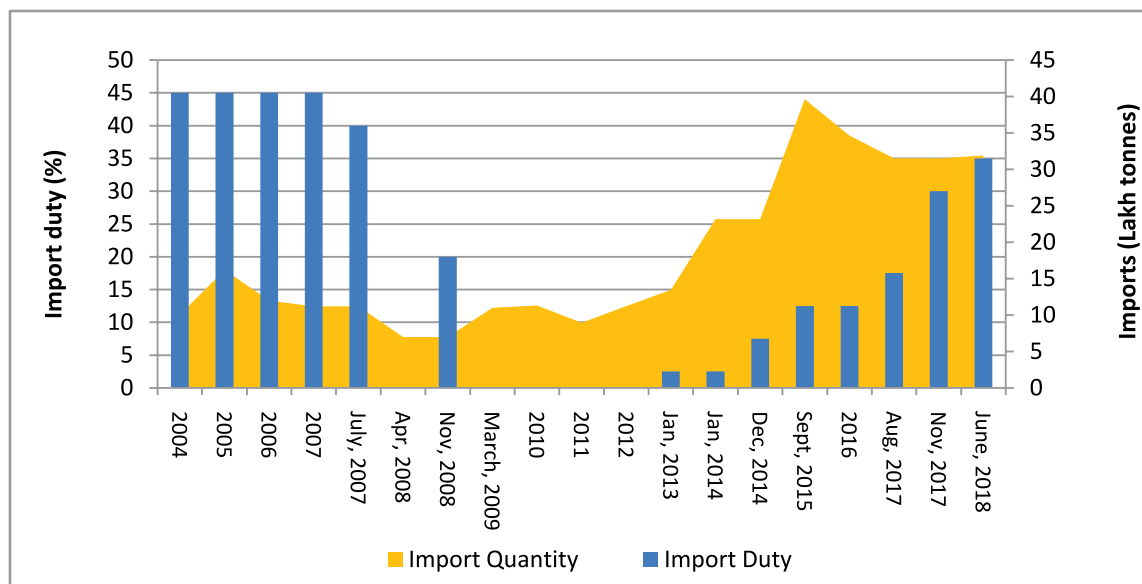
**Chart 4.21: Trends in Imports and Import Duties of Refined Palm Oil and Fractions, 2004 to 2018**



Sources: DGCIS for import quantity and CBEC for import duty



**Chart 4.22: Trends in Imports and Import Duties of w/n De-Gummed Soy Oil, 2004 to 2018**



Sources: DGCIS for import quantity and CBEC for import duty

## Trade Policy

- 4.27 Exports of oilseeds are free while imports of oilseeds are under OGL with an import duty of 30 percent since January 2003 subject to quarantine conditions. Edible oils were under negative list of imports till April 1994 when imports of Palmolein were placed under OGL with 65 percent import duty. Subsequently, import of other edible oils was also placed under OGL. Import duty was as high as 80 percent on crude oil and 90 percent on refined edible oils during early-2000s but was reduced to zero percent on crude and 7.5 percent on refined edible oils in April 2008. 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 was also increased to 10 percent in January 2014, which was further increased to 15 percent in December 2014 and to 20 percent in September 2015. However, import duty was reduced on crude palm oil to 7.5 percent and on refined palm oil to 15 percent in September 2016. In order to curtail the alarming level of imports of edible oils and to support domestic farmers and oil industry, government increased tariffs on edible oils in 2017-18. The import duty on crude palm oil was increased to 30 percent in November 2017, which was further revised to 44 percent in March 2018 but was reduced to 40 percent in January, 2019. Import duty on RBD palmolein was also raised from 40 percent in November, 2017 to 54 percent in March, 2018. Later on, in January 2019 differential rates were imposed for imports from Malaysia and Indonesia. Duty on RBD palmolein sourced from Malaysia was reduced to 45 percent and RBD palmolein sourced from Indonesia was reduced to 50 percent. Similarly, import duty on crude R&M oil was raised to 35 percent and refined R&M oil to 45 percent in June 2018. The duty cut on palm oil has reduced the effective duty difference between CPO and



RBD palmolein from 10 percent to just 5 percent for imports from Malaysia. The reduction in the duty differential will encourage large imports of RBD palmolein, which is detrimental to the interest of domestic producers and refiners and will also erode the competitiveness of domestic refiners. In order to improve self-sufficiency in edible oils, import duty needs to be linked to domestic demand-supply situation and international prices. Duty differential between crude and refined oils should be sufficient to discourage imports of refined oil and encourage domestic refinery industry through import of crude oil.

- 4.28 Exports of edible oils were initially prohibited for a period of one year in March 2008, which was extended from time to time and is still prohibited. However, there are certain exemptions, namely (a) castor oil (b) coconut oil from all EDI Ports and through all Land Custom Stations (LCS) (c) Deemed export of edible oils (as input raw material) from Domestic Tariff Area (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 (g) rice bran oil in bulk and (h) groundnut oil, sesame oil, soybean oil and maize (corn) oil in bulk. In addition, export of edible oils in branded consumer packs of up to 5 kg is permitted with a Minimum Export Price (MEP) of US \$900 per tonne. India's Trade policy for major Rabi Crops is summarized in Table 4.2.

**Table 4.2: India's Trade Policy - Rabi Crops**

Crop/ Commodity	Trade Policy				
	Import Policy			Export Policy	
	OGL/import ban	Import duty (%)	Bound duty (%)	OGL/Export ban	Export duty (%)
<b>Cereals</b>					
Wheat	OGL	40	100	OGL	Zero
Barley	OGL	Zero	100	OGL	Zero
<b>Pulses</b>					
Gram (Chickpea)	OGL	60	100	OGL	Zero
Masoor (Lentil)	OGL	50	100	OGL	Zero
<b>Oilseeds &amp; Oils</b>					
R&M	OGL	30	100	OGL	Zero
R&M Oil (Crude)	OGL	35	75	Export ban*	
R&M Oil (Refined)	OGL	45	75	Export ban*	
Palm Oil (Crude)	OGL (Tariff value -US \$522 per metric tonne)**	40	300	Export ban*	



RBD Palmolein	OGL (Tariff value -US \$556 per metric tonne)**	45 Origin: Malaysia	300	Export ban*	
		50 Origin: Indonesia			
RBD Palm Oil	OGL (Tariff value -US \$551 per metric tonne)**	54			

Note: 1. \* Export of edible oils in branded, consumer packs up to 5 kg is permitted with a MEP of US \$ 900 per tonne.

2. \*\*as on June 24, 2019.

Source: Central Board of Excise and Customs

4.29 Based on the discussions of the Commission with various stakeholders during price policy meetings and literature, certain desirable features that can be built into India's agricultural trade policy are as follows:

- The agricultural trade policy needs to be more predictable and stable so that exports as well as imports could be more reliable and consistent.
- A predictable and stable export policy would help in encouraging agri-exports and achieve the objective of doubling farmers' income.
- India needs to create and increase export-centric clusters with world class infrastructure for enhancing exports.
- Synchronization of domestic policies on trade, incentives/subsidies and infrastructure are crucial for improving global competitiveness of Indian agriculture.

## Trade Outlook

4.30 India is set to achieve third consecutive record wheat harvest, crossing 101 million tonnes in 2018-19 driven by higher yields due to favourable weather conditions. Indian wheat remains uncompetitive in the international market due to relatively higher domestic prices and low world prices, limiting wheat exports in 2019-20. Global production is forecast to increase based on larger crop in India, Russia and Ukraine. Global trade is nearly unchanged with higher imports for Indonesia partially offset by lower imports by Vietnam. Exports are projected to be higher in Russia and Ukraine, but lower for Australia and the European Union.

4.31 When prices of pulses increased sharply during 2015 and 2016 due to adverse weather conditions, Indian farmers increased acreage under pulses, improved productivity and achieved a record production. However, due to unabated imports during 2016-17 and 2017-18 there was a supply glut that led to fall in prices in

the domestic market hurting the farmers. However, domestic prices have improved during 2018-19 compared with 2017-18 and are expected improve further in coming season. Untapped potential for production of pulses could be utilised to meet domestic demand by ensuring remunerative prices to farmers and regulation of imports to avoid to farmers' distress.

- 4.32 As per USDA, global oilseeds production is forecast at 597.8 million tonnes in 2019-20, down nearly 1 percent from 2018-19. Reduced production in the United States, Canada, Argentina and India outweighed the production gains for Brazil, Paraguay, and China. Rapeseed, cottonseed, and palm kernel production is projected higher while reductions are forecasted for sunflower seed and peanut. In the context of India, assuming normal weather conditions and slightly larger planted area for soybean, rapeseed & mustard, peanut, sunflower seed, cottonseed and copra, the total oilseed production in marketing year 2019-20 is forecasted at 38.1 million tonnes, eight percent above the current year estimate. This expectation is based on near-normal yields and on assumption that the 2019 southwest monsoon season (June-September) will be 'near-normal'. Strong market prices should encourage farmers to recover area lost in past due to adverse weather conditions or competing crops.
- 4.33 As per USDA, global vegetable oil consumption is projected to expand, though at a slightly slower pace than in recent years. Food use consumption is forecast to grow 2.8 percent, down from the 3.3 percent observed in recent years. Industrial use of vegetable oil, primarily for fuel, is projected to slow down in 2019-20. Global vegetable oil trade is forecast to grow with higher consumption, with palm oil share of trade remaining nearly constant at just over 60 percent. With global vegetable oil production failing to keep pace with consumption, global vegetable oil stocks as a percent of consumption is expected to decline to below 10 percent in 2019-20, the lowest since the mid-1990s. India will need about 24.3 million tonnes of vegetable oil supply to meet rising consumption demand and therefore imports are forecast to rise by six percent to 16.4 million tonnes to fill the supply gap. Imports will include an estimated 10 million tonnes of palm oil, followed by 3.6 million tonnes of soybean, 2.6 million tonnes of sunflower seed oil, and 0.2 million tonnes of other oils.

\*\*\*\*\*



## Chapter 5

### Costs and Returns

- 5.1 The Commission considers the cost of production and other important factors such as demand and supply situation, trends in domestic and international prices, inter-crop price parity, terms of trade between agriculture and non-agriculture sectors, the likely impact of MSP on consumers 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 crops.
- 5.2 The Commission uses crop-wise, state-wise cost estimates provided by the Directorate of Economics & Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India compiled under 'Comprehensive Scheme (CS) for studying the Cost of Cultivation of Principal Crops in India. Since CS data is available upto 2017-18, it needs to be projected for crop season 2019-20. Based on CS data, crop-wise and state-wise projections of cost of cultivation (CoC) are made for the ensuing season.
- 5.3 The projected CoC estimates for wheat, barley, gram, lentil and rapeseed & mustard for rabi marketing season 2020-21. are based on actual estimates available for the latest three years viz. 2015-16, 2016-17 and 2017-18 for each State, whereas, projected CoC estimates for safflower are based on actual estimates for 2015-16 and 2017-18 as data for 2016-17 was not available. However, CoC estimates are not projected for the State/crop, where share of the State in all-India production and share of a particular crop in the State total production of the crop group is negligible or number of sample holdings under CS for the crop is inadequate. The estimates of CoC projections capture movement in overall input cost separately over each of the past three years viz. 2015-16, 2016-17 and 2017-18 for wheat, barley, gram, lentil



and rapeseed & mustard; and two years viz. 2015-16 and 2017-18 for safflower, for the crop season 2019-20.

- 5.4 An assessment of likely changes in input costs for the crop year 2019-20 with reference to each of the above mentioned three consecutive years ending with 2017-18 in respect of wheat, barley, gram, lentil and rapeseed & mustard, and 2015-16 and 2017-18 in case of safflower, is made by constructing the Composite Input Price Indices (CIPIs) (base 2011-12=100). The CIPIs are based on latest prices of major inputs like human labour, bullock labour, machine labour, fertilisers, manures, seeds, pesticides and irrigation as per data available from Labour Bureau, Ministry of Labour and Employment, State Governments and Office of the Economic Adviser, Ministry of Commerce & Industry. Based on CIPIs thus constructed, the Commission projects crop-wise, state-wise CoC  $A_2$ ,  $A_2+FL$  and  $C_2$ .
- 5.5 The state-wise cost of production (CoP)  $A_2$ ,  $A_2+FL$  and  $C_2$  estimates for the mandated crops are then derived from the projected CoCs using projected crop yields. Subsequently, all-India estimates of CoP  $A_2$ ,  $A_2+FL$  and  $C_2$  are derived based on state-wise CoPs of crops and their production shares in total production. 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 the latest three year actual cost estimates for wheat, barley, gram, lentil and rapeseed & mustard, and two year cost estimates for 2015-16 and 2017-18 for safflower, for each State under certain implicit assumptions. One, it is assumed that fixed cost components would not, in all likelihood, undergo any significant change in the intervening period between 2017-18 for which actual cost estimates are available and the year 2019-20 for which cost projections are made. 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 Rabi Crops during TE2017-18

- 5.7 The all-India average costs and gross returns during 2015-16 to 2017-18 in respect of wheat, barley, gram, lentil and rapeseed & mustard, and 2015-16 and 2017-18 in respect of safflower have been analysed and are given in Table 5.1 and Chart 5.1. It is pertinent to mention that gross value of output (GVO) is estimated at prevailing market prices of main product and by-products during harvest season in village/ cluster of villages where the crops are grown and harvested.
- 5.8 At all-India level, average gross returns over CoC  $A_2+FL$ , is highest for wheat at ₹35723 per ha, while safflower has the lowest returns of ₹666 per ha, mainly due to low productivity. Among pulses, gram has higher average gross returns over CoC  $A_2+FL$  at ₹25976 per ha compared to lentil at ₹24104 per ha. Average returns from barley (₹28303/ha) are lower than wheat. Rapeseed & mustard has significantly



higher returns (₹29166/ha) compared to safflower (₹666/ha). All pulses and oilseeds have lower CoC A<sub>2</sub>+FL and higher output prices than that of cereals, but have lower average gross returns due to lower productivity. The all-India average gross returns as percentage of CoC A<sub>2</sub>+FL are highest (115%) in lentil, followed by wheat (103%), rapeseed & mustard (102%), gram (93%), barley (81%) and the lowest at 3 percent in safflower. The state-wise details of average gross returns for six rabi crops are given in Annex Table 5.1.

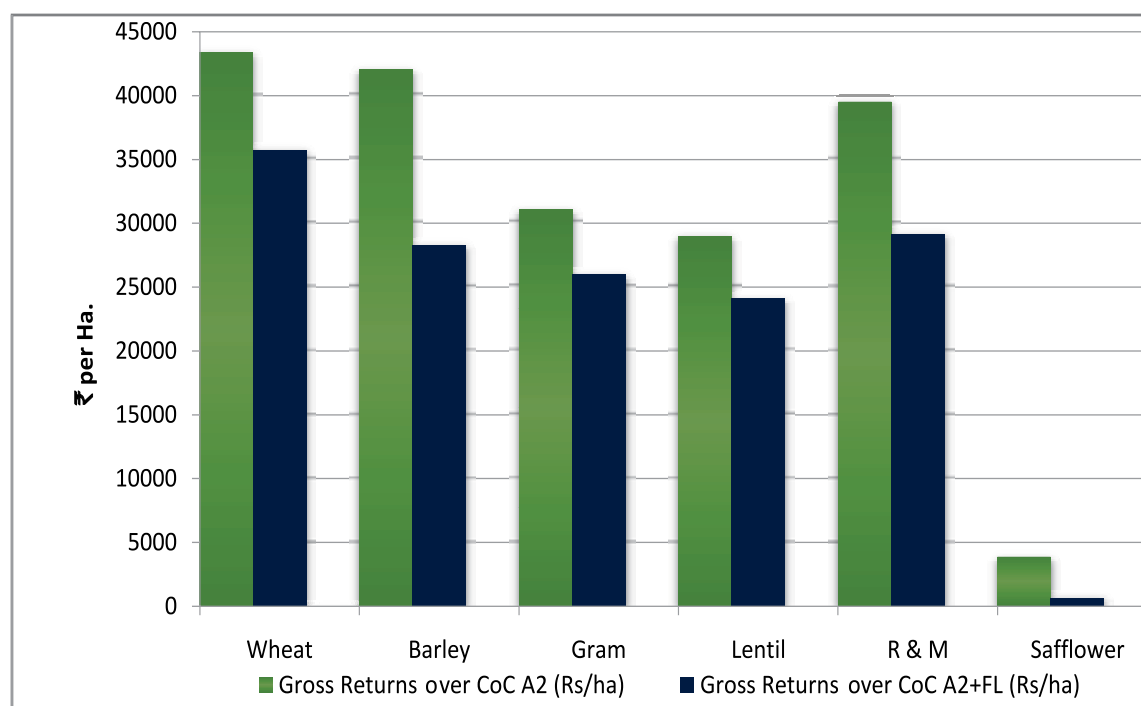
**Table 5.1: Average Gross Returns of Rabi Crops, TE2017-18**

Crop	CoC A <sub>2</sub>	CoC A <sub>2</sub> +FL	GVO	Gross Returns over CoC A <sub>2</sub>		Gross Returns over CoC A <sub>2</sub> +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)
<b>A. Cereals</b>							
Wheat	26920	34549	70272	43352	161	35723	103
Barley	21350	35062	63364	42015	197	28303	81
<b>B. Pulses</b>							
Gram	22831	27923	53899	31067	136	25976	93
Lentil	16169	21042	45146	28976	179	24104	115
<b>C. Oilseeds</b>							
Rapeseed & Mustard	18371	28712	57878	39507	215	29166	102
Safflower	16855	20062	20728	3873	23	666	3

*Note: Average Gross Returns of safflower are for 2015-16 and 2017-18*

*Source: CACP using CS data*

**Chart 5.1: Average Gross Returns for Rabi Crops, TE2017-18**



*Note: Average Gross Returns of safflower are for 2015-16 and 2017-18*

*Source: CACP using CS data*

## Movement in Agricultural Labour Wages and Prices of Farm Inputs

5.9 Growth in average daily wage rates of agricultural labour during rabi season in major States and at all-India level at current prices and constant prices (2018-19=100) during TE2018-19 are given in Table 5.2. At all-India level, agricultural wage rate increased by 5.8 percent in 2016-17, 4.6 percent in 2017-18 and 5.6 percent in 2018-19, at current prices; while at constant prices, it increased by 2.5 percent in 2016-17, 2.9 percent in 2017-18 and 2.6 percent in 2018-19. Chart 5.2 reflects state-wise average daily wages of agricultural labour during rabi season in 2018-19 and growth in average daily wages during 2018-19 over 2017-18. At all-India, average daily wage rate was ₹300, whereas, it was the highest (₹736) in Kerala and the lowest in Madhya Pradesh (₹215) in 2018-19. Tamil Nadu recorded the highest increase of 9.4 percent (at current prices), while Himachal Pradesh and Assam witnessed decline in average daily wage rate in 2018-19 compared to 2017-18. The state-wise and all-India details of monthly average of daily wage rates for agricultural labour at current prices are given in Annex Table 5.2.



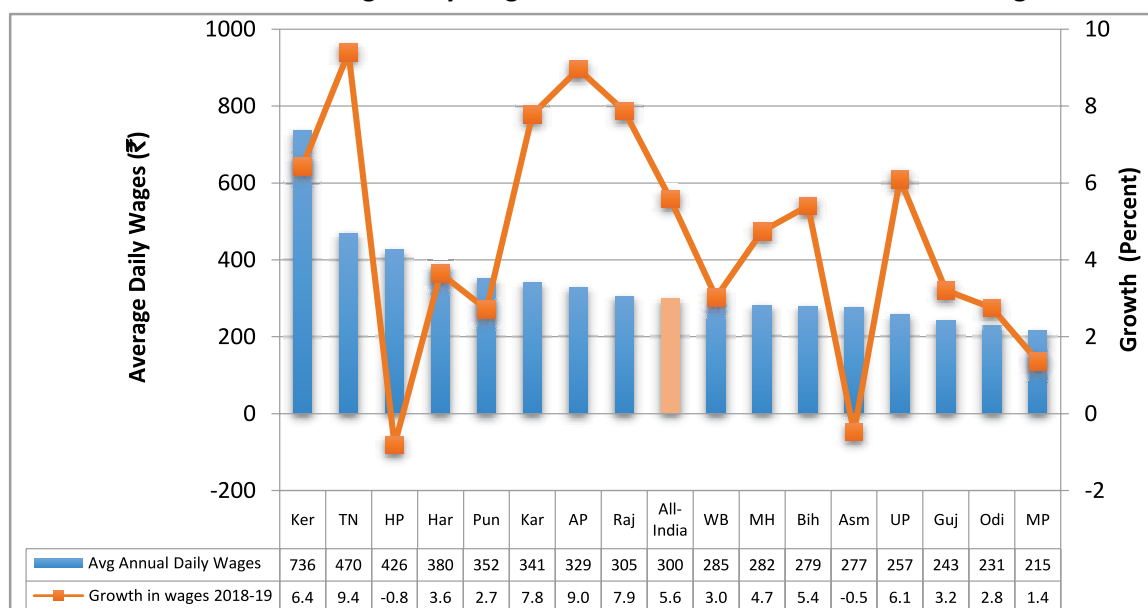
**Table 5.2: State-wise Changes in Average Daily Wage Rates of Agricultural Labour during Rabi Season**

State	Change (percent) at Current Prices			Change (percent) at Constant Prices (2018-19=100)		
	2016-17	2017-18	2018-19	2016-17	2017-18	2018-19
Andhra Pradesh	6.7	7.1	9.0	4.2	3.5	4.8
Assam	8.3	8.4	-0.5	7.5	3.8	-2.8
Bihar	1.3	6.7	5.4	1.3	6.9	2.3
Gujarat	8.0	5.4	3.2	6.2	4.7	-0.3
Haryana	2.1	0.6	3.6	-3.1	-1.0	1.0
Himachal Pradesh	6.2	7.8	-0.8	1.5	6.1	-2.9
Karnataka	5.8	6.1	7.8	-1.1	2.1	10.6
Kerala	1.3	2.9	6.4	-5.2	-1.9	5.0
Madhya Pradesh	10.7	4.2	1.4	7.6	3.4	-0.6
Maharashtra	11.9	4.3	4.7	7.4	3.6	1.5
Odisha	8.4	3.3	2.8	8.9	-0.9	-1.5
Punjab	5.3	9.1	2.7	-0.6	6.7	0.5
Rajasthan	-0.6	0.4	7.9	-5.5	1.9	2.2
Tamil Nadu	5.1	4.7	9.4	0.3	-2.2	6.0
Uttar Pradesh	6.9	4.2	6.1	8.7	5.5	0.8
West Bengal	4.2	7.3	3.0	1.8	0.9	3.3
<b>All-India</b>	<b>5.8</b>	<b>4.6</b>	<b>5.6</b>	<b>2.5</b>	<b>2.9</b>	<b>2.6</b>

Note: Average from October to April

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

**Chart 5.2: State-wise Average Daily Wage Rates and Growth in Rabi Season during 2018-19**



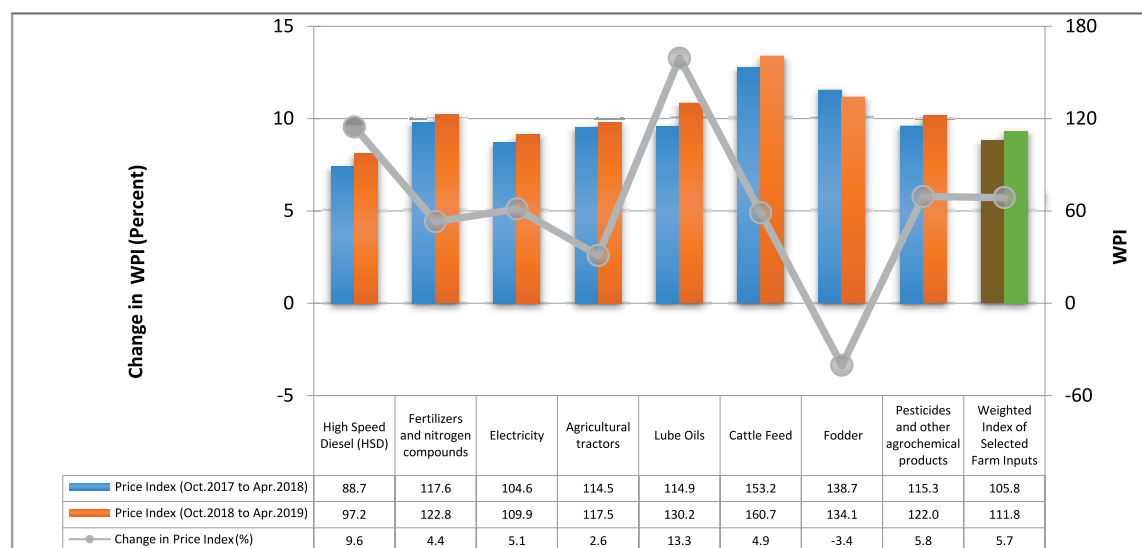
Note: Average from October to April

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



- 5.10 The changes in farm input price indices, which measure the movement in prices of farm inputs, during rabi season 2018-19 over 2017-18 are given in chart 5.3 (base: 2011-12=100). The increase in farm input price indices ranged from 2.6 percent in agricultural tractors to 13.3 percent in lube oils. The increase in other farm input indices was 9.6 percent in HSD, 4.4 percent in fertilizers & nitrogen compounds, 5.1 percent in electricity, 4.9 percent in cattle feed and 5.8 percent in pesticides & other agrochemical products while it declined by 3.4 percent in case of fodder. The weighted index of above mentioned selected farm input prices registered an increase of 5.7 percent. The month-wise indices of farm input prices from 2012 to 2019 are given at Annex Table 5.3.

**Chart 5.3: Movement in Farm Input Price Indices during Rabi Season**



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

### Cost Projections for Rabi Marketing Season, 2020-21

- 5.11 The all-India weighted average composite input price index (CIPI) is computed for RMS 2016-17 to RMS 2020-21 with base 2011-12=100. For this, based on 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 TE2018-19, has been calculated. These indices are used to compute all-India weighted average composite input price index for rabi crops, with weights being relative shares of crops in total production at all-India level during TE2018-19. It may be observed from Table 5.3. that all-India CIPI for rabi crops shows an increase of 6.4 percent while, insecticides recorded the lowest increase (4.6%) and machine labour witnessed the highest increase (8%) during 2019-20 over 2018-19.



**Table 5.3: Trends in all-India Farm Input Price Indices (Base 2011-12=100)**

Inputs	Weights (2016-17)	Farm Input Price Index				Percentage Change in Farm Input Price Index 2019-20 over 2018-19
		2016-17	2017-18	2018-19	2019-20	
Human Labour (HL)	0.36	165.03	177.21	185.84	197.19	6.1
Bullock Labour (BL)	0.02	212.61	248.15	265.58	284.76	7.2
Machine Labour (ML)	0.25	112.50	118.95	126.90	137.04	8.0
Seeds	0.10	150.80	154.70	163.65	175.37	7.2
Fertilizers	0.11	117.55	114.59	118.46	122.97	3.8
Manures	0.00	132.02	146.26	152.38	159.48	4.7
Insecticides	0.02	124.12	129.63	135.47	141.68	4.6
Irrigation Charges	0.15	125.84	131.52	138.15	146.87	6.3
<b>Composite Input Price Index (CIPI)</b>		139.38	146.90	154.63	164.56	<b>6.4</b>
<b>Percentage Change (year-on-year)</b>		-	5.4	5.3	6.4	

Source: CACP Calculations

## Costs and Returns

- 5.12 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  $C_2$  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 shares of States in all-India production during TE2018-19 has been worked out for rabi crops for the marketing season 2020-21 and are given in Table 5.4. As shown in Table,  $A_2$ +FL CoP varied from ₹919 per quintal in case of barley to ₹3470 per quintal in safflower and  $C_2$  ranged from ₹1347 per quintal in case of barley to ₹4593 per quintal in safflower. The all-India average  $A_2$ +FL and  $C_2$  CoP of wheat were ₹923 per quintal and ₹1425 per quintal, respectively. In case of pulses,  $A_2$ +FL CoP was lower in lentil while  $C_2$  CoP was lower in gram. The CoP of rapeseed & mustard was significantly lower compared to safflower.
- 5.13 State-wise and all-India projected costs of mandated rabi crops for marketing season 2020-21 are given in Annex Table 5.4. State-wise break-up of actual CoC estimates for 2016-17 and 2017-18 in respect of wheat, barley, gram, lentil and rapeseed & mustard and for 2017-18 for safflower are given in Annex Tables 5.5a to 5.5f, respectively.

**Table 5.4: Projected Cost of Production (CoP) of Mandated Rabi Crops, RMS 2020-21**

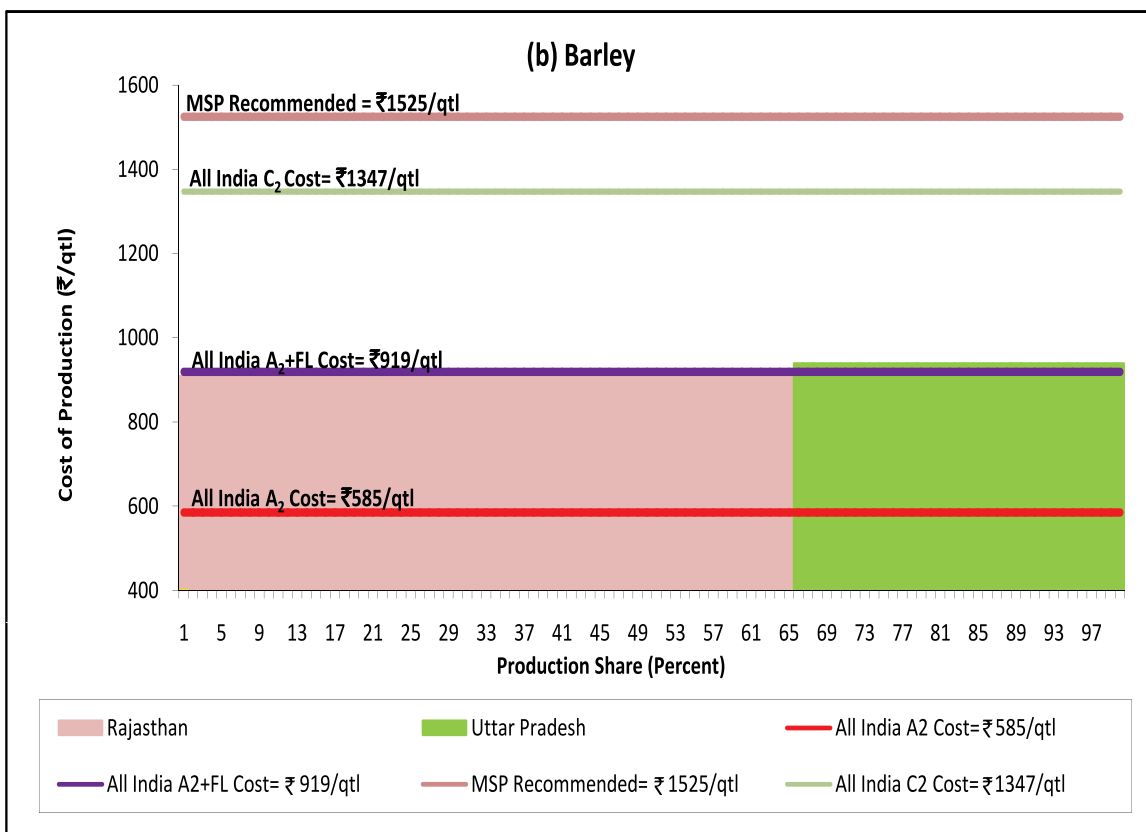
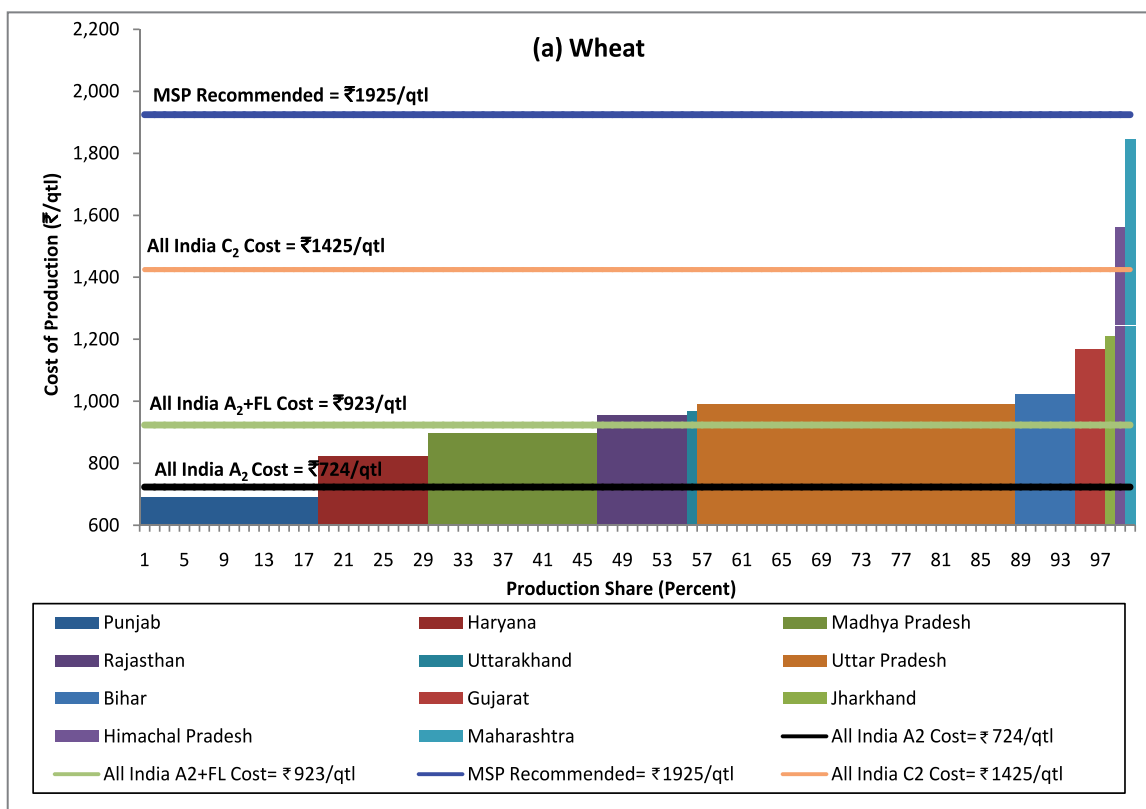
Crops	Cost of Production (₹/qtl)		
	A <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>
Wheat	724	923	1,425
Barley	585	919	1,347
Gram	2,267	2,801	4,023
Lentil	2,034	2,727	4,286
Rapeseed & Mustard	1,495	2,323	3,401
Safflower	2,951	3,470	4,593

Source: CACP Calculations

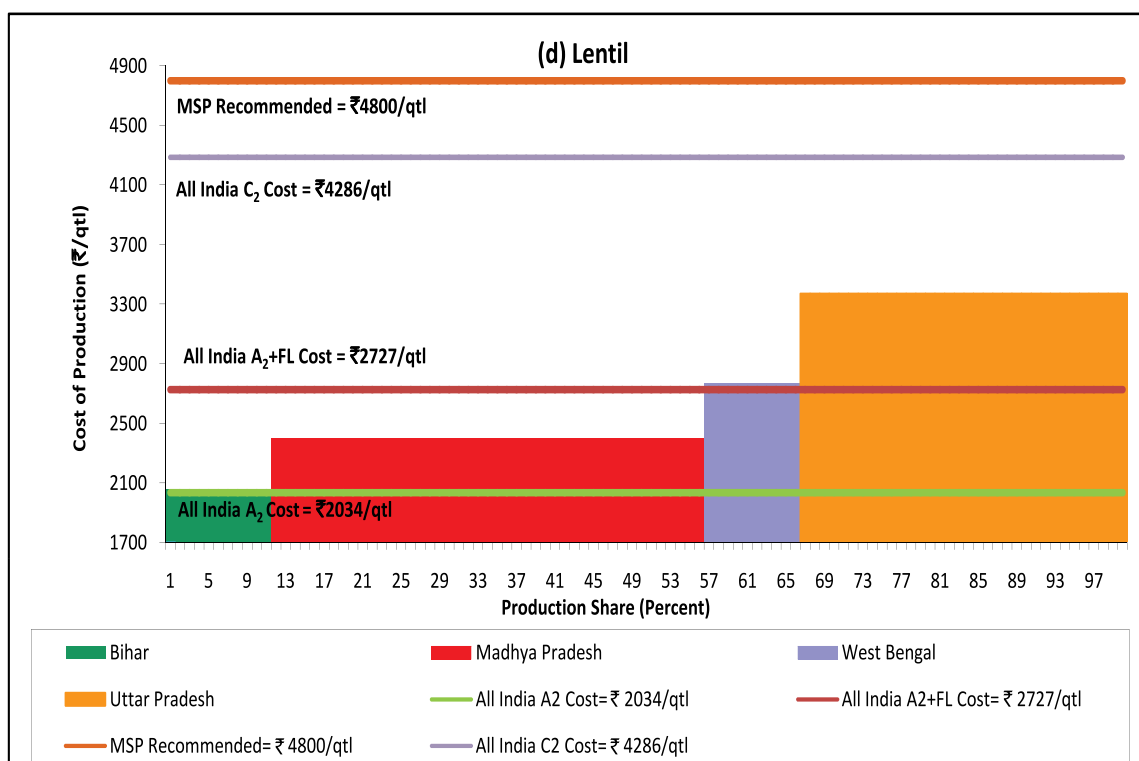
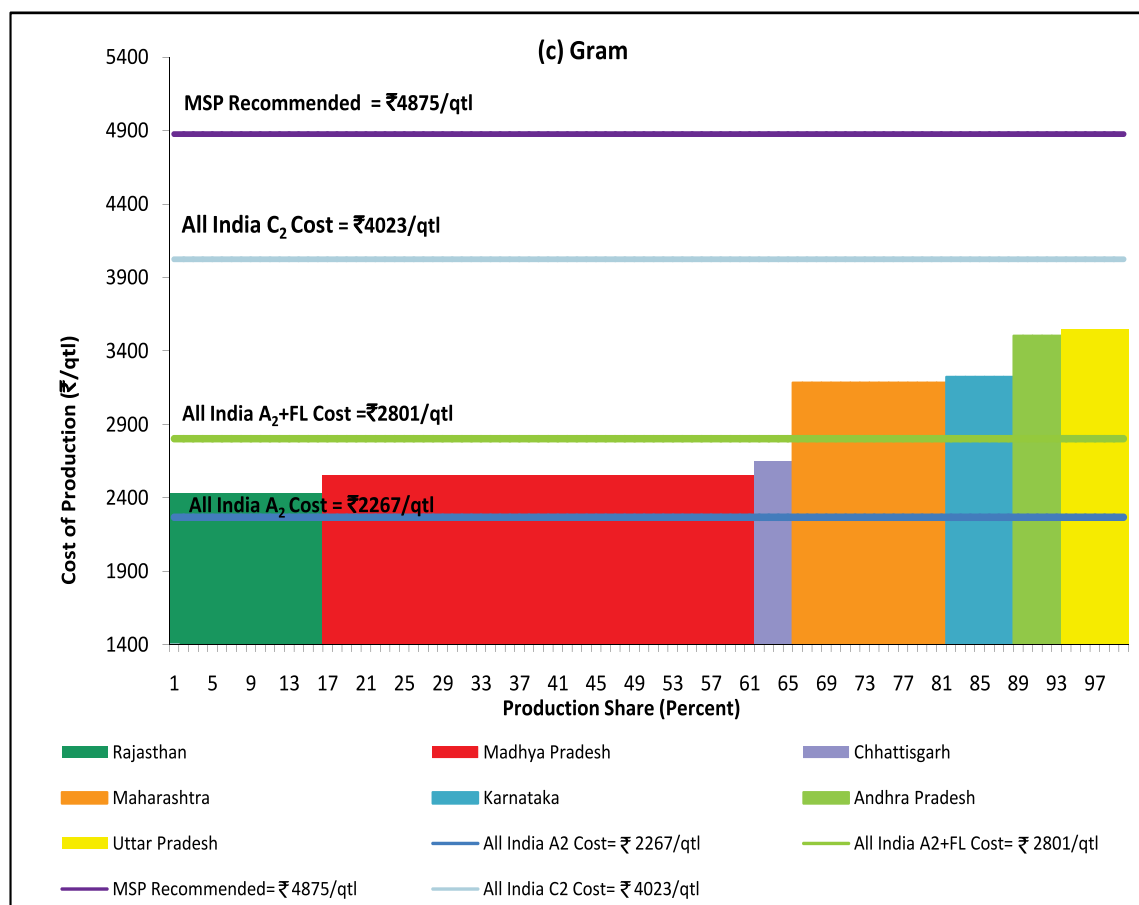
- 5.14 Charts 5.4 (a) to (f) show crop-wise supply curves for A<sub>2</sub>+FL CoP by States in ascending order with their corresponding relative shares in all-India production. Supply curves for different crops are graphical representation of CoP, which represent the quantum of production of crop produced at different CoP in various States.
- 5.15 The supply curve presented in Chart 5.4 (a) shows that A<sub>2</sub>+FL CoP for wheat is lowest at ₹690 per quintal in Punjab, followed by Haryana (₹824/qtl), Madhya Pradesh (₹897/qtl), and the highest (₹1846 per quintal) in Maharashtra. Among top-five producers of wheat in the country, Punjab has the lowest CoP while Uttar Pradesh has the highest CoP (₹992/qtl). In the case of barley, A<sub>2</sub>+FL CoP at ₹908 per quintal is the lowest in Rajasthan, while Uttar Pradesh has the highest CoP at ₹939 per quintal (Chart 5.4 (b)).
- 5.16 In gram, Rajasthan has the lowest (₹2432/qtl) A<sub>2</sub>+FL CoP, while Uttar Pradesh has the highest CoP (₹3548/qtl). Supply curve for Lentil shows that A<sub>2</sub>+FL CoP is lowest (₹2054/qtl) in Bihar and the highest (₹3370/qtl) in Uttar Pradesh.
- 5.17 In the case of oilseeds, Madhya Pradesh has the lowest A<sub>2</sub>+FL CoP (₹1556/qtl) for rapeseed & mustard while Karnataka has the lowest CoP (₹2129/qtl) for safflower. Assam has the highest A<sub>2</sub>+FL CoP (₹4408/qtl) in case of rapeseed & mustard, while in safflower, Maharashtra has the highest CoP (₹4491/qtl). Higher costs of production were mainly due to low yields, therefore, efforts are needed to improve productivity levels to reduce cost of production and improve profitability.
- 5.18 All India weighted A<sub>2</sub>+FL CoP covers 46 percent of production in case of wheat, 65 percent in barley and gram, 56 percent in lentil, 31 percent in rapeseed & mustard, and 43 percent in safflower. The projected A<sub>2</sub>+FL CoP in 2019-20 increased by 6.6 percent over 2018-19 for wheat, 6.9 percent for barley, 6.2 percent for gram, 7.7 percent for lentil, 5.0 percent for rapeseed & mustard and 5.3 percent for safflower (details in Annex Table 5.6). The increase in cost of production was mainly driven by rise in farm input costs such as human labour, machinery, seeds, fertilisers, fuel, etc.

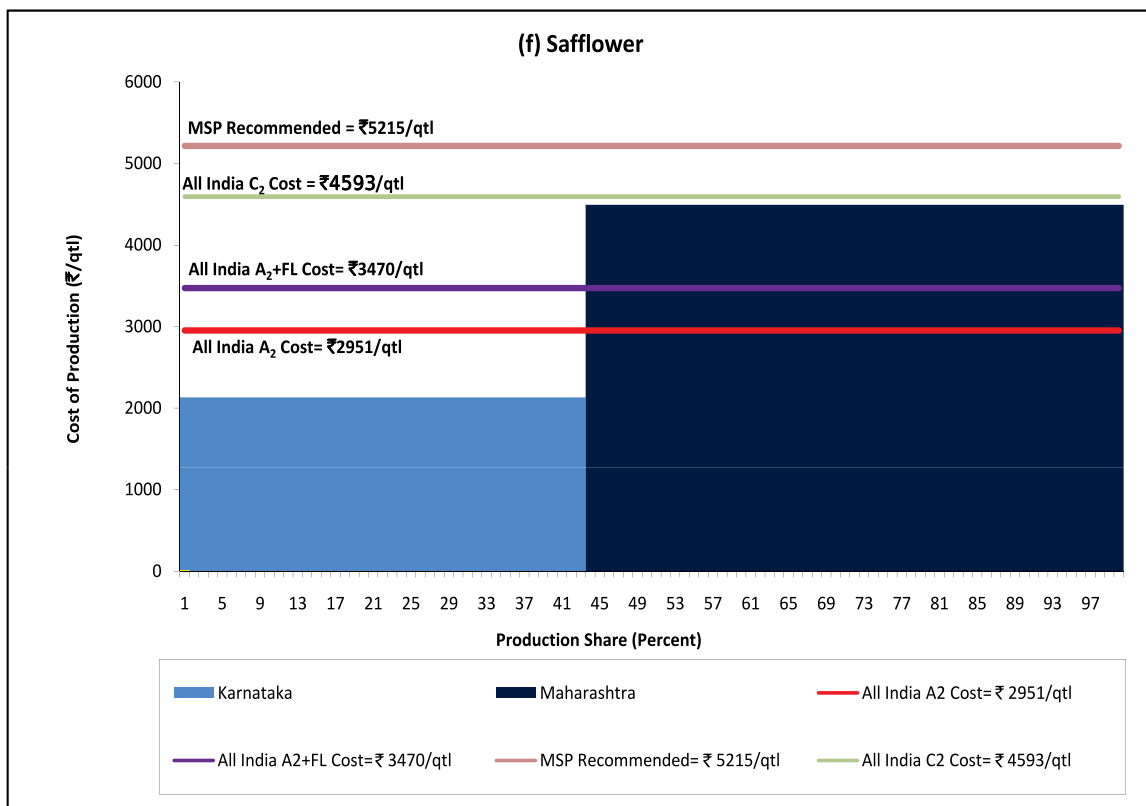
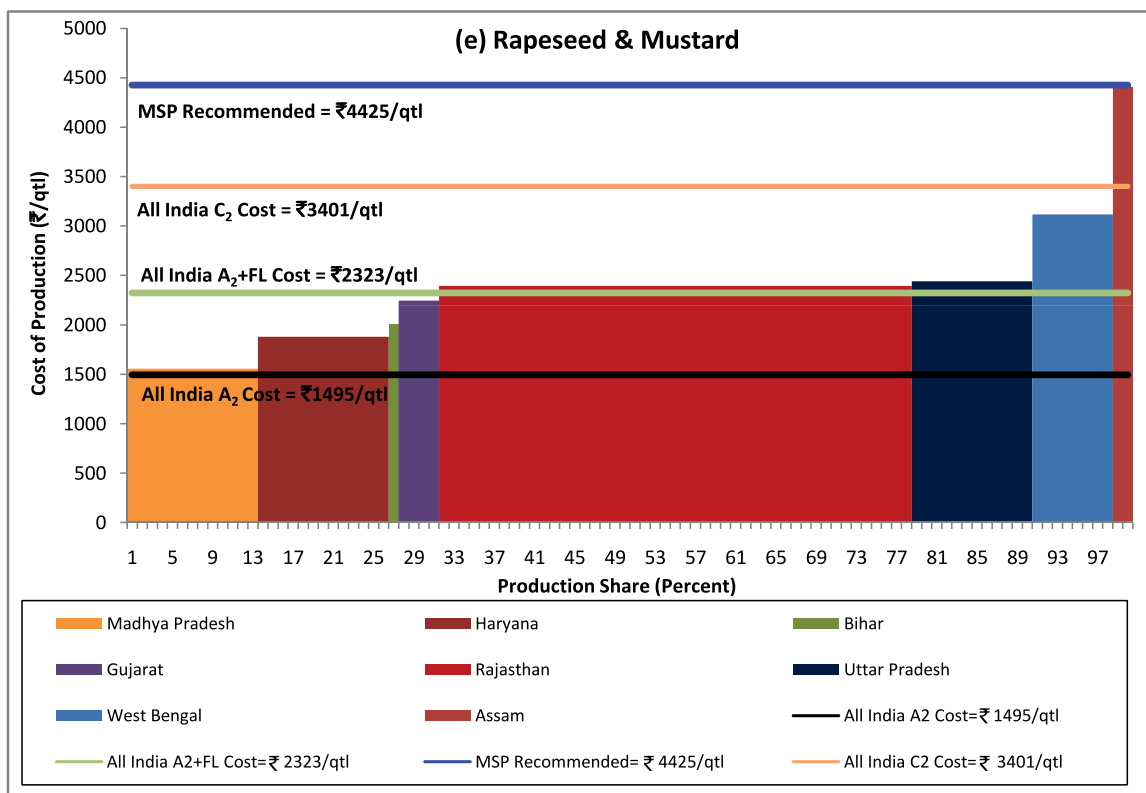


**Chart 5.4: Supply Curve and Projected CoP for Mandated Crops; RMS 2020-21**







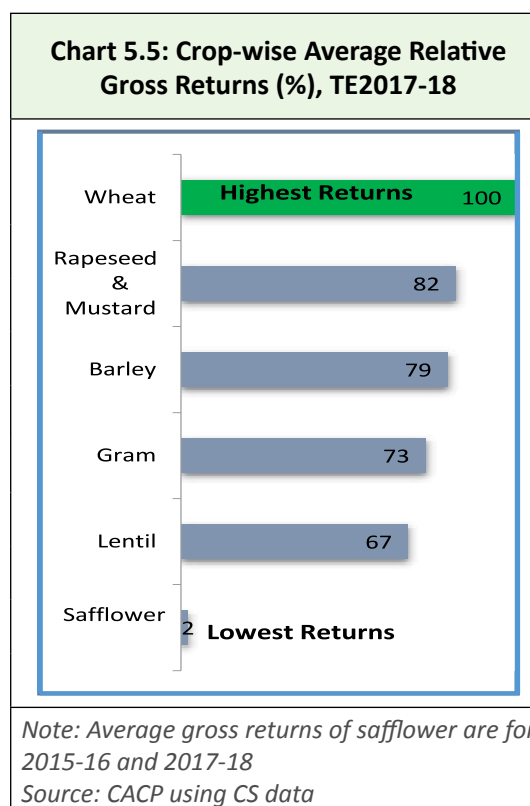


## Relative Returns of Crops

5.19 Relative returns being an important determinant for deciding MSPs, the Commission computes per hectare returns from different crops that may compete with each other. Table 5.5 and Chart 5.5 show relative returns over CoC  $A_2$ +FL in percentage terms for mandated rabi crops with reference to wheat during TE2017-18. The comparison of mandated rabi crops reveals that wheat has the highest relative gross returns. Among the competing crop groups, cereals have higher relative gross returns than pulses and oilseeds, except rapeseed & mustard. Rapeseed & mustard, gram and lentil give relative gross returns in comparison to wheat at 82 percent, 73 percent, 67 percent, respectively, while in case of safflower, the relative gross returns were 2 percent. This could be one of the reasons that area and production of safflower has recorded a significant decline over the years. Due to lower returns, high production risks and lack of assured remunerative prices in pulses and oilseeds, farmers prefer wheat over pulses and oilseeds. By improving relative gross returns through higher MSP, assured markets and remunerative prices, and reducing cost of production, farmers should be encouraged to grow pulses and oilseeds.

Table 5.5: Crop-wise Average Relative Gross Returns (%), TE2017-18	
Crops	Relative Gross Returns over $A_2$ +FL with respect to wheat
<b>A. Cereals</b>	
Wheat	100
Barley	79
<b>B. Pulses</b>	
Gram	73
Lentil	67
<b>C. Oilseeds</b>	
Rapeseed & Mustard	82
Safflower	2

*Note: Average gross returns of safflower are for 2015-16 and 2017-18*  
*Source: CACP using CS data*



## Comparison of CACP Cost Estimates and State Estimates

5.20 The estimates of CoC were provided by Bihar, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Punjab, Rajasthan and Telangana for wheat; Haryana and Rajasthan for barley; Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Rajasthan and Telangana for gram; Bihar and Madhya Pradesh for lentil; Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh,



Rajasthan and Telangana for rapeseed & mustard; and Telangana for safflower. Jharkhand, Karnataka, Uttar Pradesh, Uttarakhand and West Bengal did not provide cost of cultivation/production estimates. The projected cost estimates provided by States for mandated rabi crops for marketing season 2020-21 are given in Annex Table 5.7.

- 5.21 There are differences in cost estimates provided by the States and CACP estimates and main reasons for differences in two sets of estimates, i.e., State Government projections and CACP projections are: (i) the methodology used by the States is different from the standard methodology used by the CACP. For example, some States have included managerial costs, risk costs, power subsidy, transport costs, incidental charges, etc., which are not considered in the CACP calculations and (ii) many State Governments have given substantially higher costs of farm inputs and rental value of land compared with CS data. For example, the cost estimates provided by Government of Bihar were 305.5 percent higher than CS data for interest on working capital for rapeseed & mustard, 215 per cent more on interest on working capital and 176.3 percent more on fertiliser, manure and crop protection for wheat. Similarly, Punjab has included power subsidy amounting to ₹6074 per hectare while human labour cost was 27.2 percent, interest on working capital 68.5 percent and rental value of owned land 70.8 percent higher than CACP estimates.
- 5.22 In some States, projected costs were lower than CACP projections, e.g. in case of gram in Andhra Pradesh, gram and lentil in Bihar, gram in Chhattisgarh, gram and lentil in Madhya Pradesh, wheat and barley in Rajasthan, State estimates are lower than CACP projections.

### Inadequate Sample Size

- 5.23 The Commission analysed cost of cultivation data for making projections and observed that there the sample size was inadequate in some crops and some States. Insufficient and non-representative samples can undermine the reliability of cost estimates. The sample size of safflower was inadequate in major producing States and all-India level while sample size of gram in Haryana and Jharkhand and rapeseed & mustard in Chhattisgarh was insufficient (details in Annex Table 5.8). Therefore, the Commission recommends that additional villages/clusters should be selected for such crops and States to have adequate sample size.

### Recapitulation

- 5.24 The analysis of returns of mandated rabi crops reveals that wheat has the highest gross return over  $CoC A_2 + FL$  (₹35723/ha), followed by rapeseed & mustard (₹29166/ha), barley (₹28303/ha) and the lowest (₹666/ha) in safflower. The all-India average daily wage rate of agricultural labour (at current prices) during rabi season of 2018-19 registered an increase of 5.6 percent, while weighted index of farm inputs such as HSD, fertiliser & nitrogen compounds, electricity, agricultural tractors, lube oils, cattle feed, fodder, and pesticides & other agrochemical products increased by 5.7 percent.



- 5.25 Due to availability of cost data upto 2017-18, the Commission, by constructing CIPIs, projected the cost estimates  $A_2$ ,  $A_2+FL$  and  $C_2$  per quintal for mandated rabi crops for the ensuing season 2019-20. The growth in all-India CIPI for rabi crops during 2019-20 over 2018-19 was 6.4 percent. The all-India per hectare  $A_2+FL$  cost for agriculture year 2019-20 (RMS 2020-21) is projected at ₹923 for wheat, ₹919 for barley, ₹2801 for gram, ₹2727 for lentil, ₹2323 for rapeseed & mustard and ₹3470 for safflower. The  $C_2$  cost is projected at ₹1425 for wheat, ₹1347 for barley, ₹4023 for gram, ₹4286 for lentil, ₹3401 for rapeseed & mustard and ₹4593 for safflower. The increase in projected CoP  $A_2+FL$  during crop year 2019-20 over 2018-19 varied from 5 percent in rapeseed & mustard to 7.7 percent in lentil. The relative gross returns from rapeseed & mustard in comparison to wheat were 82 percent, while barley gave 79 percent, lentil 67 percent and safflower only 2 percent. The projected cost estimates and other factors have been considered in formulating the price policy recommendations.

\*\*\*\*\*



## Chapter 6

# Considerations and Recommendations for Price Policy

6.1 As per the Terms of Reference (TORs) of the Commission, the price policy should evolve a balanced and integrated price structure in the perspective of overall needs of the economy and with due regard to interests of the producer and consumer. Keeping in view the TORs, the Commission has considered various factors to incentivize producers for adopting improved technologies to raise productivity and developing a production pattern in response to changing national requirements while recommending price policy for rabi crops to be marketed in 2020-21 season. Cost of production, overall demand-supply situation and outlook, domestic and international prices, inter-crop parity, terms of trade between agriculture and non-agriculture sector, a minimum of 50 percent margin over cost of production, likely impact of price policy on rest of the economy, particularly on cost of living, level of wages, cost structure and competitiveness of agriculture and agro-based commodities, and rational utilization of land, water and other production resources have been considered.

### Global Outlook

6.2 Global wheat production for 2019-20 is forecast to increase by more than 5 percent and ending stocks are also projected to rise, largely on higher inventories in China and European Union. Forecast of higher production in major exporting and importing countries will increase supply of wheat in world markets while world wheat trade for the 2019-20 is forecast to be lower. World oilseed production is forecast to remain high in 2019-20 while world imports are forecast to fall significantly due to lower Chinese demand but global consumption is expected to increase.

## Domestic Demand and Supply

- 6.3 In 2018-19, India is expected to achieve a record production of wheat crossing 101 million tonnes and total wheat stocks with public agencies have touched 45.8 million tonnes on July 1, 2019, 66.2 percent more than stocking norms and 9.6 percent higher than last year. The unprecedented high stocks are largely due to record production, open-ended procurement and low exports due to subdued world prices. The trends in both domestic and world wheat markets point towards higher availability of wheat in 2019-20.
- 6.4 Pulses production in India is estimated to be marginally lower and stocks with NAFED are also lower in 2018-19. India's limited arable land and stagnant yields as well as rising imports continue to hinder growth in domestic oilseed production. With oilseeds production in the country to be stagnant at about 31-32 million tonnes, it is necessary to focus on improving productivity and promote oilseeds cultivation in fallow areas in eastern region.

## Domestic and International Price Scenario

- 6.5 World wheat prices are forecast to be lower in 2019-20 due to increased supply of wheat on world markets. Global oilseed prices are forecast to fall in 2019-20 due to higher production in major exporting countries and lower world imports due to outbreak of African swine fever in China. In case of pulses, lower production, reduced stocks and other market trends point towards tight supply situation of pulses and firming of market prices in the coming season.
- 6.6 Domestic market prices of most of rabi crops improved during RMS 2019-20 compared to RMS 2018-19. At all-India level, average market price of wheat during RMS 2018-19 was 2.9 percent lower than MSP, while in RMS 2019-20 wheat price was 1.3 percent higher than the MSP. However, in Uttar Pradesh and Rajasthan, wheat prices remained below MSP during RMS 2019-20. Market prices of gram, which were about 20 percent below MSP in RMS 2018-19, improved during RMS 2019-20 and the gap between market price and MSP reduced to about 10 percent. Market prices of lentil, which were lower than MSP in RMS 2018-19, remained below MSP during RMS 2019-20 but showed an upward trend and moved closer to the MSP.

## Non-Price Policy Recommendations

### Ensure Remunerative Prices to Farmers

- 6.7 Market prices of most of rabi crops improved in RMS 2019-20 compared to RMS 2018-19 but remained below the MSP in major States. Low market prices may undermine incentives for farmers to adopt new technologies and adversely affect competitiveness of Indian agriculture. Therefore, to ensure remunerative prices to farmers, timely market intervention and more effective participation of private sector are needed. Procurement agencies should open adequate procurement centers in markets where larger arrivals are expected during peak harvesting season.



## **Review Essential Commodities Act (ECA) and Agricultural Produce Market Committee (APMC) Act**

- 6.8 The Essential Commodities Act (ECA) and Agricultural Produce Market Committee (APMC) Act are perceived to be major impediments to private sector participation in agricultural marketing. Reforming ECA and APMC Act, promoting a competitive national market and improving post-harvest management and marketing infrastructure will help in ensuring remunerative prices to farmers. It is important that these laws are amended to facilitate development of efficient national market and participation of private sector. The Commission recommends removal/simplification of renewal of licensing under ECA and adoption of Model Agricultural Produce & Livestock Marketing (Promotion & Facilitation) Act, 2017 by all States/ Union Territories to create an enabling and conducive environment for private sector investment in the agricultural marketing.

### **Liquidate Excess Stocks**

- 6.9 The Commission recommends that excess stocks should be liquidated as it will help ease storage capacity constraint and reduce carrying costs of excessive stocks. The Government has already taken some initiatives and announced to liquidate 10 million tonnes of wheat stocks and 5 million tonnes of Grade 'A' rice at reserve price linked to MSP. However, actual liquidation has been very modest, about 4.2 lakh tonnes up to July 2019. The Commission suggests that in order to liquidate more quantity from stocks, additional allocation of foodgrains under Public Distribution Scheme (PDS) to Antyodaya Anna Yojana (AAY) households, Priority Households (PHH) under NFSA and other welfare schemes can be made.

### **Review Open-Ended Procurement Policy**

- 6.10 Due to increased procurement in most of the States and Uttar Pradesh in particular in recent years, foodgrains stocks have risen sharply. In States like Punjab and Haryana, government procured large share of wheat production and market arrivals, about 73 percent of production in Punjab and 80 percent in Haryana in RMS 2019-20. The Commission recommends that open-ended procurement policy needs to be reviewed and private sector should be encouraged to directly procure from farmers.

### **Reserve Price for Disposal of Stocks**

- 6.11 During the Commission's interactions with State Governments, farmers, industry representatives and other stakeholders, one of the concerns which emerged was open market sale of government stocks at price much below MSP and particularly during procurement season, which discouraged direct procurement by private trade. The Commission recommends that government should not sell these stocks below the MSP and during the procurement season. The reserve price linked to MSP should be fixed for disposal of pulses and oilseeds as is being done for wheat and rice under Open Market Sales Scheme (Domestic). In addition, government



should continue distribution of surplus pulses to States/UTs with subsidy under various welfare schemes to improve nutrition and sustain market prices to help farmers.

### Storage and Warehousing Capacity

- 6.12 Lack of adequate and appropriate storage facility both at farm level as well as at market places is one of the major constraints, which leads to distress sale by farmers. The present storage capacities are either inadequate or unscientific. There is a need to build storage infrastructure at farm level to increase storage capacity of producers. Large share of organized warehousing capacity in the country is in public sector and share of private sector is less than 40 percent. Modern grain storage facilities should be created through private sector participation and improve existing capacity of Cover and Plinth (CAP) structure under which grains are more vulnerable to deterioration in quality.

### Negotiable Warehouse Receipt Financing

- 6.13 In order to facilitate more orderly marketing of crops and extend 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 farmers to delay sale of produce until more favourable market conditions emerge. The Commission recommends that special efforts should be made to create awareness and promote negotiable warehouse receipt financing scheme among farmers.

### Review of Number of Crops under Mandate of the Commission and Sample Size

- 6.14 The government has reviewed coverage of crops under MSP from time to time. Nigerseed and sesamum were included under MSP in 1994, lentil was included in 2001 while tobacco was excluded from ToRs of the Commission in June 2016. The Commission has carefully examined the crops under its mandate and found that some of the crops can be excluded from MSP. For example, production of safflower has declined from over 5 lakh tonnes in early-1980s to about 22 thousand tonnes in 2018-19 and nigerseed production had fallen from about 1.9 lakh tonnes in 1985-86 to 63 thousand tonnes in 2018-9. In addition, the sample size of these crops under the Comprehensive Scheme of Studying the Cost of Cultivation of Principal Crops in India is insufficient.
- 6.15 In some other kharif crops and States, the sample size under the Comprehensive Scheme is inadequate and can undermine the reliability of cost estimates. The Commission, therefore, reiterates its earlier recommendation that additional villages/clusters may be selected for such crops/States having significant share in all-India production or within the State in a particular crop/crop group to have appropriate sample size to generate reliable cost estimates. The coverage of crops under MSP scheme needs to be reviewed.



### Emphasis on Improving Productivity

- 6.16 Indian crop yields are still significantly lower than world averages and there are large gaps between potential yield and actual yield, which could improve significantly with suitable interventions. Therefore, new technological interventions are needed to improve crop productivity along with addressing institutional and socio-economic constraints to bridge the yield gaps. Greater emphasis on research & development, quality seed and other inputs, irrigation and better management practices will go a long way in improving productivity.

### Promote Oilseeds Cultivation

- 6.17 Steeply rising imports of edible oils (from 6.9 million tonnes in 2010-11 to over 15 million tonnes in 2018-19) and stagnant domestic production of oilseeds warrant a rethinking of the strategic paradigm for oilseeds sector. The Commission recommends that National Mission on Edible Oils with substantially enhanced allocation should be launched to increase production and productivity of oilseeds including non-traditional vegetable oils. The Commission also recommends that to ensure remunerative prices to farmers, Price Deficiency Payment Scheme (PDPS) should be implemented in oilseeds as disposal of stocks procured under MSP remains a challenge due to lack of assured off-take unlike rice and wheat.

### Investment in Agriculture

- 6.18 The importance of investment for agricultural productivity and growth cannot be understated. Household sector has the largest share in agriculture investment and must remain central to any strategy for increasing investment in agriculture. However, private investment by agri-business industries is very less (about 3%) in India. Therefore, it is important to attract private corporate investment in agriculture by creating an enabling environment and making necessary changes in the regulatory and institutional frameworks.

### Market Infrastructure

- 6.19 Poor market infrastructure and inefficient markets are major constraints faced by farmers. Development and upgradation of 22,000 rural haats into Gramin Agricultural Markets (GrAMs) and linking these markets with e-NAM will strengthen farmer-market linkages. However, physical and market infrastructure of these markets need to be strengthened through convergence of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Gram Sadak Yojana (PMGSY), Agri-Market Infrastructure Fund (AMIF) and other schemes.

### Awareness about MSP and FAQ Standards

- 6.20 A variety of factors including lack of awareness about MSP and FAQ standards adversely affect farmers. Farm produce brought to the APMC mandis/procurement

centre is often rejected as it fails to meet the FAQ requirements. Therefore, there is a need to create awareness about MSP, FAQ standards, system of procurement, etc. Grading and sorting facilities should be created near the farm gate and quality testing laboratories should be set up in the APMC mandis to reduce subjectivity in quality assessment. There is a need to give wide publicity about MSP, FAQ standards and procurement agencies by the Central and State Governments in regional/vernacular languages in electronic and print media, through pamphlets and announcements in the villages before the start of procurement season so as to reach out to large number of farmers.

### **Reduce Market Distortions: Bonus and State Taxes/Charges**

- 6.21 Distortions in agricultural markets adversely affect competitiveness and efficiency of markets leading to poor price discovery for producers. Some State governments give bonus over and above MSP, which distorts market and almost crowds out private sector. Bonus also 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.
- 6.22 In some States, statutory and other charges/fees are still very high, ranging from 2 percent in Uttar Pradesh to 8.5 percent in Punjab. The Commission recommends that States should be advised to lower such charges/fee and a uniform fee of 1-2 percent should be levied at all-India level. The Central/State Governments could compensate the APMC mandis for the loss of revenue. This will go a long way to attract private sector, promote inter-state trade and achieve the objective of national agricultural market.

### **Strengthen Farmer-Market Linkages: Farmer Producer Organizations**

- 6.23 In order to improve price discovery and ensure better value to producers, farmer-market linkages need to be strengthened. It would help to increase farmers' income and enable the buyers to purchase directly from farmers by eliminating intermediaries. Organizing small and marginal farmers into groups will help them to benefit from economies of scale and scope in marketing and value-addition of their produce as well as sourcing of inputs. Commodity-specific Farmer Producer Organisations/Companies should be promoted and encouraged to take up functions of aggregation, sorting/grading and direct marketing of produce. Such organizations will create more competition in the market, improve their bargaining power and ensure better prices to member producers.

### **Trade Policy**

- 6.24 To harness export potential of Indian agriculture and make it globally competitive, government has announced a comprehensive "Agriculture Export Policy". The policy aims at doubling agricultural exports and integrating Indian farmers and



agricultural products with the global value chains to increase farmers' income. With easing of trade restrictions, establishing product-specific clusters and promoting private sector participation, agricultural trade policy will be more stable and predictable. Synchronization of domestic policies of trade, incentives/subsidies and infrastructure is crucial for improving global competitiveness of Indian agriculture.

### Wild/Stray Animals

6.25 Crop damage by wild and stray animals has been growing particularly in areas close to forests and problem needs to be addressed on priority. The Commission reiterates its recommendation of subsidizing solar fencing on community-based approach and allowing use of funds under MGNREGA and other schemes.

## Price Policy Recommendations

**Table 6.1: MSPs Recommended for RMS 2020-21**

(₹/qtl)

Crops	Projected Costs for RMS 2020-21		MSP, RMS 2019-20	Recommended MSP for RMS 2020-21	MSP as percent of A <sub>2</sub> +FL
	A <sub>2</sub>	A <sub>2</sub> +FL			
Wheat	724	923	1840	1925 (4.6)	209
Barley	585	919	1440	1525 (5.9)	166
Gram	2267	2801	4620	4875 (5.5)	174
Lentil	2034	2727	4475	4800 (7.3)	176
R&M	1495	2323	4200	4425 (5.4)	190
Safflower	2951	3470	4945	5215 (5.5)	150

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

### Incentivising Efficiency: Linking MSP with Oil Content

6.26 There are variations in oil content of different varieties of oilseeds including R&M and therefore a uniform MSP is not desirable. The Commission is of the view that farmers be incentivized for higher 'oil content'. The Commission recommends that MSP of R&M be linked to the basic 'oil content' of 35 percent in R&M seed. As per CACP's calculations, farmers should be compensated an additional ₹ 20.27 per quintal for every 0.25 percent increase in the oil content beyond this level. The Commission also recommends that such system of linking MSP with oil content in other oilseeds, where variation in oil content is high, may be introduced in a phased manner to incentivize farmers to adopt high-oil varieties and thereby increase production of edible oils in the country.



The Commission is of the considered view that these non-price and price policy recommendations would incentivize farmers to adopt new technologies and promote crop production pattern toward meeting the changing consumer demands and emerging market opportunities.

(Vijay Paul Sharma)  
Chairman

30<sup>th</sup> August 2019



## **Annex Tables**

**Annex Table 1.1 : All India Estimates of Area of Agricultural Commodities**

(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	39.62
		Rabi	4.73	4.30	4.81	3.87	3.84	4.69	4.28	3.84	4.15	4.42	4.06
		Total	45.54	41.92	42.86	44.01	42.75	44.14	44.11	43.50	43.99	43.77	43.69
2	Wheat	Rabi	27.75	28.46	29.07	29.86	30.00	30.47	31.47	30.42	30.79	29.65	29.55
3	Barley	Rabi	0.71	0.62	0.71	0.64	0.70	0.67	0.71	0.59	0.66	0.66	0.66
4	Jowar	Kharif	2.89	3.24	3.07	2.62	2.43	2.28	2.27	2.14	2.06	2.06	1.57
		Rabi	4.64	4.55	4.31	3.63	3.79	3.52	3.89	3.94	3.57	2.96	2.48
		Total	7.53	7.79	7.38	6.25	6.21	5.79	6.16	6.08	5.62	5.02	4.06
5	Bajra	Kharif	8.75	8.90	9.61	8.78	7.30	7.81	7.32	7.13	7.46	7.48	6.89
6	Maize	Kharif	6.89	7.06	7.28	7.38	7.21	7.31	7.56	7.18	7.84	7.43	7.57
		Rabi	1.28	1.20	1.27	1.40	1.46	1.76	1.62	1.63	1.79	1.95	1.41
		Total	8.17	8.26	8.55	8.78	8.67	9.07	9.19	8.81	9.63	9.38	8.98
7	Ragi	Kharif	1.38	1.27	1.29	1.18	1.13	1.19	1.21	1.14	1.02	1.19	0.89
	Nutri/Coarse Cereals	Kharif	20.83	21.31	22.05	20.75	18.82	19.27	18.95	18.23	18.99	18.71	17.40
		Rabi	6.62	6.37	6.29	5.67	5.94	5.95	6.22	6.15	6.01	5.57	4.56
		Total	27.45	27.68	28.34	26.42	24.76	25.22	25.17	24.39	25.01	24.29	21.96
	Cereals	Kharif	61.64	58.92	60.10	60.89	57.73	58.72	58.78	57.89	58.84	58.06	57.02
		Rabi	39.10	39.13	40.17	39.40	39.78	41.11	41.97	40.42	40.95	39.65	38.17
		Total	100.74	98.05	100.27	100.29	97.52	99.83	100.75	98.31	99.79	97.71	95.20
8	Tur (Arhar)	Kharif	3.38	3.47	4.37	4.01	3.89	3.90	3.85	3.96	5.34	4.44	4.73
9	Moong	Kharif	2.24	2.46	2.85	2.61	1.97	2.34	2.03	2.76	3.37	3.26	3.89
		Rabi	0.60	0.63	0.76	0.78	0.74	1.04	0.99	1.07	0.96	0.98	0.84
		Total	2.84	3.07	3.51	3.39	2.72	3.38	3.02	3.83	4.33	4.24	4.73
10	Urad	Kharif	2.02	2.23	2.51	2.36	2.44	2.35	2.49	2.72	3.48	4.35	3.97
		Rabi	0.65	0.73	0.74	0.86	0.69	0.72	0.76	0.90	1.00	0.93	0.88
		Total	2.67	2.96	3.25	3.22	3.13	3.06	3.25	3.62	4.48	5.28	4.86
11	Gram	Rabi	7.89	8.17	9.19	8.30	8.52	9.93	8.25	8.40	9.63	10.56	9.36
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	13.93	14.31
		Rabi	12.29	12.70	14.08	13.27	13.30	14.88	13.56	13.60	15.08	15.88	14.59
		Total	22.09	23.28	26.40	24.46	23.26	25.21	23.55	24.91	29.45	29.81	28.90
	Foodgrains	Kharif	71.45	69.51	72.42	72.08	67.69	69.05	68.77	69.21	73.20	72.00	71.33
		Rabi	51.39	51.83	54.25	52.67	53.09	55.99	55.53	54.01	56.03	55.53	52.76
		Total	122.83	121.33	126.67	124.75	120.78	125.04	124.30	123.22	129.23	127.52	124.10
13	Groundnut	Kharif	5.29	4.62	4.98	4.32	3.93	4.65	4.01	3.84	4.58	4.14	4.14
		Rabi	0.88	0.86	0.88	0.95	0.79	0.86	0.76	0.76	0.76	0.75	0.61
		Total	6.16	5.48	5.86	5.26	4.72	5.51	4.77	4.60	5.34	4.89	4.75
14	Soybean	Kharif	9.51	9.73	9.60	10.11	10.84	11.72	10.91	11.60	11.18	10.33	11.28
15	Sunflower	Kharif	0.66	0.57	0.32	0.26	0.30	0.25	0.22	0.16	0.17	0.14	0.11
		Rabi	1.15	0.91	0.61	0.47	0.53	0.42	0.37	0.33	0.21	0.15	0.13
		Total	1.81	1.48	0.93	0.73	0.83	0.67	0.59	0.49	0.38	0.28	0.24
16	Sesamum	Kharif	1.81	1.94	2.08	1.90	1.71	1.68	1.75	1.95	1.67	1.58	1.59
17	Nigerseed	Kharif	0.39	0.38	0.37	0.36	0.31	0.30	0.23	0.25	0.26	0.22	0.19
18	Rapeseed/Mustard	Rabi	6.30	5.59	6.90	5.89	6.36	6.65	5.80	5.75	6.07	5.98	6.21
19	Safflower	Rabi	0.29	0.29	0.24	0.25	0.18	0.18	0.17	0.13	0.17	0.08	0.04
	Nine Oilseeds	Kharif	18.53	17.97	18.23	18.42	18.32	19.65	18.21	18.86	18.67	17.23	18.08
		Rabi	9.03	7.99	9.00	7.89	8.16	8.40	7.39	7.22	7.51	7.28	7.29
		Total	27.56	25.96	27.22	26.31	26.48	28.05	25.60	26.09	26.18	24.51	25.37
20	Cotton		9.41	10.13	11.24	12.18	11.98	11.96	12.82	12.29	10.83	12.59	12.61
	Jute		0.79	0.81	0.77	0.81	0.78	0.76	0.75	0.73	0.71	0.69	0.67
	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	0.72
22	Sugarcane		4.42	4.17	4.88	5.04	5.00	4.99	5.07	4.93	4.44	4.74	5.13

Note: \* Third Advance Estimates (2018-19)

Source : Directorate of Economics & Statistics, Ministry of Agriculture & Farmers Welfare



**Annex Table 1.2: All India Estimates of Production of Agricultural Commodities**

(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	97.14	101.75
		Rabi	14.27	13.18	15.33	12.52	12.87	15.15	14.09	13.00	13.40	15.62	13.88
		Total	99.18	89.09	95.98	105.30	105.24	106.65	105.48	104.41	109.70	112.76	115.63
2	Wheat	Rabi	80.68	80.80	86.87	94.88	93.51	95.85	86.53	92.29	98.51	99.87	101.20
3	Barley	Rabi	1.69	1.35	1.66	1.62	1.75	1.83	1.61	1.44	1.75	1.78	1.73
4	Jowar	Kharif	3.05	2.76	3.44	3.29	2.84	2.39	2.30	1.82	1.96	2.27	1.78
		Rabi	4.19	3.94	3.56	2.69	2.44	3.15	3.15	2.42	2.60	2.53	1.92
		Total	7.25	6.70	7.00	5.98	5.28	5.54	5.45	4.24	4.57	4.80	3.70
5	Bajra	Kharif	8.89	6.51	10.37	10.28	8.74	9.25	9.18	8.07	9.73	9.21	8.51
6	Maize	Kharif	14.12	12.29	16.64	16.49	16.20	17.14	17.01	16.05	18.92	20.12	20.63
		Rabi	5.61	4.43	5.09	5.27	6.05	7.11	7.16	6.51	6.98	8.63	7.19
		Total	19.73	16.72	21.73	21.76	22.26	24.26	24.17	22.57	25.90	28.75	27.82
7	Ragi	Kharif	2.04	1.89	2.19	1.93	1.57	1.98	2.06	1.82	1.39	1.99	1.21
	Nutri/Coarse Cereals	Kharif	28.54	23.83	33.08	32.44	29.80	31.20	30.94	28.15	32.44	34.03	32.48
		Rabi	11.49	9.72	10.32	9.58	10.25	12.09	11.92	10.37	11.33	12.94	10.85
		Total	40.04	33.55	43.40	42.01	40.04	43.29	42.86	38.52	43.77	46.97	43.33
	Cereals	Kharif	113.49	99.78	113.77	125.22	122.16	122.70	122.34	119.56	128.74	131.16	134.23
		Rabi	106.40	103.65	112.48	116.98	116.63	123.09	112.53	115.66	123.24	128.44	125.92
		Total	219.89	203.44	226.24	242.20	238.78	245.79	234.87	235.22	251.98	259.60	260.15
8	Tur (Arhar)	Kharif	2.27	2.46	2.86	2.65	3.02	3.17	2.81	2.56	4.87	4.29	3.50
9	Moong	Kharif	0.78	0.44	1.53	1.24	0.79	0.96	0.87	1.00	1.64	1.43	1.84
		Rabi	0.26	0.25	0.27	0.40	0.40	0.65	0.64	0.59	0.52	0.59	0.53
		Total	1.03	0.69	1.80	1.63	1.19	1.61	1.50	1.59	2.17	2.02	2.37
10	Urad	Kharif	0.84	0.81	1.40	1.23	1.43	1.15	1.28	1.25	2.18	2.75	2.55
		Rabi	0.33	0.43	0.36	0.53	0.47	0.55	0.68	0.70	0.66	0.74	0.67
		Total	1.17	1.24	1.76	1.77	1.90	1.70	1.96	1.95	2.83	3.49	3.21
11	Gram	Rabi	7.06	7.48	8.22	7.70	8.83	9.53	7.33	7.06	9.38	11.38	10.09
12	Lentil (Masur)	Rabi	0.95	1.03	0.94	1.06	1.13	1.02	-	-	-	1.62	1.56
	Pulses	Kharif	4.69	4.20	7.12	6.06	5.92	5.99	5.73	5.53	9.58	9.31	8.52
		Rabi	9.88	10.46	11.12	11.03	12.43	13.25	11.42	10.82	13.55	16.11	14.70
		Total	14.57	14.66	18.24	17.09	18.34	19.25	17.15	16.35	23.13	25.42	23.22
	Foodgrains	Kharif	118.14	103.95	120.85	131.27	128.07	128.69	128.06	125.09	138.33	140.47	142.75
		Rabi	116.33	114.15	123.64	128.01	129.06	136.35	123.96	126.47	136.78	144.55	140.62
		Total	234.47	218.11	244.49	259.29	257.13	265.04	252.02	251.57	275.11	285.01	283.37
13	Groundnut	Kharif	5.62	3.85	6.64	5.13	3.19	8.06	5.93	5.37	6.05	7.60	5.15
		Rabi	1.55	1.58	1.62	1.84	1.51	1.66	1.47	1.37	1.41	1.66	1.35
		Total	7.17	5.43	8.26	6.96	4.69	9.71	7.40	6.73	7.46	9.25	6.50
14	Soybean	Kharif	9.91	9.96	12.74	12.21	14.67	11.86	10.37	8.57	13.16	10.93	13.74
15	Sunflower	Kharif	0.36	0.21	0.19	0.15	0.19	0.15	0.11	0.07	0.10	0.08	0.09
		Rabi	0.80	0.64	0.46	0.37	0.36	0.35	0.32	0.23	0.15	0.14	0.11
		Total	1.16	0.85	0.65	0.52	0.54	0.50	0.43	0.30	0.25	0.22	0.20
16	Sesamum	Kharif	0.64	0.59	0.89	0.81	0.69	0.71	0.83	0.85	0.75	0.76	0.75
17	Nigerseed	Kharif	0.12	0.10	0.11	0.10	0.10	0.10	0.08	0.07	0.09	0.07	0.06
18	Rapeseed/ Mustard	Rabi	7.20	6.61	8.18	6.60	8.03	7.88	6.28	6.80	7.92	8.43	8.78
19	Safflower	Rabi	0.19	0.18	0.15	0.15	0.11	0.11	0.09	0.05	0.09	0.06	0.02
	Nine Oilseeds	Kharif	17.81	15.73	21.92	20.69	20.79	22.62	19.22	16.70	21.53	21.01	20.99
		Rabi	9.91	9.15	10.56	9.11	10.15	10.13	8.29	8.55	9.75	10.45	10.43
		Total	27.72	24.88	32.48	29.80	30.94	32.75	27.51	25.25	31.28	31.46	31.42
20	Cotton\$		29.00	30.50	33.90	36.70	37.00	39.80	38.60	33.20			
	Cotton\$\$		22.28	24.02	33.00	35.20	34.22	35.90	34.81	30.01	32.58	32.81	27.59
	Jute#		9.63	11.23	10.01	10.74	10.34	11.08	10.62	9.94	10.43	9.59	9.38
	Mesta#		0.73	0.59	0.61	0.66	0.59	0.61	0.51	0.58	0.53	0.44	0.42
21	Jute & Mesta#		10.37	11.82	10.62	11.40	10.93	11.69	11.13	10.52	10.96	10.03	9.79
22	Sugarcane		285.03	292.30	342.38	361.04	341.20	352.14	362.33	348.45	306.07	379.90	400.37

Note: \* Third Advance Estimates (2018-19)

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

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

# : Million bales of 180 kgs each

Source : Directorate of Economics & Statistics, Ministry of Agriculture & Farmers Welfare



**Annex Table 1.3: All India Estimates of Yield of Agricultural Commodities**

(Kgs per hectare)

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	2469	2568
		Rabi	3019	3064	3185	3238	3353	3232	3291	3382	3230	3531	3416
		Total	2178	2125	2239	2393	2462	2416	2391	2400	2494	2576	2647
2	Wheat	Rabi	2907	2839	2989	3177	3117	3145	2750	3034	3200	3368	3424
3	Barley	Rabi	2394	2172	2357	2516	2521	2718	2280	2439	2663	2695	2617
4	Jowar	Kharif	1055	853	1119	1257	1171	1050	1014	849	954	1104	1134
		Rabi	904	865	827	741	644	896	808	615	730	853	773
		Total	962	860	949	957	850	957	884	697	812	956	913
5	Bajra	Kharif	1015	731	1079	1171	1198	1184	1255	1132	1305	1231	1236
6	Maize	Kharif	2048	1740	2285	2234	2246	2346	2249	2236	2413	2706	2725
		Rabi	4387	3694	4003	3765	4152	4050	4414	4006	3896	4436	5102
		Total	2414	2024	2540	2478	2566	2676	2632	2563	2689	3065	3098
7	Ragi	Kharif	1477	1489	1705	1641	1396	1661	1706	1601	1363	1662	1358
	Nutri/Coarse Cereals	Kharif	1371	1119	1500	1563	1583	1619	1633	1544	1708	1818	1867
		Rabi	1735	1525	1641	1689	1725	2034	1915	1686	1885	2323	2381
		Total	1459	1212	1531	1590	1617	1717	1703	1579	1750	1934	1973
	Cereals	Kharif	1841	1693	1893	2056	2116	2089	2081	2065	2188	2259	2354
		Rabi	2721	2649	2800	2969	2931	2995	2681	2862	3010	3239	3299
		Total	2183	2075	2256	2415	2449	2462	2331	2393	2525	2657	2733
8	Tur (Arhar)	Kharif	671	711	655	662	776	813	729	646	913	967	739
9	Moong	Kharif	348	180	538	475	398	410	428	363	488	440	473
		Rabi	423	397	354	508	539	620	640	554	546	600	637
		Total	364	226	514	483	436	475	498	416	500	477	502
10	Urad	Kharif	419	363	557	523	586	490	516	459	626	632	641
		Rabi	506	587	489	621	679	768	891	773	656	798	753
		Total	440	418	542	549	606	555	604	537	632	662	662
11	Gram	Rabi	895	915	895	928	1036	960	889	840	974	1078	1078
12	Lentil (Masur)	Rabi	693	697	591	678	797	758	-			1047	1036
	Pulses	Kharif	478	397	578	541	594	580	573	489	667	668	595
		Rabi	804	823	790	831	934	891	842	796	898	1015	1007
		Total	659	630	691	699	789	763	728	656	786	853	803
	Foodgrains	Kharif	1654	1496	1669	1821	1892	1864	1862	1808	1890	1951	2001
		Rabi	2264	2203	2279	2430	2431	2435	2232	2342	2441	2603	2665
		Total	1909	1798	1930	2078	2129	2120	2028	2042	2129	2235	2283
13	Groundnut	Kharif	1063	835	1335	1188	811	1735	1478	1399	1321	1834	1245
		Rabi	1764	1830	1846	1938	1908	1926	1948	1801	1861	2222	2197
		Total	1163	991	1411	1323	994	1764	1552	1465	1398	1893	1368
14	Soybean	Kharif	1041	1024	1327	1208	1353	1012	951	738	1177	1058	1218
15	Sunflower	Kharif	540	378	608	566	622	621	512	420	567	627	817
		Rabi	696	700	748	783	674	826	866	698	737	924	878
		Total	639	576	701	706	655	750	736	608	660	782	849
16	Sesamum	Kharif	354	303	429	426	402	426	474	436	448	478	469
17	Nigerseed	Kharif	297	266	290	269	325	328	328	295	332	321	330
18	Rapeseed/ Mustard	Rabi	1143	1183	1185	1121	1262	1185	1083	1183	1304	1410	1414
19	Safflower	Rabi	642	621	617	580	591	638	515	416	567	673	510
	Nine Oilseeds	Kharif	961	875	1203	1123	1135	1151	1054	884	1153	1219	1161
		Rabi	1097	1146	1174	1155	1244	1207	1126	1186	1300	1436	1430
		Total	1006	958	1193	1133	1168	1168	1075	968	1195	1284	1239
20	Cotton \$		524	512	513	496	525	566	504	415	512	443	372
	Cotton\$\$		403	403	499	491	486	510	462				
	Jute		2207	2492	2329	2389	2396	2639	2549	2457	2660	2517	2509
	Mesta		1141	1122	1115	1248	1237	1338	1525	1945	1664	1420	1544
21	Jute & Mesta		2071	2349	2192	2268	2281	2512	2473	2421	2585	2435	2445
22	Sugarcane		64553	70020	70091	71667	68254	70520	71512	70720	69001	80198	78033

Note: \* Third Advance Estimates (2018-19)

\$ : CAB estimates

\$\$ : DES estimates

Source : Directorate of Economics & Statistics, Ministry of Agriculture & Farmers Welfare



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

Wheat		Barley		Gram		Lentil		R&M		Safflower	
States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)	States	Share (%)
UP	31.4	Raj	47.0	MP	41.3	MP	40.1	Raj	44.3	MH	46.8
Pun	17.4	UP	25.8	Raj	15.1	UP	30.2	Har	12.2	Kar	35.7
MP	17.1	MP	16.0	MH	14.7	Bih	10.0	MP	11.9	MP	9.7
Har	11.3	Har	3.8	Kar	6.4	WB	9.3	UP	11.1	TG	3.9
Raj	9.3	Pun	2.0	UP	6.2	JH	3.8	WB	7.7	WB	1.1
Bih	5.8	HP	2.0	AP	4.9	Raj	3.4	Guj	4.2	JH	1.0
Guj	2.9	UK	1.6	CG	3.2	ASM	1.3	JH	2.3	Others *	1.8
MH	1.4	Others *	1.9	Guj	2.5	Others *	1.9	ASM	2.3		
Others *	3.4			JH	2.4			Bih	1.2		
				TG	1.3			Others *	2.8		
				Others *	1.8						

Note: \* States having less than 1 percent share in total production has been clubbed as others  
Source: Calculated from DES, MoA&FW data

**Annex Table 2.1: Procurement and Procurement as Percent of Production of Wheat in Major Wheat Producing States**

	2009-10		2010-11		2011-12		2012-13		2013-14	
State	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production
Punjab	10.21	67.30	10.96	66.53	12.83	74.27	10.90	65.68	11.64	66.07
Haryana	6.35	60.45	6.93	59.57	8.67	68.31	5.87	52.83	6.50	55.04
MP	3.54	42.07	4.97	65.10	8.49	73.61	6.36	48.39	7.09	54.83
Rajasthan	0.48	6.34	1.30	18.06	1.96	21.07	1.27	13.67	2.16	24.92
UP	1.65	5.98	3.46	11.54	5.06	16.71	0.68	2.25	0.63	2.10
Bihar	0.18	4.01	0.56	13.59	0.77	16.34	0.00	0.00	0.00	0.00
All India	22.51	27.86	28.34	32.62	38.15	40.21	25.09	26.83	28.02	29.24

	2014-15		2015-16		2016-17		2017-18		2018-19	
State	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production	Procurement (Million tonnes)	Procurement as % of Production
Punjab	10.34	68.73	10.65	66.24	11.71	71.20	12.69	71.18	12.91	72.62
Haryana	6.78	65.46	6.75	59.48	7.43	64.36	8.78	81.60	9.32	79.97
MP	7.31	42.73	3.99	22.57	6.73	37.49	7.31	45.96	6.73	38.76
Rajasthan	1.30	13.23	0.76	7.72	1.25	13.86	1.53	16.35	1.40	14.57
UP	2.27	10.11	0.80	3.13	3.70	12.31	5.29	16.61	3.64	11.30
Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.29	0.00	0.05
All India	28.09	32.46	22.96	24.88	30.83	31.29	35.80	35.84	34.06	33.65

Source: DFPD and DES, MoA&FW



**Annex Table 3.1: Production of Breeder, Foundation and Certified Seeds**

Year	Breeder Seeds	Foundation Seeds	Certified/Quality Seeds
2013-14	8229	174307	3473130
2014-15	8621	157616	3517664
2015-16	9036	149542	3435248
2016-17	11072	220907	3802904
2017-18	11233	195415	4194111

Source: MoA&FW





**Annex Table 3.2: State-wise N,P and K Fertilizers Consumption ratio**

States	2015-16	2016-17	2017-18
Bihar	10.6:3.0:1	5.3:1.9:1	6.1:2.4:1
Haryana	49.4:12.3:1	26.5:6.8:1	35.5:8.7:1
Punjab	19.7:6.6:1	53.9:15.7:1	45.7:10.8:1
Uttar Pradesh	12.0:4.6:1	13.5:5.8:1	14.2:6.9:1
Andhra Pradesh	5.3:2.7:1	4.0:1.9:1	4.2:1.9:1
Telangana	8.9:3.4:1	5.7:2.0:1	6.8:2.6:1
Karnataka	3.9:2.0:1	2.8:1.9:1	3.4:1.8:1
Madhya Pradesh	20.4:8.5:1	17.2:7.4:1	17.8:7.6:1
Rajasthan	76.4:20.3:1	88.9:23.6:1	47.2:14.5:1
All India	7.1:2.8:1	6.5:2.7:1	6.3:2.7:1

Source: FAI



**Annex Table 3.3 : Simulation-Impact of Oil Content on MSP of R&M**

S. N.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from oil cake on processing of 1 quintal of oilseeds, assuming price of cake/q= Rs. 1850 {col(3)*Price of Oil cake}/100	Cost of Oil Content i.e. oilseeds without cake (Rs/ qtl.), assuming MSP/ qtl.= 4425 MSP-Col(4)	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (Rs/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)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	35.00	65.00	1203	3223	23.02	4425
2	35.25	64.75	1198	3227	22.89	4448
3	35.50	64.50	1193	3232	22.76	4471
4	35.75	64.25	1189	3236	22.63	4494
5	36.00	64.00	1184	3241	22.51	4516
6	36.25	63.75	1179	3246	22.38	4539
7	36.50	63.50	1175	3250	22.26	4561
8	36.75	63.25	1170	3255	22.14	4583
9	37.00	63.00	1166	3260	22.02	4606
10	37.25	62.75	1161	3264	21.91	4628
11	37.50	62.50	1156	3269	21.79	4650
12	37.75	62.25	1152	3273	21.68	4671
13	38.00	62.00	1147	3278	21.57	4693
14	38.25	61.75	1142	3283	21.46	4715
15	38.50	61.50	1138	3287	21.35	4736
16	38.75	61.25	1133	3292	21.24	4757
17	39.00	61.00	1129	3297	21.13	4779
18	39.25	60.75	1124	3301	21.03	4800
19	39.50	60.50	1119	3306	20.92	4821
20	39.75	60.25	1115	3310	20.82	4842
21	40.00	60.00	1110	3315	20.72	4862
22	40.25	59.75	1105	3320	20.62	4883
23	40.50	59.50	1101	3324	20.52	4904
24	40.75	59.25	1096	3329	20.42	4924
25	41.00	59.00	1092	3334	20.33	4945
26	41.25	58.75	1087	3338	20.23	4965

Cont..

**Annex Table 3.3 : Simulation-Impact of Oil Content on MSP of R&M**

S. N.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from oil cake on processing of 1 quintal of oilseeds, assuming price of cake/q= Rs. 1850 {col(3)*Price of Oil cake}/100	Cost of Oil Content i.e. oilseeds without cake (Rs/ qtl.), assuming MSP/qtl.= 4425 MSP-Col(4)	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (Rs/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)
27	41.50	58.50	1082	3343	20.14	4985
28	41.75	58.25	1078	3347	20.04	5005
29	42.00	58.00	1073	3352	19.95	5026
30	42.25	57.75	1068	3357	19.86	5045
31	42.50	57.50	1064	3361	19.77	5065
32	42.75	57.25	1059	3366	19.68	5085
33	43.00	57.00	1055	3371	19.60	5105
34	43.25	56.75	1050	3375	19.51	5124
35	43.50	56.50	1045	3380	19.42	5144
36	43.75	56.25	1041	3384	19.34	5163
37	44.00	56.00	1036	3389	19.26	5183
38	44.25	55.75	1031	3394	19.17	5202
39	44.50	55.50	1027	3398	19.09	5221
40	44.75	55.25	1022	3403	19.01	5240
41	45.00	55.00	1018	3408	18.93	5259
42	45.25	54.75	1013	3412	18.85	5278
43	45.50	54.50	1008	3417	18.77	5297
44	45.75	54.25	1004	3421	18.70	5316
45	46.00	54.00	999	3426	18.62	5334
46	46.25	53.75	994	3431	18.54	5353
47	46.50	53.50	990	3435	18.47	5372
48	46.75	53.25	985	3440	18.40	5390
49	47.00	53.00	981	3445	18.32	5408
50	47.25	52.75	976	3449	18.25	5427
51	47.50	52.50	971	3454	18.18	5445
52	47.75	52.25	967	3458	18.11	5463
53	48.00	52.00	962	3463	18.04	5481
Average increase in MSP with 0.25 percent increase in oil content					20.27	



**Annex Table 4.1: India's Agricultural Exports of Major Commodities**

(Value in ₹ Crore)

Commodity	2017-18	2018-19	% increase/decrease over previous year	% Share in Total Export
Rice	50308	53990	7.3	19.0
Marine Products	47646	47663	0.0	16.8
Meat & Processed Meat	26896	25987	-3.4	9.2
Spices	20085	23218	15.6	8.2
Cotton (Raw)	12200	14628	19.9	5.2
Oil Meal	7043	10577	50.2	3.7
Sugar	5226	9519	82.2	3.4
Oilseeds	7573	8082	6.7	2.9
Coffee	6245	5722	-8.4	2.0
Fresh Vegetables	5298	5668	7.0	2.0
Fresh Fruits	4913	5529	12.5	2.0
Guargum Meal	4170	4707	12.9	1.7
Cashew	5945	4579	-23.0	1.6
Processed Fruits & Juices	4169	4481	7.5	1.6
Others	51014	59116	15.9	20.9
<b>Total</b>	<b>258731</b>	<b>283466</b>	<b>9.6</b>	<b>100.0</b>

Source: Directorate General of Commercial Intelligence and Statistics



**Annex Table 4.2: India's Agricultural Imports of Major Commodities**

(Value in ₹ Crore)

Commodity	2017-18	2018-19	% increase/ decrease over previous year	% Share in Total Import
Vegetable Oils	74996	69024	-8.0	42.6
Wood & Wood Products	17565	17955	2.2	11.1
Fresh Fruits	12525	13932	11.2	8.6
Cashew	9134	11162	22.2	6.9
Pulses	18749	8035	-57.1	5.0
Spices	6385	7911	23.9	4.9
Natural Rubber	5344	6128	14.7	3.8
Cotton Raw including Waste	6307	4383	-30.5	2.7
Sugar	6036	3175	-47.4	2.0
Wheat	2358	5	-99.8	0.0
Others	16244	16364	0.7	10.1
<b>Total</b>	<b>175762</b>	<b>161842</b>	<b>-7.9</b>	<b>100.0</b>

Source: Directorate General of Commercial Intelligence and Statistics



**Annex Table 4.3: Quarterly Domestic and International Prices of Rabi Crops**

(₹/qtl)

Quarter	Wheat		Barley		Gram		Lentil		R&M Oilseed		R&M Oil	
	D	I	D	I	D	I	D	I	D	I	D	I
2014 Q1	1628	1630	1265	800	2722	3202	4283	4211	3207	3332	6833	6069
2014 Q2	1537	1577	1209	824	2679	3239	4536	4464	3121	3242	6546	5776
2014 Q3	1577	1296	1325	789	2546	3303	4394	4618	3367	2575	6872	5276
2014 Q4	1569	1483	1401	947	2659	3162	4498	4717	3572	2597	7089	5023
2015 Q1	1579	1390	1336	1175	3157	3666	5159	5364	3493	2529	7090	4716
2015 Q2	1510	1302	1209	1276	3986	4412	5816	6330	3854	2713	7873	4897
2015 Q3	1545	1276	1279	1300	4416	4782	6459	6583	4137	2692	8493	4996
2015 Q4	1603	1322	1396	1234	4576	5108	6558	5813	4492	2735	9577	5296
2016 Q1	1627	1282	1425	1236	4251	4480	6364	4860	3875	2669	7902	5234
2016 Q2	1630	1270	1524	1157	5751	6115	6243	5840	4032	2776	8355	5376
2016 Q3	1687	1080	1606	957	7705	8220	6090	5761	4208	2761	8884	5432
2016 Q4	1817	1108	1636	918	8553	9727	5529	5088	4072	2924	8364	6098
2017 Q1	1737	1186	1615	620	5645	5705	5037	4359	3667	2980	7557	5911
2017 Q2	1691	1140	1491	607	5190	5704	4651	3852	3406	2722	7116	5331
2017 Q3	1683	1182	1507	615	5097	5581	4296	3586	3556	2737	7456	5587
2017 Q4	1704	1133	1501	700	4334	4818	4104	3548	3592	2789	7716	5820
2018 Q1	1724	1219	1430	819	3691	3823	3791	3622	3647	2742	7640	5309
2018 Q2	1607	1373	1447	877	3418	3500	3716	3820	3504	2756	7834	5410
2018 Q3	1686	1463	1507	882	3682	4024	3771	3923	3282	3014	8499	5915
2018 Q4	1747	1533	1660	861	3938	4392	3796	4062	3401	3084	8288	6165
2019 Q1	1763	1499	1755	842	4012	4149	4073	4195	3609	2952	7961	5775
2019 Q2	1586	1380	1638	991	4160	4379	4331	4133	3110	2848	7636	5627

Note: D: Domestic and I: International

Sources: DES, Ministry of Agricultural & Farmers Welfare, Agriwatch, Solvent Extractors Association of India, United States Department of Agriculture and World Bank.

**Annex Table 4.4: Share of Soft Oils and Palm Oil in India's Import of Edible Oil**

(percent)

Year (Nov-Oct)	Soft Oils	Palm Oil
2010-11	22	78
2011-12	23	77
2012-13	20	80
2013-14	32	68
2014-15	34	66
2015-16	42	58
2016-17	38	62
2017-18	40	60
2018-19*	36	64

Note: \* November, 2018 to July, 2019

Source: Solvent Extractors Association of India



**Annex Table 5.1: State-wise Average Gross Returns of Rabi Crops, TE2017-18**

Crop/State	Cost A <sub>2</sub>	Cost A <sub>2</sub> +FL	GVO	Gross Returns over CoC A <sub>2</sub>		Gross Returns over CoC A <sub>2</sub> +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)
<b>Wheat</b>							
Bihar	23714	29707	54937	31224	132	25230	85
Gujarat	26273	32003	59846	33574	128	27843	87
Haryana	28278	35786	90845	62567	221	55059	154
Himachal Pradesh	16037	26917	34499	18462	115	7582	28
Jharkhand	19092	25178	35799	16706	88	10621	42
Maharashtra	32698	40929	48172	15474	47	7243	18
Madhya Pradesh	22846	29389	65352	42507	186	35964	122
Punjab	28085	31233	88802	60717	216	57569	184
Rajasthan	26078	42638	81733	55655	213	39095	92
Uttarakhand	23753	32148	60277	36524	154	28128	87
Uttar Pradesh	29609	37210	68029	38420	130	30819	83
<b>ALL-INDIA</b>	<b>26920</b>	<b>34549</b>	<b>70272</b>	<b>43352</b>	<b>161</b>	<b>35723</b>	<b>103</b>
<b>Barley</b>							
Rajasthan	21559	39326	68378	46819	217	29052	74
Uttar Pradesh	20934	26909	53623	32689	156	26713	99
<b>ALL-INDIA</b>	<b>21350</b>	<b>35062</b>	<b>63364</b>	<b>42015</b>	<b>197</b>	<b>28303</b>	<b>81</b>
<b>Gram</b>							
Andhra Pradesh	31888	34799	54407	22519	71	19608	56
Chhattisgarh	18337	22826	38851	20514	112	16025	70
Karnataka	20264	22472	33992	13728	68	11520	51
Maharashtra	29861	34392	52842	22981	77	18450	54
Madhya Pradesh	22990	27659	63814	40824	178	36155	131
Rajasthan	15577	25324	51279	35702	229	25954	102
Uttar Pradesh	21145	27869	51270	30125	142	23400	84
<b>ALL-INDIA</b>	<b>22831</b>	<b>27923</b>	<b>53899</b>	<b>31067</b>	<b>136</b>	<b>25976</b>	<b>93</b>

(contd..)



**Annex Table 5.1: State-wise Average Gross Returns of Rabi Crops, TE2017-18**

Crop/State	Cost A <sub>2</sub>	Cost A <sub>2</sub> +FL	GVO	Gross Returns over CoC A <sub>2</sub>		Gross Returns over CoC A <sub>2</sub> +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)
<b>Lentil</b>							
Bihar	13217	16921	50504	37288	282	33583	198
Madhya Pradesh	16030	19616	46881	30850	192	27264	139
Uttar Pradesh	16324	22952	38041	21717	133	15089	66
West Bengal	21448	28114	56976	35529	166	28862	103
<b>ALL-INDIA</b>	<b>16169</b>	<b>21042</b>	<b>45146</b>	<b>28976</b>	<b>179</b>	<b>24104</b>	<b>115</b>
<b>Rapeseed/Mustard</b>							
Assam	15925	27884	28508	12582	79	624	2
Bihar	15183	20452	43521	28338	187	23069	113
Gujarat	23967	30665	54297	30330	127	23632	77
Haryana	19287	25963	69934	50647	263	43971	169
Madhya Pradesh	15730	22729	61162	45432	289	38433	169
Rajasthan	17588	29873	62142	44554	253	32269	108
Uttar Pradesh	20117	29440	52579	32462	161	23138	79
West Bengal	23104	34726	47137	24033	104	12411	36
<b>ALL-INDIA</b>	<b>18371</b>	<b>28712</b>	<b>57878</b>	<b>39507</b>	<b>215</b>	<b>29166</b>	<b>102</b>
<b>Safflower</b>							
Karnataka	14188	15428	23211	9023	64	7783	50
Maharashtra	18564	22934	19112	548	3	-3822	-17
<b>ALL-INDIA</b>	<b>16855</b>	<b>20062</b>	<b>20728</b>	<b>3873</b>	<b>23</b>	<b>666</b>	<b>3</b>

Note: Average Gross Returns of safflower are for 2015-16 and 2017-18.

Source: CACP using CS data.



## Annex Tables

**Annex Table 5.2: Month-wise and State-wise Average Daily Wage Rates for Agricultural Labour (Man)**

(₹/Day)

Year/Month	AP	Asm	Bih	Guj	Har	HP	Kar	Ker	MP	MH	Odi	Pun	Raj	TN	UP	WB	All-India
<b>2015</b>																	
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
<b>2016</b>																	
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..)

**Annex Table 5.2: Month-wise and State-wise Average Daily Wage Rates for Agricultural Labour (Man)**

(₹/Day)

Year/Month	AP	Asm	Bih	Guj	Har	HP	Kar	Ker	MP	MH	Odi	Pun	Raj	TN	UP	WB	All-India
<b>2017</b>																	
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
<b>2018</b>																	
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
December	321	277	276	242	376	421	343	735	213	280	232	350	308	469	256	284	298
<b>2019</b>																	
January	333	279	280	244	380	421	342	737	214	281	231	348	296	469	257	287	299
February	336	277	283	244	388	421	342	737	214	282	232	355	295	476	259	287	300
March	338	277	283	244	387	439	341	737	217	283	229	350	302	479	259	288	302
April	339	274	282	244	387	439	341	737	217	282	229	351	300	479	259	288	301

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 Tables



## Annex Tables

**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
<b>2012</b>								
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
<b>2013</b>								
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

Cont...





**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
<b>2014</b>								
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
<b>2015</b>								
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

Cont...

## Annex Tables



## Annex Tables

**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
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
<b>2016</b>								
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
<b>2017</b>								
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

Cont...

**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
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
<b>2018</b>								
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	123.4	109.3	117.5	130.2	159.4	130.5	121.0
December	93.9	123.6	110.7	117.6	130.2	159.6	131.0	119.7
<b>2019</b>								
January	91.2	122.7	110.7	117.7	130.2	160.9	132.7	122.5
February	94.8	123.0	108.2	117.2	130.2	162.3	136.3	123.5
March	96.7	122.9	110.7	117.7	130.2	161.8	138.1	124.2
April	95.5	122.7	107.3	117.7	130.2	165.5	139.2	122.9

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

## Annex Tables



**Annex Table 5.4: State-wise Projected Cost of Production for Rabi Crop Season 2019-20 and Production Shares**

States	Cost of Production (₹/qtl)			Shares in Production(%)
	A <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>	
Wheat				
Bihar	788	1,024	1,452	5.8
Gujarat	967	1,168	1,504	2.9
Haryana	650	824	1,461	11.5
Himachal Pradesh	937	1,563	2,163	0.6
Jharkhand	823	1,212	1,681	0.4
Madhya Pradesh	699	897	1,314	17.3
Maharashtra	1,429	1,846	2,408	1.5
Punjab	621	690	1,238	17.6
Rajasthan	587	956	1,354	9.5
Uttar Pradesh	790	992	1,521	31.9
Uttarakhand	723	968	1,429	0.9
All India Wtd. Avg.	724	923	1,425	
Barley				
Rajasthan	501	908	1,254	64.6
Uttar Pradesh	738	939	1,517	35.4
All India Wtd. Avg.	585	919	1,347	
Gram				
Andhra Pradesh	3,211	3,503	5,033	5.3
Chhattisgarh	1,798	2,645	3,734	3.5
Karnataka	2,918	3,223	4,297	7.0
Madhya Pradesh	2,121	2,551	3,726	45.0
Maharashtra	2,782	3,182	4,369	16.0
Rajasthan	1,504	2,432	3,553	16.4
Uttar Pradesh	2,700	3,548	5,390	6.8
All India Wtd. Avg.	2,267	2,801	4,023	
Lentil				
Bihar	1,481	2,054	3,284	11.1
Madhya Pradesh	1,943	2,401	3,673	44.8
Uttar Pradesh	2,323	3,370	5,543	33.7
West Bengal	2,081	2,768	3,928	10.4
All India Wtd. Avg.	2,034	2,727	4,286	
Rapeseed & Mustard				
Assam	2,513	4,408	5,366	2.4
Bihar	1,503	2,012	3,143	1.2
Gujarat	1,758	2,245	3,034	4.4
Haryana	1,346	1,879	3,333	12.8
Madhya Pradesh	1,120	1,556	2,576	12.6
Rajasthan	1,416	2,393	3,401	46.7
Uttar Pradesh	1,672	2,443	3,654	11.7
West Bengal	2,072	3,117	4,084	8.1
All India Wtd. Avg.	1,495	2,323	3,401	
Safflower				
Karnataka	1,953	2,129	3,565	43.2
Maharashtra	3,711	4,491	5,376	56.8
All India Wtd. Avg.	2,951	3,470	4,593	

*Note: Production share are related to production of projected States only.  
Source: CACP Calculations.*



**Annex Table 5.5(a): Wheat : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Bihar		Chattisgarh	Gujarat		Haryana		Himachal Pradesh	
	2016-17	2017-18	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	28427.7	28471.3	28471.3	31598.8	29706.2	35609.80	34040.2	24702.2	23098.1
<b>Human Labour</b>									
Casual	4731.1	5034.1	1899.9	3303.4	4018.9	4422.0	2670.4	641.9	368.7
Attached	37.7	2.4	39.0	16.6	105.0	236.9	203.7	66.1	0.0
Family	5884.8	6257.7	5731.3	5872.8	5903.9	7879.8	7151.8	11046.9	10803.7
<b>Total</b>	<b>10653.6</b>	<b>11294.2</b>	<b>7670.3</b>	<b>9192.8</b>	<b>10027.9</b>	<b>12538.7</b>	<b>10025.9</b>	<b>11754.9</b>	<b>11172.5</b>
<b>Bullock Labour</b>									
Hired	0.0	0.0	27.0	61.3	169.3	0.0	0.0	350.0	195.3
Owned	38.8	10.6	2389.4	176.6	226.2	35.5	0.0	872.2	3064.1
<b>Total</b>	<b>38.8</b>	<b>10.6</b>	<b>2416.5</b>	<b>238.0</b>	<b>395.5</b>	<b>35.5</b>	<b>0.0</b>	<b>1222.2</b>	<b>3259.4</b>
<b>Machine Labour</b>									
Hired	5758.3	6238.4	4100.2	7024.6	5518.2	8378.2	8423.2	4904.4	6403.5
Owned	45.4	90.1	854.4	783.0	599.5	1282.0	1755.6	226.3	609.5
<b>Total</b>	<b>5803.7</b>	<b>6328.5</b>	<b>4954.7</b>	<b>7807.6</b>	<b>6117.6</b>	<b>9660.2</b>	<b>10178.8</b>	<b>5130.7</b>	<b>7013.0</b>
Seed	3161.7	3314.4	2542.6	4386.0	3935.1	2460.6	2591.5	1915.5	2027.6
<b>Fertilisers and Manure</b>									
Fertilisers	3965.1	4237.2	2167.3	4271.7	3996.6	4190.4	4394.4	1197.2	1600.2
Manure	84.9	8.0	0.0	62.5	207.4	0.0	0.7	2873.5	3581.7
<b>Total</b>	<b>4049.9</b>	<b>4245.2</b>	<b>2167.3</b>	<b>4334.2</b>	<b>4204.0</b>	<b>4190.4</b>	<b>4395.1</b>	<b>4070.7</b>	<b>5181.9</b>
<b>Other Inputs</b>									
Insecticides	36.1	60.6	200.1	422.2	388.8	991.0	1532.7	90.7	195.6
Irrigation charges	4000.9	4110.2	2982.5	4438.6	5072.4	4852.5	4609.8	103.7	588.3
Interest on working capital	683.1	722.1	545.8	779.6	757.5	840.3	818.7	413.8	582.9
Miscellaneous	0.0	1.5	0.0	0.0	3.4	40.6	16.2	0.0	15.5
Crop insurance	-	-	262.3	-	-	-	-	-	1.5
Fixed Cost	15535.0	19568.9	17047.5	12669.1	13724.4	34432.5	38294.0	12916.0	17424.0
Rental value of owned land	12529.1	14777.5	6383.9	9909.4	8846.4	27763.9	27085.9	7722.9	9755.0
Rent paid for leased-in land	0.0	0.0	0.0	530.8	1051.2	105.2	0.0	28.5	210.1
Depreciation on implements & Farm buildings	505.6	861.3	1438.2	136.4	337.3	626.4	2011.1	761.1	1123.6
Interest on fixed capital	2432.0	3814.4	9224.3	2085.6	3481.6	5937.0	9197.1	4394.4	6325.6
<b>Total Cost</b>	<b>43962.7</b>	<b>49656.2</b>	<b>40789.3</b>	<b>44267.9</b>	<b>44626.6</b>	<b>70042.3</b>	<b>72462.8</b>	<b>37618.1</b>	<b>47462.2</b>
<b>Yield (Qtl/ha)</b>	<b>31.8</b>	<b>30.9</b>	<b>16.6</b>	<b>33.4</b>	<b>29.4</b>	<b>49.3</b>	<b>46.9</b>	<b>15.2</b>	<b>19.5</b>
<b>A2+FL/Qtl</b>	<b>748.7</b>	<b>797.4</b>	<b>1305.4</b>	<b>886.4</b>	<b>983.1</b>	<b>619.3</b>	<b>679.7</b>	<b>1246.9</b>	<b>1172.3</b>
<b>C2/Qtl</b>	<b>1135.4</b>	<b>1274.6</b>	<b>2114.8</b>	<b>1207.4</b>	<b>1358.3</b>	<b>1192.1</b>	<b>1341.4</b>	<b>1837.8</b>	<b>1773.0</b>

Source: Directorate of Economics and Statistics.

(Contd..)



**Annex Table 5.5(a): Wheat : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Jharkhand		Karnataka		Madhya Pradesh		Maharashtra		Punjab	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	21261.7	19375.7	14049.8	22497.9	28918.9	26334.3	43111.2	39183.9	25658.6	24832.9
<b>Human Labour</b>										
Casual	3689.7	4644.9	2238.5	3051.2	3054.5	3365.4	4669.9	3924.8	2104.5	1865.1
Attached	0.0	0.0	0.0	0.3	186.0	121.2	1259.2	408.2	692.1	597.0
Family	3243.1	11010.7	2025.5	2629.1	7113.6	6683.1	8051.1	7410.5	3491.1	2930.2
<b>Total</b>	<b>6932.8</b>	<b>15655.6</b>	<b>4264.0</b>	<b>5680.6</b>	<b>10354.1</b>	<b>10169.6</b>	<b>13980.2</b>	<b>11743.5</b>	<b>6287.7</b>	<b>5392.3</b>
<b>Bullock Labour</b>										
Hired	0.0	0.0	308.2	584.0	39.6	10.8	935.3	321.9	0.0	6.1
Owned	138.3	2860.5	3150.4	3566.1	479.5	515.6	1885.4	1928.2	48.9	22.2
<b>Total</b>	<b>138.3</b>	<b>2860.5</b>	<b>3458.6</b>	<b>4150.2</b>	<b>519.1</b>	<b>526.5</b>	<b>2820.7</b>	<b>2250.1</b>	<b>48.9</b>	<b>28.3</b>
<b>Machine Labour</b>										
Hired	4738.1	2967.4	2476.1	4941.5	6761.9	7417.0	7355.0	8210.8	6708.3	7322.0
Owned	0.0	304.1	140.0	1491.0	510.7	404.3	1252.9	661.3	2711.6	2630.8
<b>Total</b>	<b>4738.1</b>	<b>3271.5</b>	<b>2616.2</b>	<b>6432.5</b>	<b>7272.6</b>	<b>7821.2</b>	<b>8607.9</b>	<b>8872.1</b>	<b>9419.9</b>	<b>9952.8</b>
Seed	2867.2	3285.2	2097.9	2584.9	2869.9	2930.7	3844.2	3780.0	2162.1	2550.8
<b>Fertilisers and Manure</b>										
Fertilisers	3493.1	2464.0	755.1	4225.2	3085.0	2976.3	4864.1	4248.7	4829.2	5259.7
Manure	2.5	488.6	0.0	0.0	0.0	0.0	16.2	0.0	7.7	46.5
<b>Total</b>	<b>3495.6</b>	<b>2952.6</b>	<b>755.1</b>	<b>4225.2</b>	<b>3085.0</b>	<b>2976.3</b>	<b>4880.3</b>	<b>4248.7</b>	<b>4836.9</b>	<b>5306.2</b>
<b>Other Inputs</b>										
Insecticides		0.0	0.0	8.4	35.8	91.6	224.4	385.1	1572.9	1841.5
Irrigation charges		4295.6	493.6	225.9	3916.8	5264.8	7691.2	6547.2	584.8	660.7
Interest on working capital		666.0	364.4	648.4	660.8	729.3	1062.4	952.1	671.7	714.6
Miscellaneous		0.9	0.0	70.8	204.9	229.6	0.0	51.8	73.7	66.3
Crop insurance		-	-	-	-	9.3	-	-	-	-
Fixed Cost	7681.5	21492.3	6081.6	11213.4	17531.1	18829.3	14618.1	17146.9	35314.9	39179.1
Rental value of owned land	6883.9	15314.4	4032.9	7411.7	13085.0	12978.8	8584.7	7418.1	25394.2	28444.6
Rent paid for leased-in land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5340.3	4920.8
Land revenue, cesses & taxes	19.0	52.5	7.3	9.0	4.2	4.3	18.8	19.9	0.0	0.0
Depreciation on implements & Farm buildings	386.1	842.3	75.7	667.7	561.2	1011.7	490.6	687.4	476.1	1043.2
Interest on fixed capital	392.6	5283.1	1965.8	3124.9	3880.7	4834.5	5524.0	9021.5	4104.2	4770.6
<b>Total Cost</b>	<b>28943.2</b>	<b>54480.1</b>	<b>20131.3</b>	<b>35240.2</b>	<b>46450.0</b>	<b>49578.0</b>	<b>57729.4</b>	<b>55977.3</b>	<b>60973.5</b>	<b>65692.6</b>
<b>Yield (Qtl/ha)</b>	<b>18.9</b>	<b>24.9</b>	<b>5.0</b>	<b>12.4</b>	<b>38.4</b>	<b>38.4</b>	<b>26.9</b>	<b>23.5</b>	<b>49.7</b>	<b>51.2</b>
<b>A2+FL/Qtl</b>	<b>987.6</b>	<b>1114.2</b>	<b>2662.8</b>	<b>1565.5</b>	<b>646.8</b>	<b>711.1</b>	<b>1578.2</b>	<b>1635.1</b>	<b>569.3</b>	<b>578.2</b>
<b>C2/Qtl</b>	<b>1318.9</b>	<b>1791.2</b>	<b>3710.6</b>	<b>2234.0</b>	<b>1018.3</b>	<b>1109.9</b>	<b>2088.5</b>	<b>2314.5</b>	<b>1102.6</b>	<b>1169.4</b>

Source: Directorate of Economics and Statistics.

(Contd..)

**Annex Table 5.5(a): Wheat : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Rajasthan		Uttar Pradesh		Uttarakhand		West Bengal	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	41069.4	45911.7	34600.4	37340.3	28662.7	35866.7	40106.0	36272.4
<b>Human Labour</b>								
Casual	3801.6	4421.0	3951.9	5104.8	1928.6	3934.4	11706.6	790.8
Attached	343.4	98.2	15.6	25.0	28.1	52.3	3.7	0.0
Family	16124.9	18891.4	7855.9	7215.8	8724.3	8933.0	7585.0	11219.5
<b>Total</b>	<b>20269.9</b>	<b>23410.6</b>	<b>11823.4</b>	<b>12345.6</b>	<b>10681.0</b>	<b>12919.7</b>	<b>19295.3</b>	<b>12010.3</b>
<b>Bullock Labour</b>								
Hired	43.1	15.4	0.0	0.0	194.9	9060.2	1839.5	0.0
Owned	362.2	572.2	145.7	28.3	6361.2	185.8	1420.5	0.0
<b>Total</b>	<b>405.2</b>	<b>587.6</b>	<b>145.7</b>	<b>28.3</b>	<b>6556.1</b>	<b>9246.0</b>	<b>3260.0</b>	<b>0.0</b>
<b>Machine Labour</b>								
Hired	5442.2	5751.1	6759.2	7932.4	3338.8	3491.5	3506.2	8754.7
Owned	656.1	1358.2	559.5	670.7	570.5	1563.0	6.2	0.0
<b>Total</b>	<b>6098.3</b>	<b>7109.3</b>	<b>7318.7</b>	<b>8603.1</b>	<b>3909.3</b>	<b>5054.5</b>	<b>3512.3</b>	<b>8754.7</b>
Seed	3862.9	3787.1	3667.7	3294.8	2608.5	2916.1	3886.4	4615.4
<b>Fertilisers and Manure</b>								
Fertilisers	3537.5	3077.2	4396.1	4211.5	1990.7	3460.1	4853.9	5612.2
Manure	598.7	520.0	12.0	11.0	817.6	0.0	361.5	1289.9
<b>Total</b>	<b>4136.2</b>	<b>3597.2</b>	<b>4408.1</b>	<b>4222.5</b>	<b>2808.3</b>	<b>3460.1</b>	<b>5215.4</b>	<b>6902.1</b>
<b>Other Inputs</b>								
Insecticides	181.9	172.9	43.8	112.9	171.3	223.9	1.9	0.0
Irrigation charges	5359.0	6417.8	6382.5	7820.0	1324.1	1230.3	3949.2	3230.8
Interest on working capital	755.9	818.8	810.4	912.9	604.2	816.2	985.5	759.2
Miscellaneous	0.0	10.4	0.0	0.2	0.0	0.0	0.0	0.0
Crop insurance	-	-	-	-	-	-	-	-
<b>Fixed Cost</b>	<b>20684.9</b>	<b>23460.9</b>	<b>24394.8</b>	<b>25130.9</b>	<b>19716.2</b>	<b>21792.2</b>	<b>11718.9</b>	<b>11507.5</b>
Rental value of owned land	13923.2	13969.1	17737.4	17793.8	17321.8	16733.2	8641.2	10893.4
Rent paid for leased-in land	497.9	7.5	1037.5	591.1	0.0	0.0	41.6	0.0
Land revenue, cesses & taxes	13.1	10.5	4.4	3.6	3.7	2.2	38.7	31.0
Depreciation on implements & Farm buildings	568.4	1052.7	881.3	1115.7	308.6	1572.3	617.9	332.5
Interest on fixed capital	5682.3	8421.2	4734.3	5626.7	2082.1	3484.5	2379.5	250.6
<b>Total Cost</b>	<b>61754.3</b>	<b>69372.6</b>	<b>58995.2</b>	<b>62471.2</b>	<b>48378.8</b>	<b>57658.9</b>	<b>51824.9</b>	<b>47779.9</b>
<b>Yield (Qtl/ha)</b>	<b>42.2</b>	<b>40.3</b>	<b>39.0</b>	<b>35.1</b>	<b>37.5</b>	<b>36.1</b>	<b>26.7</b>	<b>31.0</b>
<b>A2+FL/Qtl</b>	<b>803.5</b>	<b>923.8</b>	<b>779.5</b>	<b>915.2</b>	<b>656.5</b>	<b>930.0</b>	<b>1465.4</b>	<b>1181.8</b>
<b>C2/Qtl</b>	<b>1172.3</b>	<b>1364.1</b>	<b>1260.5</b>	<b>1464.2</b>	<b>1092.4</b>	<b>1432.2</b>	<b>1853.1</b>	<b>1541.3</b>

Source: Directorate of Economics and Statistics.



**Annex Table 5.5(b): Barley : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Himachal Pradesh	Rajasthan		Uttar Pradesh	
	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	40229.1	38752.8	43938.2	24933.5	31701.4
<b>Human Labour</b>					
Casual	0.0	1632.7	3341.3	4143.1	5578.0
Attached	0.0	0.0	497.6	0.0	0.0
Family	12802.3	18673.4	18782.8	5285.2	7365.4
<b>Total</b>	<b>12802.3</b>	<b>20306.2</b>	<b>22621.7</b>	<b>9428.3</b>	<b>12943.3</b>
<b>Bullock Labour</b>					
Hired	407.8	45.1	18.9	0.0	0.0
Owned	17817.1	460.5	225.0	709.6	128.3
<b>Total</b>	<b>18225.0</b>	<b>505.5</b>	<b>243.8</b>	<b>709.6</b>	<b>128.3</b>
<b>Machine Labour</b>					
Hired	1315.0	4248.7	4465.3	5074.2	4307.4
Owned	473.1	1392.7	1794.3	1238.3	3450.5
<b>Total</b>	<b>1788.1</b>	<b>5641.4</b>	<b>6259.6</b>	<b>6312.4</b>	<b>7757.9</b>
Seed	1750.1	3142.6	2650.5	2975.1	2464.0
<b>Fertilisers and Manure</b>					
Fertilisers	102.5	2331.3	2441.9	1924.6	3116.0
Manure	4727.4	0.0	2663.1	0.0	0.0
<b>Total</b>	<b>4829.9</b>	<b>2331.3</b>	<b>5105.0</b>	<b>1924.6</b>	<b>3116.0</b>
<b>Other Inputs</b>					
Insecticides	0.0	330.6	149.7	10.1	98.9
Irrigation charges	831.1	5886.8	6133.3	2978.0	4455.7
Crop insurance	-	-	-	-	-
Interest on working capital	2.8	608.5	762.3	595.4	737.5
Miscellaneous	0.0	0.0	12.5	0.0	0.0
Crop insurance		-	-		
<b>Fixed Cost</b>	<b>14502.6</b>	<b>17099.1</b>	<b>18572.0</b>	<b>19931.0</b>	<b>24143.5</b>
Rental value of owned land	4184.8	12081.5	10459.1	16004.5	16846.2
Rent paid for leased-in land	0.0	0.0	0.0	917.8	177.0
Land revenue, cesses & taxes	12.2	19.4	11.3	14.8	8.9
Depreciation on implements & Farm buildings	1628.0	527.8	867.4	369.6	947.9
Interest on fixed capital	8677.6	4470.4	7234.2	2624.3	6163.5
<b>Total Cost</b>	<b>54731.7</b>	<b>55851.9</b>	<b>62510.2</b>	<b>44864.4</b>	<b>55845.0</b>
<b>Yield (Qtl/ha)</b>	<b>8.4</b>	<b>38.6</b>	<b>33.6</b>	<b>30.5</b>	<b>31.3</b>
<b>A2+FL/Qtl</b>	<b>3117.2</b>	<b>764.0</b>	<b>986.2</b>	<b>750.2</b>	<b>842.8</b>
<b>C2/Qtl</b>	<b>4076.2</b>	<b>1090.1</b>	<b>1375.5</b>	<b>1272.9</b>	<b>1433.5</b>

Source: Directorate of Economics and Statistics.



**Annex Table 5.5(c) : Gram : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Andhra Pradesh		Bihar		Chhattisgarh		Gujarat	Haryana		Karnataka	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2017-19	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	29582.2	29971.9	21795.5	21390.4	21961.8	19040.8	20757.7	13089.4	16599.5	21584.8	24645.3
<b>Human Labour</b>											
Casual	5374.5	6582.2	4778.8	5238.6	2022.8	2526.3	6083.5	2314.5	5800.1	4862.8	3606.8
Attached	349.3	408.4	26.5	0.0	102.1	116.6	4.0	274.1	0.0	0.0	108.3
Family	2901.0	2505.5	3967.8	5565.5	3802.9	4876.4	6339.9	9704.8	7118.2	1629.7	2660.4
<b>Total</b>	<b>8624.8</b>	<b>9496.1</b>	<b>8773.0</b>	<b>10804.1</b>	<b>5927.8</b>	<b>7519.3</b>	<b>12427.4</b>	<b>12293.5</b>	<b>12918.2</b>	<b>6492.5</b>	<b>6375.4</b>
<b>Bullock Labour</b>											
Hired	254.1	178.8	0.0	0.0	0.0	7.2	287.7	0.0	0.0	508.5	529.7
Owned	3128.3	211.8	83.1	0.0	499.0	354.5	1679.6	10.9	0.0	477.3	4849.5
<b>Total</b>	<b>3382.4</b>	<b>390.6</b>	<b>83.1</b>	<b>0.0</b>	<b>499.0</b>	<b>361.8</b>	<b>1967.3</b>	<b>10.9</b>	<b>0.0</b>	<b>985.8</b>	<b>5379.2</b>
<b>Machine Labour</b>											
Hired	4087.4	7956.7	3523.6	3964.0	4188.3	5661.4	2167.7	3850.3	4714.7	3005.3	4041.1
Owned	563.1	768.3	112.9	107.8	485.6	970.1	874.6	734.8	1622.5	1096.5	1023.2
<b>Total</b>	<b>4650.4</b>	<b>8725.0</b>	<b>3636.5</b>	<b>4071.7</b>	<b>4673.9</b>	<b>6631.5</b>	<b>3042.3</b>	<b>4585.2</b>	<b>6337.2</b>	<b>4101.8</b>	<b>5064.2</b>
Seed	7653.5	6831.2	5264.8	3584.9	5898.7	4866.7	3438.0	3154.8	2263.3	6658.6	3555.6
<b>Fertilisers and Manure</b>											
Fertilisers	2610.2	4049.3	2384.3	2678.6	1776.9	1709.2	1891.5	0.0	0.0	1585.5	2310.6
Manure	24.6	104.6	359.1	187.3	0.0	0.0	0.0	0.0	0.0	0.0	8.9
<b>Total</b>	<b>2634.8</b>	<b>4153.9</b>	<b>2743.4</b>	<b>2865.9</b>	<b>1776.9</b>	<b>1709.2</b>	<b>1891.5</b>	<b>0.0</b>	<b>0.0</b>	<b>1585.5</b>	<b>2319.5</b>
<b>Other Inputs</b>											
Insecticides	1673.1	2945.7	448.0	180.4	971.4	904.4	2162.1	114.7	0.0	1139.3	1158.4
Irrigation charges	132.5	217.4	306.4	115.4	1663.8	2500.3	3107.9	263.8	122.1	16.7	30.9
Interest on work- ing capital	808.5	947.8	540.2	501.8	550.3	620.7	678.0	334.9	453.8	604.7	666.2
Miscellaneous	22.1	75.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	96.0
Crop insurance	-	-	-	-	-	246.0	-	-	-	-	-
<b>Fixed Cost</b>	<b>19749.7</b>	<b>19763.7</b>	<b>18678.6</b>	<b>19879.1</b>	<b>11670.8</b>	<b>11104.2</b>	<b>12920.2</b>	<b>21488.8</b>	<b>23098.9</b>	<b>9316.9</b>	<b>13799.1</b>
Rental value of owned land	12353.2	16463.7	16568.2	14346.2	9524.7	6808.0	6955.1	18293.6	17476.3	8880.8	10574.1
Rent paid for leased-in land	5289.9	676.2	0.0	0.0	0.0	0.0	626.1	0.0	0.0	0.0	0.0
Land revenue, cesses & taxes	0.0	0.0	52.4	92.0	1.5	1.3	3.8	0.0	0.0	5.9	7.3
Depreciation on implements & Farm buildings	238.8	491.3	379.0	974.0	477.9	998.8	270.2	176.3	493.3	79.6	508.3
Interest on fixed capital	1867.9	2132.4	1679.0	4466.9	1666.8	3296.0	5065.0	3018.9	5129.3	350.5	2709.4
<b>Total Cost</b>	<b>49331.9</b>	<b>53547.0</b>	<b>40474.0</b>	<b>42003.4</b>	<b>33632.6</b>	<b>36464.0</b>	<b>41634.6</b>	<b>42246.5</b>	<b>45193.5</b>	<b>30901.7</b>	<b>38444.5</b>
<b>Yield (Qtl/ha)</b>	<b>11.8</b>	<b>7.6</b>	<b>16.4</b>	<b>19.1</b>	<b>10.9</b>	<b>10.9</b>	<b>16.3</b>	<b>9.2</b>	<b>12.8</b>	<b>6.4</b>	<b>10.1</b>
<b>A2+FL/Qtl</b>	<b>2949.8</b>	<b>4551.4</b>	<b>1323.4</b>	<b>1171.3</b>	<b>1983.1</b>	<b>2295.5</b>	<b>1734.4</b>	<b>2157.5</b>	<b>1708.9</b>	<b>3371.4</b>	<b>2294.7</b>
<b>C2/Qtl</b>	<b>4141.9</b>	<b>6975.4</b>	<b>2406.6</b>	<b>2121.4</b>	<b>2971.8</b>	<b>3176.1</b>	<b>2438.6</b>	<b>4348.9</b>	<b>3419.5</b>	<b>4805.3</b>	<b>3507.1</b>

Source: Directorate of Economics and Statistics.

(Contd..)



**Annex Table 5.5 (c): Gram : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Madhya Pradesh		Maharashtra		Punjab	Rajasthan		Uttar Pradesh		West Bengal
	2016-17	2017-18	2016-17	2017-18	2017-18	2016-17	2017-18	2016-17	2017-18	2017-18
<b>Operational Cost</b>	30152.4	26543.6	35959.8	37513.7	36785.7	27145.4	27854.9	28294.0	28254.4	41940.9
<b>Human Labour</b>										
Casual	3543.8	3959.5	6449.1	7218.0	4326.9	1528.5	3741.5	5815.9	4258.8	7865.8
Attached	92.4	436.3	566.1	1021.0	9087.7	807.4	12.4	0.0	5.4	4038.6
Family	4733.2	4551.0	4606.9	4141.6	12002.7	10590.5	10395.8	6433.0	6811.3	11590.8
<b>Total</b>	<b>8369.4</b>	<b>8946.7</b>	<b>11622.1</b>	<b>12380.6</b>	<b>25417.3</b>	<b>12926.4</b>	<b>14149.7</b>	<b>12248.9</b>	<b>11075.5</b>	<b>23495.2</b>
<b>Bullock Labour</b>										
Hired	35.7	167.9	878.0	476.8	0.0	23.9	1.4	0.0	0.0	641.2
Owned	567.7	197.8	1159.0	2688.7	0.0	575.7	41.8	273.3	542.8	1493.2
<b>Total</b>	<b>603.4</b>	<b>365.8</b>	<b>2037.0</b>	<b>3165.5</b>	<b>0.0</b>	<b>599.6</b>	<b>43.1</b>	<b>273.3</b>	<b>542.8</b>	<b>2134.4</b>
<b>Machine Labour</b>										
Hired	4962.6	4860.8	6699.4	6545.2	0.0	2331.7	3656.4	3474.8	5541.6	7443.7
Owned	516.2	471.1	331.9	810.3	6267.4	88.8	1248.5	909.3	1446.3	0.0
<b>Total</b>	<b>5478.7</b>	<b>5331.9</b>	<b>7031.2</b>	<b>7355.5</b>	<b>6267.4</b>	<b>2420.4</b>	<b>4904.9</b>	<b>4384.0</b>	<b>6987.9</b>	<b>7443.7</b>
Seed	9658.7	5638.6	7335.7	5782.3	3000.0	6602.3	3329.7	7630.2	5473.1	4292.0
<b>Fertilisers and Manure</b>										
Fertilisers	1661.2	1615.0	2278.1	3589.4	830.8	1206.5	1044.1	974.0	713.9	2810.0
Manure	0.0	0.0	791.1	101.7	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>1661.2</b>	<b>1615.0</b>	<b>3069.2</b>	<b>3691.0</b>	<b>830.8</b>	<b>1206.5</b>	<b>1044.1</b>	<b>974.0</b>	<b>713.9</b>	<b>2810.0</b>
<b>Other Inputs</b>										
Insecticides	1300.3	1292.0	1042.2	1973.7	519.2	1.3	342.8	607.6	571.3	649.2
Irrigation charges	2169.0	2458.6	2872.4	2099.5	0.0	2887.2	3506.3	1494.2	2227.3	196.8
Interest on working capital	770.3	666.4	950.1	1011.3	751.0	501.7	529.1	662.5	649.8	919.7
Miscellaneous	141.4	87.2	0.0	54.3	0.0	0.0	5.3	19.3	13.0	0.0
Crop insurance	-	141.4	-	-	-	-	-	-	-	-
<b>Fixed Cost</b>	<b>17690.4</b>	<b>15524.0</b>	<b>14720.8</b>	<b>16560.7</b>	<b>26967.9</b>	<b>16519.7</b>	<b>13733.4</b>	<b>26076.1</b>	<b>16423.5</b>	<b>8807.9</b>
Rental value of owned land	14792.5	10354.8	10159.9	9268.9	20972.3	12279.4	6467.6	18901.4	10534.5	6338.1
Rent paid for leased-in land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land revenue, cesses & taxes	4.1	4.2	18.9	16.8	0.0	9.3	5.3	12.9	9.3	2.6
Depreciation on implements & Farm buildings	609.0	941.9	510.2	665.8	993.7	416.8	647.6	1527.5	848.5	501.2
Interest on fixed capital	2284.9	4223.1	4031.8	6609.3	5002.0	3814.1	6612.9	5634.2	5031.1	1966.0
<b>Total Cost</b>	<b>47842.8</b>	<b>42067.6</b>	<b>50680.6</b>	<b>54074.4</b>	<b>63753.6</b>	<b>43665.1</b>	<b>41588.3</b>	<b>54370.1</b>	<b>44677.9</b>	<b>50748.7</b>
<b>Yield (Qtl/ha)</b>	<b>14.4</b>	<b>13.6</b>	<b>12.1</b>	<b>13.0</b>	<b>7.7</b>	<b>12.7</b>	<b>12.4</b>	<b>14.7</b>	<b>8.4</b>	<b>7.3</b>
<b>A2+FL/Qtl</b>	<b>2062.4</b>	<b>1904.1</b>	<b>2959.8</b>	<b>2866.1</b>	<b>4900.8</b>	<b>2026.0</b>	<b>2123.4</b>	<b>1948.6</b>	<b>3253.5</b>	<b>5688.9</b>
<b>C2/Qtl</b>	<b>3207.5</b>	<b>2913.7</b>	<b>4112.8</b>	<b>4056.0</b>	<b>8267.7</b>	<b>3215.4</b>	<b>3097.0</b>	<b>3543.7</b>	<b>4996.0</b>	<b>6799.3</b>

Source: Directorate of Economics and Statistics.

(Contd..)

**Annex Table 5.5 (d): Lentil (Masur) : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Bihar		Madhya Pradesh		Uttar Pradesh		West Bengal	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	17257.9	15346.5	18063.4	19628.2	26342.4	22414.4	27566.4	27518.5
<b>Human Labour</b>								
Casual	4745.7	4055.4	2800.4	3991.2	2088.2	3475.4	6796.2	9544.5
Attached	289.2	0.0	200.5	50.8	0.0	0.0	3.6	0.0
Family	4158.6	3267.3	3191.9	3834.5	8557.1	6073.0	7667.1	6770.4
<b>Total</b>	<b>9193.5</b>	<b>7322.7</b>	<b>6192.7</b>	<b>7876.4</b>	<b>10645.3</b>	<b>9548.4</b>	<b>14467.0</b>	<b>16314.8</b>
<b>Bullock Labour</b>								
Hired	0.0	0.0	10.8	0.0	0.0	0.0	1658.5	446.2
Owned	0.0	104.7	681.3	1281.3	2259.2	0.0	535.3	42.2
<b>Total</b>	<b>0.0</b>	<b>104.7</b>	<b>692.1</b>	<b>1281.3</b>	<b>2259.2</b>	<b>0.0</b>	<b>2193.8</b>	<b>488.4</b>
<b>Machine Labour</b>								
Hired	3049.8	3903.4	4122.6	3751.0	3983.4	3932.3	4611.0	4988.3
Owned	110.8	51.1	484.1	672.9	1056.7	1320.5	10.5	2.6
<b>Total</b>	<b>3160.6</b>	<b>3954.5</b>	<b>4606.7</b>	<b>4423.9</b>	<b>5040.0</b>	<b>5252.8</b>	<b>4621.5</b>	<b>4990.9</b>
Seed	2381.1	1525.1	2959.2	2051.6	5685.3	3641.1	4000.6	3388.3
<b>Fertilisers and Manure</b>								
Fertilisers	1964.8	1926.0	1067.7	1022.5	680.3	1197.9	1577.4	1427.5
Manure	6.3	48.0	0.0	0.0	0.0	0.0	0.0	144.9
<b>Total</b>	<b>1971.1</b>	<b>1974.0</b>	<b>1067.7</b>	<b>1022.5</b>	<b>680.3</b>	<b>1197.9</b>	<b>1577.4</b>	<b>1572.4</b>
<b>Other Inputs</b>								
Insecticides	109.3	67.1	640.5	311.2	205.1	62.6	45.6	120.3
Irrigation charges	45.4	32.3	1443.9	2067.9	1275.8	2212.5	52.3	11.6
Interest on working capital	397.0	366.0	450.7	478.6	539.0	495.2	603.0	628.7
Miscellaneous	0.0	0.0	10.0	70.0	12.5	3.9	5.5	3.1
Crop insurance			-	44.8	-	-	-	-
<b>Fixed Cost</b>	<b>13882.4</b>	<b>14413.5</b>	<b>13915.9</b>	<b>11115.1</b>	<b>17673.8</b>	<b>15529.7</b>	<b>15907.5</b>	<b>14044.3</b>
Rental value of owned land	11310.2	11308.2	10100.7	7793.8	15781.0	10391.7	13799.5	12818.5
Rent paid for leased-in land	0.0	0.0	0.0	0.0	0.0	0.0	1011.8	160.2
Land revenue, cesses & taxes	56.5	102.5	6.1	3.2	8.9	10.5	57.8	3.7
Depreciation on implements & Farm buildings	212.2	525.2	575.7	786.8	268.1	840.2	546.5	387.4
Interest on fixed capital	2303.5	2477.6	3233.5	2531.3	1615.7	4287.3	491.8	674.5
<b>Total Cost</b>	<b>31140.3</b>	<b>29760.0</b>	<b>31979.4</b>	<b>30743.3</b>	<b>44016.2</b>	<b>37944.1</b>	<b>43473.9</b>	<b>41562.8</b>
<b>Yield (Qtl/ha)</b>	<b>12.0</b>	<b>10.9</b>	<b>12.8</b>	<b>10.5</b>	<b>9.4</b>	<b>7.5</b>	<b>10.6</b>	<b>15.1</b>
<b>A2+FL/Qtl</b>	<b>1411.0</b>	<b>1407.0</b>	<b>1378.1</b>	<b>1817.9</b>	<b>2726.7</b>	<b>2969.3</b>	<b>2724.9</b>	<b>1805.7</b>
<b>C2/Qtl</b>	<b>2508.5</b>	<b>2622.0</b>	<b>2364.3</b>	<b>2736.5</b>	<b>4518.3</b>	<b>4840.6</b>	<b>4058.6</b>	<b>2674.6</b>

Source: Directorate of Economics and Statistics.

(Contd..)



**Annex Table 5.5(e): Rapeseed & Mustard : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Assam		Bihar		Chhattisgarh	Gujarat		Haryana	
	2016-17	2017-18	2016-17	2017-18	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	28970.8	25816.1	19453.2	22276.3	14167.2	29830.5	31251.7	24599.0	24452.1
<b>Human Labour</b>									
Casual	1401.7	3778.8	5240.8	6322.7	5043.1	5644.3	5405.3	3857.2	4037.4
Attached	13.6	0.0	627.8	2.0	0.0	0.0	0.0	154.3	74.5
Family	14101.0	8834.7	5231.6	4885.3	1915.2	6650.7	6376.5	6713.2	6649.9
<b>Total</b>	<b>15516.3</b>	<b>12613.5</b>	<b>11100.2</b>	<b>11210.0</b>	<b>6958.3</b>	<b>12295.0</b>	<b>11781.7</b>	<b>10724.7</b>	<b>10761.9</b>
<b>Bullock Labour</b>									
Hired	5.2	55.0	0.0	0.0	0.0	660.8	262.2	0.0	0.0
Owned	8380.7	3355.2	0.0	0.0	0.0	443.9	3.0	19.4	11.9
<b>Total</b>	<b>8385.9</b>	<b>3410.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1104.6</b>	<b>265.2</b>	<b>19.4</b>	<b>11.9</b>
<b>Machine Labour</b>									
Hired	1492.6	5068.5	2406.7	3548.4	3815.0	3965.7	4924.7	4733.9	4966.1
Owned	274.8	731.7	137.7	73.1	399.2	829.3	501.7	1538.0	1521.0
<b>Total</b>	<b>1767.5</b>	<b>5800.2</b>	<b>2544.4</b>	<b>3621.5</b>	<b>4214.2</b>	<b>4795.0</b>	<b>5426.3</b>	<b>6271.8</b>	<b>6487.0</b>
Seed	598.9	516.6	821.1	1438.5	534.4	987.1	1112.8	952.9	1012.7
<b>Fertilisers and Manure</b>									
Fertilisers	1253.3	2016.9	2874.2	3102.1	2089.1	3096.3	3882.6	3180.9	3088.8
Manure	966.6	718.8	219.7	238.8	0.0	67.4	188.8	0.0	0.0
<b>Total</b>	<b>2220.0</b>	<b>2735.7</b>	<b>3093.9</b>	<b>3340.8</b>	<b>2089.1</b>	<b>3163.7</b>	<b>4071.4</b>	<b>3180.9</b>	<b>3088.8</b>
<b>Other Inputs</b>									
Insecticides	31.7	100.4	0.0	23.8	0.0	120.1	684.7	94.3	173.5
Irrigation charges	0.0	100.9	1462.6	2113.9	0.0	6662.6	7155.8	2806.2	2377.0
Interest on work- ing capital	450.6	514.6	431.0	527.0	371.3	702.4	753.8	542.0	539.5
Miscellaneous	0.0	24.2	0.0	0.7	0.0	0.0	0.0	6.8	0.0
Crop insurance	-	-	-	-	-	-	-	-	-
<b>Fixed Cost</b>	<b>8827.0</b>	<b>10011.0</b>	<b>14146.7</b>	<b>15731.0</b>	<b>13067.9</b>	<b>12733.7</b>	<b>17835.0</b>	<b>27917.3</b>	<b>32851.7</b>
Rental value of owned land	6207.2	6502.8	11734.8	13271.2	6578.4	9203.5	9225.2	21612.1	21657.8
Rent paid for leased-in land	0.0	0.0	0.0	0.0	0.0	62.1	445.7	0.0	0.0
Land revenue, cesses & taxes	39.5	93.6	80.2	130.4	3.7	2.7	2.9	0.0	0.0
Depreciation on implements & Farm buildings	720.9	562.7	257.9	555.7	571.7	105.3	313.0	590.9	1494.7
Interest on fixed capital	1859.4	2851.9	2073.9	1773.7	5914.2	3360.1	7848.2	5714.3	9699.3
<b>Total Cost</b>	<b>37797.8</b>	<b>35827.1</b>	<b>33599.9</b>	<b>38007.3</b>	<b>27235.1</b>	<b>42564.2</b>	<b>49086.8</b>	<b>52516.3</b>	<b>57303.8</b>
<b>Yield (Qtl/ha)</b>	<b>8.3</b>	<b>10.2</b>	<b>12.8</b>	<b>12.7</b>	<b>7.2</b>	<b>16.3</b>	<b>19.1</b>	<b>18.9</b>	<b>21.5</b>
<b>A2+FL/Qtl</b>	<b>3595.8</b>	<b>2581.1</b>	<b>1481.1</b>	<b>1733.4</b>	<b>1976.8</b>	<b>1768.0</b>	<b>1592.5</b>	<b>1246.7</b>	<b>1136.2</b>
<b>C2/Qtl</b>	<b>4573.9</b>	<b>3491.8</b>	<b>2513.0</b>	<b>2868.7</b>	<b>3651.7</b>	<b>2508.3</b>	<b>2896.8</b>	<b>2600.1</b>	<b>2509.0</b>

Source: Directorate of Economics and Statistics.

(Contd..)



**Annex Table 5.5(e): Rapeseed & Mustard : Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Madhya Pradesh		Odisha	Punjab	Rajasthan		Uttar Pradesh		West Bengal	
	2016-17	2017-18	2017-19	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
<b>Operational Cost</b>	21838.8	24378.8	12938.0	25705.4	26767.6	33726.8	26757.9	26967.0	36399.5	32605.5
<b>Human Labour</b>										
Casual	2914.8	3173.9	1693.6	4848.7	2402.6	3574.4	2828.1	4658.2	9527.5	6512.7
Attached	40.4	0.0	2.1	2071.2	97.5	170.1	3.0	12.9	1.3	8.0
Family	7255.5	7239.7	7018.9	6293.2	12002.9	13011.6	10495.9	7519.4	12184.9	13012.1
<b>Total</b>	<b>10210.7</b>	<b>10413.6</b>	<b>8714.6</b>	<b>13213.1</b>	<b>14503.0</b>	<b>16756.1</b>	<b>13327.0</b>	<b>12190.5</b>	<b>21713.8</b>	<b>19532.8</b>
<b>Bullock Labour</b>										
Hired	0.1	0.0	53.8	0.0	7.1	0.5	3.7	1.9	1042.3	483.7
Owned	58.1	0.0	1520.4	3.9	90.7	9.8	174.3	51.2	447.4	104.2
<b>Total</b>	<b>58.2</b>	<b>0.0</b>	<b>1574.2</b>	<b>3.9</b>	<b>97.9</b>	<b>10.3</b>	<b>178.0</b>	<b>53.1</b>	<b>1489.7</b>	<b>587.9</b>
<b>Machine Labour</b>										
Hired	5240.6	6718.9	447.1	1397.0	4314.7	5700.9	5332.3	5450.9	3621.7	3867.5
Owned	409.3	96.4	165.6	3722.5	527.2	1096.0	665.6	1458.1	43.8	16.7
<b>Total</b>	<b>5649.9</b>	<b>6815.3</b>	<b>612.7</b>	<b>5119.5</b>	<b>4841.9</b>	<b>6796.9</b>	<b>5997.9</b>	<b>6909.0</b>	<b>3665.5</b>	<b>3884.2</b>
Seed	1027.2	1212.5	457.3	1311.7	1448.3	1502.9	811.6	869.6	874.1	626.0
<b>Fertilisers and Manure</b>										
Fertilisers	2826.7	2644.5	759.5	3381.1	2564.5	2688.5	2929.3	2824.3	4460.5	4376.1
Manure	0.0	0.0	131.3	0.0	0.0	474.6	33.6	114.3	517.1	211.6
<b>Total</b>	<b>2826.7</b>	<b>2644.5</b>	<b>890.8</b>	<b>3381.1</b>	<b>2564.5</b>	<b>3163.1</b>	<b>2962.9</b>	<b>2938.6</b>	<b>4977.6</b>	<b>4587.6</b>
<b>Other Inputs</b>										
Insecticides	332.9	476.0	146.7	1294.4	21.5	75.1	1.7	17.6	485.7	285.8
Irrigation charges	1285.4	2246.6	344.6	793.4	2842.3	4791.3	2983.3	3395.2	2352.1	2470.7
Interest on working capital	441.9	519.4	179.4	588.2	447.4	627.7	492.8	589.3	733.8	593.7
Miscellaneous	6.0	0.0	17.9	0.0	0.7	3.4	2.7	4.1	107.2	36.7
Crop insurance	-	51.1	-	-	-	-	-	-	-	-
<b>Fixed Cost</b>	<b>18342.2</b>	<b>23937.6</b>	<b>6850.5</b>	<b>26493.0</b>	<b>16834.8</b>	<b>18985.1</b>	<b>22013.7</b>	<b>25360.3</b>	<b>13695.4</b>	<b>13536.0</b>
Rental value of owned land	13754.4	12982.0	4098.6	17810.5	10510.3	12201.8	16379.8	15758.9	11701.7	11173.6
Rent paid for leased-in land	0.0	0.0	0.0	1437.7	3.3	0.0	1516.0	4001.4	285.2	167.3
Land revenue, cesses & taxes	5.8	7.1	9.7	0.0	12.0	11.2	12.0	12.8	39.6	8.8
Depreciation on implements & Farm buildings	393.2	1090.1	674.3	1194.7	430.8	1020.4	631.9	883.1	536.2	292.4
Interest on fixed capital	4188.8	9858.3	2067.9	6050.2	5878.4	5751.8	3474.0	4704.1	1132.6	1894.0
<b>Total Cost</b>	<b>40181.1</b>	<b>48316.4</b>	<b>19788.5</b>	<b>52198.3</b>	<b>43602.4</b>	<b>52711.8</b>	<b>48771.6</b>	<b>52327.3</b>	<b>50094.8</b>	<b>46141.5</b>
<b>Yield (Qtl/ha)</b>	<b>19.2</b>	<b>18.2</b>	<b>4.2</b>	<b>15.1</b>	<b>17.2</b>	<b>20.5</b>	<b>16.2</b>	<b>16.1</b>	<b>12.7</b>	<b>13.0</b>
<b>A2+FL/Qtl</b>	<b>1076.4</b>	<b>1294.4</b>	<b>3274.5</b>	<b>1843.5</b>	<b>1504.4</b>	<b>1617.1</b>	<b>1669.1</b>	<b>1847.4</b>	<b>2828.8</b>	<b>2409.6</b>
<b>C2/Qtl</b>	<b>1945.2</b>	<b>2454.9</b>	<b>4760.2</b>	<b>3396.2</b>	<b>2412.3</b>	<b>2452.0</b>	<b>2819.0</b>	<b>3034.5</b>	<b>3799.7</b>	<b>3362.9</b>

Source: Directorate of Economics and Statistics.

(Contd..)



**Annex Table 5.5(f): Safflower: Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Karnataka	Maharashtra
	2017-18	2017-18
<b>Operational Cost</b>	16718.1	28866.1
<b>Human Labour</b>		
Casual	5099.4	5547.9
Attached	0.0	1357.1
Family	1773.1	5133.8
<b>Total</b>	<b>6872.5</b>	<b>12038.8</b>
<b>Bullock Labour</b>		
Hired	271.2	332.6
Owned	567.6	7806.1
<b>Total</b>	<b>838.7</b>	<b>8138.7</b>
<b>Machine Labour</b>		
Hired	1140.6	4221.4
Owned	3676.1	137.3
<b>Total</b>	<b>4816.7</b>	<b>4358.7</b>
Seed	1334.7	1303.4
<b>Fertilisers and Manure</b>		
Fertilisers	1561.2	1606.7
Manure	0.0	0.0
<b>Total</b>	<b>1561.2</b>	<b>1606.7</b>
<b>Other Inputs</b>		
Insecticides	795.0	594.6
Irrigation charges	0.0	0.0
Interest on working capital	452.9	719.1
Miscellaneous	46.4	106.2
<b>Crop insurance</b>	-	-
Fixed Cost	24889.9	7278.8
Rental value of owned land	7094.1	4214.7
Rent paid for leased-in land	0.0	0.0
Land revenue, cesses & taxes	9.7	15.7
Depreciation on implements & Farm buildings	2494.2	316.9
Interest on fixed capital	<b>15291.9</b>	<b>2731.5</b>
<b>Total Cost</b>	41608.0	36144.8
<b>Yield (Qtl/ha)</b>	9.5	7.0
<b>A2+FL/Qtl</b>	1867.4	4112.2
<b>C2/Qtl</b>	<b>4041.8</b>	<b>5090.5</b>

Source: Directorate of Economics and Statistics.



**Annex Table 5.6: All-India Projected Costs of Production of Rabi Crop season  
for 2019-20 over 2018-19**

Crops	Cost of Production (₹/qtl)				Percentage Change in Projected Cost (2019-20 over 2018-19)	
	2018-19		2019-20			
	A <sub>2</sub> +FL	C <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>
Wheat	866	1,339	923	1,425	6.6	6.4
Barley	860	1,247	919	1,347	6.9	8.0
Gram	2,637	3,838	2,801	4,023	6.2	4.8
Lentil	2,532	4,215	2,727	4,286	7.7	1.7
Rapeseed & Mustard	2,212	3,277	2,323	3,401	5.0	3.8
Safflower	3,294	4,072	3,470	4,593	5.3	12.8



**Annex Table 5.7: Comparison of Cost Projections of Rabi Crops, RMS 2020-21**

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)
Wheat				
Bihar	32	1674	28	1452
Chattisgarh	16	1328	NP	
Gujarat	21	1949	32	1504
Haryana	47	2081	43	1461
Jharkhand	-	1055	20	1681
Madhya Pradesh	36	1466	34	1314
Punjab	48	1807	49	1238
Rajasthan	-	1325	40	1354
Telangana	15	2868	-	-
West Bengal	-	2931	NP	
Barley				
Haryana	35.07	1633	-	-
Rajasthan	-	1149	36	1254
Gram				
Andhra Pradesh	16	4762	11	5033
Bihar	16	3529	NP	
Chattisgarh	11	1982	9	3734
Gujarat	12	4253	NP	
Haryana	10	5289	NP	
Jharkhand	-	2281	NP	
Madhya Pradesh	15	3552	12.08	3726
Rajasthan		3569	11	3553
Telangana	14	5222	-	-
Lentil				
Bihar	13	3175	11	3284
Madhya Pradesh	12	3493	10	3673
Rapeseed/Mustard				
Andhra Pradesh	10	4076	-	-
Bihar	13	3914	12	3143
Chattisgarh	6	1347	NP	
Gujarat	17	3237	17	3034
Haryana	16	4379	18	3333
Jharkhand	-	1869	-	-
Madhya Pradesh	14	3074	17	2576
Rajasthan	-	3525	15	3401
Telangana	9	3906	-	-
West Bengal		5633	12.79	4084
Safflower				
Telangana	6	5175		

NP: Not Projected.

Note: Average of Cost of cultivation/ production of irrigated and un-irrigated land has been taken in respect Gujarat State.

**Annex Table 5.8: Updating States under Comprehensive Scheme for Rabi Crops**

Crop	States to be dropped from CS	State for which Sample size to be increased	Reasons
Wheat	Karnataka	-	Share of State area and production in all-India area and production during TE2018-19 are 0.55 percent and 0.19 percent respectively, and share of wheat in rabi cereals of State is 10.49 percent; which are negligible.
Wheat	West Bengal	-	Share of State area and production in all-India area and production during TE2018-19 are 0.64 percent and 0.52 percent respectively, and share of wheat in rabi cereals of State is 8.99 percent; which are negligible.
Gram	Bihar		Share of State area and production in all-India area and production during TE2018-19 are 0.60 percent and 0.64 percent respectively, and share of gram in production of rabi pulses of State is 16.64 percent, which are Low.
Gram		Haryana	Share of State area and production in all-India area and production during TE2018-19 are 0.36 percent and 0.38 percent respectively, but share of gram in production of rabi pulses of State is 73.95 percent, which is reasonably adequate; while allocation of sampling unit is 6 (0.70 percent of all-India Sample for gram during 2017-18), which is a thin sample.
Gram		Jharkhand	Share of State area and production in all-India area and production during TE2018-19 are 2.14 percent and 2.44 percent respectively, but share of gram in production of rabi pulses of State is 65.48 percent, which is reasonably adequate; while allocation of sampling unit is 5 (0.73 percent of all-India Sample for gram in 2016-17), which is a thin sample.
Gram	Punjab		Share of State area and production in all-India area and production during TE2018-19 are 0.03 percent and 0.03 percent respectively, and share of gram in rabi pulses of State is 16.90 percent; which are negligible.
Rapeseed & Mustard		Chhattisgarh	Share of State area and production in all-India area and production during TE2018-19 are 0.72 percent and 0.23 percent respectively, and share of rapeseed & mustard in rabi oilseeds of State is 65.97 percent; while allocation of sampling unit is 3 (0.32 percent of all-India Sample for rapeseed & mustard in 2017-18), which is a thin sample
Rapeseed & Mustard	Odisha		Share of State area and production in all-India area and production during TE2018-19 are 0.14 percent and 0.03 percent respectively, and share of rapeseed & mustard in rabi oilseeds of State is 4.99 percent; which are negligible.



# **Commission for Agricultural Costs and Prices**

## **List of Officers**

### **Advisers**

Shri K. M. M. Alimalmigothi  
Shri D. K. Pandey

### **Joint Director**

Shri Raj Kumar

### **Deputy Directors**

Shri Nikhil Kumar Agarwal  
Dr. Harish Kumar Kallega  
Shri Amit Sahu  
Dr. Sunil Kumar Gupta

### **Assistant Directors**

Shri Sube Singh  
Ms. Sutapa Ghosh  
Shri Ayush Punia  
Shri S. P. Budgujar

### **Economic Officers**

Dr. Surendra Singh  
Dr. Bhavik Lukka  
Mrs. Shilpa Taneja  
Md. Abdul Aleem

### **Sr. Statistical Officers**

Shri Mohd Shoeb  
Shri S.K. Srivastava  
Shri A. K. Pandey  
Mrs. Meenakshi Choudhary

### **Economic Investigators**

Shri Chandra Kumar

### **Jr. Statistical Officer**

Shri Vedprakash Meena



सत्यमेव जयते

# **Commission for Agricultural Costs and Prices**

Department of Agriculture, Cooperation & Farmers Welfare

Ministry of Agriculture & Farmers Welfare

Government of India, New Delhi

August 2019