

# THE MARKETING SEASON 2018-19



सत्यमेव जयते

**Commission for Agricultural Costs and Prices**  
Department of Agriculture, Cooperation & Farmers Welfare  
Ministry of Agriculture & Farmers Welfare  
Government of India, New Delhi  
July 2017

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# Price Policy for Rabi Crops

THE MARKETING SEASON 2018-19



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**Commission for Agricultural Costs and Prices**

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Department of Agriculture, Cooperation and Farmers Welfare

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

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जुलाई, 2017

July, 2017



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Commission for Agricultural Costs and Prices  
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Ministry of Agriculture and Farmers Welfare  
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## Preface and Acknowledgements

It is my great pleasure and privilege to present the report of **“Price Policy for Rabi Crops: The Marketing Season 2018-19”**. 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 recommendations. While making price policy recommendations, the commission has taken into account various factors such as cost of production, overall demand-supply situation, domestic and international prices, inter-crop price parity, terms of trade, and likely impact of MSP on general price level and resource use efficiency. I hope that these recommendations will serve the interests of both producers and consumers, incentivise farmers to adopt new technologies and practices, lead to stability of prices, and improve competitiveness of Indian agriculture.

Summary of Recommendations is followed by overview of Indian agriculture in Chapter 1. Chapter 2 of the report discusses demand-supply and procurement operations. Trends in productivity of Rabi crops are analysed in Chapter 3 and trade competitiveness is presented in Chapter 4. Costs and returns and cost projections for Rabi Marketing Season 2018-19 including inter-crop price parity issues 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 involved in procurement, post-harvest management, processing and marketing of agricultural commodities, and various other stakeholders for providing valuable insights and information during the meetings and preparation of this report. I would like to express my special appreciation and thanks to Government of Karnataka, Government of Madhya Pradesh, Government of Punjab, and Government of West Bengal for organizing regional meetings of the Commission with farmers, government officials and other stakeholders. Special thanks to the Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare for providing key data on cost estimates for this report.

Last but not least, credit is due to the officers and staff of the commission, who contributed to this report. Sincere gratitude goes to Dr. Shailja Sharma, Member Secretary, who not only contributed greatly to the report but managed the process and timely completion of the report. The report would not have been possible without active support of Mr. S. R. Joshi (ex-Adviser), Mr. K. M. M. Alimalmigothi (Adviser), Mr. D. K. Pandey (Adviser), Ms. Nutan Raj (Adviser), Mr. Raj Kumar, Mr. Anand Krishan, Dr. S. K. Gupta, Dr. Harish Kumar Kallega, Mr. Manish Bindal, Mr. Amit Sahu, Mr. Sube Singh, Mr. Byasadev Naik, Ms. Reeta Yadav, Dr. Surendra Singh, Dr. Bhavin Lukka, Mr. Mohd Shoeb, Mr. S. K. Srivastava, Mr. A. K. Pandey, Ms. Meenakshi Choudhary, Mr. Md. Abdul Aleem, Mr. Chandra Kumar and Mr. Vedprakash Meena, who worked tirelessly in preparation of this report. I would like to thank them all for their contribution and support.

31<sup>st</sup> July 2017

(Vijay Paul Sharma)

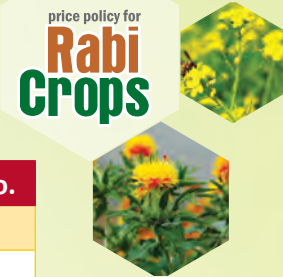


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# ACRONYMS

## Acronyms

A <sub>2</sub>	Actual Paid out Cost
A <sub>2</sub> +FL	Actual Paid out Cost plus Imputed Value of Family Labour
AICRP	All-India Coordinated Research Project
APEDA	Agricultural and Processed Food Products Export Development Authority
APMC	Agricultural Produce Marketing Committee
C&F	Cost and Freight
C <sub>2</sub>	Comprehensive Cost including Imputed Rent on Owned Land and Interest on Value of Owned Capital Asset
CACP	Commission for Agricultural Costs and Prices
CAGR	Compound Annual Growth Rate
CHCs	Custom Hiring Centres
CIF	Cost, Insurance and Freight
CIPI	Composite Input Price Index
CoC	Cost of Cultivation
CoP	Cost of Production
CPI	Consumer Price Index
CS	Comprehensive Scheme
CSO	Central Statistics Office
CSR	Corporate Social Responsibility
CWC	Central Warehousing Corporation
DAP	Di-Ammonium Phosphate
DBT	Direct Benefit Transfer
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 and Promotion
DRMR	Directorate of Rapeseed-Mustard Research
DTA	Domestic Tariff Area
EDI	Electronic Data Interchange
e-NAM	National Agriculture Market
EOUs	Export Oriented Units
EU	European Union
FAI	Fertiliser Association of India
FAO	Food and Agriculture Organisation
FAQ	Fair Average Quality
FCI	Food Corporation of India
FLD	Front-Line Demonstration
FPO	Farmer Producers Organizations
GVA	Gross Value Added
GVO	Gross Value of Output
ha	Hectare
HSD	High Speed Diesel
HYVs	High Yielding Varieties
ICAR	Indian Council of Agricultural Research
IFS	Integrated Farming System
IGC	International Grains Council
ISS	Interest Subvention Scheme
KMS	Kharif Marketing Season
LCS	Land Custom Stations
MEP	Minimum Export Price
MSP	Minimum Support Price
MSR	Marketed Surplus Ratio
MT	Million Tonnes
N:P:K	Nitrogen : Phosphorous : Potassium
NAFED	National Agriculture Cooperative Marketing Federation
NBS	Nutrient Based Subsidy
NCCF	National Cooperative Consumers Federation of India Ltd.
NFSA	National Food Security Act

NGO	Non-Government Organisation
NITI	National Institution for Transforming India
NSSO	National Sample Survey Organisation
OGL	Open General License
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PPP	Public Private Partnership
PSF	Price Stabilization Fund
PSS	Price Stabilization Scheme
Q <sub>1</sub>	Quarter 1
Q <sub>2</sub>	Quarter 2
Q <sub>3</sub>	Quarter 3
Q <sub>4</sub>	Quarter 4
qtl	Quintal
R&M	Rapeseed & Mustard
RMS	Rabi Marketing Season
SAMPADA	Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters
SAUs	State Agricultural Universities
SEAI	Solvent Extractors Association Of India
SEZs	Special Economic Zones
SFAC	Small Farmers Agribusiness Consortium
SHC	Soil Health Card
SUR	Stock-to-Use Ratio
t/ha	Tonnes per Hectare
TE	Triennium Ending
USDA	United States Department of Agriculture
WDRA	Warehousing Development Regulatory Authority
WPI	Wholesale Price Index
WTO	World Trade Organization

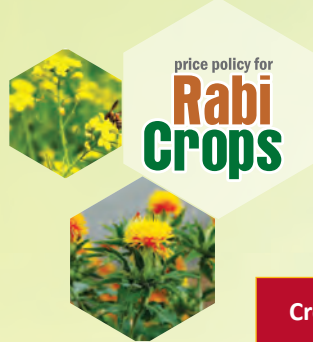


# SUMMARY OF RECOMMENDATIONS

S.1 India's pulses imports hit an all-time record high of about 6.6 million tonnes and wheat imports at 5.75 million tonnes in 2016-17, due to increasing domestic demand and lower production as a result of two consecutive years of drought. In order to incentivize farmers to improve productivity and produce more, the Government substantially increased the MSPs of all crops but in particular pulses and oilseeds during 2017-18. Farmers have positively responded to these price signals and supported by good weather and enabling policy environment, India's foodgrains production reached a new record of about 273.4 million tonnes (wheat 97.44 million tonnes and pulses 22.4 million tonnes) in 2016-17. As a result of this spectacular performance on production front, and strong procurement mechanism for wheat, as on July 3, 2017, the public agencies had procured 30.8 million tonnes of wheat and there were 53.3 million tonnes of rice and wheat stocks. However, market prices of pulses mainly tur and moong during Kharif Marketing Season 2017-18 and rapeseed & mustard in Rabi Marketing Season 2017-18, were below MSP in many states. Therefore, the challenge is to ensure that farmers get at least MSP for their produce, particularly pulses and oilseeds.

## Price Policy Recommendations

S.2 Considering the cost of production, overall demand and supply situation of various commodities, domestic and world price trends currently prevailing and likely to be in the near future, inter-crop price parity, terms of trade between agriculture and non-agriculture and finally, the likely impact of price policy recommendations on the cost of living, especially the poor and competitiveness of Indian agriculture, the Commission recommends the following MSPs for six rabi crops to be marketed in 2018-19 (Table S.1). The recommended MSPs cover  $C_2$  costs of all six crops and gross margins over cost  $A_2+FL$  range from 28 percent in case of safflower to 112.4 percent in wheat while net returns over cost  $C_2$  vary from 0.5 percent in safflower to 38.1 percent in wheat.



**Table S.1: MSPs Recommended for RMS 2018-19**

(₹/qtl)

Crops	Projected Costs for Crop Season 2018-19		MSP (Marketing Season)		Recommended MSP for RMS 2018-19	Gross Margin over (A <sub>2</sub> +FL) w.r.t. recommended MSP (percent)
	A <sub>2</sub> +FL	C <sub>2</sub>	2016-17	2017-18		
Wheat	817	1256	1525 (5.2)	1625 (6.6)	1735 (6.8) [6.8]	112.36
Barley	845	1190	1225 (6.5)	1325 (8.2)	1410 (6.4) [6.4]	66.86
Gram	2461	3526	3500 (10.2)	4000 (14.3)	4250 (6.3) [11.8]	72.69
Lentil	2366	3727	3400 (10.6)	3950 (16.2)	4150 (5.1) [9.2]	75.40
R&M	2123	3086	3350 (8.1)	3700 (10.4)	3900* (5.4) [8.3]	83.70
Safflower	3125	3979	3300 (8.2)	3700 (12.1)	4000 (8.1) [11.1]	28.00

Note: \*Corresponding to oil content of 35 percent

MSPs of 2016-17 and 2017-18 are inclusive of bonus

Figures in parenthesis () represent increase in MSP (including bonus) over the previous year

Figures in parenthesis [] represent increase in MSP (excluding bonus) over the previous year

## Non-Price Policy Recommendations

### Effective Procurement

S.3 The MSP policy can have desired impact only when it is supported by effective and supporting procurement mechanism. This season witnessed market prices of wheat and R&M falling below MSP in several states. Government procurement system was either absent or very slow in responding to the situation. For example, despite R&M prices being much below the MSP, NAFED procured about 37.6 thousand tonnes of mustard seeds, which had hardly any impact on market prices. Similar situation was faced by pulses growers during Kharif marketing season 2016-17, when market prices ruled below MSP in major producing states.

### Stocks with Central Pool

S.4 Procurement of wheat was 30.8 million tonne in RMS 2017-18 (as on 30<sup>th</sup> June 2017). The total stock position of wheat has improved during April and May 2017 and reached a level of 33.44 million tonnes in June 2017. Thus domestic stocks of wheat will be at comfortable level even after meeting the requirements under National Food Security Act (NFSA) and other Welfare Schemes. However, world



wheat production is anticipated to fall in 2017-18 but overall global supplies will remain ample due to higher inventories.

### Bridge Yield Gaps and Improve Efficiency

S.5 Yield gaps in India compared to those of the world average and potential yields are quite significant. These yield gaps are high in states which face various institutional and infrastructural constraints. Improving farm productivity through bridging yield gaps and improving efficiency is the most effective and sustainable way to enhance the farmers' income. Therefore, the Commission recommends that a special programme on 'Bridging the Yield Gap' needs to be implemented to move into the higher productivity levels.

### Incentivise Pulses Production

S.6 Pulses play an important role in improving soil health and have low carbon and water footprints. Therefore, farmers should be incentivised for growing pulses. The Commission reiterates its earlier recommendation of giving a financial assistance of at least ₹1800 per ha to farmers growing pulses. Also, in order to increase pulses productivity, good quality seeds, protective irrigation and better extension services should be provided.

S.7 Restrictions on stockholding limits of pulses were removed by the Department of Food and Public Distribution with effect from 17<sup>th</sup> May 2017, keeping in view a record production and comfortable availability of pulses as well as depressed market prices. As on 30.06.2017, ten states have removed the stock limits of pulses. The Commission had recommended removal of stock holding limits in its Kharif price policy report for marketing season 2017-18 but there was delay in removing these restrictions. By the time the decision was taken, most of farmers had already sold their produce and did not benefit much from the decision.

### Reform Agricultural Markets

S.8 In order to address the problems of present agricultural marketing system and create efficient, competitive, and transparent market structure for better price discovery, the government has initiated several reforms such as National Agricultural Market (e-NAM), the State/UT Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017 as a Model Act and Model Contract Farming (Promotion and Facilitation) Act, 2017. The Commission reiterates the importance of marketing reforms and need for reforming the State APMC Acts.

### Commodity Markets Outlook

S.9 Commodity Markets Outlook reports providing detailed market analysis, production, consumption, and trade statistics for major commodities and price forecasts can help in efficient functioning of markets. The Commission suggests that project on reliable and timely information about markets and price forecasts

for selected agricultural commodities should to be launched to enable farmers to make informed decisions on production and marketing as well as facilitate government to take appropriate and timely trade policy decisions, which would lead to less volatility in markets and higher profitability. It will also help the Commission while recommending MSP.

### Interest Subvention Scheme

S.10 In order to make agricultural credit available at affordable rates, Government has extended Interest Subvention Scheme for 2017-18. This will help farmers in getting short term crop loans up to ₹3 lakh payable within one year at only 4 percent interest rate. In view of declining trend in investment credit, the Commission recommends that Scheme of interest subvention should also be extended to long-term credit to facilitate investment in land development, irrigation infrastructure, farm mechanization, etc. which will in turn enhance agricultural growth.

### Crop Residues Management

S.11 During Commission's interactions with farmers it was found that they resort to burning of crop residues due to shortage of labour and high wages, as the process is labour intensive and time between harvesting and sowing of next crop is too short. The Commission suggests that subsidy on farm machinery for management of crop residues should be increased or farmers should be given payment through Direct Benefit Transfer (DBT) for management of crop residues. State governments should involve private sector and also use Corporate Social Responsibility (CSR) funds of companies selling farm machinery and equipments for better management of crop residues.

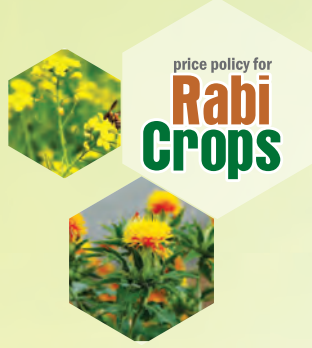
### Promote Balanced Use of Fertilizers

S.12 The distortion in price of urea vis-à-vis other fertilizers due to partial decontrol under Nutrient Based Subsidy (NBS) Scheme in April 2010 has adversely affected the use ratio of N, P and K because farmers use more urea than other fertilizers as it is cheaper. The government and industry should make concerted efforts to promote balanced use of fertilizers to achieve the ideal N:P:K ratio. The Commission recommends that the fertilizer industry should organize awareness programmes and field demonstrations on efficient and balanced use of fertilizers and its impact on crop productivity and profitability. There is also a need to gradually increase price of urea and reduce price of phosphatic and potassic fertilizers to promote balanced use of fertilizers.

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price policy for  
**Rabi**  
**Crops**

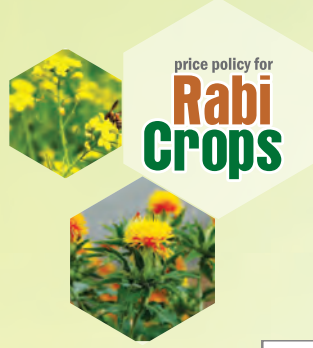






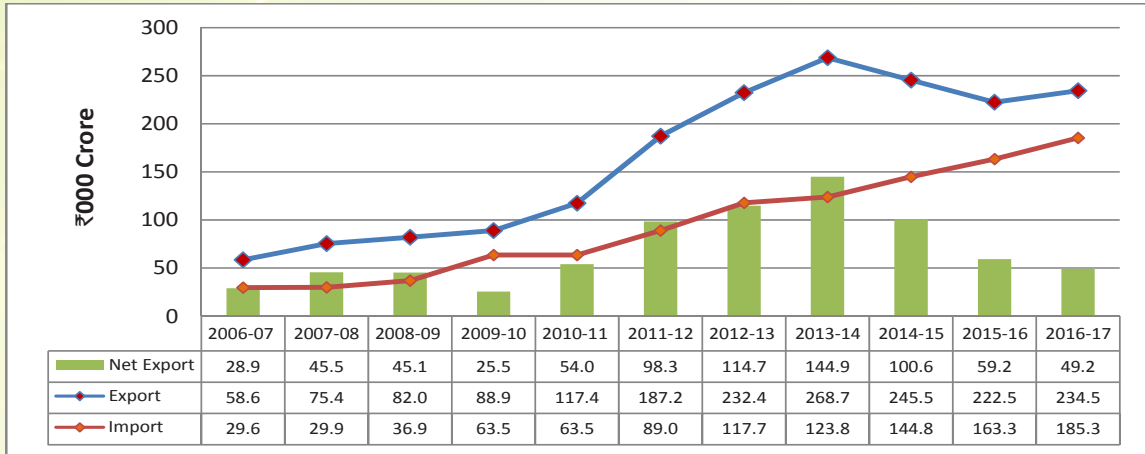
## Overview

- 1.1 Agricultural development is one of the most important instruments for promoting growth and reducing poverty. But changing market conditions, institutional arrangements, climate change and natural resource degradation are the major challenges faced by the agricultural sector. In order to address these, government has initiated several programmes such as National Agriculture Market (e-NAM), Soil Health Card Scheme, Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Pradhan Mantri Fasal Bima Yojana (PMFBY), etc.
- 1.2 Total foodgrains production in the country set new record at 273.4 million tonnes in 2016-17. The production of cereals increased from 235.2 million tonnes in 2015-16 to about 251 million tonnes in 2016-17, while pulses production increased from 16.35 million tonnes to a new high of 22.4 million tonnes during this period. Rabi foodgrains production is estimated at 135.34 million tonnes, about a million tonnes higher than the last year. Total foodgrains production target for 2017-18 is set at 274.55 million tonnes and oilseeds at 35.5 million tonnes. As per 3<sup>rd</sup> Advance Estimates, wheat production is expected to be 97.4 million tonnes, gram at 9 million tonnes and Rapeseed & Mustard (R&M) at 8 million tonnes in 2016-17. Productivity was a major driver of growth in most of rabi crops.
- 1.3 As a result of high production of foodgrains, the GVA from agriculture has shown a sizeable increase over the previous year. Latest estimates of GVA at basic prices (2011-12 prices) for agriculture, forestry and fishing sector released by CSO in May 2017 show that the sector is likely to grow by 4.9 percent in 2016-17 against 0.7 percent in 2015-16.
- 1.4 Total value of agricultural exports declined from a peak of ₹268.7 thousand crores in 2013-14 to ₹222.5 thousand crores in 2015-16 but showed some improvement and rose to ₹234.5 thousand crores in 2016-17 (Chart 1.1). On the other hand, agri-imports showed a significant increase from ₹123.8 thousand crores in 2013-14 to ₹185.3 thousand crores in 2016-17. As a result, trade surplus declined from ₹144.9 thousand crores to ₹49.2 thousand crores during the corresponding period. There was a significant decline in exports of cotton, sugar, meat products and guar gum meal, while imports of wheat, pulses, cotton and raw sugar increased in the country. India imported about 5.75 million tonnes of wheat and 6.6 million tonnes of pulses during 2016-17. Imports of edible oils have increased by about 46 percent in the last



5 years and the share of soft oils such as soybean, sunflower and rapeseed has also witnessed a significant increase in the recent years.

**Chart 1.1: India's Exports, Imports and Net Trade of Agri-Commodities**

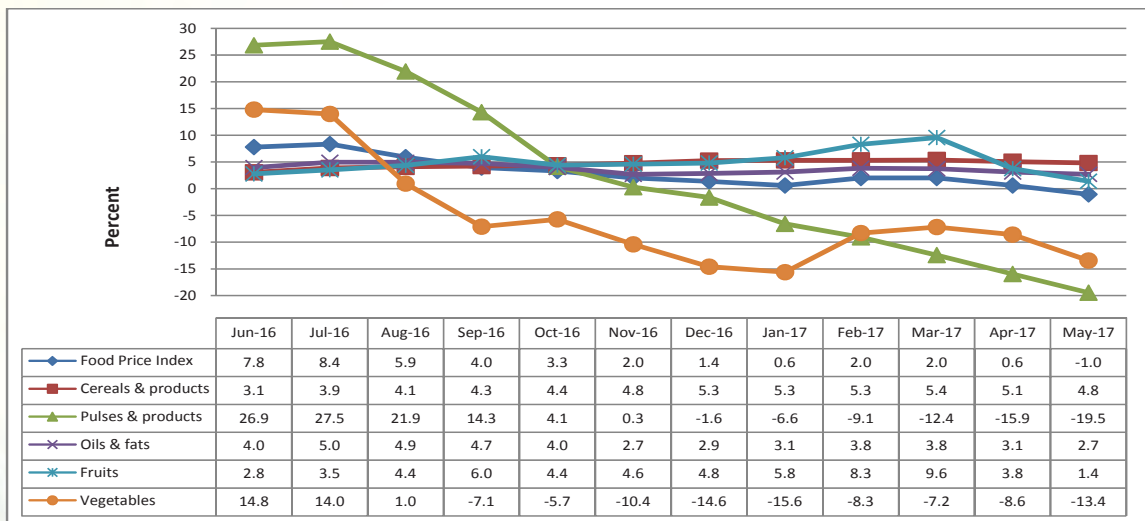


Source: Directorate General of Commercial Intelligence and Statistics

### Consumer Price Index (CPI) Based Inflation

1.5 Consumer Food Price Index has a significant weightage (39.06 percent) in overall Consumer Price Index. It is therefore, important to examine trends in food inflation. CPI based food inflation has declined from 8.4 percent in July 2016 to -1.0 percent in May 2017 (Chart 1.2). The major contributor to high food inflation during 2016 was pulses and pulse products, which was in the range from 0.3 to 27.5 percent during June to November 2016. Thereafter, pulses showed a continuous declining trend, with the lowest (-19.5 percent) being in May 2017 mainly due to bumper production of pulses in 2016-17. Cereal and cereal products showed moderate rate of inflation in the range of 3.1 to 5.4 percent during June 2016 - May 2017. Oils and fats also showed moderate rate of inflation. Similar trend in WPI based inflation is observed in case of pulses and vegetables (Annex Table 1.5).

**Chart 1.2: Trends in CPI based Food Inflation**



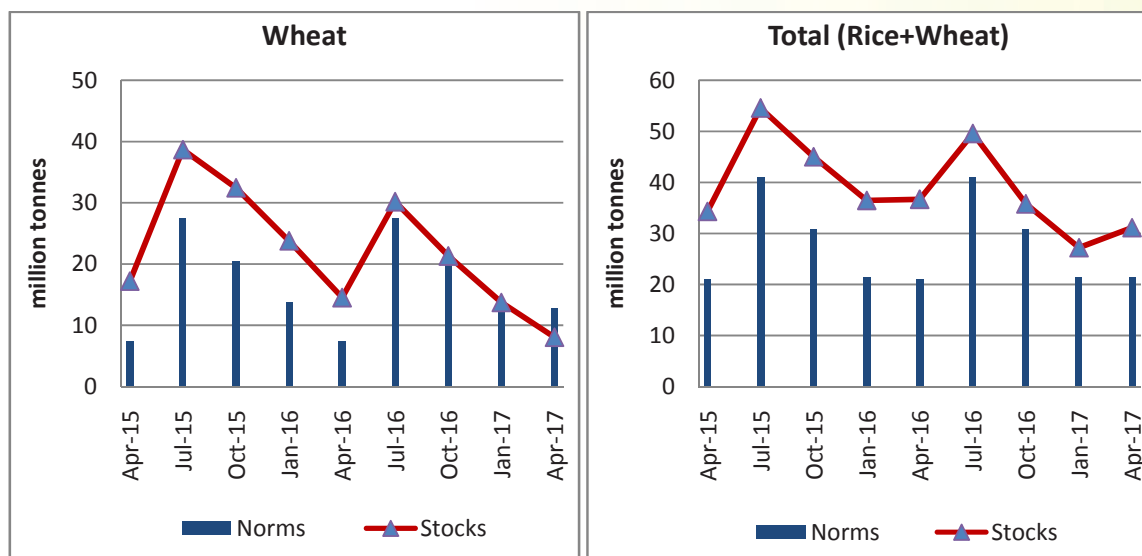
Source: Ministry of Statistics and Programme Implementation, Government of India



## Central Pool Stocks

1.6 The total stocks of rice and wheat with the central pool on April 2017 were higher (31.14 million tonnes) than the stocking norms (21.4 million tonnes). However, due to procurement of wheat, stock in central pool increased to about 55.5 million tonnes on June 1, 2017. Central pool stock of wheat depicts a declining trend from July 2016 onwards and was at the lowest level in April 2017 (8.06 million tonnes) in the last 5 years. The total stock position of wheat has improved during April and May 2017 and reached a level of 33.44 million tonnes in June 2017, which is higher than stocking norms. Stocks position in respect of wheat and wheat+rice during April 2015 to April 2017 is given in Chart 1.3. Procurement of wheat was 30.8 million tonne in RMS 2017-18 (as on 30<sup>th</sup> June 2017), which is significantly higher (34.1 percent) than the last year but still lower than the target of 33 million tonnes for 2017-18. Total allocation of wheat under National Food Security Act (NFSA) and other welfare schemes for 2017-18 is 25.27 million tonnes. With record production and higher procurement, wheat stocks would be comfortable during 2017-18.

**Chart 1.3: Central Pool Stocks of Wheat with FCI, April 2015 to April 2017**

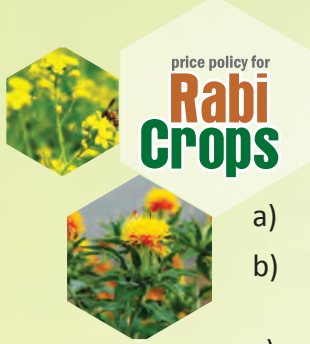


Note: Norms for January and April 2017 is as per revised norms from November 2016 to June 2017

Source: Department of Food and Public Distribution

## Doubling Farmers Income

1.7 According to NITI Aayog Policy Paper (March 2017), doubling real income of farmers by 2022 would require annual growth of 10.41 percent in farmers income, which is significantly higher than the on-going and earlier growth rates achieved in farm income. Therefore, in order to double the income of farmers it is necessary to encourage allied agricultural sectors like apiculture, livestock, fisheries, horticulture, organic farming, agro-forestry etc. as well as non-farm sector. Following measures can be adopted to increase farmers income:



- a) Improve productivity through provision of timely and quality inputs and services
- b) Reducing cost of production through rational utilisation of inputs like irrigation water, fertilizers and soil health management
- c) Remunerative prices to producers
- d) Increase in cropping intensity through irrigation development and improving water use efficiency by promoting micro-irrigation
- e) Integrated Farming System (IFS) based on agro-climatic regional planning
- f) Skill development of farmers
- g) Promotion of Farmer Producers Organizations (FPOs) for better inputs services and aggregation of output
- h) Moving people from agriculture to non-agriculture

### Interest Subvention Scheme

1.8 Credit is a critical input in achieving high productivity and production in agricultural sector. In order to make agricultural credit available at affordable rates, Government has extended Interest Subvention Scheme (ISS) for 2017-18. This will help farmers getting short term crop loans up to ₹3 lakh payable within one year at only 4 percent interest rate. The Scheme also envisages other benefits including interest at concessional rate of 7 percent for storage in warehouses accredited by Warehousing Development Regulatory Authority (WDRA) for upto 6 months post-harvest for avoiding distress sale. This provides institutional credit to the farmers and disengages them from non-institutional sources of credit, where they are prone to exploitation by private money lenders. However, in view of declining trend in investment credit, the Commission recommends that scheme of interest subvention should also be extended to long-term credit to improve capital formation in agriculture. This will bring growth in agricultural sector through investment in land development, irrigation infrastructure, farm mechanization, etc. Small and marginal farmers need to be brought under the ambit of formal financial institutions to ensure easy access to credit under Pradhan Mantri Jan-Dhan Yojana (PMJDY)

### Value-addition in Agriculture

1.9 For holistic development of agriculture sector it is essential to encourage forward and backward linkages in food processing sector. This sector contributed 9.1 percent and 8.6 percent of GVA in manufacturing and agriculture sectors respectively in 2015-16. In order to reduce post-harvest losses and increase value addition, the Ministry of Food Processing industries has accorded approval to 42 Mega Food Parks and 236 Integrated Cold Chains for creation of modern infrastructure for food processing along the value chain from the farm to market. Recently, the Ministry has come up with a new programme called Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters (SAMPADA) with the objective of supplementing agriculture, modernizing processing and reducing agri-waste. It is an umbrella scheme incorporating ongoing schemes of the Ministry like Mega



Food Parks, Integrated Cold Chain and Value Addition Infrastructure, Food Safety and Quality Assurance Infrastructure and also new schemes like Infrastructure for Agro-processing Clusters, Creation of Backward and Forward Linkages, Creation or Expansion of Food Processing and Preservation Capacities.

## Crop Residues Management

1.10 Burning of crop residues creates environmental pollution and leads to health related problems. During Commission's interactions with farmers it was found that they resort to such practices as removal of residue is a labour intensive operation and time span between harvesting and sowing is very short. Due to shortage of labour and high wages, farmers burn straw in the field. State Governments should create massive awareness on crop stubble management and promote Custom Hiring Centres (CHCs) under which machines for crop residue management should be made available at affordable prices to the farmers. It was reported that subsidy given on farm machinery for management of crop residues is low in view of high cost of machines. The Commission suggests that subsidy on these machines should be increased or farmers should be given payment through Direct Benefit Transfer (DBT) for management of crop residues. State governments should involve private sector and use Corporate Social Responsibility (CSR) funds for better management of crop residues.

## Reforms in Agricultural Marketing

1.11 Ministry of Agriculture and Farmers Welfare in collaboration with NITI Aayog has identified a set of 9 marketing reforms. These include enabling integration to e-NAM viz provision for e-trading, unified trading license, single point levy of market fee, setting up markets in the private sector, direct marketing, etc. These reforms aim at reducing the intermediaries between producer and consumer so as to ensure remunerative prices to the farmer. Ministry of Agriculture and Farmers Welfare has also formulated new Model APMC Act, 2017 and Model Contract Farming (Promotion and Facilitation) Act, 2017. These encompass the reforms being advocated for a transparent market enabling price discovery and competition where farmers would have multiple options to sell their produce, including the e-NAM platform. Hence the Commission reiterates the importance of marketing reforms and adoption of the best practices in State Marketing Acts.

## Management of Wild Animals

1.12 During the regional consultations of the Commission, various states like Uttar Pradesh, Bihar, Uttarkhand, Himachal Pradesh, Haryana, Punjab, Rajasthan, etc. have expressed concerns about crop losses due to wild animals mainly blue bulls, wild pigs and monkeys. In order to prevent crops from wild animals, barbed/solar fencing is the only way out. According to estimates provided by the Department of Agriculture, Government of Uttarkhand, cost of barbed wire fencing is around ₹85000 per hectare. The Commission recommends that central/state governments

should work out a plan and provide subsidy so as to enable the farmers, preferably groups of farmers to fence their fields to protect from wild animals.

*Menace of wild animals is a serious problem faced by the farmers in almost all States. Recently, Government of Gujarat has announced 50 percent subsidy on fencing of fields. Government of Himachal Pradesh provides 60 percent subsidy on solar fencing under Mukhya Mantri “Khet Suraksha Yojana” but has received poor response from farmers as cost of fencing is high. It is recommended that community/cluster approach should be adopted to make such schemes successful. State Governments should take up initiatives including crop insurance to protect against wild animals and compensate the farmers in case of losses.*

### Incentivising Pulses Production

1.13 Pulses play an important role in improving soil health and balancing the nutrient availability of soil through biological nitrogen fixation. Pulses also provide other ecosystem services as pulses have the lowest carbon and water footprints. Therefore, farmers growing pulses should be given a direct incentive for their contribution towards positive externalities. Also, in order to increase pulses productivity, good quality seeds, protective irrigation and better extension services should be provided. The Commission in its earlier report had recommended that a financial assistance of at least ₹1800 per ha may be given to farmers growing pulses. The Commission reiterates this recommendation.

### Farm Mechanisation

1.14 In India, labour cost is the largest component in cost of cultivation, followed by land cost, capital cost and other inputs like fertilisers, seeds, insecticides etc. Non-availability of labour during peak agriculture operations and high labour cost, especially during sowing and harvesting are major drivers of farm mechanisation. However, high cost of farm machinery and small farm size are the biggest hurdles in the way of adopting large scale farm mechanization. The Commission has recommended in its earlier reports that farm mechanization should be promoted extensively among small and marginal farmers through Custom Hiring Centres (CHC). Karnataka has established CHCs called ‘*Krishi Yantradhare Centres*’ on Public Private Partnership (PPP) model and are managed by NGOs, farmer’s organizations and charitable trusts. In Madhya Pradesh, the state is implementing the Scheme called ‘*Yantradoot*’, where 200 villages are selected every year and use of farm machinery is demonstrated for promoting the use of farm implements on custom hiring basis. Some leading farm equipment manufacturers are also trying out different models of custom hiring. Other states like Gujarat, West Bengal and Maharashtra have also set up CHCs which will help in lowering costs and increasing productivity. Therefore, efforts are needed to promote CHCs and also involve private sector, mainly farm equipment manufactures in promoting farm mechanization.



## Stakeholders Consultation

1.15 In order to strengthen MSP operations, the Commission holds regular consultations with State Governments, farmers and other stakeholders. This provides more insights and in-depth understanding of farmer's problem and ground level MSP operations. The data on cost of cultivation provided by the State Governments and that under the Comprehensive Scheme (CS) is at variance due to various conceptual differences. In order to ensure the quality of estimates, it is necessary that the State Governments and State Agricultural Universities (SAUs)/other institutions responsible for collecting data under the CS hold regular discussions so that the data collected by the two agencies are comparable and more realistic.

## Structure of the report

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

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# Demand-Supply Scenario and Procurement Operations

- 2.1 Rabi foodgrains production has witnessed an increase of around 7 percent as a result of increase in area (2.5 percent) and yield (4.4 percent) during 2016-17. Production of wheat has increased by 5.6 percent, mainly driven by improvement in yield (4.6 percent). An increase of 24.4 percent in production of barley is due to increase in both area (17.6 percent) and yield (5.8 percent) over the last year. Increase in productivity of gram (13.2 percent) and area expansion have resulted in a record increase in production by 28.6 percent over the last year. In case of rapeseed & mustard, there was a significant increase in area (8.4 percent) and production (17.4 percent). Despite decline in area under safflower (-5.4 percent), production increased by 20.4 percent in 2016-17 due to significant increase in productivity (27.2 percent).
- 2.2 As per FAO estimates (June 2017), world wheat production in 2017 is anticipated to fall from last year's record level of 760 million tonnes. Global wheat production is expected to be 743 million tonnes due to decline of production in North America, the Russian Federation and Australia. However, as per USDA's projection of June 2017, global production of wheat is likely to be 739.5 million tonnes in 2017-18, which is 2 percent lower than 2016-17 estimates of 754.1 million tonnes. According to International Grains Council (IGC), world wheat production is projected at 735.9 million tonnes in 2017-18. Global oilseeds production is expected to record an all-time high (581.6 million tonnes) in 2016-17 and FAO's tentative projections for 2017-18 season indicate that world oilseed production may be around the current season's production.

### Stock-to-Use Ratio (SUR)

- 2.3 Stock-to-use ratio, an important indicator of supply and demand is given in Table 2.1 and Annex Table 2.1. The SUR for wheat was 11.2 percent in 2016-17, lower (13.8 percent) than 2015-16. It is forecast to increase to 14.7 percent due to



anticipated increase in production. There is a significant increase in SUR of pulses from 4.9 percent in 2015-16 to 7.7 percent in 2016-17 due to record production of pulses in 2016-17. It is expected to further increase to 11.5 percent due to higher production target (23 million tonnes) and almost the same level of consumption during 2017-18.

**Table 2.1: Stock-to-Use Ratio (SUR) of Rabi Crops**

Crop/Year	2014-15	2015-16	2016-17	2017-18 (E)
Wheat	18.7	13.8	11.2	14.7
Pulses	6.9	4.9	7.7	11.5

Source: National Council of Applied Economic Research, Delhi, DES, Ministry of Agriculture & Farmers Welfare and Directorate General of Commercial Intelligence and Statistics

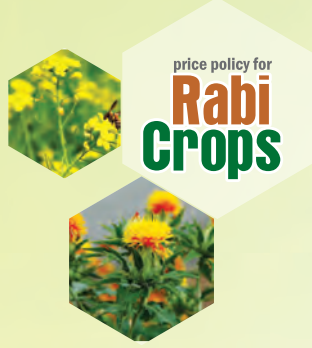
2.4 As per FAO estimates, the world wheat SUR is forecast to be 34.2 percent, slightly higher than 2016-17 level (34 percent). However, major exporters stock-to-disappearances ratio is forecast to decrease to 18.5 percent, below 2016-17 level of 20.1 percent but well above 16.5 percent observed during 2015-16. International Grains Council (IGC) projections also show a marginal decline in SUR for wheat, 32.3 percent in 2017-18 compared with 32.7 percent in 2016-17. In case of oils and fats, the SUR is projected at 16.5 percent, marginally higher (16.1 percent) than 2015-16 but much lower than 2014-15 level (18.9 percent). The global SUR for meals and cakes is also forecast to improve, from 17.8 percent in 2015-16 to 19.5 percent in 2016-17. Taking into account the SURs and current production and utilization trends, oilseeds and oilseeds product prices are projected to be at relatively low levels in the coming season. In the last two years, FAO food price index has increased from 164.9 in June 2015 to 172.6 in May 2017.

## Wholesale Prices and MSP

2.5 Demand-supply situation of agricultural commodities can be best estimated by studying the price trends in market along with other parameters. The weighted average wholesale price is a better indicator of market prices as it captures price movements of major producing states. Analysis of trends in domestic and world prices plays crucial role in deciding the price policy for agricultural commodities, which helps in maintaining the price stability. In this section, we analyze trends in wholesale prices and MSPs of Rabi crops during April 2015 to June 2017. Charts 2.1 to 2.8 present the movement of wholesale prices vis-à-vis MSPs of wheat, barley, gram, lentil, R&M and safflower, respectively.

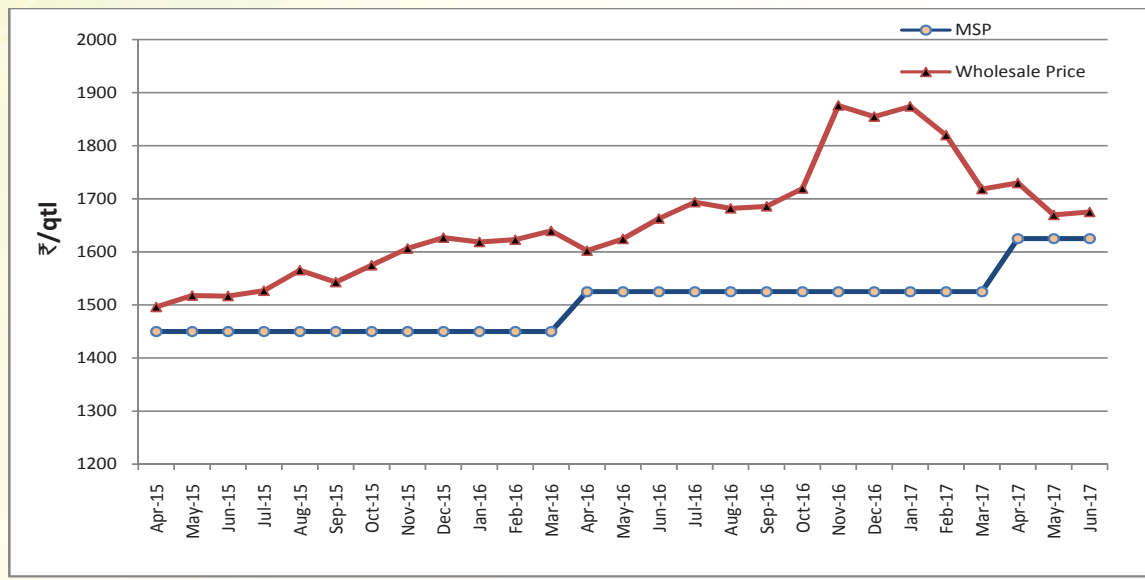
## Wheat

2.6 Chart 2.1 depicts weighted average wholesale prices of wheat in the country. Market prices of wheat were ruling above MSP continuously from April 2015 to June 2017. However, in May and June 2017, the peak arrival season, prices dropped due to lower price in Madhya Pradesh. Chart 2.2 illustrates instances



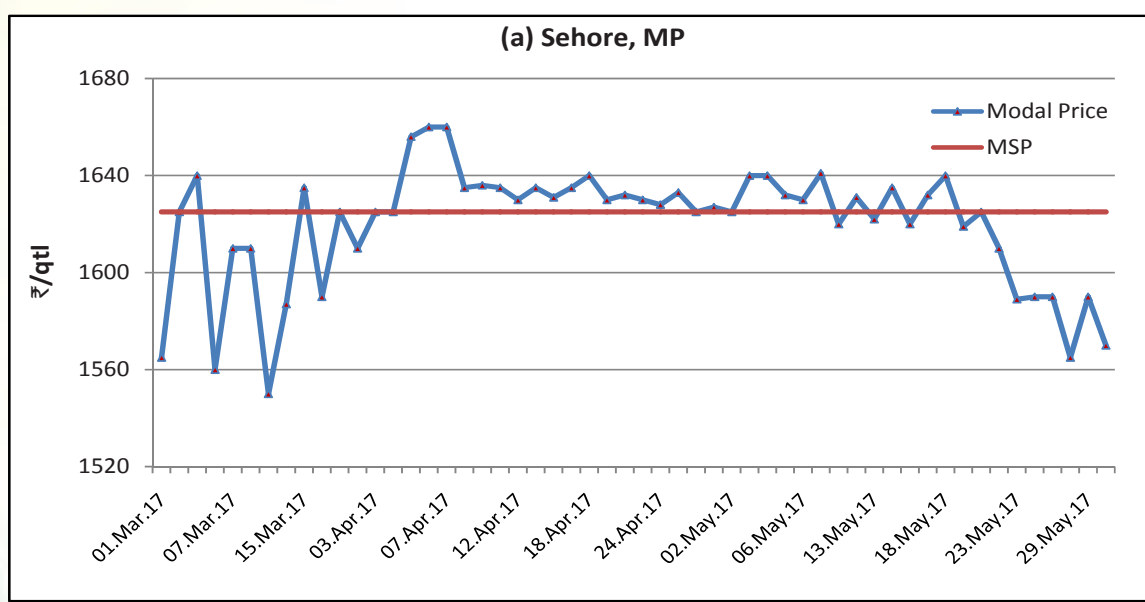
of market prices ruling below MSP in Madhya Pradesh. For example, in Sehore and Raisen market of Madhya Pradesh, market prices were reported below MSP for 19 days and 5 days, respectively, during March to May, 2017. The prices were below MSP, even though Madhya Pradesh produces premium quality wheat which is higher price, generally above MSP. This decline in wholesale prices may be attributed to increase in production of around 6 percent in 2016-17. Detailed analysis of market prices below MSP is provided in Annex Table 2.2

**Chart 2.1: Wholesale Prices vis-à-vis MSP of Wheat**



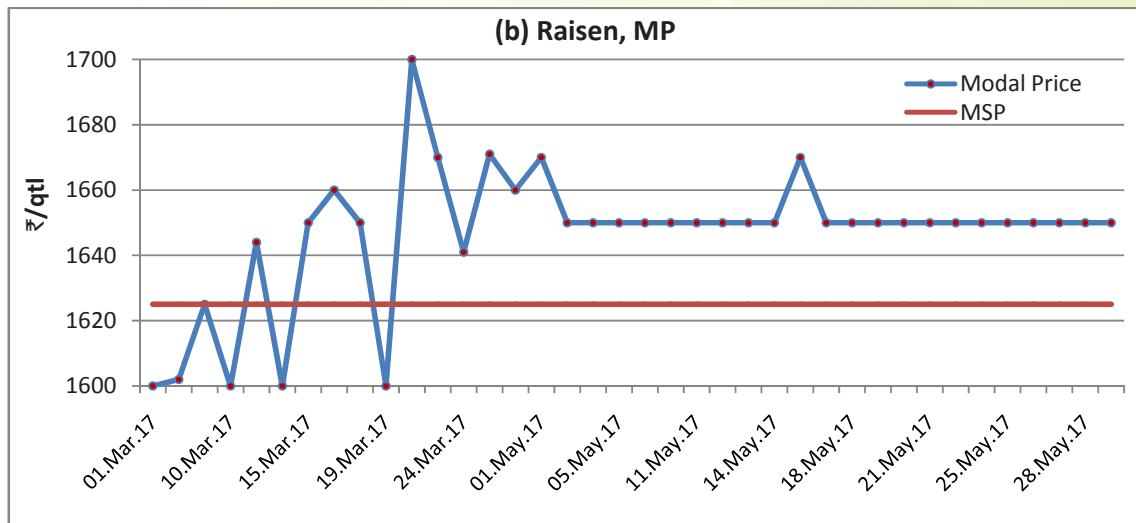
Note: Weighted average wholesale prices of Bihar, Gujarat, Haryana, Jharkhand, Karnataka, Maharashtra, MP, Punjab, Rajasthan and UP, which cover 97 percent of production  
 Source: DES, Ministry of Agriculture & Farmers Welfare

**Chart 2.2: Comparison of Market Prices in Madhya Pradesh and MSP of Wheat**



Source: Agricultural Marketing Information Network



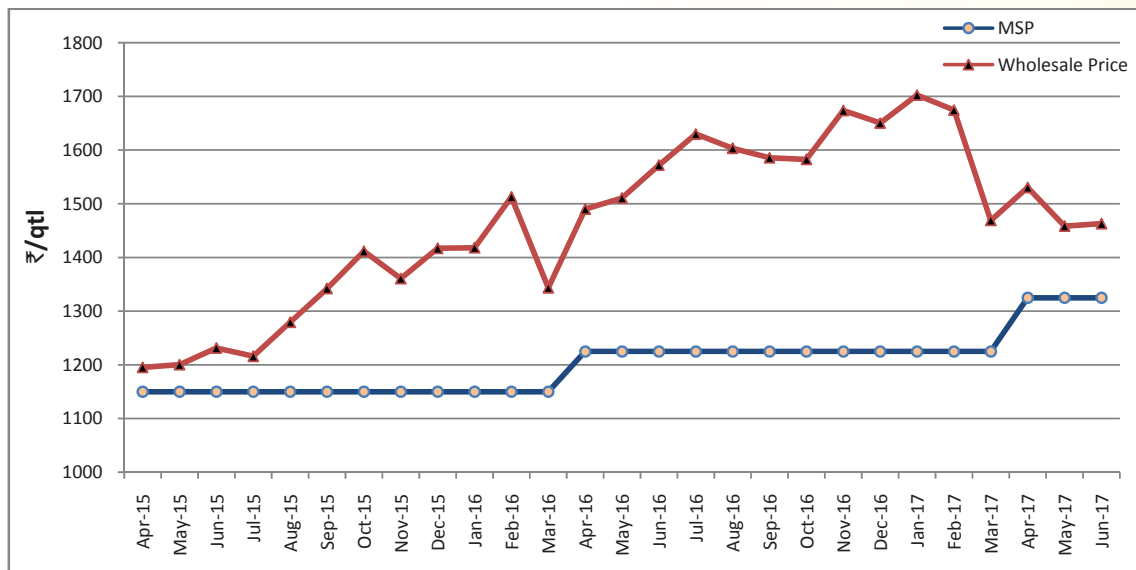


Source: Agricultural Marketing Information Network

## Barley

2.7 Wholesale price of barley is above MSP from April 2015 to June 2017. Prices drastically declined from March 2017 onwards. Prices declined to ₹1463 per quintal in June 2017, after the peak price of ₹1703 per quintal in January 2017 (Chart 2.3). This is mainly attributed to 18 percent increase in area under cultivation. Market prices of barley have been higher than MSP but the gap has narrowed during the recent period.

**Chart 2.3: Wholesale Prices vis-à-vis MSP of Barley**



Note: Weighted average wholesale prices of Haryana, Rajasthan and UP, which cover 79 percent of production

Source: DES, Ministry of Agriculture & Farmers Welfare

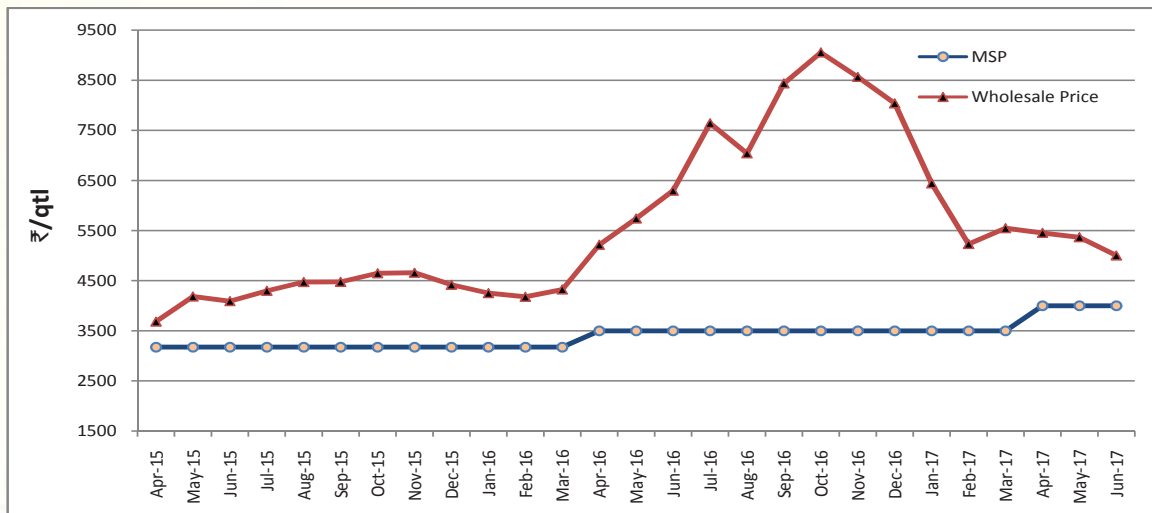


**Gram**

2.8 India is the largest producer, importer and consumer of pulses in the world. India imports about 5-6 million tonnes of pulses to bridge the gap between demand and supply. In order to incentivize pulses production and encourage farmers to grow pulses, government significantly increased MSPs of both kharif and rabi pulses in 2016-17. As a result of which there was a record increase in area and production of pulses in the country, which had an adverse impact on market prices (Chart 2.4). Gram area increased by about 14 percent, while production increased by 29 percent due to significant improvement in yield. Gram prices, which increased from ₹4179 per quintal in February 2016 to ₹9053 per quintal in October 2016, fell to ₹5231 per quintal in February 2017 and were less than ₹5000 per quintal in major producing states like Maharashtra, Madhya Pradesh, Karnataka and Rajasthan during the month of June 2017.

2.9 Prices of kharif pulses, mainly tur and green gram, were also below MSP in many markets during kharif marketing season 2016-17. This essentially shows that a high MSP is not the only policy instrument to sustain higher production but it should be backed up by a robust procurement system. This emphasizes the importance of public procurement machinery and adequate preparatory measures for establishment of proper procurement system with active participation of state/state agencies. Similar phenomenon of price fall was also observed in 2013-14, when an all-time record production of 9.53 million tonnes was achieved in case of gram, even higher than 2016-17 level of 9.02 million tonnes. During the second half of 2013 and whole of 2014, market prices of gram were below MSP. It is quite possible that in the absence of effective and timely procurement system in place, market prices may fall below MSP during forthcoming Kharif season, thereby discouraging farmers from growing pulses. The Commission recommends that long-term sustainable procurement as well as disposal system needs to be evolved for pulses through effective participation of state governments, producers' organizations including cooperatives and private sector.

**Chart 2.4: Wholesale Prices vis-à-vis MSP of Gram**



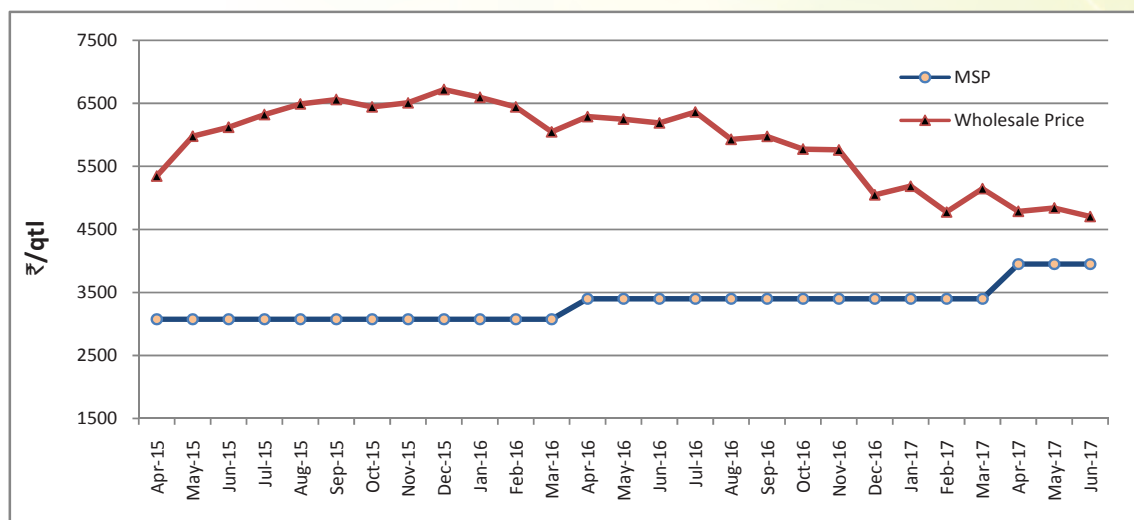
Note: Weighted wholesale prices of AP, Bihar, Karnataka, MP, Maharashtra, TN, UP and WB, which cover 88 percent of production, MSPs are inclusive of bonus

Source: DES, Ministry of Agriculture & Farmers Welfare

## Lentil

2.10 Wholesale prices of lentil, the second important rabi pulse, have been substantially higher than MSP and showed a declining trend during last one year, narrowing the gap between market prices and MSP. Monthly prices showed a declining trend mainly due to low prices in Madhya Pradesh during May and June 2017.

**Chart 2.5: Wholesale Prices vis-à-vis MSP of Lentil**

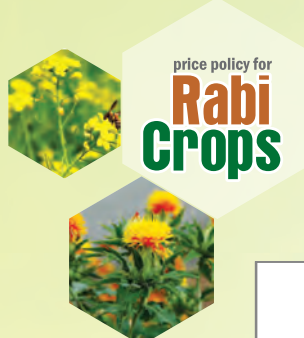


Note: Weighted average wholesale prices of Bihar, MP, UP and West Bengal, which cover 88 percent of production, MSPs are inclusive of bonus

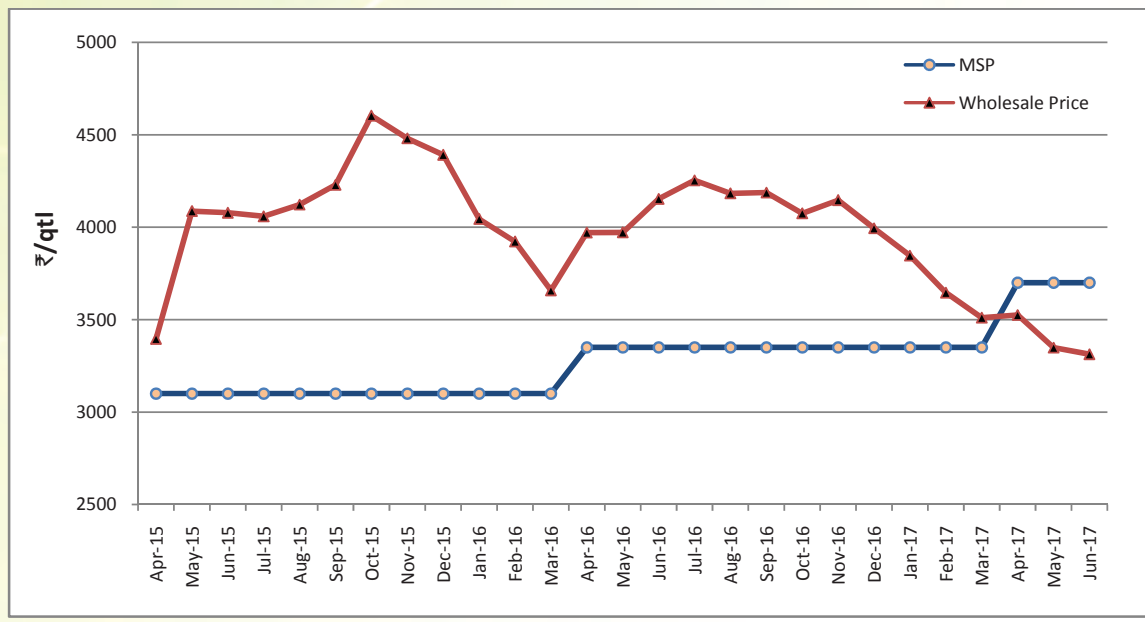
Source: DES, Ministry of Agriculture & Farmers Welfare

## Rapeseed and Mustard

2.11 The prices of R&M were ruling above MSP from April 2015 to March 2017 with fluctuating trends. However, during April to June 2017, prices were below MSP, which necessitated procurement of R&M by the public agencies (Chart 2.6). However the quantity procured by NAFED was so meager (37649 tonnes as on 29.06.2017) that it did not have any effect on the market prices. Chart 2.7 displays market prices of R&M vis-à-vis MSP in selected markets of major producing states like Rajasthan, Haryana, Madhya Pradesh and Uttar Pradesh. The trends show that prices were lower than MSP during March-June 2017, when market arrivals are large. Low prices below would discourage farmers from growing oilseeds and area under R&M may fall in the next rabi season. A detailed analysis of comparison of market prices and MSP in selected markets is given in Annex Table 2.3. Awareness about MSP is also low in case of R&M farmers. As per NSS Report No. 573 (Some Aspects of Farming in India, 2012-13), about 15.5 percent R&M farmers are aware of MSP and less than one percent farmers sold the crop to procurement agency. Therefore, there is a need to create more awareness about MSP and procurement agencies. Timely market intervention by public agencies is also needed to stabilize market prices and ensure benefits of MSP operations to farmers.

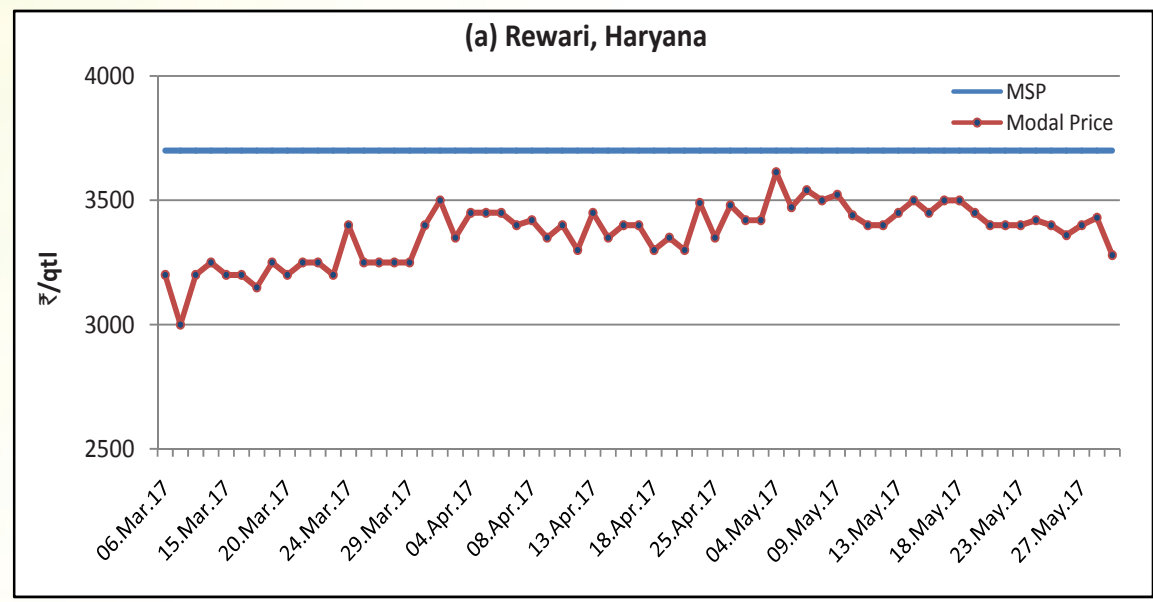


**Chart 2.6: Wholesale Prices vis-à-vis MSP of R&M**

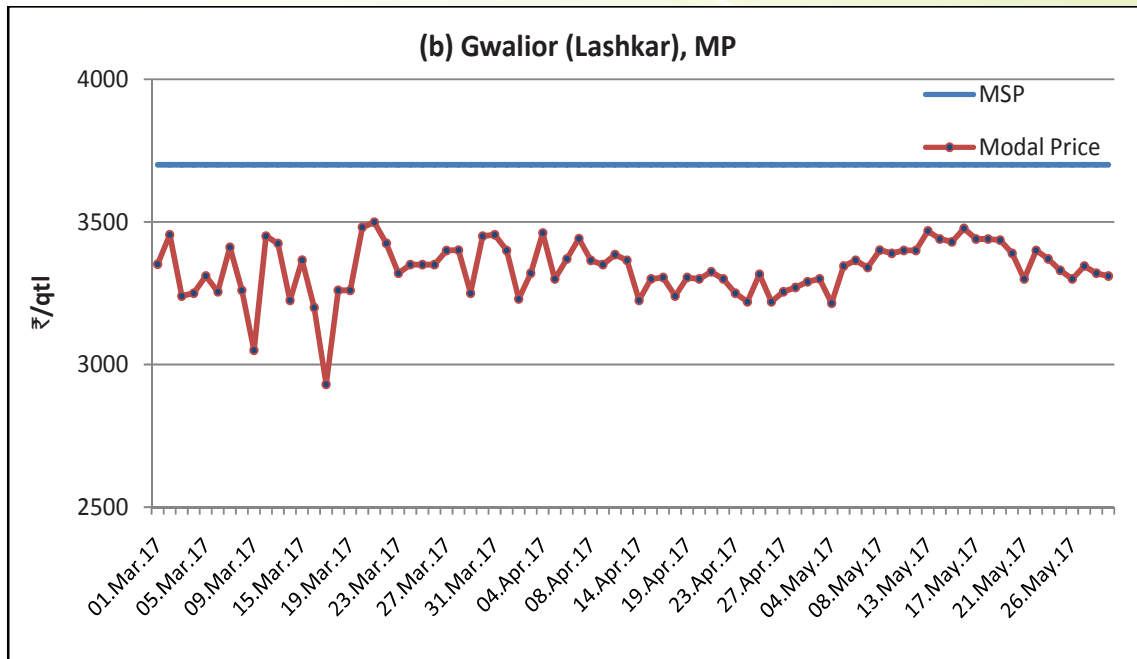


Note: Weighted average wholesale prices of Gujarat, Haryana, Rajasthan, UP and West Bengal, which cover 76 per cent of production, MSPs are inclusive of bonus  
 Source: DES, Ministry of Agriculture & Farmers Welfare

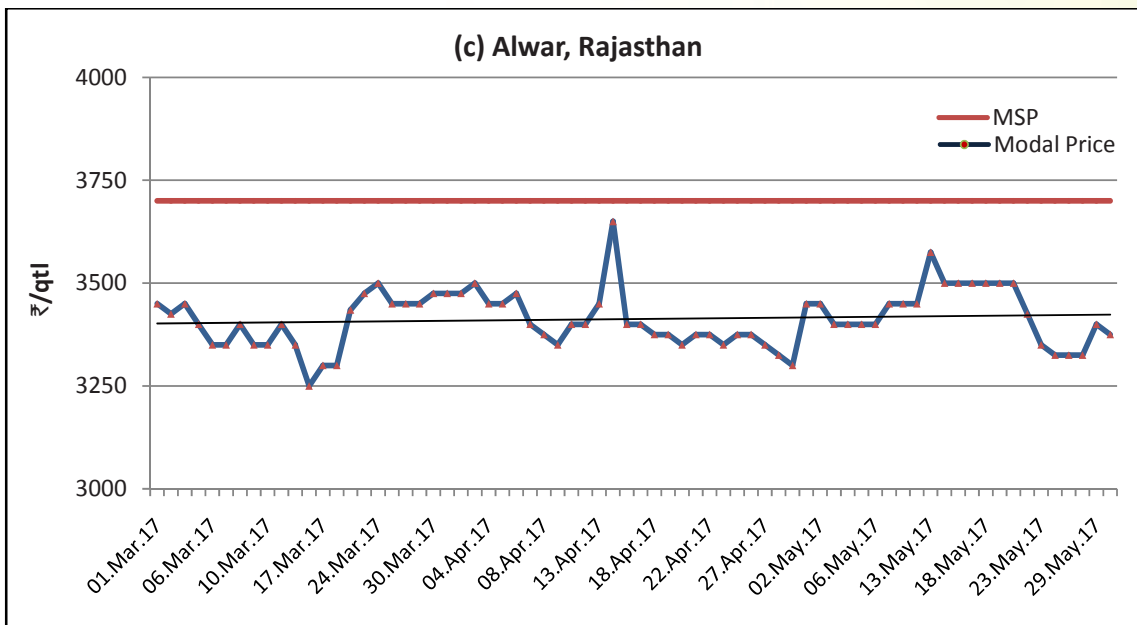
**Chart 2.7: Comparison of Market Prices and MSP of R&M**



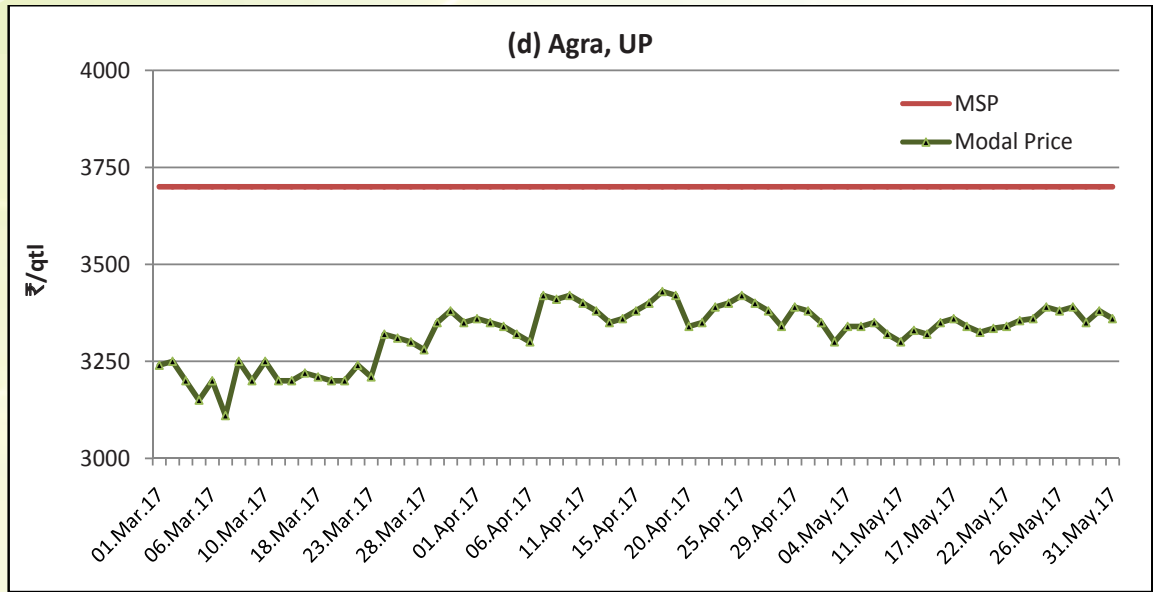
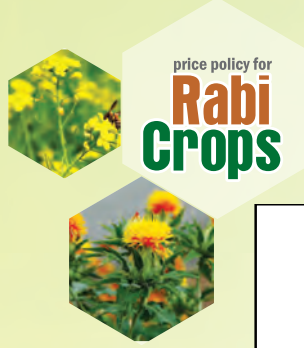
Source: Agricultural Marketing Information Network



Source: Agricultural Marketing Information Network



Source: Agricultural Marketing Information Network

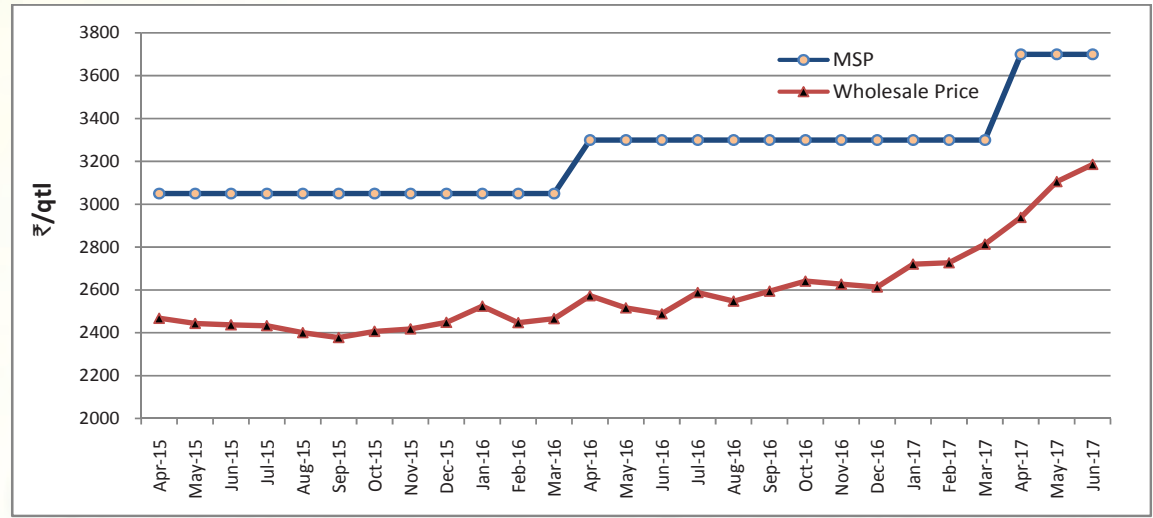


Source: Agricultural Marketing Information Network

### Safflower

2.12 Although safflower oil is a premium cooking oil, safflower production has continuously declined over the last ten years, from 2.4 lakh tonnes in 2006-07 to 0.53 lakh tonnes in 2016-17. Wholesale prices of safflower were ruling below MSP from April 2015 to June 2017 (Chart 2.8). Market prices witnessed a marginal recovery in the recent period but are still much lower than the MSP. Due to very low productivity of safflower in the country, cost of production is very high, which makes it less competitive. Efforts are needed to improve crop productivity and seed oil content to make it competitive.

Chart 2.8: Wholesale Prices vis-à-vis MSP of Safflower



Note: Weighted average wholesale prices of Karnataka and Maharashtra, which cover 69 percent of production MSPs, are inclusive of Bonus

Source: DES, Ministry of Agriculture & Farmers Welfare



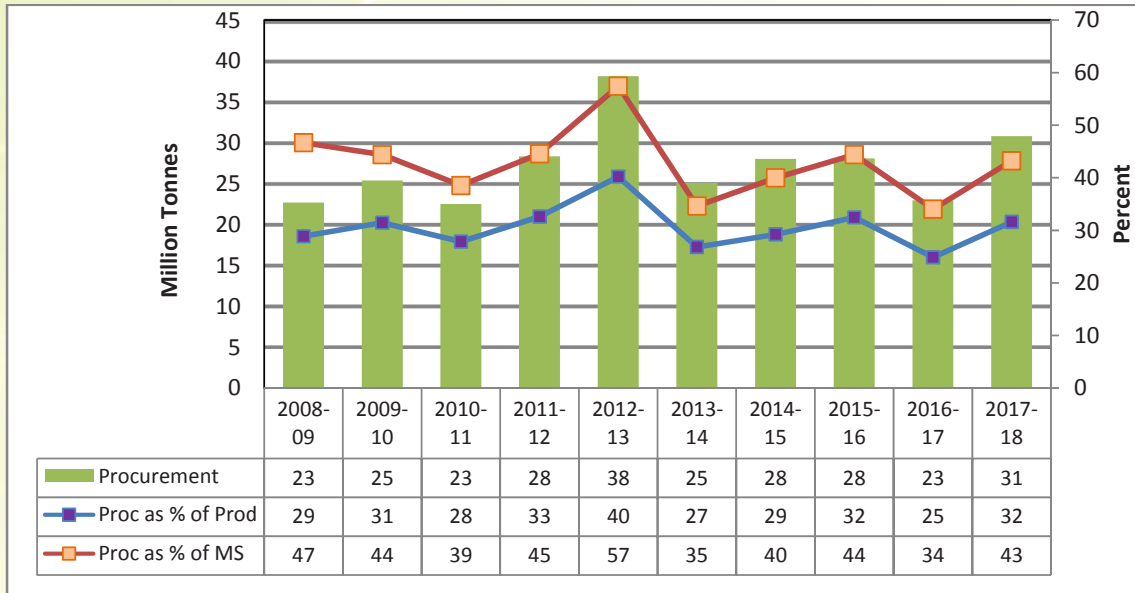
## Market Outlook and Price Forecast

2.13 A forecast regarding major trends in prices of a particular commodity based on the past price trends, production pattern, consumer demand and other economic factors will help in smooth functioning of markets. System of preparing of market outlook reports for major crops will facilitate temporal and spatial integration of markets and prices, thus strengthening the market intelligence network and reducing volatility in market prices. CACP suggests that a project similar to Network Project on Market Intelligence initiated by the Indian Council of Agricultural Research (ICAR) in 2013 to provide reliable and timely price forecasts to farmers for selected agricultural commodities needs to be launched on a larger scale to enable farmers to make informed decisions on production and marketing, which would lead to less volatility in markets and higher profitability.

## Procurement Policy and Operations

- 2.14 Procurement operations in case of Rabi crops are largely confined to wheat. The Food Corporation of India (FCI) is the central nodal agency designated for procurement of wheat at MSP while NAFED undertakes procurement of pulses and oilseeds. In addition to this, National Cooperative Consumers Federation of India Ltd. (NCCF), Small Farmers Agribusiness Consortium (SFAC) and Central Warehousing Corporation (CWC) are other central nodal agencies for undertaking procurement of pulses and oilseeds under PSS, when market prices fall below MSP. However no sizeable procurement has been undertaken by these agencies.
- 2.15 The trend in procurement of wheat during 2008-09 to 2017-18 is shown in Chart 2.9. As can be seen, there are significant inter-year variations in the scale of procurement of wheat. The average annual procurement of wheat during the triennium ending (TE) 2017-18 was about 27 million tonnes. The procurement during the current marketing season (2017-18) is already at about 30 million tonnes, significantly higher than 2016-17 but lower than the target. In 2016-17, procurement was lower (23 million tonnes) as compared to previous two years due to high market prices. Similarly procurement as percentage of production and marketed surplus has also increased to 31 percent and 43 percent, respectively in 2017-18.

**Chart 2.9: Wheat Procurement as Percent of Production and Marketed Surplus**



Note: MSR is available upto 2014-15 only hence repeated in 2015-16, 2016-17 and 2017-18  
Procurement for 2017-18 as on 30.06.2017

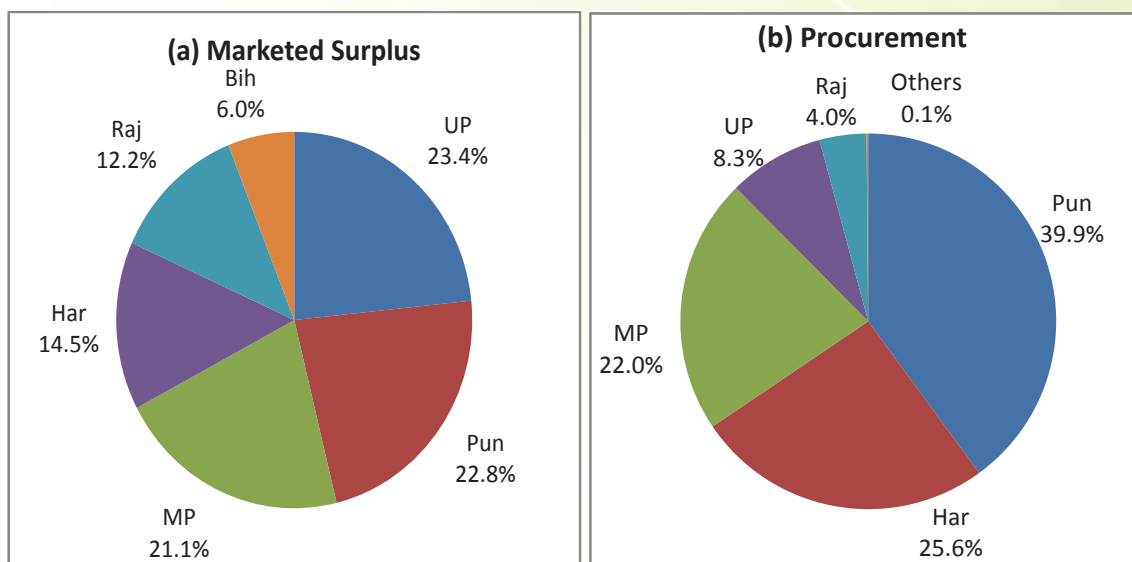
Source: DES, Ministry of Agriculture & Farmers Welfare, Department of Food and Public Distribution, Agricultural Statistics at a Glance, 2016.

2.16 Another aspect of procurement that needs to be noted is that the state-wise procurement pattern does not match with the production pattern. During TE2017-18, out of the total wheat procurement of about 27 million tonnes, 39.9 percent is contributed by Punjab, 25.6 percent by Haryana and 22 percent by Madhya Pradesh (Chart 2.10). These three states account for 87.6 percent of total wheat procurement in the country. Uttar Pradesh, which is the largest producer of wheat in the country with an estimated share of about 28.2 percent, contributes about 8.3 percent to procurement. The share of Bihar in total wheat production is about 5 percent but its share in procurement is negligible.

2.17 Although marketed surplus share of Uttar Pradesh (23.4 percent) and Madhya Pradesh (21.1 percent) is high, their share in procurement is much lower. It is evident from Chart 2.11 that large number of procurement centers have been setup in Bihar and Uttar Pradesh, but procurement has not been adequate indicating low capacity utilization and infrastructure weaknesses. However, it is encouraging to note that wheat procurement in Uttar Pradesh has increased from about 8 lakh tonnes in 2016-17 to about 3.7 million tonnes in 2017-18, making Uttar Pradesh the fourth largest contributor to wheat procurement in the country. Similarly, procurement in Madhya Pradesh has also increased from about 4 million tonnes in 2016-17 to 6.7 million tonnes in 2017-18.

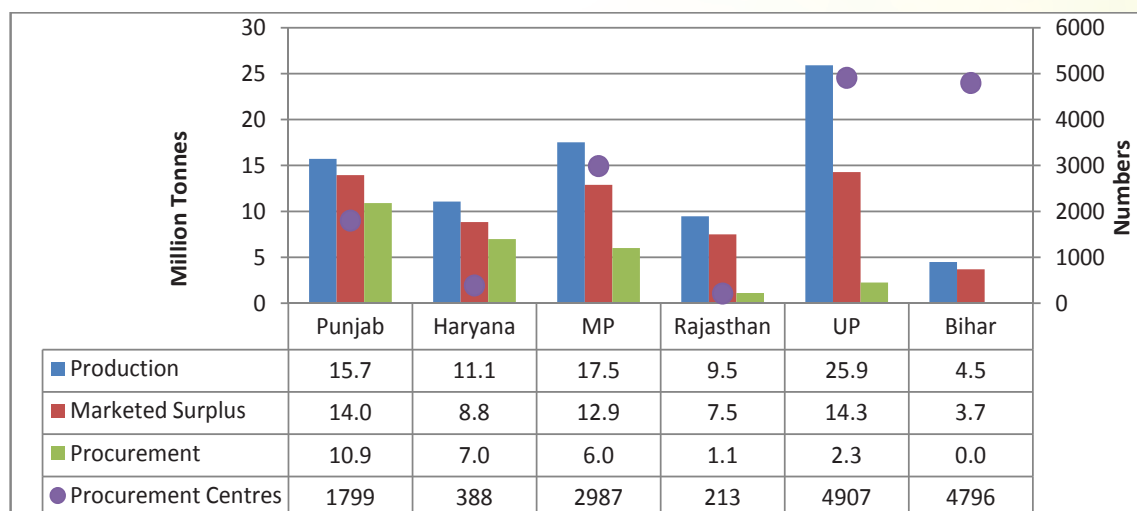


**Chart 2.10: Shares of Major States in Marketed Surplus (TE2016-17) and Procurement (TE2017-18) of Wheat**



Sources: Agricultural Statistics at a Glance, 2016 and Food Corporation of India

**Chart 2.11: State-Wise Production, Marketed Surplus, Procurement and Procurement Centres of Wheat in TE2016-17**



Source: DES, Ministry of Agriculture & Farmers Welfare and Food Corporation of India

## Pulses

2.18 The country achieved a record production of pulses during 2016-17, which led to a fall in market prices. Participation of FCI in addition to NAFED and SFAC in procurement of pulses in 2016-17 has yielded limited results. The tentative target fixed for procurement of Rabi pulses in RMS 2017-18 is 5 lakh tonnes (4 lakh tonnes of gram and one lakh tonnes lentil). As regard Rabi pulses 2017-18, the procurement is being carried out by NAFED only under PSF. As on 29.06.2017, NAFED has procured

19.1 thousand tonnes of lentil and 50.8 thousand tonnes of gram (Table 2.2). It is reported that in the absence of assurance of reimbursement of losses, state government agencies do not come forward for procurement of pulses. Since pulses have relatively short shelf life, there is also a need to evolve a robust mechanism for disposal of these stocks which is not in place currently. Another issue which came up for discussion during the meetings with state governments, farmers and other stakeholders, was different sowing and harvesting period of pulses in states. In view of this, CACP recommends that the procurement period in case of pulses in the respective States should be fixed as per harvesting period.

- 2.19 In 2016-17, rabi oilseeds production is expected to be about 9.7 million tonnes compared to 8.5 million tonnes in 2015-16, which will increase domestic availability of oils. During March to May 2017, market prices of mustard were below MSP in many states. In order to ensure remunerative prices to farmers, NAFED has intervened in the market and procured 37.6 thousand tonnes of mustard seeds, which hardly had any impact on monthly prices (Table 2.2). With high degree of substitutability among oils and high price elasticity, domestic edible oil and oilseeds prices are directly linked with the world prices. World edible oil prices have also shown a declining trend during last 3-4 months. Since India is the largest importer of edible oils in the world, world prices have direct impact on domestic prices. Therefore, there is a need to closely monitor international prices and have appropriate import tariff levels as well as strengthen procurement operations.

**Table 2.2: Procurement of Pulses and Oilseeds by NAFED in RMS 2017-18**

Crops	Quantity (tonnes)
Masoor (lentil)	19100
Chana (gram)	50841
<b>Total Pulses</b>	<b>69942</b>
Mustard Seed	37649

*Note: Procurement of pulses as on 29.06.2017  
Source: Food Corporation of India*

### Stock Limits and Licensing Requirements for Pulses

- 2.20 A substantial hike was given in the MSP of pulses to incentivize farmers to increase pulses production. Due to increase in MSP and availability of certified/quality seeds, pulses production increased in the country and government procured about 2 million tonnes of Kharif pulses. Still in many states, Kharif pulses were sold below MSP as private traders did not enter the market mainly due to stock holding limit restrictions and unrestricted imports of pulses during peak market arrivals.
- 2.21 Restrictions on stockholding limits have been removed by the Department of Food and Public Distribution with effect from 17<sup>th</sup> May 2017, keeping in view a record production and comfortable availability of pulses as well as depressed market prices. As on 30.06.2017, ten states have completely/partially removed the stock limits of pulses. The Commission had recommended removal of stock holding limits in its

Kharif price policy report for marketing season 2017-18. The State governments have notified the same with a time lag after Central Government notified, hence prices continued to rule below MSP in some states.

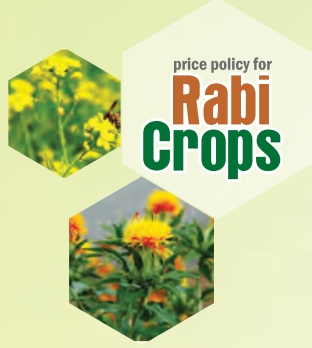
**Table 2.3: Status of Stock Limits of Pulses in different States**

State/ UT	Cities	Status as on 15.05.2017		Status as on 30.06.2017
		Wholesalers (qtl)	Retailers (qtl)	
A&N	-	500	25	Removed
Andhra Pradesh	Category A cities - Vijayawada, Vishakhapatnam	5500	155	Removed
	Other Places	4000	120	(*30.05.2017)
Tamil Nadu	Municipal Area	2500	62.5	Removed
	District HQ	1250	50	
	Other Areas	1250	50	
Telangana	Hyderabad and Secunderabad	5500	155	Removed
	Other Places	4000	120	
Maharashtra	Corporation Area	10500	600	Removed except for chana dal/ chana  (*01.06.2017)
	Class-A Municipality Area	7500	450	
	Other Areas	4500	450	
Odisha	-	2000	50	Not Removed
Delhi	-	2000	50	Removed (*23.06.2017)
Jharkhand	-	1000	50	Removed
Karnataka	-	5000	100	Removed (*20.05.2017)
Punjab	-	2000	100	Removed
Rajasthan	-	2000	25	Removed
Assam	-	10 (for all Pulses)		Removed

Source: Department of Food and Public Distribution

## Awareness Creation about MSP and FAQ

2.22 During CACP's interactions with the farmers it was pointed out that the agricultural produce brought to the market is at times rejected as it does not meet the FAQ norms. In addition, awareness about MSP and procurement agencies is also low in many regions and crops. In order to strengthen MSP operations, awareness about MSP and FAQ norms need to be created so as to ensure that farmers meet the requisite quality norms. Strong procurement operations need to be expanded to neglected regions, particularly eastern and north-eastern regions. This calls for giving wide publicity about MSP and procurement agencies by the State Governments in regional/vernacular, electronic and print media and also through pamphlets, and announcements in the villages regarding MSPs and FAQ parameters of important

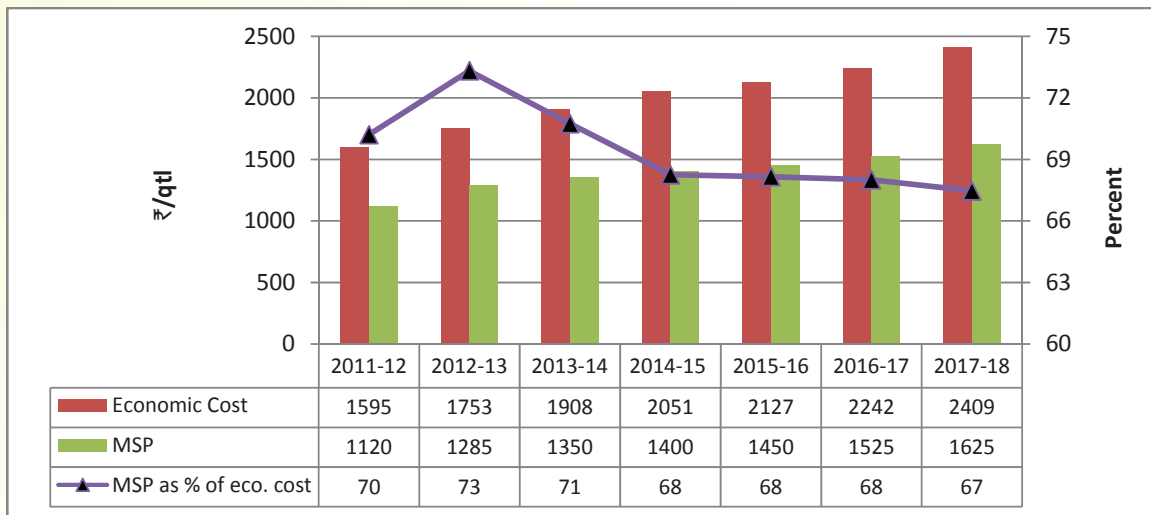


commodities at least 15 days before the procurement starts. In addition, farmers need to be trained on FAQ norms and post-harvest handling of commodities so as to minimize post-harvest losses and better prices to farmers. To instill confidence among farmers for procurement of their produce, a legislation conferring on farmers 'The Right to Sell at MSP' may be brought out.

### Economic Cost of Wheat

2.23 Economic cost of wheat has increased significantly over the years, whereas MSP as percentage of economic cost has decreased continuously from 2012-13 (Chart 2.12). The rising trends of procurement incidentals and distribution costs have contributed more to the increase in economic cost. One of the main factors for rising economic cost is the continuous increase in statutory taxes and other incidentals levied by the state governments. These statutory levies, mandi tax, VAT etc. are major source of market distortion.

**Chart 2.12: Economic Cost of Wheat**



Source: Food Corporation of India

### Recapitulation

2.24 Rabi foodgrains production has witnessed an increase of around 7 percent as a result of increase in area and yield during 2016-17. Domestic and global supplies of most commodities are anticipated to be adequate and less volatile. Substantial increase in the production of pulses and absence of effective and timely procurement resulted in market prices falling below MSP. Restrictions on stock holding limits have been removed by the Department of Food and Public Distribution but only in the third week of May 2017. There is a need to evolve a robust, sustainable procurement system as well as disposal system through effective participation of state governments, producers' organizations including cooperatives and private sector.

\*\*\*\*\*

## Productivity of Rabi Crops

3.1 Increase in agricultural output comes from three sources: increase in area under cultivation, use of additional inputs and increased productivity resulting from improved technology. It is well documented that while introduction of high-yielding varieties (HYVs) and the expansion of irrigation and fertilizer use have been major drivers of productivity growth in Indian agriculture, there have been significant regional differences in the level of use of these inputs. By and large, the use of these inputs is low in poorer states compared with the developed states. In Punjab, for instance, more than 95 percent of the cropped area is under irrigation, while in states like Assam, Jharkhand, Odisha, Maharashtra, less than 30 per cent of the total cropped area was irrigated in 2013-14. Increasing productivity growth will need to remain a priority if high growth rates are to be achieved and sustained and target of doubling farmers' income has to be realized by 2022. Productivity improvement helps in reducing cost of production, enhancing profitability of the farmers and making agriculture globally competitive and remunerative. In this chapter analysis of yield trends and the yield gap of major Rabi crops has been done and measures to enhance productivity and reduce yield gap have also been discussed.

### Decadal Productivity Growth Trends

3.2 The compound annual growth rates of area, production and productivity of Rabi crops during the decades of 1990s (1991-92 to 2000-01), 2000s (2001-02 to 2010-11) and 2010s (2011-12 to 2016-17) are analyzed and given in Table 3.1. The growth rates in productivity of wheat witnessed a declining trend during last 25 years. The growth rate declined from 1.69 percent during 1990s to 1.16 percent during the 2000s and became negative (-0.63 percent) during the recent decade. Area under wheat and production also showed decelerating trend. Due to two consecutive drought years during the 2010s, wheat production and productivity recorded a negative growth. During 2010s, barley recorded negative growth rate in production (-0.64 percent) due to shrinkage in area (-0.21 percent) and decline in productivity (-0.43 percent) compared with positive growth rates in area, production and yield during the 2000s.

3.3 In case of gram, growth rate in area and productivity has decelerated and productivity turned negative during the 2010s, resulting in negative production growth rate of

-0.33 percent per annum. However, lentil has shown improvement in productivity growth (1.21 percent) but due to significant decline in area (-3.67 percent), lentil production recorded a negative growth rate of -2.51 percent per annum.

- 3.4 Though area under R&M declined by -0.48 percent during 2010s, production posted a positive growth rate of 0.63 percent due to higher growth rate in yield (1.11 percent). However, safflower, which recorded a significant positive growth in productivity (4.22 percent) during the decade of 2000s, fell to -4.84 percent during 2010s with a decline of area by -12.71 percent, leading to significant decline in growth rate of production (-16.94 percent).
- 3.5 It is quite evident that all Rabi crops showed deceleration in growth rate in area and production during the 2010s while in case of productivity, lentil recorded increase in growth rate and all other crops showed a decline in productivity growth. Deceleration in growth rate in productivity should be a matter of great concern and efforts should be made to reverse this trend.

**Table 3.1: CAGR in Area, Production and Productivity of various Rabi Crops (percent)**

Crop/Year	1990s	2000s	2010s	All Period
<b>Area</b>				
Wheat	1.40	1.34	0.61	0.95
Barley	-2.21	0.06	-0.21	-1.32
Gram	0.24	4.01	1.35	1.53
Lentil	2.78	0.49	-3.67	0.73
R &M	-1.80	2.58	-0.48	-0.05
Safflower	-5.15	-4.59	-12.71	-6.50
<b>Production</b>				
Wheat	3.11	2.51	-0.03	2.01
Barley	-0.71	1.53	-0.64	0.25
Gram	1.19	5.58	-0.33	2.52
Lentil	3.00	-0.11	-2.51	1.18
R &M	-1.16	4.84	0.63	1.63
Safflower	-5.69	-0.56	-16.94	-5.76
<b>Productivity</b>				
Wheat	1.69	1.16	-0.63	1.05
Barley	1.53	1.47	-0.43	1.59
Gram	0.95	1.51	-1.65	0.98
Lentil	0.21	-0.61	1.21	0.45
R &M	0.65	2.20	1.11	1.69
Safflower	-0.57	4.22	-4.84	0.80

Note: Data for lentil is upto 2015-16.

Source: CACP calculations based on data from DES, Ministry of Agriculture & Farmers Welfare.

## Annual Productivity Growth

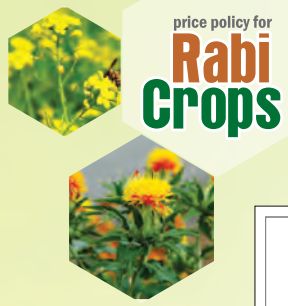
3.6 Annual growth rates of productivity of Rabi crops are presented in Table 3.2. In 2016-17, area under barley, gram, R&M and safflower increased considerably while wheat acreage increased by about one percent. All crops except R&M recorded an impressive growth in productivity leading to high growth rate in production of all Rabi crops. Gram area and productivity increased by more than 13 percent in 2016-17 primarily due to very high prices and good monsoons during 2016. Barley production increased by 24.4 percent while area increased by 17.6 percent and yield by 5.8 percent in 2016-17. Safflower production, which recorded high negative growth rate during 2014-15 and 2015-16, showed an impressive growth rate of 31.4 percent driven by both productivity (18.8 percent) and area expansion (10.6 percent). Productivity trends of wheat, barley, gram, lentil, R&M and safflower during 2001-02 to 2016-17 are presented in Chart 3.1. It is evident from the chart that all crops have shown a steady increase in crop yields during last 15 years but yield variability was higher in case of safflower, R&M and barley compared with wheat. Therefore, efforts are needed to improve yield rate and reduce yield variability.

**Table 3.2: Annual Growth Rate of Rabi Crops, 2012-13 to 2016-17 (percent)**

Crop/Year	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Area</b>					
Wheat	0.5	1.6	3.3	-3.3	1.0
Barley	8.0	-3.1	5.0	-16.7	17.6
Gram	2.7	16.5	-16.9	1.8	13.5
Lentil	-8.9	-5.8	9.5	-13.1	na
R & M	8.0	4.5	-12.7	7.4	3.1
Safflower	-26.7	-3.1	-1.6	-31.0	10.6
<b>Production</b>					
Wheat	-1.4	2.5	-9.7	6.7	5.6
Barley	8.3	4.5	-11.9	-10.9	24.4
Gram	14.7	7.9	-23.0	-3.7	28.6
Lentil	7.1	-10.3	1.7	-5.7	na
R & M	21.6	-1.9	-20.2	27.0	3.3
Safflower	-25.3	4.5	-20.5	-29.2	31.4
<b>Yield</b>					
Wheat	-1.9	0.9	-12.6	10.3	4.6
Barley	0.2	7.8	-16.1	7.0	5.8
Gram	11.7	-7.4	-7.4	-5.5	13.3
Lentil	17.6	-4.8	-7.1	8.5	na
R & M	12.6	-6.1	-8.6	18.2	0.2
Safflower	1.9	7.9	-19.2	2.6	18.8

Note: Data for lentil is upto 2015-16, na : not available

Source: DES, Ministry of Agriculture & Farmers Welfare



Productivity of Rabi Crops

**Chart 3.1: Productivity of various Rabi Crops, 2001-02 to 2016-17**



Source: DES, Ministry of Agriculture & Farmers Welfare

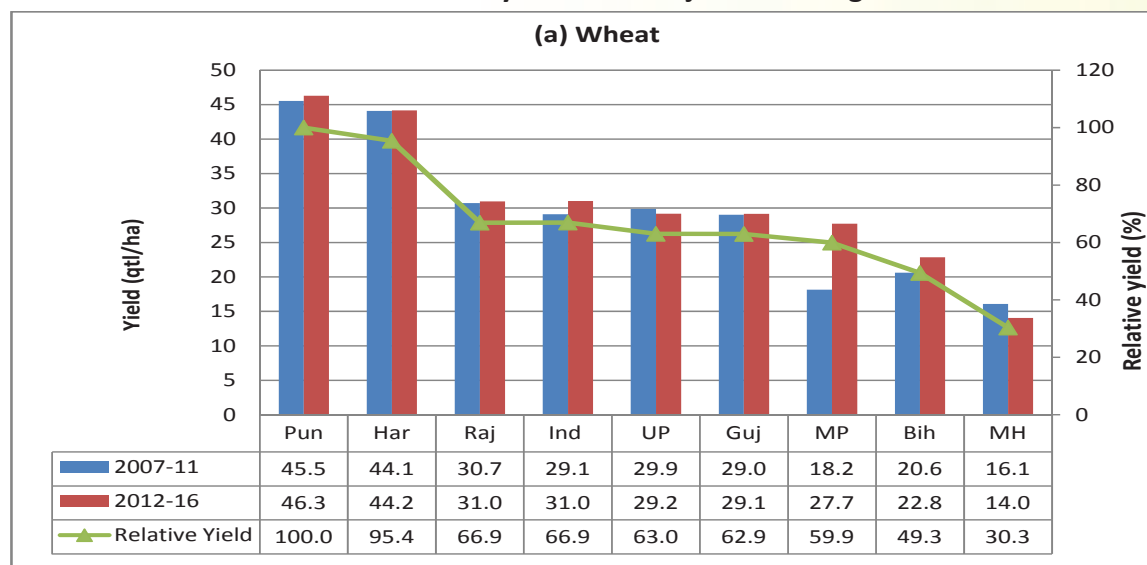
**Crop Productivity in the Major Producing States**

3.7 In order to study productivity trends at state level, 5-year Olympic average yield per ha (Olympic average is calculated by dropping the highest and lowest yield from the most-recent 5-year and averaging the remaining 3 values) in major producing states has been compared during 2007-2011 and 2012-2016 and results are presented in Charts 3.2 (a) to (d).



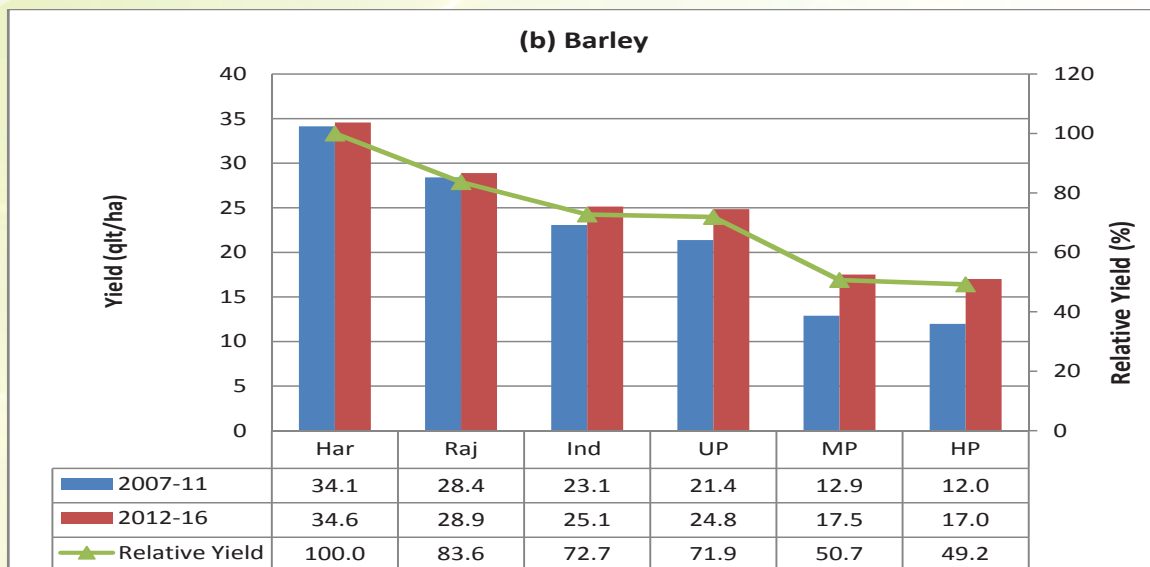
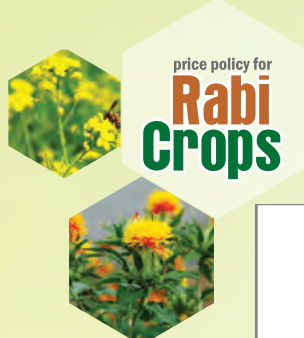
3.8 **Wheat:** The major wheat producing states are Uttar Pradesh, Madhya Pradesh, Punjab, Haryana, Rajasthan and Bihar that contribute about 91 percent of the total wheat production in the country. The yield levels are high in Punjab and Haryana but have stagnated during the last 10 years. Productivity has also remained at almost the same level in Rajasthan and Gujarat. The wheat yield has declined by 2.4 percent in Uttar Pradesh and 12.7 percent in Maharashtra between 2007-11 and 2012-16. However, Madhya Pradesh has shown a remarkable achievement in wheat productivity, which increased by 52.8 percent during this period but yield levels are still lower than all-India average. Bihar has also recorded significant improvement (10.8 percent) in wheat yield. The wheat yields in Uttar Pradesh, Gujarat, Madhya Pradesh, Bihar and Maharashtra are lower than the national average and much lower than those compared with Punjab and Haryana. There are large inter-state variations in crop yields. For example, wheat yield in Maharashtra is less than one-third of Punjab yield and in case of Bihar it's less than half. Even in Uttar Pradesh and Madhya Pradesh, major producers of wheat, productivity levels are less than one-third of Punjab yields. Therefore, efforts are needed to reduce the inter-state variations in crop yields.

**Chart 3.2: State-wise Productivity Levels in Major Producing States 2007-2016**



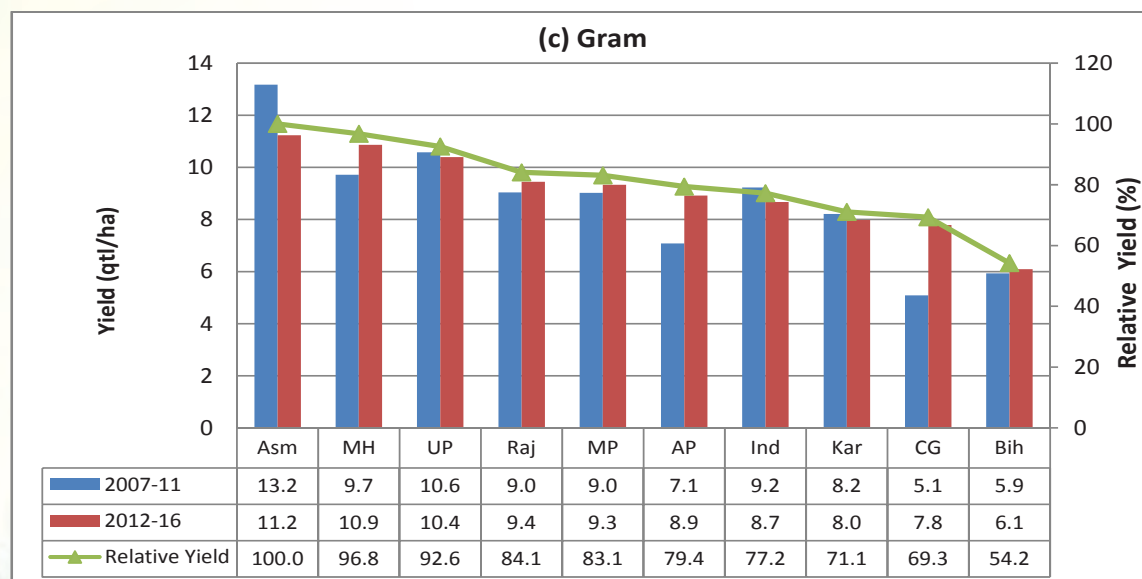
Source: DES, Ministry of Agriculture & Farmers Welfare

3.9 **Barley:** The major barley producing states are Rajasthan, Uttar Pradesh, Madhya Pradesh and Haryana that contribute about 83 percent of the total barley production in the country. The yield levels are high in Haryana and Rajasthan but have stagnated during the last 10 years. Productivity in Uttar Pradesh, Madhya Pradesh and Himachal Pradesh is lower than all-India average. The productivity of barley in Madhya Pradesh and Himachal Pradesh has improved significantly and increased by 35.6 percent and 41.6 percent, respectively, between 2007-11 and 2012-16. Barley yield in Madhya Pradesh and Himachal Pradesh is almost half of the yield in Haryana and in case of Uttar Pradesh it is two third of Haryana yield. Therefore, efforts are needed to increase the yields in these States.



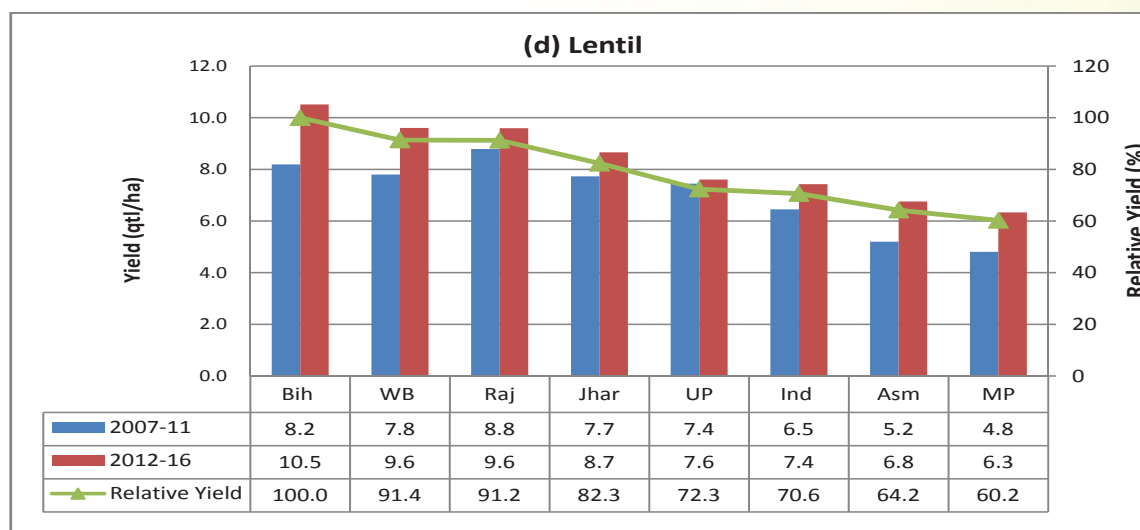
Source: DES, Ministry of Agriculture & Farmers Welfare

**3.10 Gram:** The five major gram producing states Madhya Pradesh, Maharashtra, Rajasthan, Karnataka and Andhra Pradesh contribute nearly 85 percent of the total production in the country. The all-India average yield fell from 9.2 quintal per hectare in 2007-11 to 8.7 quintal per hectare in 2012-16. Gram yield has increased in Maharashtra, Rajasthan, Madhya Pradesh, Andhra Pradesh and Chhattisgarh while Assam, Uttar Pradesh and Karnataka recorded a decline in gram yield. Productivity in major producing states of Madhya Pradesh, Maharashtra, and Rajasthan is higher than the national average in 2012-16. Gram productivity in eastern states like Bihar and Chhattisgarh is lower than national average and much lower than other main producers like Madhya Pradesh and Maharashtra. However, it is interesting to note that yield gaps between high-productivity and low-productivity states have narrowed between 2007-11 and 2012-16.



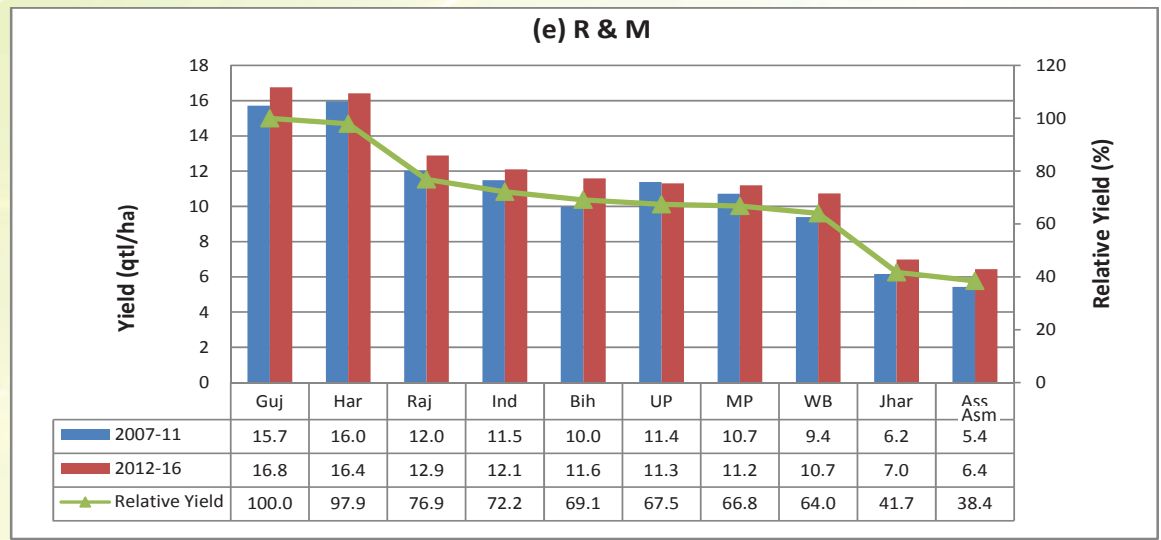
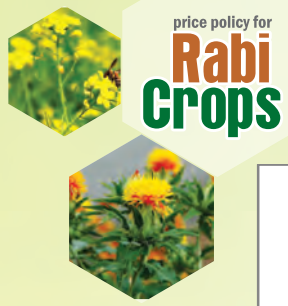
Source: DES, Ministry of Agriculture & Farmers Welfare

**3.11 Lentil:** The three major lentil growing states Madhya Pradesh, Uttar Pradesh and Bihar, contribute 83 percent of the total production in the country. The all-India average yield has increased from 6.5 quintal per hectare in 2006-10 to 7.4 quintal per hectare in 2011-15, an increase of about 15 percent. The average yields have increased in all the major producing states between 2006-10 and 2011-15. Madhya Pradesh, the largest lentil producing state in the country, has one of the lowest productivity levels but has recorded impressive increase (31.8 percent) during the last 10 years. Uttar Pradesh, the second largest producer, has higher yield than all-India average but has increased marginally (2.2 percent). Bihar, West Bengal, Rajasthan and Jharkhand have yield level greater than national average whereas Assam and Madhya Pradesh yields are lower than national average. Among other major producing states, Bihar and West Bengal have also recorded significant increase in lentil yields. From Chart 3.2(d) it is quite clear that Bihar is having the highest yield (10.5 quintal per hectare) while productivity in Madhya Pradesh is less than one-third of Bihar and there is need to increase productivity of lentil in Madhya Pradesh as it has the highest production share but the lowest yield among the major lentil producing states. The productivity gap between the states having high yields and low yields has increased during last ten years and the issue needs to be addressed.



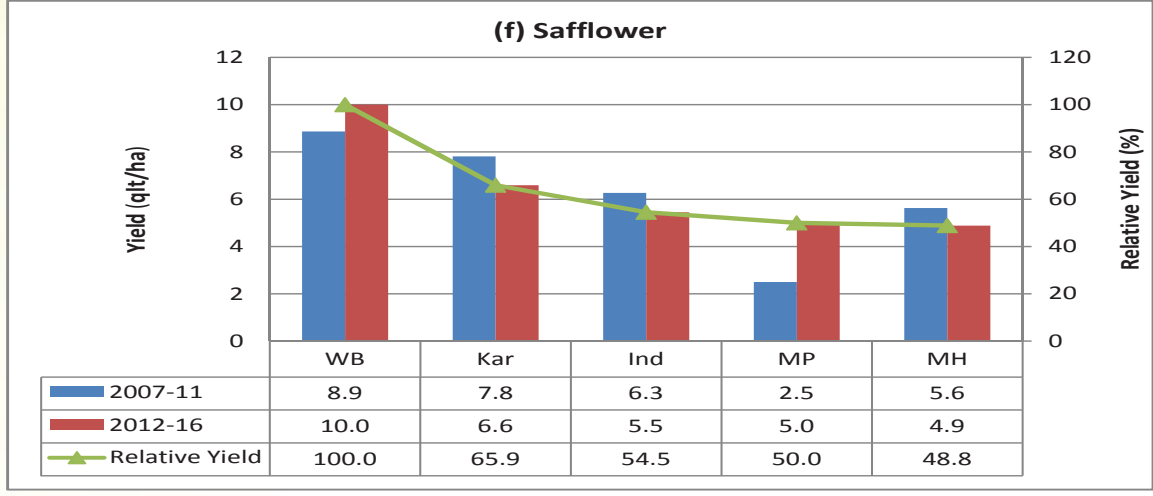
Source: DES, Ministry of Agriculture & Farmers Welfare

**3.12 R&M:** The top five R&M growing states Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal contribute more than 85 percent of the total production in the country. All states, except Uttar Pradesh, have experienced increase in yield levels during last 10 years. Bihar recorded the highest increase (from 10 quintal per hectare in 2007-11 to 11.6 quintal per hectare in 2012-16), followed by West Bengal and Jharkhand. The productivity in Gujarat, Haryana and Rajasthan is more than the national average while in Madhya Pradesh, Uttar Pradesh and West Bengal it is below the national average. The productivity in Jharkhand and Assam is almost half of the national average. Even in Madhya Pradesh and Uttar Pradesh, 3<sup>rd</sup> and 4<sup>th</sup> largest producers, productivity level is about two-third that of Gujarat and Haryana. The yield gaps among different states have reduced during the last ten years.



Source: DES, Ministry of Agriculture & Farmers Welfare

**3.13 Safflower:** Safflower is produced mainly in Maharashtra, Karnataka, Madhya Pradesh and West Bengal and these states contribute around 95 percent to the total production in the country. The yield levels are high in West Bengal and Karnataka and the lower in Madhya Pradesh and Maharashtra than all-India average yield. The yield has improved in Madhya Pradesh and West Bengal whereas it has declined in other states.



Source: DES, Ministry of Agriculture & Farmers Welfare

**State-level Productivity Growth Rates**

**3.14** The analysis of the growth performance of productivity of Rabi crops at the state level during 2000s and 2010s is presented in Table 3.3. The number of States having productivity less than national average increased in the decade of 2010s as compared to the decade of 2000s due to consecutive drought years in 2014-15 and 2015-16. In case of R&M, number of States whose productivity is more than national average has increased in 2010s. In case of pulses (gram and lentil), the overall yield performance has declined compared to previous decade in the major producing states.

**Table 3.3 State-wise Productivity Growth of Major Rabi Crops (2001-02 to 2016-17)**

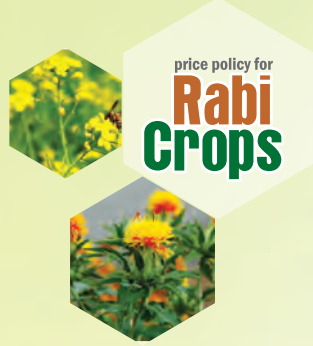
Crop/ Year	2001-02 to 2010-11		2011-12 to 2016-17	
	<National Average	>National Average	<National Average	>National Average
Wheat (1.2%) <sup>1</sup>	Pun (0.6), Bih (1.1)	UP (1.5), Har (1.3), MP (1.5), MH (3.3), Guj (2.7)	UP (-2.4), Pun (-1.6), MH (-3.4), Har (-2.7), Guj (-0.7), Bih (-1.1)	MP (5.7), Raj (0.3)
Barley (1.9%)	UP (-0.8), MP (-0.4), UK (-0.9)	Raj (2.2), Har (2.9)	UP (-2.5), Har (-1.4), UK (-3.7)	MP (3.2), Raj (0.6)
Gram (1.3%)	UP (-1.1), Raj (0.1), MP (1.1)	AP (2.3), CG (3.4), Kar (2.8), MH (5.7)	CG (-2.0), Kar (-8.6), MH (-1.8), UP (-6.8)	Raj (1.7), MP (-0.3), AP (1.5)
Lentil (1%)	Bih (-1.5), Raj (-3.0)	MP (1.8), WB (1.5), Jhar (1.1)	Bih (0.5), Jhar (-1.0), Raj (-2.7), UP (-4.7)	MP (19.5)
R&M (1.5 %)	WB (2.1), Raj (1.9), Asm(1.1)	Bih (3.6), Har (3.3), MP (3.2), UP (2.5)	UP (-0.9), MP (0.6), Guj(0.4)	WB (2.8),Raj (1.7), Har (1.7), Bih (7.6), Asm (3.8)
Safflower (0.4%)	MH (3.9), Kar (3.8), MP (-2.3)	AP (8.5)	MP (-7.5), Kar (-7.6)	Odi (0.2), CG (2.0)

Note: <sup>1</sup>Shows all India productivity CAGR during the period from 2001-02 to 2016-17

Source: CACP using DES Data

### Crop Productivity and Variability

- 3.15 There are wide variations in the mean yield and yield variability among various states. For example, average yield of wheat per hectare ranges from a low of 2.2 tonnes in Bihar to a high of more than 4.5 tonnes in Punjab. The coefficient of variation in the average yield ranges from about 6 percent in Punjab to about 24 percent in Madhya Pradesh. The states have been classified as “high” and “low” based on yield and variability to plan appropriate development strategy. The states falling under different categories with the triennium average area and production ending 2016-17 for wheat, gram, lentil and R&M are given in Table 3.4. In case of wheat, Haryana, which accounts for 8.3 percent of wheat acreage and 11.9 percent of production, having high yield but high variability, attempts should be made to reduce variability. In the states of Punjab and Rajasthan having high yield and low variability, the strategy should be thus in inducing area expansion. In the low yield but high variability states of Madhya Pradesh, Maharashtra, Uttar Pradesh, Bihar and Gujarat (contributing 56.7 percent of production and occupying 65 percent area) technologies that raise productivity and at the same time reduce yield variability need to be developed for large scale adoption. In the state of West Bengal having low yield and low variability, attempt should be made for increasing productivity through generation of appropriate technologies.
- 3.16 In case of gram, about 46 percent area and 56 percent of production falls under high yield and high variability category, indicating a need for addressing the issue of risks due to high variability. Remaining states have problems of both low yield and high variability.



Similar trend was observed in case of lentil. In R&M, more than half of area and about 63 percent of production is under high-yield and high-variability category and the remaining area and production fall under low-yield high-variability group. These results clearly show that risks in pulses and oilseeds are much higher and attempts should be made to reduce variability in addition to addressing the issue of low productivity.

3.17 This type of analysis needs to be conducted separately for all major crops and at more disaggregated, district and block levels, for orienting the research and development programmes in crops especially pulses and oilseeds to suit the local conditions.

**Table 3.4: Classification of States based on Yield and Variability of Crops**

Category	Name of States	TE2016-17	
		Area (000 ha)	Production (000 tonnes)
<b>Wheat</b>			
High Yield – High Variability	Haryana	2572 (8.3)	10949 (11.9)
High Yield – Low Variability	Punjab, Rajasthan	6591 (20.6)	25287 (27.5)
Low Yield – High Variability	MP, Maharashtra, UP, Bihar and Gujarat	19866 (65.0)	52233 (56.7)
Low Yield – Low Variability	West Bengal	338 (1.1)	953 (1.0)
<b>Gram</b>			
High Yield – High Variability	AP, Chhattisgarh, Gujarat, Jharkhand and MP.	4004 (46.3)	4380 (56.0)
High Yield – Low Variability	-	-	-
Low Yield – High Variability	Karnataka, Maharashtra Rajasthan and UP	4407 (50.5)	3179 (40.8)
Low Yield – Low Variability	-	-	-
<b>Lentil</b>			
High Yield – High Variability	Bihar, WB, UP and Jharkhand	738 (52.4)	624 (58.7)
High Yield – Low Variability	-	-	-
Low Yield – High Variability	Assam and MP	600 (42.6)	384 (36.1)
Low Yield – Low Variability	-	-	-
<b>R&amp;M</b>			
High Yield – High Variability	Gujarat, Haryana and Rajasthan	3267 (55.1)	4407 (62.8)
High Yield – Low Variability	-	-	-
Low Yield – High Variability	Assam, Jharkhand, MP, UP and WB	2273 (38.4)	2274 (32.4)
Low Yield – Low Variability	-	-	-

Source: Computed by CACP using data of DES, Ministry of Agriculture & Farmers Welfare  
 Figures in parentheses show percent to total area/production

## District Level Productivity of Major Rabi Crops

- 3.18 In order to assess the performance of productivity at district level at different time periods (TE2005-06 and TE2014-15), area under different productivity bands at district level for major crops in main producing states is analyzed. In this analysis, districts having at least one percent share in total production in the State have been considered. The changes in number of districts and area under different yield bands in TE2005-06 and TE2014-15 are presented in Tables 3.5 (a) to 3.5 (c).
- 3.19 **Wheat:** Uttar Pradesh, Punjab, Madhya Pradesh, Haryana and Rajasthan, which account for 86 percent of the total wheat production in the country, have been included in the analysis. The yield bands considered are, < 2t/ha, 2-3 t/ha, 3-4 t/ha and >4 t/ha. It is evident from the Table that the number of districts and percentage of area in the highest band of >4 t/ha has increased in all the major wheat growing states, whereas, number of districts and percentage of area in the lowest band (<2 t/ha) has declined in all the states except Uttar Pradesh where the number of districts and share of area has increased from 3.2 percent to 8.7 percent, whereas it has significantly increased in the 3-4 t/ha band. In the States of Punjab and Haryana there are no districts in the yield band of <3 t/ha while in Madhya Pradesh the highest share of area is under yield band of 2-3 t/ha and in Rajasthan and Uttar Pradesh in 3-4 t/ha. Increase in number of districts in higher yield bands in all major producing states is a positive trend and efforts should be made to improve it further in states like Uttar Pradesh and Madhya Pradesh.

**Table 3.5: District-level Productivity Trends**

State/Year	(a) Wheat							
	<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>								
TE2005-06	0	0	0	0	4	19.3	13	80.7
TE2014-15	0.0	0.0	0.0	0.0	2	7.2	19	91.8
<b>Haryana</b>								
TE2005-06	0	0	0	0	10	49.4	8	49.9
TE2014-15	0.0	0.0	0.0	0.0	6	21.8	15	78.0
<b>Madhya Pradesh</b>								
TE2005-06	23	60.0	14	31.5	1	2.1	0	0.0
TE2014-15	1	3.9	18	45.0	15	37.0	3	5.3
<b>Rajasthan</b>								
TE2005-06	2	4.1	14	50.1	9	40.3	0	0.0
TE2014-15	0	0.7	8	23.6	14	53.1	4	18.4
<b>Uttar Pradesh</b>								
TE2005-06	2	3.2	30	54.4	17	25.0	0	0.0
TE2014-15	5	8.7	18	29.2	25	39.4	1	1.8

Source: Computed by CACP using data of DES, Ministry of Agriculture & Farmers Welfare

3.20 **Gram:** In case of gram and R & M, yield bands considered are <0.5 t/ha, 0.5-1 t/ha and >1 t/ha. The leading gram growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka and Andhra Pradesh. It can be observed from Table 3.5 (b) that in all the States, the number of districts and share of area under higher yield bands increased between TE2005-06 and TE2014-15. For example, in Madhya Pradesh, the largest producer, the area under highest yield band (> 1 t/ha) increased from 37.1 percent to 46.6 percent during last 10 years while in Maharashtra, the area under the highest band increased from zero to 22.5 percent and in Rajasthan from 13.5 to 36.6 percent during this period. Andhra Pradesh and Karnataka also witnessed a similar trend.

(b) 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>Andhra Pradesh</b>						
TE2005-06	1	15.5	1	23.4	4	66.0
TE2014-15	0	6.6	1	24.6	5	68.4
<b>Karnataka</b>						
TE2005-06	5	34.0	5	58.9	0	0
TE2014-15	1	8.9	11	89.2	0	0
<b>Rajasthan</b>						
TE2005-06	2	36.4	12	46.5	6	13.5
TE2014-15	2	26.4	7	42.5	13	36.6
<b>Maharashtra</b>						
TE2005-06	8	35.2	20	74.9	0	0.0
TE2014-15	3	13.6	17	60.8	5	22.5
<b>Madhya Pradesh</b>						
TE2005-06	0	0.0	16	54.4	15	37.1
TE2014-15	1	5.4	14	39.0	18	46.6

Source: Computed by CACP using data of DES, Ministry of Agriculture & Farmers Welfare

3.21 **R & M:** Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal contribute about 86 percent of the total R&M production in the country. The number of districts and share of area has shifted from medium yield band (0.5-1 t/ha) to high yield band (>1 t/ha) in all the states except Uttar Pradesh. Only one district in Madhya Pradesh and two districts in Uttar Pradesh were in the lowest yield band in TE2014-15. In case of West Bengal, area under the highest yield band increased by more than three times between TE2005-06 and TE2014-15.



<b>(c) Rapeseed &amp; Mustard</b>						
State/Year	<0.5 tonnes/ha		0.5- 1 tonnes/ha		>1tonnes/ha	
	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)
<b>Haryana</b>						
TE2005-06	0	0.0	1	8.2	9	89.2
TE2014-15	0	0.0	0	0.0	10	96
<b>Rajasthan</b>						
TE2005-06	0	0.0	6	25.8	18	70.2
TE2014-15	0	0.0	4	13.0	21	79.9
<b>Madhya Pradesh</b>						
TE2005-06	0	0.0	12	31.8	5	54.2
TE2014-15	1	3.1	6	28.1	7	56.8
<b>Uttar Pradesh</b>						
TE2005-06	0	0.0	12	28.2	15	52.5
TE2014-15	2	5.9	13	30.8	16	42.7
<b>West Bengal</b>						
TE2005-06	1	3.2	10	74.3	3	21.0
TE2014-15	0	0.0	6	27.8	7	69.5

Source: Computed by CACP using data of DES, Ministry of Agriculture & Farmers Welfare

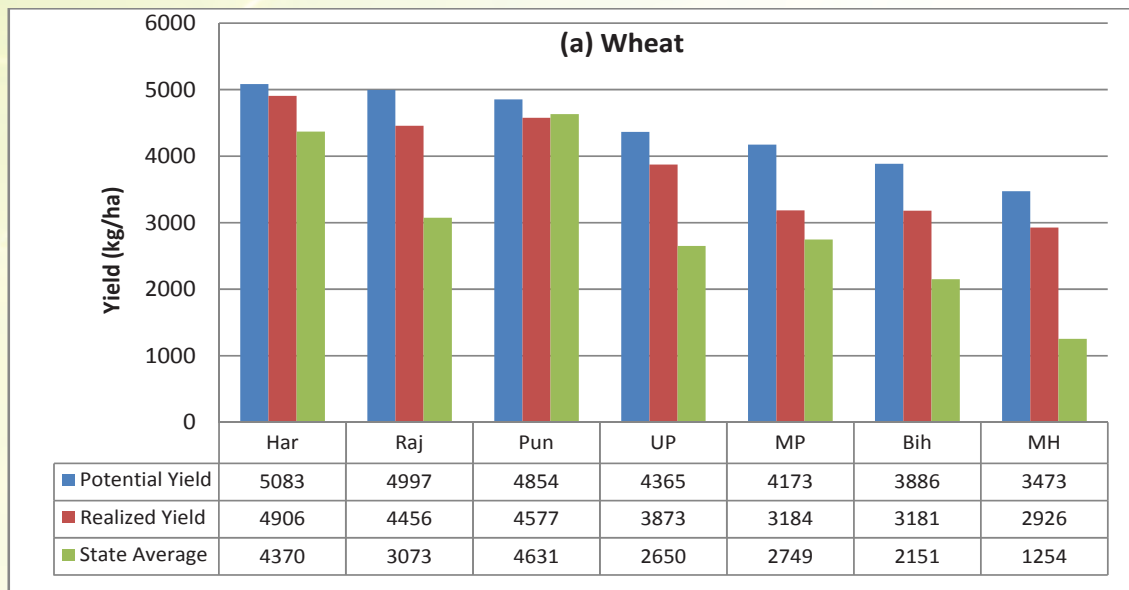
## Yield Gap Analysis

- 3.22 While efforts are needed to raise the yield levels, there is even a more pressing need to address the problem of yield gaps. In this chapter, we have analyzed yield gaps in wheat, gram and R&M in major producing states using Front-Line Demonstration (FLD) data collected under All-India Coordinated Research Project (AICRP). We grouped yield-gaps in three broad categories. Yield Gap (A) is the difference between potential farm yields achieved under Front Line Demonstration (FLD), where best scientific and management practices are followed and realized farm yield of improved technology under farmer's practices. Yield Gap (B) compares state average yield with realized farm yield of improved technology under farmer's 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 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.
- 3.23 A comparison of potential, realized and state average yields of wheat is presented in Chart 3.3. It is evident from the chart that the large yield gap exists in Madhya Pradesh, Bihar, Maharashtra, Uttar Pradesh and Rajasthan. Farm yields in Punjab and Haryana have almost reached the potential yield. The state average yield of wheat in Maharashtra is about 64 percent lower than the potential yield and 57 percent lower than the realized yield. Yield gaps are also high in states like Bihar, Uttar Pradesh, Rajasthan and Madhya Pradesh. It is interesting to note that in



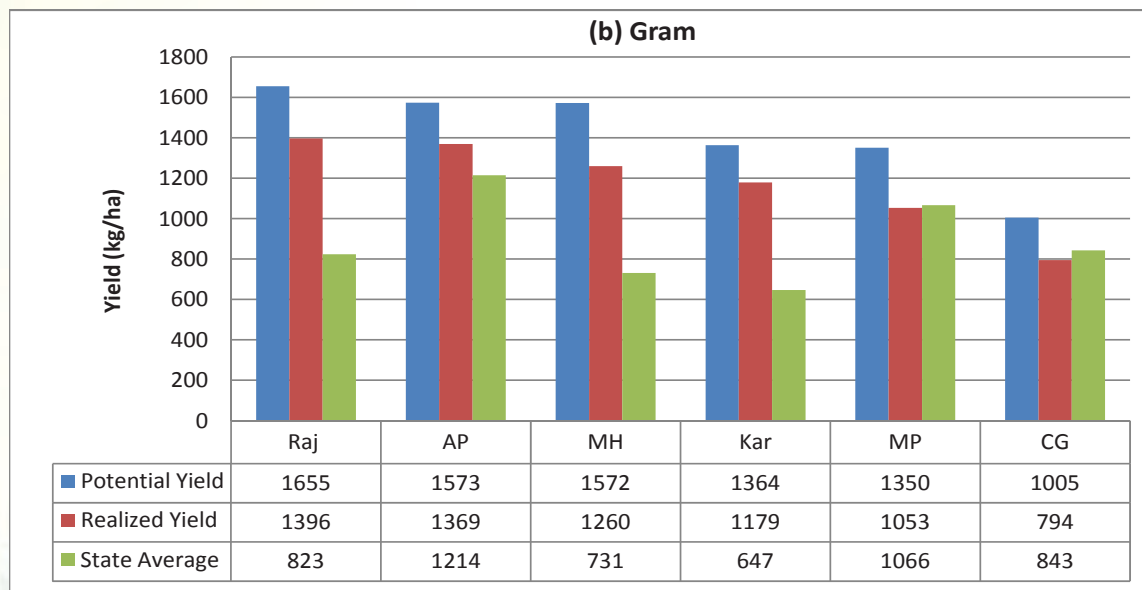
Punjab, state average yield is higher than realized yield which calls for technological breakthrough to address the issue of yield stagnation in the state.

**Chart 3.3: Yield Gap Analysis of Major Rabi Crops (TE2015-16)**



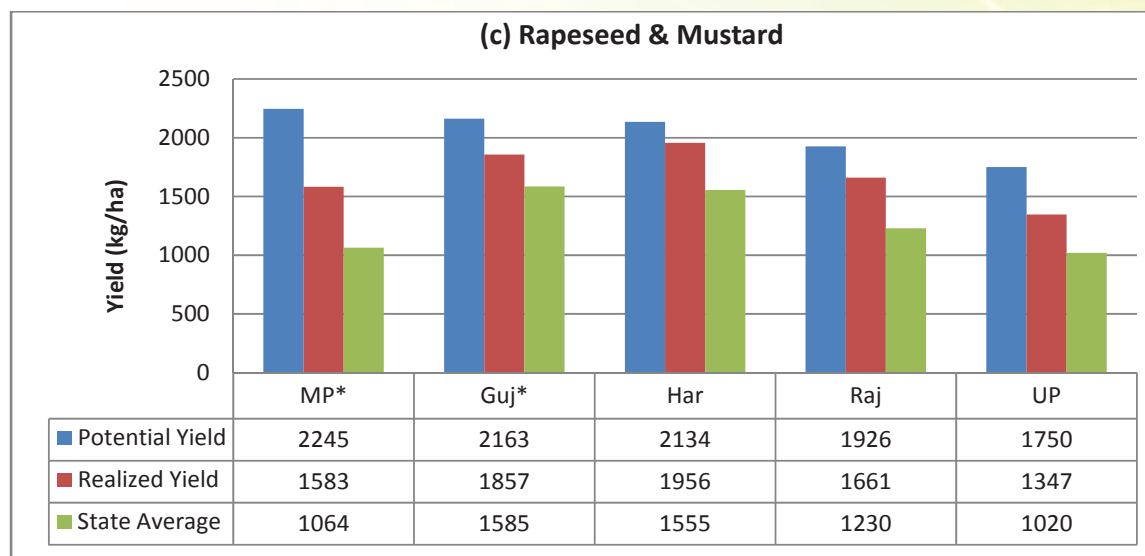
Source: Indian Institute of Wheat and Barley Research, Karnal & DES, Ministry of Agriculture & Farmer Welfare

3.24 In case of gram, the difference between state average yield and potential yield is highest in Maharashtra (53.5 percent), followed by Karnataka (52.6 percent), Rajasthan (50.2 percent) and the lowest in case of Chhattisgarh (16.1 percent). The realized yields are 13-22 percent less than the potential yield while state average yields are much lower than realized and potential farm yields in majority of the States. However, state average yields are higher than realized yields in Madhya Pradesh and Chhattisgarh.



Source: Indian Institute of Pulses Research, Kanpur & DES, Ministry of Agriculture & Farmers Welfare.

3.25 In case of R&M, the gap in potential and realized yield as also realized and State average yield ranges from about 10 percent to 42 percent, whereas the gap between the state average yield and potential yield varies from about 15 percent in Gujarat to about 33 percent in Madhya Pradesh. The yield gaps are the highest in case of Madhya Pradesh.



Note:\* FLD data Year 2015-16

Source: Directorate of Rapeseed-Mustard Research (DRMR), Bharatpur & DES, Ministry of Agriculture & Farmer Welfare

3.26 The above trends clearly show that productivity and production of wheat, gram and R&M in most of the states can increase significantly with the existing technologies if biological, institutional and socio-economic constraints are addressed and farmers follow the best practices

### Drivers of Yield Growth

3.27 Better quality seeds, fertilizers, irrigation, and better management practices are important drivers for increasing the productivity. By assuring timely availability of first four factors and better extension services, crop productivity can be enhanced significantly.

### Quality Seed Requirement and Availability

3.28 Seed is the most vital and critical input for increasing production and productivity of crops. The trends in requirement and availability of quality seeds of major Rabi crops during the last five years are presented in Table 3.6. It is observed that for wheat, barley and safflower, availability of quality seed is not an issue as availability has been more than requirement. Although availability of seeds has increased at a faster rate compared with requirement during the last five years but in case of gram, lentil and R&M, availability has been less than the requirement. Therefore, efforts are needed to bridge the gap between demand and supply of quality seeds particularly for pulses and oilseeds.

**Table 3.6: Trends in Requirement (R) and Availability (A) of Quality Seeds (lakh qtl)**

Crop	2012-13		2013-14		2014-15		2015-16		2016-17	
	R	A	R	A	R	A	R	A	R	A
Wheat	108.2	112.23	112.53	108.35	112.53	116.86	113.46	117.98	117.55	136.57
Barley	1.93	2.35	2.05	2.81	2.23	2.87	2.25	3.17	2.44	2.95
Gram	16.32	15.14	17.07	20.1	16.11	15.72	18.14	14.86	17.65	16.01
Lentil	1.04	0.74	1.46	1.42	1.79	1.38	1.3	1.06	1.47	1.15
R & M	2.44	2.64	2.61	2.74	2.64	2.7	2.52	2.65	2.49	2.46
Safflower	0.67	0.68	0.54	0.60	0.45	0.46	0.48	0.51	0.39	0.40

Source: DES, Ministry of Agriculture & Farmers Welfare

### Fertilizer Use

- 3.29 The government has taken two important initiatives in fertilizer sectors, One, it has been made mandatory for all importers and the indigenous producers of urea to produce 100 percent of their total production of subsidized urea as neem coated urea, which is expected to stop diversion of urea towards non-agricultural purposes as well as improve fertilizer use efficiency. Two, government introduced Direct Benefit Transfer (DBT) system for fertilizer subsidy payment on pilot basis in 16 selected districts from November 2016. However, reports of some mal-practices such as mixing of spurious oil in neem oil have appeared in media and appropriate action needs to be taken. Soil Health Card Scheme, under which information is provided to farmers on nutrient status of soil along with recommendations on appropriate dosage of nutrients would help in reducing imbalanced use of nutrients and improving soil health and fertility.
- 3.30 Fertiliser consumption during Rabi season has remained almost stagnant during the last three years (Table 3.7). During Rabi 2016-17, N consumption is estimated to fall marginally (-1.5 percent) over 2015-16, while P and K consumption is expected to increase by 0.3 percent and 6.5 percent, respectively. Fertilizer imports are forecast to decline during 2016-17. For example, import of urea and DAP at about 5 million tonnes and 4.2 million tonnes during April-December 2016, witnessed fall of 27.4 percent and 28.8 percent, respectively, over the corresponding period in the previous year. However, import of MOP at 2.9 million tonnes, was 7.6 percent higher than the level of the previous year.
- 3.31 The distortion in price of urea vis-à-vis other fertilisers due to partial decontrol under Nutrient Based Subsidy (NBS) Scheme in April 2010 has adversely affected the use ratio of N, P and K because farmers use more urea as it is cheaper than other fertilisers. However, increase in consumption of P and K due to relatively lower prices during 2016 is expected to marginally improve N:P:K ratio, from 7.1:2.8:1 in 2015-16 to 6.6:2.6:1 in 2016-17. The government and industry should make concerted efforts to promote balanced use of fertilisers to achieve the ideal N:P:K ratio. The Commission recommends that price of urea should be increased while prices of P and K fertilisers should be reduced to promote balanced use of nutrients. Fertilizer industry should organize awareness programmes and field demonstrations

on efficient and balanced use of fertilisers and its impact on crop productivity and profitability. The problem of deficiency of micro-nutrients and organic carbon in the soil needs immediate attention.

**Table 3.7: Trends in Fertilizer Consumption and N:P:K Ratio during Rabi Season**  
(million tonnes)

Fertilizers	2010-11	2012-13	2013-14	2014-15	2015-16	2016-17 (E)
N	8.84	8.93	8.53	9.02	8.72	8.59
P <sub>2</sub> O <sub>5</sub>	3.63	3.42	3.04	3.11	3.45	3.46
K <sub>2</sub> O	1.73	1.03	1.08	1.27	1.23	1.31
<b>Total (N+P<sub>2</sub>O<sub>5</sub>+K<sub>2</sub>O)</b>	<b>14.20</b>	<b>13.38</b>	<b>12.65</b>	<b>13.40</b>	<b>13.40</b>	<b>13.35</b>
<b>N:P:K Ratio</b>	<b>5.1:2.1:1</b>	<b>8.6:3.3:1</b>	<b>7.9:2.8:1</b>	<b>7.1:2.5:1</b>	<b>7.1:2.8:1</b>	<b>6.6:2.6:1</b>

Source: Fertiliser Association of India

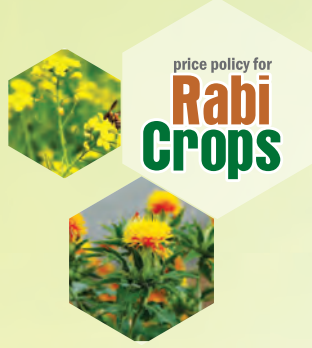
## Irrigation

3.32 Irrigation is considered as the leading input in boosting agricultural production and productivity but only less than half of gross cropped area is irrigated in the country. In order to increase area under assured irrigation, improve water use efficiency and promote sustainable conservation practices, Government of India has launched Pradhan Mantri Krishi Sinchai Yojana (PMKSY) with an outlay of Rs. 50000 crore for a period of five years (2015-16 to 2019-20). One of the main components of the PMKSY '**Har Khet Ko Pani**' aims at creating new water sources through minor irrigation, repair, restoration and renovation of water bodies and command area development. Under **More Crop per Drop** efficient water conveyance and precision water application devices like drip, sprinkler, etc. are being promoted. For 2017-18, an outlay of ₹2500 crore has been made for micro-irrigation.

## Linking MSP with Oil Content in Rapeseed and Mustard

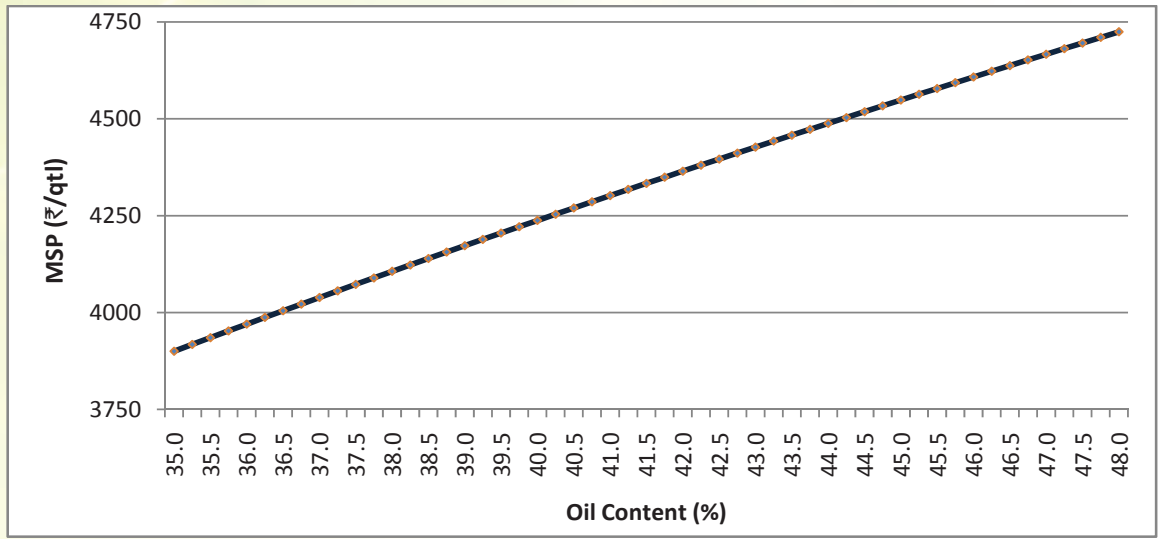
3.33 To ensure better returns to farmers they should be incentivized through linking MSP of R&M seed with its oil content. There are variations in oil content of different varieties of R&M and therefore a uniform MSP may not be desirable. Therefore, the Commission is of the opinion that farmers be incentivized for higher 'oil content'. On the basis of detailed discussions held with various stakeholders such as R&M cultivators, processors, scientists of ICAR, the Commission recommends that the MSP of R&M be linked to the basic 'oil content' of 35 percent in R&M seeds and farmers be incentivized for every 0.25 percent point increase in its 'oil content' beyond this level.

3.34 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 ₹2470 which will contain 35 kg of oil. Thus, the MSP will increase by ₹15.83 for every 0.25 percent point increase in oil content (Chart 3.4). Cost per unit of oil content slowly decreases with increase in 'oil content' (Annex Table 3.1). Taking average oil content between 35 percent and 48 percent,



the average cost for every 0.25 percentage point works out to ₹15.83 per quintal. Hence Commission recommends that MSP of R&M seeds should be increased by ₹15.83 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 3.4: MSP based on Oil Content of R&M**



**Recapitulation**

- 3.35 Recent decade has seen a persistent and worrying slowdown in crop productivity growth. Productivity gains, which are a central driver of long-term improvements in farmers' income and living standards, have slowed down in many crops. Improving crop productivity growth will require effective policy interventions to address the obstacles to knowledge and technology diffusion, and institutional and infrastructure bottlenecks. However, impressive growth during 2016-17 and the forecast of good monsoon during the current year are expected to give boost to the sector.
- 3.36 Based on state/district-level analysis, it emerges that yield levels in certain states are significantly higher than national average and in some other states and in some districts yield levels are higher compared to the state average. Therefore, it is important to have a detailed study of high-yield districts/states so as to promote such management and input usage practices in low-productivity districts/states.
- 3.37 There are wide variations in the mean yield and yield variability among various crops and states. In case of pulses and oilseeds, crop yields are generally low and risks are high. Therefore, attempts should be made to reduce yield variability and increase productivity through generation of appropriate technologies and adoption of best management practices.
- 3.38 The Yield gap analysis reflects that by bridging the gaps between FLD yields and actual farm yields in all crops, production can be increased significantly even with the existing technologies if timely availability of seed and other inputs is assured and farmers follow best management practices. Higher productivity would help in reducing cost of production, augment profitability and increase global competitiveness.

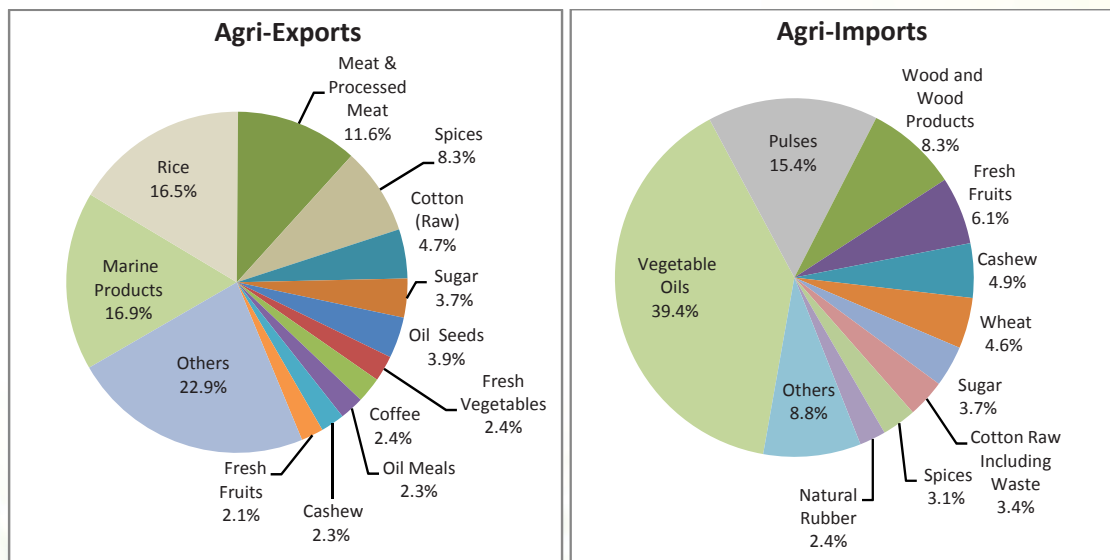
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## Trade Competitiveness of Indian Agriculture

### Trade Performance

4.1 As per World Trade Organization (WTO), the share of India's agri-exports in global agri-exports has increased from 1.1 percent in 2000 to 2.5 percent in 2014 but declined to 2.2 percent in 2015. India's total agri-exports declined by about 19 percent to US\$ 35 billion in 2015 from US\$ 43.5 billion in 2014, the largest decline among major exporting countries of the world. However, the share of agri-imports to global agri-imports has increased from 0.7 percent to 1.6 percent during the corresponding period. As per DGCIS, the share of India's agri-exports in its total exports declined from 13 percent in 2015-16 to 12.6 percent in 2016-17 whereas the share of agri-imports in total imports increased from 6.6 percent to 7.2 percent during this period. Major agri-export commodities are marine products, rice, meat, spices, cotton (raw), sugar, oilseeds, fresh vegetables, coffee, oil meals and cashew, which account for two-third of total agri-exports. The main commodities that India imports include edible oils, pulses, wood & wood products, fresh fruits, cashew, wheat and sugar, which account for more than 80 percent of total agri-imports.

**Chart 4.1: Share of Major Agri-Commodities in Total Agri-Exports and Agri-Imports in 2016-17**



Source: Directorate General of Commercial Intelligence and Statistics

- 4.2 India experienced decline in its agri-exports during 2014-15 and 2015-16 by 8.6 and 9.4 percent, respectively but registered an increase of 5.4 percent in 2016-17. In value-terms agri-exports increased from ₹222.5 thousand crore in 2015-16 to ₹234.5 thousand crore in 2016-17. The major commodities that accounted for increase in agri-exports during 2016-17 are oil meals, marine products, fresh fruits, oilseeds and coffee. However, agri-imports have increased at an annual growth rate of over 16 percent during last five years. Agri-imports increased from ₹163.3 thousand crore in 2015-16 to ₹185.3 thousand crore in 2016-17, an increase of 13.5 percent. Higher imports of wheat, edible oils, pulses, cotton raw including waste, sugar, mainly due to lower production in 2015-16 owing to drought in the country and increasing consumption, have led to rise in agri-imports. Though the country continues to be a net-exporter of agri-commodities, trade surplus has declined from ₹144.9 thousand crore in 2013-14 to ₹49.2 thousand crore in 2016-17. Adverse impact of low global commodity prices and low production of wheat, pulses and oilseed in the country have contributed to the steep decline in trade surplus.

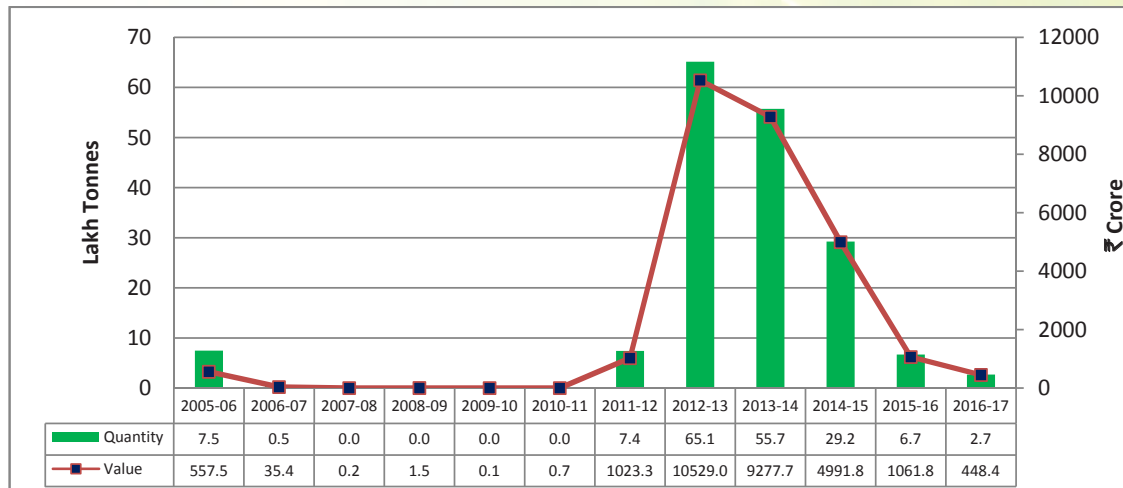
### Wheat

- 4.3 As per USDA, the global production of wheat was 739.4 million tonnes in TE2016-17, out of which 170.9 million tonnes (23.1 percent) was traded. European Union (EU) is the largest producer with a share of 20.9 percent followed by China (17.4 percent) and India (12.1 percent). EU is also the largest exporter of wheat with a share of 18.9 percent followed by Russia (14.9 percent). Other major exporters are USA (14.3 percent), Canada (13.1 percent) and Australia (10.6 percent). Egypt is the largest importer with a share of 6.8 percent followed by Indonesia (5.2 percent), Algeria (4.6 percent), Brazil (3.8 percent) and Japan (3.4 percent). Wheat exports are more concentrated than imports, as the share of top five exporters in world exports is more than 70 percent while top five importers account for less than one-fourth of total imports.
- 4.4 The Government of India had prohibited exports of wheat from Central Pool in August, 2003 because of fall in wheat production in 2002-03. Exports on private account were also prohibited in February, 2007, so there were no exports during 2007-08 to 2010-11. The ban on export of wheat was lifted in September, 2011 when export of 20 lakh tonnes was allowed under Open General License (OGL) by private parties out of privately held stocks through Electronic Data Interchange (EDI) enabled ports. From February 2012, unrestricted export of wheat under OGL was allowed. India's exports of wheat were at a record level of 65.1 lakh tonnes during 2012-13 (Chart 4.2). However, thereafter exports witnessed a steady decline due to stiff competition from Australian and Ukrainian wheat. Other factors that contributed to the decline in exports were higher domestic prices and low production in 2014-15 and 2015-16.





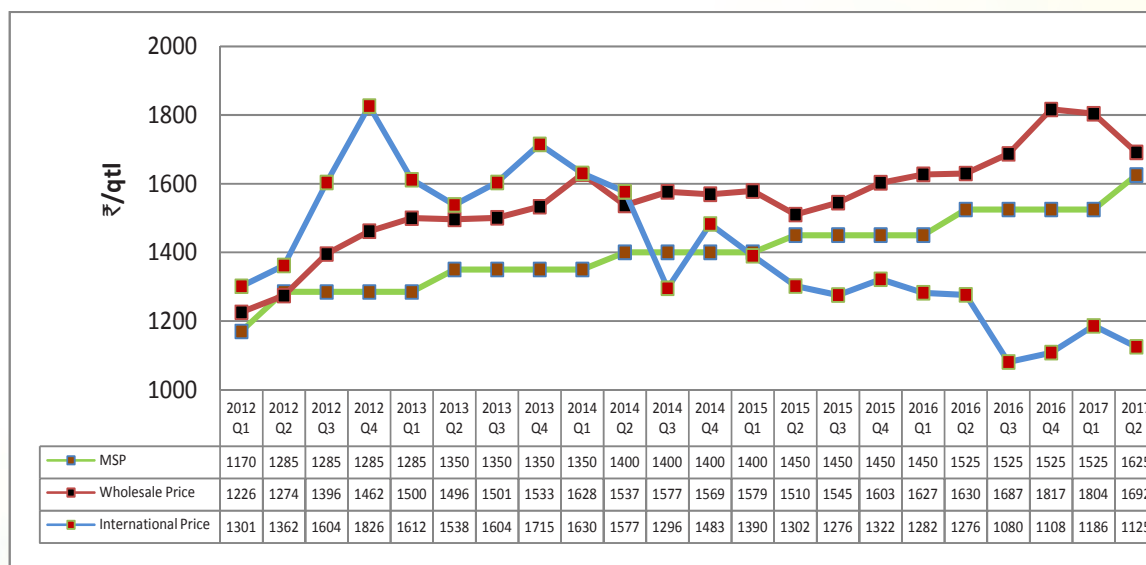
**Chart 4.2: India's Exports of Wheat, 2005-06 to 2016-17**



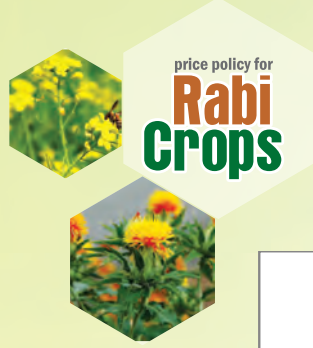
Source: Directorate General of Commercial Intelligence and Statistics

4.5 It may be seen from Chart 4.3 that during the period from 2012(Q<sub>1</sub>) to 2014(Q<sub>2</sub>), the domestic wholesale prices of wheat were consistently lower than international prices. India benefitted from higher international prices and was able to export record quantity of 65.1 lakh tonnes in 2012-13 and 55.7 lakh tonnes in 2013-14, respectively. However, during the period from 2015(Q<sub>1</sub>) to 2017(Q<sub>2</sub>), the domestic wholesale prices as well as MSP of wheat were higher than international prices, that led to decline in exports during this period. The international wheat prices, expected to remain under pressure during 2017-18 due to higher stocks in major exporting countries and it may be difficult for India to export despite bumper crop in 2016-17.

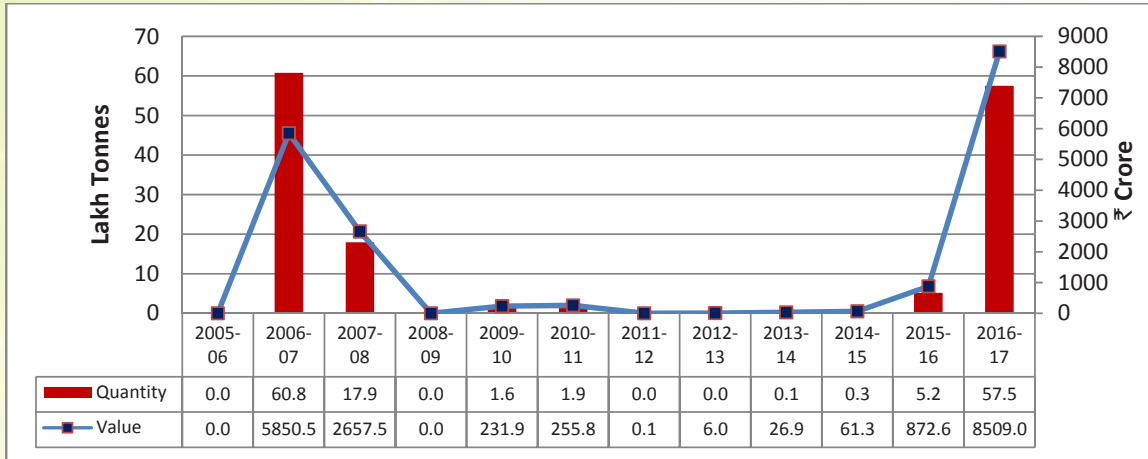
**Chart 4.3: MSP, Domestic and International Prices of Wheat, 2012 to 2017 (Q<sub>2</sub>)**



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



**Chart 4.4: India's Imports of Wheat, 2005-06 to 2016-17.**



Source: Directorate General of Commercial Intelligence and Statistics

4.6 India has been an occasional importer of wheat depending upon the demand and supply situation at home. When the actual wheat stocks with the Central Pool went below the minimum buffer norm in 2006-07, the Government imported 60.8 lakh tonnes of wheat during 2006-07 and 17.9 lakh tonnes during 2007-08 (Chart 4.4). No imports of wheat have been made for the Central Pool thereafter. However, 5.2 lakh tonnes of wheat was imported by the private parties mainly from Australia during 2015-16. During 2016-17 India imported over 5.7 million tonnes of wheat valued at ₹8509 crore, the highest quantity during last 10 years. Domestic prices increased from less than ₹1500 per quintal in April 2015 to about ₹1900 per quintal in January, 2017. In order to control prices and to meet the demand, the Government reduced import duty on wheat from 25 percent to 10 percent in September 2016 and thereafter to zero percent in December 2016. However, due to expected record production of over 97 million tonnes in 2016-17 and to protect interest of wheat growers, government imposed 10 percent import duty with effect from March 28, 2017.

### Barley

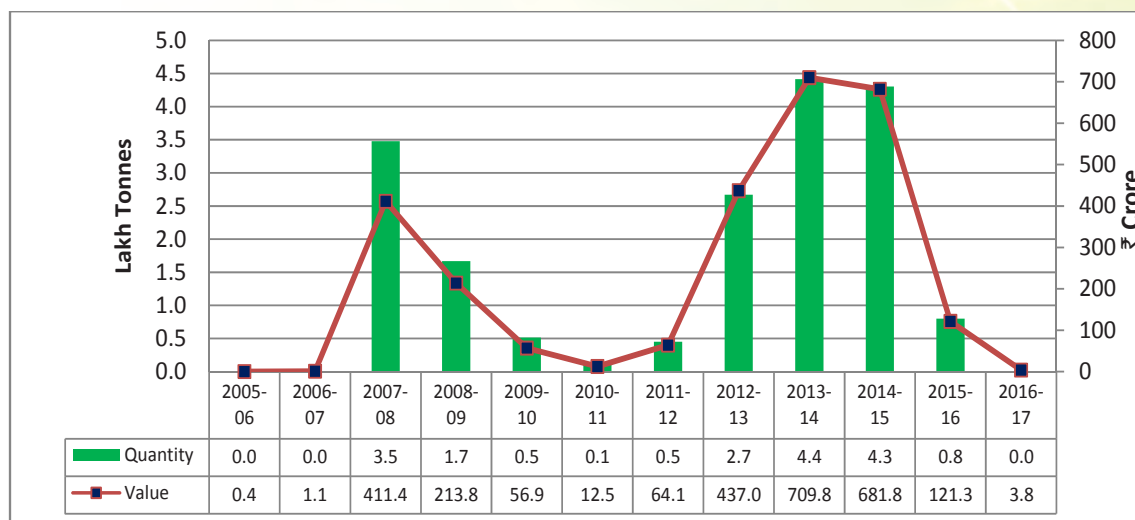
4.7 Global production of barley was 146.0 million tonnes in TE2016-17 out of which 28.5 million tonnes (19.5 percent) was traded (USDA, 2017). EU is the largest producer with a share of 41.7 percent, followed by Russia (12.5 percent) and Ukraine (6.4 percent). EU is also the largest exporter of barley with a share of 28.8 percent, followed by Australia (22.6 percent), Ukraine (17.0 percent) and Russia (15.1 percent). Saudi Arabia is the largest importer of barley (34.6 percent) followed by China (25.3 percent) and Iran (5.8 percent).

4.8 India is a small player in world barley markets. India exported about 4.4 lakh tonnes during 2013-14 and 2014-15 but exports declined to about 80000 tonnes in 2015-16 (Chart 4.5). Quantitative ceiling on exports of barley was removed in March, 2002 while import restrictions were removed in November 2002. Domestic wholesale prices, international prices and MSP of barley are given in Chart 4.6. Though domestic



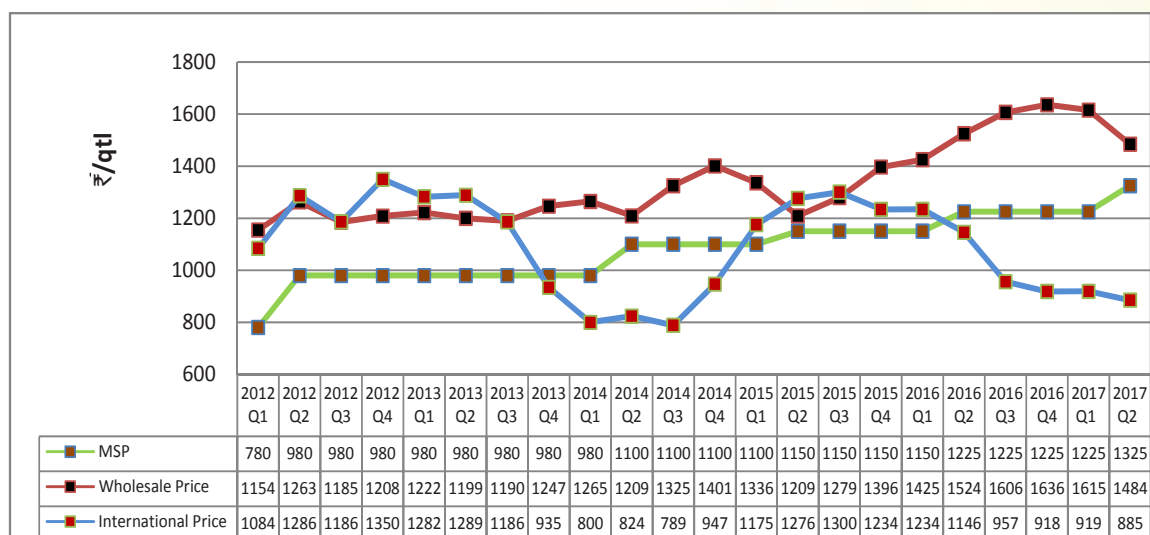
wholesale prices are generally higher than the international prices, India exports small quantities of barley to countries like UAE, Bahrain, Qatar, Oman, Bhutan and Nepal where it enjoys freight advantage over major barley exporting countries like EU, Australia and Russia.

**Chart 4.5: India's Exports of Barley, 2005-06 to 2016-17**



Source: Directorate General of Commercial Intelligence and Statistics

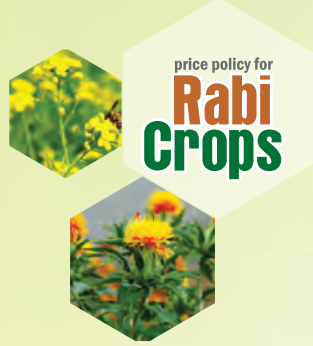
**Chart 4.6: MSP, Domestic and International Prices of Barley, 2012(Q<sub>1</sub>) to 2017 (Q<sub>2</sub>)**



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

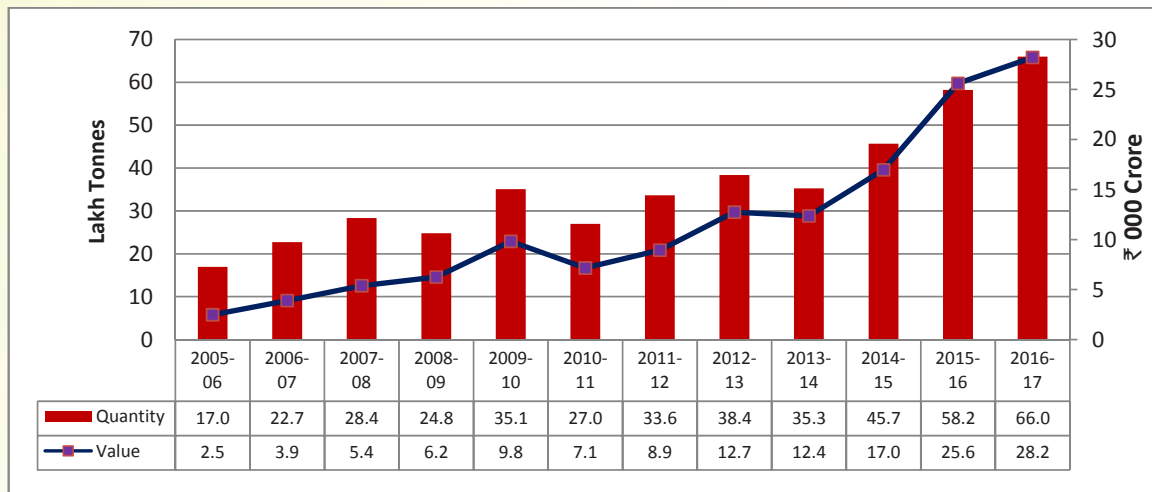
## Pulses

4.9 As per UN Comtrade, Canada was the largest exporter of pulses (4.9 million tonnes) with a share of 30 percent followed by Australia (11.7 percent), EU (9.1 percent), USA (8.3 percent) and Myanmar (6.7 percent) in 2016. India is the largest importer with a share of about 34 percent followed by EU (9.8 percent), China (6.2 percent) and Bangladesh (5.3 percent). As per DGCIS, pulses imports in the country have nearly



tripled during last 10 years, from 22.7 lakh tonnes in 2006-07 to 66 lakh tonnes in 2016-17 (Chart 4.7). Peas constituted the largest share (43.4 percent) in total imports of pulses, followed by lentil (17.1 percent) and chickpea (14.9 percent) in TE2016-17 (Table 4.1). Canada, Australia and Myanmar are major exporters of pulses to India and accounted for more than two-third of total imports in the country in TE2016-17. Other important suppliers are Russia, USA and Tanzania. The share of Myanmar in total imports has declined significantly from 28.7 percent in TE2008-09 to 13 percent in TE2016-17. On the other hand, share of Australia has increased from 7.3 percent to 14.2 percent and Russia from 0.8 percent to 6.7 percent in the corresponding period (Annexure 4.4). Canada is the largest exporter of peas and lentil to India while Australia supplies 74.2 percent of chickpeas and Myanmar about two third of urad and moong.

**Chart 4.7: India's Imports of Pulses, 2005-06 to 2016-17**



Source: Directorate General of Commercial Intelligence and Statistics.

**Table 4.1: Share and Key Originating Countries of India's Pulses Imports TE2016-17**

(Quantity in Lakh Tonnes)

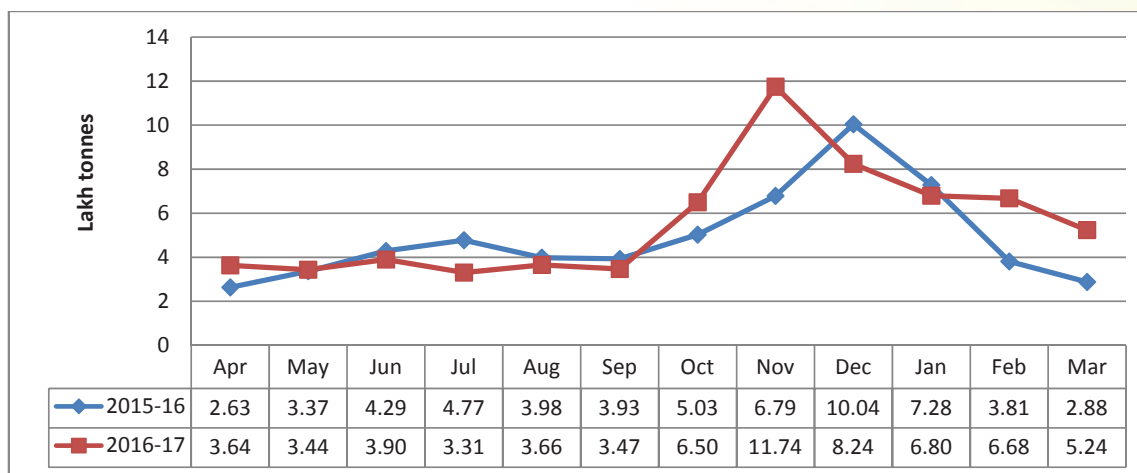
Name of Pulses	Import Quantity	Percent share in total pulses imports	Key Origins (percent)
Peas	24.6	43.4	Canada (62.9), Russia(9.9), USA (7.6)
Lentil	9.7	17.1	Canada (83.3), USA (10.2), Australia (6.4)
Chickpea	8.4	14.9	Australia (74.2), Russia (15.2), Tanzania (3.6)
Urad & Moong	5.9	10.5	Myanmar (74.3), Tanzania (6.3), Australia(5.4)
Tur	5.8	10.3	Myanmar (40.1), Tanzania (23.0), Mozambique (19.3)
Others	2.2	3.8	-
Total	56.6	100	Canada (41.8), Australia (14.2), Myanmar (13.0)

Source: Directorate General of Commercial Intelligence and Statistics.

4.10 Import duty on pulses was brought down from 10 percent to zero percent in June, 2006 and continued to be zero percent since then. However due to record production in 2016-17, domestic prices of tur and moong fell below MSP in many markets. In order to protect domestic producers, government imposed 10 percent import duty on Tur in March 2017. Exports of pulses were prohibited in June, 2006, initially for a period of six months which has been extended from time to time and latest being in March, 2014. However, prohibition on exports of pulses is not applicable to export of Kabuli Chana and 50000 MT of organic pulses and lentils per annum, subject to certification and registration by APEDA and such exports are allowed from Customs Electronic Data Interchange (EDI) Ports only. Exports of pulses to Bhutan have been exempted from any ban and without any quantitative restriction. The export of pulses to the republic of Maldives has been permitted for the years 2014-15 to 2016-17 with quantitative restrictions.

4.11 As seen in Chart 4.8, Imports of pulses tend to rise from the month of September and reach a peak in November/December. It is important to note that this is peak arrival season for domestic kharif pulses. High imports of pulses during this period in 2016-17 and high production led to fall in domestic prices. Therefore, there is a need to restrict imports during peak domestic market arrivals, depending upon domestic and international prices. The decision to impose 10 percent import duty on tur was taken in March and by that time most of farmers had already sold their produce.

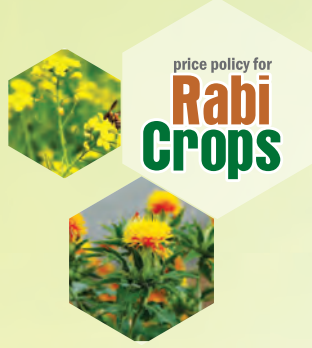
**Chart 4.8: Month-wise Imports of Pulses during 2015-16 and 2016-17**



Source: Directorate General of Commercial Intelligence and Statistics

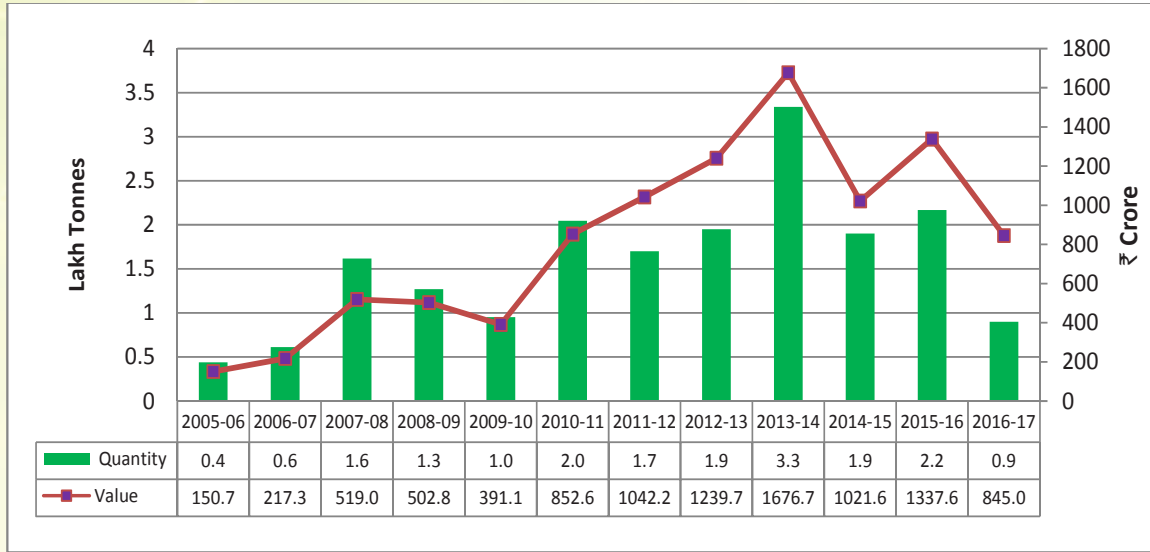
### Gram (Chickpea)

4.12 India imports as well as exports small quantities of gram. India's exports (mostly kabuli chana) have increased from about one lakh tonnes in 2009-10 to 3.3 lakh tonnes in 2013-14 and then declined to 1.9 lakh tonnes in 2014-15. Exports of gram were 2.2 lakh tonnes in 2015-16 and fell to less than one lakh tonnes in 2016-17 (Chart 4.9). However, imports of gram have increased from 2.8 lakh tonnes in



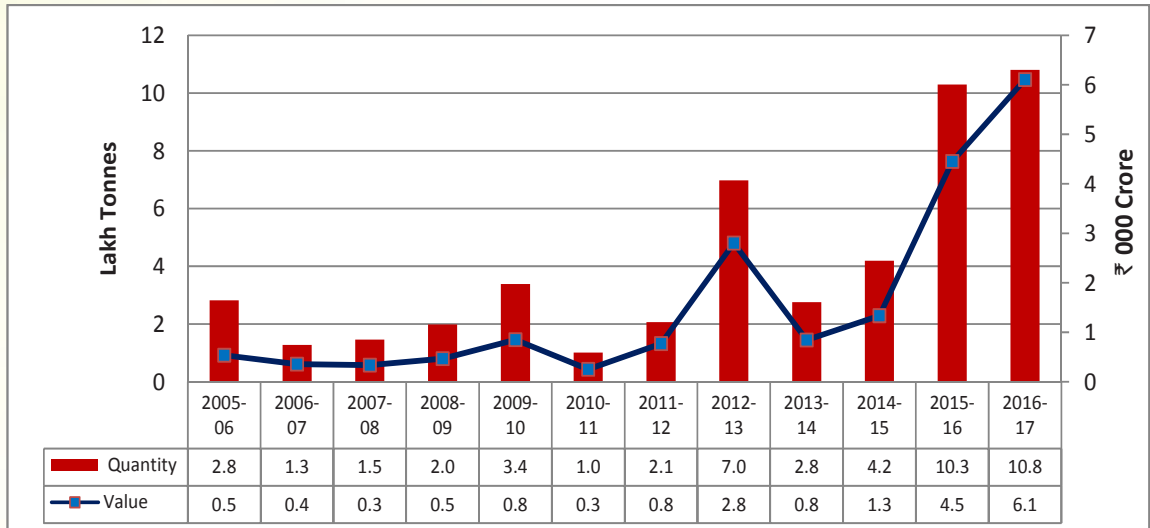
2005-06 to 7 lakh tonnes in 2012-13 before declining to 2.8 lakh tonnes in 2013-14 due to bumper production during 2013-14. Imports of gram increased to 4.2 lakh tonnes in 2014-15 and reached a peak of 10.8 lakh tonnes in 2016-17 (Chart 4.10).

**Chart 4.9: India's Exports of Gram (Chickpea) 2005-06 to 2016-17**



Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.10: India's Imports of Gram (Chickpea), 2005-06 to 2016-17**

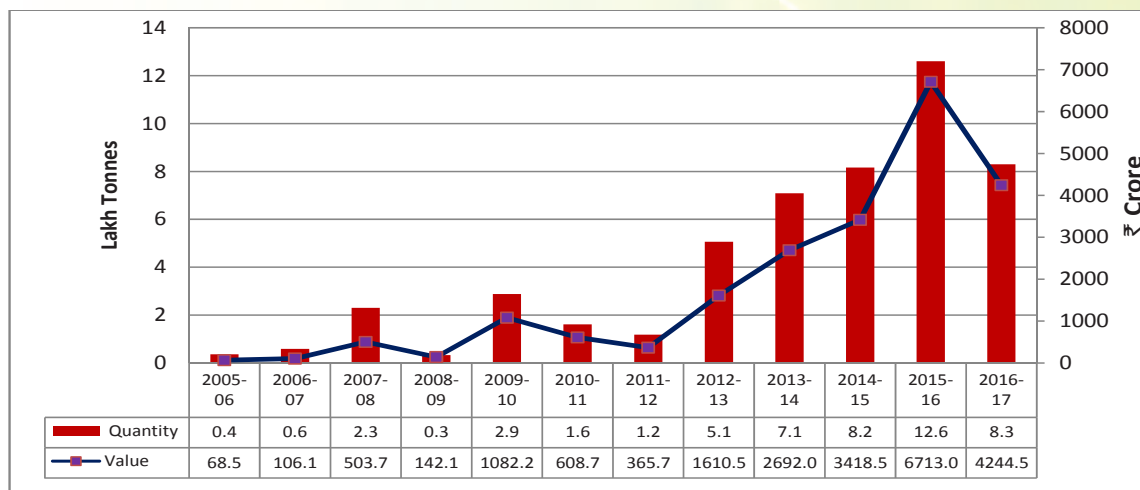


Source: Directorate General of Commercial Intelligence and Statistics

### Lentil (Masoor)

4.13 India's exports of lentils are negligible whereas imports have increased from 0.4 lakh tonnes in 2005-06 to 12.6 lakh tonnes in 2015-16 but declined to 8.3 lakh tonnes in 2016-17 due to higher domestic production (Chart 4.11).

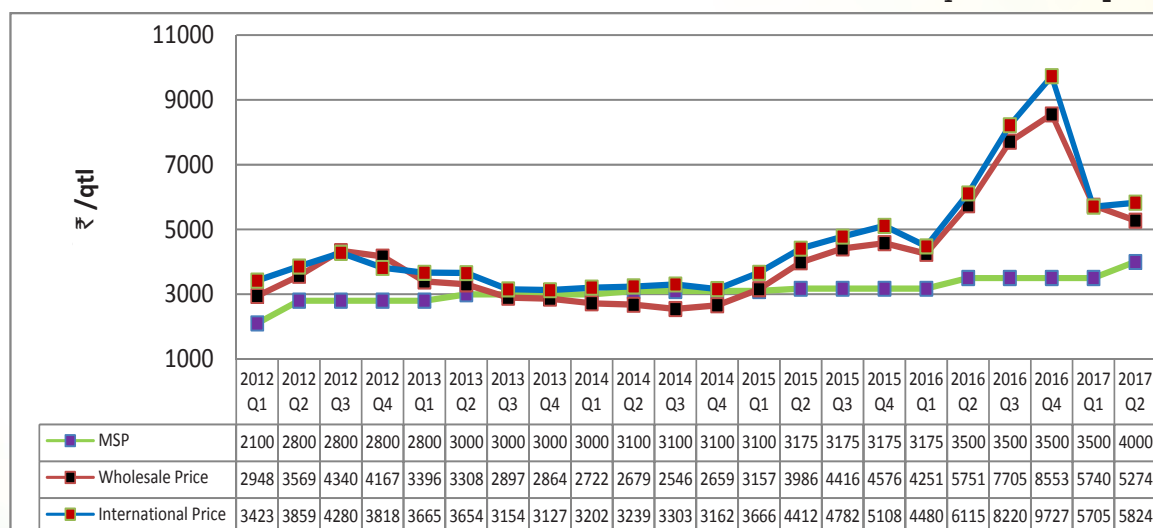
**Chart 4.11: India's Imports of Lentil, 2005-06 to 2016-17**



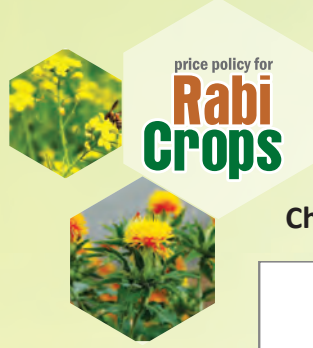
Source: Directorate General of Commercial Intelligence and Statistics

4.14 During the last five years, domestic wholesale prices of gram have generally been lower than international prices except in 2012(Q<sub>3</sub>&Q<sub>4</sub>) and 2017(Q<sub>1</sub>) (Chart 4.12) whereas domestic wholesale prices of masoor which were generally lower than world prices during 2015, became higher than international prices during 2016 and 2017 (Chart 4.13) . Lower world prices might adversely affect domestic lentil growers. MSP of masoor has been lower than the domestic and international prices. While gram prices, which have been generally higher than MSP, were below MSP during 2013(Q<sub>3</sub>) to 2014(Q<sub>4</sub>) on account of record production in the country during 2013-14. In order to promote pulses production, producers need to be protected through appropriate tariff levels when international prices are low and have effective procurement policy when market prices fall below MSP.

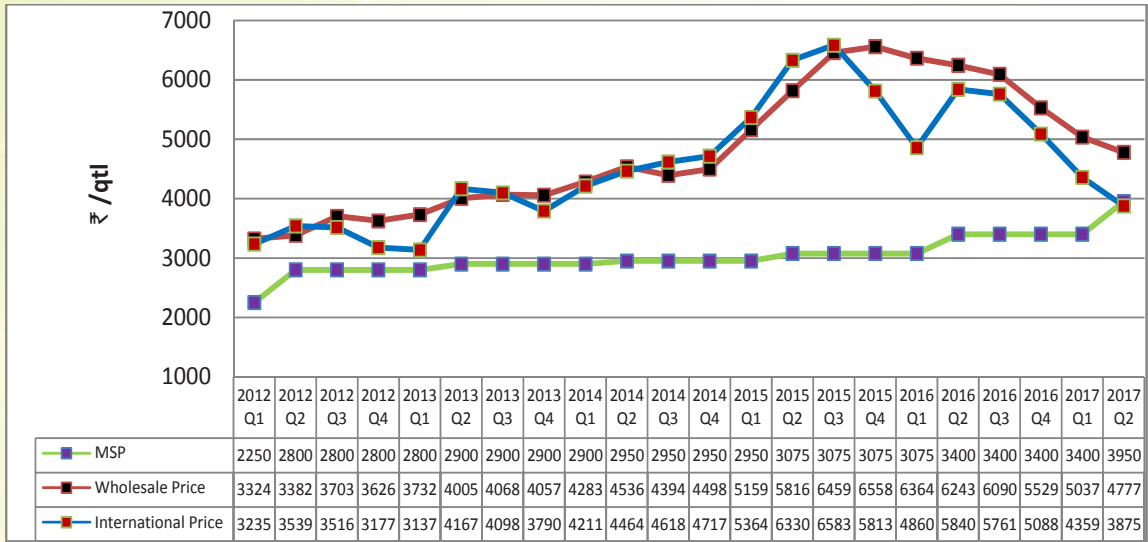
**Chart 4.12: MSP, Domestic and International Prices of Gram, 2012(Q<sub>1</sub>) to 2017(Q<sub>2</sub>)**



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



**Chart 4.13: MSP, Domestic and International Prices of Lentil, 2012(Q1) to 2017 (Q<sub>2</sub>)**



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

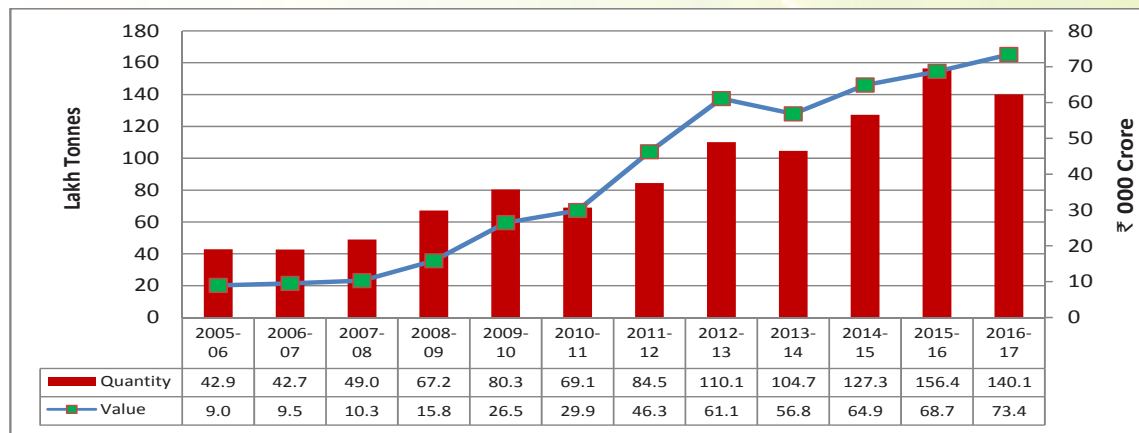
### Oilseeds/Edible Oils

- 4.15 As per USDA, global production of major oilseeds was 541.6 million tonnes in TE2016-17 out of which 154.5 million tonnes was traded. USA is the largest producer (119.7 million tonnes) with a share of 22.1 percent. Other major producers are Brazil (19.3 percent), Argentina (11.6 percent), China (10.3 percent) and India (6.1 percent). Brazil and USA accounted for 70 percent of the global exports, with a share of 35.9 percent and 34.6 percent, respectively. Other major exporters are Canada (9.1 percent) and Argentina (7.1 percent). China is the single largest importer of oilseeds (88.2 million tonnes) with a share of 57.5 percent, followed by EU (12.5 percent), Mexico (3.9 percent) and Japan (3.8 percent).
- 4.16 According to USDA, global production of vegetable oils was 180 million tonnes during TE2016-17, out of which 41 percent was traded. Indonesia is the largest producer with a share of 20.9 percent. Other major producers are China (14.4 percent), Malaysia (11.8 percent) and EU (10.1 percent). Indonesia (35.6 percent) and Malaysia (24.1 percent) account for about 60 percent of global exports. India is the largest importer of vegetable oils with a share of about 20.6 percent, followed by EU (13.8 percent), China (11.4 percent) and USA (6.3 percent).
- 4.17 As per DGCIS, India's imports of edible oils have increased from 42.9 lakh tonnes (valued at ₹9000 crore) in 2005-06 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 (Chart 4.14).





**Chart 4.14: India's Imports of Edible Oils, 2005-06 to 2016-17**



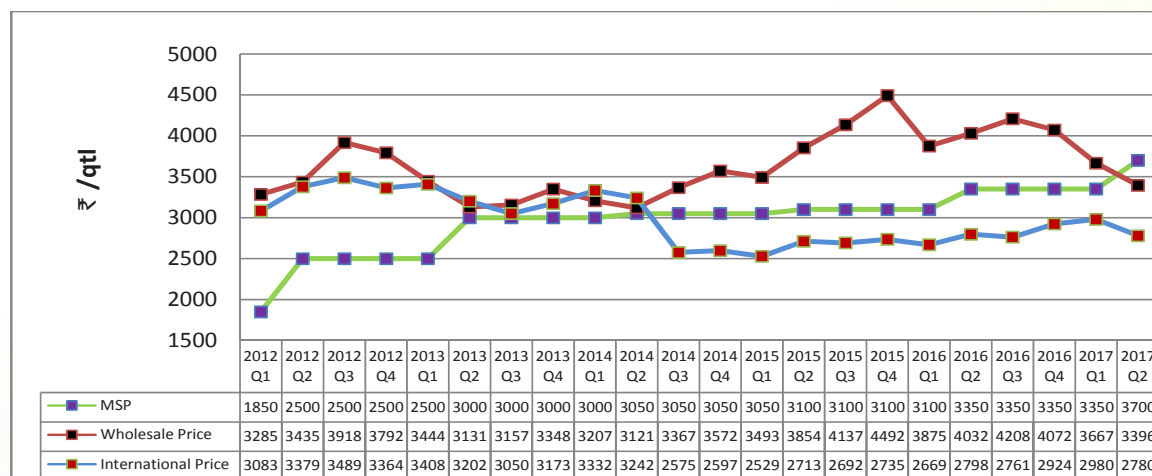
Source: Directorate General of Commercial Intelligence and Statistics

### R&M Oilseeds

4.18 As per USDA, global production of R&M was 70.1 million tonnes, out of which 21.1 percent (14.8 million tonnes) was traded. EU is the largest producer of R&M with a share of 31.8 percent, followed by China (25.3 percent), Canada (20.5 percent) and India (8.5 percent). Canada is the largest exporter of R&M with a share of 66.8 percent, while China is the largest importer with a share of 27.6 percent, followed by EU (22.3 percent) and Japan (16.6 percent).

4.19 India exports small quantities of R&M while its imports are nil. As per DGCIS, India's exports of R&M were 28 thousand tonnes in TE2015-16. During the period from 2012(Q<sub>1</sub>) to 2014(Q<sub>2</sub>), the domestic wholesale prices of R&M have generally followed the trend of international prices. However, during the period from 2014(Q<sub>3</sub>) to 2017(Q<sub>2</sub>), the domestic wholesale prices of R&M have been consistently higher than international prices. MSP of R&M has been lower than domestic wholesale prices except in 2017(Q<sub>2</sub>), but higher than international prices during the period from 2014(Q<sub>3</sub>) to 2017(Q<sub>2</sub>) [Chart 4.15].

**Chart 4.15: MSP, Domestic and International Prices of R&M, 2012 to 2017(Q<sub>2</sub>)**



Source: DES, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices and World Bank for International prices

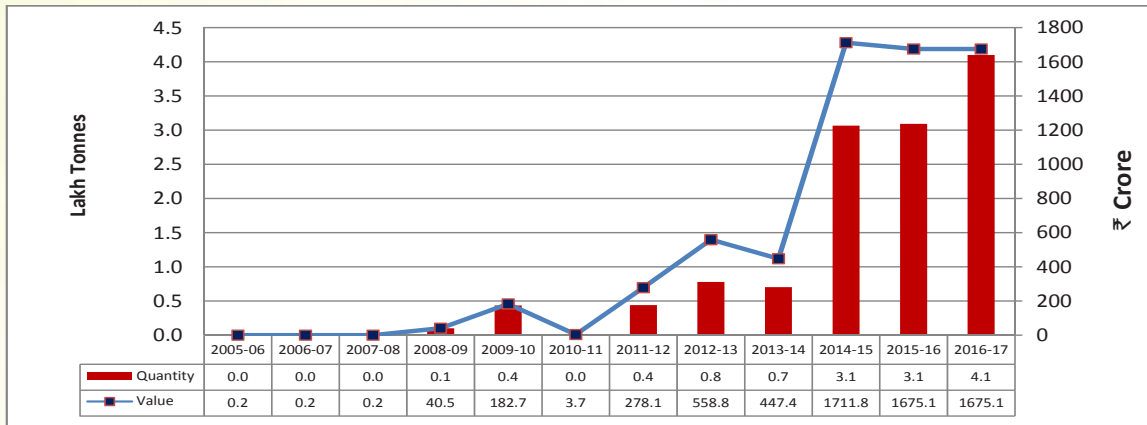


### Rapeseed and Mustard (R&M) Oil

4.20 As per USDA, global production of R&M oil was 27.8 million tonnes in TE2016-17, out of which about 15.1 percent was traded. EU is the largest producer of R&M oil (10.2 million tonnes) with a share of 36.9 percent followed by China (25.1 percent), Canada (13.1 percent) and India (6.8 percent). Canada is the largest exporter of R&M oil with a share of 65.6 percent, followed by EU (8.1 percent). China is the largest importer of R&M oil with a share of 17.6 percent, followed by India (9.7 percent) and EU (4.9 percent).

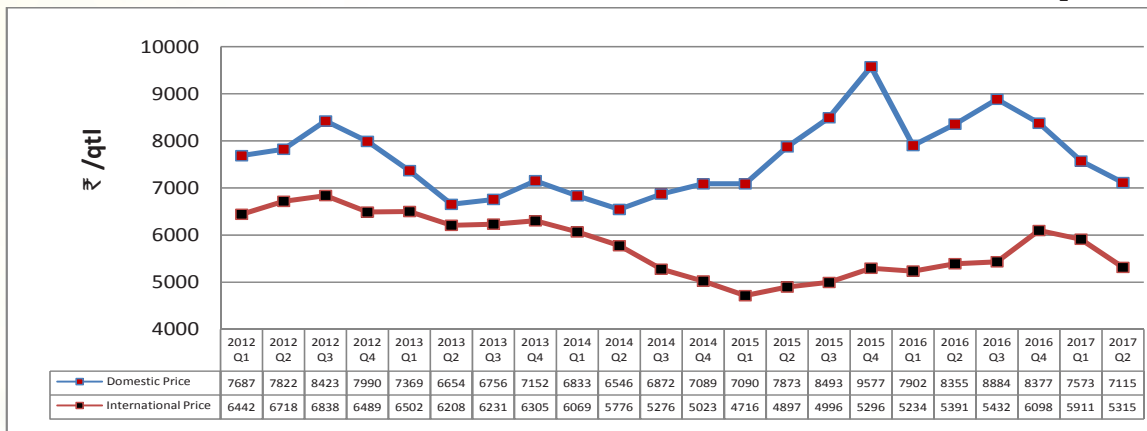
4.21 India's exports of R&M oil are negligible but imports of R&M oil have increased during the last four years. Imports of R&M oil rose from 70 thousand tonnes in 2013-14 to 3.1 lakh tonnes in 2015-16 which further increased to 4.1 lakh tonnes in 2016-17 (Chart 4.16). The domestic prices of R&M oil have continuously been higher than international prices from 2012 (Q<sub>1</sub>) to 2017 (Q<sub>2</sub>) [Chart 4.17]. Domestic prices of R&M oil experienced increasing trend from 2014 (Q<sub>2</sub>) to 2015 (Q<sub>4</sub>) and significantly fell during 2016 (Q<sub>1</sub>), but again increased in the next two quarters. However, both prices showed a downward trend in recent months.

**Chart 4.16: India's Imports of R&M Oil, 2005-06 to 2016-17.**



Source: Directorate General of Commercial Intelligence and Statistics

**Chart 4.17: Domestic and International Prices of R&M Oil, 2012 to 2017 (Q<sub>2</sub>)**



Note: International prices of 2017 (Q<sub>2</sub>) is the average of April and May, 2017

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

## Trade Policy

- 4.22 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 were also placed under OGL and import duty was as high as 80 percent on crude oil and 90 percent on refined edible oils during early 2000s 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 to 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 from September, 2016. In order to improve self-sufficiency in edible oils, import duty needs to be linked to domestic production and international prices. Duty differential between crude and refined oil should be increased to discourage imports of refined oil and encourage domestic refining industry.
- 4.23 Exports of edible oils were initially prohibited for a period of one year in March, 2008 which was extended from time to time. However, there are certain exemptions, namely (a) Castor oil, (b) Coconut oil from all Electronic Data Interchange (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, and (g) Rice Bran oil in bulk (irrespective of any pack size). 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 MT. 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 (percent)	Bound duty (percent)	OGL/Export ban	Export duty (percent)
<b>Cereals</b>					
Wheat	OGL	10.0	100	OGL	Zero
Barley	OGL	Zero	100	OGL	Zero

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

Crop/ Commodity	Trade Policy				
	Import Policy			Export Policy	
	OGL/import ban	Import duty (percent)	Bound duty (percent)	OGL/Export ban	Export duty (percent)
<b>Pulses</b>					
Gram (Chickpea)	OGL	Zero	100	Export prohibited except kabuli chana and 50,000 tonnes per annum of organic pulses and lentils	
Masoor (Lentil)	OGL	Zero	100		
<b>Oilseeds &amp; Oils</b>					
R&M	OGL	30	100	OGL	Zero
R&M Oil (Crude)	OGL	12.5	75	Export ban*	
R&M Oil (Refined)	OGL	20.0	75	Export ban*	
Palm Oil (Crude)	OGL	7.5	300	Export ban*	
	(Tariff value -US \$693 per metric tonne)**				
RBD Palmolein	OGL	15.0	300	Export ban*	
	(Tariff value -US \$720 per metric tonne)**				
RBD Palm Oil	OGL				
	(Tariff value -US \$709 per metric tonne)**				

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

\*\*as on July 14, 2017

Source: Central Board of Excise and Customs.

## Trade Outlook

4.24 During 2017-18, the government has set foodgrains production target at 274.55 million tonnes (22.9 million tonnes pulses) and oilseeds output target at 35.5 million tonnes. The production of cereals, pulses and oilseeds in the country is expected to be good in 2017-18 in view of forecast of normal southwest monsoon season for



2017. No significant increase in agri-exports is expected in 2017-18 due to lower demand as well as relatively low prices in the international market, whereas agri-imports are likely to be at the level of 2016-17 mainly due to lower imports of wheat and pulses. The domestic supply of pulses and wheat is expected to be comfortable due to normal monsoon and sufficient stocks.

4.25 As per FAO's Food Outlook, June 2017, global cereal production in 2017-18 is projected to be 2594 million tonnes, 0.5 percent lower than 2016. The global trade in cereals in 2017-18 is predicted to decline by 1.2 percent compared to 2016-17, mainly due to reduced import demand for wheat, maize and sorghum. Global wheat trade is likely to be down (-1.7 percent) from 2016-17. The overall contraction in world cereal trade is likely to intensify competition for market share among major exporters keeping international prices subdued. Based on current forecasts, world output of oilseeds and derived products viz. oils/oil meals are expected to increase in 2016-17 season. However, increased forecast would not be effective on total availabilities of oil crops, due to low carry stocks in last season. The likelihood of smoother global supply and demand balances in oil crop complex explains the recent softening in international prices of oilseeds and oils/oil meals. As per the current outlook, international prices of oil meals/cakes are likely to remain at relatively low levels in the coming months. However, vegetable oil prices are projected to increase in 2017. According to Commodity Market Outlook, a World Bank quarterly report of April 2017, agricultural prices are expected to remain stable in 2017 but with significant variations across commodities. Grain prices are projected to decline due to high surpluses but oils and meals prices are expected to marginally increase due to tight supplies.

\*\*\*\*\*



## CHAPTER 5

### 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 agricultural and non-agricultural sectors and likely impact of MSP on consumers and overall economy along with rational utilization of scarce natural resources like land and water while recommending MSPs of the agricultural crops. Thus, cost is an important factor but not the only factor in determining MSPs.
- 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, compiled under 'Comprehensive Scheme (CS) for studying the Cost of Cultivation of Principal Crops in India'. Since CS data are generally available with a time lag of two years in case of rabi crops, these need to be projected for Rabi crop season 2017-18. Crop-wise state-wise projections are made for arriving at the cost of cultivation for the ensuing season. Subsequently for each crop from state level estimates, all-India estimates are derived. These projected cost estimates are considered into formulation of price policy recommendations by the Commission.
- 5.3 The projected cost of cultivation (CoC) estimates of six crops for RMS 2018-19 are based on actual estimates for the latest three years *viz.* 2013-14 to 2015-16 for each state. However, CoC estimates are not projected for the states whose share of production in all-India production for a particular crop is less than 1 percent or where number of sample holdings under CS for that crop is less than 10. The CoC estimates' projections capture movement in overall input cost separately for the crop season 2017-18 over each of the past three years *viz.* 2013-14, 2014-15 and 2015-16. An assessment of likely changes in input costs for the crop year 2017-18 with reference to each of the above mentioned three consecutive years ending with 2015-16 is made by constructing the Composite Input Price Index

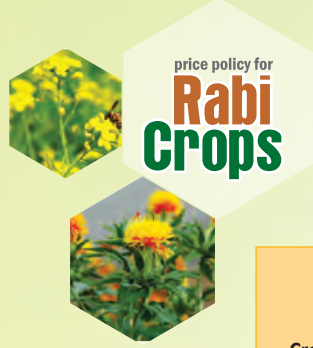


(CIPI) (base 2011-12=100) based on latest prices of different inputs like human labour, bullock labour, machine labour, manures, fertilisers, seeds, pesticides and irrigation charges as per data available from Labour Bureau, State governments, Office of Economic Adviser, Ministry of Commerce & Industry, Fertiliser Association of India (FAI), etc. Based on CIPI thus constructed, the Commission projects CoC for  $A_2$ +FL and subsequently  $C_2$ . Cost of production (CoP) is then derived from this projected CoC using the projected yield.

- 5.4 The Commission undertakes cost projection exercise on the basis of latest three years' cost estimates for each state under certain implicit assumptions. One, since projections for each crop grown in a state are made two years ahead, it is assumed that fixed cost components would not, in all likelihood, undergo any significant change in the intervening period. Two, since yield varies from year to year due to multiplicity of factors, projections of cost for the last three years, latest being 2015-16, have been undertaken for each state to smoothen out fluctuations in yield and hence in cost of production. However, in cases where there is wide fluctuation in the yields, olympic average yield (olympic average is calculated by dropping the highest and lowest yield and calculating the average of the remaining 3 yields) has been used.

### Costs and Returns of Rabi Crops during 2013-14 to 2015-16

- 5.5 The Commission examines the actual costs and returns of the crops, for which latest CS data is available from the DES. It is pertinent to mention that the gross value of output is estimated at the prevailing market prices during harvest season in the village/cluster of villages where the crop is grown and harvested. With this stipulation, an analysis of profitability and rate of return over costs  $A_2$ ,  $A_2$ +FL and  $C_2$  for the mandated crops during TE2015-16 is presented.
- 5.6 To estimate profitability of a crop, gross returns over cost  $A_2$  (gross value of output (GVO) less cost  $A_2$ ), gross returns over  $A_2$ +FL (GVO less cost  $A_2$ +FL) and net returns, which represent GVO less cost  $C_2$  are calculated. The average returns (both gross and net) during 2013-14 to 2015-16 for various rabi crops are presented in Table 5.1 and Chart 5.1. It is evident from Table 5.1 that the gross rate of returns over  $A_2$  and  $A_2$ +FL and net returns are positive for all crops except safflower. The average gross returns over  $A_2$  are highest (199 percent) for barley while average gross returns over  $A_2$ +FL are maximum for lentil (106 percent). The net rate of return is maximum for barley and lentil, followed by wheat (22 percent) and R&M (21 percent). It may be noted that safflower has negative gross returns over  $A_2$ +FL and net rate of return mainly due to the high cost of production resulting from very low yields. The state-wise details of average returns are given in Annex Table 5.1.

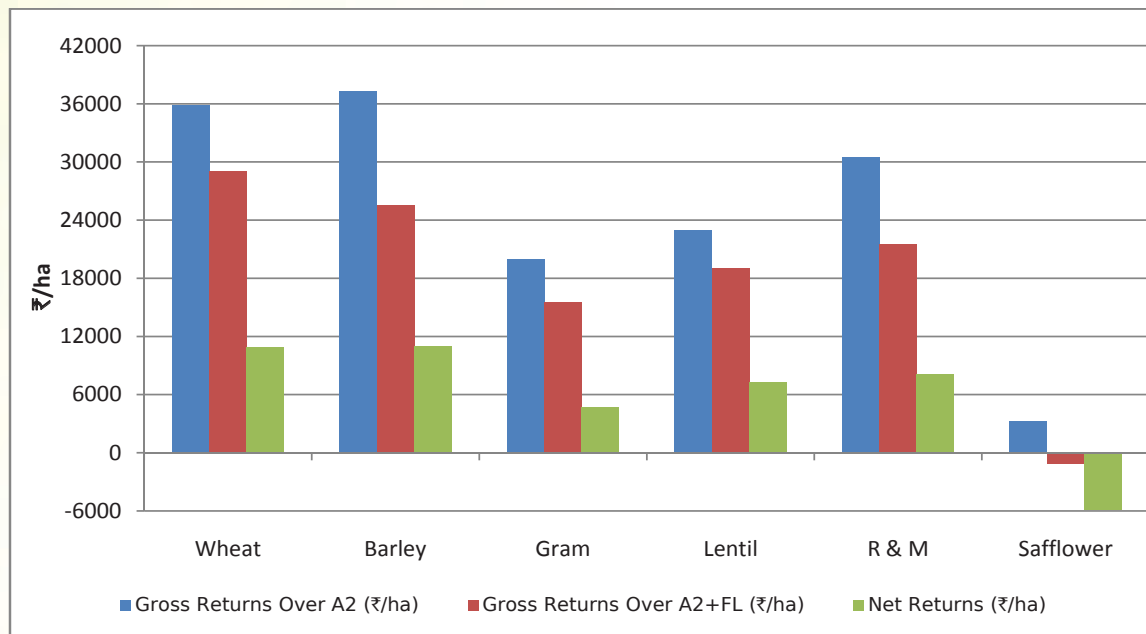


**Table 5.1: Gross and Net Returns of Rabi Crops (TE2015-16)**

Crop	Cost A <sub>2</sub>	Cost A <sub>2</sub> +FL	Cost C <sub>2</sub>	GVO	Gross Returns over A <sub>2</sub>		Gross Returns over A <sub>2</sub> +FL		Net Returns	
	₹/ha				₹/ha (Col.5- Col.2)	Percent (Col.6/ Col.2* 100)	₹/ha (Col.5- Col.3)	Percent (Col.8/ Col.3* 100)	₹/ha (Col.5- Col.4)	Percent (Col.10/ Col.4* 100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>A. Cereals</b>										
Wheat	24,142	30,930	49,154	59,996	35,854	149	29,066	94	10,842	22
Barley	18,709	30,463	44,978	55,969	37,260	199	25,507	84	10,991	24
<b>B. Pulses</b>										
Gram	17,789	22,216	33,095	37,735	19,946	112	15,518	70	4,640	14
Lentil	13,979	17,954	29,755	36,983	23,005	165	19,030	106	7,229	24
<b>C. Oilseeds</b>										
R & M	15,853	24,764	38,251	46,310	30,456	192	21,545	87	8,058	21
Safflower	13,962	18,374	23,098	17,252	3,290	24	-1,122	-6	-5,846	-25

Source: CACP using CS data

**Chart 5.1: Gross and Net Returns of Rabi Crops, TE2015-16**



Source: CACP calculations

## Agricultural Wages and Input Price Movement

5.7 Table 5.2 presents annual average growth in wage rates of agricultural labour in nominal and real terms (2016-17=100) in major states and at all-India level during



2014-15 to 2016-17. At all-India level, agricultural labour wages increased by 12.8 percent in 2014-15, 3.8 percent in 2015-16 and 4.8 percent in 2016-17 at current prices. The increase in real wages was 6.9 percent, (-) 1.5 percent and 1.2 percent in the corresponding years. Further, Chart 5.2 reflects state-wise annual average daily wages of agricultural labour in 2016-17 and growth in wages during 2016-17 over 2015-16. The wage rate is the highest (₹670/day) in Kerala and the lowest in MP (₹200/day). Generally wages are low in eastern and western states. Rajasthan witnessed a decline in wage rates while Maharashtra recorded the highest growth. The state-wise and all-India details of monthly average daily wage rates of agricultural labour in nominal terms of major crop growing states are given in Annex Table 5.2.

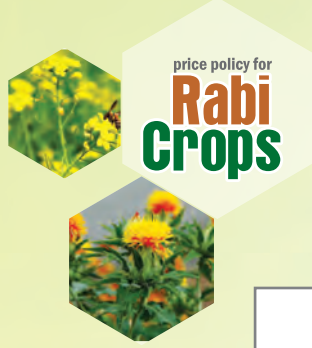
**Table 5.2: Annual Average Growth in Wages of Agricultural Labour**

State	Growth (%) at Current Prices			Growth (%) at Constant Prices (2016-17=100)		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
Andhra Pradesh	7.3	6.5	7.7	0.7	-0.02	4.7
Assam	22.2	4.8	7.1	14.6	2.9	6.5
Bihar	16.2	9.7	1.4	11.8	8.5	0.8
Gujarat	21.6	6.9	7.3	14.9	0.3	4.3
Haryana	7.3	3.6	2.2	0.4	0.03	-2.5
Himachal Pradesh	9.0	5.9	5.4	2.3	1.2	1.0
Karnataka	9.1	12.6	5.8	2.7	4.0	-0.8
Kerala	11.4	6.4	1.2	2.4	1.9	-4.2
Madhya Pradesh	18.1	4.7	7.5	15.7	0.1	4.1
Maharashtra	5.9	3.6	8.5	-1.1	-2.2	3.8
Odisha	18.8	-0.1	6.8	11.0	3.0	6.5
Punjab	3.7	1.7	2.1	-1.1	-2.1	-3.2
Rajasthan	17.8	-3.8	-0.6	11.3	-8.5	-5.5
Tamil Nadu	23.9	-4.0	4.3	14.7	-11.6	-0.7
Uttar Pradesh	6.9	7.4	5.9	3.5	0.8	6.2
West Bengal	9.1	4.2	4.2	5.5	3.4	2.0
<b>All-India</b>	<b>12.8</b>	<b>3.8</b>	<b>4.8</b>	<b>6.9</b>	<b>-1.5</b>	<b>1.2</b>

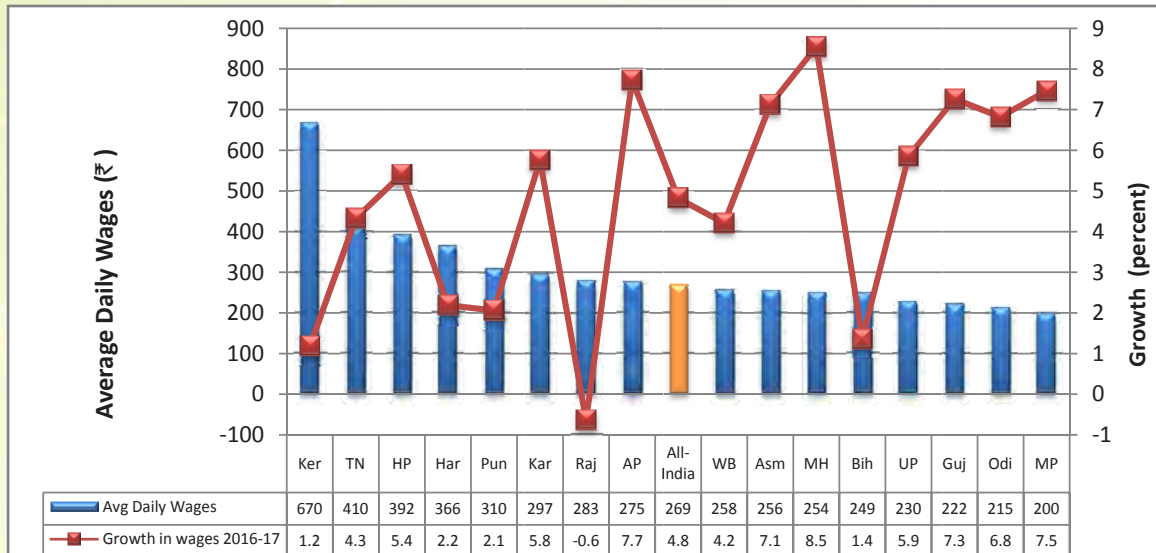
Note: 1. Average is from July to June

2. Average for 2016-17 is from July, 2016 to April, 2017

Source: Labour Bureau, Shimla



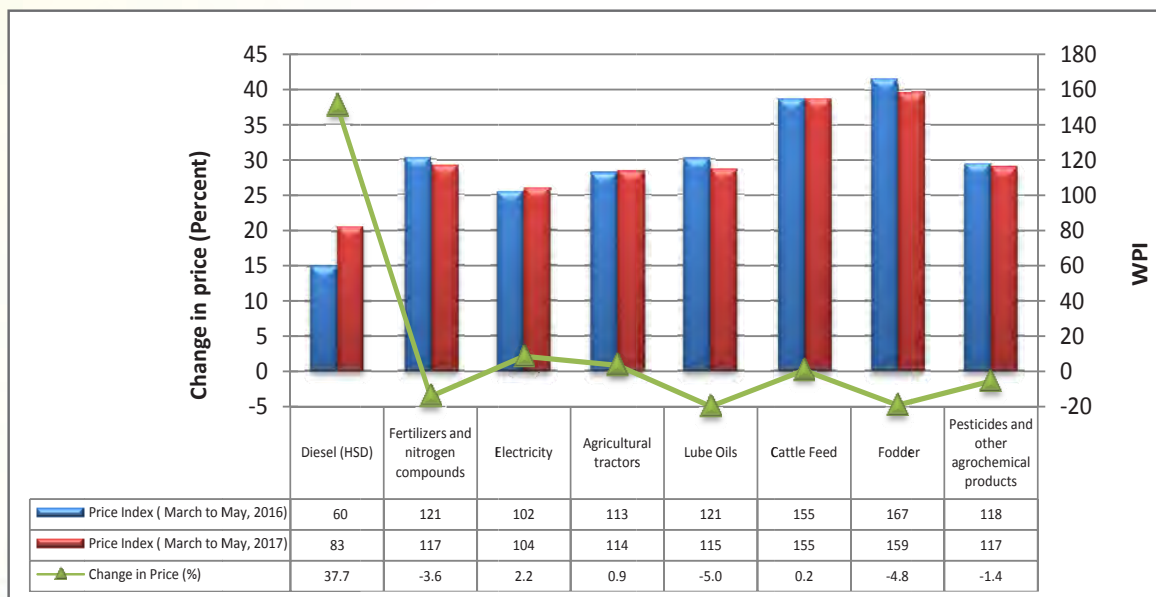
**Chart 5.2: Average Daily Wages in Agricultural Labour in 2016-17 and Growth in Wages 2016-17 over 2015-16**



Source: Labour Bureau, Shimla

5.8 Chart 5.3 presents trends in prices of farm inputs (based on WPI 2011-12=100) during March to May, 2017 over March to May, 2016. The chart shows that prices of high speed diesel (HSD), electricity, agricultural tractors and cattle feed have increased in the range of 0.2 percent to 37.7 percent, while prices of fertilizers & nitrogen compounds, lube oils, fodder and pesticides and other agrochemical products have declined in the range of 1.4 percent to 5 percent (details in Annex Table 5.3).

**Chart 5.3: Movements in Prices of Farm Inputs (March to May, 2017 over March to May, 2016)**



Source: DIPP, Ministry of Commerce and Industry



## Cost Projections for RMS 2018-19

5.9 Based on the state-wise cost estimates and CIPI, crop-wise cost of cultivation is projected. The cost of production is obtained by using 3 years average yield. However, in case of wide fluctuations in yield of a crop in a state during three years, olympic average yield was used to project the CoC estimates. Subsequently, all-India weighted average cost of production with weights being shares of states in the national production in TE2016-17, has been worked out for rabi crops for the year 2017-18 (Table 5.3).

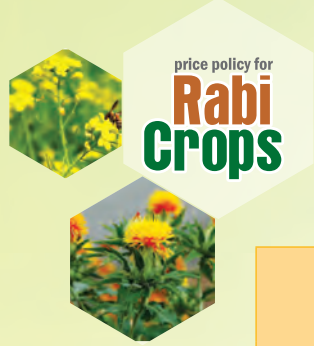
**Table 5.3: Projected Costs of Production of Mandated Crops during Rabi Marketing Season, 2018-19**

Crops	Cost of Production (₹/qtl)		
	A <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>
Wheat	642	817	1,256
Barley	522	845	1,190
Gram	1,977	2,461	3,526
Lentil	1,845	2,366	3,727
Rapeseed & Mustard	1,354	2,123	3,086
Safflower	2,216	3,125	3,979

Source: CACP Calculations

5.10 The average cost of production (C<sub>2</sub>) ranges from ₹1190 per quintal in case of barley to ₹3979 per quintal in safflower. The average C<sub>2</sub> cost in wheat is ₹1256 per quintal, gram (₹3526 per quintal) and lentil (₹3727 per quintal). The average A<sub>2</sub>+FL cost is the lowest (₹817 per quintal) in wheat and the highest (₹3125 per quintal) in case of safflower. The state-wise and all-India projected costs of six rabi crops covered under MSP are given in Annex Table 5.4. The actual costs for different states for 2014-15 and 2015-16 are given in Annex Table 5.5a to 5.5f.

5.11 The Commission computes all-India weighted average and composite index of all the crops for the years 2014-15 to 2017-18 with base 2011-12=100. For this, on the basis of state-wise indices, an all-India crop-wise weighted average input price index for all inputs, with weights being relative shares of the states in total area under the crop in TE2016-17 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 the crops in the total production (TE2016-17). It may be observed from Table 5.4 that the all-India rabi crops CIPI for all crops shows an increase of 6.4 percent in 2017-18 over 2016-17.



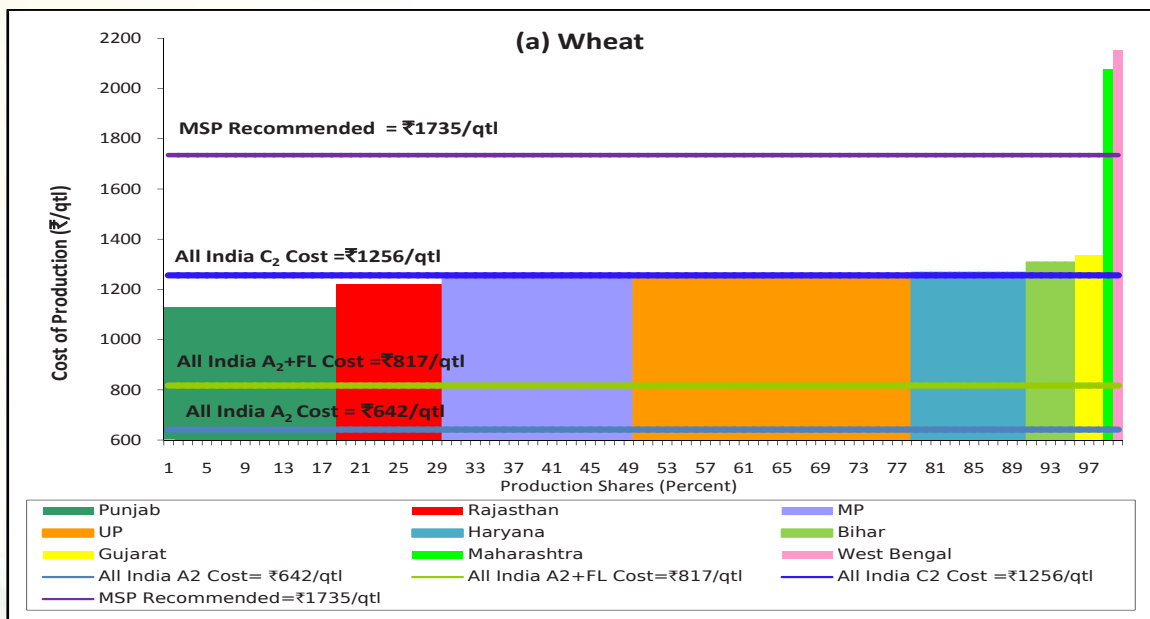
**Table 5.4: All-India Rabi Crops Input Price Index (Base 2011-12=100)**

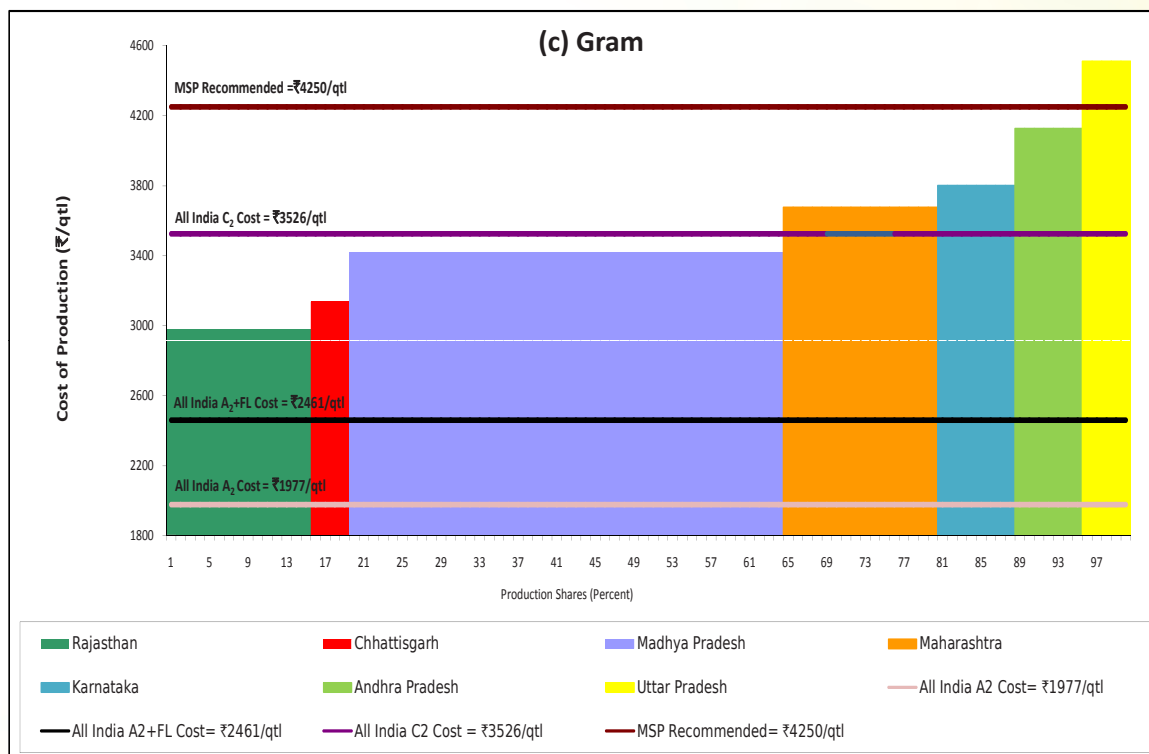
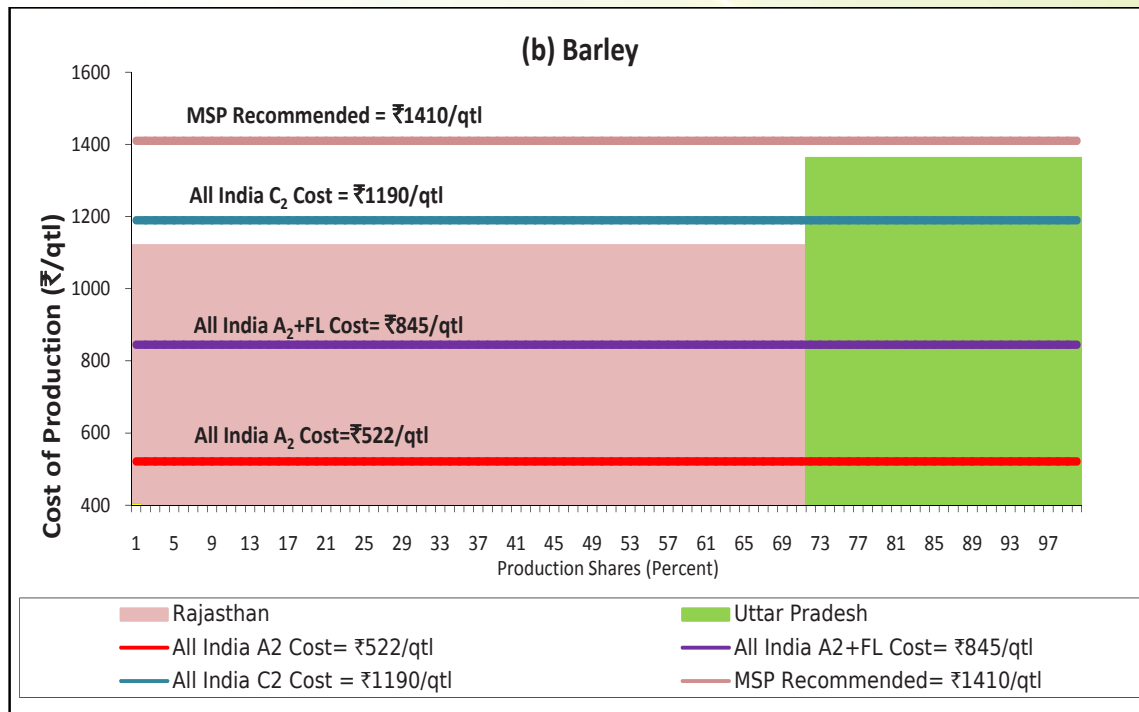
Inputs	Weights (2015-16)	Crops Input Price Index (CIPI)				Percentage Change in Input Price Index 2017-18 over 2016-17
		2014-15	2015-16	2016-17	2017-18	
Human Labour (HL)	0.37	150.51	155.30	165.53	176.81	6.8
Bullock Labour (BL)	0.02	179.56	187.86	200.02	212.99	6.5
Machine Labour (ML)	0.23	106.24	77.74	85.44	91.43	7.0
Seeds	0.10	131.86	142.10	154.75	168.62	9.0
Fertilizers	0.13	122.59	124.28	130.17	136.38	4.8
Manures	0.00	129.33	118.94	124.84	131.12	5.0
Insecticides	0.02	121.43	121.42	116.42	120.14	3.2
Irrigation Charges	0.13	117.58	121.34	125.80	130.56	3.8
<b>Composite Input Price Index (CIPI)</b>		<b>130.58</b>	<b>127.81</b>	<b>136.19</b>	<b>144.91</b>	<b>6.4</b>
<b>Percentage Change (year-on-year)</b>		---	<b>-2.1</b>	<b>6.6</b>	<b>6.4</b>	---

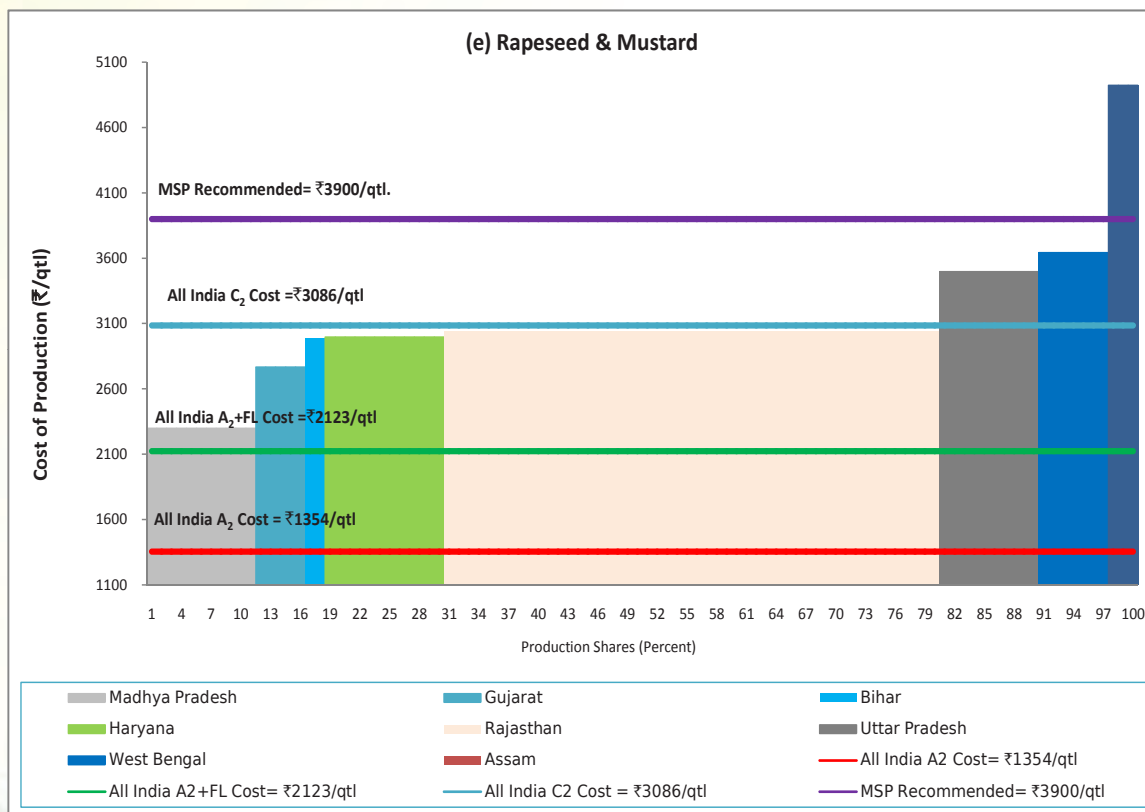
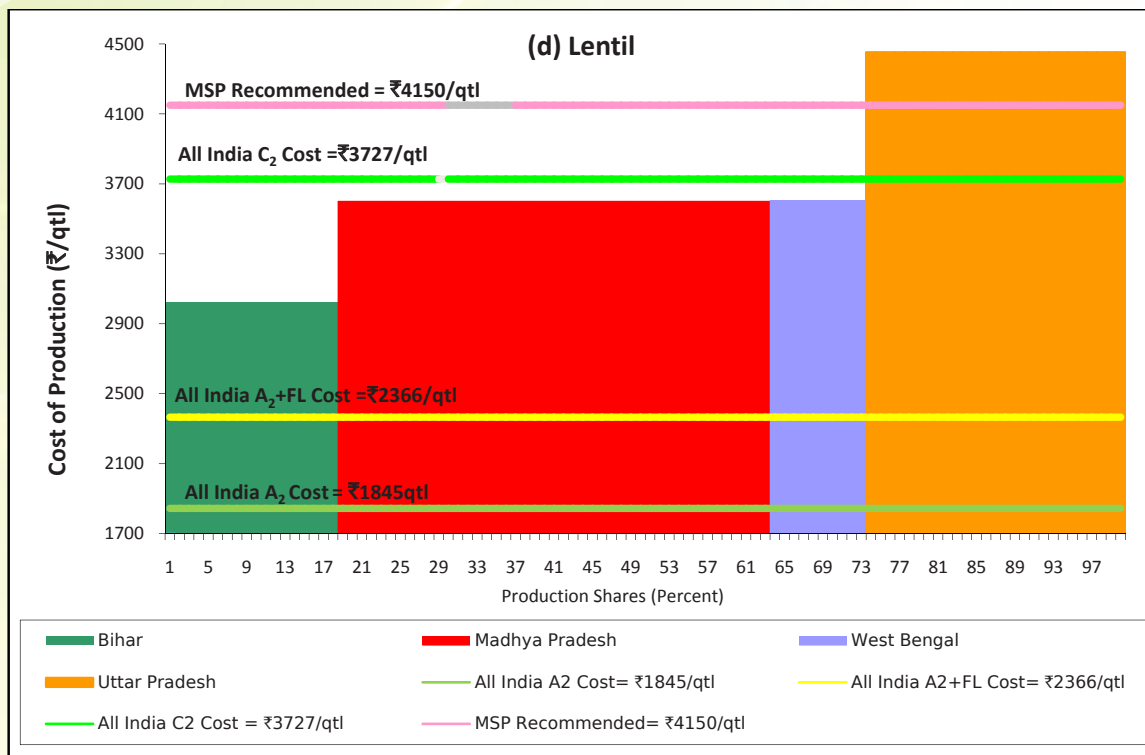
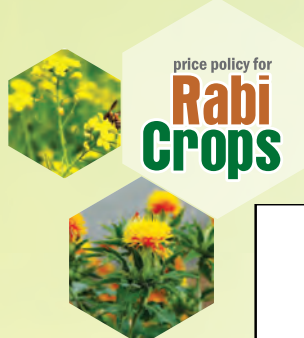
Source: CACP Calculations.

5.12 Charts 5.4 (a) to (e) show the cost of production ( $C_2$ ) by states in ascending order with their corresponding relative shares in total production of respective crops. It may be noted that percentage of production covered by all-India weighted average cost of production and MSP vary from crop to crop. For instance, the production covered at  $C_2$  cost is 78 percent in case of wheat, 71 percent in case of barley, 64 percent in case of gram, 73 percent in case of lentil and 80 percent in case of rapeseed and mustard. Recommended MSPs fully cover the total CoP in all the six rabi crops, margin of MSP over  $C_2$  being as high as 38 percent, 18 percent, 21 percent, 11 percent and 26 percent in case of wheat, barley, gram, lentil and R&M, respectively.

**Chart 5.4: Supply Curve and Projected Cost, RMS 2018-19**







## Relative Returns with Respect to Wheat

5.13 Inter-crop price parity being one of the factors for determination of MSP, per hectare returns of different competing crops are computed. Table 5.5 outlines relative returns measured in percentage terms over  $A_2$ ,  $A_2+FL$  and  $C_2$  for various rabi crops with reference to wheat. It is observed that relative gross returns over cost  $A_2$  for all rabi crops vary from 9 percent in safflower to 104 percent in barley. The relative gross returns over  $A_2+FL$  for all crops are lower than wheat. Relative net returns are the highest for barley (101 percent) followed by wheat and the lowest for safflower (-54 percent).

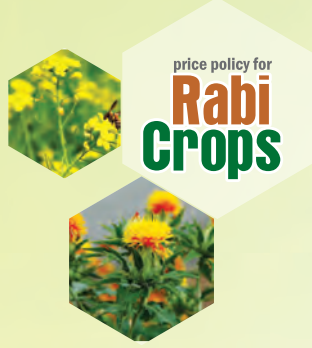
**Table 5.5: Crop-wise Relative Returns (Percent), TE2015-16**

Crops	Relative Gross Returns over $A_2$ with respect to wheat	Relative Gross Returns over $A_2+FL$ with respect to wheat	Relative Net Returns with respect to wheat
<b>A. Cereals</b>			
Wheat	100	100	100
Barley	104	88	101
<b>B. Pulses</b>			
Gram	56	53	43
Lentil	64	65	67
<b>C. Oilseeds</b>			
Rapeseed & Mustard	85	74	74
Safflower	9	-4	-54

Source: CACP Calculations.

## Comparison of Projected Cost Estimates with State Estimates

5.14 Some states provide cost of production estimates to the Commission. The projected cost estimates of the states and the Commission for various rabi crops are given in Annex Table 5.6. Since state governments use different methodology and include some cost components such as weather risks, farmers margin/profit, which are not included in the Commission's calculations, the state estimates are generally on the higher side. For example, Rajasthan has used the trend analysis to project cost of production for 2017-18 by using the CS data upto 2013-14 provided by DES. In case of Andhra Pradesh and Telangana, the main reason for difference between the states' projections and CACP projections is difference in yield levels of gram. Labour charges including human, bullock and machine labour computed by states are generally on higher side. Some states include 10 percent managerial cost over  $C_2$ , which has resulted in higher cost estimates of states. For Bihar, projected CoP is higher than CACP projections for wheat, gram, lentil and R&M due to similar reasons. For instance, Bihar has included risk cost at 10 percent of sum of variable



cost and overhead cost, which is not a part of cost in CS estimates. Punjab has used the cost of cultivation data and projected it for RMS 2018-19 while Uttarakhand has projected the costs considering 7 percent increase in cost per year after 2014-15. However, in few cases, the state estimates are lower than the corresponding CACP projections.

### Recapitulation

5.15 Given the time lag of two years in the availability of data, the Commission projects the cost estimates ( $A_2+FL$  and  $C_2/ql$ ) for mandated rabi crops for the ensuing Rabi crop season 2017-18 (RMS 2018-19). The Commission uses CIPI to capture changes in input prices over the years and subsequently CoP is projected using average/olympic average yield. The all-India  $A_2+FL$  cost per quintal for wheat, barley, gram, lentil, R&M and safflower are projected at ₹817, ₹845, ₹2461, ₹2366, ₹2123, ₹3125 per quintal, respectively. The corresponding projected  $C_2$  costs are ₹1256, ₹1190, ₹3526, ₹3727, ₹3086, ₹3979, respectively. These projected cost estimates have been considered into formulation of price policy recommendations.

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## Considerations and Recommendations

6.1 As per the mandate of the Commission, first and foremost need is to evolve a balanced and integrated price policy in the perspective of the overall needs of the economy and with due regard to the interests of the producer and the consumer. Hence, farmers need to be incentivized for adopting improved technologies and raising productivity to increase competitiveness of Indian agriculture. While recommending the MSPs, the Commission considers cost of production, overall demand-supply situation, domestic and international price trends, inter-crop price parity, terms of trade between agriculture and non-agriculture sector, the likely impact of the price policy on the rest of the economy particularly on the cost of living, level of wages and competitiveness of agriculture, besides ensuring rational utilization of land, water and other production resources. Thus, pricing policy is rooted not in “cost plus” approach, though cost is an important determinant of MSPs. The Commission on the basis of detailed analysis of relevant issues and discussions with various stakeholders suggests the following non-price and price policy recommendations.

### Non-Price Policy Recommendations

#### Overall Demand and Supply

6.2 In 2016-17, India is anticipated to achieve a record production of foodgrains crossing 273 million tonnes (wheat 97.4 million tonnes and rabi pulses at about 13.3 million tonnes), surpassing the target of 270.1 million tonnes for 2016-17. World wheat production is anticipated to fall in 2017-18 but overall global supplies are expected to remain ample due to higher inventories. Procurement of wheat in the country by public agencies, as on July 3, 2017, was 30.8 million tonnes and total foodgrains stocks were 53.3 million tonnes on July 1, 2017. The domestic stocks position of wheat is expected to be fairly comfortable even after meeting the requirements under National Food Security Act (NFSA) and other Welfare Schemes. In case of pulses, despite record production of 22.4 million tonnes in 2016-17, small deficit in supply is still expected later in the year while in edible oils India will remain one of the largest importer.

### Procurement of Wheat

6.3 Procurement operations show significant inter-year variations in procurement of wheat. The average annual procurement of wheat during the triennium ending (TE) 2017-18 was about 27 million tonnes. Procurement during the current marketing season (2017-18) has already crossed 30 million tonnes, significantly higher than 2016-17. In 2016-17, procurement was lower (23 million tonnes) as compared to previous two years due to high market prices and lower domestic production. During TE2017-18, out of the total wheat procurement of about 27 million tonnes, 39.9 percent was contributed by Punjab, 25.6 percent by Haryana, and 22 percent by Madhya Pradesh. These three states accounted for 87.6 percent of total wheat procurement in the country. Uttar Pradesh, which is the largest producer of wheat in the country with an estimated share of about 28.2 percent, contributed about 8.3 percent to procurement but procurement in the state has increased during 2017-18 and is expected to improve further in the coming years. The share of Bihar in total wheat production is about 5 percent but its share in procurement is negligible. It is therefore important that procurement be strengthened in UP and other states which have higher marketable surplus and prices remain subdued. However, during Rabi Marketing Season 2017-18, market prices of wheat were ruling below MSP in some states and the issue needs to be addressed.

### Pulses

6.4 The country achieved a record production of pulses during 2016-17, which led to a fall in market prices. As regard Rabi pulses 2017-18, the procurement is being carried out by NAFED under PSF. It is reported that in the absence of assurance of reimbursement of losses, state government agencies do not come forward for procurement of pulses. Market prices of rabi pulses were higher than MSP but significantly lower than the last year. Since pulses have relatively short shelf life, there is a need to evolve a robust mechanism for disposal of these stocks which is not in place currently. Another issue which came up for discussion during the meetings with state governments, farmers and other stakeholders, was different sowing and harvesting period of various pulses in different states. In view of this, CACP recommends that the procurement period in case of pulses in the States should be fixed as per the crop calendar.

6.5 With increase in MSP and availability of certified/quality seeds, pulses production substantially increased in the country and government procured about 2 million tonnes of pulses during Kharif Marketing Season 2016-17. Restrictions on stockholding limits were removed by the Department of Food and Public Distribution with effect from 17<sup>th</sup> May 2017, keeping in view a record production and depressed market prices. The Commission had recommended removal of stock holding limits in its Kharif Price Policy Report for Marketing Season 2017-18. However, the State governments lifted these restrictions with a time



lag after Central Government notification, hence prices continued to rule below MSP in some states. The Commission is of the view that such decisions should be taken promptly.

### Incentivizing Pulses Production

- 6.6 Pulses play an important role in improving soil health and balancing the nutrient availability of soil through biological nitrogen fixation. Pulses also provide other ecosystem services as pulses have the lowest carbon and water footprints. The Commission in its earlier report had recommended that a financial assistance of at least ₹1800 per ha may be given to farmers growing pulses. Also, in order to increase pulses productivity, good quality seeds, protective irrigation and better extension services should be provided to farmers.

### Oilseeds

- 6.7 In 2016-17, rabi oilseeds production is expected to be about 9.7 million tonnes compared to 8.5 million tonnes in 2015-16, which will increase domestic availability of oils. However, it is pertinent to note that market prices of mustard were ruling much below MSP in many states during March-June 2017. With high degree of substitutability amongst oils and high price elasticity, domestic edible oil and oilseeds prices are directly linked with the world edible oil market prices, which have shown a declining trend during last few months. For example, crude palm oil prices have declined from US\$ 806 per tonne in January 2017 to US\$ 681 per tonne in June 2017. Since India is the largest importer of edible oils in the world, world prices have direct impact on domestic prices. Therefore, there is a need to closely monitor international prices and have appropriate import tariff levels as well as strengthen procurement operations to ensure remunerative prices to oilseeds producers. The Commission recommends that import duty on refined oils should be significantly higher than crude oils to improve capacity utilization of domestic refining industry. Import duty on edible oils particularly soft oils may be increased to protect domestic oilseed growers. This should be supported by interventions to address the supply side constraints through technological interventions and appropriate incentives.

### Doubling Farmers Income

- 6.8 According to NITI Aayog Policy Paper (March 2017), doubling real income of farmers by 2022 would require annual growth of 10.41 percent in farmers' income, which is significantly higher than the on-going and earlier growth rates achieved in farm income. Therefore, in order to double the income of farmers it is necessary to ensure remunerative prices to farmers and encourage allied agricultural sectors like apiculture, livestock, fisheries, horticulture, organic farming, agro-forestry etc. as well as non-farm sector.



### Awareness Campaigns about MSP and FAQ

6.9 In order to strengthen MSP operations, awareness about MSP and FAQ norms need to be created so as to ensure that farmers meet the requisite quality norms. Strong procurement operations need to be expanded to neglected regions, particularly eastern and north-eastern regions. This calls for giving wide publicity about MSP and procurement agencies by the State Governments in regional/vernacular, electronic and print media and also through pamphlets, and announcements in the villages regarding MSPs at least 15 days before the procurement starts. In addition, farmers need to be trained on FAQ norms and post-harvest handling of commodities so as to minimize rejection of produce, reduce post-harvest losses and ensure better prices to farmers. To instill confidence among farmers for procurement of their produce and stop exploitation by traders, a legislation conferring on farmers 'The Right to Sell at MSP' may be brought out.

### Management of Wild Animals

6.10 During the regional consultations of the Commission, various states have expressed concerns about crop losses due to wild animals mainly blue bulls, wild pigs, and monkeys. In order to prevent crops from wild animals, barbed/solar fencing is the only way out. The Commission recommends that central/state governments should work out a plan and provide subsidy so as to enable the farmers, preferably on a cluster/group basis, to fence their fields to protect from wild animals.

### Crop Residues Management

6.11 Due to shortage of labour, high wages and time constraint, farmers burn straw in the field, which leads to several environmental and health problems. State Governments should create massive awareness about crop stubble management and promote Custom Hiring Centres (CHCs) under which machines for crop residue management should be made available to the farmers at affordable prices. It was reported that subsidy given on farm machinery for management of crop residues is low in view of high cost of machines. The Commission suggests that subsidy on these machines should be increased or farmers should be given payment through Direct Benefit Transfer (DBT) for management of crop residues. State governments should involve private sector and also use Corporate Social Responsibility (CSR) funds for better management of crop residues.

### Agricultural Credit

6.12 Credit is a critical input in achieving high productivity and production in agricultural sector. In order to make agricultural credit available at affordable rates, Government has extended Interest Subvention Scheme (ISS) for 2017-18. In view of declining trend in investment credit, the Commission recommends



that scheme of interest subvention should be extended to long-term credit to improve capital formation in agriculture. This will bring growth in agricultural sector through investment in land development, irrigation infrastructure, farm mechanization, etc. Small and marginal farmers should be brought under formal institutional credit system through financial inclusion.

### Farm Mechanization

6.13 In India, labour cost is the largest component in cost of cultivation, followed by land cost, capital cost and other inputs like fertilizers, seeds, insecticides etc. Non-availability of labour during peak agricultural operations and high labour cost, especially during sowing and harvesting season are major drivers of farm mechanization. However, high cost of farm machinery and small and fragmented farms are the biggest constraints in adopting large scale farm mechanization. The Commission has recommended in its earlier reports that farm mechanization should be promoted extensively among small and marginal farmers through Custom Hiring Centres (CHC). States like Karnataka, Madhya Pradesh, Gujarat, West Bengal and Maharashtra have set up CHCs which will help in lowering costs and increasing productivity. Some leading farm equipment manufacturers are also trying out different models of custom hiring in some states. Therefore, efforts are needed to promote CHCs and also involve private sector, mainly farm equipment manufactures in promoting farm mechanization.

### Agricultural Marketing Reforms

6.14 Ministry of Agriculture and Farmers Welfare has formulated new Model APMC Act, 2017 and Model Contract Farming (Promotion and Facilitation) Act, 2017. These encompass the reforms being advocated for a transparent market enabling price discovery and competition where farmers would have multiple options to sell their produce, including the e-NAM platform. Hence the Commission reiterates the importance of marketing reforms and adoption of the best practices in the State Marketing Acts.

### Balanced Use of Fertilizers

6.15 The distortion in price of urea vis-à-vis other fertilizers due to partial decontrol under Nutrient Based Subsidy (NBS) Scheme in April 2010 has adversely affected the use ratio of N, P and K because farmers use more urea that is cheaper than other fertilizers. The government and industry should make concerted efforts to promote balanced use of fertilizers to achieve the ideal N:P:K ratio. The Commission recommends that the fertilizer industry should organize awareness programmes and field demonstrations on efficient and balanced use of fertilizers and its impact on crop productivity and profitability. There is also a need to gradually increase price of urea and reduce price of phosphatic and potassic fertilizers to promote balanced use of fertilizers.



### Cost of Cultivation Data

6.16 The data on cost of cultivation provided by the State Governments and that under the Comprehensive Scheme (CS) are at variance due to various conceptual differences. In order to ensure the reliability and quality of estimates, it is necessary that the State Governments and State Agricultural Universities (SAUs)/other institutions responsible for collecting data under the CS hold regular discussions with various stakeholders so that the data collected by the two agencies are comparable and more realistic.

### MSP Recommendations for RMS 2018-19

6.17 Taking into consideration the terms of reference, the Commission recommends the MSPs for 6 Rabi crops for RMS 2018-19 as given in the Table 6.1. It may be noted that percentage of production covered by the all-India weighted average cost of production and MSP vary from crop to crop.

6.18 For instance, production covered at  $C_2$  cost is 78 percent in case of wheat, 71 percent in case of barley, 64 percent in gram, 73 percent in lentil and 80 percent in case of rapeseed and mustard. Recommended MSPs fully cover the total cost of production in all the six crops, margin of MSP over  $C_2$  being as high as 38 percent, 18 percent, 21 percent, 11 percent and 26 percent in case of wheat, barley, gram, lentil and R&M, respectively. It may be noted that the share of production covered at MSP is 98 percent in wheat, 100 percent in barley, 95 percent in gram, 73 percent in lentil and 97 percent in R&M.

### Incentivising Efficiency: Linking MSP of R&M with Oil Content

6.19 There are variations in oil content of different varieties of R&M and therefore a uniform MSP may not be desirable. Therefore, the Commission is of the opinion that farmers be incentivized for higher 'oil content'. The Commission recommends that the MSP of R&M be linked to the basic 'oil content' of 35 percent in R&M seeds. As per CACP's calculations, farmers should be compensated an additional ₹15.83 per quintal for every 0.25 percent point increase in the oil content beyond this level. The Commission also recommends that such a dispensation 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 content varieties and thereby increase production of edible oils in the country.

**Table 6.1: Recommended MSPs of Rabi Crops (RMS 2018-19) (₹/qtl)**

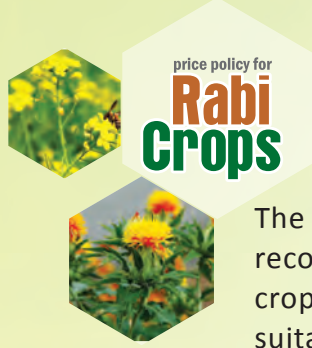
Crops	Projected Costs			MSP for RMS		MSP Recommended for the RMS 2018-19	Gross Margin over (A <sub>2</sub> +FL) w.r.t. recommended MSP (percent)	Remarks
	A <sub>2</sub>	A <sub>2</sub> +FL	C <sub>2</sub>	2016-17	2017-18			
Wheat	642	817	1256	1525 (5.2)	1625 (6.6)	1735 (6.8) [6.8]	112.4	Increase in CoP, SUR. Prices though declining but marginally higher than last year. International production is lower.
Barley	522	845	1190	1225 (6.5)	1325 (8.2)	1410 (6.4) [6.4]	66.9	Increase in CoP, MSP of 2017-18 higher than projected C <sub>2</sub> for 2018-19, domestic prices higher than MSP.
Gram	1977	2461	3526	3500 (10.2)	4000 (14.3)	4250 (6.3) [11.8]	72.7	High CoP compared to last year, increase in production, domestic and international prices higher than MSP.
Lentil	1845	2366	3727	3400 (10.6)	3950 (16.2)	4150 (5.1) [9.2]	75.4	Significant increase in C <sub>2</sub> cost. Market prices higher than MSP. To incentivize farmers to grow more pulses.
R&M	1354	2123	3086	3350 (8.1)	3700 (10.4)	3900* (5.4) [8.3]	83.7	Increase in CoP. To incentivize farmers to grow more oilseeds.
Safflower	2216	3125	3979	3300 (8.2)	3700 (12.1)	4000 (8.1) [11.1]	28.0	Recommended MSP fully covers C <sub>2</sub> cost.

Note: \*Corresponding to oil content of 35 percent

MSPs of 2016-17 and 2017-18 are inclusive of bonus

Figures in parenthesis ( ) represent increase in MSP (including bonus) over the previous year

Figures in parenthesis [ ] represent increase in MSP (excluding bonus) over the previous year



The Commission is of the considered opinion that these non-price and price policy recommendations would help farmers in reducing cost of cultivation and improving crop productivity, thereby enhancing their income. It would also contribute to suitable diversification of crops in line with emerging demand patterns and would boost growth of agriculture sector.

(Vijay Paul Sharma)  
**Chairman**

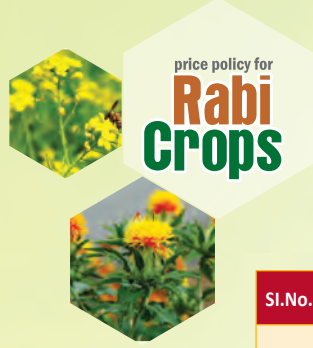
(Shailja Sharma)  
**Member Secretary**

31<sup>st</sup> July, 2017





# Annex Tables



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

(Million hectares)

Sl.No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17*	
1	Rice	Kharif	40.81	37.62	38.05	40.14	38.91	39.45	39.83	39.66	38.84	
		Rabi	4.73	4.30	4.81	3.87	3.84	4.69	4.28	3.84	4.08	
		Total	45.54	41.92	42.86	44.01	42.75	44.14	44.11	43.50	42.92	
2	Wheat	Rabi	27.75	28.46	29.07	29.86	30.00	30.47	31.47	30.42	30.71	
3	Barley	Rabi	0.71	0.62	0.71	0.64	0.70	0.67	0.71	0.59	0.69	
4	Jowar	Kharif	2.89	3.24	3.07	2.62	2.43	2.28	2.27	2.14	1.91	
		Rabi	4.64	4.55	4.31	3.63	3.79	3.52	3.89	3.94	3.21	
		Total	7.53	7.79	7.38	6.25	6.21	5.79	6.16	6.08	5.13	
5	Bajra	Kharif	8.75	8.90	9.61	8.78	7.30	7.81	7.32	7.13	7.47	
6	Maize	Kharif	6.89	7.06	7.28	7.38	7.21	7.31	7.56	7.18	8.02	
		Rabi	1.28	1.20	1.27	1.40	1.46	1.76	1.62	1.63	1.73	
		Total	8.17	8.26	8.55	8.78	8.67	9.07	9.19	8.81	9.76	
7	Ragi	Kharif	1.38	1.27	1.29	1.18	1.13	1.19	1.21	1.14	1.05	
		Coarse Cereals	Kharif	20.83	21.31	22.05	20.75	18.82	19.27	18.95	18.23	19.06
			Rabi	6.62	6.37	6.29	5.67	5.94	5.95	6.22	6.15	5.64
		Total	27.45	27.68	28.34	26.42	24.76	25.22	25.17	24.39	24.68	
	Cereals	Kharif	61.64	58.92	60.10	60.89	57.73	58.72	58.78	57.89	57.90	
		Rabi	39.10	39.13	40.17	39.40	39.78	41.11	41.97	40.42	40.43	
		Total	100.74	98.05	100.27	100.29	97.52	99.83	100.75	98.31	98.32	
8	Tur (Arhar)	Kharif	3.38	3.47	4.37	4.01	3.89	3.90	3.85	3.96	5.39	
		Moong	Kharif	2.24	2.46	2.85	2.61	1.97	2.34	2.03	2.76	3.36
			Rabi	0.60	0.63	0.76	0.78	0.74	1.04	0.99	1.07	0.95
		Total	2.84	3.07	3.51	3.39	2.72	3.38	3.02	3.83	4.30	
10	Urad	Kharif	2.02	2.23	2.51	2.36	2.44	2.35	2.49	2.72	3.49	
		Rabi	0.65	0.73	0.74	0.86	0.69	0.72	0.76	0.90	1.01	
		Total	2.67	2.96	3.25	3.22	3.13	3.06	3.25	3.62	4.49	
11	Gram	Rabi	7.89	8.17	9.19	8.30	8.52	9.93	8.25	8.40	9.54	
12	Lentil (Masoor)	Rabi	1.38	1.48	1.60	1.56	1.42	1.34	1.47	1.47	-	
	Pulses	Kharif	9.81	10.58	12.32	11.19	9.95	10.33	9.99	11.31	14.34	
		Rabi	12.29	12.70	14.08	13.27	13.30	14.88	13.56	13.60	14.94	
		Total	22.09	23.28	26.40	24.46	23.26	25.21	23.55	24.91	29.28	
	Foodgrains	Kharif	71.45	69.51	72.42	72.08	67.69	69.05	68.77	69.21	72.23	
		Rabi	51.39	51.83	54.25	52.67	53.09	55.99	55.53	54.01	55.37	
		Total	122.83	121.33	126.67	124.75	120.78	125.04	124.30	123.22	127.60	
13	Groundnut	Kharif	5.29	4.62	4.98	4.32	3.93	4.65	4.01	3.84	4.51	
		Rabi	0.88	0.86	0.88	0.95	0.79	0.86	0.76	0.76	0.78	
		Total	6.16	5.48	5.86	5.26	4.72	5.51	4.77	4.60	5.30	
14	Soybean	Kharif	9.51	9.73	9.60	10.11	10.84	11.72	10.91	11.60	11.35	
15	Sunflower	Kharif	0.66	0.57	0.32	0.26	0.30	0.25	0.22	0.16	0.17	
		Rabi	1.15	0.91	0.61	0.47	0.53	0.42	0.37	0.33	0.19	
		Total	1.81	1.48	0.93	0.73	0.83	0.67	0.59	0.49	0.36	
16	Sesamum	Kharif	1.81	1.94	2.08	1.90	1.71	1.68	1.75	1.95	1.71	
17	Nigerseed	Kharif	0.39	0.38	0.37	0.36	0.31	0.30	0.23	0.25	0.25	
18	Rapeseed/ Mustard	Rabi	6.30	5.59	6.90	5.89	6.36	6.65	5.80	5.75	6.23	
19	Safflower	Rabi	0.29	0.29	0.24	0.25	0.18	0.18	0.17	0.13	0.12	
	Nine Oilseeds@	Kharif	18.53	17.97	18.23	18.42	18.32	19.65	18.21	18.86	18.85	
		Rabi	9.03	7.99	9.00	7.89	8.16	8.40	7.39	7.22	7.61	
		Total	27.56	25.96	27.22	26.31	26.48	28.05	25.60	26.09	26.47	
20	Cotton		9.41	10.13	11.24	12.18	11.98	11.96	12.82	12.29	10.80	
		Jute	0.79	0.81	0.77	0.81	0.78	0.76	0.75	0.73	0.70	
		Mesta	0.12	0.09	0.10	0.10	0.09	0.08	0.06	0.05	0.05	
21	Jute & Mesta		0.90	0.91	0.87	0.90	0.86	0.84	0.81	0.78	0.75	
22	Sugarcane		4.42	4.17	4.88	5.04	5.00	4.99	5.07	4.93	4.50	

Note: \* Third Advance Estimates

@ : Nine Oilseeds include Castorseed and Linseed also

Source : DES, Ministry of Agriculture & Farmers Welfare



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

(Million tonnes)

Sl.No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17*
1	Rice	Kharif	84.91	75.92	80.65	92.78	92.37	91.50	91.39	91.41	96.09
		Rabi	14.27	13.18	15.33	12.52	12.87	15.15	14.09	13.00	13.06
		Total	99.18	89.09	95.98	105.30	105.24	106.65	105.48	104.41	109.15
2	Wheat	Rabi	80.68	80.80	86.87	94.88	93.51	95.85	86.53	92.29	97.44
3	Barley	Rabi	1.69	1.35	1.66	1.62	1.75	1.83	1.61	1.44	1.79
4	Jowar	Kharif	3.05	2.76	3.44	3.29	2.84	2.39	2.30	1.82	1.95
		Rabi	4.19	3.94	3.56	2.69	2.44	3.15	3.15	2.42	2.80
		Total	7.25	6.70	7.00	5.98	5.28	5.54	5.45	4.24	4.74
5	Bajra	Kharif	8.89	6.51	10.37	10.28	8.74	9.25	9.18	8.07	9.86
6	Maize	Kharif	14.12	12.29	16.64	16.49	16.20	17.14	17.01	16.05	19.17
		Rabi	5.61	4.43	5.09	5.27	6.05	7.11	7.16	6.51	6.97
		Total	19.73	16.72	21.73	21.76	22.26	24.26	24.17	22.57	26.14
7	Ragi	Kharif	2.04	1.89	2.19	1.93	1.57	1.98	2.06	1.82	1.43
	Coarse Cereals	Kharif	28.54	23.83	33.08	32.44	29.80	31.20	30.94	28.15	32.84
		Rabi	11.49	9.72	10.32	9.58	10.25	12.09	11.92	10.37	11.55
		Total	40.04	33.55	43.40	42.01	40.04	43.29	42.86	38.52	44.39
	Cereals	Kharif	113.49	99.78	113.77	125.22	122.16	122.70	122.34	119.56	128.93
		Rabi	106.40	103.65	112.48	116.98	116.63	123.09	112.53	115.66	122.05
		Total	219.89	203.44	226.24	242.20	238.78	245.79	234.87	235.22	250.98
8	Tur (Arhar)	Kharif	2.27	2.46	2.86	2.65	3.02	3.17	2.81	2.56	4.60
9	Moong	Kharif	0.78	0.44	1.53	1.24	0.79	0.96	0.87	1.00	1.53
		Rabi	0.26	0.25	0.27	0.40	0.40	0.65	0.64	0.59	0.54
		Total	1.03	0.69	1.80	1.63	1.19	1.61	1.50	1.59	2.07
10	Urad	Kharif	0.84	0.81	1.40	1.23	1.43	1.15	1.28	1.25	2.16
		Rabi	0.33	0.43	0.36	0.53	0.47	0.55	0.68	0.70	0.76
		Total	1.17	1.24	1.76	1.77	1.90	1.70	1.96	1.95	2.93
11	Gram	Rabi	7.06	7.48	8.22	7.70	8.83	9.53	7.33	7.06	9.08
12	Lentil (Masoor)	Rabi	0.95	1.03	0.94	1.06	1.13	1.02	1.04	0.98	-
	Pulses	Kharif	4.69	4.20	7.12	6.06	5.92	5.99	5.73	5.53	9.12
		Rabi	9.88	10.46	11.12	11.03	12.43	13.25	11.42	10.82	13.29
		Total	14.57	14.66	18.24	17.09	18.34	19.25	17.15	16.35	22.40
	Foodgrains	Kharif	118.14	103.95	120.85	131.27	128.07	128.69	128.06	125.09	138.04
		Rabi	116.33	114.15	123.64	128.01	129.06	136.35	123.96	126.47	135.34
		Total	234.47	218.11	244.49	259.29	257.13	265.04	252.02	251.57	273.38
13	Groundnut	Kharif	5.62	3.85	6.64	5.13	3.19	8.06	5.93	5.37	6.26
		Rabi	1.55	1.58	1.62	1.84	1.51	1.66	1.47	1.37	1.39
		Total	7.17	5.43	8.26	6.96	4.69	9.71	7.40	6.73	7.65
14	Soybean	Kharif	9.91	9.96	12.74	12.21	14.67	11.86	10.37	8.57	14.01
15	Sunflower	Kharif	0.36	0.21	0.19	0.15	0.19	0.15	0.14	0.07	0.10
		Rabi	0.80	0.64	0.46	0.37	0.36	0.35	0.29	0.23	0.13
		Total	1.16	0.85	0.65	0.52	0.54	0.50	0.43	0.30	0.23
16	Sesamum	Kharif	0.64	0.59	0.89	0.81	0.69	0.71	0.83	0.85	0.80
17	Nigerseed	Kharif	0.12	0.10	0.11	0.10	0.10	0.10	0.08	0.07	0.09
18	Rapeseed/ Mustard	Rabi	7.20	6.61	8.18	6.60	8.03	7.88	6.28	6.80	7.98
19	Safflower	Rabi	0.19	0.18	0.15	0.15	0.11	0.11	0.09	0.05	0.06
	Nine Oil- seeds@	Kharif	17.81	15.73	21.92	20.69	20.79	22.61	19.22	16.68	22.81
		Rabi	9.91	9.15	10.56	9.11	10.15	10.14	8.29	8.57	9.71
		Total	27.72	24.88	32.48	29.80	30.94	32.75	27.51	25.25	32.52
20	Cotton\$		29.00	30.50	33.90	35.50	37.00	39.80	38.00	36.50	-
	Cotton\$\$		22.28	24.02	33.00	35.20	34.22	35.90	34.81	30.01	32.58
	Jute#		9.63	11.23	10.01	10.74	10.34	11.08	10.62	9.94	9.83
	Mesta#		0.73	0.59	0.61	0.66	0.59	0.61	0.51	0.58	0.44
21	Jute & Mesta#		10.37	11.82	10.62	11.40	10.93	11.69	11.13	10.52	10.27
22	Sugarcane		285.03	292.30	342.38	361.04	341.20	352.14	362.33	348.45	306.03

Note: \* Third Advance Estimates

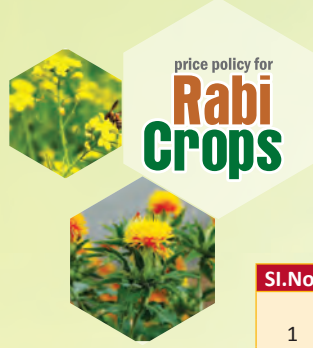
@ : Nine Oilseeds include Castorseed and Linseed also

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

\$\$ : E&S estimates of Million bales of 170 kgs each

# : Million bales of 180 kgs each

Source : DES, Ministry of Agriculture & Farmers Welfare, Cotton Advisory Board.



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

(Kg/ha)

Sl.No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17*
1	Rice	Kharif	2081	2018	2120	2311	2374	2319	2295	2305	2474
		Rabi	3019	3064	3185	3238	3353	3232	3291	3382	3201
		Total	2178	2125	2239	2393	2462	2416	2391	2400	2543
2	Wheat	Rabi	2907	2839	2989	3177	3117	3145	2750	3034	3172
3	Barley	Rabi	2394	2172	2357	2516	2521	2718	2280	2439	2580
4	Jowar	Kharif	1055	853	1119	1257	1171	1050	1014	849	1017
		Rabi	904	865	827	741	644	896	808	615	871
		Total	962	860	949	957	850	957	884	697	924
5	Bajra	Kharif	1015	731	1079	1171	1198	1184	1255	1132	1319
6	Maize	Kharif	2048	1740	2285	2234	2246	2346	2249	2236	2390
		Rabi	4387	3694	4003	3765	4152	4050	4414	4006	4018
		Total	2414	2024	2540	2478	2566	2676	2632	2563	2679
7	Ragi	Kharif	1477	1489	1705	1641	1396	1661	1706	1601	1367
		Kharif	1371	1119	1500	1563	1583	1619	1633	1544	1723
		Rabi	1735	1525	1641	1689	1725	2034	1915	1686	2049
	Coarse Cereals	Total	1459	1212	1531	1590	1617	1717	1703	1579	1798
		Kharif	1841	1693	1893	2056	2116	2089	2081	2065	2227
		Rabi	2721	2649	2800	2969	2931	2995	2681	2862	3019
	Cereals	Total	2183	2075	2256	2415	2449	2462	2331	2393	2553
		Kharif	671	711	655	662	776	813	729	646	854
		Rabi	348	180	538	475	398	410	428	363	455
9	Moong	Rabi	423	397	354	508	539	620	640	554	573
		Total	364	226	514	483	436	475	498	416	481
		Kharif	419	363	557	523	586	490	516	459	620
10	Urad	Rabi	506	587	489	621	679	768	891	773	759
		Total	440	418	542	549	606	555	604	537	651
		Rabi	895	915	895	928	1036	960	889	840	951
11	Gram	Rabi	895	915	895	928	1036	960	889	840	951
12	Lentil (Masoor)	Rabi	693	697	591	678	797	759	705	664	-
		Kharif	478	397	578	541	594	580	573	489	636
		Rabi	804	823	790	831	934	891	842	796	890
	Pulses	Total	659	630	691	699	789	763	728	656	765
		Kharif	1654	1496	1669	1821	1892	1864	1862	1808	1911
		Rabi	2264	2203	2279	2430	2431	2435	2232	2342	2444
	Foodgrains	Total	1909	1798	1930	2078	2129	2120	2028	2042	2142
		Kharif	1063	835	1335	1188	811	1735	1478	1399	1387
		Rabi	1764	1830	1846	1938	1908	1926	1948	1801	1776
13	Groundnut	Total	1163	991	1411	1323	994	1764	1552	1465	1445
		Kharif	1041	1024	1327	1208	1353	1012	951	738	1235
		Rabi	540	378	608	566	622	621	660	420	588
15	Sunflower	Rabi	696	700	748	783	674	826	781	698	698
		Total	639	576	701	706	655	750	736	608	647
		Kharif	354	303	429	426	402	426	474	436	470
16	Sesamum	Kharif	354	303	429	426	402	426	474	436	470
17	Nigerseed	Kharif	297	266	290	269	325	328	328	295	338
18	Rapeseed/ Mustard	Rabi	1143	1183	1185	1121	1262	1185	1083	1183	1281
19	Safflower	Rabi	642	621	617	580	591	638	515	416	529
	Nine Oilseeds@	Kharif	961	875	1203	1123	1135	1151	1056	884	1210
		Rabi	1097	1146	1174	1155	1244	1207	1122	1186	1275
		Total	1006	958	1193	1133	1168	1168	1075	968	1229
20	Cotton \$		524	512	513	496	525	566	504	2969	0
		Cotton \$\$	403	403	499	491	486	510	462	415	513
		Jute	2207	2492	2329	2389	2396	2639	2549	2457	2541
	Mesta	1141	1122	1115	1248	1237	1338	1525	1945	1532	
21	Jute & Mesta		2071	2349	2192	2268	2281	2512	2473	2421	2471
22	Sugarcane		64553	70020	70091	71667	68254	70520	71512	70721	67967

Note: \* Third Advance Estimates

@ : Nine Oilseeds include Castorseed and Linseed also

\$ : CAB estimates

\$\$ : E&S estimates

Source : DES, Ministry of Agriculture & Farmers Welfare



**Annex Table 1.4: Share of Rabi Crops (under MSP) in Total Production and Area (TE2016-17)**

(Percent)

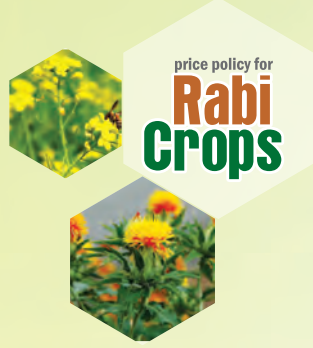
Crop/State	Bihar	Chhattisgarh	Gujarat	Haryana	Jharkhand	Karnataka	MP	MH	Punjab	Raj	UP	UK	WB	Others	Total
<b>Production</b>															
Wheat	4.9	0.2	3.1	11.9	0.4	0.2	19.0	1.4	17.1	10.4	28.3	0.8	1.0	1.4	100.0
Barley	0.9	0.1	0.4	7.1	0.0	0.0	11.2	0.0	2.4	52.4	21.3	1.4	0.2	2.6	100.0
Gram	0.7	3.5	2.4	0.5	2.4	7.4	42.1	15.0	0.0	13.4	5.0	0.0	0.4	7.3	100.0
Lentil	17.5	0.7	0.0	0.4	2.9	0.0	37.9	0.0	0.0	4.4	25.9	0.9	7.3	2.3	100.0
R&M	1.3	0.4	4.4	11.5	2.2	0.0	10.7	0.0	0.6	46.9	9.8	0.2	7.0	5.0	100.0
Safflower	0.1	0.3	0.0	0.0	0.4	33.5	19.8	39.1	0.0	0.0	0.0	0.0	1.4	5.3	100.0
<b>Area</b>															
Wheat	6.9	0.3	3.2	8.3	0.6	0.6	19.3	3.3	11.4	10.0	31.7	1.1	1.1	2.2	100.0
Barley	1.7	0.4	0.7	5.1	0.0	0.0	15.1	0.0	1.6	44.3	23.3	3.1	0.4	4.4	100.0
Gram	0.7	3.3	1.7	0.6	2.0	12.9	34.7	18.2	0.0	14.1	5.3	0.0	0.3	6.1	100.0
Lentil	12.3	1.2	0.0	0.3	2.5	0.0	41.4	0.1	0.0	3.7	29.9	0.8	5.6	2.3	100.0
R&M	1.5	0.8	3.2	8.6	3.8	0.0	11.5	0.1	0.6	43.3	10.7	0.3	7.6	8.0	100.0
Safflower	0.1	0.5	0.0	0.0	0.3	27.9	16.3	51.1	0.0	0.0	0.0	0.0	0.5	3.4	100.0

Note: Area and production of lentil relates to TE2015-16  
Source : DES, Ministry of Agriculture & Farmers Welfare

**Annex Table 1.5: Trends in WPI Based Inflation (Percent)**

Commodity	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
Foodgrains	10.22	9.12	9.15	10.81	11.62	13.32	15.78	13.53	11.68	10.62	12.04	11.07	7.52	6.37	4.26	2.16	-1.50
Cereals	4.25	4.09	4.90	5.21	6.67	9.47	10.35	9.89	9.44	8.27	9.89	9.89	8.45	9.05	7.64	6.88	4.15
Pulses	37.27	31.37	27.68	34.33	31.23	27.35	35.59	26.18	19.20	18.18	18.97	14.77	4.22	-2.84	-7.78	-13.64	-19.73
Vegetables	-2.25	-8.56	-5.48	4.33	13.93	18.62	12.59	-7.75	-9.90	-11.84	-17.31	-26.88	-23.49	-8.00	-0.50	-7.79	-18.51
Fruits	-1.31	-2.10	-2.74	2.66	4.27	6.00	9.44	11.93	12.79	6.43	5.51	0.63	1.87	3.60	6.01	0.07	-0.73

Source: Department of Industrial Policy & Promotion



**Annex Table 2.1: Balance Sheet of Wheat and Total Pulses, 2013-14 to 2017-18**

(Million Tonne, Percent)

Sl.No.	Particulars	Wheat				Total Pulses			
		2014-15	2015-16	2016-17	2017-18F	2014-15	2015-16	2016-17	2017-18F
1	Opening Stocks	18.59	18.06	12.77	11.14	1.70	1.51	1.10	2.16
2	Production	95.85	86.53	92.29	97.44	17.15	16.35	22.40	22.40
3	Imports	0.03	0.52	5.75	5.75	4.57	5.82	6.60	6.60
4	Total Supply (1+2+3)	114.47	105.10	110.81	114.33	23.42	23.68	30.10	31.16
5	Exports	2.92	0.67	0.27	0.27	0.22	0.26	0.14	0.14
6	Consumption	93.49	91.66	99.40	100.00	21.69	22.32	27.80	27.80
7	Total Use (5+6)	96.41	92.33	99.67	100.27	21.91	22.58	27.94	27.94
8	Ending Stock (4-7)	18.06	12.77	11.14	14.06	1.51	1.10	2.16	3.22
9	Stock to Use Ratio (%) (8/7)	18.73	13.84	11.18	14.03	6.89	4.89	7.75	11.54

Note: Trade data of 2016-17 is repeated for 2017-18, Consumption and production of pulses 2016-17 is repeated for 2017-18

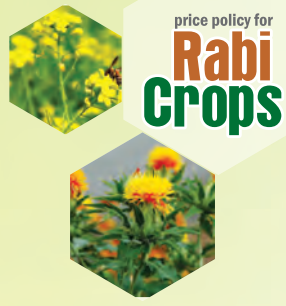
Source : National Council of Applied Economic Research, DES, Ministry of Agriculture & Farmers Welfare, Directorate General of Commercial Intelligence and Statistics



**Annex Table 2.2: Centres with Wholesale Prices below MSP for Wheat**

State	District	No. of Prices Reported	Prices Below MSP	Arrival (tonnes)	Arrival (tonnes)			Average Wholesale Price (₹/qtl.)			
					Mar	April	May	Mar	April	May	
Punjab	Patiala	17	0	47346		47346			1626		
	Sirsa	17	1	337481		326611	10870		1625		1619
Madhya Pradesh	Sehore	54	19	50967	15701	20576	14690	1601	1635	1635	1616
	Raisen	38	5	6029	2244		3785	1638			1652
	Hoshangabad	50	1	24426	201	19178	5047	1630	1625	1625	1625
Uttar Pradesh	Badaun	66	0	31795	1745	10935	19115	1742	1673	1625	1625
	Aligarh	69	1	16200	1920	7105	7175	1674	1631	1628	1628
	Hardoi	58	2	62740	7100	17890	37750	1788	1625	1625	1625

Source: Agricultural Marketing Information Network



Annex Table 2.3: Centres with Wholesale Prices below MSP for Rapeseed and Mustard

State	District	No. of Prices Reported	Prices Below MSP Reported	Arrival (tonnes)	Arrival (tonnes)			Average Wholesale Price (₹/Qtl.)		
					Mar	April	May	Mar	April	May
Haryana	Rewari	67	67	22478	6273	11792	4413	3231	3393	3444
	Sirsa	41	41	7358	1919	3753	1686	3498	3487	3368
Rajasthan	Sawai Madhopur	71	71	19760	13692	3486	2583	3468	3436	3382
	Bharatpur	71	71	20757	9749	6824	4184	3381	3234	3284
	Alwar	70	70	40064	23547	11680	4838	3402	3404	3433
	Tonk	68	68	32760	18106	8419	6235	3444	3448	3395
Uttar Pradesh	Badaun	70	57	8268	3185	3930	1153	3671	3383	3334
	Mathura	62	62	17065	3665	7210	6190	3273	3461	3427
	Agra	73	73	48135	10985	18630	18520	3243	3378	3348
Madhya Pradesh	Morena	68	68	8221	4551	2122	1547	3377	3320	3344
	Bhind	67	66	222	167	22	33	3439	3411	3455
	Sheopur	67	67	4324	2765	1005	554	3358	3363	3334
	Mandsaur	49	49	3601	1890	891	820	3317	3379	3259
	Gwalior	80	80	8632	5912	1903	817	3325	3312	3259

Source: Agricultural Marketing Information Network

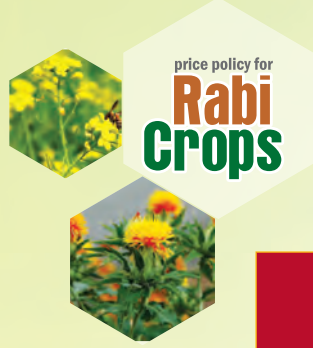




**Annex Table 3.1 : Simulation-Impact of Oil Content on MSP of R&M**

Sl. No.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from oil cake on processing of 1 quintal of oilseeds, assuming price of cake/qrtl= ₹2200 {col(3)*Price of Oil cake}/100	Cost of Oil Content i.e. oilseeds without cake (₹/ qtl.), assuming MSP/qrtl=₹3900 MSP-Col(4)	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (₹/qrtl.) {col(5)/col(2)}*0.25
(1)	(2)	(3)	(4)	(5)	(6)
1	35.00	65.00	1430	2470	17.64
2	35.25	64.75	1425	2476	17.56
3	35.50	64.50	1419	2481	17.47
4	35.75	64.25	1414	2487	17.39
5	36.00	64.00	1408	2492	17.31
6	36.25	63.75	1403	2498	17.22
7	36.50	63.50	1397	2503	17.14
8	36.75	63.25	1392	2509	17.06
9	37.00	63.00	1386	2514	16.99
10	37.25	62.75	1381	2520	16.91
11	37.50	62.50	1375	2525	16.83
12	37.75	62.25	1370	2531	16.76
13	38.00	62.00	1364	2536	16.68
14	38.25	61.75	1359	2542	16.61
15	38.50	61.50	1353	2547	16.54
16	38.75	61.25	1348	2553	16.47
17	39.00	61.00	1342	2558	16.40
18	39.25	60.75	1337	2564	16.33
19	39.50	60.50	1331	2569	16.26
20	39.75	60.25	1326	2575	16.19
21	40.00	60.00	1320	2580	16.13
22	40.25	59.75	1315	2586	16.06
23	40.50	59.50	1309	2591	15.99
24	40.75	59.25	1304	2597	15.93
25	41.00	59.00	1298	2602	15.87
26	41.25	58.75	1293	2608	15.80
27	41.50	58.50	1287	2613	15.74
28	41.75	58.25	1282	2619	15.68
29	42.00	58.00	1276	2624	15.62
30	42.25	57.75	1271	2630	15.56

Contd...



**Annex Table 3.1 : Simulation-Impact of Oil Content on MSP of R&M**

Sl. No.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from oil cake on processing of 1 quintal of oilseeds, assuming price of cake/qttl= ₹2200 {col(3)*Price of Oil cake}/100	Cost of Oil Content i.e. oilseeds without cake (₹/ qtl.), assuming MSP/qttl=₹3900 MSP-Col(4)	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (₹/qttl.) {col(5)/ col(2)}*0.25
(1)	(2)	(3)	(4)	(5)	(6)
31	42.50	57.50	1265	2635	15.50
32	42.75	57.25	1260	2641	15.44
33	43.00	57.00	1254	2646	15.38
34	43.25	56.75	1249	2652	15.33
35	43.50	56.50	1243	2657	15.27
36	43.75	56.25	1238	2663	15.21
37	44.00	56.00	1232	2668	15.16
38	44.25	55.75	1227	2674	15.10
39	44.50	55.50	1221	2679	15.05
40	44.75	55.25	1216	2685	15.00
41	45.00	55.00	1210	2690	14.94
42	45.25	54.75	1205	2696	14.89
43	45.50	54.50	1199	2701	14.84
44	45.75	54.25	1194	2707	14.79
45	46.00	54.00	1188	2712	14.74
46	46.25	53.75	1183	2718	14.69
47	46.50	53.50	1177	2723	14.64
48	46.75	53.25	1172	2729	14.59
49	47.00	53.00	1166	2734	14.54
50	47.25	52.75	1161	2740	14.49
51	47.50	52.50	1155	2745	14.45
52	47.75	52.25	1150	2751	14.40
53	48.00	52.00	1144	2756	14.35
<b>Average increase in MSP with 0.25 percent increase in oil content</b>					<b>15.83</b>

(Concluded)

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

(Value in ₹ Crore)

Commodity	2015-16	2016-17	Percent increase/Decrease over previous year	Share in Total Export
Marine Products	31219	39694	27.1	16.9
Rice	38202	38727	1.4	16.5
Meat & Processed Meat	27528	27185	-1.2	11.6
Spices	16630	19367	16.5	8.3
Cotton (Raw)	12821	10949	-14.6	4.7
Sugar	9825	8670	-11.8	3.7
Oilseeds	8176	9133	11.7	3.9
Fresh Vegetables	5237	5719	9.2	2.4
Coffee	5125	5669	10.6	2.4
Oil Meals	3600	5371	49.2	2.3
Cashew	5028	5303	5.5	2.3
Fresh Fruits	4191	4967	18.5	2.1
Processed Fruits and Juices	3767	3905	3.7	1.7
Guargum Meal	3234	3132	-3.2	1.3
Others	47954	46746	-2.5	19.9
<b>Total</b>	<b>222537</b>	<b>234537</b>	<b>5.4</b>	<b>100.0</b>

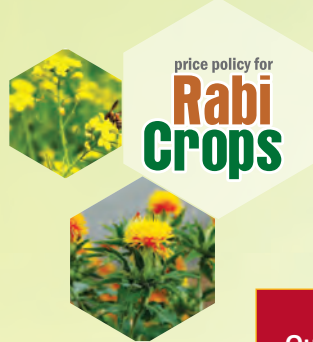
Source: Directorate General of Commercial Intelligence and Statistics

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

(Value in ₹ Crore)

Commodity	2015-16	2016-17	Percent Increase/Decrease over previous year	Share in Total Import
Vegetable Oils	68677	73048	6.4	39.4
Pulses	25619	28524	11.3	15.4
Wood and Wood Products	17284	15364	-11.1	8.3
Fresh Fruits	11072	11241	1.5	6.1
Cashew	8701	9027	3.7	4.9
Wheat	873	8509	875.1	4.6
Sugar	4038	6869	70.1	3.7
Cotton Raw Including Waste	2566	6337	147.0	3.4
Spices	5400	5758	6.6	3.1
Natural Rubber	4672	4374	-6.4	2.4
Others	14423	16242	12.6	8.8
<b>Total</b>	<b>163324</b>	<b>185292</b>	<b>13.5</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
2012 Q1	1226	1301	1154	1084	2948	3423	3324	3235	3285	3083	7687	6442
2012 Q2	1274	1362	1263	1286	3569	3859	3382	3539	3435	3379	7822	6718
2012 Q3	1396	1604	1185	1186	4340	4280	3703	3516	3918	3489	8423	6838
2012 Q4	1462	1826	1208	1350	4167	3818	3626	3177	3792	3364	7990	6489
2013 Q1	1500	1612	1222	1282	3396	3665	3732	3137	3444	3408	7369	6502
2013 Q2	1496	1538	1199	1289	3308	3654	4005	4167	3131	3202	6654	6208
2013 Q3	1501	1604	1190	1186	2897	3154	4068	4098	3157	3050	6756	6231
2013 Q4	1533	1715	1247	935	2864	3127	4057	3790	3348	3173	7152	6305
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	1234	4251	4480	6364	4860	3875	2669	7902	5234
2016 Q2	1630	1276	1524	1146	5751	6115	6243	5840	4032	2798	8355	5391
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	8377	6098
2017 Q1	1804	1186	1615	919	5740	5705	5037	4359	3667	2980	7573	5911
2017 Q2	1692	1125	1484	885	5274	5824	4777	3875	3396	2780	7115	5315

Note: D: Domestic and I: International

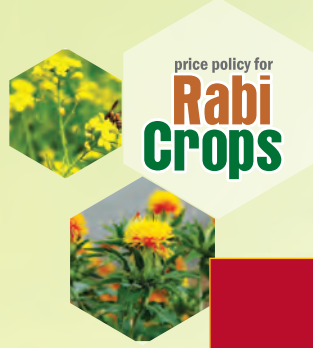
Sources: DES, Ministry of Agricultural & Farmers Welfare, Agriwatch, Solvent Extractors Association of India, United States Department of Agriculture and World Bank.

**Annex Table 4.4: Changing Share of India's Imports of Pulses**

(tonnes, percent)

Name of Country	2006-2007	2007-2008	2008-2009	TE2008-09	% of Total	2014-2015	2015-2016	2016-17	TE2016-17	% of Total
Myanmar	615622	634014	929211	726282	28.7	879275	676985	658862	738374	13.0
Australia	194198	147866	214504	185522	7.3	332361	912306	1174188	806285	14.2
Russia	21864	16518	24311	20898	0.8	236893	503490	392285	377556	6.7
Total Pulses	2270922	2835051	2481102	2529025	100.0	4567776	5820887	6599174	5662612	100.0

Source: Directorate General of Commercial Intelligence and Statistics



**Annex Table 5.1: State-wise Gross and Net returns of Rabi crops, TE2015-16**

Crop/State	Cost A <sub>2</sub>	Cost A <sub>2</sub> +FL	Cost C <sub>2</sub>	GVO	Gross Returns over A <sub>2</sub>		Gross Returns over A <sub>2</sub> +FL		Net Returns	
	₹/ha				₹/ha (Col.5- Col.2)	Percent (Col.6/ Col.2* 100)	₹/ha (Col.5- Col.3)	Percent (Col.8/ Col.3* 100)	₹/ha (Col.5- Col.4)	Percent (Col.10/ Col.4* 100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>Wheat</b>										
Bihar	21,643	26,670	38,884	47,806	26,163	121	21,136	79	8,923	23
Gujarat	26,540	32,265	42,790	59,280	32,739	123	27,015	84	16,490	39
Haryana	26,098	34,361	62,685	78,171	52,072	200	43,810	127	15,485	25
Himachal Pradesh	12,565	22,397	33,167	28,540	15,975	127	6,143	27	-4,627	-14
Jharkhand	17,609	20,767	28,197	29,692	12,083	69	8,925	43	1,495	5
Maharashtra	29,569	36,823	48,653	47,044	17,475	59	10,221	28	-1,609	-3
Madhya Pradesh	19,519	24,974	41,926	54,837	35,318	181	29,863	120	12,911	31
Punjab	26,406	29,246	54,807	76,785	50,378	191	47,539	163	21,978	40
Rajasthan	22,781	36,205	52,628	72,285	49,504	217	36,080	100	19,657	37
Uttarakhand	17,628	24,557	39,325	49,280	31,652	180	24,723	101	9,954	25
Uttar Pradesh	26,053	33,003	50,944	55,046	28,993	111	22,044	67	4,103	8
West Bengal	31,376	37,562	48,935	40,016	8,640	28	2,454	7	-8,920	-18
<b>ALL-INDIA</b>	<b>24,142</b>	<b>30,930</b>	<b>49,154</b>	<b>59,996</b>	<b>35,854</b>	<b>149</b>	<b>29,066</b>	<b>94</b>	<b>10,842</b>	<b>22</b>
<b>Barley</b>										
Rajasthan	18,703	33,572	46,944	61,084	42,381	227	27,512	82	14,140	30
Uttar Pradesh	18,700	24,386	41,137	46,059	27,359	146	21,673	89	4,921	12
<b>ALL-INDIA</b>	<b>18,709</b>	<b>30,463</b>	<b>44,978</b>	<b>55,969</b>	<b>37,260</b>	<b>199</b>	<b>25,507</b>	<b>84</b>	<b>10,991</b>	<b>24</b>
<b>Gram</b>										
Andhra Pradesh	28,332	30,801	43,298	45,901	17,568	62	15,099	49	2,603	6
Bihar	15,199	18,168	31,901	58,885	43,686	287	40,717	224	26,984	85
Chhattisgarh	13,848	17,803	25,109	22,977	9,128	66	5,174	29	-2,132	-8
Haryana	13,250	20,234	34,075	47,296	34,046	257	27,062	134	13,221	39
Karnataka	17,288	19,693	28,201	32,533	15,245	88	12,840	65	4,332	15
Maharashtra	23,339	27,456	38,611	40,902	17,563	75	13,446	49	2,290	6
Madhya Pradesh	17,782	21,879	34,523	41,547	23,765	134	19,668	90	7,024	20
Rajasthan	10,512	17,700	26,210	33,929	23,417	223	16,229	92	7,719	29
Uttar Pradesh	16,334	21,937	33,066	26,884	10,549	65	4,947	23	-6,182	-19
<b>ALL-INDIA</b>	<b>17,789</b>	<b>22,216</b>	<b>33,095</b>	<b>37,735</b>	<b>19,946</b>	<b>112</b>	<b>15,518</b>	<b>70</b>	<b>4,640</b>	<b>14</b>

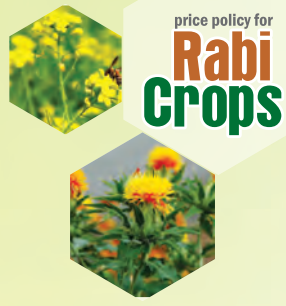
(Continued)

**Annex Table 5.1: State-wise Gross and Net returns of Rabi crops, TE2015-16**

Crop/State	Cost A <sub>2</sub>	Cost A <sub>2</sub> +FL	Cost C <sub>2</sub>	GVO	Gross Returns over A <sub>2</sub>		Gross Returns over A <sub>2</sub> +FL		Net Returns	
	₹/ha				₹/ha (Col.5- Col.2)	Percent (Col.6/ Col.2* 100)	₹/ha (Col.5- Col.3)	Percent (Col.8/ Col.3* 100)	₹/ha (Col.5- Col.4)	Percent (Col.10/ Col.4* 100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>Wheat</b>										
Bihar	12,061	15,155	28,016	51,497	39,436	327	36,342	240	23,480	84
Madhya Pradesh	14,041	17,472	29,177	38,028	23,988	171	20,556	118	8,851	30
Uttar Pradesh	14,002	18,559	29,873	27,790	13,787	98	9,231	50	-2,084	-7
West Bengal	16,969	23,925	36,877	50,797	33,828	199	26,872	112	13,920	38
<b>ALL-INDIA</b>	13,979	17,954	29,755	36,983	23,005	165	19,030	106	7,229	24
<b>Rapeseed/Mustard</b>										
Assam	13,531	25,897	33,521	24,363	10,831	80	-1,534	-6	-9,158	-27
Bihar	13,808	18,555	29,973	38,632	24,824	180	20,077	108	8,659	29
Gujarat	20,825	27,425	39,683	55,069	34,245	164	27,644	101	15,386	39
Haryana	19,174	26,281	48,217	55,105	35,932	187	28,824	110	6,888	14
Madhya Pradesh	13,083	18,887	34,877	50,641	37,558	287	31,755	168	15,765	45
Rajasthan	14,545	24,632	36,215	46,634	32,089	221	22,002	89	10,419	29
Uttar Pradesh	16,459	25,742	41,720	40,558	24,099	146	14,816	58	-1,162	-3
West Bengal	23,042	31,233	43,437	45,552	22,509	98	14,318	46	2,115	5
<b>ALL-INDIA</b>	15,853	24,764	38,251	46,310	30,456	192	21,545	87	8,058	21
<b>Safflower</b>										
Maharashtra	13,962	18,374	23,098	17,252	3,290	24	-1,122	-6	-5,846	-25
<b>ALL-INDIA</b>	13,962	18,374	23,098	17,252	3,290	24	-1,122	-6	-5,846	-25

Source: CACP calculations based on CS data

(Concluded)



**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>2011</b>																	
January	171	117	101	92	197	195	116	335	86	124	126	172	140	175	115	122	129
February	171	118	100	94	202	207	118	335	87	127	133	165	141	181	118	126	131
March	174	123	101	93	202	207	119	341	89	131	128	169	149	184	116	126	133
April	174	122	101	94	203	217	120	341	89	131	133	170	163	186	116	126	136
May	171	122	102	95	203	211	125	341	90	135	135	211	179	178	117	129	139
June	174	123	103	96	203	218	127	350	90	140	133	189	172	199	119	130	140
July	174	127	108	112	205	219	128	360	94	156	133	215	208	200	123	133	151
August	171	128	110	112	206	232	133	372	98	155	134	211	191	208	122	139	150
September	176	115	113	113	206	232	136	376	98	152	137	189	154	206	123	141	145
October	177	127	113	113	205	230	137	392	99	153	135	219	162	209	126	142	148
November	191	131	119	113	214	232	138	454	99	155	138	223	203	213	130	143	157
December	176	127	113	113	206	232	136	376	98	152	137	189	154	206	123	141	145
<b>2012</b>																	
January	177	127	113	113	205	237	137	392	99	153	135	219	162	209	126	142	148
February	203	131	124	115	212	241	145	420	100	153	140	235	172	231	136	151	157
March	195	132	126	116	213	241	147	413	106	156	140	233	198	226	135	152	161
April	207	132	127	117	210	241	146	417	110	156	145	256	194	231	136	159	164
May	198	134	129	118	210	241	148	417	108	154	148	243	202	232	138	161	164
June	185	134	134	118	215	246	156	420	113	165	137	223	204	238	138	160	165
July	191	138	138	125	219	270	163	453	116	171	140	246	223	244	146	169	174
August	193	138	143	126	229	246	168	453	119	170	152	241	213	253	149	167	175
September	205	140	144	126	229	246	170	455	121	173	143	240	214	252	153	165	177
October	199	145	147	126	238	246	173	461	119	174	135	278	216	251	156	165	179
November	210	148	148	126	233	251	178	461	120	173	137	274	217	246	158	171	180
December	224	145	151	127	228	260	177	461	120	182	138	273	221	247	160	173	184

(Continued)





(Continued)

**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>2013</b>																	
January	224	146	162	130	246	273	184	465	126	186	136	257	219	253	163	178	187
February	228	157	164	130	245	259	188	465	126	192	134	260	204	259	165	180	187
March	221	154	166	133	245	259	189	461	130	194	136	260	208	265	166	181	189
April	230	153	167	130	247	264	192	478	135	195	137	284	217	265	168	182	193
May	223	150	167	131	245	266	192	489	138	197	141	273	244	266	169	185	197
June	222	162	168	132	244	262	196	483	134	189	143	290	235	271	173	185	196
July	221	178	175	136	258	263	203	485	132	201	150	291	220	272	174	198	198
August	210	183	177	137	317	284	210	487	133	200	157	279	215	275	181	200	199
September	213	178	176	138	312	290	212	490	138	196	150		219	284	181	200	192
October	212	175	175	139	312	298	213	487	144	199	156	283	229	294	180	199	203
November	247	184	205	142	328	337	235	585	140	221	196		248	330	192	224	214
December	242	181	191	165	325	356	228	580	151	216	179	278	247	352	186	229	222
<b>2014</b>																	
January	229	182	194	172	320	336	237	580	155	215	178	276	262	355	191	229	225
February	226	188	200	172	329	336	240	629	158	214	180	275	251	362	191	230	226
March	222	189	202	175	333	341	243	594	161	219	164	279	270	356	195	223	229
April	222	199	204	179	335	352	240	594	163	223	160	306	291	361	201	226	235
May	225	203	206	179	346	335	242	594	165	223	173	307	283	364	202	225	235
June	217	204	207	179	347	341	241	594	164	230	191	304	280	362	199	227	235
July	230	208	218	185	345	345	241	599	173	225	201	302	320	372	200	226	244
August	226	220	220	190	348	343	241	599	173	226	208	304	305	371	202	230	243
September	239	225	220	190	350	343	242	586	180	222	204	310	296	417	198	234	246
October	241	226	222	198	354	339	242	586	171	222	202	310	297	412	201	237	246
November	247	238	220	198	357	330	244	597	170	223	200	312	305	421	199	236	248
December	236	234	220	192	344	349	252	604	176	222	194	307	307	417	199	237	247



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

Year/Month	AP	Asm	Bih	Guj	Har	HP	Kar	Ker	MP	MH	Odi	Pun	Raj	TN	UP	WB	All-India
<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
<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

(Concluded)

Note: Daily Wage rate - Average of five operations i.e. Ploughing, Sowing, Weeding, Transplanting and Harvesting

Source: Labour Bureau, Ministry of Labour, Govt. of India

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

Year/Month	High Speed Diesel (HSD)	Fertilizers and nitrogen compounds	Electricity	Agricultural tractors	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products
<b>Annual Average (July - June)</b>								
2012-13	113	115	101	105	111	131	123	108
2013-14	130	117	104	105	115	143	143	114
2014-15	105	120	106	108	120	141	148	121
2015-16	68	121	104	112	121	152	168	121
<b>2012</b>								
April	112	108	97	104	106	107	108	106
May	112	110	101	104	106	110	105	106
June	110	112	103	104	110	113	102	106
July	109	114	102	104	110	118	107	107
August	111	114	99	104	110	123	111	108
September	114	115	97	104	110	129	119	109
October	108	115	101	105	110	131	123	108
November	108	115	102	105	110	132	125	109
December	108	115	101	105	110	131	125	108
<b>2013</b>								
January	112	115	105	105	110	130	122	108
February	118	115	101	105	110	131	127	107
March	118	116	98	105	110	134	129	108
April	115	115	101	106	112	138	126	109
May	112	115	101	104	112	140	125	105
June	117	116	102	104	112	140	132	107
July	123	117	102	104	112	140	136	110
August	126	117	103	104	115	140	137	111
September	133	117	105	104	115	142	138	112
October	130	116	103	105	115	143	139	113
November	130	117	103	105	115	143	140	113
December	133	117	106	104	115	142	142	114
<b>2014</b>								
January	132	117	106	104	115	141	144	113
February	132	117	106	104	115	141	150	111
March	133	118	106	105	115	142	156	115
April	130	117	106	106	117	144	148	119
May	131	118	103	107	117	148	139	119
June	129	119	102	106	117	147	142	121
July	132	119	103	107	117	146	142	120
August	131	119	106	107	117	144	146	118
September	130	119	105	107	120	142	154	124
October	126	119	104	107	120	139	155	122
November	113	119	107	107	120	137	156	122
December	104	120	108	108	120	137	157	119

(Continued)

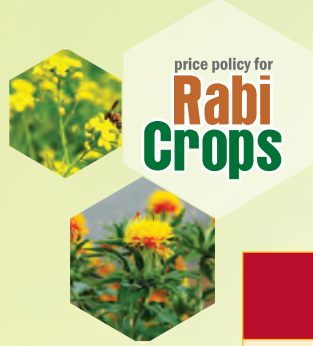
**Annex Table 5.3: Farm Inputs- Wholesale Price Index (Base 2011-12=100)**

Year/Month	High Speed Diesel (HSD)	Fertilizers and nitrogen compounds	Electricity	Agricultural tractors	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products
<b>2015</b>								
January	88	119	109	108	120	138	156	123
February	79	120	108	108	120	139	151	123
March	87	120	108	108	120	139	143	120
April	83	121	108	111	121	141	140	122
May	92	121	106	111	121	144	138	123
June	93	121	106	111	121	145	143	123
July	87	121	107	111	121	145	151	125
August	73	122	105	111	121	147	166	123
September	71	122	106	111	121	149	167	124
October	74	122	103	112	121	151	169	124
November	74	121	105	112	121	150	173	123
December	72	121	105	112	121	150	176	122
<b>2016</b>								
January	57	122	106	112	121	151	173	123
February	50	122	104	112	121	154	170	122
March	55	121	103	112	121	154	172	120
April	59	121	101	114	121	155	167	117
May	67	121	102	113	121	156	161	119
June	75	121	103	113	121	159	170	118
July	75	120	103	113	121	161	170	117
August	67	119	103	114	115	162	163	116
September	71	118	104	114	115	161	163	117
October	73	118	104	114	115	159	165	115
November	77	118	106	114	115	159	164	115
December	77	117	106	114	115	158	164	116
<b>2017</b>								
January	83	117	108	114	115	157	163	118
February	85	117	107	114	115	158	166	117
March	85	117	103	113	115	155	160	117
April	82	117	107	114	115	155	159	116
May	82	117	103	114	115	156	157	117
% change of March to May 2017 over March to May 2016	37.7	-3.6	2.2	0.9	-5.0	0.2	-4.8	-1.4

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

**Annex Table 5.4: Projected Cost of Production ( $A_2$ ,  $A_2+FL$  &  $C_2$ ) for Rabi 2017-18 and Production Shares**

States	Cost of Production (₹/qtl)			Shares in Production(%)
	$A_2$	$A_2+FL$	$C_2$	
<b>Wheat</b>				
Bihar	770	948	1,308	5
Gujarat	856	1,040	1,336	3
Haryana	559	736	1,267	12
Madhya Pradesh	614	786	1,248	20
Maharashtra	1,295	1,615	2,076	1
Punjab	580	642	1,128	18
Rajasthan	548	871	1,218	11
Uttar Pradesh	659	835	1,255	29
West Bengal	1,486	1,777	2,153	1
<b>All India Wtd. Avg.</b>	<b>642</b>	<b>817</b>	<b>1,256</b>	
<b>Barley</b>				
Rajasthan	473	849	1,120	71
Uttar Pradesh	641	834	1,362	29
<b>All India Wtd. Avg.</b>	<b>522</b>	<b>845</b>	<b>1,190</b>	
<b>Gram</b>				
Andhra Pradesh	2,828	3,052	4,127	7
Chhattisgarh	1,759	2,266	3,136	4
Karnataka	2,484	2,820	3,801	8
Madhya Pradesh	1,857	2,284	3,418	45
Maharashtra	2,285	2,689	3,675	16
Rajasthan	1,238	2,084	2,981	15
Uttar Pradesh	2,299	3,084	4,510	5
<b>All India Wtd. Avg.</b>	<b>1,977</b>	<b>2,461</b>	<b>3,526</b>	
<b>Lentil</b>				
Bihar	1,493	1,853	3,023	18
Madhya Pradesh	1,807	2,241	3,602	45
Uttar Pradesh	2,170	2,877	4,452	27
West Bengal	1,768	2,486	3,606	10
<b>All India Wtd. Avg.</b>	<b>1,845</b>	<b>2,366</b>	<b>3,727</b>	
<b>Rapeseed &amp; Mustard</b>				
Assam	2,098	3,990	4,923	3
Bihar	1,521	2,053	2,988	2
Gujarat	1,566	2,060	2,768	5
Haryana	1,252	1,718	2,996	12
Madhya Pradesh	922	1,329	2,300	11
Rajasthan	1,297	2,193	3,045	50
Uttar Pradesh	1,415	2,215	3,498	10
West Bengal	2,032	2,740	3,643	7
<b>All India Wtd. Avg.</b>	<b>1,354</b>	<b>2,123</b>	<b>3,086</b>	
<b>Safflower</b>				
Karnataka	1,092	1,863	2,715	46
Maharashtra	3,178	4,207	5,062	54
<b>All India Wtd. Avg.</b>	<b>2,216</b>	<b>3,125</b>	<b>3,979</b>	



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

Cost Items	Bihar		Gujarat		Haryana		Himachal Pradesh	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	28,471.30	26,816.98	29,706.20	30,992.83	34,040.24	33,124.07	23,098.07	22,091.19
Human Labour								
Casual	4,544.25	4,229.60	3,358.49	3,838.33	4,369.71	3,379.19	470.65	657.04
Attached	26.49	24.32	17.40	64.18	244.07	193.43	73.82	95.84
Family	5,839.18	5,308.16	5,414.21	5,929.69	7,492.23	8,780.67	10,788.66	10,203.07
<b>Total</b>	<b>10,409.92</b>	<b>9,562.08</b>	<b>8,790.10</b>	<b>9,832.20</b>	<b>12,106.01</b>	<b>12,353.29</b>	<b>11,333.13</b>	<b>10,955.95</b>
Bullock Labour								
Hired	0.00	0.00	61.38	73.92	1.29	0.00	475.11	327.22
Owned	27.66	15.41	178.08	227.06	95.09	5.00	615.26	349.21
<b>Total</b>	<b>27.66</b>	<b>15.41</b>	<b>239.46</b>	<b>300.98</b>	<b>96.38</b>	<b>5.00</b>	<b>1,090.37</b>	<b>676.43</b>
Machine Labour								
Hired	5,913.04	5,550.84	5,255.99	5,387.27	7,833.46	7,349.23	3,997.21	3,899.98
Owned	23.36	83.97	812.87	882.70	1,211.92	1,255.49	231.88	185.49
<b>Total</b>	<b>5,936.40</b>	<b>5,634.81</b>	<b>6,068.86</b>	<b>6,269.97</b>	<b>9,045.38</b>	<b>8,604.72</b>	<b>4,229.09</b>	<b>4,085.47</b>
Seed	3,234.08	2,994.30	4,337.26	4,184.80	2,408.99	2,356.10	1,855.67	1,855.97
Fertilisers and Manure								
Fertilisers	4,124.60	4,317.49	4,600.28	4,171.95	4,490.42	4,280.12	1,039.67	1,046.62
Manure	70.52	78.73	8.69	257.64	0.00	19.67	2,506.46	2,956.96
<b>Total</b>	<b>4,195.12</b>	<b>4,396.22</b>	<b>4,608.97</b>	<b>4,429.59</b>	<b>4,490.42</b>	<b>4,299.79</b>	<b>3,546.13</b>	<b>4,003.58</b>
Other Inputs								
Insecticides	36.36	62.24	413.86	462.70	1,019.02	887.59	238.03	79.22
Irrigation charges	3,945.94	3,500.14	4,511.57	4,753.10	4,069.55	3,879.90	432.64	74.32
Interest on working capital	685.82	651.78	736.12	759.49	804.49	737.68	373.01	360.25
Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>14,453.85</b>	<b>14,632.08</b>	<b>11,640.79</b>	<b>11,303.25</b>	<b>32,339.70</b>	<b>28,194.63</b>	<b>11,756.29</b>	<b>11,956.74</b>
Rental value of owned land	11,649.57	11,480.42	7,952.44	7,110.29	24,763.67	21,511.95	6,617.50	6,851.01
Rent paid for leased-in land	0.00	0.00	1,569.99	1,837.02	0.00	0.00	29.59	43.66
Land revenue, cesses & taxes	69.64	65.20	6.29	5.22	0.00	0.00	8.96	9.39
Depreciation on implements & Farm buildings	515.33	589.84	154.75	164.62	797.40	524.96	731.95	722.03
Interest on fixed capital	2,219.31	2,496.62	1,957.32	2,186.10	6,778.63	6,157.72	4,368.29	4,330.65
<b>Total Cost</b>	<b>42,925.15</b>	<b>41,449.06</b>	<b>41,346.99</b>	<b>42,296.08</b>	<b>66,379.94</b>	<b>61,318.70</b>	<b>34,854.36</b>	<b>34,047.93</b>

Source: DES, Ministry of Agriculture & Farmers Welfare

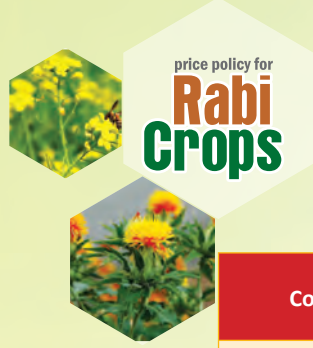
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**Annex Table 5.5a: Wheat- Break-up of Cost of Cultivation (₹/ha)**

Cost Items	Jharkhand		Karnataka		Madhya Pradesh		Maharashtra		Punjab	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	19,375.69	20,147.64	22,497.87	21,059.01	26,334.34	25,625.32	39,183.92	33,806.65	24,832.93	23,717.84
Human Labour										
Casual	3,138.24	3,857.84	6,197.44	5,759.85	2,661.80	2,468.46	4,397.51	5,084.87	2,116.63	2,120.71
Attached	0.00	0.00	0.00	0.00	159.26	146.31	952.42	655.81	648.93	580.45
Family	4,002.24	4,031.50	4,843.38	4,062.73	5,832.51	5,854.77	9,231.20	6,236.15	3,021.38	2,735.92
Total	7,140.48	7,889.34	11,040.82	9,822.58	8,653.57	8,469.54	14,581.13	11,976.83	5,786.94	5,437.08
Bullock Labour										
Hired	361.82	645.99	1,164.79	1,404.62	36.46	64.17	361.76	542.48	0.44	1.37
Owned	0.00	353.73	1,402.66	839.88	510.76	710.32	2,075.74	1,111.11	46.78	47.82
Total	361.82	999.72	2,567.45	2,244.50	547.22	774.49	2,437.50	1,653.59	47.22	49.19
Machine Labour										
Hired	3,569.78	2,994.91	2,329.30	2,753.14	6,379.25	6,234.68	7,467.77	6,358.47	6,121.50	5,995.54
Owned	1.24	0.00	728.97	389.45	317.37	398.01	634.65	440.90	2,243.69	2,280.70
Total	3,571.02	2,994.91	3,058.27	3,142.59	6,696.62	6,632.69	8,102.42	6,799.37	8,365.19	8,276.24
Seed	2,848.87	2,624.13	2,162.31	2,452.51	2,839.95	2,589.10	3,437.03	3,846.36	2,169.31	1,961.84
Fertilisers and Manure										
Fertilisers	2,928.10	3,153.33	2,271.72	2,058.29	3,023.04	2,877.00	3,734.55	3,730.76	5,383.96	5,203.53
Manure	9.82	9.64	0.00	0.00	0.42	0.00	13.57	55.74	7.65	25.37
Total	2,937.92	3,162.97	2,271.72	2,058.29	3,023.46	2,877.00	3,748.12	3,786.50	5,391.61	5,228.90
Other Inputs										
Insecticides	0.00	0.00	0.00	0.00	34.86	38.72	201.25	171.04	1,829.16	1,545.83
Irrigation charges	2,049.72	1,988.20	862.32	823.50	3,732.18	3,644.49	5,768.81	4,676.25	545.04	498.45
Interest on working capital	465.86	488.37	534.98	515.04	621.27	599.11	907.66	835.47	660.96	635.82
Miscellaneous	0.00	0.00	0.00	0.00	185.21	0.18	0.00	61.24	37.50	84.49
<b>Fixed Cost</b>	8,331.82	8,662.01	7,280.48	6,219.84	17,983.25	18,329.28	13,160.55	12,136.33	32,152.31	28,872.63
Rental value of owned land	6,613.74	6,631.38	4,715.26	4,297.20	13,749.21	13,808.68	8,088.00	7,019.93	23,001.33	20,587.25
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,499.04	3,653.11
Land revenue, cesses & taxes	26.78	22.46	8.80	5.49	4.47	5.24	18.43	19.00	0.00	0.00
Depreciation on implements & Farm buildings	581.57	688.63	155.54	124.04	578.97	590.01	425.27	449.70	413.29	401.56
Interest on fixed capital	1,109.73	1,319.54	2,400.88	1,793.11	3,650.60	3,925.35	4,628.85	4,647.70	4,238.65	4,230.71
<b>Total Cost</b>	27,707.51	28,809.65	29,778.35	27,278.85	44,317.59	43,954.60	52,344.47	45,942.98	56,985.24	52,590.47

Source: DES, Ministry of Agriculture & Farmers Welfare

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

Cost Items	Rajasthan		Uttar Pradesh		Uttarakhand		West Bengal	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	37,814.56	35,134.58	33,763.37	30,543.85	29,076.84	22,050.27	36,658.15	39,977.57
Human Labour								
Casual	2,941.75	3,177.68	3,924.96	3,672.14	1,516.45	1,208.10	10,571.87	13,126.41
Attached	366.84	260.33	7.89	9.87	16.55	29.56	0.00	2.11
Family	14,663.93	13,489.59	7,731.55	7,314.89	7,528.85	6,314.61	6,083.94	6,678.04
<b>Total</b>	<b>17,972.52</b>	<b>16,927.60</b>	<b>11,664.40</b>	<b>10,996.90</b>	<b>9,061.85</b>	<b>7,552.27</b>	<b>16,655.81</b>	<b>19,806.56</b>
Bullock Labour								
Hired	52.61	34.37	0.07	0.41	219.31	206.52	755.88	1,246.29
Owned	268.03	363.23	651.94	584.04	5,972.89	3,302.09	1,671.45	1,096.02
<b>Total</b>	<b>320.64</b>	<b>397.60</b>	<b>652.01</b>	<b>584.45</b>	<b>6,192.20</b>	<b>3,508.61</b>	<b>2,427.33</b>	<b>2,342.31</b>
Machine Labour								
Hired	4,984.71	4,521.60	6,468.89	5,897.57	5,040.60	3,218.36	3,440.85	3,616.20
Owned	931.52	1,073.87	307.14	306.00	528.33	605.78	0.84	0.16
<b>Total</b>	<b>5,916.23</b>	<b>5,595.47</b>	<b>6,776.03</b>	<b>6,203.57</b>	<b>5,568.93</b>	<b>3,824.14</b>	<b>3,441.69</b>	<b>3,616.36</b>
Seed	3,542.34	3,432.66	3,330.46	3,177.11	2,378.07	2,397.03	4,086.84	4,159.92
Fertilisers and Manure								
Fertilisers	3,591.47	3,558.17	4,753.87	4,836.89	2,299.88	2,226.04	5,443.90	5,598.44
Manure	286.61	168.02	4.15	31.11	1,270.50	998.80	45.16	219.93
<b>Total</b>	<b>3,878.08</b>	<b>3,726.19</b>	<b>4,758.02</b>	<b>4,868.00</b>	<b>3,570.38</b>	<b>3,224.84</b>	<b>5,489.06</b>	<b>5,818.37</b>
Other Inputs								
Insecticides	163.36	95.45	44.66	41.46	368.18	303.87	39.81	31.13
Irrigation charges	5,318.90	4,303.70	5,748.94	3,968.25	1,284.26	762.67	3,591.12	3,193.84
Interest on working capital	701.53	655.91	788.84	703.91	652.97	476.84	926.49	1,009.08
Miscellaneous	0.96	0.00	0.01	0.20	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>18,945.49</b>	<b>14,954.89</b>	<b>22,442.56</b>	<b>20,536.73</b>	<b>18,272.41</b>	<b>16,350.25</b>	<b>10,456.47</b>	<b>12,570.35</b>
Rental value of owned land	12,578.23	10,359.99	15,268.61	13,376.25	15,463.81	13,703.42	8,127.72	10,670.31
Rent paid for leased-in land	326.54	307.09	1,408.24	1,175.49	0.00	0.00	94.78	0.00
Land revenue, cesses & taxes	28.81	12.22	3.67	4.13	3.23	3.66	38.84	36.12
Depreciation on implements & Farm buildings	613.81	419.04	881.30	1,020.94	948.77	583.95	462.43	405.01
Interest on fixed capital	5,398.10	3,856.55	4,880.74	4,959.92	1,856.60	2,059.22	1,732.70	1,458.91
<b>Total Cost</b>	<b>56,760.05</b>	<b>50,089.47</b>	<b>56,205.93</b>	<b>51,080.58</b>	<b>47,349.25</b>	<b>38,400.52</b>	<b>47,114.62</b>	<b>52,547.92</b>

Source: DES, Ministry of Agriculture & Farmers Welfare



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

Cost Items	Rajasthan		Uttar Pradesh	
	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	33,325.97	34,187.08	21,019.80	24,152.27
Human Labour				
Casual	1,676.37	1,613.95	4,207.38	7,103.17
Attached	0.00	33.36	0.00	41.58
Family	15,844.29	14,646.35	5,275.73	4,029.34
<b>Total</b>	<b>17,520.66</b>	<b>16,293.66</b>	<b>9,483.11</b>	<b>11,174.09</b>
Bullock Labour				
Hired	103.51	46.07	0.00	0.00
Owned	71.63	601.70	50.49	75.07
<b>Total</b>	<b>175.14</b>	<b>647.77</b>	<b>50.49</b>	<b>75.07</b>
Machine Labour				
Hired	3,644.89	4,315.85	4,215.91	4,211.52
Owned	1,739.27	1,418.11	1,389.46	1,755.04
<b>Total</b>	<b>5,384.16</b>	<b>5,733.96</b>	<b>5,605.37</b>	<b>5,966.56</b>
Seed				
	2,559.94	2,555.02	1,887.89	2,161.85
Fertilisers and Manure				
Fertilisers	2,164.59	2,139.60	869.65	2,538.66
Manure	713.14	622.24	0.00	0.00
<b>Total</b>	<b>2,877.73</b>	<b>2,761.84</b>	<b>869.65</b>	<b>2,538.66</b>
Other Inputs				
Insecticides	136.99	158.82	0.00	0.00
Irrigation charges	4,141.60	5,443.87	2,646.20	1,626.25
Interest on working capital	529.75	592.14	477.09	609.79
Miscellaneous	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>16,039.35</b>	<b>11,013.54</b>	<b>19,084.45</b>	<b>17,817.97</b>
Rental value of owned land	11,349.53	8,236.17	14,950.36	14,954.75
Rent paid for leased-in land	172.43	0.00	85.72	13.35
Land revenue, cesses & taxes	12.88	11.42	15.53	15.33
Depreciation on implements & Farm buildings	350.85	237.77	535.52	457.19
Interest on fixed capital	4,153.66	2,528.18	3,497.32	2,377.35
<b>Total Cost</b>	<b>49,365.32</b>	<b>45,200.62</b>	<b>40,104.25</b>	<b>41,970.24</b>

Source: DES, Ministry of Agriculture & Farmers Welfare

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

Cost Items	Andhra Pradesh		Bihar		Chhattisgarh		Haryana		Jharkhand	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	29,971.91	30,266.34	21,390.43	18,584.31	19,040.77	15,521.70	26,147.15	17,863.57	16,599.54	13,212.83
Human Labour										
Casual	5,713.63	10,615.85	4,978.22	4,740.69	1,363.50	1,062.30	6,501.12	4,947.09	4,592.93	3,999.94
Attached	148.29	202.02	27.46	6.35	0.00	0.00	2,860.18	249.46	0.00	0.00
Family	3,325.97	2,563.41	3,582.30	3,487.55	4,788.59	3,042.55	7,528.53	6,525.50	2,381.29	2,253.07
<b>Total</b>	<b>9,187.89</b>	<b>13,381.28</b>	<b>8,587.98</b>	<b>8,234.59</b>	<b>6,152.09</b>	<b>4,104.85</b>	<b>16,889.83</b>	<b>11,722.05</b>	<b>6,974.22</b>	<b>6,253.01</b>
Bullock Labour										
Hired	352.21	450.58	0.00	0.00	5.09	68.74	0.00	0.00	0.00	0.00
Owned	3,682.25	649.32	12.22	0.00	848.62	570.19	0.00	9.78	16.04	330.74
<b>Total</b>	<b>4,034.46</b>	<b>1,099.90</b>	<b>12.22</b>	<b>0.00</b>	<b>853.71</b>	<b>638.93</b>	<b>0.00</b>	<b>9.78</b>	<b>16.04</b>	<b>330.74</b>
Machine Labour										
Hired	4,443.84	4,695.96	3,524.28	3,505.16	4,072.57	3,968.71	2,709.30	2,147.61	3,686.18	1,769.27
Owned	96.04	97.67	39.24	52.17	109.28	20.18	1,199.12	1,359.64	0.00	0.00
<b>Total</b>	<b>4,539.88</b>	<b>4,793.63</b>	<b>3,563.52</b>	<b>3,557.33</b>	<b>4,181.85</b>	<b>3,988.89</b>	<b>3,908.42</b>	<b>3,507.25</b>	<b>3,686.18</b>	<b>1,769.27</b>
Seed	4,954.78	4,653.37	4,943.41	3,433.70	3,290.80	2,964.75	3,268.67	1,702.91	4,062.55	3,588.54
Fertilisers and Manure										
Fertilisers	3,624.70	2,581.28	2,516.51	2,426.17	1,750.47	1,505.18	217.37	0.00	1,429.69	939.16
Manure	352.63	1,280.76	416.32	13.93	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>3,977.33</b>	<b>3,862.04</b>	<b>2,932.83</b>	<b>2,440.10</b>	<b>1,750.47</b>	<b>1,505.18</b>	<b>217.37</b>	<b>0.00</b>	<b>1,429.69</b>	<b>939.16</b>
Other Inputs										
Insecticides	2,431.46	1,612.70	448.48	354.48	459.46	320.44	372.80	59.95	0.00	0.00
Irrigation charges	0.00	23.94	362.35	106.63	1,920.51	1,620.50	925.86	518.05	0.00	0.00
Interest on working capital	807.45	839.48	539.64	457.48	431.88	378.16	564.20	343.58	430.86	332.11
Miscellaneous	38.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>14,037.19</b>	<b>17,147.46</b>	<b>17,209.43</b>	<b>14,678.63</b>	<b>8,861.58</b>	<b>8,161.54</b>	<b>16,519.78</b>	<b>14,843.12</b>	<b>4,294.75</b>	<b>4,493.56</b>
Rental value of owned land	8,728.68	13,931.58	15,563.08	12,987.94	6,247.54	5,930.61	14,113.56	12,496.96	3,936.57	2,910.10
Rent paid for leased-in land	4,237.28	1,731.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	0.00	0.55	51.20	48.94	1.28	2.34	0.00	0.00	24.12	20.62
Depreciation on implements & Farm buildings	126.03	335.99	368.69	396.02	636.08	447.49	239.10	129.66	226.18	253.28
Interest on fixed capital	945.20	1,147.78	1,226.46	1,245.73	1,976.68	1,781.10	2,167.12	2,216.50	107.88	1,309.56
<b>Total Cost</b>	<b>44,009.10</b>	<b>47,413.80</b>	<b>38,599.86</b>	<b>33,262.94</b>	<b>27,902.35</b>	<b>23,683.24</b>	<b>42,666.93</b>	<b>32,706.69</b>	<b>20,894.29</b>	<b>17,706.39</b>

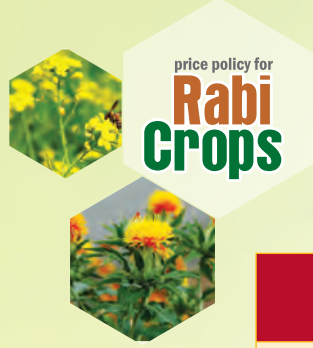
Source: DES, Ministry of Agriculture & Farmers Welfare

(Contd..)

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

Cost Items	Karnataka		Madhya Pradesh		Maharashtra		Rajasthan		Uttar Pradesh	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	20,447.35	20,686.08	24,072.99	20,867.48	28,013.89	25,655.80	19,564.58	16,444.00	23,964.69	22,024.75
Human Labour										
Casual	5,125.10	6,379.57	2,683.95	2,686.70	4,994.11	5,759.56	780.77	1,028.50	3,821.18	2,882.32
Attached	63.03	94.89	93.31	122.76	708.41	560.67	59.56	0.00	0.00	0.00
Family	2,332.64	2,703.90	4,723.97	4,156.71	4,844.55	3,607.79	8,255.83	6,867.87	6,928.98	6,353.65
<b>Total</b>	<b>7,520.77</b>	<b>9,178.36</b>	<b>7,501.23</b>	<b>6,966.17</b>	<b>10,547.07</b>	<b>9,928.02</b>	<b>9,096.16</b>	<b>7,896.37</b>	<b>10,750.16</b>	<b>9,235.97</b>
Bullock Labour										
Hired	1,002.45	817.06	28.12	154.57	679.32	459.13	0.33	5.38	51.32	16.91
Owned	1,466.13	1,158.68	720.46	528.93	2,872.59	835.59	356.48	427.05	0.00	202.24
<b>Total</b>	<b>2,468.58</b>	<b>1,975.74</b>	<b>748.58</b>	<b>683.50</b>	<b>3,551.91</b>	<b>1,294.72</b>	<b>356.81</b>	<b>432.43</b>	<b>51.32</b>	<b>219.15</b>
Machine Labour										
Hired	3,208.24	2,560.20	4,227.15	3,867.03	3,667.62	3,848.19	1,975.12	2,633.63	5,113.67	4,323.66
Owned	179.19	329.24	438.67	430.17	384.99	460.42	611.50	311.09	591.87	448.74
<b>Total</b>	<b>3,387.43</b>	<b>2,889.44</b>	<b>4,665.82</b>	<b>4,297.20</b>	<b>4,052.61</b>	<b>4,308.61</b>	<b>2,586.62</b>	<b>2,944.72</b>	<b>5,705.54</b>	<b>4,772.40</b>
Seed	3,597.63	2,221.77	5,366.78	4,237.46	4,284.68	3,051.58	3,535.96	2,053.75	5,356.60	5,099.99
Fertilisers and Manure										
Fertilisers	1,149.45	2,093.80	1,853.77	1,640.34	2,011.05	2,542.80	988.61	1,051.18	241.04	1,250.91
Manure	5.05	0.00	3.04	0.00	4.31	80.59	0.00	0.00	0.29	0.00
<b>Total</b>	<b>1,154.50</b>	<b>2,093.80</b>	<b>1,856.81</b>	<b>1,640.34</b>	<b>2,015.36</b>	<b>2,623.39</b>	<b>988.61</b>	<b>1,051.18</b>	<b>241.33</b>	<b>1,250.91</b>
Other Inputs										
Insecticides	1,744.90	1,754.35	1,254.42	916.67	738.11	989.55	93.55	2.71	35.33	10.71
Irrigation charges	24.61	27.71	1,884.88	1,491.23	2,122.05	2,791.81	2,564.18	1,772.65	1,308.18	960.74
Interest on working capital	548.93	544.91	586.33	506.39	702.10	668.12	342.69	290.19	516.23	474.88
Miscellaneous	0.00	0.00	208.14	128.52	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>6,307.91</b>	<b>11,255.97</b>	<b>17,409.32</b>	<b>13,084.87</b>	<b>11,435.46</b>	<b>12,132.99</b>	<b>10,776.38</b>	<b>7,558.81</b>	<b>16,603.70</b>	<b>10,504.97</b>
Rental value of owned land	5,203.34	9,781.76	13,890.96	10,012.92	6,997.53	6,252.56	6,897.44	4,426.09	12,153.38	7,726.43
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	9.58	10.56	4.44	4.80	21.18	20.51	7.64	8.30	13.04	8.64
Depreciation on implements & Farm buildings	127.79	189.82	645.54	504.41	455.49	471.57	321.42	420.10	683.93	422.65
Interest on fixed capital	967.20	1,273.83	2,868.38	2,562.74	3,961.26	5,388.35	3,549.88	2,704.32	3,753.35	2,347.25
<b>Total Cost</b>	<b>26,755.26</b>	<b>31,942.05</b>	<b>41,482.31</b>	<b>33,952.35</b>	<b>39,449.35</b>	<b>37,788.79</b>	<b>30,340.96</b>	<b>24,002.81</b>	<b>40,568.39</b>	<b>32,529.72</b>

Source: DES, Ministry of Agriculture & Farmers Welfare



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

Cost Items	Bihar		Madhya Pradesh		Uttar Pradesh		West Bengal	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	16,907.29	16,109.62	19,283.02	18,531.08	18,113.90	17,844.14	25,300.72	21,976.59
Human Labour								
Casual	4,814.85	4,670.84	2,410.95	1,882.56	2,649.14	2,861.17	7,589.69	4,628.82
Attached	196.35	145.89	495.56	329.61	0.00	0.00	0.00	0.00
Family	3,688.34	3,302.66	3,730.99	3,915.31	5,253.58	4,233.41	5,562.51	5,432.34
<b>Total</b>	<b>8,699.54</b>	<b>8,119.39</b>	<b>6,637.50</b>	<b>6,127.48</b>	<b>7,902.72</b>	<b>7,094.58</b>	<b>13,152.20</b>	<b>10,061.16</b>
Bullock Labour								
Hired	0.00	0.00	7.23	19.69	0.00	0.00	2,391.37	93.86
Owned	0.00	0.00	1,273.01	1,013.00	0.00	236.63	294.47	446.14
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>1,280.24</b>	<b>1,032.69</b>	<b>0.00</b>	<b>236.63</b>	<b>2,685.84</b>	<b>540.00</b>
Machine Labour								
Hired	3,243.19	3,321.85	3,858.11	4,073.80	1,624.66	3,887.22	3,802.45	6,257.64
Owned	22.39	193.46	183.80	430.00	1,197.28	486.44	1.10	5.11
<b>Total</b>	<b>3,265.58</b>	<b>3,515.31</b>	<b>4,041.91</b>	<b>4,503.80</b>	<b>2,821.94</b>	<b>4,373.66</b>	<b>3,803.55</b>	<b>6,262.75</b>
Seed	2,172.67	1,837.74	3,431.66	2,938.64	3,678.68	2,899.47	3,726.25	2,857.67
Fertilisers and Manure								
Fertilisers	2,138.24	2,089.67	1,311.02	1,309.88	1,441.53	1,121.12	1,254.60	1,741.70
Manure	60.05	0.00	0.00	0.00	0.00	0.00	4.21	0.00
<b>Total</b>	<b>2,198.29</b>	<b>2,089.67</b>	<b>1,311.02</b>	<b>1,309.88</b>	<b>1,441.53</b>	<b>1,121.12</b>	<b>1,258.81</b>	<b>1,741.70</b>
Other Inputs								
Insecticides	119.04	112.07	568.90	311.27	114.65	0.00	9.80	5.12
Irrigation charges	51.60	47.35	1,532.44	1,855.89	1,746.21	1,706.23	66.14	6.85
Interest on working capital	400.57	388.09	471.27	442.90	389.71	412.45	598.13	501.34
Miscellaneous	0.00	0.00	8.08	8.53	18.46	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>13,766.71</b>	<b>13,995.54</b>	<b>15,405.67</b>	<b>12,590.35</b>	<b>13,641.53</b>	<b>12,199.70</b>	<b>16,642.86</b>	<b>16,704.02</b>
Rental value of owned land	11,199.13	11,340.52	12,317.43	9,388.68	8,671.00	7,703.53	14,498.82	15,924.61
Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	1,427.70	0.00
Land revenue, cesses & taxes	49.69	46.92	5.10	5.84	6.91	11.82	36.59	50.07
Depreciation on implements & Farm buildings	306.61	301.03	497.14	500.11	850.96	716.57	325.86	300.76
Interest on fixed capital	2,211.28	2,307.07	2,586.00	2,695.72	4,112.66	3,767.78	353.89	428.58
<b>Total Cost</b>	<b>30,674.00</b>	<b>30,105.16</b>	<b>34,688.69</b>	<b>31,121.43</b>	<b>31,755.43</b>	<b>30,043.84</b>	<b>41,943.58</b>	<b>38,680.61</b>

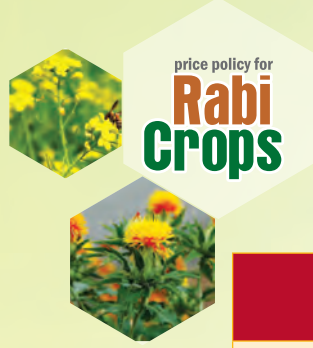
Source: DES, Ministry of Agriculture & Farmers Welfare

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

Cost Items	Assam		Bihar		Gujarat		Haryana	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	26,739.62	26,733.52	18,275.26	15,693.44	29,537.86	26,049.55	26,214.08	24,229.11
Human Labour								
Casual	1,537.39	1,206.68	3,603.29	3,139.41	7,036.41	4,874.23	5,089.33	3,609.86
Attached	43.02	64.29	232.02	114.19	0.00	0.00	278.64	123.74
Family	12,940.75	13,519.68	5,690.98	3,857.12	7,066.18	5,981.72	6,664.07	7,177.69
<b>Total</b>	<b>14,521.16</b>	<b>14,790.65</b>	<b>9,526.29</b>	<b>7,110.72</b>	<b>14,102.59</b>	<b>10,855.95</b>	<b>12,032.04</b>	<b>10,911.29</b>
Bullock Labour								
Hired	28.31	142.23	0.00	0.00	284.31	31.75	5.69	5.90
Owned	6,760.37	7,069.29	7.68	42.48	209.61	440.09	22.89	33.41
<b>Total</b>	<b>6,788.68</b>	<b>7,211.52</b>	<b>7.68</b>	<b>42.48</b>	<b>493.92</b>	<b>471.84</b>	<b>28.58</b>	<b>39.31</b>
Machine Labour								
Hired	1,797.21	1,422.82	2,863.04	2,883.80	3,883.02	4,365.82	4,556.04	4,983.41
Owned	366.88	272.81	41.62	165.32	611.19	259.41	1,150.11	1,195.54
<b>Total</b>	<b>2,164.09</b>	<b>1,695.63</b>	<b>2,904.66</b>	<b>3,049.12</b>	<b>4,494.21</b>	<b>4,625.23</b>	<b>5,706.15</b>	<b>6,178.95</b>
<b>Seed</b>	<b>593.52</b>	<b>447.62</b>	<b>799.63</b>	<b>699.96</b>	<b>565.43</b>	<b>397.17</b>	<b>713.25</b>	<b>871.17</b>
Fertilisers and Manure								
Fertilisers	1,270.72	1,053.60	2,203.39	2,962.26	2,824.04	3,168.65	3,528.39	3,309.33
Manure	939.69	1,082.22	948.05	319.03	287.23	794.12	0.00	0.00
<b>Total</b>	<b>2,210.41</b>	<b>2,135.82</b>	<b>3,151.44</b>	<b>3,281.29</b>	<b>3,111.27</b>	<b>3,962.77</b>	<b>3,528.39</b>	<b>3,309.33</b>
Other Inputs								
Insecticides	43.60	41.62	76.23	120.36	257.63	136.95	108.77	93.10
Irrigation charges	0.00	0.00	1,427.99	1,030.83	5,831.85	4,991.52	3,504.48	2,309.25
Interest on working capital	418.16	400.42	381.34	358.68	680.96	608.12	592.42	516.71
Miscellaneous	0.00	10.24	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>8,912.69</b>	<b>9,068.29</b>	<b>13,919.76</b>	<b>13,156.33</b>	<b>11,961.47</b>	<b>13,400.15</b>	<b>24,368.03</b>	<b>23,450.15</b>
Rental value of owned land	6,292.03	6,012.75	11,820.62	10,727.26	8,239.78	10,071.48	18,273.03	16,386.91
Rent paid for leased-in land	0.00	53.37	0.00	0.00	266.20	58.42	0.00	0.00
Land revenue, cesses & taxes	36.65	39.54	59.78	54.96	2.42	2.21	0.00	0.00
Depreciation on implements & Farm buildings	672.87	676.05	268.14	290.16	173.18	140.77	538.54	712.31
Interest on fixed capital	1,911.14	2,286.58	1,771.22	2,083.95	3,279.89	3,127.27	5,556.46	6,350.93
<b>Total Cost</b>	<b>35,652.31</b>	<b>35,801.81</b>	<b>32,195.02</b>	<b>28,849.77</b>	<b>41,499.33</b>	<b>39,449.70</b>	<b>50,582.11</b>	<b>47,679.26</b>

Source: DES, Ministry of Agriculture & Farmers Welfare

(Contd..)



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

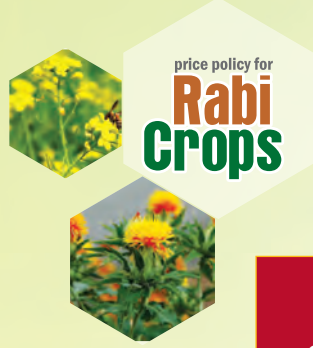
Cost Items	Madhya Pradesh		Rajasthan		Uttar Pradesh		West Bengal	
	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	20,174.39	18,366.86	27,218.70	23,513.59	25,552.37	24,184.42	32,958.54	31,273.25
Human Labour								
Casual	2,459.29	2,974.10	2,224.09	2,288.10	2,425.14	2,566.88	9,876.95	10,377.02
Attached	215.37	109.21	92.54	24.82	5.27	24.63	2.71	3.17
Family	6,501.71	5,470.46	11,840.71	10,025.43	9,955.15	9,921.70	9,667.75	7,399.35
<b>Total</b>	<b>9,176.37</b>	<b>8,553.77</b>	<b>14,157.34</b>	<b>12,338.35</b>	<b>12,385.56</b>	<b>12,513.21</b>	<b>19,547.41</b>	<b>17,779.54</b>
Bullock Labour								
Hired	5.83	51.19	8.01	6.57	1.81	5.38	1,060.47	1,397.44
Owned	60.36	113.37	57.94	128.78	898.90	145.81	487.64	1,099.84
<b>Total</b>	<b>66.19</b>	<b>164.56</b>	<b>65.95</b>	<b>135.35</b>	<b>900.71</b>	<b>151.19</b>	<b>1,548.11</b>	<b>2,497.28</b>
Machine Labour								
Hired	4,400.47	4,557.16	4,915.25	3,877.19	4,426.22	4,369.60	2,677.35	2,016.18
Owned	256.28	196.48	574.87	658.30	254.86	491.34	0.82	2.16
<b>Total</b>	<b>4,656.75</b>	<b>4,753.64</b>	<b>5,490.12</b>	<b>4,535.49</b>	<b>4,681.08</b>	<b>4,860.94</b>	<b>2,678.17</b>	<b>2,018.34</b>
Seed	768.41	380.70	1,287.50	892.15	941.87	850.18	580.27	530.64
Fertilisers and Manure								
Fertilisers	2,908.90	2,839.00	2,463.18	2,287.37	3,158.96	3,038.69	4,295.22	4,816.97
Manure	522.41	0.00	8.67	0.00	11.63	0.00	497.48	274.61
<b>Total</b>	<b>3,431.31</b>	<b>2,839.00</b>	<b>2,471.85</b>	<b>2,287.37</b>	<b>3,170.59</b>	<b>3,038.69</b>	<b>4,792.70</b>	<b>5,091.58</b>
Other Inputs								
Insecticides	319.54	264.26	14.68	19.84	1.42	0.00	478.17	301.80
Irrigation charges	1,316.80	1,020.13	3,264.50	2,896.31	2,996.41	2,338.01	2,627.93	2,330.16
Interest on working capital	414.32	390.80	466.00	408.73	472.64	432.20	705.78	723.45
Miscellaneous	24.70	0.00	0.76	0.00	2.09	0.00	0.00	0.46
<b>Fixed Cost</b>	<b>17,784.23</b>	<b>16,122.24</b>	<b>13,716.08</b>	<b>11,304.45</b>	<b>18,471.71</b>	<b>17,292.90</b>	<b>13,848.50</b>	<b>14,061.86</b>
Rental value of owned land	13,551.66	12,066.58	8,356.54	7,657.15	12,487.71	10,888.77	11,992.74	11,849.09
Rent paid for leased-in land	0.00	0.00	0.00	0.00	1,168.51	555.82	271.93	337.51
Land revenue, cesses & taxes	6.36	6.66	12.90	13.88	7.84	8.54	40.28	54.45
Depreciation on implements & Farm buildings	292.45	300.51	415.08	397.98	810.07	872.47	571.60	575.18
Interest on fixed capital	3,933.76	3,748.49	4,931.56	3,235.44	3,997.58	4,967.30	971.95	1,245.63
<b>Total Cost</b>	<b>37,958.62</b>	<b>34,489.10</b>	<b>40,934.78</b>	<b>34,818.04</b>	<b>44,024.08</b>	<b>41,477.32</b>	<b>46,807.04</b>	<b>45,335.11</b>

Source: DES, Ministry of Agriculture & Farmers Welfare



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

Cost Items	Karnataka		Maharashtra	
	2015-16	2014-15	2015-16	2014-15
<b>Operational Cost</b>	11,535.27	10,138.16	16,356.17	18,133.96
Human Labour				
Casual	2,537.53	3,038.68	604.74	4,069.15
Attached	0.00	0.00	939.51	0.00
Family	706.80	1,912.57	3,606.34	6,476.14
<b>Total</b>	<b>3,244.33</b>	<b>4,951.25</b>	<b>5,150.59</b>	<b>10,545.29</b>
Bullock Labour				
Hired	209.57	516.76	0.00	951.55
Owned	15.88	517.83	4,677.48	3,528.57
<b>Total</b>	<b>225.45</b>	<b>1,034.59</b>	<b>4,677.48</b>	<b>4,480.12</b>
Machine Labour				
Hired	1,263.27	1,487.96	2,517.09	1,344.01
Owned	558.20	789.33	0.00	0.00
<b>Total</b>	<b>1,821.47</b>	<b>2,277.29</b>	<b>2,517.09</b>	<b>1,344.01</b>
Seed				
	1,066.22	646.12	1,017.66	602.37
Fertilisers and Manure				
Fertilisers	21.41	484.53	2,337.30	703.39
Manure	4,400.95	0.00	0.00	0.00
<b>Total</b>	<b>4,422.36</b>	<b>484.53</b>	<b>2,337.30</b>	<b>703.39</b>
Other Inputs				
Insecticides	427.30	495.12	269.69	105.51
Irrigation charges	0.00	0.00	0.00	0.00
Interest on working capital	328.14	249.26	386.36	353.27
Miscellaneous	0.00	0.00	0.00	0.00
<b>Fixed Cost</b>	<b>3,072.14</b>	<b>8,093.14</b>	<b>4,698.47</b>	<b>4,201.96</b>
Rental value of owned land	2,913.06	6,726.96	2,157.20	1,894.82
Rent paid for leased-in land	0.00	0.00	0.00	0.00
Land revenue, cesses & taxes	20.29	8.29	22.68	24.96
Depreciation on implements & Farm buildings	77.56	102.02	290.43	332.91
Interest on fixed capital	61.23	1,255.87	2,228.16	1,949.27
<b>Total Cost</b>	<b>14,607.41</b>	<b>18,231.30</b>	<b>21,054.64</b>	<b>22,335.92</b>



**Annex Table 5.6: Comparison of Cost Projections of Rabi Crops, RMS 2018-19**

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)
<b>Wheat</b>				
Bihar	30	1,528	27	1,308
Punjab	45	1,597	47	1,128
Rajasthan	-	1,175	38	1,218
Telangana	11	3,245	NP	
Uttarakhand	-	3,626	NP	
<b>Barley</b>				
Rajasthan	-	1,157	37	1,120
<b>Gram</b>				
Andhra Pradesh	16	4,382	11	4,127
Bihar	16	3,170	NP	
Rajasthan	-	2,654	9	2,981
Telangana*	14	4,649	11	4,127
<b>Lentil</b>				
Bihar	12	2,977	11	3,023
<b>Rapeseed/Mustard</b>				
Andhra Pradesh	10	3,722	NP	
Bihar	12	3,713	12	2,988
Rajasthan	-	2,948	13	3,045
Telangana	9	3,659	NP	
<b>Safflower</b>				
Telangana	8	3,599	NP	

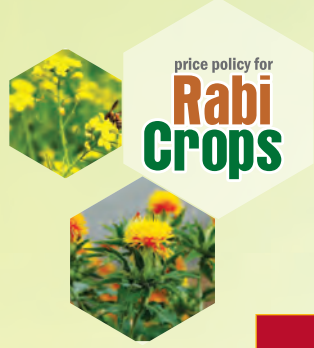
Note: NP: Not Projected due to non-availability of CS estimates or share of production in All India is less than one percent.

\* The CACP projection of Andhra Pradesh (Andhra Pradesh & Telangana united) is considered for Telangana.



**Annex Table 5.7: All-India Projected Costs of Production of Rabi Crops for 2017-18 over RMS 2016-17**

Crops	Cost of Production (₹/qtl)				Percentage Change in Projected Cost (2017-18 over 2016-17)	
	2016-17		2017-18		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	797	1,203	817	1,256	2.5	4.4
Barley	816	1,119	845	1,190	3.5	6.3
Gram	2,241	3,185	2,461	3,526	9.8	10.7
Lentil	2,174	3,360	2,366	3,727	8.8	10.9
Rapeseed & Mustard	1,871	2,773	2,123	3,086	13.5	11.3
Safflower	3,049	3,952	3,125	3,979	2.5	0.7



**Annex Table 6.1: MSP Suggested by State Governments for the Rabi Crops of 2017-18 to be Marketed in 2018-19**

(₹/qtl)

State	Wheat	Barley	Gram	Lentil	R&M	Safflower
Andhra Pradesh			6573		5583	
Assam	2050		4500	4480	4400	
Bihar	2292		4755	4465	5570	
Jharkhand	1700		4500	4400	4000	4000
Odisha	1790		4400	4345	4070	4070
Punjab	2180	1813	4193		3960	
Rajasthan	1750	1650	4400		3800	
Tamil Nadu			4400			
Telangana	4867		6974		5488	5398
West Bengal	2800				5120	

Source : State Replies



# Commission for Agricultural Costs and Prices

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**Commission for Agricultural Costs and Prices**  
Department of Agriculture, Cooperation & Farmers Welfare  
Ministry of Agriculture & Farmers Welfare  
Government of India, New Delhi  
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