

# Price Policy for Rabi Crops

THE MARKETING SEASON 2017-18



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 2016

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**Commission for Agricultural Costs and Prices**

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

भारत सरकार

Government of India

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New Delhi

जुलाई, 2016

July, 2016





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Commission for Agricultural Costs and Prices  
Department of Agriculture, Cooperation  
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## Preface and Acknowledgements

It is my great honour and privilege to present the report of **“Price Policy for Rabi Crops: The Marketing Season 2017-18”**. The report contains Minimum Support Price (MSP) recommendations for the mandated Rabi crops, namely, **wheat, barley, gram, lentil, rapeseed & mustard and safflower**, and non-price recommendations. While making price policy recommendations, the Commission has taken into account several 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 protect interests of both producers and consumers, incentivise farmers to adopt new technologies, lead to stability of prices, and promote sustainability and competitiveness of Indian agriculture.

Summary of Recommendations is followed by Overview of Indian agriculture in Chapter 1. Chapter 2 of the report provides a general overview of the demand-supply and procurement operations. Productivity of Rabi crops is discussed in Chapter 3 and trade competitiveness of Indian agriculture is presented in Chapter 4. Costs and returns during 2012-13 to 2014-15 and cost projections for Rabi Marketing Season 2017-18 including inter-crop price parity issues are analysed in Chapter 5. Non-price and price policy recommendations are given in Chapter 6.

Preparation of this report required the concerted efforts of a number of individuals and institutions. First and foremost, I would like to express my sincere thanks to farmers, farmers’ representatives/associations, senior officers from Central and State Governments, representatives of various agencies/organizations involved in 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. 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 members, officers and staff of the Commission, who contributed to this report. Sincere gratitude goes to Dr. Suresh Pal, Member (Official) and Mr. K. Pradhan, Member (Non-official) for their valuable contribution, support and guidance in preparation of this report. However, special thanks should go 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 the support of Mr. S. R. Joshi (Adviser), Mr. S. N. Tobria (Adviser), Ms. Nutan Raj (Adviser), Mr. R.K. Sharma, Ms. Mamta, Ms. Nidhi Satija, Dr. Harish Kumar Kallega, Mr. Manish Bindal and Mr. Sube Singh who worked tirelessly to support the preparation of this report. I would like to thank them all for their contribution and support.

31<sup>st</sup> July 2016

(Vijay Paul Sharma)





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## Acronyms

A <sub>2</sub>	Actual Paid out Cost
A <sub>2</sub> +FL	Actual Paid out Cost plus Imputed Value of Family Labour
APEDA	Agricultural and Processed Food Products Export Development Authority
APMC	Agricultural Produce Marketing Committee
C <sub>2</sub>	Comprehensive Cost including Imputed Rent and Interest on Owned Land and Capital
CACP	Commission for Agricultural Costs & Prices
CBOT	Chicago Board of Trade
CIP	Central Issue Price
CIPI	Composite Input Price Index
CoP	Cost of Production
CS	Comprehensive Scheme of Studying Cost of Cultivation of Principal Crops in India
CWC	Central Warehousing Corporation
DAP	Di Ammonium Phosphate
DAC&FW	Department of Agriculture, Co-operation and Farmers Welfare
DBT	Direct Benefit Transfer
DCP	Decentralized Procurement
DCCB	District Central Cooperative Bank
DES	Directorate of Economics and Statistics
DFPD	Department of Food and Public Distribution
DGCIS	Directorate General of Commercial Intelligence and Statistics
DGFT	Directorate General of Foreign Trade
DIPP	Department of Industrial Policy and Promotion
DTA	Domestic Tariff Area
EDI	Electronic Data Interchange
e-NAM	Electronic National Agricultural Market
EOU	Export Oriented Units

## Acronyms

EU	European Union
FAI	Fertilizers Association of India
FAO	Food and Agriculture Organisation
FCI	Food Corporation of India
FHP	Farm Harvest Price
FLD	Front-Line Demonstration
FPI	Food Price Index
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GMP	Good Manufacturing Practices
GVO	Gross Value of Output
ha	hectare
HSD	High Speed Diesel
ICAR	Indian Council of Agricultural Research
ICDS	Integrated Child Development Services
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IMD	Indian Meteorological Department
LCS	Land Custom Stations
MEAS	Modernizing Extension and Advisory Services
MEP	Minimum Export Price
MNAIS	Modified National Agricultural Insurance Scheme
MoA&FW	Ministry of Agriculture and Farmers Welfare
MSP	Minimum Support Price
MSR	Market Surplus Ratio
MOP	Muriate of Potash
MT	Metric Tonne
NAFED	National Agricultural Cooperative Marketing Federation
NAIS	National Agricultural Insurance Scheme
NAPCC	National Action Plan on Climate Change
NBS	Nutrient Based Subsidy
NCAER	National Council of Applied Economic Research
NFSM	National Food Security Mission
NGO	Non-Government Organization
N:P:K	Nitrogen : Phosphorous : Potassium
NPOP	National Project for Organic Production
NSC	National Seeds Corporation



NSSO	National Sample Survey Organisation
NWR	Negotiable Warehouse Receipt
OGL	Open General License
PDS	Public Distribution System
PDPS	Price Deficiency Payment System
PMFBY	Pradhan Mantri Fasal Bima Yojana
P-PAS	Paddy Procurement Automation System
Q <sub>1</sub>	Quarter 1
Q <sub>2</sub>	Quarter 2
Q <sub>3</sub>	Quarter 3
Q <sub>4</sub>	Quarter 4
QR	Quantitative Restrictions
qtl	Quintal
RKVY	Rashtriya Krishi Vikas Yojana
R&M	Rapeseed & Mustard
RMS	Rabi Marketing Season
SCH	Single Cross Hybrid
SEAI	Solvent Extractors Association of India
SEZ	Special Economic Zones
SFAC	Small Farmers' Agri-Business Consortium
SUR	Stock-to-Use Ratio
t/ha.	Tonnes per Hectare
TE	Triennium Ending
ToT	Terms of Trade
TPDS	Targeted Public Distribution System
UNO	United Nations Organisation
UPIS	Unified Package Insurance Scheme
USDA	United States Department of Agriculture
VAT	Value Added Tax
WBCIS	Weather Based Crop Insurance Scheme
WP	Wholesale Price
WPI	Wholesale Price Index
WRDA	Warehouse Regulatory Development Authority
WTO	World Trade Organization

## Summary of Recommendations

- S.1 **Indian agriculture** is likely to grow at 1.2 percent in 2015-16 and as per third advance estimates for 2015-16, total foodgrains production is likely to be 252 million tonnes, with rabi foodgrains at 128 million tonnes and wheat at 94 million tonnes. Thus, the country is likely to maintain a comfortable position in terms of food stocks, as wheat procurement reached 23 million tonnes (July 2016). Global outlook for rabi crops for 2016-17 as per FAO assessment looks to be stable and the stocks are likely to improve marginally.
- S.2 **Procurement of wheat** is nearly 30 percent of marketed surplus and most of the procurement (90 percent) is done in Punjab, Haryana and Madhya Pradesh. In the absence of procurement, market prices would have been much lower and thus all the farmers are indirectly benefited from procurement. However, there is a need to increase procurement of wheat in other states, such as Uttar Pradesh (the largest producer), Rajasthan and Bihar.

### Non-Price Recommendations

- S.3 **Production of pulses and oilseeds** can be increased by bridging the gap between potential and actual farm yield. The yield gap reported under the National Food Security Mission ranges from 28 to 55 percent in case of gram in the major producing states. In case of lentil, the gap ranges from 23 to 45.8 percent in different states. Besides remunerative price support, improving availability of quality seeds, cultivation on rice fallows with supplementary irrigation and introduction of pulses in rice-wheat cropping systems and as intercrop with other crops can bridge the demand-supply gap. Since pulses and leguminous oilseeds fix 30-40 kg/ha nitrogen in soil, it is recommended that the farmers should be provided incentives to the extent of Rs.1050/ha as payment for this ecosystem service.
- S.4 **Edible oil imports** at 15.6 million tonnes account for more than 70 percent of consumption in the country. Although imports are necessary to meet the domestic

demand, but excessive reliance on imports shall have significant impact on the domestic prices, which may erode incentive for the producers. Also, increasing domestic supply through technological interventions for higher yield is necessary. The import duty structure and duty differential between crude edible oils and refined oils should be such that the domestic producers and refining industry are protected.

- S.5 **Agricultural wages** and share of human labour in the cost of cultivation are rising and therefore, the Commission is of the view that farm mechanization through grants and institutional credit for purchase of farm machines and their access to small and marginal farmers on custom hiring basis should be promoted. Farm mechanization will also help in increasing input use efficiency and better product handling during harvesting operations.
- S.6 **Water and fertilizers** are two critical factors affecting crop yields. Availability of groundwater is low in water scarce regions like semi-arid tropics and north-west plains, and therefore improved water use efficiency, using water-saving technologies and rainwater harvesting should become an integral part of crop planning. Farmers can also be incentivized for using water saving irrigation practices. Fertilizer use during the last three years has been stable but is likely to increase in 2016-17 with normal rains. However, measures to promote balanced use of fertilizer nutrients, use of organic manure, crop residues and green manuring and promotion of bio-fertilizers should get high priority in agricultural development programmes.
- S.7 **Size of holding** is getting smaller and fragmented, indicating a need for minimising diseconomies of scale through tenancy reforms. The Government has accorded priority to implementation of tenancy reforms and a Model Act to legalise tenancy is under consideration. This will improve access of land to marginal and small farmers thereby optimising use of their resources. This reform should be supported with measures to enhance tenant farmers' access to technology, inputs and services like credit, insurance, extension and other benefits primarily available to land owners.
- S.8 **The e-National Agricultural Market**, connecting APMCs through a portal, is an important initiative of the Government. This effort should be supplemented with necessary infrastructure for product grading and testing along with dissemination of price information to farmers. This will facilitate price discovery, empower farmers and promote market integration. Also, market taxes should be reduced and restricted to a maximum five percent of MSP (2016-17) for the next five years in order to facilitate inter-market transactions and reduce cost of procurement.
- S.9 **Risk in agriculture** is increasing because of vagaries of weather and market uncertainty. Therefore, wider adoption of **Pradhan Mantri Fasal Bima Yojana** is necessary to protect farmers against crop losses. Low premium rate and proposed speedy settlement of claims should attract farmers to the Scheme.
- S.10 **Database** of market information and prices should be strengthened for wider dissemination of market information and promotion of market integration.



Horticultural and livestock products now form more than half of the agricultural output. Although these are non-mandated commodities, the Commission reiterates its recommendation for strengthening of database on production, marketing and prices of these commodities. Similarly, computerization of procurement operations and e-payment to farmers will improve efficiency of the market interventions.

**S.11 Role of States in decentralized procurement** in the states where reach of central agencies is limited should be evolved to improve farmers' access to markets, reduce market risks and encourage farmers to grow these crops. Also, the facilities for cooperatives and FPOs involved in procurement of paddy and wheat in some states like Bihar and Madhya Pradesh should be strengthened. The states have larger role in strengthening technology transfer system and therefore efforts should be intensified to bridge the yield gap in pulses and bring green revolution in eastern India.

**S.12 Considering the overall demand and supply** situation of various crops, cost of production, domestic and world prices, and other related factors, the Commission recommends the MSPs for six rabi crops for the RMS 2017-18 as given in the Table-6.1. These MSPs will cover A<sub>2</sub>+FL costs of 100 percent production of barley, gram, lentil; 99 percent of wheat and 98 percent of R&M.

**Table S.1: MSPs Recommended for RMS 2017-18**

(Rs./qtl)

Crops	Projected Costs (2017-18)		MSP (Marketing Season)		Recommended MSP for RMS 2017-18	Gross Margin over (A <sub>2</sub> +FL) w.r.t. MSP recommended in 2017-18 (percent)
	A <sub>2</sub> +FL	C <sub>2</sub>	2015-16	2016-17		
Wheat	797	1203	1450 (3.57)	1525 (5.17)	1625 (6.56)	103.89
Barley	816	1119	1150 (4.55)	1225 (6.52)	1325 (8.16)	62.38
Gram	2241	3185	3175 (2.42)	3425 (7.87)	3800 (10.95)	69.57
Lentil	2174	3360	3075 (4.24)	3325 (8.13)	3800 (14.29)	74.79
R&M#	1871	2773	3100 (1.64)	3350 (8.06)	3600 (7.46)	92.41
Safflower	3049	3952	3050 (1.67)	3300 (8.20)	3600 (9.09)	18.07

Note: # corresponding to oil content of 35 percent

Figures in parenthesis represent increase in MSP over the previous year

\*\*\*\*\*



## Chapter 1

### Overview

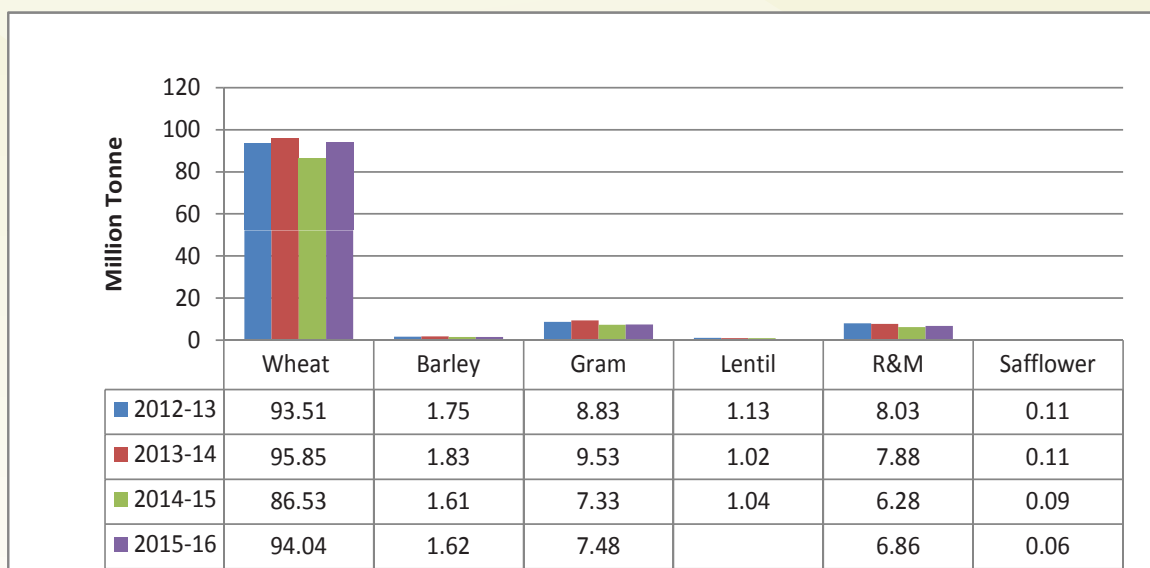
- 1.1 Although the share of agriculture in India's gross domestic product (GDP) has progressively declined to about 15 percent, it still employs close to half of workforce and the number of operational holdings has increased from about 106.6 million in 1990-91 to 138.3 million in 2010-11. Therefore, importance of agriculture in India's economic and social development goes well beyond its contribution to national GDP. Given the importance of agriculture sector in socio-economic development of the economy, the Government has started several initiatives and programmes for sustainable development of agriculture. The Prime Minister has called upon all stakeholders, including farmers, states and the Union Government to double farmers' income by 2022, when the country completes 75 years of independence. Therefore, suitable strategies are needed to make agriculture **productive, profitable, competitive, diversified, and sustainable**.

### Performance of Agricultural Sector: Production and Trade

- 1.2 Total foodgrains production in the country has been almost stable at 252.2 million tonnes in 2015-16 (252 million tonnes in 2014-15) due to deficit monsoon during 2014-15 and 2015-16, by about 12 percent and 14 percent, respectively. This has resulted in fall in production during last two years compared with a record foodgrains production of 265.04 million tonnes in 2013-14. Kharif foodgrains production recorded a fall of about 3.2 percent, while rabi foodgrains recorded an increase of 3.5 percent compared to 2014-15. The production of rice has declined by 2 per cent in 2015-16, from about 105.5 million tonnes in 2014-15 to 103.4 million tonnes, whereas production of wheat has increased by 8.7 percent, from 86.53 million tonnes to 94.0 million tonnes during the same period. Total cereal production has recorded a marginal increase at 235.2 million tonnes with an increase of 3.7 percent in rabi cereals and a fall of 3.1 percent in kharif cereals in 2015-16. However, production

of coarse cereals has declined by nearly 12 percent, from 42.86 million tonnes in 2014-15 to about 37.8 million tonnes in 2015-16, with major fall (-17.2%) in rabi coarse cereals and a reduction of 9.8 percent in kharif coarse cereals. Total pulses have shown a marginal decline of 0.5 percent from 17.15 million tonnes in 2014-15 to 17.06 million tonnes in 2015-16. Among pulses, rabi pulses production recorded an increase of 1.3 percent while kharif pulses declined by 4.2 percent in 2015-16. Total oilseeds production has declined by 5.9 percent, at 25.9 million tonnes (down from 27.5 million tonnes in 2014-15) with an increase of 4.8 percent in rabi and a fall of 10.5 percent in kharif season. Chart 1.1 depicts the production of major rabi crops during 2012-13 to 2015-16. It is evident from the Chart that production is highly concentrated towards wheat, accounting for more than 70 percent of total rabi foodgrains production, at the cost of pulses and oilseeds, whose domestic demand is consistently growing over the years, thereby, justifying the need for crop diversification, mainly towards pulses and oilseeds.

**Chart 1.1: Production of Major Rabi Crops, 2012-13 to 2015-16**

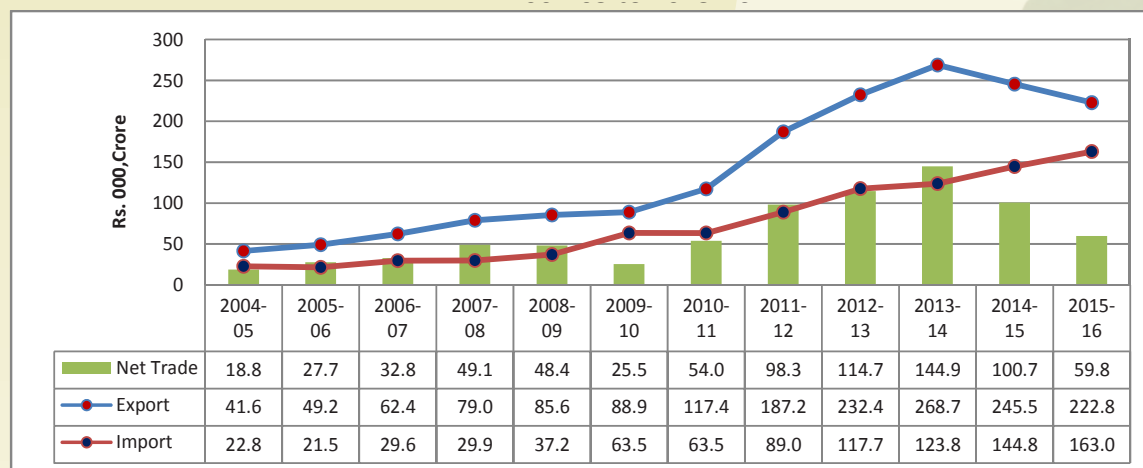


Source: DES

- 1.3 Indian agri-exports, which experienced significant increase during 2009-10 to 2013-14, recorded a continuous decline during the last two years, 2014-15 and 2015-16. In contrast, agri-imports witnessed a steep increase, from Rs. 123.8 thousand crore in 2013-14 to 163 thousand crore in 2015-16, an increase of about 32 percent. There has been unprecedented increase in imports of pulses and edible oils during the last 2-3 years due to widening gap between stagnant domestic production and rising consumption in the country. Imports of pulses have more than doubled in the last three years, from Rs.12.4 thousand crore in 2013-14 to 25.6 thousand crore in 2015-16 and edible oils imports from 56.8 thousand crore to 68.6 thousand crore during the same period.



**Chart 1.2: Trends in Agricultural Exports, Imports and Net Trade in India, 2004-05 to 2015-16**



Source: DGCIS, Kolkata

## Central Pool Stocks

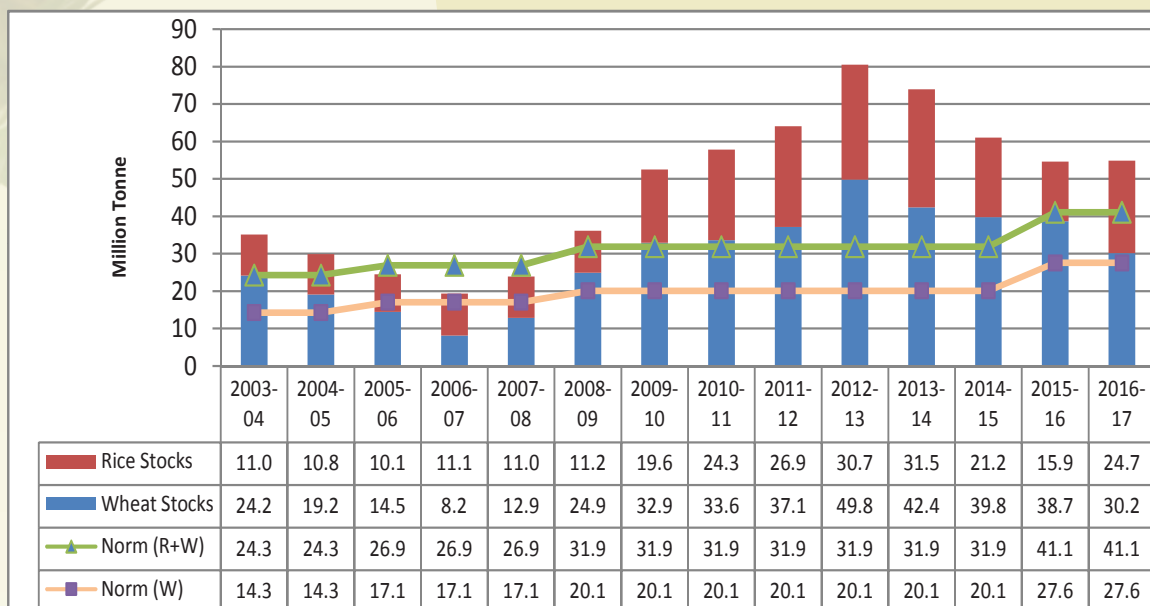
1.4 The revised buffer stock norms of foodgrains in the Central Pool fixed by Government of India are given in Table 1.1. As against the buffer stock norm of 41.12 million tonnes (13.54 million tonnes of rice and 27.58 million tonnes of wheat) as on 1<sup>st</sup> July, total foodgrains stocks in Central Pool were 54.85 million tonnes consisting of 24.67 million tonnes of rice and 30.18 million tonnes of wheat as on 1<sup>st</sup> July, 2016 (Chart-1.3). The foodgrains stocks have shown a consistent decline during last five years, from a peak of over 80 million tonnes in 2012-13 to 54.85 million tonnes in 2016-17. There has been significant decline in wheat procurement during 2016-17. Total procurement of wheat as on 1<sup>st</sup> July 2016 was about 22.9 million tonnes, compared with about 27.9 million tonnes during 2015-16. Uttar Pradesh (64.6%), Madhya Pradesh (44.5%) and Rajasthan (41.4%) have recorded a significant decline in wheat procurement during 2016-17. Total stocks of wheat were 30.18 million tonnes in July 2016 against 38.68 million tonnes in July 2015 and the buffer stock norms of 27.58 million tonnes on 1<sup>st</sup> July.

**Table 1.1: Buffer Norms of Foodgrains (million tonnes) in Central Pool**

As on	Total Stocks	Of which, Wheat
1 <sup>st</sup> July	41.12	27.58
1 <sup>st</sup> October	30.77	20.52
1 <sup>st</sup> January	21.41	13.80
1 <sup>st</sup> April	21.04	7.46

Source: DFPD

**Chart 1.3: Total Foodgrain Stocks in Central Pool, 2003-04 to 2016-17**

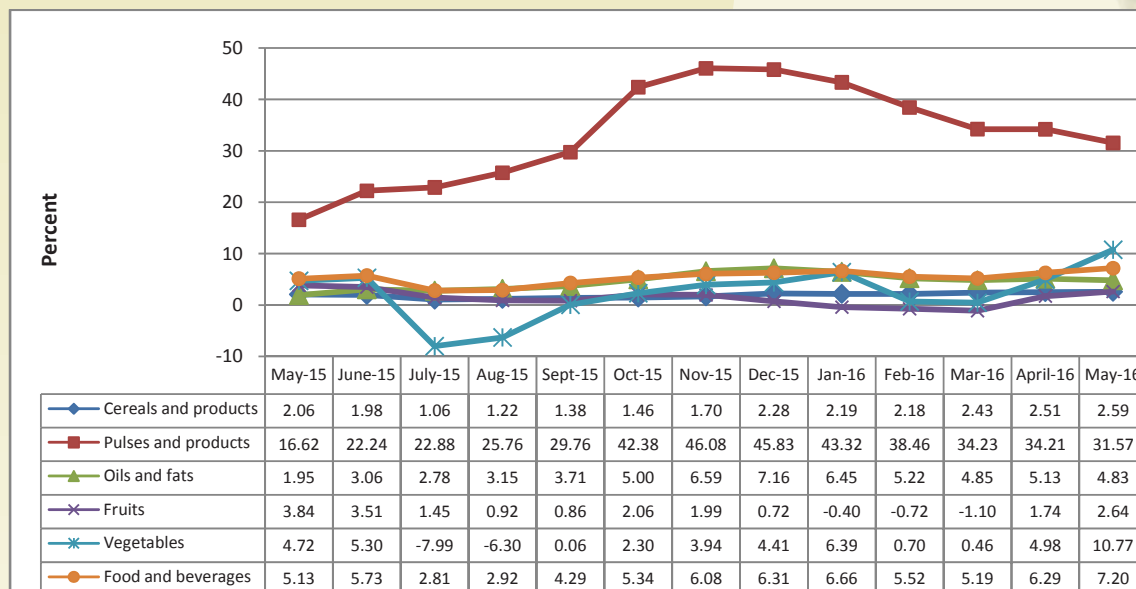


Source: FCI and DFPD

## Food inflation

1.5 Consumer Food Price Inflation (on point to point basis) has reached a nearly two-year high at 7.55 in May 2016 (7.75 in rural and 7.24 for urban area), mainly driven by rising prices of pulses, sugar, vegetables and spices. Inflation in respect of cereals, oils and fats, fruits and food and beverages has been in the range of -1.1 percent (fruits) in March 2016 to 7.2 percent (food and beverages) in May 2016 during the period May 2015 to May 2016. However, inflation in respect of pulses and vegetables has witnessed high fluctuations during the same period. Pulses have recorded an inflation of 16.6 percent in May 2015, increased to a peak of 46.1 percent in Nov 2015 and declined since then and reached at 31.57 percent in May 2016 indicating the need of enhanced production along with an effective supply chain management of pulses. In case of vegetables, inflation ranged between -8 percent in July 2015 to 10.8 percent in May 2016 with wide fluctuations in the interim period. Annual Inflation rate based on consumer price index in case of egg, meat and fish group and sugar and confectionary is 9.13 percent, 8.67 percent and 13.96 percent respectively in May 2016 as compared to last year.

**Chart 1.4: Monthly Inflation, May 2015 to May 2016 (CPI Based)**



Source: MoSPI

## Land Resources

1.6 Declining availability of agricultural land shrinking farm size and fragmentation, as a demographically-induced change in landholding structure are major problems of Indian agriculture. The average farm size has declined to 1.15 ha (0.37 ha in case of marginal farmers) in 2010-11 as compared to 2.28 ha in 1970-71. Therefore, there is a need to increase effective farm size either through land consolidation and/or appropriate land tenancy reforms. The land tenancy can be used as an effective tool, which benefits both lessees through increased farm incomes and lessors through income from rent payments for their land. However, the outright ban/restrictions on tenancy (leasing) in many states has perverse effects and leads to concealed tenancy arrangements. As per the 'Report of the Expert Committee on Land Leasing' under the chairmanship of Dr. T. Haque, large number of landless and marginal land owners/farmers lease in more land than they lease out and actual cultivators/tenants do not have any right or security of tenure. Informal tenants are most insecure, as they either have short duration oral leases or get rotated from plot to plot each year so that they cannot prove continuous possession of any particular piece of land for any specified period which could give them occupancy rights. This creates a disincentive to tenant farmers to make any investment in land improvement for productivity enhancement. Legalization of land leasing would ensure security of land ownership rights for the land owners, which in turn would provide security of tenure to the tenants. The Commission is of the considered opinion that there is a need to have a re-look at land tenancy policies and Model Agricultural Land Leasing Act as suggested by the Haque committee can provide solutions to some of problems associated with existing tenancy laws.

## Utilization of Rainfed Rice Fallows and Bunds

- 1.7 It is a common practice among farmers to leave the rice area fallow in the rabi season after harvest of rice. According to baseline survey conducted by ICRISAT, approximately 12 million ha of 40 million ha rice area cultivated during the kharif season remains uncultivated in the rabi season. Of the total rice fallow area, about 73 percent (8.6 million ha) in Bihar, Chhattisgarh, Madhya Pradesh and West Bengal provide immense scope for cultivation of second crop, mainly pulses and oilseeds on available soil moisture after harvest of rice.
- 1.8 As lack of irrigation facilities is main impediment to production of another crop in the rice fallows, residual moisture left in the soil at the time of rice harvest is often sufficient to raise short-duration pulses and oilseed crops and thus rice fallows can be converted into productive land. Introduction of short duration pulses like green gram, lentil, etc. and oilseeds in rice fallows can augment domestic availability and will also help in restoring the soil health. In several areas in Indo-Gangetic plains and North-East, people don't grow any crop after rice or wheat. The rice-wheat acreage in Indo-Gangetic plains is about 10 million hectares and if short duration varieties of pulses are grown in these areas, we can produce additional 4-5 million tonnes of pulses. Some states like Bihar, Chhattisgarh and Odisha have started this practice under NFSM-Pulses for growing moong, urad and arhar on rice fallows and bunds and yielded positive results. Government should, therefore, take initiatives to support cultivation of pulses in these fallows to increase production of pulses, which is required to bridge the demand supply gap.

## Bed System of Wheat Cultivation

- 1.9 Conventional flat planting of wheat is mostly irrigated by flood irrigation, which leads to inefficient use of fertilisers due to poor aeration and leaching. The practice also results in lower water use efficiency and crusting of the soil surface. Bed planting of wheat cultivation saves water as also improves fertilizer use efficiency and grain yield. Raised-bed planting facilitates irrigation before sowing and helps in weed control prior to planting.
- 1.10 During the interactions with the State government officials and farmers, it was reported that adoption of this system reduces seed, water and fertilizers requirements but gives higher yield and thus there is an urgent need to promote this method as currently very few farmers are aware of this technique.

## Water Productivity

- 1.11 Irrigation accounts for more than 80 percent of total water use in India, therefore, judicious use of water in agriculture will have significant impact on the overall

availability of water. However, most state governments have been content with subsidising electricity for pumping irrigation water and surface water charges are very low, which lead to inefficiencies. Although area under irrigation has increased but increase in irrigated area does not appear to be commensurate with the increase in expenditure on irrigation. Moreover, there is a gap between irrigation potential created and its utilization, which seems to be widening over time. The Commission has recommended in its earlier Price Policy Reports that economy in water use in agriculture should be encouraged by fixing quantitative ceilings on per hectare use of both water and electricity. If some farmers use water/electricity less than the ceilings fixed for them, they should be incentivized by cash rewards equivalent to unused units of water/power at the rates of their domestic resource costs. This would encourage farmers to use drip irrigation and would enhance production per drop of water bringing us closer to the concept of *more crop per drop*. An alternative measure could be to allocate power and water quota on per ha basis, which would facilitate economical usage of water among farmers. If usage is more than allocated quota, power and water could be charged at full cost pricing. Further, drip and sprinklers should be promoted aggressively to save around 40-50 per cent water which will help realizing the idea of *har khet me paani*. In addition, water scientists should explore innovative water saving methods and how global warming and increased rainfall variability affect the demand for irrigation.

## Risk Management

- 1.12 Agricultural production is subject to a variety of risks and uncertainties, which directly affect farmers' production decisions and welfare. Weather conditions and market developments cannot be controlled by the farmer but have a direct impact on the farm output and income. Indian agriculture is more prone to such risks as still more than half of cropped area is unirrigated, markets and infrastructure are not very well developed, particularly for perishable commodities and majority of farmers are small and marginal. Managing agricultural risks has been an important part of agricultural policy objectives and the government has introduced several crop insurance schemes over the past decades but with limited success. Dr. P. K. Mishra Committee (2014) reviewed the performance of major crop insurance schemes and made several recommendations. In order to make crop insurance simpler and cheaper for the farmers and to provide them with effective insurance services, a Central Sector Scheme of Pradhan Mantri Fasal Bima Yojana (PMFBY) has been approved by the Government of India replacing NAIS and MNAIS. The scheme covers sowing/planting risks, post-harvest losses and local calamities. However, success of this scheme will depend on network of weather stations, estimation of crops losses and budgetary provisions for premium subsidy by the States.



## e-National Agricultural Market (e-NAM)

1.13 The present agri-marketing system in the country is plagued with severe institutional and infrastructural constraints. In order to overcome these constraints and create a unified national market for agricultural commodities, e-NAM, the e-trading platform for the National Agriculture Market was launched by the Government in April 2016 and 21 mandis from 8 States joined e-NAM. The e-NAM would provide a platform to have a transparent and stable price discovery at national level, transforming the market into a competitive one and ultimately benefit the farmers. It will cover selected 585 regulated wholesale markets in States/UTs by 2017-18 and provide a single window service for all APMC related information and services. This will facilitate more direct interface between farmers and buyers by reducing number of intermediaries. This will benefit the farmers in terms of better selling options, competitive returns and reasonable and stable prices to the consumers. However inter-state variations in the rates of taxes/levies and commissions add to the price differentials across states even for the same grade/quality commodity. Unless common taxes/levies are fixed at all India level with free inter-state movement of commodities, physical integration of all markets of the country would be difficult to realize.

1.14 The components of NAM include transparent sale transactions and price discovery, liberal licensing to intermediaries, one license for a trader valid across all markets in the State, harmonization of quality standards, and single point levy of market fees. Hence the Centre will have to initiate dialogue with States to establish necessary infrastructure facilities and amend existing rules for successful implementation of the Scheme.

## Agriculture Credit

1.15 The Government has taken many initiatives for strengthening of agricultural credit delivery for providing credit at affordable rates of interest to farmers. The Government is giving interest subvention to provide short-term crop loans upto Rs. 3 lakh to farmers at the interest rate of 7 percent per annum and in case of timely repayment, interest rate is 4 percent. There has been an impressive growth in agricultural credit flow from 1.25 lakh crore to 8.45 lakh crore during 2004–05 to 2014–15. However, while crop loan increased more than eightfold (0.76 lakh crore to 6.36 lakh crore) during the same period, while term loan (investment credit) increased only fourfold (0.49 lakh crore to 2.05 lakh crore). The share of term loan in agricultural credit has declined from 39.3 percent in 2004-05 to about 19.5 percent in 2013-14 but increased to 24.3 percent in 2014-15. Since investment credit is a major driver of private capital formation in agriculture, a consistent decline in its share and slow



growth trend raises concerns about sustainable growth in agricultural production and productivity. Interest rate subvention on production credit seems to have played a critical role in it. A continuous and steady increase in the share of term loan would lead to increase in capital formation in agriculture, and the consequent increase in agricultural productivity and farm income. Therefore, policy interventions such as interest rate subvention on term loan are needed to increase flow of investment credit in agricultural sector.

## Fertilizer Use and Subsidy Reforms

1.16 The Nutrient Based Subsidy (NBS) Policy is being implemented from April 2010 and under this policy, a fixed amount of subsidy decided on annual basis, is provided on subsidized Phosphatic and Potassic (P&K) fertilizers depending on its nutrient content. At present 22 grades of P&K fertilizers are covered under the NBS policy. Under NBS policy, the MRP of urea is statutorily controlled by the Government and is Rs. 5360 per MT while prices of other fertilizers are fixed by the manufacturers/marketers based on demand supply situation. Currently, the price of DAP (the primary source of P) is about 4.5 times that of urea and MOP (the primary source of K) is more than three times than urea prices. As a consequence of this price differential between N, P and K, the usage ratio has deteriorated from about 4.3:2.0:1.0 in 2009-10 (pre-NBS period) to 8.0:2.7:1.0 in 2013-14, which marginally improved to 6.8:2.4:1.0 in 2014-15. This imbalance in use of fertilizer nutrients has adverse impact on soil health and crop productivity. Moreover, dependence on imports has increased manifold during the last decade from about 2 million tonnes in 2003-04 to about 13 million tonnes in 2011-12 and 9.3 million tonnes in 2014-15. Import of urea, at 8.75 million MT, DAP at 3.82 million MT and MOP at 4.18 million MT during 2014-15, represented an increase of 23.4 percent, 17 percent and 31.4 percent, respectively, over 2013-14. Nutrient Based Subsidy (NBS), which was intended to promote a balanced use of fertilizers and growth and diversification of indigenous industry, has failed to do so. Due to low prices, urea is illegally diverted to neighbouring countries and for industrial use. However, government's recent initiative of neem-coating urea will reduce diversion to industrial use and also improve fertiliser use efficiency and crop productivity. Economic Survey 2015-16 suggested direct transfer of fertiliser subsidy to farmers. It's a good initiative but there are several practical problems, such as informal tenancy, identification of beneficiaries due to issues with land records, etc., in implementing this scheme. It is suggested that direct transfer of subsidy can be implemented on pilot basis in those states where tenancy is not prohibited and have proper land records.

## Farm Mechanization

1.17 Farm mechanization is essential to increase production, productivity and profitability in agriculture through timely farm operations and to augment labour

productivity in farming. In order to achieve it, Commission has been emphasising that 'Custom Hiring Model' through establishing Farm Machinery Banks should be promoted to offset the adverse economies of scale due to predominance of small landholding and high investment cost of ownership.

### **Modernizing Extension and Advisory Services (MEAS)**

1.18 Strengthening of India's agricultural research and extension systems is one of the most important needs for sustainable agricultural growth. While interacting with farmers it was reported that agricultural research and extension services have not produced desired results and farmers need government support in promoting agriculture and allied activities as an enterprise rather than just price support. For instance, there exist large yield gaps in all crops. For example, in case of wheat, Punjab and Haryana are the only two major states which have realised more than 86 percent of yield potential of wheat (based on average yield under Front-Line Demonstrations and the state average). Other wheat producing states like Uttar Pradesh (38.3 percent), Madhya Pradesh (46.2 percent), Rajasthan (32.6 percent) and Bihar (45.4 percent) have very high yield gaps. This gap calls for ensuring timely availability of inputs and services and better extension and advisory services to farmers. Narrowing yield gap will increase crop productivity, improve land and labour use, reduce production costs and increase farm incomes. The government has launched a Sub-Mission on Agricultural Extension to create awareness and enhance use of appropriate technologies in agriculture and allied sectors.

### **Addressing Pesticides Residue Related Issues**

1.19 Recently, increased attention has been focused on pesticides/chemical residues in food. To tackle the problem at the farm level itself, awareness among farmers to use safe and permissible pesticides, adoption of Good Agricultural Practices (GAP) and training for processing units for adoption of Good Manufacturing Practices (GMP) should be organized. This will help in expanding international market for domestic producers.

### **Solar/Renewable Energy**

1.20 India is a fit case to exploit its abundant solar energy in farm sector and help in power/electricity saving. Solar energy has the advantage of being available in plenty, with about 5000 trillion kwh per year incident over India's land area with most parts receiving 4-7 kwh per sq. m per day. It is environment friendly and cost effective in the long run. Renewable energy and farming are a winning combination and therefore solar along with wind and biomass energy can be harvested forever, providing farmers with a long-term source of income. Renewable energy can be used on the farm to replace other fuels or even sold as a cash crop. It is one of the

most promising and important opportunities for value added products in agriculture. It has been said that “anything that can be generated from a barrel of oil can be generated from biomass”. Solar energy can be used in agriculture in a number of ways, saving money, increasing self-reliance, and reducing pollution. Its uses will help in bringing down the input cost and enhancing return to farmers.

## Outlook for Indian Agriculture in 2016-17

1.21 Despite two consecutive drought years, foodgrains production in the country has marginally increased during 2015-16 and is targeted to increase by about 7 percent to 270.1 million tonnes in 2016-17. In April, the India Meteorological Department (IMD) had predicted the monsoon be “above normal” after two consecutive droughts, with country receiving 106 per cent of the Long Period Average (LPA) rain, which is the first time since 1999 that “above normal” prediction was made by IMD. In view of expected good monsoon, target of foodgrains production is set at 270.1 million tonnes for the year 2016-17. The target for rice production has been set at 108.50 million tonnes, while, it is 96.5 million tonnes for wheat, 20.75 million tonnes for pulses, 35 million tonnes for oilseeds and 355 million tonnes for sugarcane. Against above normal prediction, the country received 85.5 mm rainfall (18 percent below the Long Period Average) against the normal rainfall of 103.8 mm during June 1-22, 2016. However, rainfall activity is likely to increase in the coming days and cover most parts of the country. Kharif sowing is expected to pick up as the monsoon progresses and covers the rest of the country while an increased water level in reservoirs is expected to have a positive impact on rabi output. However, level of foodgrains stocks in the Central Pool particularly wheat is going to be lower than last year but sufficient to meet the operational requirements under targeted public distribution scheme (TPDS) and other welfare schemes and food security reserves.

## Global Outlook

1.22 According to FAO Food Outlook, June 2016, global food commodity markets are expected to be mostly stable, supported by adequate supplies and prospects remain favorable for 2016-17. Global wheat production is forecast to be around 724 million tonnes in 2016-17, 10 million tonnes less than 2015-16 level. The world stock-to-use ratio of wheat is expected to be marginally lower than 2015-16. As per Chicago Board of Trade (CBOT), wheat future prices are expected to be higher than last year prices. For example, wheat futures for September delivery at the CBOT were USD 160 per tonne in end-May, marginally up from April 2016 and about 12 percent higher than in May 2015, signaling an upward movement of prices in 2016-17 marketing season. Based on FAO’s latest assessment of supply and demand prospects, coarse grain markets are likely to be generally subdued during 2016-17 season. For oil crops and products, the forecasts for 2015-16 season indicate a tightening in the

global supply-and-demand balance. World rape and cottonseed output is expected to be lower and soybean forecast for South America is also lower due to adverse El Niño-related and weather conditions, which are expected to result in a contraction in global oilseed production. In addition, world output of palm oil is also expected to shrink for the first time in 18 years, thereby, international prices of oilseeds and oilseed products are expected to be high over the coming months. The FAO Food Price Index (2002-04=100) averaged 155.8 points in May 2016, which was 3.2 points higher than in April 2016, and marked the fourth consecutive month of rise in the value of the FAO FPI. The Food Price Index has started moving up since January 2016.

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## Chapter 2

# Demand-Supply and Procurement Operations

- 2.1 Rabi foodgrains production has witnessed an increase of around 3.5 percent inspite of a fall in area by 4 percent essentially due to 7.8 percent growth in yield during 2015-16. Production of wheat has increased by 8.7 percent with a fall of 4.5 percent area under it, demonstrating an increase of 13.8 percent in its yield. An increase of 8.4 percent in the yield of barley has resulted in a marginal increase in its production over the last year though area under the crop has recorded a fall of 7.4 percent. Area under gram has increased by 3.3 percent but production has recorded an increase of 2.0 percent due to fall in its yield. However total rabi pulses have shown a slight increase in area, production and yield during 2015-16. Rapeseed & Mustard has recorded an increase of 9 percent in its production and yield with a marginal increase of around 1 percent in area during 2015-16. Safflower has registered a fall of 30.2 percent in its production due to 17.7 percent fall in area and yield lower by 15.1 percent during 2015-16 as compared to the previous year.
- 2.2 According to USDA, in 2015-16 world production of wheat and barley has increased by 1.0 percent and 4.8 percent respectively whereas that of coarse grains, rapeseed and oilseeds has fallen by 3.5 percent, 4.4 percent and 2.7 percent respectively.

### Stocks-to-Use-Ratios (SURs)

- 2.3 Stocks-to-Use-Ratios (SURs) reflect the annual total availability and use scenario of the crop. Based on the table on availability of wheat and pulses given in detail in Annex Table 2.1, SUR of wheat and pulses has been presented in Table 2.1. It shows that SUR of wheat has reduced from 27.1 percent in 2012-13 to 14.8 percent in 2015-16 due to low production in 2014-15. However it has increased to 19.6 percent

in 2016-17 indicating more comfortable situation in terms of stocks and prices. SUR of total pulses has declined from 8.8 percent in 2012-13 to 2.9 percent in 2016-17, indicating a tight position of its stocks, which may lead to hike in its prices in the coming year.

**Table 2.1: Stocks-to-Use-Ratios of Wheat and Total Pulses** (Percent)

Crop/Year	2012-13	2013-14	2014-15	2015-16	2016-17E
Wheat	27.1	18.7	19.3	14.8	19.6
Total Pulses	8.8	7.4	6.6	9.1	2.9

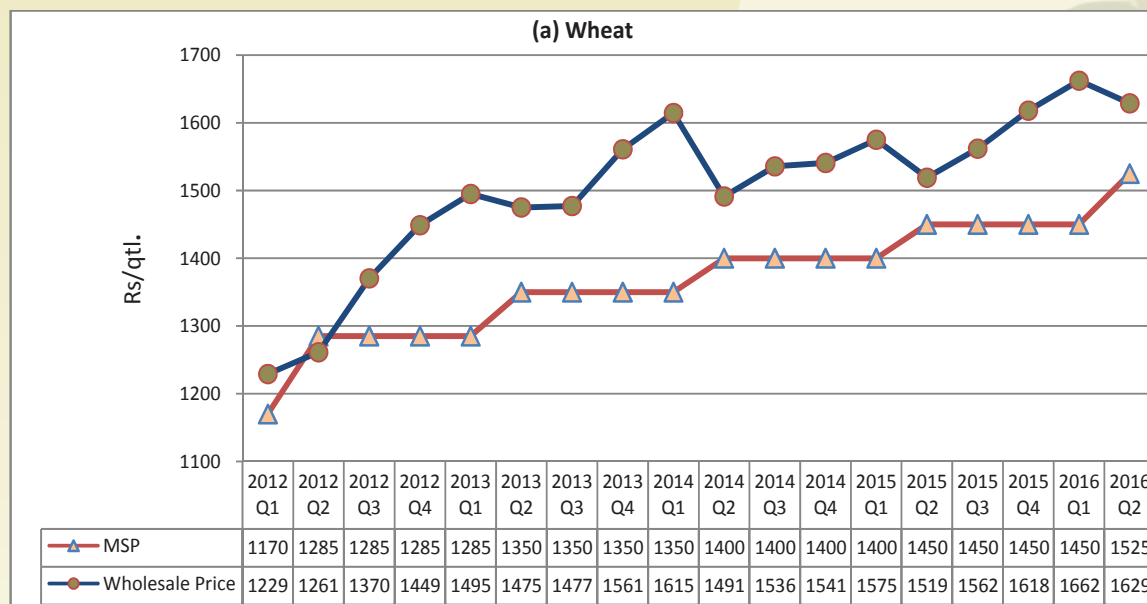
Note: E-Estimated

Source: NCAER, DES, DFPD and DGCIS

### Wholesale Prices and MSP

- 2.4 Price is a barometer reflecting the demand supply management of the commodity in the market. Agriculture is no exception to this. However to achieve price discovery, capturing the actual picture of the availability and demand of various crops, a well-developed and accessible market structure which provides fair and equal competition/opportunities to all participants is essential. In absence of this, to prevent the farmers from extreme downward fluctuations in prices of their crops, MSP as an instrument of price policy provides the lowest bar to the price volatility.
- 2.5 Chart 2.1 shows the behavior of market prices and MSP of six rabi crops during 2012 to 2016. It is evident that wholesale prices of major rabi crops are generally ruling above their respective MSPs except gram for some specific periods and safflower in recent years. The price trends world over are subdued as FAO's Food Price Index has shown a fall of 6.8 percent from 167.2 in May 2015 to 155.8 in May 2016.
- 2.6 Chart 2.1a highlights a fluctuating trend in the price of wheat in different quarters since Q<sub>1</sub> of 2012 to Q<sub>2</sub> of 2016 with a shallow dip in Q<sub>2</sub> of 2016.

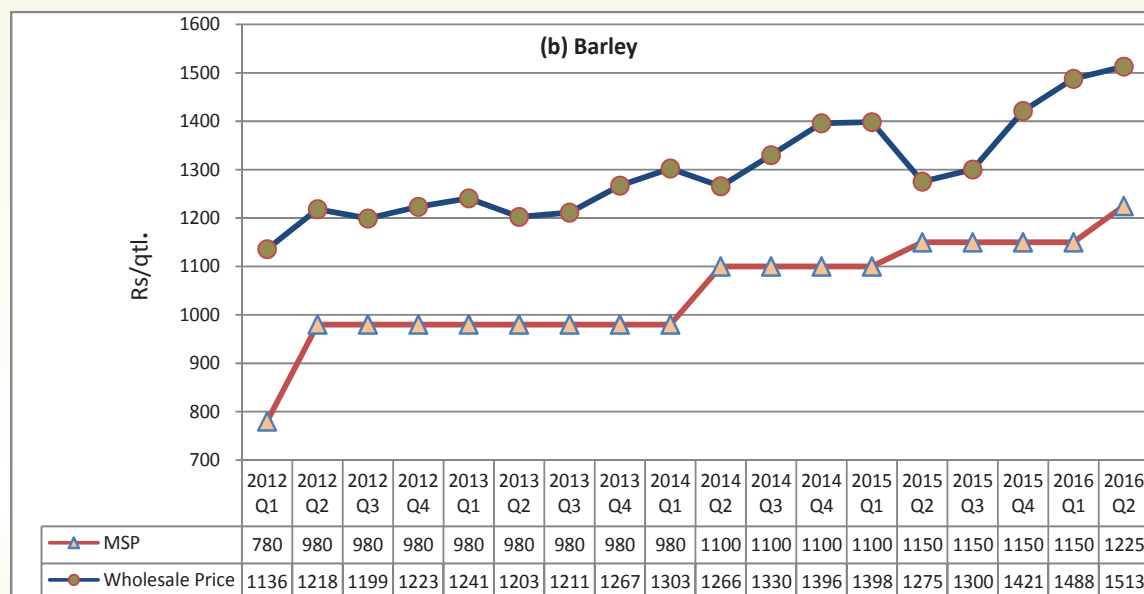
**Chart 2.1: Wholesale Prices vis-à-vis MSPs of Rabi Crops (2012 – 2016)**



*Note: Average wholesale price of Bihar, Haryana, MP, Punjab, Rajasthan and UP (These states cover 91 percent of production)*

*Source: DES*

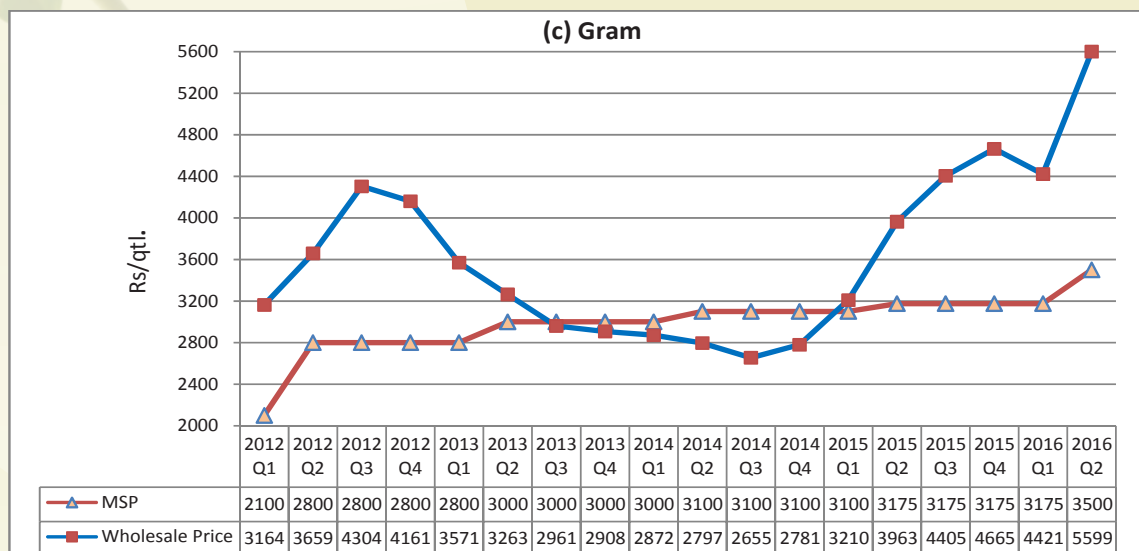
2.7 Price of barley has been in the range of Rs.1136/qttl in Q<sub>1</sub> of 2012 to Rs. 1513/qttl Q<sub>2</sub> of 2016 as depicted in chart 2.1b. The chart also shows that price of barley has been steadily rising over the last three years with minor fluctuations but has always remained above MSP.



*Note: Average wholesale price of Haryana, Rajasthan and UP (These states cover 85 percent of production)*

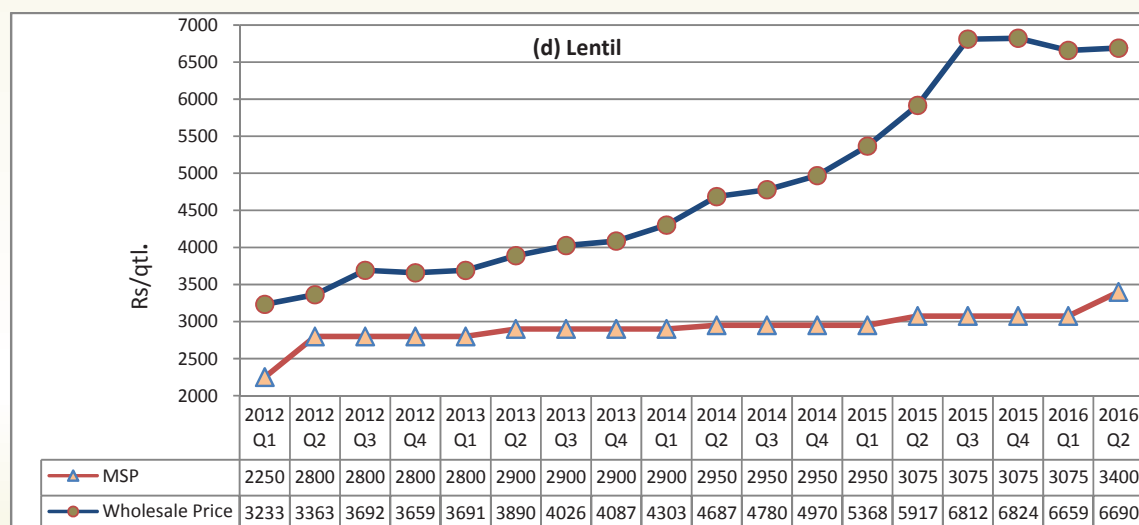
*Source: DES*

- 2.8 The price of gram has shown sharp fluctuations during the period of Q<sub>1</sub> of 2012 to Q<sub>2</sub> of 2016 with the lowest price recorded at Rs.2655/qtt in Q<sub>3</sub> of 2014 and highest price recorded at Rs.5599/qtt in Q<sub>2</sub> of 2016. The price had dipped below MSP during Q<sub>3</sub> of 2013 to Q<sub>4</sub> of 2014 but shot up sharply since then except Q<sub>1</sub> of 2016 when it recorded a slight fall (Chart 2.1c).



Note: Average wholesale price of Karnataka, MH, MP, Rajasthan and UP (These states cover 82 percent of production)  
Source: DES

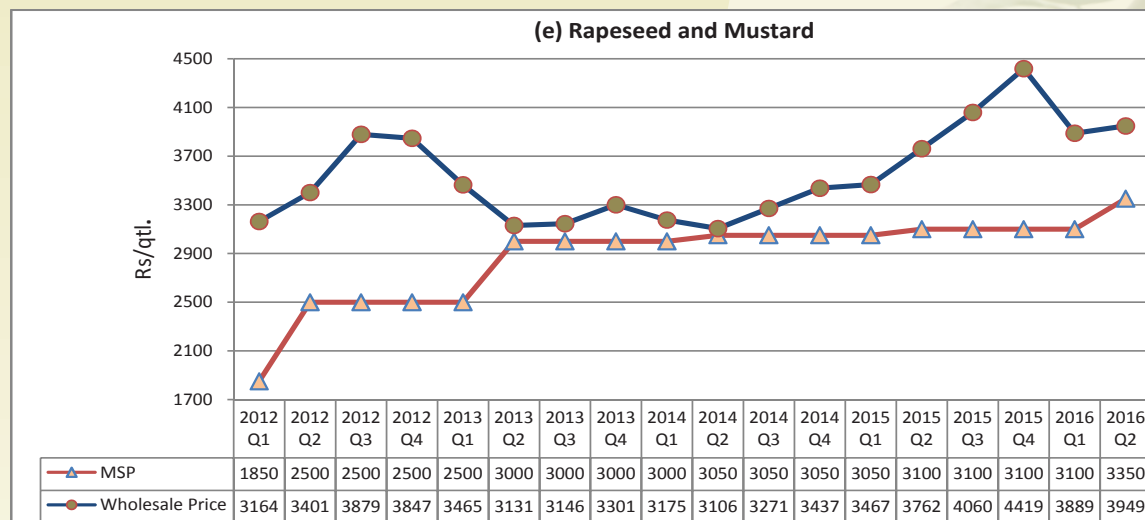
- 2.9 Chart 2.1d exhibits sharp rise in the price of lentil since Q<sub>1</sub> of 2012 until Q<sub>4</sub> of 2015 when it reached the maximum price of Rs.6824/qtt indicating an urgent need to bridge the gap between demand and supply of pulses. In Q<sub>1</sub> of 2016 the price has fallen marginally but in Q<sub>2</sub> of 2016 it is again rising. The gap between MSP and market price is widening over the years which has become quite significant since 2015.



Note: Average wholesale price of Bihar, MP, UP and WB (These states cover 89 percent of production)  
Source: DES



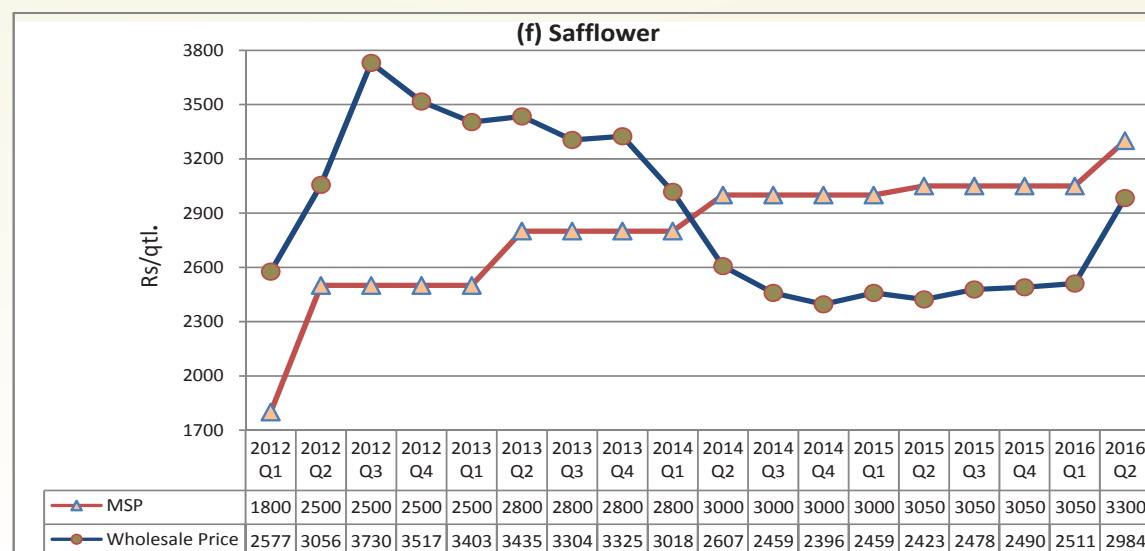
2.10 Price of R&M has been moving up and down all through the period Q<sub>1</sub> of 2012 to Q<sub>2</sub> of 2016 but remains above the MSP in all the quarters as shown in Chart 2.1e. The highest price is recorded at Rs.4419 in Q<sub>4</sub> of 2015.



Note: Average wholesale price of Gujarat, Haryana, Rajasthan, UP and WB (These states cover 76 percent of production)

Source: DES

2.11 Chart 2.1f exhibits that price of safflower remained above MSP before sinking below MSP in Q<sub>2</sub> of 2014 and hovering around Rs. 2500/qttl since then with an increase in Q<sub>2</sub> of 2016.



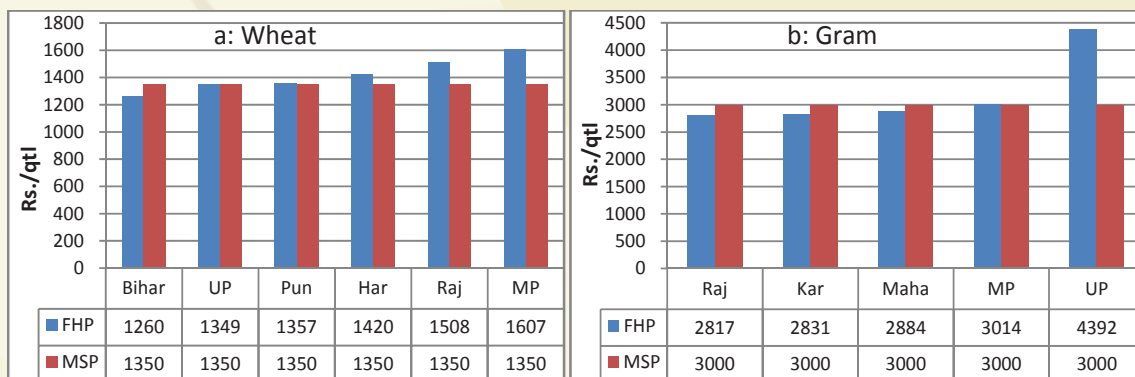
Note: Average wholesale price of Karnataka and MH (These states cover 82 percent of production)

Source: DES

2.12 A comparison has been made amongst MSP, farm harvest price (FHP), and wholesale price (WP) (Annex Table 2.2). It is observed from the tables that FHPs of wheat in Bihar and U.P. are lower than MSPs. This is essentially due to weak procurement system in

these states which reinforces the need for improvement in the same. FHPs of gram have been lower than MSPs in Karnataka, Maharashtra, and Rajasthan in 2013-14 and in MP and Maharashtra in 2014-15 which necessitates timely intervention to ensure MSP to the farmers. It is also observed from the Annex Table 2.2 that FHPs have been higher than WPs in some states for some crops viz. wheat in Punjab, gram in MP and UP, barley in Haryana and R&M in Rajasthan and UP in 2013-14. State wise MSPs and FHPs of wheat and gram for 2013-14 have been illustrated in Chart 2.2.

**Chart 2.2: FHP and MSP of Rabi Crops, 2013-14**

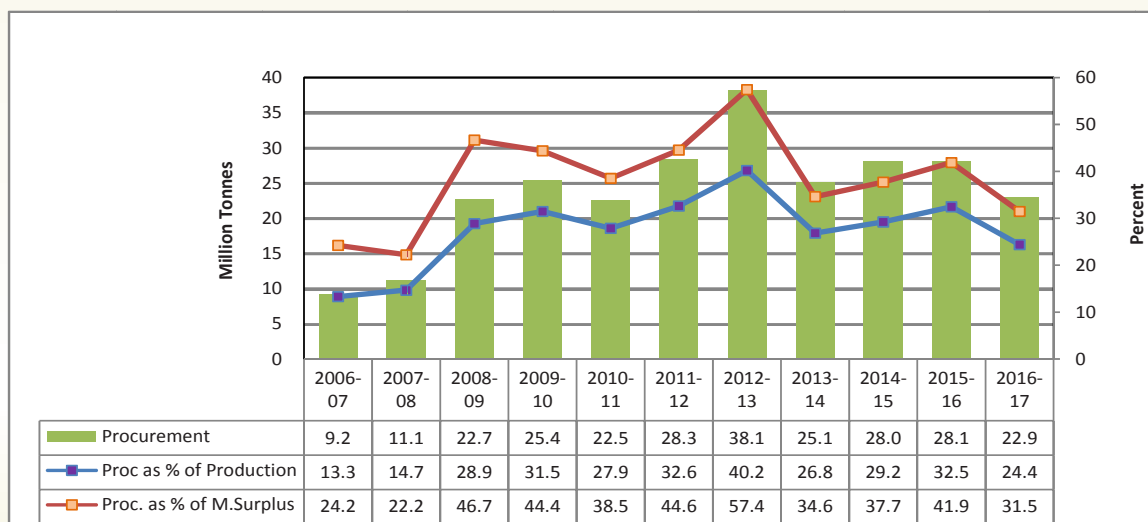


Source: DES

## Procurement – Policy and Operations

2.13 Procurement of wheat by FCI has been 22.9 million tonnes (as on 01.07.2016) during rabi marketing season 2016-17 which is 18.5 percent less than previous year's procurement of 28.1 million tonnes. This accounts for 24.4 percent of wheat production and 31.5 percent of marketed surplus (Chart 2.3).

**Chart 2.3 Wheat Procurement as Percent of Production and Marketed Surplus, 2006-07 to 2016-17**

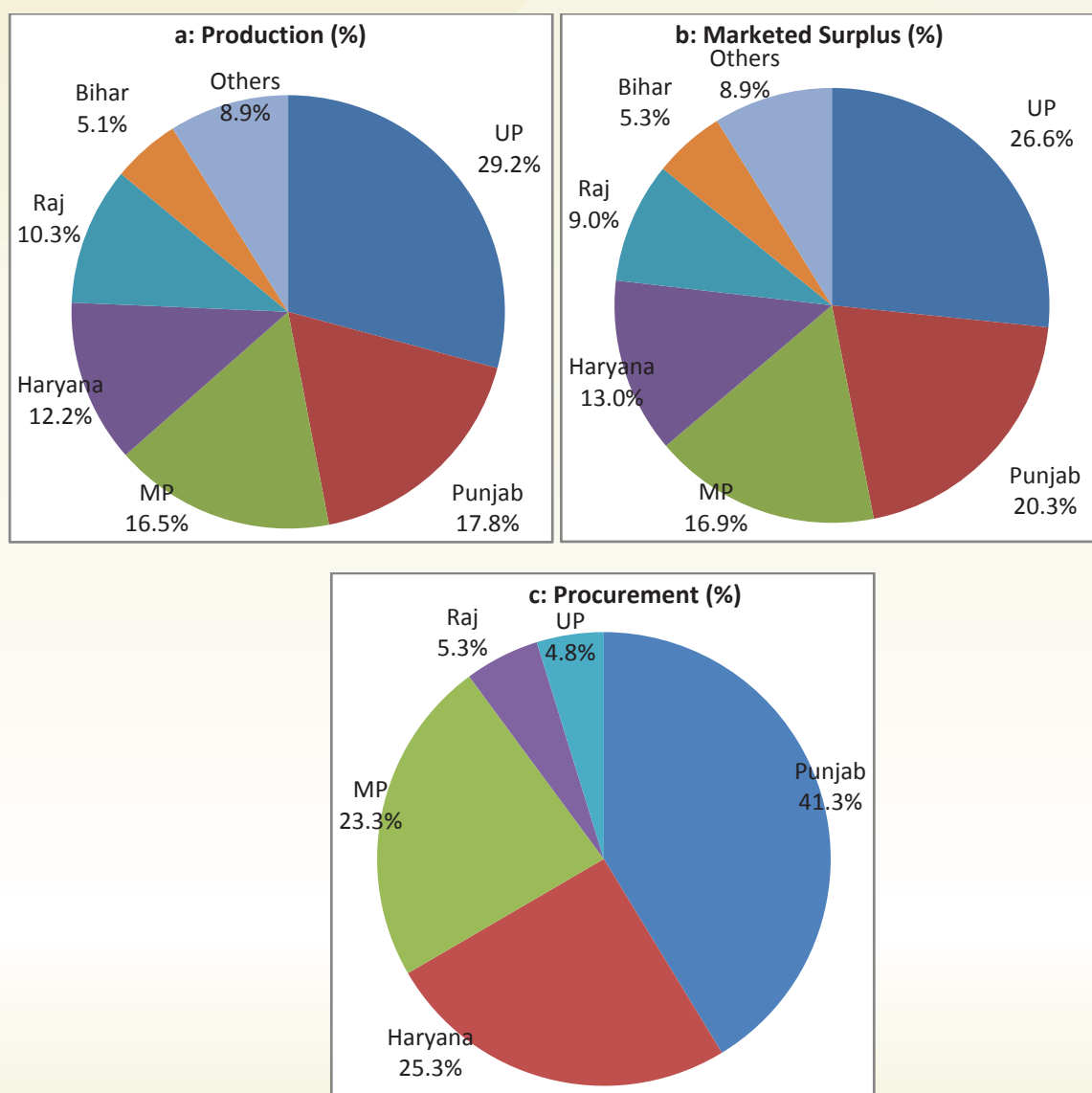


Note: MSR is available upto 2012-13 only and repeated thereafter

Source: DES and FCI

2.14 The major wheat producing states are Uttar Pradesh (29 percent), Punjab (18 percent), Madhya Pradesh (17 percent), Haryana (12 percent) and Rajasthan (10 percent), which accounted for 86 percent of the total production and marketed surplus of wheat in the country in TE 2015-16 (Chart 2.4a&b). Of these, three states namely Haryana, M.P. and Punjab accounted for 90 percent of the total procurement of wheat in TE 2015-16 while Uttar Pradesh, the largest producer of wheat and Rajasthan together accounted for only 10 percent in procurement (Chart 2.4c). This indicates concentration of procurement operations in only three states. Thus the procurement machinery in other wheat producing states also needs to be strengthened, a point which the Commission has been emphasizing in its earlier reports.

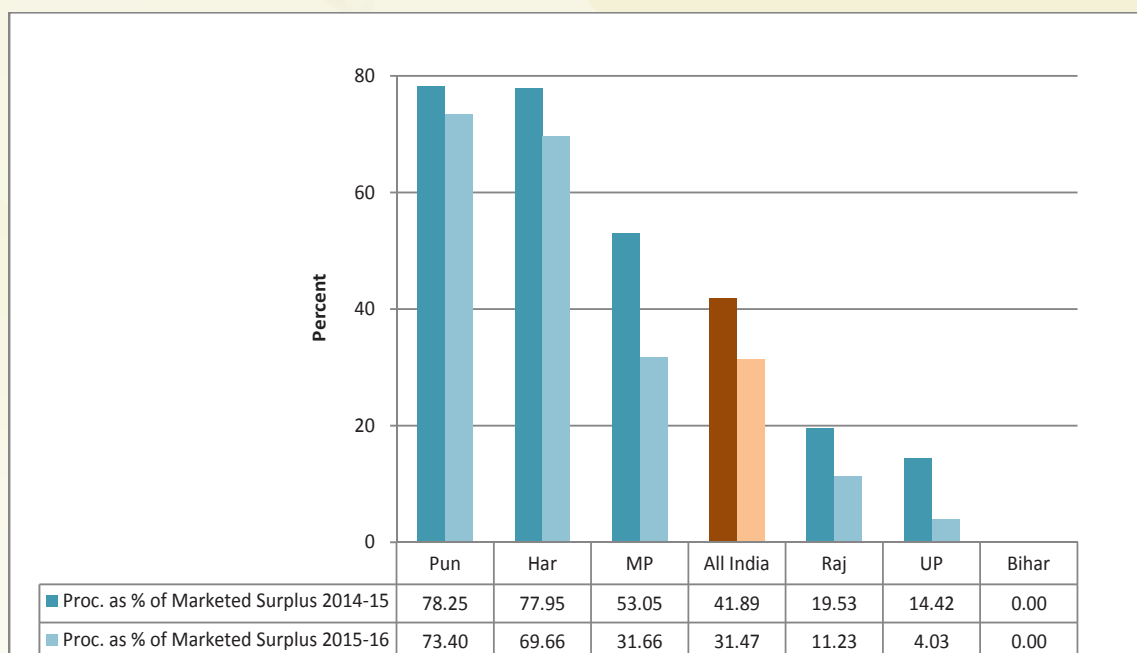
**Chart 2.4: Share of Major States in Wheat Production, Marketed Surplus and Procurement, TE 2015-16**



Source: DES and FCI

2.15 The Scheme of Decentralized Procurement (DCP) of foodgrains was introduced by the Government in 1997-98 with a view to effecting savings in the form of reduction in the outgo of food subsidy, enhancing the efficacy of procurement and encouraging local procurement to the maximum extent thereby extending benefits of MSP to local farmers. At present the total number of DCP states is 15 of which 8 are for wheat (Annex Table 2.3). Haryana (non-DCP) and Punjab (DCP) procure more than two-third of market arrivals in their respective states (Chart 2.5), while in other states the share is low. In UP, the largest producer of wheat, only 4 percent of total market arrival was procured in 2015-16.

**Chart 2.5: State-Wise Wheat Procurement as Percentage of Marketed Surplus, 2014-15 and 2015-16**



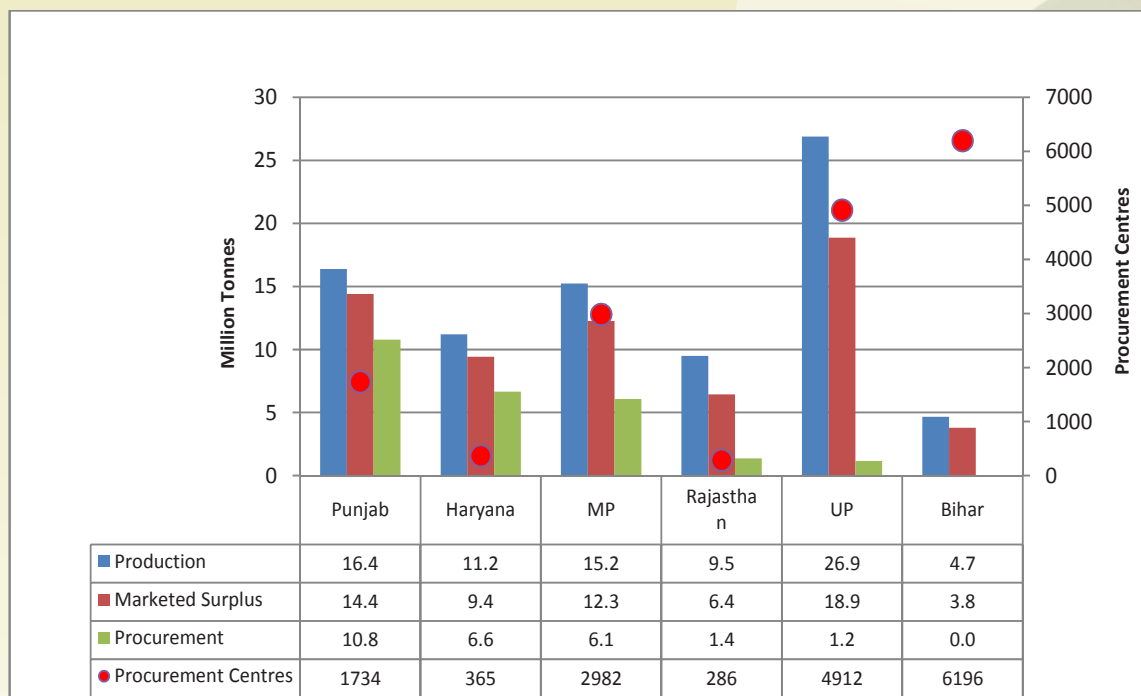
Source: FCI

### **Efficacy of Procurement System**

2.16 U.P. is a non-DCP state and the number of procurement centres is 4912 whereas the procurement in the state is only 6.3 percent of the total marketed surplus during TE 2015-16. Bihar is a DCP state with 6196 procurement centres with no procurement of wheat in TE 2015-16 (Chart 2.6). Such a large number of centres with no procurement raise the issue of resource use efficiency and drain on the exchequer which needs to be addressed on priority.



**Chart 2.6: State-Wise Production, Marketed Surplus, Procurement and Procurement Centres/Agencies of Wheat in TE 2015-16**



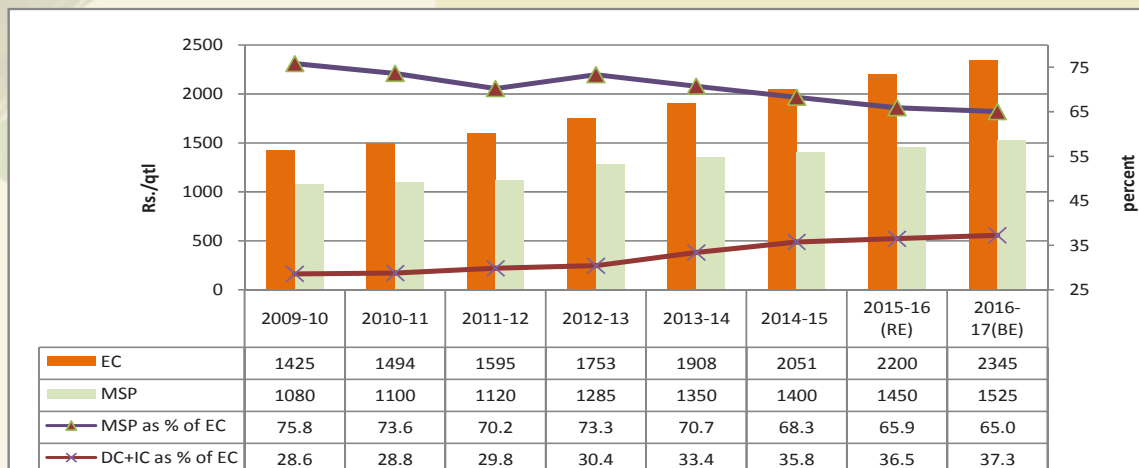
Note: Procurement Centres are of 2014-15

Source: DES and FCI

## Economic Cost of Wheat

2.17 The MSP as a percent of economic cost of wheat has declined from 72.4 percent in TE 2012-13 to 66.4 percent in TE 2016-17 whereas distribution cost and incidental charges taken together as percent of economic cost have increased from 29.7 percent in TE 2012-13 to 36.5 percent in TE 2016-17. However annual variation in economic cost of wheat is shown in Chart 2.7. The components of economic cost (over and above MSP) include costs on storage, distribution, gunny bags and other incidentals such as market fees, development cess, arhatia commission etc. Therefore increasing incidental charges and distribution cost without an increase in Central Issue Price (CIP) is one of the reasons for substantial increase in working capital requirement of FCI. It is also worth mentioning that Haryana, M.P. and Punjab lead in high procurement incidental costs thus pushing up the actual cost of wheat and also effectively raising the food subsidy bill which is already pretty high at Rs. 135402 crore.

**Chart 2.7: Economic Cost of Wheat, 2009-10 to 2016-17**



Note: EC-Economic Cost, DC-Distribution Cost, IC-Incidental Cost

Source: FCI

### Procurement and Statutory Levies

2.18 Increasing procurement incidentals are due to high rates of statutory levies by major wheat procuring states like Punjab (14.5 percent), Haryana (11.50 percent) and Madhya Pradesh (9.20 percent) (Table-2.2). State governments are not much receptive to the lowering/freezing of statutory levies and taxes w.r.t. MSP operations and to reduce the cost of procurement as it is a source of income for them. For instance Haryana, Madhya Pradesh and Punjab, which account for almost 90 percent of procurement, have realized Rs. 31842 crores by way of levies/taxes on wheat procurement during 2004-05 to 2015-16. Out of this, Rs. 17032 crore has been realized on account of tax rates as also increasing procurement and Rs.14811 crores on account of increase in MSP alone (Annex Table 2.6).

**Table 2.2: Statutory Levies Imposed on Wheat by States, 2013-14 to 2015-16**

State	Taxes/Levies (As % of MSP)			Price after Tax (Rs/qtl)		
	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16
<b>MSP</b>				<b>1350</b>	<b>1400</b>	<b>1450</b>
Bihar	4.00	6.00	5.86	1404	1484	1535
Haryana	11.50	11.50	11.50	1505	1561	1617
M.P.	7.20	9.20	9.20	1447	1529	1583
Punjab	14.50	14.50	14.50	1546	1603	1660
Rajasthan	1.60	3.53	8.46	1372	1449	1573
U.P.	6.50	8.43	8.36	1438	1518	1571
Uttarakhand	7.50	7.50	7.50	1451	1505	1559

Note: Data revised for 2014-15 and 2015-16 as per latest information received by FCI

Source: FCI

2.19 In this background, the least the states can do is to restructure taxes/levies on foodgrains in such a manner that the incidence of taxes/levies in absolute terms on per quintal basis does not increase with increase in MSP. The Commission, therefore, reiterates that states should levy the taxes in next five years on the level of MSP fixed for RMS 2015-16 (for the purpose of taxation only). This dispensation should be implemented with immediate effect and be reviewed after five years.

### **e-Payment to Farmers**

2.20 In a bid to ensure transparency in MSP operations, the states should opt for e-payment system under which the payment is credited to bank accounts of farmers directly without involving intermediaries in the process. However for implementing direct payment, the states must complete digitization of farmers list and seed bank account details for fund transfer. Based on the discussions of the Commission with farmers and their associations, it emerged that their interest will be better served if the system of direct payment is institutionalized. The Commission, therefore, recommends that all states should put in place an arrangement for direct payment to farmers' accounts as is the practice in Madhya Pradesh (e-uparjan), Odisha (P-PAS) and Chhattisgarh.

### **Pulses and Oilseeds**

2.21 The country has been consistently importing pulses and edible oils to bridge the gap between domestic demand and availability of these crops. Imports of pulses and edible oils were valued at Rs 94239.5 crore in 2015-16. The government is taking steps to enhance the domestic production of pulses and oilseeds viz., government has given a bonus of Rs. 200/qtl in Kharif 2015-16, Rs. 75/qtl in Rabi 2016-17, and Rs. 425 in Kharif 2016-17 crop seasons on pulses over and above MSP as an incentive to farmers to grow more pulses. However for sustained growth in pulses and oilseeds, reasonably strong procurement machinery is essential to instill confidence among the farmers against market risks. This will incentivize the farmers to produce more. The procurement of pulses and oilseeds during 2012-13 to 2016-17 is shown in Table 2.3. FCI has been designated as an additional central nodal agency for procurement of these two commodities. Agency wise procurement of pulses and oilseeds is given in Annex Table 2.7. This is a step in the right direction for providing market support to pulses and oilseeds, which in turn will encourage the diversification towards these crops.

**Table 2.3: Procurement of Pulses and Oilseeds, 2012-13 to 2016-17**

(Tonnes)

Commodity		2012-13	2013-14	2014-15	2015-16	2016-17
<b>Pulses</b>						
Kharif	Arhar/Tur	16557.9	92858.9	1543.0	45532.4	0.0
	Moong	322.0	243.0	0.0	0.0	0.0
	Urad	84686.3	12107.6	0.0	4891.7	0.0
Rabi	Gram	3554.8	40238.2	364207.0	24192.8	56290.6
	Masur/Lentil	1769.8	0.0	0.0	1017.5	8555.8
<b>Oilseeds</b>						
Kharif	Groundnut	2943.1	694402.8	6229.8	0.0	0.0
	Sunflower	1499.1	9281.8	4153.2	4241.9	4367.0
	Soyabean	19291.5	493.4	0.0	0.0	0.0
Rabi	R&M	4484.0	6387.6	1714.8	0.0	0.0

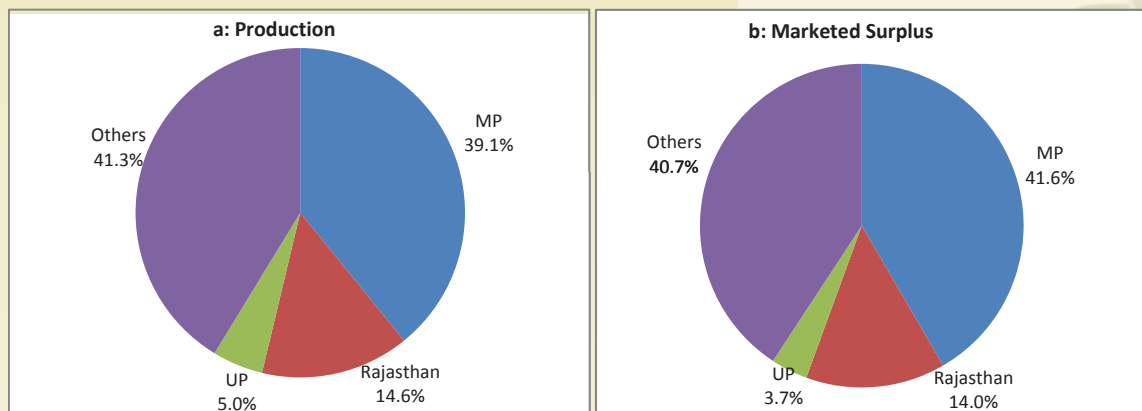
Source: NAFED, FCI and SFAC

## Pulses

2.22 Government has taken initiatives under NFSM-Pulses in 24 states including North Eastern States and Hill States except Meghalaya to increase production of pulses through area expansion and productivity enhancement during Rabi/Summer 2015. Interventions include demonstrations, seed distribution, bio-fertilizers, farm machineries/farm implements, efficient water application tools, plant protection measures, micro-nutrients, soil ameliorants and cropping system based trainings. As a result, area under total pulses has increased by 5.5 percent (12.1 percent under kharif and 0.6 percent under rabi) in 2015-16. However production has declined by 0.5 percent (drop of 4.2 percent under kharif and growth of 1.3 percent under rabi) indicating an overall fall in productivity by 5.7 percent (fall of 14.5 percent under kharif and rise of 0.7 percent under rabi) in 2015-16. It is pertinent to mention that the productivity of rice, wheat and oilseeds has increased by 117.8 percent, 131.4 percent and 112.4 percent respectively whereas that of pulses has increased only by 46.5 percent between TE1971-72 and TE2014-15. Canada, a major exporter of pulses to India, has productivity almost three times that of India. It highlights the fact that productivity of pulses in the country is low not just in relation to cereals (rice and wheat) and oilseeds but also with reference to other major pulse producing countries in the world. State wise share of production and marketed surplus of gram for TE 2015-16 is given in Chart 2.8.



**Chart 2.8: Share of Major States in Gram Production and Marketed Surplus, TE 2015-16**



Source: DES

2.23 Initiatives to increase the productivity of pulses have not yielded desired results so far which raises the question of efficiency in pulse agriculture. An assured, open ended and crop specific procurement of paddy and wheat pushed the pulses cultivation to marginal, poorly irrigated and low quality soils, resulting in lower yield. Moreover, pulses are mostly grown in rainfed areas with unstable and uncertain rainfall conditions which increases the risk of crop failure. Poor access to storage and milling facilities causes further risks to farmers as unshelled/unprocessed pulses have a low shelf life. Poor market linkages cause constraints in effectively meeting market demand. As long term measures to stabilize prices and to make the country self-sufficient in pulses, its production should be increased by eliminating the risks farmers experience in pulses cultivation. The issue was discussed with farmers, crop scientists, state governments, mill owners and other stakeholders and some of the measures suggested are as follows:

- i. *Developing short duration and disease and pest resistant varieties:* Long duration and susceptibility to pest and diseases are a few reasons farmers find it difficult to fit pulses in the usual cropping pattern therefore research is required in developing short duration and pest resistant varieties. Seed multiplication and distribution also need immediate attention.
- ii. *Area expansion:* Substantial additional area can be brought under pulses by adopting cropping systems, such as pigeon pea and wheat in northern region and rice and lentil in eastern region. Besides, setting up of mini pulse mills or processing units for pulses would fill the gap in its supply chain.
- iii. *Effective Procurement:* Although minimum support prices are announced for various pulses, farmers are not assured remunerative price for their produce in the absence

of procurement on a significant scale hence they have no incentive to invest in pulses cultivation. Therefore under the system of decentralized procurement, it is proposed that states should be entrusted to procure pulses engaging their own agencies, NAFED or private agencies when their prices fall below MSP.

- iv. *Creation of buffer stock:* As the country experienced its second consecutive drought and spike in prices of pulses, farm income is likely to fall which may have a negative impact on the food and nutritional security of the poor. Creation of buffer stock of pulses will not only provide much needed support to farmers for crop diversification and reduction in price fluctuations but also help consumers improving the nutritional security.

2.24 While interacting with farmers and their representatives, the Commission observed that some pulses and oilseeds like moong, sunflower and groundnut are grown in both rabi and kharif seasons. NAFED had requested that MSP recommended should be applicable for both rabi and kharif seasons as this will facilitate market intervention by procurement agencies in both the seasons. In the present dispensation, the concerned state governments need specific approval for procurement in case the crop is grown in other season. The Commission therefore recommends that the MSP recommended for pulses and oilseeds should be applicable for both rabi and kharif marketing seasons.

### **Stock Limit**

2.25 To ensure availability of pulses at reasonable prices and plugging the leakages in supply chain in the current vulnerable pulses situation, hoarding of pulses and speculation in market should be checked. Stock limits should be based on a logical and scientific formula separately for consuming states and surplus states and also for bordering areas of states where it is not imposed. Stock limit of pulses, edible oils and oilseeds fixed by various state governments is given in Annex Table 2.8.

### **Oilseeds**

2.26 Productivity of oilseeds in India is much less than that of world average and there is an urgent need to address this issue. The production of oilseeds in India has remained stagnant over last many years and there is a strong association between use of good quality certified seeds and productivity. Therefore, as a measure to provide boost to productivity, government should ensure availability of certified seeds to the farmers.

2.27 It is reported that self sufficiency of the country in respect of vegetable oils has fallen from about 60 percent in 2001-02 to nearly 30 percent in 2015-16 indicating gross neglect of the sector in domestic crop system. As a result, import of vegetable oils has risen by a whopping 236 percent from 4.8 million tonnes in 2001-02 to about 16 million tonnes in 2015-16, whereas domestic availability has recorded just a marginal increase of 7.1 percent during the same period. The present scenario

demands a substantial push to the production of oilseeds alongwith pulses in the country (Annex Table 2.9).

- 2.28 The cultivation of mustard seed is done by mainly small and marginal farmers who extract oil in small ghanis located in rural/semi urban areas. It is to protect the interest of these small ghanis that mustard processing was reserved for the small scale industry. However, the oil cake generated from these ghanis was used as raw material by the large scale solvent extraction units. Since de-reservation of mustard seed, most of the seed in the mandis is purchased by the large industries. Consequently small scale industry is not having access to processing material. Possibilities could be explored to meet the shortage of processing material to the local ghanis. Share of processing units in terms of capacity is shown in Table 2.4.

**Table 2.4: Capacity Distribution and Share of Processing Units in Bharatpur District, Rajasthan**

Capacity (Tonnes/Day)	No of Units	Share (%)
Low (30)	47	67.14
Medium (60)	15	21.43
High (100)	8	11.43

Source: Directorate of Rapeseed-Mustard Research, Bharatpur, Rajasthan

### Diversification from Rice-Wheat System

- 2.29 During the course of discussion with research institutes it emerged that due to exhaustive nature of rice-wheat cropping sequence, soil fertility is depleting leading to a decline in productivity. Diversification by replacing one or the other crop or such options like introducing a short duration legume crop was explored. The alternative cropping systems which were more remunerative with accompanying changes in tillage options were, rice-pea(vegetable)-winter maize, rice-wheat-moong, rice-pea (vegetable)-wheat for one year rotation and pigeonpea-wheat-rice-wheat and rice-mustard-moong-rice-wheat for two year rotation.

### Negotiable Warehouse Receipt (NWR) System

- 2.30 Negotiable Warehouse Receipt System needs strengthening alongwith creation of quality warehousing across the country. Currently, the NWR system is grappling with certain issues like problems in accreditation and registration of warehouses, procedure of renewal of registration, lack of full fledged infrastructure status to warehousing sector, need of electronic warehouse receipts and a unified policy of insurance for WDRA requirement, a robust mechanism of inspection of warehouses, awareness programmes for farmers etc. The Commission recommends that to strengthen and popularize the NWR systems as an alternative approach or supplementary to FCI, the above mentioned weaknesses should be addressed on priority.

\*\*\*\*\*





## Chapter 3

# Productivity of Rabi Crops

3.1 Productivity plays a critical role in enhancing competitiveness of agricultural commodities and farm income. It helps in reducing the cost of production, making agriculture globally competitive and releasing pressure on the scarce natural resources. Besides reducing the cost of production, it also helps in increasing farmers' income and reducing poverty. This chapter analyzes the growth pattern in the productivity of rabi crops and measures to enhance it. In particular, decadal growth rates of area, production and productivity of mandated rabi crops of the Commission, namely wheat, barley, gram, lentil, rapeseed and mustard (R&M) and safflower are analyzed. District-level productivity of these crops in the major producing states is also presented. In order to assess the growth potential, domestic crop productivity is compared with the global productivity levels. Actual crop yields are also compared with the potential yields achieved under the Front-Line Demonstrations.

### Decadal Productivity Growth

3.2 The average annual rates of growth (year on year) in the area, production and productivity of rabi crops during the decades of 1990s (period from 1990-91 to 1999-2000), 2000s (2000-01 to 2009-10) and 2010s (2010-11 to 2015-16) are analyzed and given in Table 3.1. The decade of 2010s has witnessed a sort of revival of wheat production with production growth of about 2.8 percent per annum after a slow growth performance of 0.8 percent per annum in 2000s. The growth in 2010s is primarily led by increase in yield growth (2 percent per annum as against 0.3 percent in 2000s) and area growth (0.9 percent in 2010s). In comparison to other rabi crops, barley has registered a comparatively higher growth rate in area and production during 2010s as compared to previous two decades. The growth rate in productivity has doubled in 2010s (2.6 percent) as compared to 2000s (1.3 percent).

- 3.3 In case of gram, growth rate in area and production has decelerated in 2010s, resulting in a negative productivity growth of -0.5 percent per annum. Similarly, lentil has shown decelerating growth in area and production from 1990s to 2010s, whereas productivity growth has increased to 3.1 percent per annum in 2010s and consequently there was a marginal decrease in the production growth despite significant negative growth in area (-2.2 percent).
- 3.4 Though area under R&M has increased at a rate of 1.5 percent in 2010s, production posted a moderate growth of 2.2 percent in comparison to the preceding decade when the production growth was 4.5 percent. This is mainly on account of higher productivity growth of 3 percent in 2000s as compared to 0.2 percent in 2010s. Safflower productivity growth rate slipped to -5.2 percent per annum in 2010s and the growth rates in area and production were also negative i.e. -10.3 percent and -15.1 percent, respectively.

**Table 3.1: Average Annual Growth Rates of Various Rabi Crops, 1990s to 2010s**

(percent)

Crop	1990s	2000s	2010s
<b>Area</b>			
Wheat	1.6	0.4	0.9
Barley	-2.7	-1.0	1.1
Gram	0.9	3.5	1.4
Lentil #	2.9	0.3	-2.2
R & M	2.3	0.7	1.5
Safflower	-3.9	-4.0	-10.3
<b>Production</b>			
Wheat	4.5	0.8	2.8
Barley	0.6	0.4	3.5
Gram	3.9	6.0	0.9
Lentil #	5.4	0.2	0.1
R & M	4.8	4.5	2.2
Safflower	7.5	-1.9	-15.1
<b>Productivity</b>			
Wheat	2.9	0.3	2.0
Barley	3.2	1.3	2.6
Gram	3.0	1.5	-0.5
Lentil #	2.2	-0.1	3.1
R & M	3.0	3.0	0.2
Safflower	14.7	2.1	-5.2

Note: # 2010s for lentil refers to 2010-11 to 2014-15

Source: DES, DAC&FW

- 3.5 There is a continuous decline in area under gram in major growing states of Rajasthan, Uttar Pradesh and Gujarat from 2013-14 to 2015-16 and a fluctuating trend in Maharashtra, Madhya Pradesh and Andhra Pradesh. Production of gram has



declined in Maharashtra and Gujarat during 2013-14 to 2015-16 with a fluctuating trend in Rajasthan, Madhya Pradesh and Andhra Pradesh. Similarly in case of safflower, there is significant decline in area and production in Maharashtra and Karnataka from 2008-09, while in Karnataka the growth rate of area turned positive, but production growth rate further declined in 2010s due to negative growth in productivity. The negative growth rate of these two rabi crops in 2010s is a cause of concern. Annual growth rate of rabi crops from 2011-12 to 2015-16 is given in Table 3.2. There is a significant decline in productivity and production of rabi crops, except lentil production, in 2014-15. The area under gram, R&M and safflower also declined.

- 3.6 The productivity of rabi crops from 1989-90 to 2015-16 are shown in Chart 3.1. There is a declining productivity of gram in last three years after a peak of 2012-13. Productivity of wheat has been in the range of 3 to 3.2 t/ha in last 6 years except 2.7 t/ha in 2014-15. The yield of wheat is quite stable except a significant decline in 2014-15 due to adverse weather, but yields are more unstable for other crops, indicating high risk in their production.

### Annual Productivity Growth

- 3.7 Annual growth rates of productivity of rabi crops are presented in Table 3.2. In 2015-16, area under wheat, barley and safflower has declined. Even then production of rabi cereals (wheat and barley) has shown a positive growth mainly due to higher productivity growth rates of 13.8 percent in wheat and 8.3 percent in barley. There was no change in area under R&M, but production and productivity grew more than 8 percent in 2015-16. Gram has shown expansion in area by 3.3 percent in 2015-16 but its productivity declined in three consequent years. Performance of safflower shows a bleak picture as area, production and yield have posted negative growth rates in last two years.

**Table 3.2: Annual Growth Rates of Rabi Crops, 2011-12 to 2015-16**

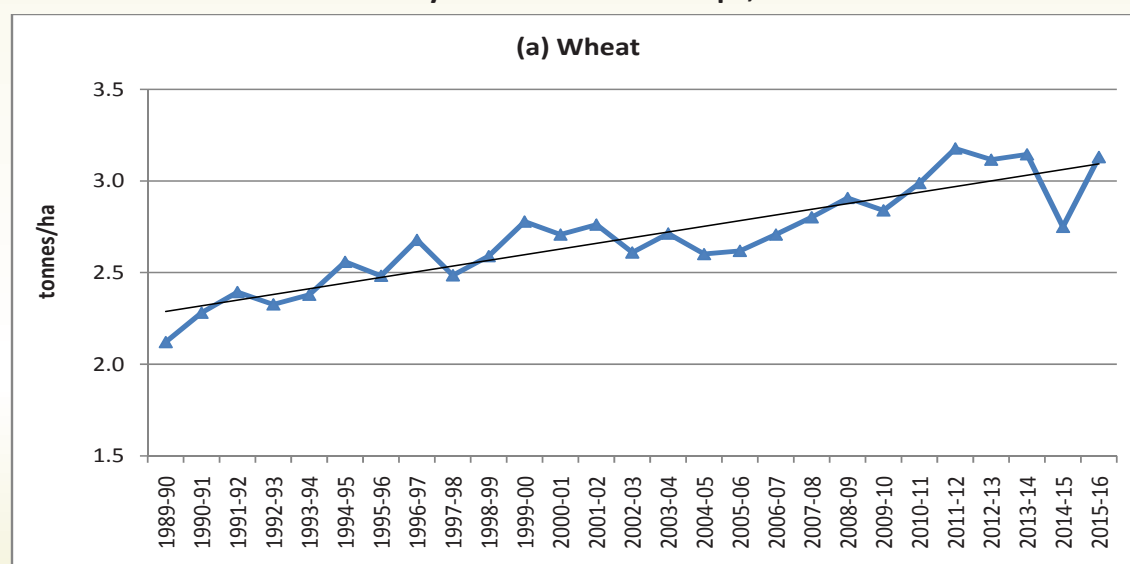
(percent)

Crop	2011-12	2012-13	2013-14	2014-15	2015-16
<b>Area</b>					
Wheat	2.7	0.5	1.6	3.3	-4.5
Barley	-8.8	8.0	-3.1	5.0	-7.4
Gram	-9.7	2.7	16.5	-16.9	3.3
Lentil	-2.2	-8.9	-5.8	9.5	NA
R & M	-14.6	8.0	4.5	-12.7	0.6
Safflower	2.7	-26.7	-3.1	-1.6	-17.7
<b>Production</b>					
Wheat	9.2	-1.4	2.5	-9.7	8.7
Barley	-2.7	8.3	4.5	-11.9	0.3
Gram	-6.3	14.7	7.9	-23.1	2.0
Lentil	12.2	7.1	-10.3	1.7	NA
R&M	-19.3	21.6	-1.9	-20.2	9.1
Safflower	-3.4	-25.3	4.5	-20.5	-30.1
<b>Yield</b>					
Wheat	6.3	-1.9	0.9	-12.6	13.8
Barley	6.7	0.2	7.8	-16.1	8.3
Gram	3.7	11.7	-7.4	-7.4	-1.2
Lentil	14.7	17.6	-4.8	-7.1	NA
R&M	-5.5	12.6	-6.1	-8.6	8.5
Safflower	-5.9	1.9	7.9	-19.2	-15.1

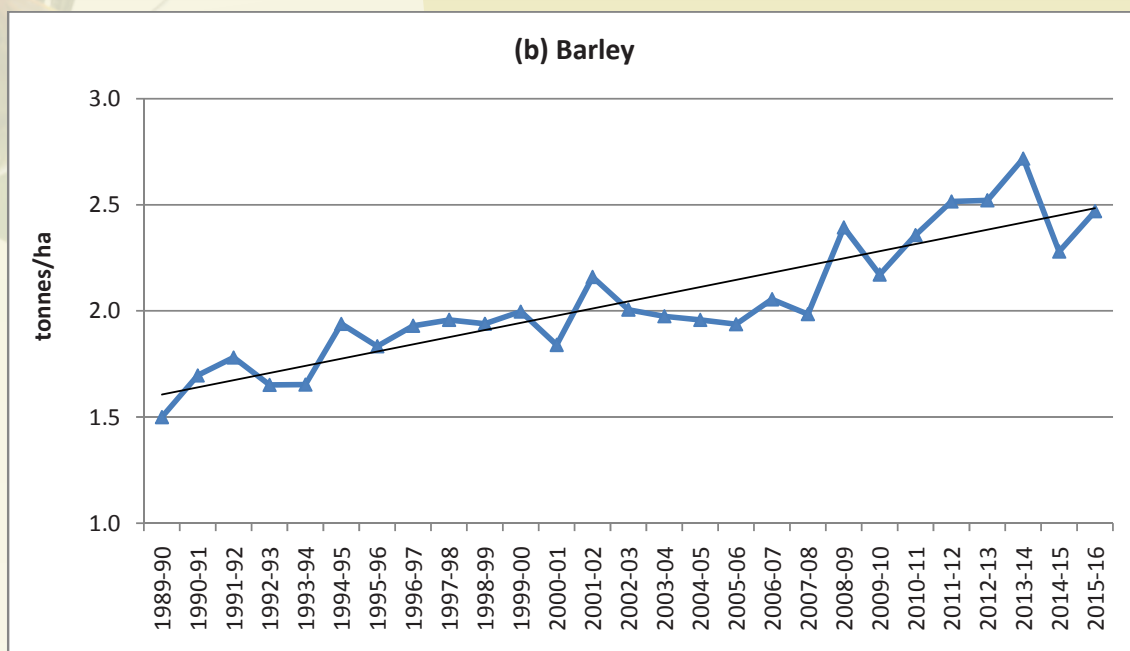
Note: NA indicates data Not Available

Source: DES, DAC&FW

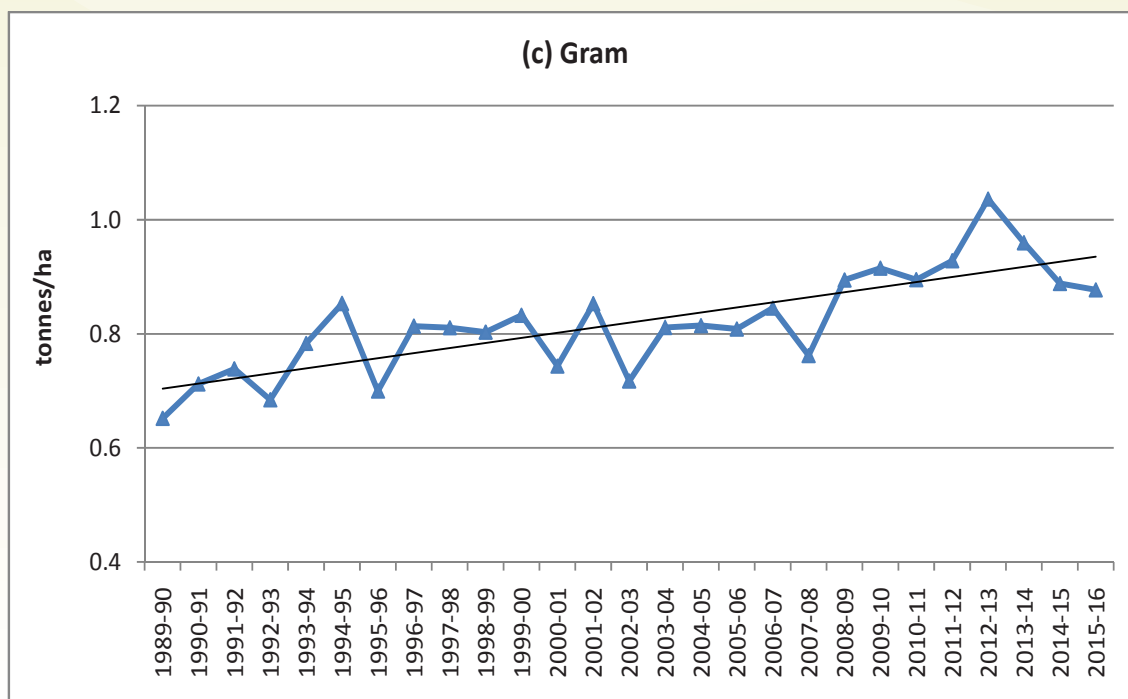
**Chart 3.1: Productivity of Various Rabi Crops, 1989-90 to 2015-16**



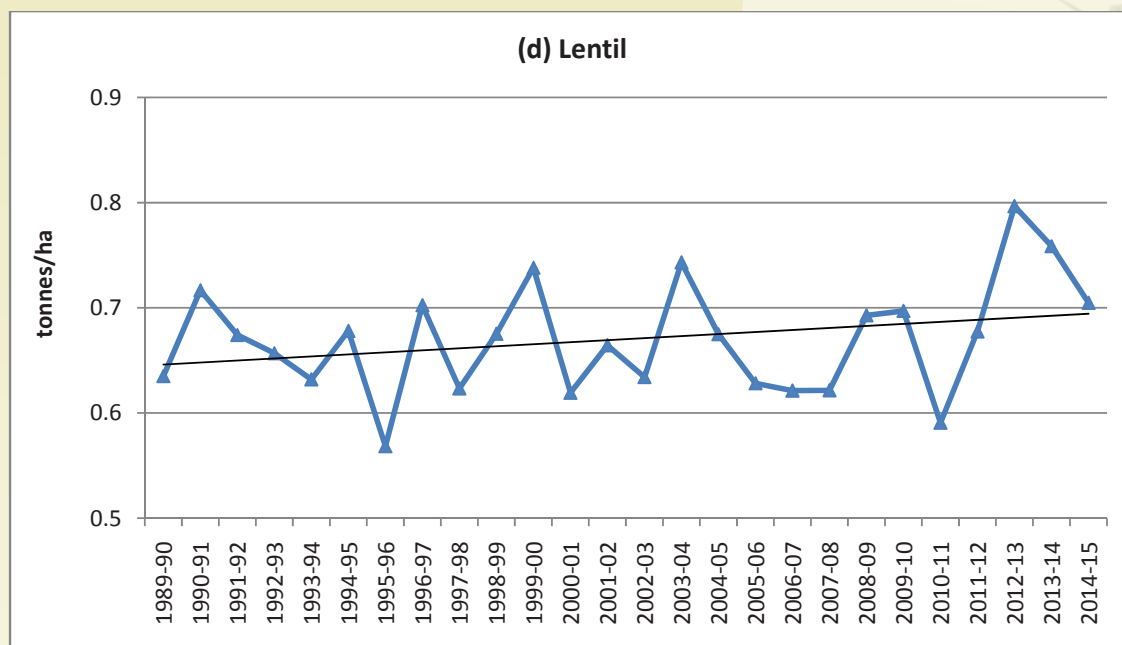
Source: DES, DAC&FW



Source: DES, DAC&FW

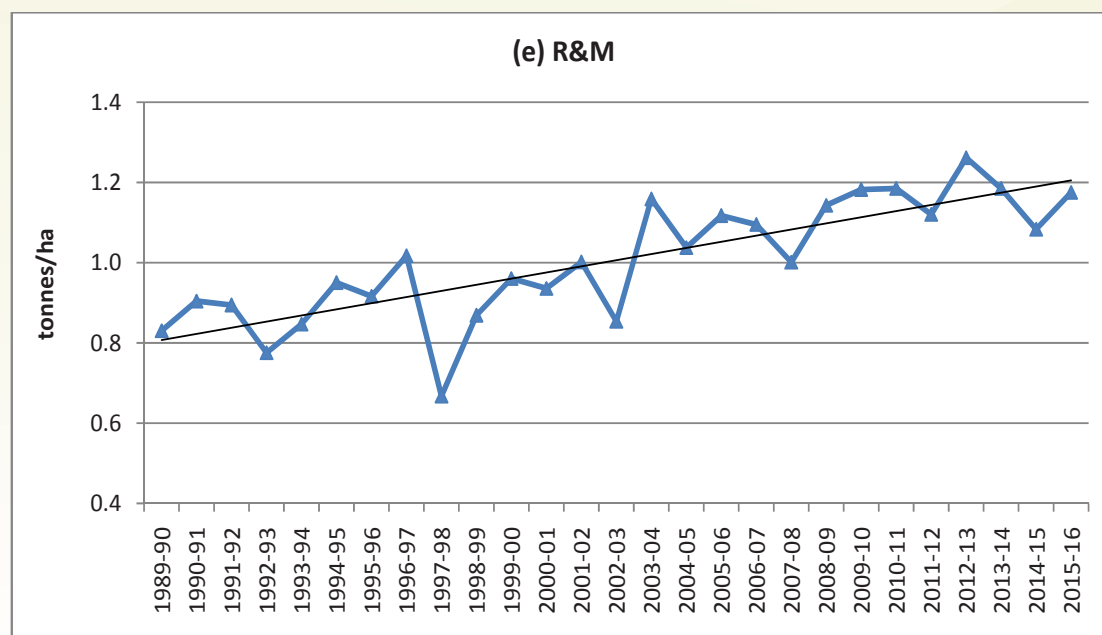


Source: DES, DAC&FW



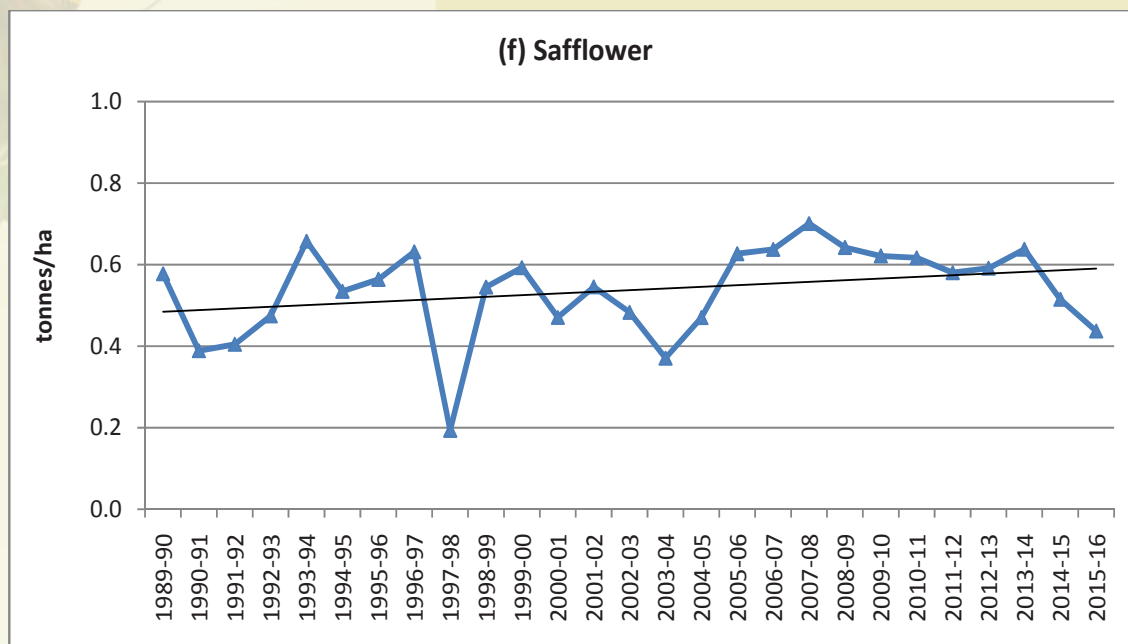
Note: Data used is 2014-15

Source: DES, DAC&FW



Source: DES, DAC&FW

**Productivity of Rabi Crops**



Source: DES, DAC&FW

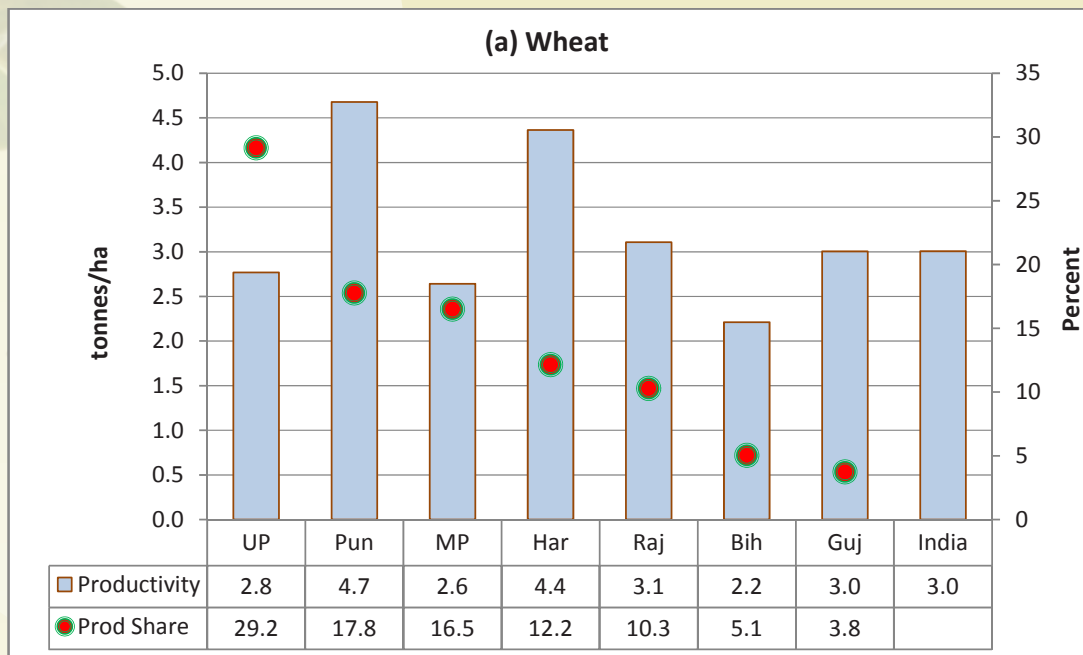
### Crop Productivity in the Major Producing States

- 3.8 In order to study the productivity at state levels, the major producing states which contribute more than 2 percent to the national production have been selected and average yield is calculated during triennial ending (TE) 2015-16. The production shares of various states along with their productivity are depicted in Chart 3.2.
- 3.9 **Wheat:** The five major wheat growing States of Uttar Pradesh, Punjab, Madhya Pradesh, Haryana and Rajasthan contributed nearly 86 percent to the total production in the country in TE 2015-16. The production share and productivity of major wheat growing States based on TE 2015-16 are shown in Chart 3.2a. Punjab has the highest average productivity of 4.7 t/ha followed by Haryana (4.4 t/ha), Rajasthan (3.1 t/ha), Gujarat (3 t/ha), Uttar Pradesh (2.8 t/ha), Madhya Pradesh (2.6 t/ha) and Bihar (2.2 t/ha).
- 3.10 **Barley:** Production share and productivity of the major barley growing states based on TE 2015-16 are shown in Chart 3.2b. The states of Uttar Pradesh (53.7 percent), Rajasthan (21.9 percent), Madhya Pradesh (8.5 percent) and Haryana (6.7 percent) contributed nearly 91 percent to the total production in the country in TE 2015-16. The productivity level in Punjab is highest (3.7 t/ha) even though its share in production is only 2.5 percent. The productivity of other major states are 3.6 t/ha in Haryana followed by Rajasthan (2.9 t/ha) and Uttar Pradesh (2.4 t/ha).

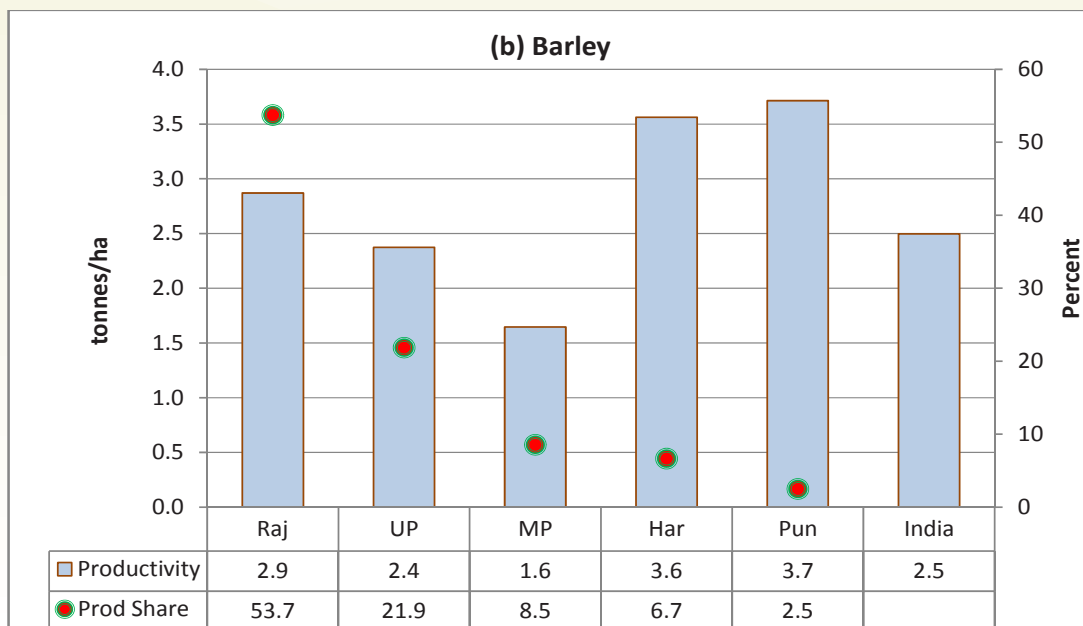


- 3.11 **Gram:** The production share and productivity of the major states are shown in Chart 3.2c. Gram is produced mainly in Madhya Pradesh, Rajasthan, Maharashtra, Karnataka and Andhra Pradesh. These states contributed about 84 percent of the total production of India in TE 2015-16. However, the highest productivity of 1.2 t/ha is recorded in Gujarat and Andhra Pradesh. The productivity in Madhya Pradesh, Rajasthan, Maharashtra, and Karnataka is 1.1 t/ha, 0.8 t/ha and 0.7 t/ha, respectively.
- 3.12 **Lentil:** The production share and productivity of the major lentil growing States are shown in Chart 3.2d. The major lentil growing States Madhya Pradesh (34.2 percent), Uttar Pradesh (31.0 percent) and Bihar (18.0 percent) contributed nearly 83 percent of the total production in the country in TE 2014-15. The productivity level shows that even though Madhya Pradesh is a major producer, its productivity is only 0.6 t/ha. The productivity of other major states are 1.1 t/ha in Bihar followed by West Bengal (1.0 t/ha), Jharkhand (1.0 t/ha) and Rajasthan (0.9 t/ha).
- 3.13 **Rapeseed and Mustard:** The five major R&M growing states Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh and West Bengal contributed approximately 86 percent to the total production in the country in TE 2015-16. The production share and productivity of the major R&M growing states are shown in Chart 3.2e. Gujarat and Haryana have the highest productivity of 1.6 t/ha followed by Rajasthan (1.2 t/ha) and 1.1 t/ha in Madhya Pradesh, Uttar Pradesh and West Bengal.
- 3.14 **Safflower:** Safflower is produced mainly in Maharashtra, Karnataka, Gujarat and Madhya Pradesh and these states contributed about 91 percent to the total production in TE 2015-16. However, the higher productivity (1 t/ha) is recorded in West Bengal, followed by Bihar and Andhra Pradesh (each having 0.8 t/ha), Karnataka, Telangana, Jharkhand and Madhya Pradesh (each having nearly 0.7 t/ha). The production share and productivity of the major States are shown in Chart 3.2f.

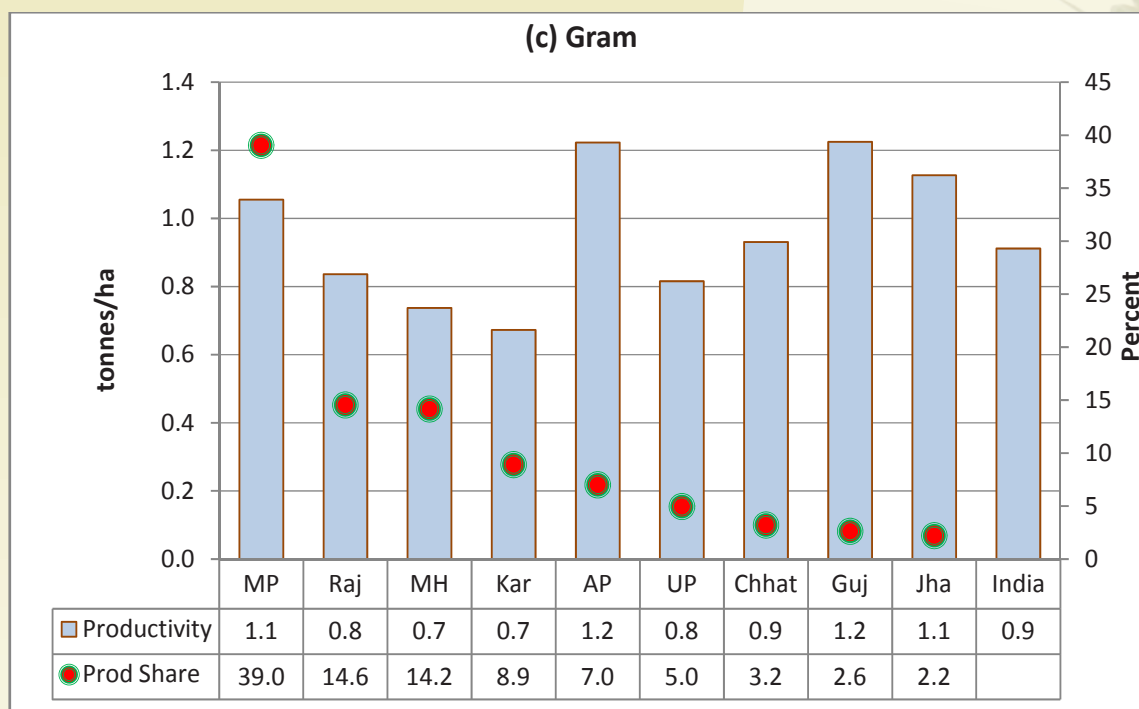
**Chart 3.2: State-wise Productivity and Production Shares of Rabi Crops (TE 2015-16)**



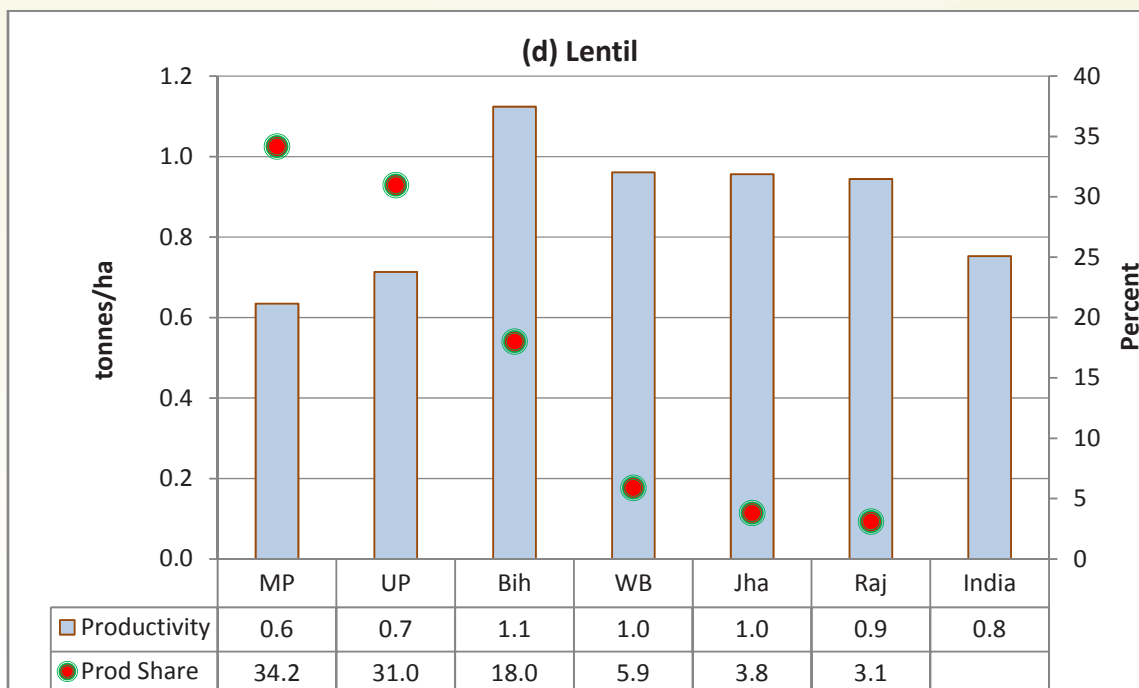
Source: DES, DAC&FW



Source: DES, DAC&FW

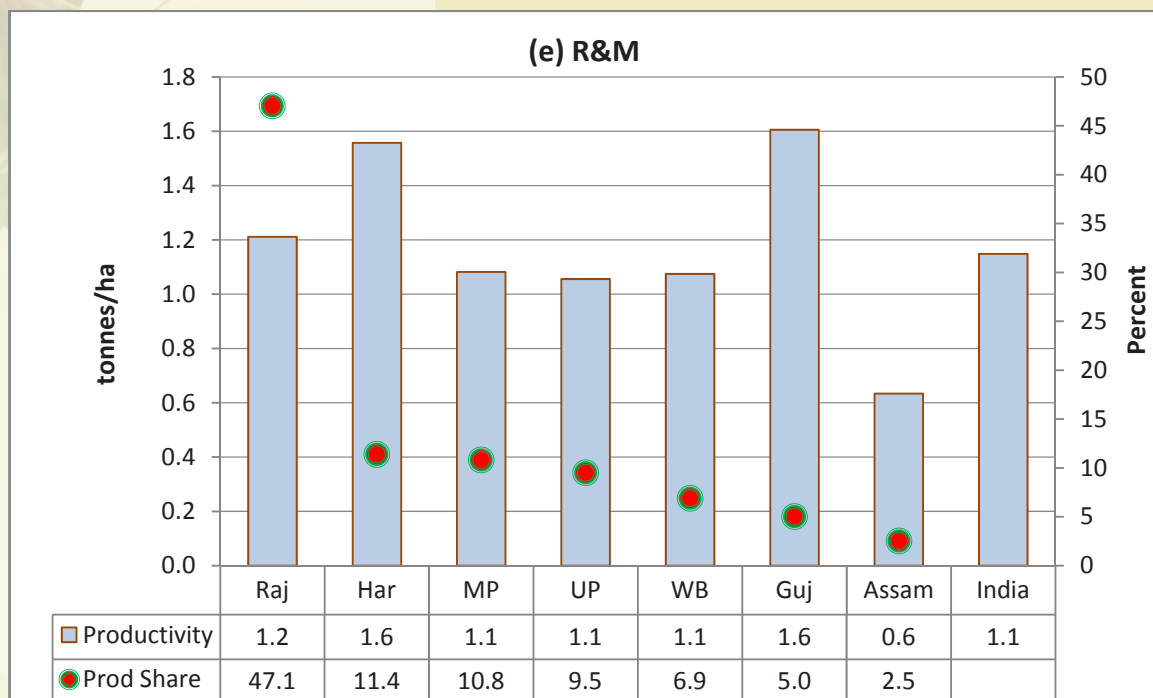


Source: DES, DAC&FW

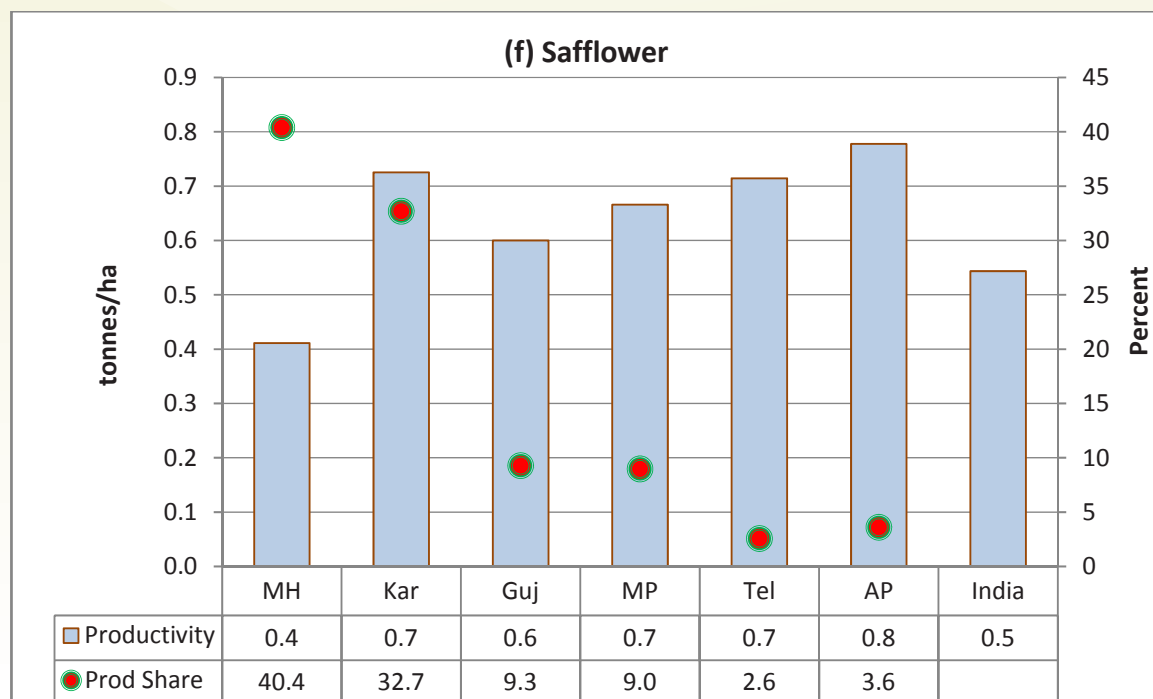


Note: Data used TE 2014-15

Source: DES, DAC&FW



Source: DES, DAC&FW



Source: DES, DAC&FW

## District-level Productivity of Major Rabi Crops

- 3.15 With a view to assess the performance of yield at district level at different time intervals, the area under different yield bands at district level for major crops (wheat, gram and R&M) is analyzed in the major producing states. The changes in area under different yield bands since 2001 are shown in Tables 3.3 to 3.5.
- 3.16 **Wheat:** Major wheat growing states are Haryana, Madhya Pradesh, Punjab and Uttar Pradesh. Yield bands considered are <2 t/ha, 2-3 t/ha, 3-4 t/ha and >4 t/ha. In Punjab most of the districts fall under the yield band of >4 t/ha. Area under this yield band increased from 93.3 percent in 2000-01 to 98.8 percent in 2013-14. There is no district with yield <3 t/ha in the state. Similar trend was observed in Haryana as only one district has yield <3 t/ha in 2010-11 and the state has about 95 percent of area under >4 t/ha in 2010-11 and 2013-14. Whereas Uttar Pradesh and Madhya Pradesh show very less area under >4 t/ha yield band. In Uttar Pradesh, about 33 percent of area was under 3-4 t/ha yield band in 2000-01 which has increased to 65 percent in 2013-14. Similarly, Madhya Pradesh had 16.9 percent of area in 2-3 t/ha yield band in 2000-01, which has increased to 67.2 percent in 2013-14 (Table 3.3).
- 3.17 **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 major states considered for gram production are Rajasthan, Madhya Pradesh, Maharashtra and Karnataka. Most of the district in Rajasthan belong to yield band of 0.5-1 t/ha (covering 37.5 percent area) and >1 t/ha (covering 42.3 percent area) in 2013-14. There is a marked improvement in yield levels in Rajasthan as 9 districts with area of 50.6 percent in <0.5 t/ha yield band in 2000-01 has come down to 20.2 percent in 2013-14 and the area under yield band >1 t/ha has increased from just 18 percent in 2000-01 to 42 percent in 2013-14. In Madhya Pradesh, most of the district belongs to yield band of >0.5 t/ha in all the time intervals. Gram productivity has not improved significantly in Madhya Pradesh as 42.8 percent of the area under >1 t/ha in 2005-06 has decreased to 26.9 percent in 2010-11 and it further declined to 14.6 percent in 2013-14. This indicates low and fluctuating yields. Most of the area in Maharashtra (55.8 percent) belongs to 0.5-1.0 t/ha in 2000-01 and yield progressed significantly having 36.7 percent of area in >1 t/ha yield band in 2013-14 (Table 3.4).

**Table 3.3: District Level Productivity of Wheat**

Year	<2 t/ha		2-3 t/ha		3-4 t/ha		>4 t/ha	
	No. of Districts	Area (%)	No. of Districts	Area (%)	No. of Districts	Area (%)	No. of Districts	Area (%)
<b>Uttar Pradesh (29.2%)</b>								
2000-01	7	6.6	41	60.2	21.0	33.3	0.0	0.0
2005-06	10	11.7	41	62.7	19.0	25.6	0.0	0.0
2010-11	4	3.2	30	41.1	35.0	53.5	3.0	2.2
2013-14	4	4.5	21	26.0	44.0	65.0	6.0	4.5



Year	<2 t/ha		2-3 t/ha		3-4 t/ha		>4 t/ha	
	No. of Districts	Area (%)	No. of Districts	Area (%)	No. of Districts	Area (%)	No. of Districts	Area (%)
<b>Punjab (17.8%)</b>								
2000-01	0	0.0	0	0.0	2.0	6.7	15.0	93.3
2005-06	0	0.0	0	0.0	6.0	30.8	11.0	69.2
2010-11	0	0.0	0	0.0	1.0	1.9	19.0	98.1
2013-14	0	0.0	0	0.0	1.0	1.2	21.0	98.8
<b>Madhya Pradesh (16.5%)</b>								
2000-01	35	80.8	9	16.9	1.0	2.3	0.0	0.0
2005-06	34	75.0	13	23.2	1.0	1.8	0.0	0.0
2010-11	29	56.5	15	27.8	5.0	14.2	1.0	1.5
2013-14	9	10.9	31	67.2	9.0	19.6	2.0	2.3
<b>Haryana (12.2%)</b>								
2000-01	0	0.0	1	0.7	7.0	28.3	11.0	71.0
2005-06	2	5.9	0	0.0	9.0	44.5	9.0	49.6
2010-11	0	0.0	1	0.6	1.0	3.5	19.0	95.9
2013-14	0	0.0	0	0.0	2.0	4.8	19.0	95.2

Note: Figures in parenthesis indicates share in production

Source: DES, DAC&FW

**Table 3.4: District level Productivity of Gram**

Year	<0.5 t/ha		0.5-1 t/ha		>1 t/ha	
	No. of Districts	Area (%)	No. of Districts	Area (%)	No. of Districts	Area (%)
<b>Madhya Pradesh (39.0%)</b>						
2000-01	13	13.1	25	70.9	7	16.0
2005-06	6	2.4	23	54.8	19	42.8
2010-11	8	8.1	28	65.0	14	26.9
2013-14	5	16.9	33	68.6	13	14.6
<b>Rajasthan (14.6%)</b>						
2000-01	9	50.6	20	31.4	3	18.0
2005-06	10	52.6	18	43.7	4	3.8
2010-11	1	0.4	20	73.3	12	26.3
2013-14	1	20.2	12	37.5	20	42.3
<b>Maharashtra (14.2%)</b>						
2000-01	14	44.2	17	55.8	0	0.0
2005-06	3	1.1	28	98.9	0	0.0
2010-11	0	0.0	23	65.4	8	34.6
2013-14	2	0.6	19	62.7	9	36.7
<b>Karnataka (8.9%)</b>						
2000-01	3	14.9	17	82.6	1	2.4
2005-06	7	20.9	18	79.1	0	0.0
2010-11	4	18.8	21	81.1	1	0.1
2013-14	3	7.1	24	92.9	0	0.0

Note: Figures in parenthesis indicates share in production

Source: DES, DAC&FW

**3.18 R&M:** The major states considered for production of R&M are Haryana, Rajasthan, Uttar Pradesh and Madhya Pradesh. In Haryana, all the districts belong to yield level of >1 t/ha in 2010-11 and 2013-14. Most of the districts (24 districts covering 58.4 percent area) in Rajasthan are in 0.5-1 t/ha yield band in 2000-01, which have come down to five districts having 14.9 percent area in 2013-14. At the same time, area under the districts belonging to > 1 t/ha yield has increased from 35.5 percent in 2000-01 to 85.1 percent in 2013-14. Uttar Pradesh and Madhya Pradesh have 49.2 percent and 39.0 percent of area, respectively, under >1 t/ha yield band in 2013-14 (Table 3.5).

**Table 3.5: District level Productivity of R&M**

Year	<0.5 t/ha		0.5-1 t/ha		>1 t/ha	
	No. of districts	Area (%)	No. of districts	Area (%)	No. of districts	Area (%)
<b>Rajasthan (47.1%)</b>						
2000-01	3	6.1	24	58.4	5	35.5
2005-06	2	2.2	5	12.4	25	85.4
2010-11	0	0.0	2	4.6	31	95.4
2013-14	0	0.0	5	14.9	28	85.1
<b>Haryana (11.4%)</b>						
2000-01	0	0	2	0.6	16	99.3
2005-06	0	0	6	25.4	14	74.6
2010-11	0	0	0	0.0	21	100.0
2013-14	0	0	0	0.0	21	100.0
<b>Madhya Pradesh (10.8%)</b>						
2000-01	26	30.2	18	43.6	1	26.3
2005-06	11	9.0	29	41.3	7	49.7
2010-11	11	13.5	26	21.7	11	64.8
2013-14	8	9.2	29	51.8	11	39.0
<b>Uttar Pradesh (9.5%)</b>						
2000-01	7	3.3	38	44.8	24	51.9
2005-06	7	2.8	25	33.0	38	64.2
2010-11	1	0.3	31	42.4	40	57.3
2013-14	10	10.1	30	40.7	35	49.2

Note: Figures in parenthesis indicates share in production

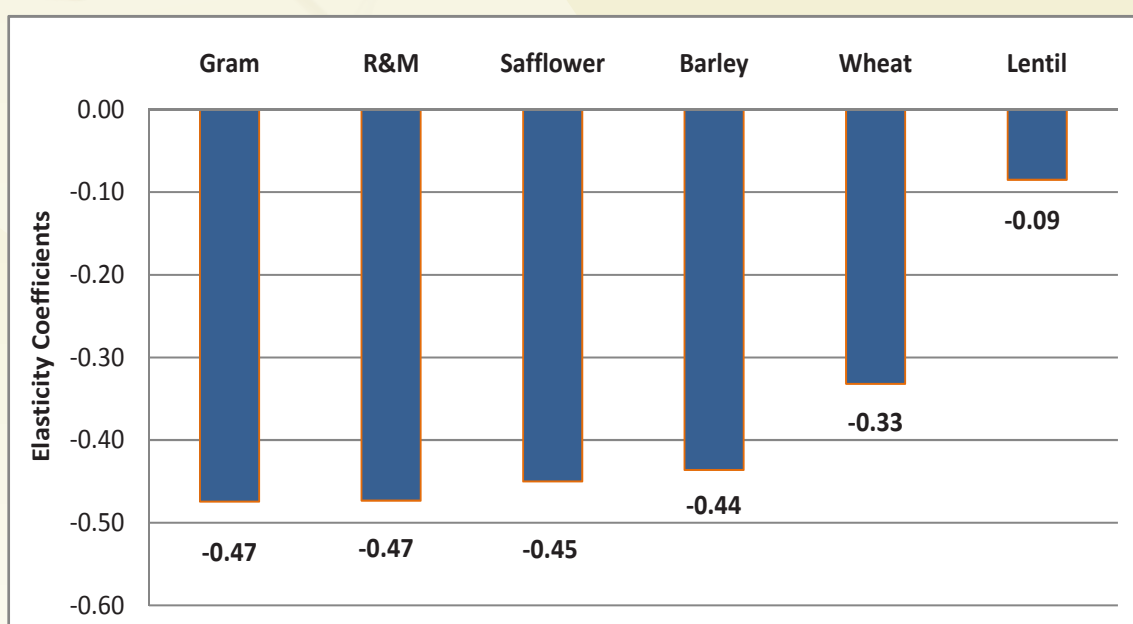
Source: DES, DAC&FW

## Cost of Production and Productivity Levels

**3.19** To understand the relationship between the cost of production (CoP) and productivity levels, scatter diagram and trend on the basis of panel data of the real CoP and productivity of rabi crops are analyzed. The scatter diagrams clearly establish an inverse relationship between the real CoP and productivity (Annex Chart 3.1).

3.20 Having established an inverse relationship between real CoP and productivity, it becomes important to know how CoP will change with the increase in the productivity. In order to know the elasticity coefficient, a regression model between CoP and productivity of various rabi crops is fitted using the panel data (across states over time 2000-01 to 2012-13) and elasticities are shown in Chart 3.3. It is seen that elasticity coefficients of gram and R&M is 0.47, which is the highest among rabi crops, followed by safflower (0.45), barley (0.44), wheat (0.33) and lentil (0.09). Therefore an increasing productivity of gram, barley and R&M has considerable scope for increasing the profitability of these crops.

**Chart 3.3: Relationship Between Real Cost of Production and Productivity of Rabi Crops**



Source: DES, DAC&FW

### Productivity in India vis-à-vis Major Producing Countries

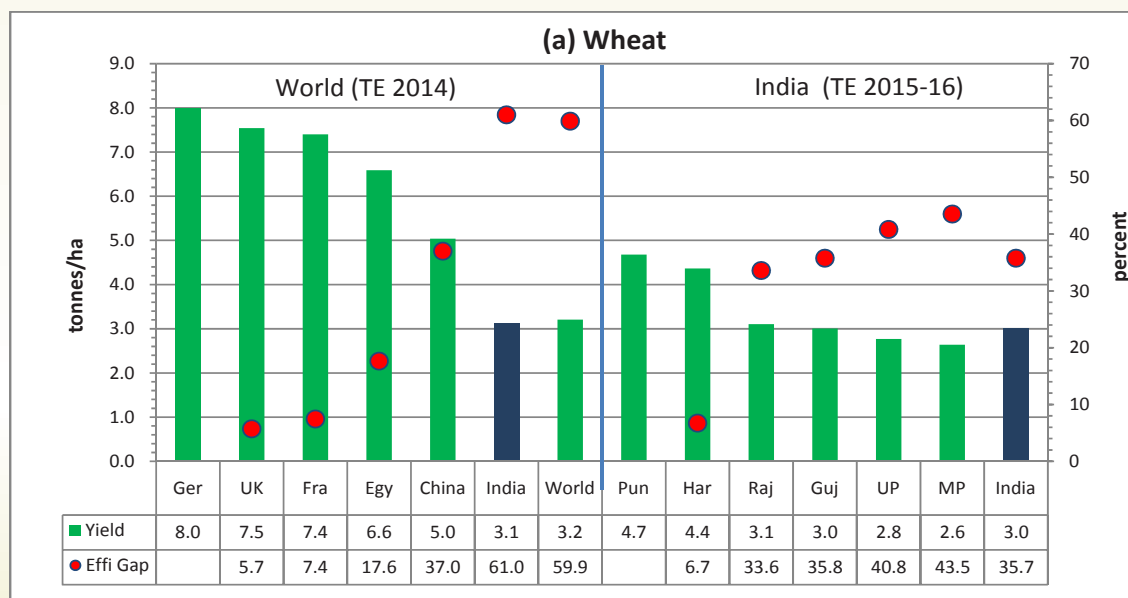
3.21 In the context of global competitiveness and rising domestic demand, productivity levels of rabi crops in the country are compared with those of major producing countries and their yields are taken as benchmarks to envision India's position vis-à-vis other major producing countries in the world. The gap in the productivity is measured as 'efficiency gap'. [Efficiency Gap =  $(1 - \text{Actual yield} / \text{Maximum yield}) \times 100$ ]. The efficiency gaps in the productivity of different rabi crops are shown in Annex Table 3.1.

3.22 Productivity levels of rabi crops in benchmarking countries and states along with their efficiency gaps are depicted in Chart 3.4. The efficiency gap between the productivity of India and benchmarking country has been as high as 72.8 percent in lentil and as low as 49.6 percent in safflower. However the efficiency gaps are

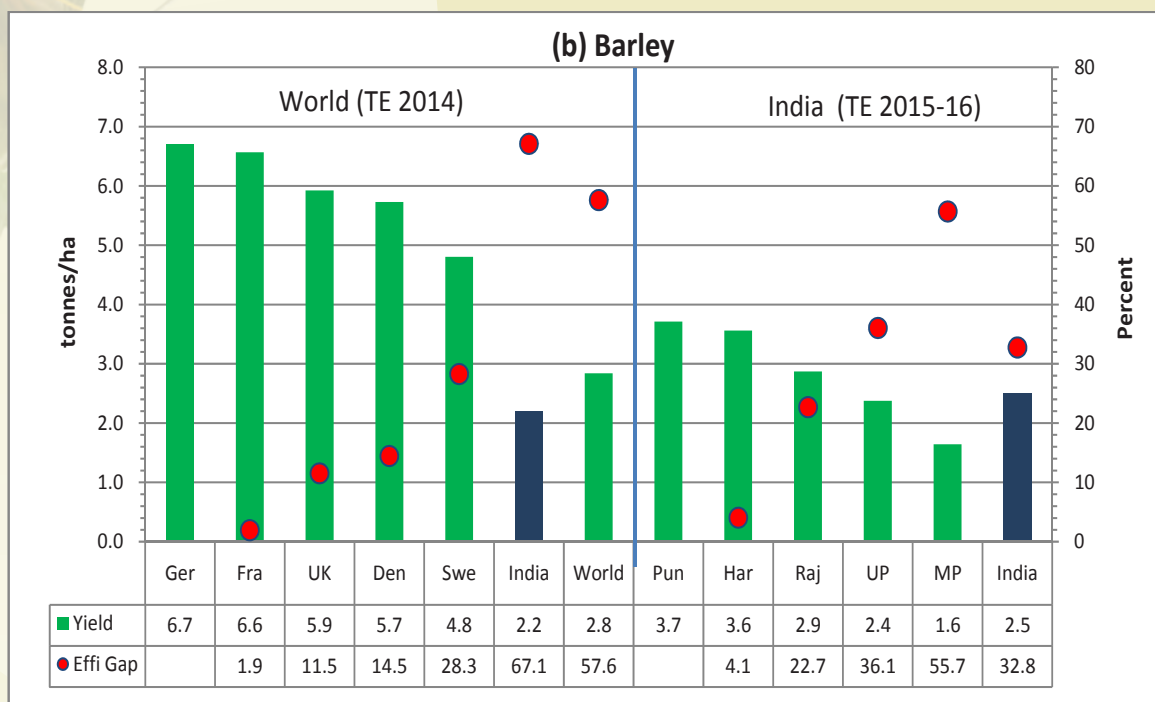
lower when the productivity of the benchmarking state is compared with that of India. The efficiency gaps in the productivity of benchmarking state with those of India are in the range of 35.7 percent in wheat to 25.6 percent in barley. Further details of the efficiency gaps for all crops are given in Annex Table 3.1. Reducing the efficiency gaps would enable the country to gain greater competitiveness by setting out the targets of benchmarking productivity levels. The cost of production can be reduced by enhancing the productivity. Therefore, it is imperative to study the farming practices of the benchmarking countries as well as benchmarking states of India and emulate those practices which are suitable to our country so as to reduce production cost, increase the crop production and profitability of the farmers.

- 3.23 In order to increase production of rabi crops, rainfed rice fallow lands need to be utilized as it is a common practice for farmers to leave rice area fallow in rabi season after harvest of rice. According to baseline survey conducted by ICRISAT, approximately 12 million ha out of 40 million ha rice area cultivated during kharif season remains uncultivated in rabi season. Of the total rice fallow area, about 73 percent (8.6 million ha) lies in the states of Chhattisgarh, Bihar, West Bengal and Madhya Pradesh. Hence, there is tremendous opportunity for cultivation of a second crop on available soil moisture after harvest of rice. Pulses and oilseeds are the crops that have better tolerance to moisture stress. Introduction of pulses such as lentil, moong, urad and oilseeds such as mustard, groundnut, safflower etc. in rice fallows can augment the domestic availability of pulses and oilseeds, which are in short supply. These crops will also help restoration of soil health. According to discussions held with State Governments, Odisha and Chhattisgarh targeted rice fallow areas for growing pulses.

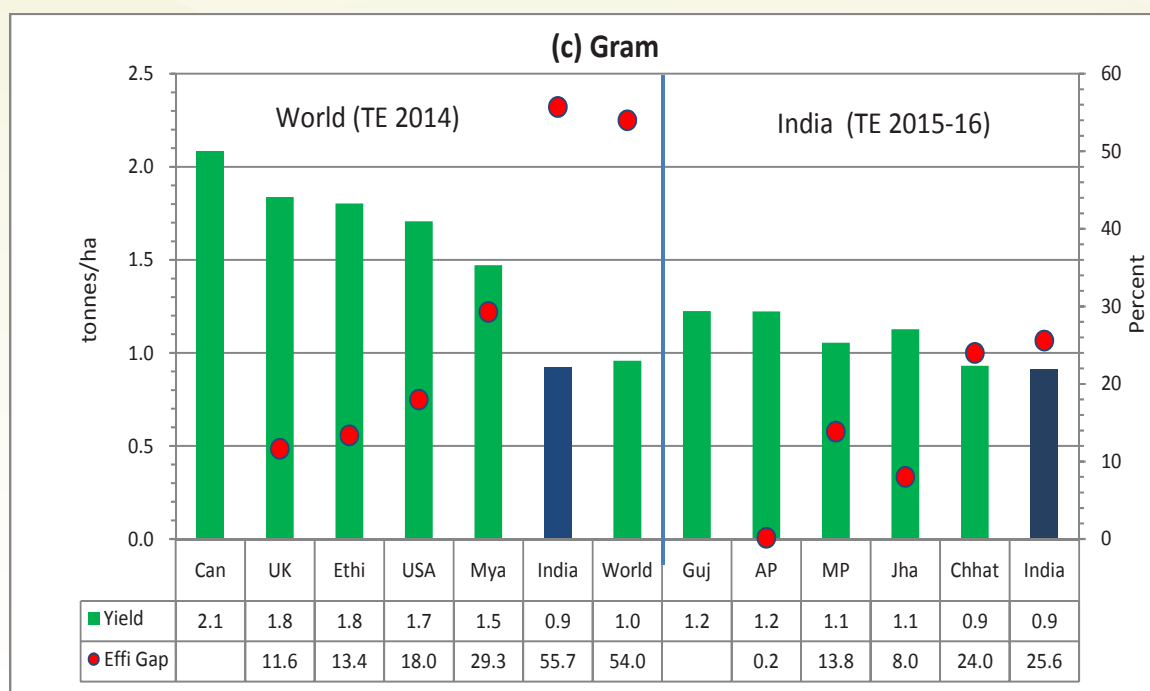
**Chart 3.4: Benchmarking of Productivity across Countries and States in India**



Source: FAO and DES

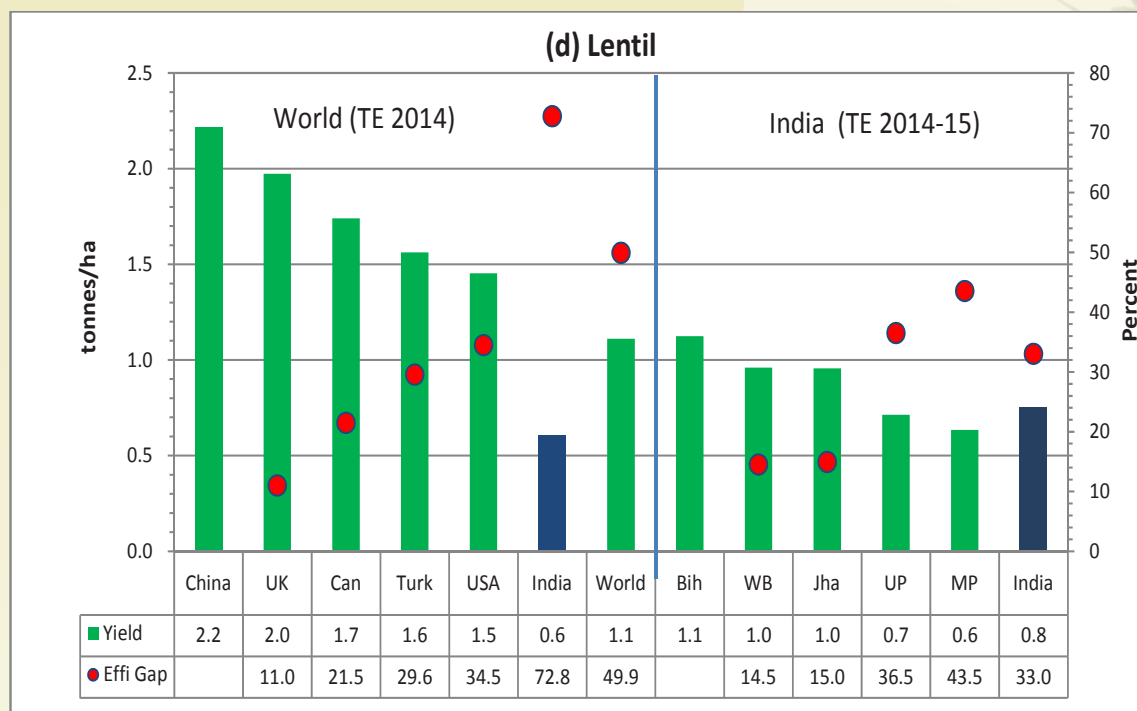


Source: FAO and DES



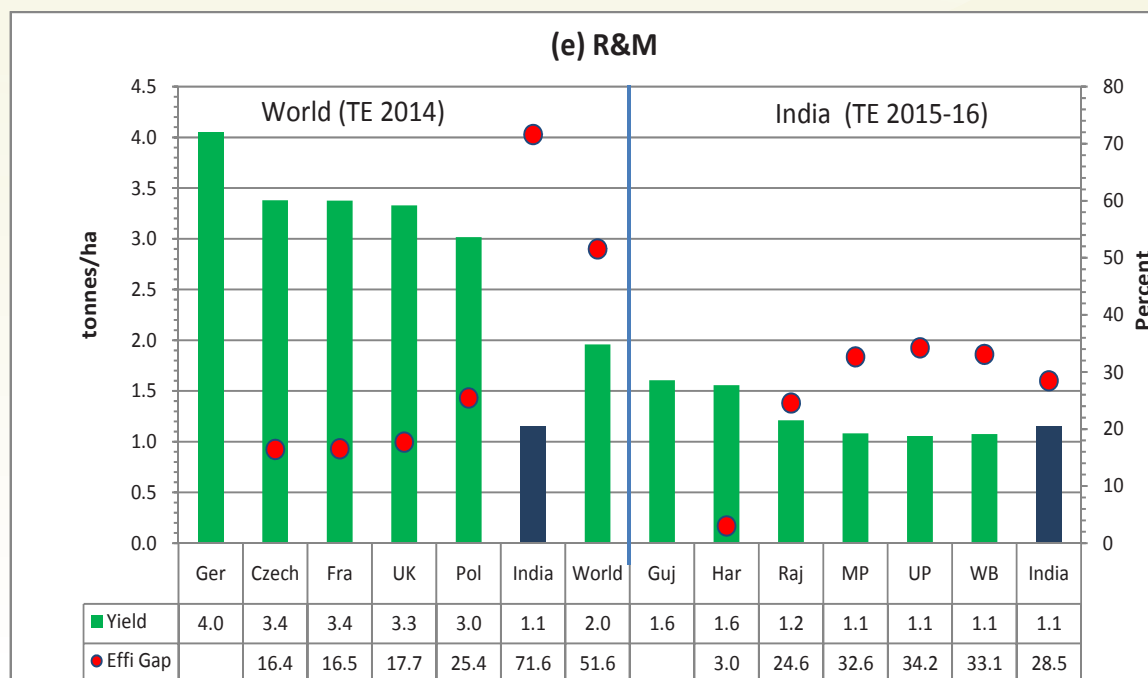
Source: FAO and DES



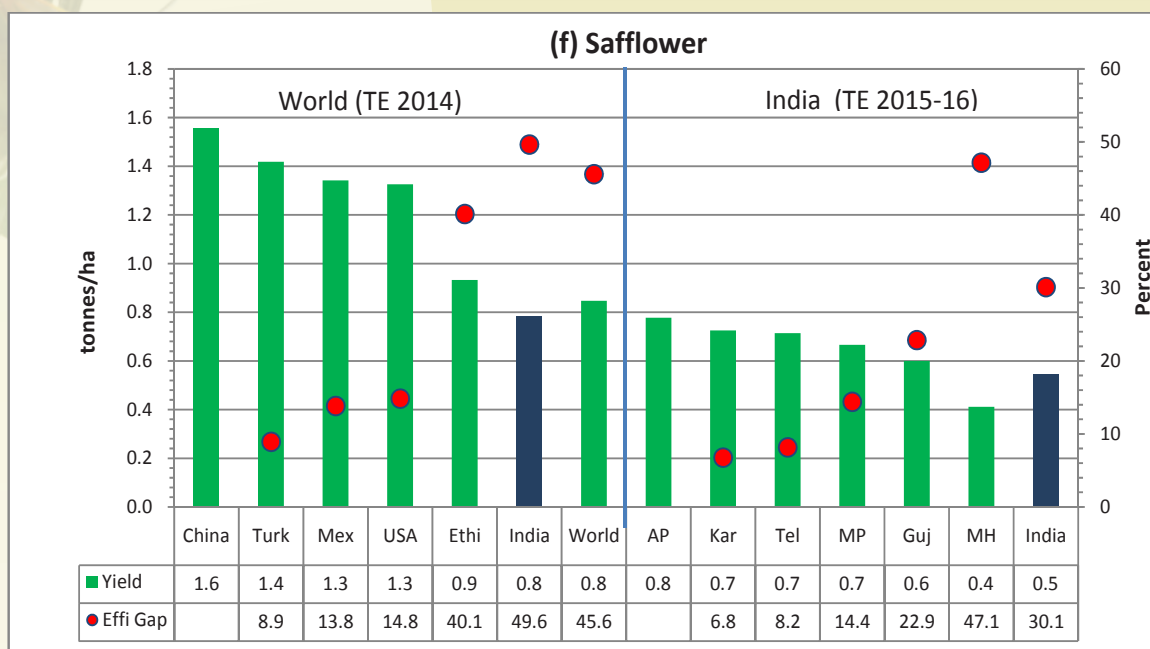


Note: Data used TE 2014-15 for India

Source: FAO and DES



Source: FAO and DES



Source: FAO and DES

### Yield Gap Analysis

3.24 Another way to enhance crop yield is assessment of yield gap and taking appropriate measures to bridge this gap. Yield gap of wheat, gram and lentil is compared statewise in Table 3.6. Analysis used the yield of Front-Line Demonstration (FLD) conducted in different states under the National Food Security Mission (NFSM). Yield gap of wheat in Punjab (10.2 percent) and Haryana (17.2 percent) is lower than all India yield gap of 21.8 percent. Uttar Pradesh and Madhya Pradesh are major producers of wheat (about 46 percent production) having yield gap of 40 percent and 36 percent, respectively. Yield gap of gram is the lowest in Gujarat (13.2 percent) followed by 27.9 percent in Andhra Pradesh and 28.9 percent in Madhya Pradesh, whereas it is higher in Maharashtra (40.9 percent), Karnataka (51.6 percent) and Rajasthan (52.8 percent). In case of lentil, yield gap is 31 percent at all India level, which is lower than major producing states of Uttar Pradesh (45.8 percent), Bihar (39.9 percent) and West Bengal (42.1 percent). Thus, bridging yield gap can increase crop yields significantly and can reduce the dependency on import of pulses and oilseeds.

**Table 3.6: Yield Gap of Rabi Crops in Comparison to Front-Line Demonstration Yield**

State	FLD Yield* (t/ha)	Actual Yield** (t/ha)	Yield Gap (%)
<b>Wheat</b>			
Punjab	5.2	4.7	10.2
Haryana	5.3	4.4	17.2
Gujarat	4.0	3.0	25.2
Rajasthan	4.6	3.1	31.7
Madhya Pradesh	4.1	2.6	35.9
Uttar Pradesh	4.6	2.8	40.2
All India	3.8	3.0	21.8
<b>Gram</b>			
Gujarat	1.4	1.2	13.2
Andhra Pradesh	1.7	1.2	27.9
Madhya Pradesh	1.5	1.1	28.9
Maharashtra	1.2	0.7	40.9
Karnataka	1.4	0.7	51.6
Rajasthan	1.8	0.8	52.8
Uttar Pradesh	1.8	0.8	54.5
All India	1.5	0.9	38.1
<b>Lentil</b>			
Rajasthan	1.2	0.9	23.3
Madhya Pradesh	1.0	0.6	37.8
Bihar	1.9	1.1	39.9
West Bengal	1.7	1.0	42.1
Uttar Pradesh	1.3	0.7	45.8
All India	1.1	0.8	31.0

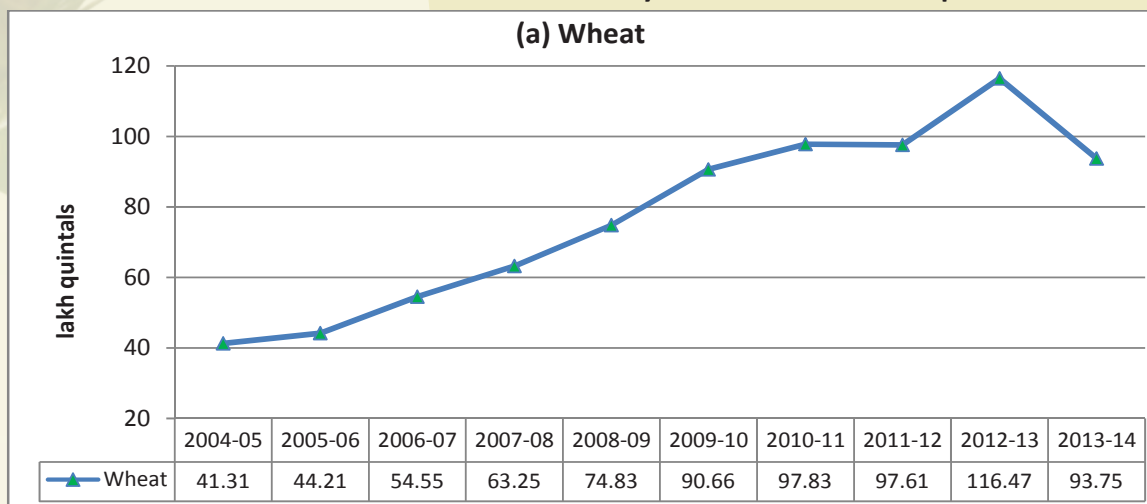
Note: \*Front Line Demonstration Yield collected from NFSM includes average of 2009-10 to 2013-14 for wheat, average of 2011-12 to 2013-14 for gram and average of 2009-10, 2011-12 and 2013-14 for lentil

\*\* Actual yield is of TE 2015-16 for wheat and gram, TE 2014-15 for lentil collected from DES

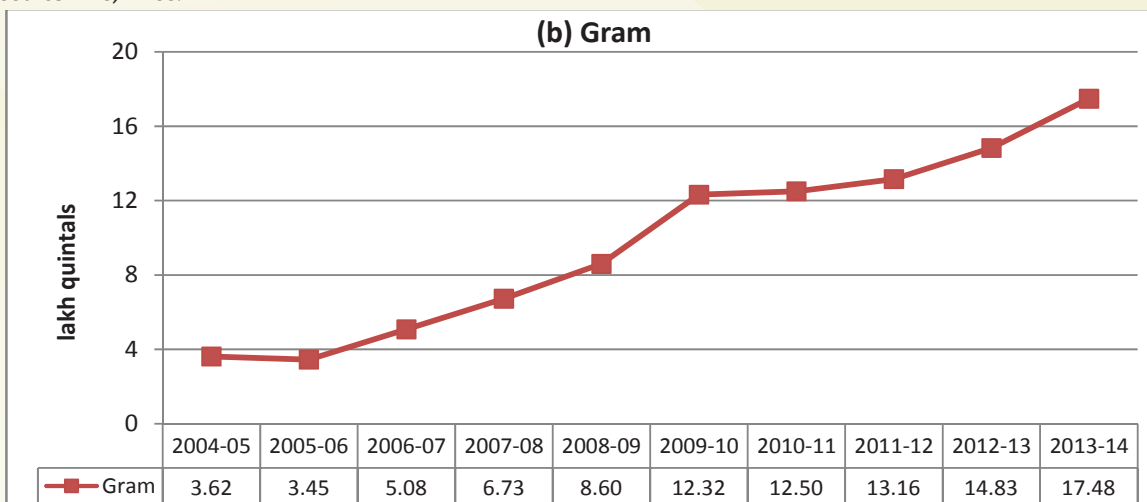
## Distribution of Quality Seeds

3.25 The use of quality seeds plays an important role in enhancing the productivity. The trends in distribution of quality seeds of major rabi crops are given in Chart 3.5. It is observed that distribution of quality seeds of wheat has stagnated after 2009-10, except a record high distribution of 116.47 lakh quintals in 2012-13. The distribution of quality seeds of gram has been increasing constantly since 2010-11 and it became four times of that in 2004-05. However this growth was not reflected in the yield, especially during last three years. In case of barley and R&M, distribution of quality seeds has declined in 2012-13 and 2013-14, whereas it has been stagnant in case of lentil, except in 2013-14. These trends indicate that greater efforts are required for increasing availability of quality seeds for rabi crops to enhance their productivity levels.

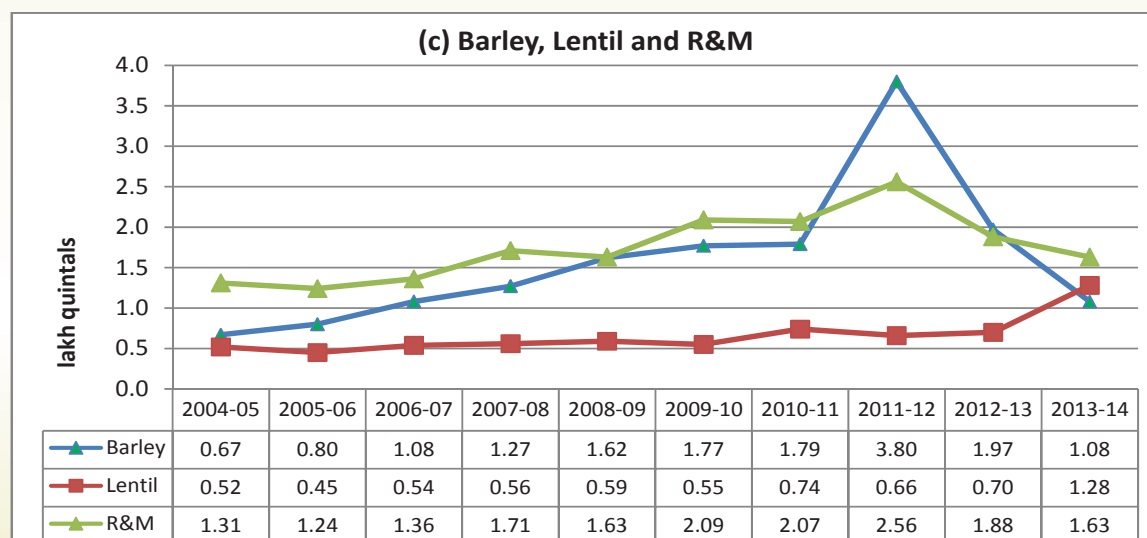
**Chart 3.5: Distribution of Quality Seeds under Rabi Crops**



Source: DES, DAC&FW



Source: DES, DAC&FW  
Source: DES, DAC&FW

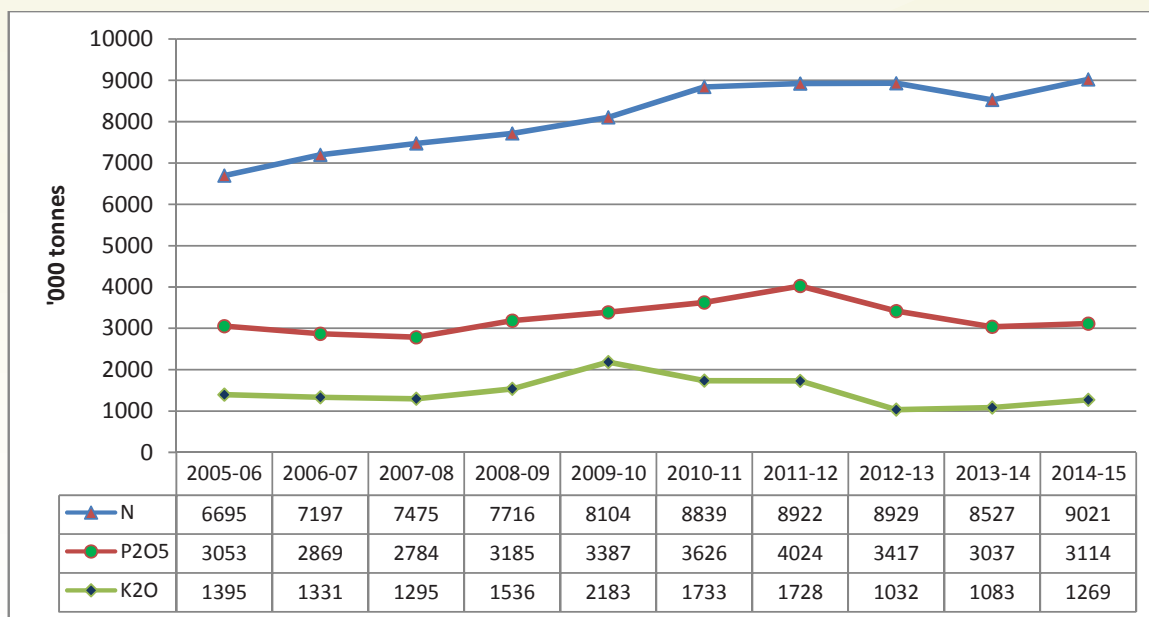


Source: DES, DAC&FW

## Fertilizers Use in Rabi Crops

3.26 Fertilizer consumption has been constantly increasing over the years from 2005-06 to 2014-15 (Chart 3.6). Among different fertilizers, Phosphorous and Potassic fertilizer consumption has declined after 2011-12 but consumption of Nitrogenous fertilizers has stagnated after 2010-11. Also, there is a huge imbalance in use of crop nutrients across the states that have pulled the all India N:P:K use to 7.1:2.5:1 (Table 3.7). N:P:K ratio is higher in Rajasthan (68.6:17.6:1), Punjab (50.5:14.2:1) and Haryana (41.1:14.2:1), whereas it is nearer to recommended proportion of 4:2:1 in the states of West Bengal, Maharashtra, Karnataka, Odisha and Andhra Pradesh. This wide variation across the states calls for a long-term sustainable strategy to get the nutrient balance right. In some states, to achieve the objective of soil conservation and restoring soil health by making it free from chemical contamination, organic farming is being promoted extensively. It is established from the wider consultations with farmers that the higher productivity under organic farming can be sustained with innovation and application of traditional and scientific knowledge based on research experiments.

**Chart 3.6: Fertilizer Consumption of Rabi Crops, 2004-05 to 2014-15**



Note: 2014-15 (Provisional data)

Source: Fertilizer Association of India.



**Table 3.7: N: P: K and N: P Ratio of Fertilizers Use under Rabi Crops, 2014-15**

States	N: P: K	N: P
Rajasthan	68.6 : 17.6 : 1	3.9 : 1
Punjab	50.5 : 14.2 : 1	3.6 : 1
Haryana	41.1 : 9.9 : 1	4.1 : 1
Madhya Pradesh	24.0 : 10.7 : 2	2.2 : 1
Uttar Pradesh	14.8 : 4.5 : 1	3.3 : 1
Gujarat	11.9 : 2.6 : 2	4.6 : 1
Telangana	9.9 : 3.2 : 2	3.1 : 1
Bihar	7.9 : 2.1 : 1	3.7 : 1
Andhra Pradesh	5.3 : 2.2 : 1	2.4 : 1
Odisha	5.3 : 2.3 : 1	2.3 : 1
Karnataka	2.9 : 1.3 : 1	2.2 : 1
Maharashtra	3.0 : 1.5 : 1	2.0 : 1
West Bengal	2.5 : 1.3 : 1	1.9 : 1
All India	7.1 : 2.5 : 1	2.9 : 1

Source: Fertilizer Association of India.

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

3.27 To augment resource use efficiency, the Commission is of the considered opinion that farmers should be incentivized for higher oil content. On the basis of detailed discussions with various stakeholders, 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 increase in its oil content beyond this level. State governments should encourage the cultivation of varieties with high oil content.

3.28 To determine the incentive for higher oil content, it is assumed, without loss of generality, that miller processes one quintal of oilseeds. From this process, he will get 35 kg of oil and 65 kg of oil cake. Based on average prices of oil cakes at Rs.2450 per quintal MSP at Rs.3600 per quintal (being recommended in this report), he will realize Rs.1593 (Rs.2450\*0.65) from the cake. Thus, the cost of this raw material (oil component but without cake) would be Rs.2008 (Rs.3600 - 1593) which will contain 35 kg of oil. Thus, the cost per kg (which is nothing but one percent) of oil will be Rs.52.45 or Rs.13.11 for every 0.25 percent point (Table 3.8 and details in Annex Table 3.2).

**Table 3.8: Simulation-Impact of Oil Content on MSP of R&M**

Oil Content (%)	Oil Cake (%) {100-col(2)}	Realization from oil cake on processing of 1 quintal of oilseeds, assuming price of cake/qlt= Rs. 2450	Cost of Oil Content i.e. oilseeds without cake (Rs/qlt), assuming MSP/ qtl=3600	Cost of Oil Content i.e. oilseeds without cake for each 0.25 percent point of oil content (Rs/qlt) {col(5)/col(2)}*0.25	MSP at Oil Content given in col.(2) [MSP+{Average of col.(6)* percent points of oil content that is over & above 35%}]/(0.25)
		{col(3)*Price of Oil cake}/100	MSP-Col(4)		
(1)	(2)	(3)	(4)	(5)	(6)
35.00	65.00	1593	2008	14.34	3600
35.25	64.75	1586	2014	14.28	3614
35.50	64.50	1580	2020	14.22	3629
35.75	64.25	1574	2026	14.17	3643
36.00	64.00	1568	2032	14.11	3657
42.00	58.00	1421	2179	12.97	3982
43.00	57.00	1397	2204	12.81	4033
44.00	56.00	1372	2228	12.66	4085
45.00	55.00	1348	2253	12.51	4135
46.00	54.00	1323	2277	12.38	4185
47.00	53.00	1299	2302	12.24	4234
48.00	52.00	1274	2326	12.11	4283
Average increase in MSP with 0.25 percent increase in oil content				13.11	

## Recapitulation

- 3.29 There is a need to study the farming practices of the benchmarking countries as well as benchmarking states and emulate those practices which are suitable to our country so as to increase crop yields, reduce production cost and increase income of farmers. There is also need to bridge yield gap, particularly in the states of Uttar Pradesh, Madhya Pradesh, Maharashtra, West Bengal and Rajasthan.
- 3.30 Production of rabi crops can be increased by increasing area under cultivation by utilizing rainfed rice fallow lands judiciously. There is opportunity for cultivation of a second crop on available soil moisture after harvest of rice. Pulses and oilseeds are the crops that have better tolerance to moisture stress. Introduction of pulses such as lentil, moong, urad and oilseeds such as mustard, groundnut, etc. in rice fallows can augment the domestic availability of pulses and oilseeds. This will also help in restoration of soil health. Improved seed, balanced use of fertilizers and crop protection measures need special attention.
- 3.31 In order to augment the resource use efficiency, MSP of R&M be linked to the basic oil content of 35 percent. For every 0.25 percent point increase beyond this level, the MSP be increased by Rs.13.11 per quintal so as to incentivise the farmers to invest in technology. The Government should lend initial hand holding to procurement centres to acquire or purchase the equipment to measure oil content scientifically.

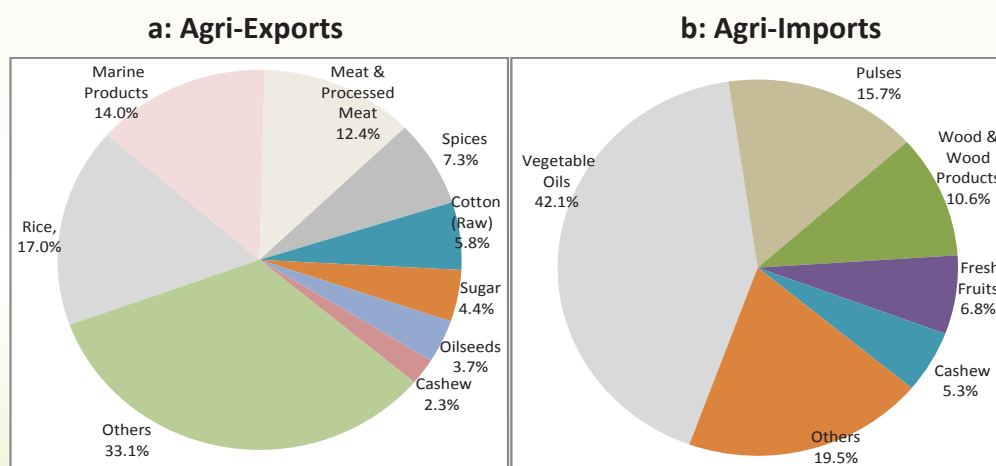
## Chapter 4

# Trade Competitiveness of Indian Agriculture

### Trade Performance

4.1 As per World Trade Organization (WTO), the share of India's agri-exports to global agri-exports has increased from 1.1 percent in 2004 to 2.6 percent in 2013 but declined to 2.5 percent in 2014 while that of share of agri-imports to global agri-imports has increased from 0.8 percent to 1.5 percent during the corresponding period. As per DGCIS, the share of India's agri-exports in its total exports has marginally increased from 12.9 percent in 2014-15 to 13.0 percent in 2015-16 whereas the share of agri-imports in total imports has increased from 5.3 percent to 6.6 percent during this period. Major agri-export commodities are rice, marine products, meat and processed meat, spices, cotton (raw), sugar, oilseeds and cashew and account for two-third of total agri-exports (Chart 4.1a). The major agri-import commodities are edible oils, pulses, wood & wood products, fresh fruits and cashew and account for 80 percent of total agri-imports (Chart 4.2b).

**Chart 4.1: Share of Major Agri-Commodities in Total Agri-Exports and Agri-Imports in 2015-16**



Source: DGCIS

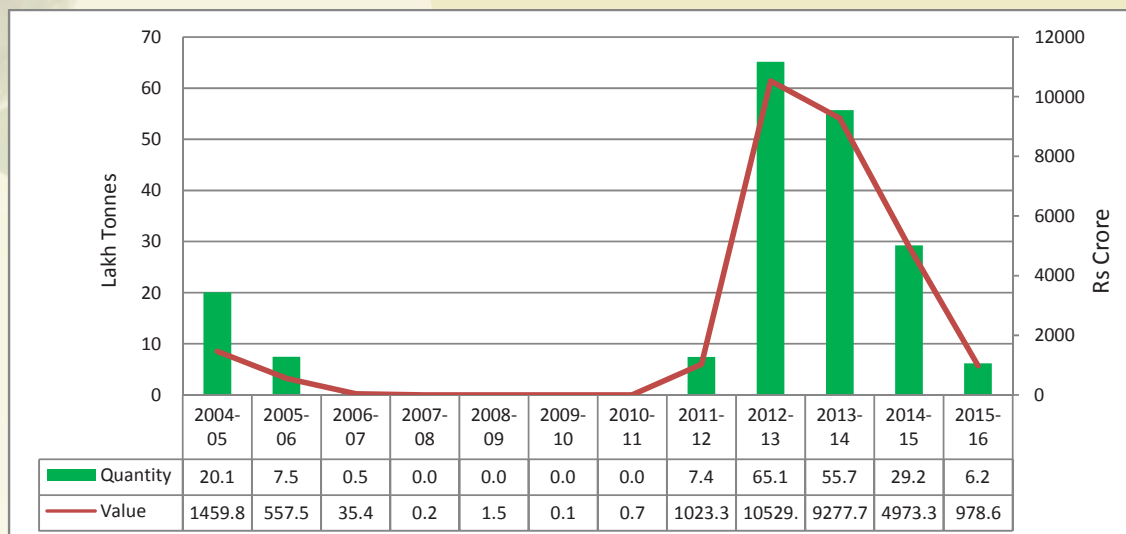
- 4.2 India has experienced continuous decline in its agri-exports in last two years, i.e. 2014-15 and 2015-16 whereas agri-imports have increased during this period. The agri-exports have declined by 8.7 percent from Rs.268.7 thousand crore in 2013-14 to Rs.245.5 thousand crore in 2014-15 and by 9.2 percent to Rs.222.8 thousand crore in 2015-16 over the previous year. Major commodities which accounted for this decline are rice, guar gum meal, oilmeals, wheat, maize, meat & processed meat and marine products. This decline is mainly due to subdued prices of agri-commodities in the international market. Agri-imports have increased from Rs.123.8 thousand crore in 2013-14 to Rs.144.8 thousand crore with an increase of 17 percent in 2014-15 and Rs.163 thousand crore in 2015-16 with an increase of 12.6 percent, mainly due to enhanced imports of edible oils and pulses during this period owing to widening gap between stagnant domestic production and continuous increase in consumption of these commodities in the country. The country continues to be a net-exporter of agri-commodities which has increased from 18.8 thousand crores in 2004-05 to 144.9 thousand crore in 2013-14 but declined to 59.8 thousand crore in 2015-16 (Chart 1.2).

### Wheat

- 4.3 As per USDA, the global production of wheat was 725.3 million tonnes in TE 2015-16 out of which 22.5 percent (163.5 million tonnes) was traded. European Union (EU) is the largest producer of wheat (153.8 million tonnes) with a share of 21.2 percent followed by China (17.4 percent) and India (12.7 percent). EU is also the largest exporter of wheat (33.3 million tonnes) with a share of 20.4 percent followed by USA (15.4 percent). Other major exporters of wheat are Canada (14.2 percent), Russia (13.4 percent) and Australia (10.5 percent). Egypt is the largest importer of wheat (11.1 million tonnes) with a share of 6.8 percent followed by Indonesia (4.8 percent), Algeria (4.7 percent), Brazil (3.8 percent) and Japan (3.6 percent). Wheat exports are more concentrated than imports.
- 4.4 The Government of India prohibited exports of wheat from Central Pool in August, 2003 because of decline in wheat production in 2002-03 due to drought in 2002. Exports on private account were also prohibited in February, 2007 and 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 export of wheat during 2011-12 were only 7.4 lakh tonnes which increased to record level of 65.1 lakh tonnes in 2012-13 (Chart 4.2). However, its exports declined to 55.7 lakh tonnes in 2013-14 which further declined to 29.2 lakh tonnes in 2014-15 and 6.2 lakh tonnes in 2015-16.



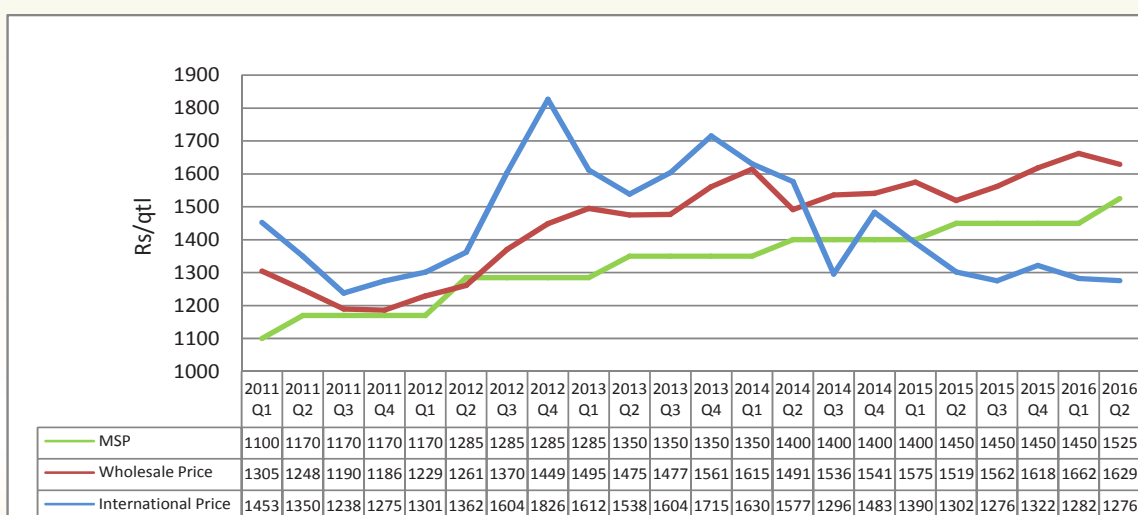
**Chart 4.2: India's Exports of Wheat, 2004-05 to 2015-16**



Source: DGCIS

4.5 It may be seen from Chart 4.3 that during the period from Q<sub>1</sub> of 2011 to Q<sub>1</sub> of 2014, the domestic wholesale prices of wheat have been continuously lower than international prices. India reaped the benefit of higher international prices and was able to export record quantity of 65.1 lakh tonnes and 55.7 lakh tonnes in 2012-13 and 2013-14, respectively. However, during the period from Q<sub>2</sub> of 2014 to Q<sub>2</sub> of 2016, the domestic wholesale prices of wheat have been higher than international prices and even MSP is also higher than international prices and that has led to decline in wheat exports during this period.

**Chart 4.3: MSP, Domestic and International Prices of Wheat, 2011 to 2016 (Q<sub>2</sub>)**



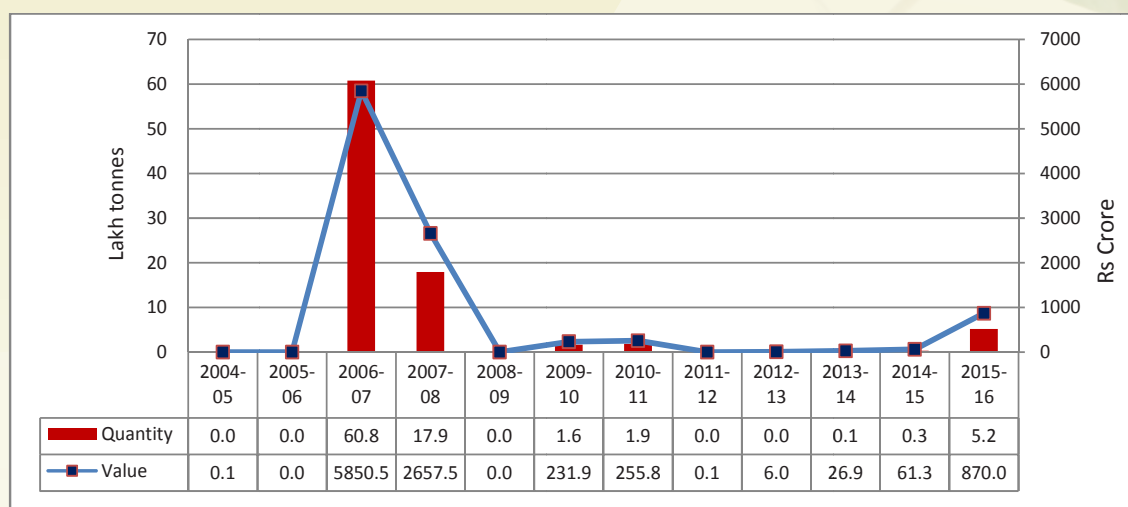
Note: International price of 2016 (Q<sub>2</sub>) is the average of April, 2016 and May, 2016

Source: World Bank for International prices and DES for domestic prices.



- 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 after these two years. However, 5.2 lakh tonnes of wheat have been imported by the private parties mainly from Australia during 2015-16. In order to restrict imports, the Government imposed import duty of 10 percent on wheat in August, 2015, which was further increased to 25 percent in October 2015.

**Chart 4.4: India's Imports of Wheat, 2004-05 to 2015-16**



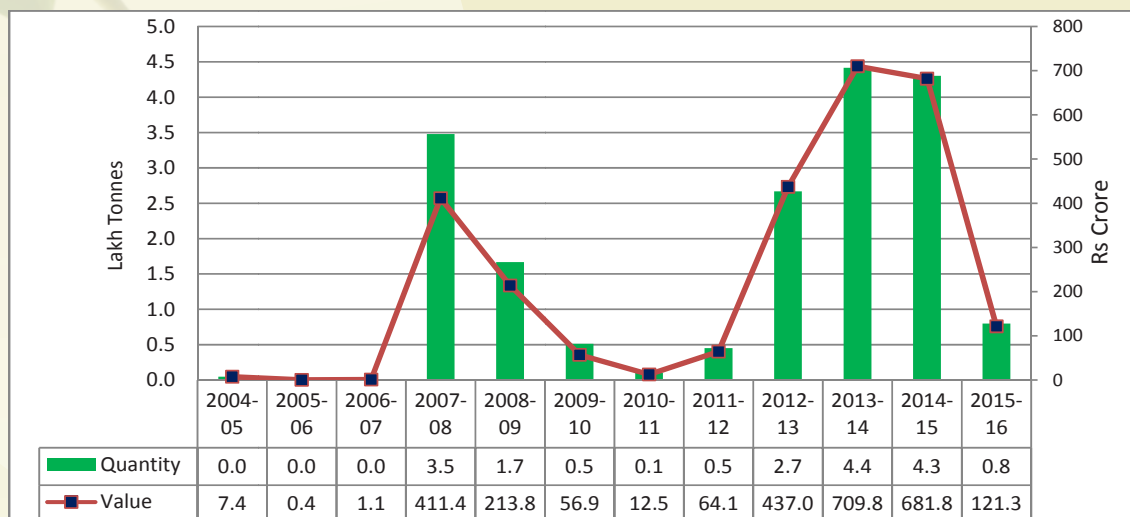
Source: DGCIS

## Barley

- 4.7 As per USDA, the global production of barley was 144.5 million tonnes in TE 2015-16 out of which 18.8 percent (27.1 million tonnes) was traded. EU is the largest producer of barley (60.5 million tonnes) with a share of 41.9 percent followed by Russia (12.1 percent) and Australia (6 percent). EU is also the largest exporter of barley (8.5 million tonnes) with a share of 31.1 percent followed by Australia (20.9 percent), Russia (14.7 percent) and Ukraine (14.3 percent). Saudi Arabia is the largest importer of barley (8.6 million tonnes) with a share of 31.5 percent followed by China (27.3 percent) and Iran (6 percent). Top three exporters (importers) account for two-third of world exports (imports).
- 4.8 India's exports of barley have increased from negligible quantity to a high of 4.4 lakh tonnes in 2013-14 before declining to 4.3 lakh tonnes in 2014-15. Exports of barley further declined to only 0.8 lakh tonnes in 2015-16 (Chart 4.5). Quantitative ceiling on exports of barley was removed in March, 2002 and since then exports continue to be free. Import was made free in November, 2002 and continues to be so till date. Domestic wholesale prices, international prices and MSP of barley are given

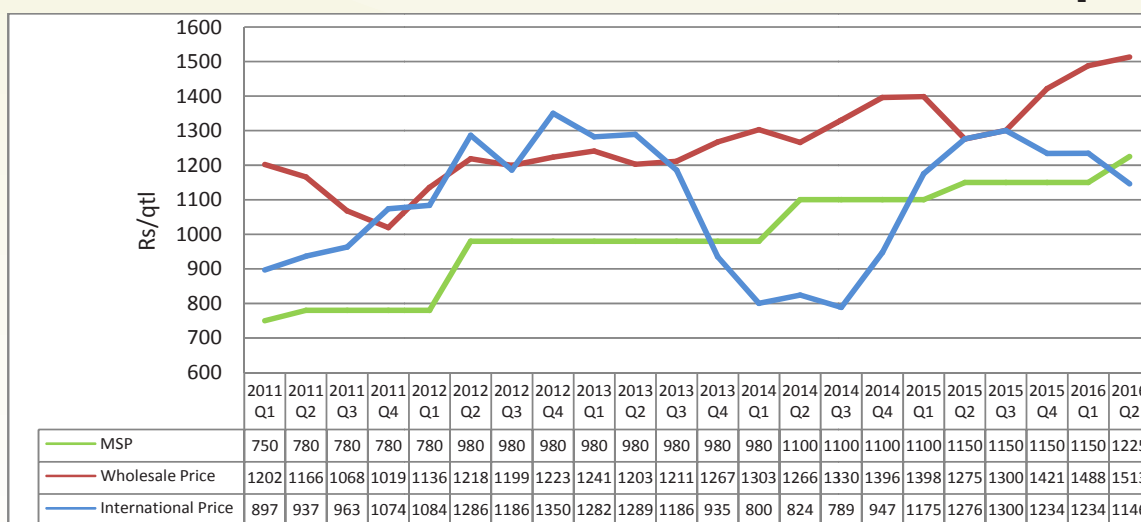
in Chart 4.6. Though domestic wholesale prices are generally higher than the international prices, India exports small quantities of barley to countries like Iran, Jordan, UAE, Oman, Bahrain, Qatar, Bhutan and Nepal where it enjoys a freight advantage over major barley exporting countries like EU, Australia and Russia.

**Chart 4.5: India's Exports of Barley, 2004-05 to 2015-16**



Source: DGCIS

**Chart 4.6: MSP, Domestic and International Prices of Barley, 2011 to 2016 Q<sub>2</sub>**



Note: International price of 2016 (Q<sub>2</sub>) is the average of April, 2016 and May, 2016

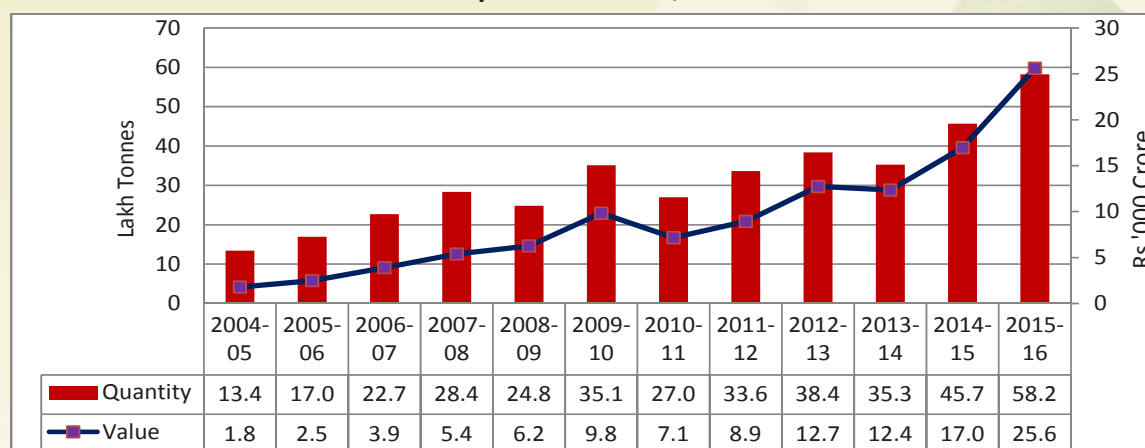
Source: World Bank for international prices and DES for domestic prices.

## Pulses

4.9 As per FAO, the global production of total pulses was 76.7 million tonnes in TE 2014, out of which 18.6 percent (14.3 million tonnes) was traded. India is the largest producer of pulses (18.3 million tonnes) with a share of 23.9 percent. Other major producers are Canada (7.7 percent), Myanmar (6.5 percent), China (5.9 percent),

Nigeria (5.3 percent) and Australia (4.2 percent). However, Canada is the largest exporter of pulses (4.7 million tonnes) with a share of 33 percent followed by Australia (11.1 percent), Myanmar (9.4 percent), USA (8.9 percent) and EU (7.3 percent). India is the largest importer of pulses with a share of about 30 percent followed by EU (11.3 percent), China (7.1 percent) and Bangladesh (5.3 percent). India is the largest producer, consumer and importer of pulses in the world. As per DGCIS, pulses imports in the country have increased from 13.4 lakh tonnes in 2004-05 to 58.2 lakh tonnes in 2015-16 (Chart 4.7).

**Chart 4.7: India's Imports of Pulses, 2004-05 to 2015-16**



Source: DGCIS

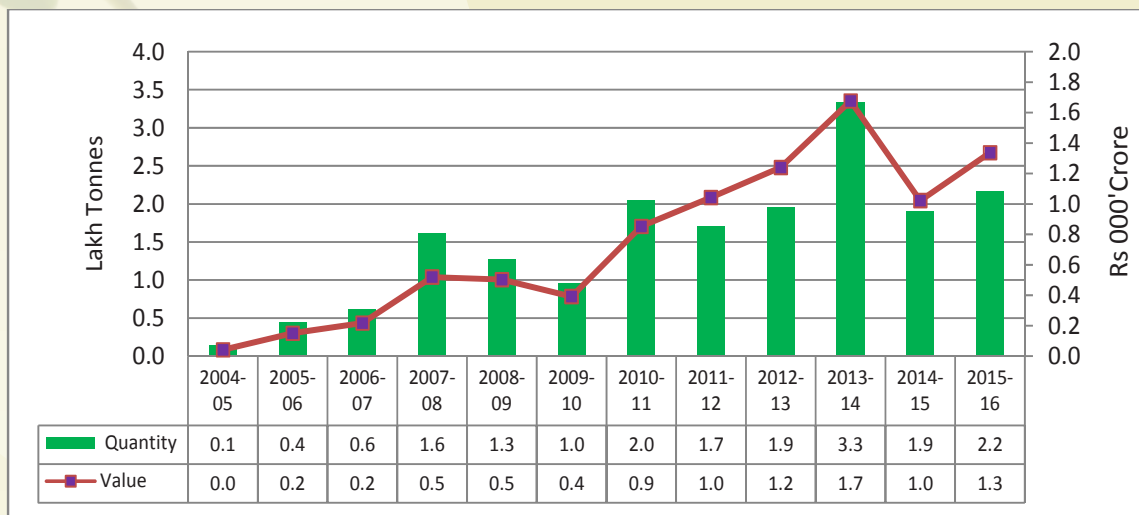
4.10 Import duty on pulses was brought down from 10 percent to zero percent in June, 2006 and continues to be zero percent since then. Export of pulses was prohibited in June, 2006, initially for a period of six months which has been extended from time to time and latest being in March, 2014. However, Kabuli Channa is exempted from export ban. Also, exports of organic pulses up to 10,000 tonnes per annum have been allowed since March, 2011, subject to certification by APEDA and such exports are allowed from Customs Electronic Data Interchange (EDI) Ports only.

### Gram (Chickpea)

4.11 As per FAO, the global production of gram (chickpea) was 13.1 million tonnes in TE 2014, out of which 13.2 percent (1.73 million tonnes) was traded. India is the largest producer (8.80 million tonnes) with a share of 67.4 percent. Other major producers are Australia (5.9 percent), Pakistan (4.6 percent), Myanmar (3.8 percent) and Turkey (3.8 percent). Australia is the largest exporter (0.69 million tonnes) with a share of 39.9 percent followed by India (14.5 percent) and Mexico (9.8 percent). India is the largest importer with a share of 31.8 percent followed by Bangladesh (12.4 percent) and EU (11.7 percent). India imports as well as exports small quantities of gram. India's exports (mostly Kabuli Channa) have increased from a small quantity of 0.1 lakh tonnes to 3.3 lakh tonnes in 2013-14 before declining to 1.9 lakh tonnes in 2014-15. Exports of gram were 2.2 lakh tonnes

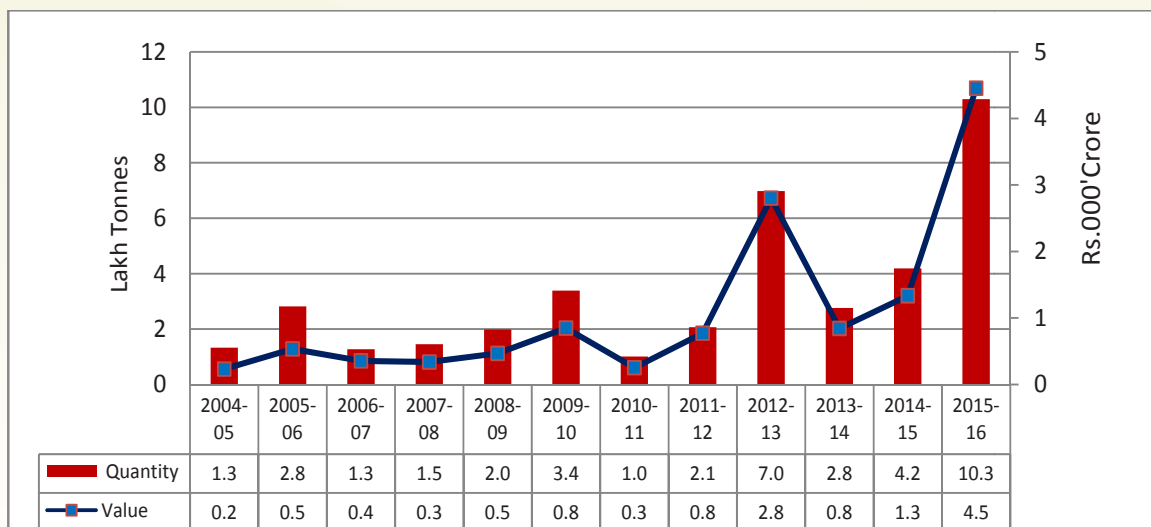
in 2015-16 (Chart 4.8). However, our imports of gram have increased from 1.3 lakh tonnes in 2004-05 to 7.0 lakh tonnes in 2012-13 before declining to 2.8 lakh tonnes in 2013-14. However, imports of gram have increased to 4.2 lakh tonnes in 2014-15 and 10.3 lakh tonnes in 2015-16 (Chart 4.9).

**Chart 4.8: India's Exports of Gram (Chickpea) 2004-05 to 2015-16**



Source: DGCI

**Chart 4.9: India's Import of Gram (Chickpea), 2004-05 to 2015-16**



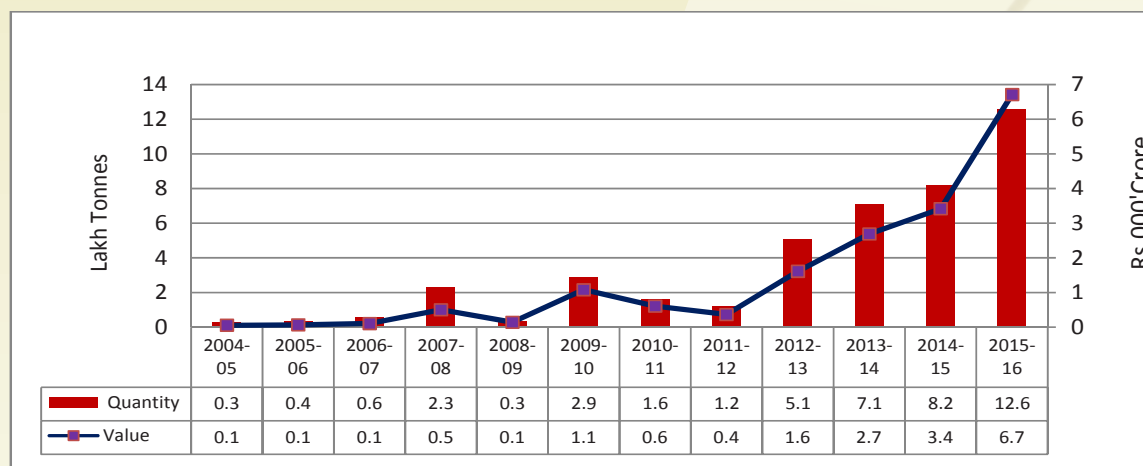
Source: DGCI

### Lentil (Masoor)

4.12 As per FAO, the global production of masoor (lentil) was 4.96 million tonnes in TE 2014, out of which 52 percent (2.59 million tonnes) was traded. Canada is the largest producer of lentils (1.90 million tonnes) with a share of 38 percent. Other major producers are India (22 percent), Turkey (8 percent) and Australia (8 percent). Canada is also the largest exporter of lentils (1.68 million tonnes)

with a share of 65 percent followed by Australia (13 percent). India is the largest importer of lentils with a share of 27 percent followed by Turkey (10 percent), EU (9 percent) and Bangladesh (8 percent). India, Turkey, EU and Bangladesh together account for 54 percent of the total global imports of lentils. India's exports of lentils are negligible whereas its imports have increased from 0.3 lakh tonnes in 2004-05 to 12.6 lakh tonnes in 2015-16 (Chart 4.10).

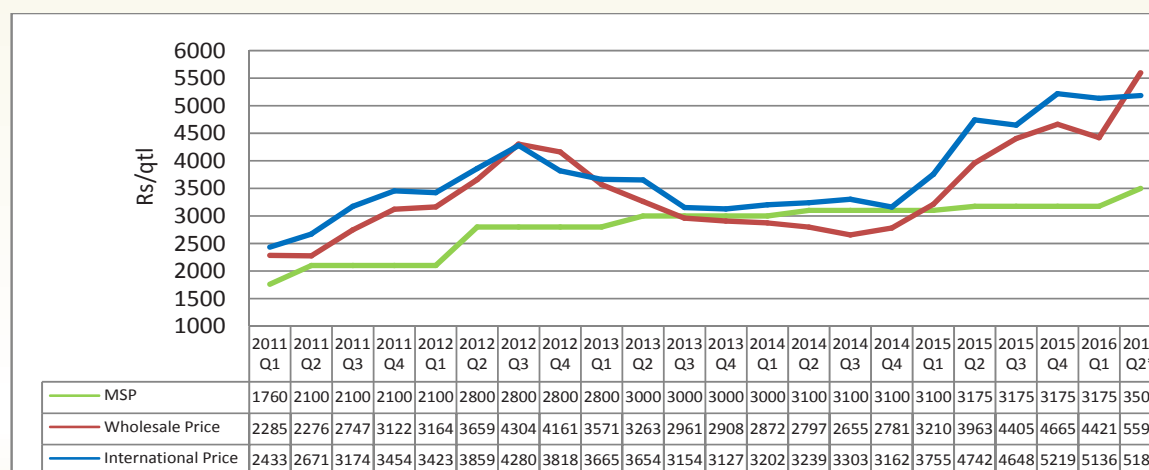
**Chart 4.10: India's Imports of Lentil, 2004-05 to 2015-16**



Source: DGCIS

4.13 During the period from  $Q_1$  of 2011 to  $Q_2$  of 2016, the domestic wholesale prices of gram have generally been lower than international prices (Chart 4.11) whereas domestic wholesale prices of masoor have been generally higher than international prices (Chart 4.12). MSP of gram and masoor have generally been lower than the corresponding domestic and international prices during this period.

**Chart 4.11: MSP, Domestic and International Prices of Gram, 2011 to 2016Q<sub>2</sub>**

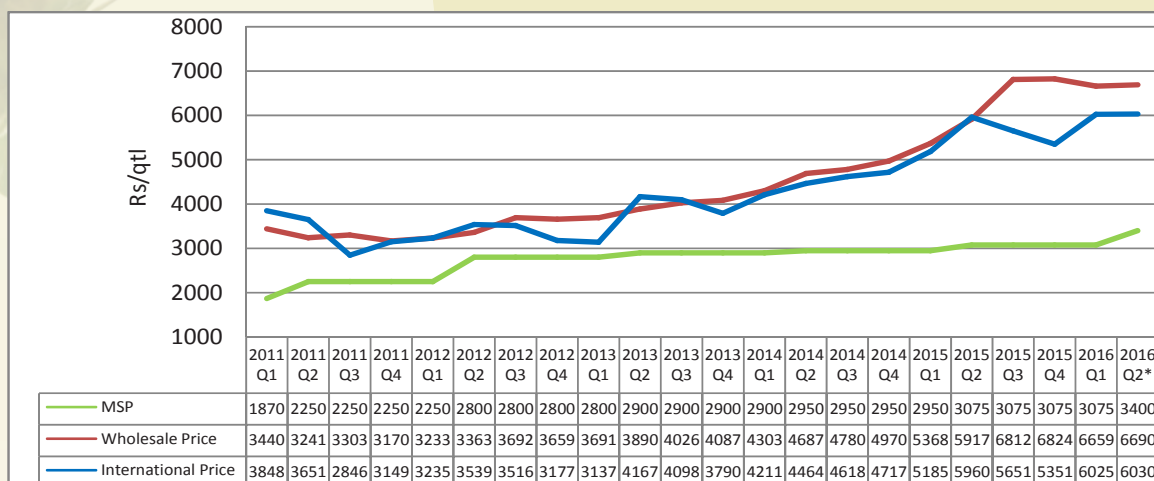


Note: International price of 2016 ( $Q_2$ ) is the average of April, 2016 and May, 2016

Source: DES for Domestic prices and NAFED for International prices.



**Chart 4.12: MSP, Domestic and International Prices of Lentil (Masoor), 2011 to 2016Q<sub>2</sub>**



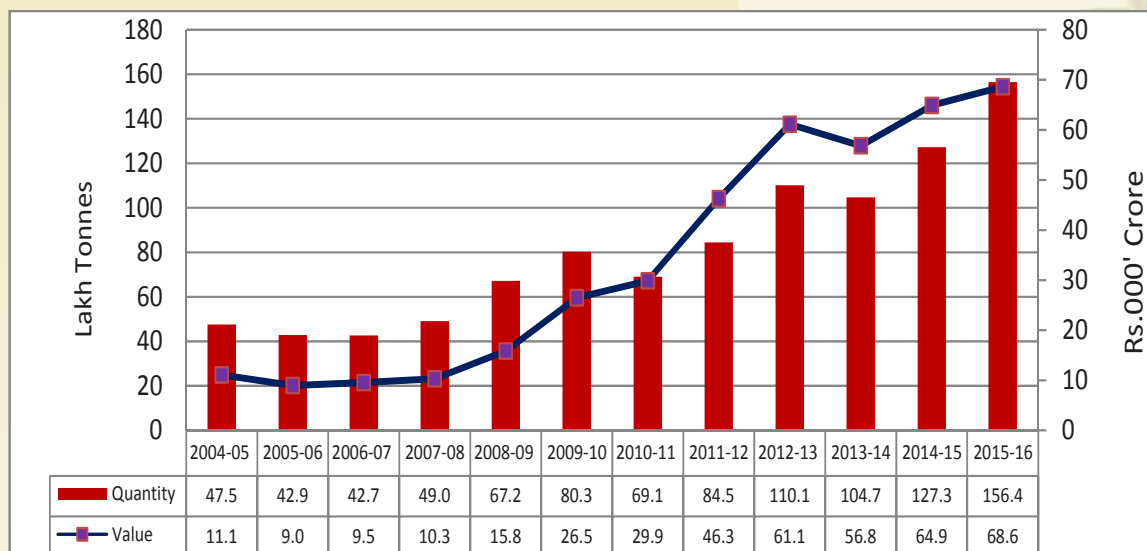
Note: International price of 2016 (Q<sub>2</sub>) is the average of April, 2016 and May, 2016

Source: DES for Domestic prices and NAFED for International prices.

### Oilseeds/Edible Oils

- 4.14 As per USDA, the global production of major oilseeds was 521.1 million tonnes in TE 2015-16 out of which 27.6 percent (144 million tonnes) was traded. USA is the largest producer (110.4 million tonnes) with a share of 21.2 percent. Other major producers are Brazil (18.7 percent), Argentina (11.7 percent), China (10.9 percent) and India (6.4 percent). Brazil and USA accounted for 70 percent of the global exports, with a share of 36.5 percent and 33.5 percent, respectively. Other major exporters are Canada (9.1 percent) and Argentina (7.5 percent). China is the single largest importer of oilseeds (82 million tonnes) with a share of 57.9 percent. Other major importers are EU (12.2 percent), Mexico (4 percent) and Japan (4 percent).
- 4.15 As per USDA, the global production of vegetable oils was 176.3 million tonnes during TE 2015-16, out of which 42.2 percent (74.4 million tonnes) was traded. Indonesia is the largest producer (36.9 million tonnes) with a share of 20.9 percent. Other major producers are China (14.2 percent), Malaysia (12.7 percent) and EU (10.2 percent). Indonesia and Malaysia export about 61 percent of global exports with a share of 35.5 percent and 25.4 percent, respectively. India is the largest importer with a share of about 19 percent followed by EU (13.7 percent), China (12.5 percent) and USA (5.9 percent).
- 4.16 As per DGCIS, India's imports of edible oils have increased from 47.5 lakh tonnes valued at 11.1 thousand crore in 2004-05 to 110.1 lakh tonnes valued at 61.1 thousand crore in 2012-13 and declined to 104.7 lakh tonnes valued at 56.8 thousand crore in 2013-14 (Chart 4.13). However, import of edible oils has increased to 127.3 lakh tonnes valued at 64.9 thousand crore in 2014-15 and 156.4 lakh tonnes valued at 68.6 thousand crore in 2015-16 which is due to decline in the domestic production coupled with decline in international prices of edible oils, particularly of palm oil.

**Chart 4.13: India's Imports of Edible Oils, 2004-05 to 2015-16**



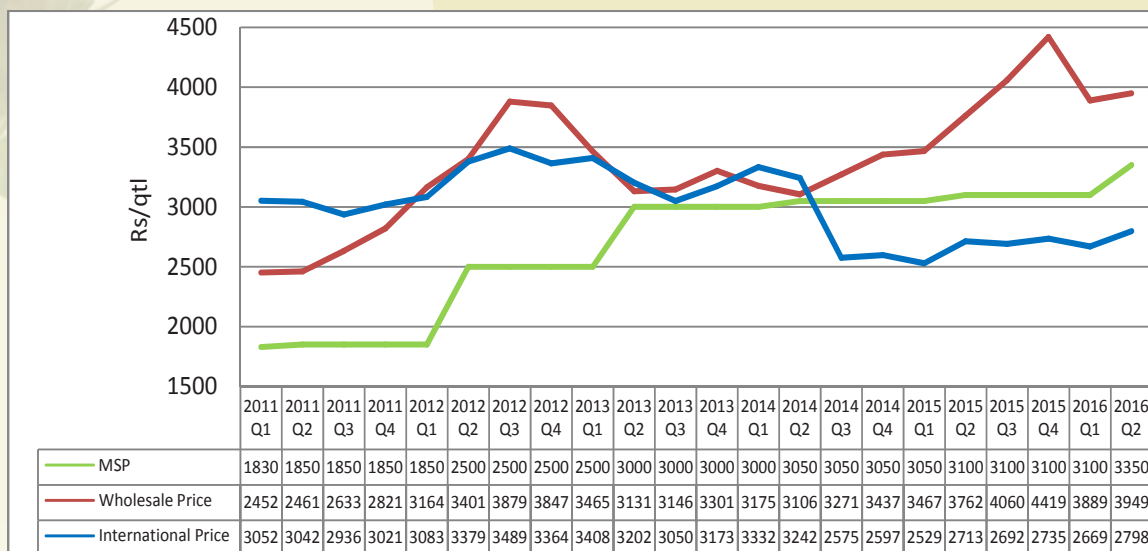
Source: DGCIS

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

4.17 As per USDA, the global production of R&M was 70.4 million tonnes, out of which 20.7 percent (14.6 million tonnes) was traded. EU is the largest producer of R&M (22.6 million tonnes) with a share of 32.1 percent. Other major producers are Canada (24.7 percent), China (20.6 percent) and India (8.6 percent). Canada is the single largest exporter of R&M (9.2 million tonnes) with a share of 63.2 percent. China is the largest importer (4.6 million tonnes) with a share of 31.9 percent followed by EU (20 percent) and Japan (16.9 percent).

4.18 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 TE 2015-16. During the period from Q<sub>1</sub> of 2011 to Q<sub>2</sub> of 2014, the domestic wholesale prices of R&M have generally followed the trend of international prices. However, during the period from Q<sub>3</sub> of 2014 to Q<sub>2</sub> of 2016, the domestic wholesale prices of R&M have been continuously higher than international prices. MSP of R&M has been consistently lower than domestic wholesale prices. However, MSP of R&M has been higher than international prices during the period from Q<sub>3</sub> of 2014 to Q<sub>2</sub> of 2016 (Chart 4.14).

**Chart 4.14: MSP, Domestic and International Prices of R&M, 2011 to 2016**



Note: International price of 2016 (Q<sub>2</sub>) is the average of April, 2016 and May, 2016

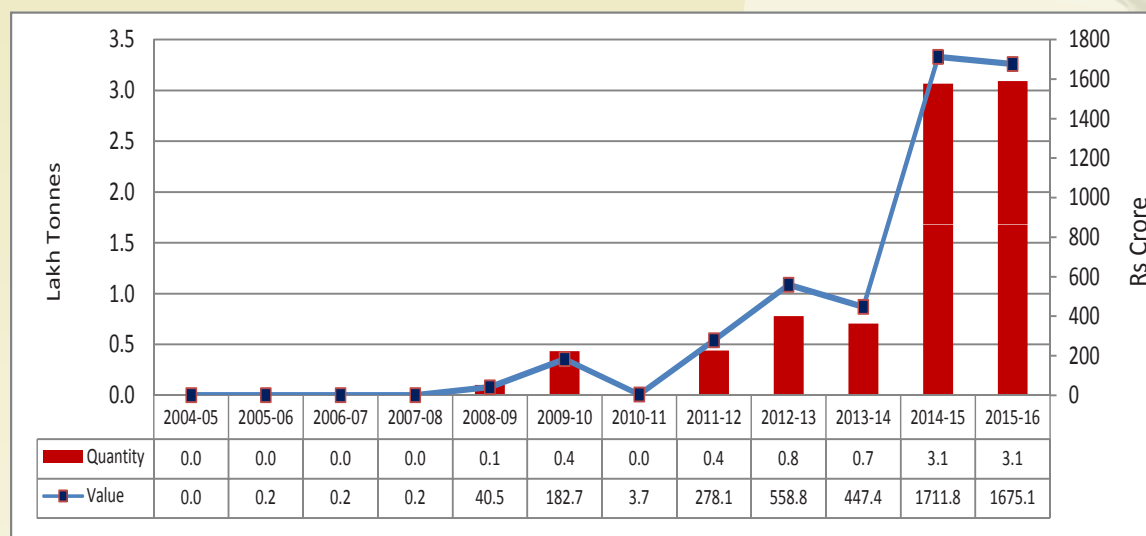
Source: DES for Domestic prices and World Bank for International prices.

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

4.19 As per USDA, the global production of R&M oil was 27.4 million tonnes in TE 2015-16, out of which about 15 percent (4 million tonnes) was traded. EU is the largest producer of R&M oil (10.2 million tonnes) with a share of 37.3 percent followed by China (25.4 percent), Canada (12 percent) and India (7.1 percent). Canada is the single largest exporter of R&M oil (2.5 million tonnes) with a share of 62.6 percent followed by EU (8.4 percent). China is the largest importer of R&M oil (0.8 million tonnes) with a share of 20.8 percent followed by India (8.3 percent) and EU (6.8 percent).

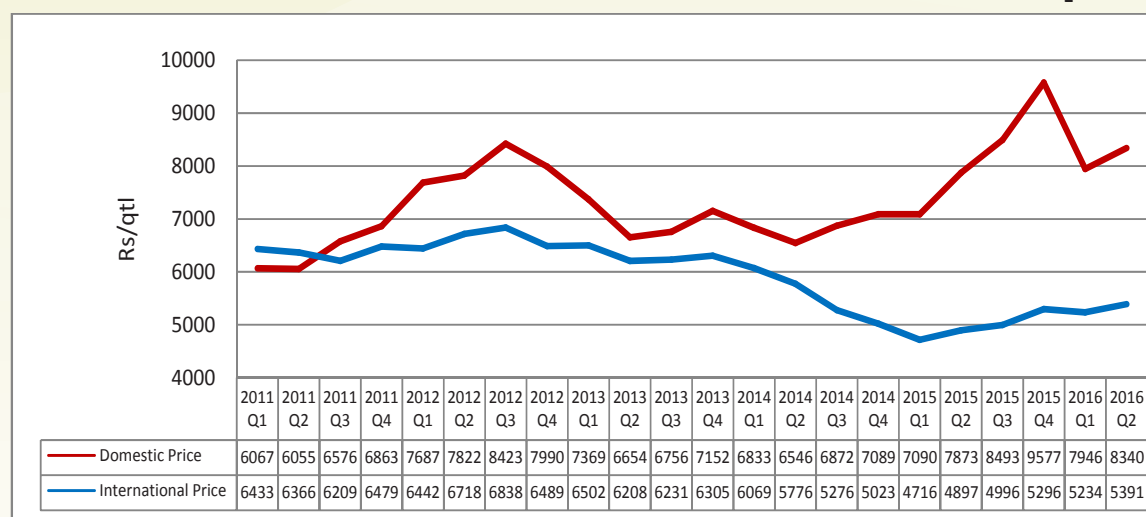
4.20 India's exports of R&M oil are negligible but imports of R&M oil have increased in last two years. Imports of R&M oil have increased from 70 thousand tonnes in 2013-14 to 3.1 lakh tonnes each in 2014-15 and 2015-16 (Chart 4.15). The domestic wholesale prices of R&M oil have continuously been higher than international prices from Q<sub>3</sub> of 2011 to Q<sub>2</sub> of 2016 [Chart 4.16]. Domestic wholesale prices of R&M oil have experienced increasing trend from Q<sub>2</sub> of 2011 to Q<sub>3</sub> of 2012, moderate declining trend thereafter till Q<sub>2</sub> of 2014 and steep increasing trend up to Q<sub>4</sub> of 2015. Similarly, international prices have experienced increasing trend up to Q<sub>3</sub> of 2012, declining trend thereafter up to Q<sub>1</sub> of 2015 and increasing trend up to Q<sub>2</sub> of 2016.

**Chart 4.15: India's Imports of R&M Oil, 2004-05 to 2015-16**



Source: DGCIS

**Chart 4.16: Domestic and International Prices of R&M Oil, 2011 to 2016Q<sub>2</sub>**



Note: International price of 2016 (Q<sub>2</sub>) is the average of April, 2016 and May, 2016

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

## Trade Policy – Oilseeds/Edible oils

4.21 Export of oilseeds is free while import of oilseeds are under OGL with an import duty of 30 percent since January, 2003. Edible oils were under negative list of imports till April, 1994 when import of palmolein was placed under OGL subject to 65 percent import duty. Subsequently, import of other edible oils were also placed under OGL and import duty was high up to 80 percent on crude 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 has been further increased to 7.5 percent in December, 2014 and to 12.5 percent

in September, 2015. Import duty on refined edible oil was also increased to 10 percent in January, 2014 which has been further increased to 15 percent in December, 2014 and to 20 percent in September, 2015.

- 4.22 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 and (f) 10,000 tonnes of organic edible oils per annum. In addition, exports of edible oils in branded consumer packs of up to 5 kg. is permitted with a MEP of US \$ 900 per MT. India's Trade policy for major Rabi Crops is summarized in Table 4.1.

**Table 4.1: India's Trade Policy - Rabi Crops**

Crop/ Commodity	Trade Policy				
	Import Policy			Export Policy	
	OGL/Import Ban	Import Duty (%)	Bound Duty (%)	OGL/Export Ban	Export Duty (%)
A - Cereals					
Wheat	OGL	25.0	100	OGL	Zero
Barley	OGL	Zero	100	OGL	Zero
B – Pulses					
Gram (Chickpea)	OGL	Zero	100	Export ban [except (i)Kabuli Channa (ii) 10,000 tonnes per annum of organic pulses and Lentils]	
Masoor (Lentil)	OGL	Zero	100		
C – Oilseeds/Edible oils					
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 (Tariff value -US \$710 per metric tonne)	12.5	300	Export ban*	
RBD Palmolein	OGL (Tariff value -US \$727 per metric tonne)	20.0	300	Export ban*	

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



## Trade Outlook

- 4.23 India's production of cereals, pulses and oilseeds is expected to increase in 2016-17 in view of prediction of normal rainfall in 2016 monsoon season. Agri-exports in 2016-17 are expected to be higher than 2015-16. However, any substantial increase in agri-exports in 2016-17 is not likely to take place due to lower demand as well as prices in the international market, whereas agri-imports are likely to increase mainly due to widening gap between production and consumption of edible oils and pulses, the latter more because of rise in prices in the international market. International prices of cereals, oilseeds, edible oils and cotton are likely to remain subdued in the near future, whereas pulses are likely to remain on the higher side than the trend mainly due to higher demand from India which is the largest importer of pulses in the world.
- 4.24 As per FAO's Food Outlook, June 2016, global cereal production in 2016 is predicted to be 0.6 percent higher than 2015. The global trade in cereals in 2016-17 is predicted to decline by 1.9 percent compared to 2015-16, mostly due to reduced import demand for barley and sorghum whereas wheat trade is likely to increase slightly. The overall contraction in world cereal trade is likely to intensify competition for market share among major exporters keeping international prices in check. Based on current forecasts, world output of oilseeds and derived products viz. oils/oilmeals are expected to contract in 2015-16 season. The likelihood of tighter global supply and demand balances in oil crop complex explains the recent strengthening in international prices of oilseeds and oils/oilmeals. As per the current outlook, international prices of oilseeds and oils/meals are likely to remain under upward pressure over the coming months.

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## Chapter 5

# Costs, Returns and Inter-Crop Price Parity

- 5.1 As per the mandate of the Commission, cost of production (CoP) is one of the important factors in the determination of MSP of mandated crops. Besides this, the Commission considers other important factors such as demand and supply, trends in the domestic and international market prices, inter-crop price parity and terms of trade between agricultural and non-agricultural sectors, likely impact of MSPs on consumers, in addition to ensuring rational utilization of natural resources like land and water. Thus, pricing policy is rooted not only in cost plus approach though cost is one of the important factors.
- 5.2 The Commission uses the cost estimates furnished by the DES, Ministry of Agriculture & Farmers Welfare under Comprehensive Scheme (CS) for Studying the Cost of Cultivation of Principal Crops in India. CS data is generally available with a time lag of two years. It needs to be projected for Rabi Marketing Season (RMS) 2017-18 state-wise and at all-India level. These projected cost estimates are factored into formulation of price policy recommendations by the Commission.
- 5.3 The Commission has projected CoP estimates for RMS 2017-18, based on actual estimates for the latest three years' viz. 2012-13 to 2014-15 for each state. These projections capture movement in overall input cost separately for the crop season 2016-17 over each of the past three years viz. 2012-13, 2013-14 and 2014-15. An assessment of overall movement in input cost likely for the crop year 2016-17 with reference to each of the three consecutive years ending with 2014-15 is made by constructing the Composite Input Price Index (CIPI) based on latest prices of different inputs like human labour, bullock labour, machine labour, manures, fertilisers, seeds, pesticides and irrigation charges based on data available from different sources; like Labour Bureau, Office of Economic Adviser, Ministry of Commerce & Industry, Fertilizer Association of India and replies from State governments etc. Based on these input price indices, Commission then makes projections for cost of production likely to prevail in RMS 2017-18.
- 5.4 The Commission prepares its cost projections on the basis of latest three years' cost estimates for each crop and each state. In this exercise, there are certain implicit assumptions. One, since projection for a crop for each growing state is

made two to three years ahead, it is assumed that fixed cost components would not, in all likelihood, undergo any perceptible change in the intervening period. Two, since yield level varies, over a short to wide range, year-on-year due to multiplicity of factors, including natural and man-made, three projections of cost are attempted for each state for a particular crop to smoothen out erratic fluctuations in yield and hence in cost of production. How accurate the projected costs are in relation to actual costs when they are available in future is always a matter of ex-post analysis for further refining the on-going exercise in cost projection.

### Costs and Returns of Rabi Crops during 2012-13 to 2014-15

- 5.5 Before giving its projection, the Commission first examines the actual cost and profitability of various crops, for which latest data is made available by DES. It is pertinent to point out that the gross value of output is estimated at the prevailing market prices during harvest season in the village/cluster of villages where crops are grown and harvested. With this stipulation, an analysis of profitability and rate of return over cost  $A_2$ ,  $A_2+FL$  and  $C_2$  for various crops during TE 2014-15 is presented.
- 5.6 Profitability can be seen from three perspectives. The first is gross returns over  $A_2$  which is defined as gross value of output less cost  $A_2$ , second is gross returns over  $A_2+FL$  which is defined as gross value of output less cost  $A_2+FL$  and the third is net returns which represent gross value of output less cost  $C_2$ . The average returns (both gross and net) during 2012-13 to 2014-15 for various rabi crops are presented in Table 5.1 and Chart 5.1. It may be seen from Table 5.1 that the gross rate of returns over  $A_2$  are significantly higher for all rabi crops compared to the gross rate of returns over  $A_2+FL$  and  $C_2$ . The gross rate of return over  $A_2$  is maximum for rapeseed & mustard; gross rate of return over  $A_2+FL$  cost is maximum for lentil and net rate of return is maximum for R&M and lentil. However, gross rate of return over  $A_2+FL$  is minimum and net return is negative for safflower. The state-wise details of average returns are given in Annex Table 5.1.

**Table 5.1: Gross and Net Returns of Rabi Crops (TE 2014-15)**

S.No.	Crops	Cost $A_2$	Cost $A_2+FL$	Cost $C_2$	GVO	Gross Returns over $A_2$		Gross Returns over $A_2+FL$		Net Returns	
		Rs./ha.				Rs./ha. (Col.6- Col.3)	Percent (Col.7/ Col.3*100)	Rs./ha. (Col.6- Col.4)	Percent (Col.9/ Col.4*100)	Rs./ha. (Col.6- Col.5)	Percent (Col.11/ Col.5*100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>A-Cereals</b>											
1	Wheat	22742	28879	45814	58340	35598	157	29461	102	12527	27
2	Barley	18898	29953	43867	53657	34759	184	23704	79	9791	22
<b>B-Pulses</b>											
3	Gram	16708	20647	30871	35521	18813	113	14873	72	4650	15
4	Lentil	12728	16170	26653	34210	21482	169	18040	112	7557	28
<b>C-Oilseeds</b>											
5	R & M	14813	22572	35381	45421	30607	207	22848	101	10040	28
6	Safflower	14776	18815	24383	22137	7361	50	3322	18	-2246	-9

Notes: 1.  $A_2$  cost includes all expenses in cash and kind on account of hired labour including human, bullock, machine, seed, insecticides, pesticides, manure, fertilizers, irrigation charges and miscellaneous expenses.

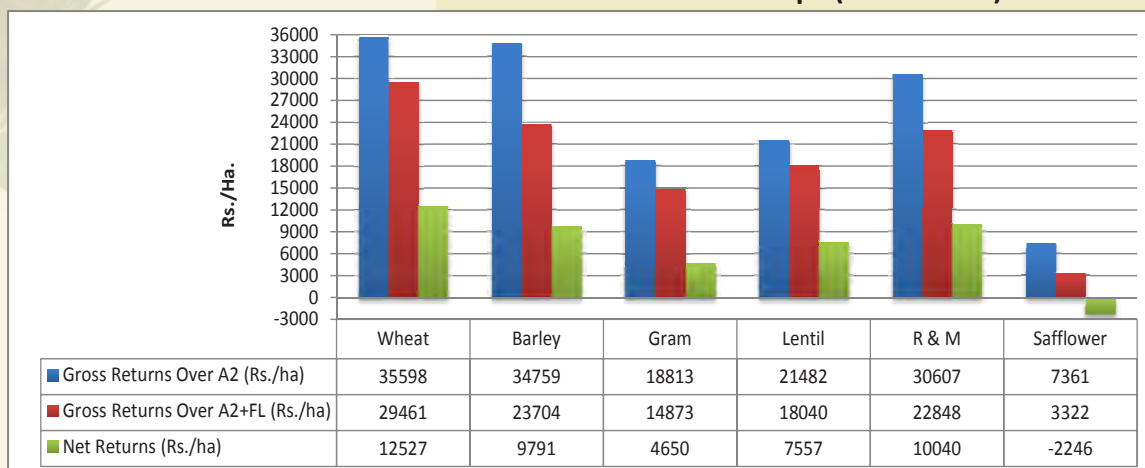
2.  $A_2+FL$  cost includes  $A_2$  and family labour.

3.  $C_2$  cost includes  $A_2+FL$  cost, rental value of owned land and interest on owned fixed capital.

Source: CACP Calculations based on data received under Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India, DES, Ministry of Agriculture and Farmers Welfare



**Chart 5.1: Gross and Net Returns of Rabi Crops (TE 2014-15)**

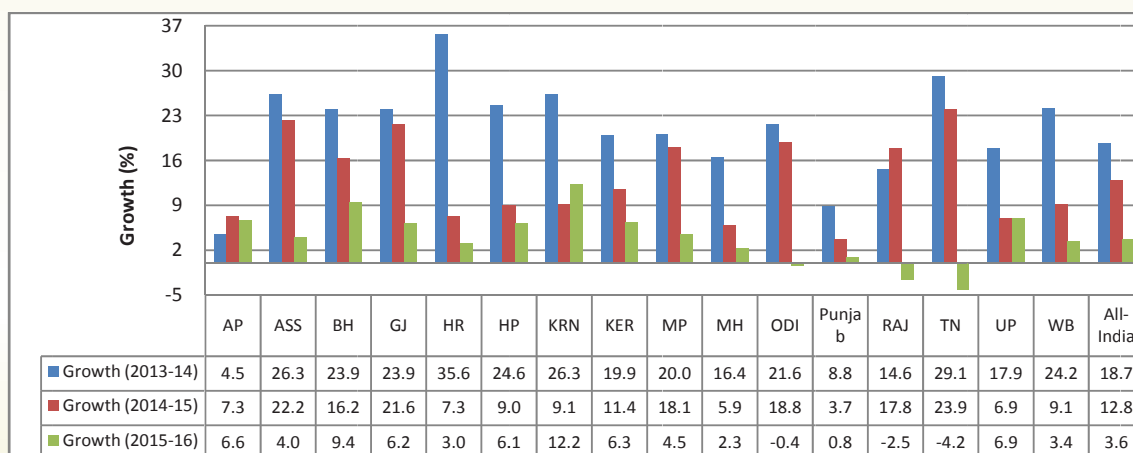


Source: CACP Calculations.

## Labour and Input Price Movement

5.7 Chart 5.2a and b depict annual average growth in wage rates of agricultural labour in major states and at all-India level at current prices and constant prices (2015-16=100) respectively for TE 2015-16. At all-India level, increase in agricultural labour wage was 18.7 percent in 2013-14, 12.8 percent in 2014-15 and it slowed down further to 3.6 percent in 2015-16 at current prices. The increase in real wages was 8.0 percent, 6.9 percent and -1.1 percent in corresponding years. The annual average for a particular year is from July to June. This reflects a declining trend in growth of agricultural labour wages over the last three years. Further, Chart 5.2(c) reflects annual average daily wages of agricultural labour 2015-16 and growth in wages 2015-16 over 2014-15. The state-wise and all-India details of monthly average daily wage rates of agriculture labour in nominal terms of major states are given in Annex Table 5.2.

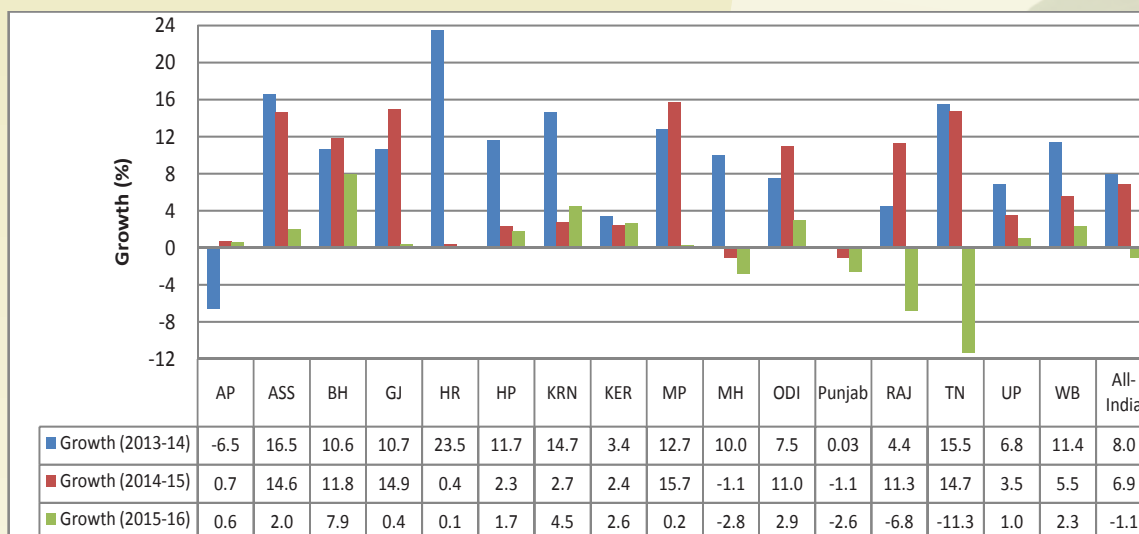
**Chart 5.2a: Annual Average Growth in Wages of Agricultural Labour**  
(During 2013-14 to 2015-16 at Current Prices)



Note: For the year 2015-16 the annual average is from July, 2015 to April, 2016

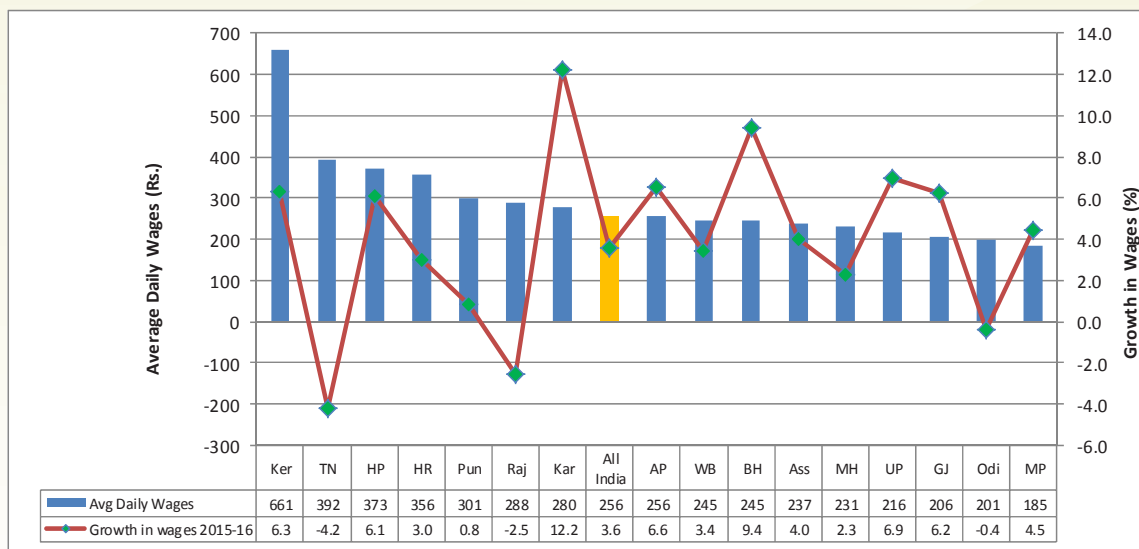
Source: Labour Bureau, Shimla

**Chart 5.2b: Annual Average Growth in Wages of Agricultural Labour**  
(During 2013-14 to 2015-16 at Constant Prices 2015-16 = 100)



Source: Labour Bureau, Shimla

**Chart 5.2c: Annual Average Daily Wages of Agricultural Labour 2015-16 and Growth in Wages, 2015-16 over 2014-15**



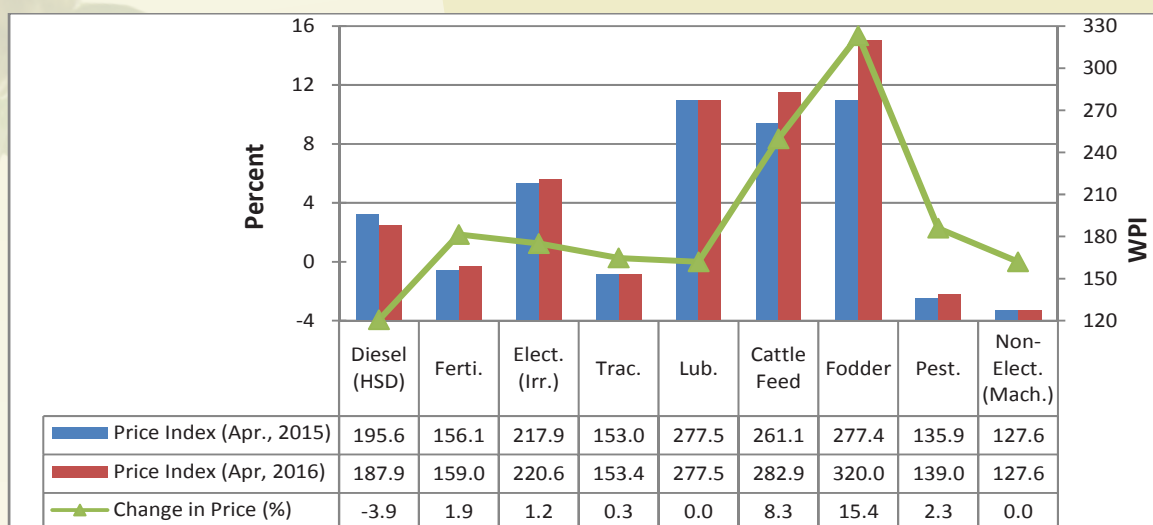
Source: Labour Bureau, Shimla

5.8 Chart 5.3 exhibits trend of prices of farm inputs based on WPI 2004-05=100 during April, 2016 over April, 2015. While the prices of fertilizers, electricity for irrigation, tractors, cattle feed and pesticides have increased in the range of 0.3 percent to 15.4 percent, those of HSD have declined by 3.9 percent and in case of lubricant and non-electrical machinery, the prices remained the same during the corresponding period (details in Annex Table 5.3).



**Chart 5.3: Movements in Prices of Farm Inputs**

(April, 2016 over April, 2015)



Source: DIPP, Ministry of Commerce and Industry

### Cost Projections for RMS 2017-18

5.9 Based on the state-wise costs and CIPI, crop-wise all India weighted average cost of production, with weights being relative shares of the states in the total production in TE 2015-16 is projected for RMS 2017-18. Table 5.2 presents the projected cost ( $A_2$ ,  $A_2+FL$  and  $C_2$ ) of all rabi crops at all India level. The state-wise and all India projected costs of six mandated rabi crops for RMS 2017-18 are given in Annex Table 5.4. Also state-wise actual costs for 2013-14 and 2014-15 are in Annex Table 5.5 (a) to (f).

**Table 5.2: Projected Costs of Rabi Marketing Season, 2017-18**

Crops	Cost of Production (Rs./qtl.)		
	$A_2$	$A_2+FL$	$C_2$
Wheat	631	797	1203
Barley	511	816	1119
Gram	1799	2241	3185
Lentil(Masur)	1674	2174	3360
Rapeseed/Mustard	1232	1871	2773
Safflower	2076	3049	3952

Source: CACP Calculations

### Comparison of Projected Cost Estimates

5.10 The Commission has made a comparison of its projected costs of mandated rabi crops with those provided by few states viz. Bihar, Chhattisgarh, Haryana, Punjab, Rajasthan and Telangana for RMS 2017-18. As per practice followed, the

Commission takes a close look at the projected cost estimates for various rabi crops generated by some of the states through their own surveys and compares them with the corresponding CACP estimates projected on the basis of actual cost estimates made available by DES under the Comprehensive Scheme (CS). Since the concepts and methodologies used by the states are at variance with those under CS, the Commission sometimes finds it difficult to reconcile the two sets of data. The projected cost estimates of states and CACP for various rabi crops are given in Annex Table 5.6. It may be noted that in some cases the state projections are higher than that of CACP's projected cost mainly due to high land rent, high seed cost and additional "After Care" cost, etc. considered by the states in their cost calculations. However, in few crops, viz. wheat, barley, gram and lentil in some states, the state estimates are lower than the corresponding CACP projections. It may also be mentioned that State Governments have considered higher cost which includes various other charges viz. managerial cost, weather risk, profit/margin over and above the projected cost of production ( $C_2$ ) while recommending MSP for different crops.

- 5.11 The Commission computes the all India weighted average composite input price index for all the crops for the years 2013-14 to 2016-17. 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 crop area in TE 2015-16 has been calculated. These indices are used to compute all India weighted average rabi crops composite input price index, with weights being relative shares of the crops in the total production in TE 2015-16. It may be observed from Table 5.3 that the all India rabi crops CIPI is showing an upward trend with an increase of 7.0 percent in 2016-17 over 2015-16.

**Table 5.3: All India Rabi Crops Input Price Index (Base 2004-05=100)**

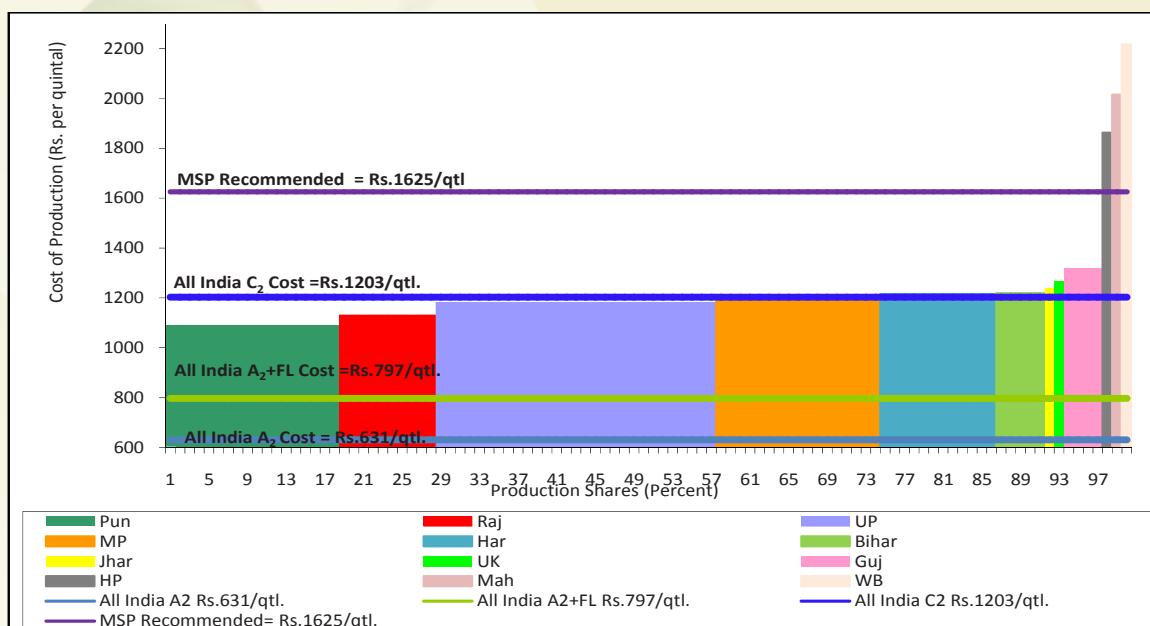
Inputs	Weights (2014-15)	Rabi Crops Input Price Index				Percentage Change in Input Index 2016-17 over 2015-16
		2013-14	2014-15	2015-16	2016-17	
Human Labour(HL)	0.38	330	371	398	433	8.7
Bullock Labour (BL)	0.02	322	353	384	420	9.3
Machine Labour (ML)	0.23	218	211	180	188	4.2
Seeds	0.10	240	269	293	315	7.5
Fertilizers	0.14	150	154	159	164	3.1
Manures	0.00	225	239	250	263	5.0
Insecticides	0.01	128	136	138	143	4.0
Irrigation Charges	0.11	182	188	194	200	3.2
<b>Composite Input Price Index (CIPI)</b>		<b>250</b>	<b>269</b>	<b>276</b>	<b>296</b>	<b>7.0</b>

Source: CACP Calculations.

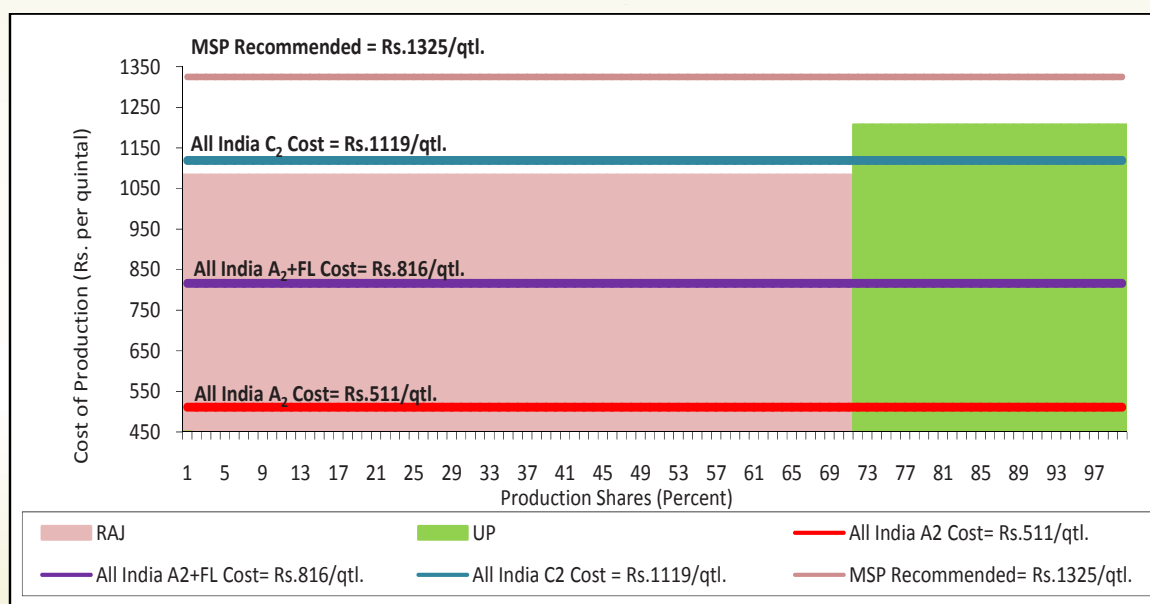
5.12 Charts 5.4a to (e) depict the cost of production ( $C_2$ ) by states in ascending order of the cost with their corresponding relative shares in total production of respective crops. It may be noted that percent of the production covered by the all India weighted average cost of production and also MSP vary from crop to crop. For instance, the production covered at  $C_2$  cost is 58 percent in case of wheat, 71 percent in case of barley, 62 percent in case of gram, 71 percent in case of lentil, 66 percent in case of rapeseed/mustard.

**Chart 5.4: Supply Curve and Projected Cost, RMS 2017-18**

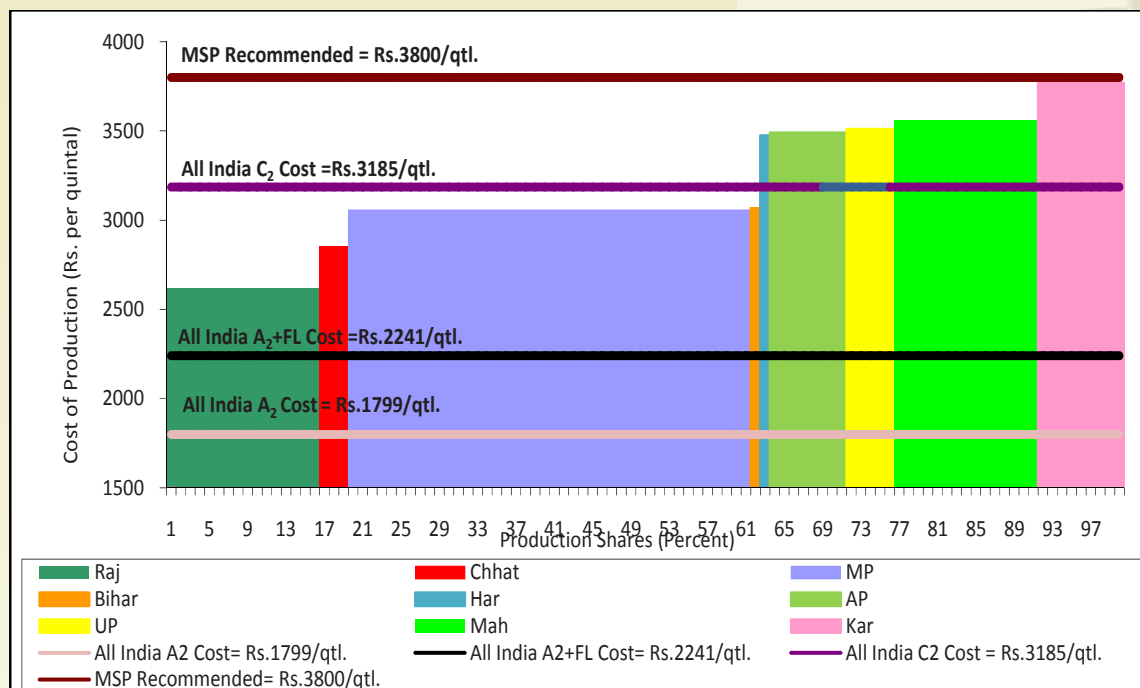
**a: Wheat**



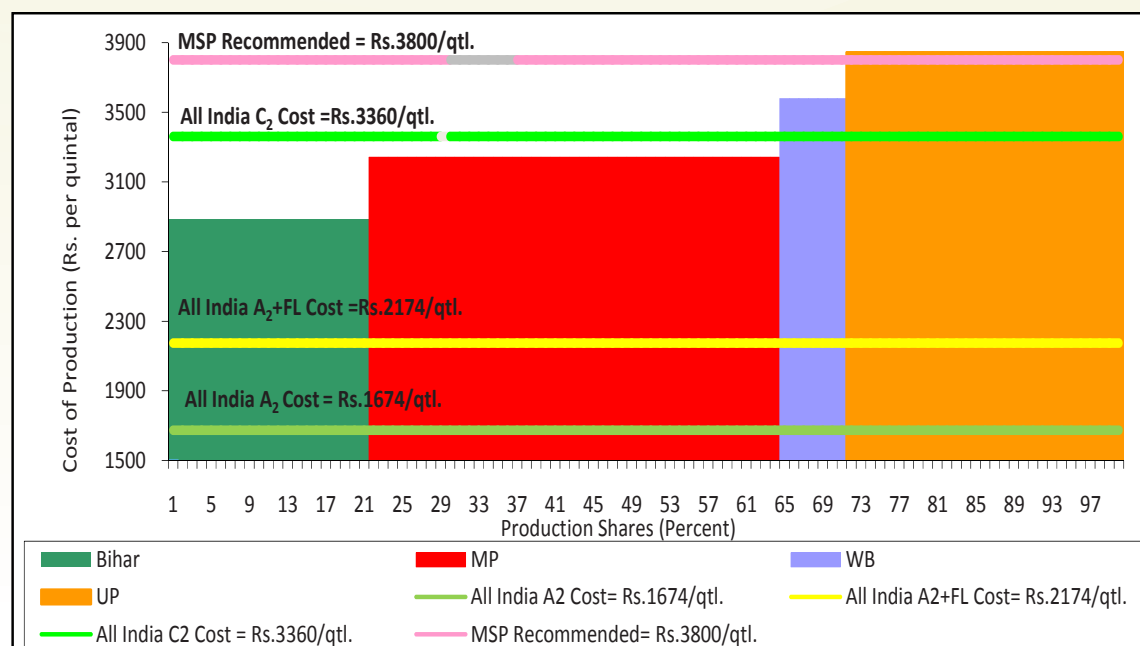
**b: Barley**



c: Gram

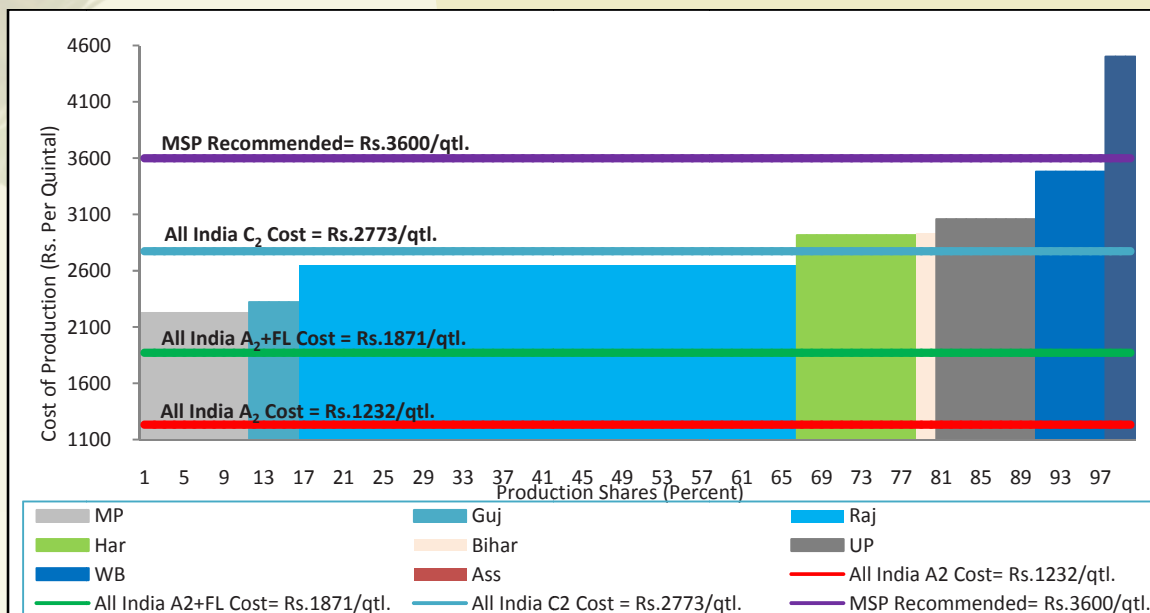


d: Lentil



Costs, Returns and Inter-Crop Price Parity

## e: Rapeseed/Mustard



### Inter Crop Price Parity

5.13 Inter crop price parity being one of the factors for determination of MSP, per hectare returns of different crops that are substitutes for each other are computed. Table 5.4 outlines relative returns over  $A_2$ ,  $A_2+FL$  and  $C_2$  in percentage terms for various rabi crops in reference to that of wheat. It is observed that relative gross returns over  $A_2$ ,  $A_2+FL$  and net return for  $C_2$  for all crops are low as compared to wheat ranging from 98 percent for barley over  $A_2$  to (-)18 percent for safflower over  $C_2$ .

**Table 5.4: Relative Returns of Rabi Crops (Percent) TE 2014-15**

Crops	Relative Gross Returns over $A_2$ w.r.t. wheat	Relative Gross Returns over $A_2+FL$ w.r.t. wheat	Relative Net Returns w.r.t. wheat
<b>A-Cereals</b>			
Wheat	100	100	100
Barley	98	80	78
<b>B-Pulses</b>			
Gram	53	50	37
Lentil	60	61	60
<b>C-Oilseeds</b>			
R & M	86	78	80
Safflower	21	11	-18

Source: CACP Calculations



## Recapitulation

5.14 To sum up, the pricing policy is not rooted in the 'cost plus' exercise, though cost is one of its important determinants. Given the time lag of about two years in the availability of data from field levels to DES, the Commission by constructing CIPI, projects  $A_2+FL$  and  $C_2$  cost per quintal for wheat, barley, gram, lentil, R&M and safflower for the ensuing RMS 2016-17. The percentage change in the all-India projected  $A_2+FL$  costs varies from (-)0.3 percent for safflower to 9.9 percent for rapeseed/mustard and  $C_2$  cost varies from 2.7 percent for gram to 8.5 percent for lentil in 2016-17 over 2015-16 for all 6 rabi crops (details in Annex Table 5.7).

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## Chapter 6

# Considerations and Recommendations

6.1 The Commission is mandated to take into account the cost of production, overall demand-supply, domestic and international prices, inter-crop price parity, terms of trade between agricultural and non-agricultural sectors, the likely effect of the price policy on the rest of the economy besides ensuring rational utilization of production resources like land and water while recommending Minimum Support Prices (MSPs). Thus, pricing policy is rooted not in “cost plus” approach, though cost is an important determinant of the level of MSPs. The Commission on the basis of detailed analysis of relevant issues in this report suggests the following non price and price policy recommendations.

## Non-Price Policy Recommendations

### Improve Efficiency of Procurement Operations

6.2 In order to make the procurement policy and its operations effective and justifiable, required machinery/infrastructure in all major wheat growing states need to be strengthened and evenly distributed rather being concentrated in a few states as is the case now. Haryana, Madhya Pradesh and Punjab accounted for 90 percent of the total procurement of wheat in TE 2015-16 while Uttar Pradesh, the largest producer of wheat and Rajasthan together accounted for only 10 percent in procurement. In terms of production Uttar Pradesh (29 percent), Punjab (18 percent), Madhya Pradesh (17 percent), Haryana (12 percent) and Rajasthan (10 percent) are major states accounting for 86 percent of production and marketed surplus in TE 2015-16. The Farm Harvest Prices of wheat were lower than MSP in Bihar and U.P. during last 3-4 years, thereby indicating poor implementation of pricing policy. Moreover UP with low procurement and Bihar with no procurement despite having large number of procurement centres raise the issue of resource use efficiency and the drain on the exchequer which needs to be addressed on priority.

### **Rising Economic Cost of Wheat**

- 6.3 The MSP as a percent of economic cost of wheat has declined from 72.4 percent in TE 2012-13 to 66.4 percent in TE 2016-17 whereas distribution cost and incidental charges taken together as percent of economic cost have increased from 29.7 percent in TE 2012-13 to 36.5 percent in TE 2016-17. To contain rising economic cost, which in effect is raising the food subsidy bill, incidental charges and distribution costs should be minimized by restricting unnecessary overhead charges and improving procurement and distribution efficiency.

### **Rationalization of Statutory Levies/Taxes on Procurement**

- 6.4 High statutory levies on procurement in Haryana, Madhya Pradesh and Punjab escalate the food subsidy as these states account for almost 90 percent of wheat procurement. These states have realized Rs. 31,414 crores by way of statutory levies/taxes during 2004-05 to 2016-17. Out of this, Rs. 16,847 crore has been realized on account of tax rates as also increasing procurement and Rs. 14,567 crore on account of increase in MSP alone. In this background, the States should restructure taxes/levies on foodgrains in such a manner that the incidence of taxes/levies in absolute terms on per quintal basis does not increase with increase in MSP. The Commission, therefore, recommends that states should levy the taxes in next five years on the level of MSP fixed for RMS 2015-16 (for the purpose of taxation only). This dispensation should be implemented with immediate effect and be reviewed after five years.

### **Facilitate e-Payment to Farmers**

- 6.5 Transparency should be ensured in MSP operations through e-payment system under which the payment is credited to bank accounts of farmers directly without involving intermediaries in the process. Based on the discussions of the Commission with farmers and their associations, it emerged that their interest will be better served if the system of direct payment is institutionalized. Madhya Pradesh (e-uparjan), Odisha (P-PAS) and Chhattisgarh have already put the system in place. The Commission recommends that other states must also complete digitization of farmers list and seed bank account details for direct fund transfer.

### **e-National Agricultural Market (e-NAM)**

- 6.6 e-NAM will facilitate more direct interface between farmers and buyers by reducing number of intermediaries and will benefit the farmers in terms of better selling options, and competitive returns and ensure reasonable and stable prices to the consumers. However inter-state variations in the rates of taxes/levies and commissions add to the price differential across states even for the same grade/quality of commodity. Unless common taxes/levies are fixed at all India level with free inter-state movement of commodities, physical integration of all markets of the country would be difficult to realize.

### Facilitate Access to Land

- 6.7 Informal tenants are most insecure, as they either have short duration oral leases or get rotated from plot to plot each year so that they cannot prove continuous possession of any particular piece of land for a specified period which could give them occupancy right, according to law of a state. This creates a disincentive to tenant farmers to make any investment in land improvement for productivity enhancement. Legalising land leasing would ensure security of land ownership rights for the land owners, which in turn would provide security of tenure to the tenants. The Commission is of the considered opinion that there is a need to have a re-look at land tenancy policies, Model Agricultural Land Leasing Act as suggested by Haque committee can provide solutions to some of problems associated with existing tenancy laws.

### Utilization of Rainfed Rice Fallows

- 6.8 It is a common practice among farmers to leave the rice area fallow in the rabi season after harvest of rice. Lack of irrigation facilities is the main impediment to production of another crop in the rice fallows. The residual moisture in soil at the time of rice harvest is often sufficient to raise short-duration pulses and oilseed crops and thus rice fallows can be converted into productive land. Government should therefore strengthen the initiatives undertaken in NFSM to support cultivation of these fallows so as to ensure increase in production of pulses to bridge the demand supply gap.

### Bed System of Wheat Cultivation

- 6.9 Conventional flat planting of wheat is mostly irrigated by flood irrigation, which leads to inefficient use of fertilisers due to poor aeration and leaching. The practice also results in lower water use efficiency and crusting of the soil surface. Bed planting of wheat cultivation saves water as also improves fertilizer use efficiency and grain yield. Raised-bed planting facilitates irrigation before sowing and helps in weed control prior to planting. During interactions with the State government officials and farmers, it was reported that adoption of this system reduces seed, water and fertilizers requirements but gives higher yield. Thus there is an urgent need to promote this method as currently very few farmers are aware of this technique.

### Fertilizer Pricing and Subsidy Reforms

- 6.10 The imbalance in use of fertilizer nutrients has adverse impact on soil health and crop productivity. Nutrient Based Subsidy (NBS), which was intended to promote a balanced use of fertilizers and growth and diversification of indigenous industry, has failed to do so. Due to low prices, urea is illegally diverted to neighbouring countries and for industrial use. However, government's recent initiative of neem-coating urea will reduce diversion to industrial use and also improve fertiliser use efficiency and crop productivity. Commission in its earlier Price Policy Reports had recommended direct transfer of fertiliser subsidy to farmers. The same has also been suggested in Economic Survey 2015-16. It is a good initiative but there are several practical



problems, such as informal tenancy, identification of beneficiaries due to issues with land records, etc., in implementing this scheme. It is suggested that direct transfer of subsidy can be implemented on pilot basis in those states where tenancy is not prohibited and which have proper land records.

### Emphasis on Public Investment

6.11 Both public and private investment in agriculture to develop and modernize infrastructure, R&D, irrigation, connectivity, fair and competitive market, setting up of agro processing units for value addition and smoothening the supply chain, timely information dissemination using IT (electronic and print media) etc. need major thrust in overall Scheme of policy formulation and its effective implementation. However, share of public investments in total capital formation, which is necessary for developing basic agri-rural infrastructure, has declined significantly during last 2-3 decades. This declining trend in share of public investment needs to be reversed if higher growth in sector is to be achieved.

### Agriculture Credit

6.12 Investment credit is a major driver of private capital formation in agriculture and there has been a consistent decline in its share. A continuous and steady increase in the share of term loan would lead to increase in capital formation in agriculture, and consequent increase in agricultural productivity and farm income. Therefore, policy interventions such as interest rate subvention on term loan are needed to increase flow of investment credit in agricultural sector.

### Pulses

6.13 As long term measures to stabilize prices and to make the country self-sufficient in pulses, the Commission recommends that its production should be increased by eliminating the risks farmers experience in pulses cultivation. It can be done by *developing short duration and disease and pest resistant varieties, area expansion, effective procurement and creation of buffer stock* alongwith setting up of mini pulse mills or processing units for pulses to fill the gap in its supply chain.

6.14 Some pulses and oilseeds like moong, sunflower and groundnut are grown in both rabi and kharif seasons. NAFED had requested that the recommended MSP for a particular crop should be applicable for both rabi and kharif seasons as this will enable the procurement agencies for market intervention in both the seasons. The Commission endorses the proposal that the MSP recommended for pulses and oilseeds should be applicable for both rabi and kharif marketing seasons.

### Oilseeds

6.15 The production of oilseeds in India has remained stagnant over last many years with not much improvement in its productivity as compared to world average. The Commission recommends that the government should ensure availability of quality



seeds to the farmers to provide boost to productivity as there is a strong association between use of good quality seeds and productivity.

- 6.16 It is reported that self sufficiency of the country in respect of vegetable oils has fallen sharply over the years indicating gross neglect of the sector in domestic crop system and making import of vegetable oils indispensable, which is rising continuously, to meet the domestic demand supply gap. The Commission observes that the production of oilseeds alongwith pulses in the country needs tremendous thrust through varietal development and necessary infrastructure support like irrigation, setting up of processing units for value addition and robust market structure. Moreover, since de-reservation of mustard seed, most of the seed in the mandis are purchased by the big industries leading to rise in seed prices thereby crowding out the small scale industry from having access to processing material.

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

- 6.17 In order to augment the resource use efficiency, MSP of R&M be linked to the basic oil content of 35 percent. For every 0.25 percentage increase in oil content beyond this level, the MSP be increased by Rs.13.11 per quintal so as to incentivise the farmers to invest in technology. The Government should lend initial hand holding to procurement centres to acquire or purchase the equipment to measure oil content scientifically.

### **Diversification from Rice-Wheat System**

- 6.18 Intensive rice-wheat cropping system depletes soil fertility and has an adverse impact on productivity. The Commission recommends diversification by replacing one or the other crop or adopting options like introducing a short duration legume crop in between rice-wheat system to revive soil fertility. The alternative cropping systems which are more remunerative with accompanying changes in tillage options should also be promoted.

### **Negotiable Warehouse Receipts (NWR) System**

- 6.19 Negotiable Warehouse Receipt System needs strengthening alongwith creation of quality warehousing across the country. Currently, the NWR system is grappling with certain issues like problems in accreditation and registration of warehouses, procedure of renewal of registration, lack of full fledged infrastructure status to warehousing sector, need of electronic warehouse receipts and a unified policy of insurance for WDRA requirement, a robust mechanism of inspection of warehouses, awareness programmes for farmers etc. The Commission recommends that to strengthen and popularize the NWR systems as an alternative approach or supplementary to FCI, the above mentioned weaknesses should be addressed on priority.

### **Enhancing Farmers Income**

- 6.20 We must focus on enhancing farmers income. There is a need to improve productivity, reduce cost of cultivation and ensure remunerative prices to producers. More

emphasis on diversification and off-farm income, as income from farm operations is insufficient, will go a long way in enhancing farmers income. There is also a need to bridge yield gap through improved management, better extension service and improved technological packages particularly in the states of Uttar Pradesh, Madhya Pradesh, Maharashtra, West Bengal and Rajasthan.

### **Promotion of Local and Regional Crops**

6.21 A surge in consumer demand for locally-produced food can create jobs and opportunities to farmers and rural population. The government should introduce variety of tools to help farmers grow and raise crops for local and regional markets. The market share and value of local and regional food system has grown in response to consumer and community demand. Programmes should be designed so as to support every link in the local or regional supply chain.

### **Distribution of Quality Seeds**

6.22 The use of quality seeds plays an important role in enhancing crop productivity. It is observed that distribution of quality seeds of wheat has stagnated after 2009-10, except a record high of 116.47 lakh quintals of seed in 2012-13. The distribution of quality seeds of gram has increased significantly since 2010-11. However, this growth has not been reflected in the yield, especially during last three years. In case of barley and R&M, distribution of quality seeds has declined in 2012-13 and 2013-14, whereas it has almost stagnated in case of lentil, except in 2013-14. These trends indicate that greater efforts are required to increase availability of quality seeds for rabi crops to enhance productivity levels.

### **Solar Energy**

6.23 India is a fit case to exploit its abundant solar energy in farm sector and help in power/electricity saving. Solar energy can be used in agriculture in a number of ways, saving money, increasing self-reliance, and reducing pollution. Its use will help in reducing the input cost and enhancing return to farmers.

### **Timely Availability of Cost Data**

6.24 The Commission prepares its cost projections on the basis of latest three years' cost estimates furnished by the DES, Ministry of Agriculture & Farmers Welfare under Comprehensive Scheme (CS) for Studying the Cost of Cultivation of Principal Crops in India for each crop and each state, which is generally available with a time lag of two years. These projected cost estimates are factored into formulation of price policy recommendations. In this exercise, there are certain implicit assumptions. How accurate the projected costs are in relation to actual costs, when they are available in future, is always a matter of ex-post analysis for further refining the on-going exercise in cost projections. The Commission is of the considered opinion that

for better projected estimates time lag in the availability of data should be reduced and eliminated gradually by using the latest technologies for speedy collection and compilation of data from field levels.

## Price Policy Recommendations

6.25 Considering the overall demand and supply situation of various crops, cost of production, domestic and world prices, and other related factors, the Commission recommends the MSPs for six rabi crops for RMS 2017-18 as given in the Table-6.1. These MSPs will cover  $A_2$ +FL costs of 100 percent production of barley, gram, lentil; 99 percent of wheat and 98 percent of R&M.

**Table 6.1: MSPs Recommended for RMS 2017-18**

(Rs. /quintal)

Crops	Projected Costs			Average Prices, 2016-17 (April-June)		MSP for RMS		MSP Recommended (RMS 2017-18)	Gross Margin over ( $A_2$ +FL) w.r.t. MSP recommended in 2017-18 (percent)	Justification
	$A_2$	$A_2$ +FL	$C_2$	D	I	2015-16	2016-17			
Wheat	631	797	1203	1629	1276	1450 (3.57)	1525 (5.17)	1625 (6.56)	103.89	MSP above the projected cost of production and almost equal to domestic prices.
Barley	511	816	1119	1513	1146	1150 (4.55)	1225 (6.52)	1325 (8.16)	62.38	Recommended MSP fully covers cost of production
Gram	1799	2241	3185	5599	5185	3175 (2.42)	3425 (7.87)	3800 (10.95)	69.57	To incentivise farmers to grow more pulses.
Lentil	1674	2174	3360	6690	6030	3075 (4.24)	3325 (8.13)	3800 (14.29)	74.79	do
R&M	1232	1871	2773	3949	2798	3100 (1.64)	3350 # (8.06)	3600# (7.46)	92.41	To incentivise farmers to grow more oilseeds
Safflower	2076	3049	3952	2984	-	3050 (1.67)	3300 (8.20)	3600 (9.09)	18.07	do

#: Corresponding to oil content of 35 percent.

Note: i. D: Domestic, I: International

ii. Figures in parentheses represent increases in MSP over the previous year.

6.26 The Commission feels that these non-price and price policy recommendations would incentivize farmers in general but pulses and oilseeds producers in particular. This would also help farmers to get remunerative prices and higher farm income.

(Vijay Paul Sharma)  
**Chairman**

(Suresh Pal)  
**Member (Official)**

(Shailja Sharma)  
**Member Secretary**

31<sup>st</sup> July, 2016

**Considerations and Recommendations**



# Annex Tables



**Annex Table 1.1: All India Estimates of Area under Agricultural Crops**

(Million hectares)

S. No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Rice	Kharif	40.81	37.62	38.05	40.14	38.91	39.45	39.83	39.69
		Rabi	4.73	4.30	4.81	3.87	3.84	4.69	4.28	3.78
		Total	45.54	41.92	42.86	44.01	42.75	44.14	44.11	43.47
2	Wheat	Rabi	27.75	28.46	29.07	29.86	30.00	30.47	31.47	30.04
3	Barley	Rabi	0.71	0.62	0.71	0.64	0.70	0.67	0.71	0.66
4	Jowar	Kharif	2.89	3.24	3.07	2.62	2.43	2.28	2.27	1.91
		Rabi	4.64	4.55	4.31	3.63	3.79	3.52	3.89	3.75
		Total	7.53	7.79	7.38	6.25	6.21	5.79	6.16	5.66
5	Bajra	Kharif	8.75	8.90	9.61	8.78	7.30	7.81	7.32	7.01
6	Maize	Kharif	6.89	7.06	7.28	7.38	7.21	7.31	7.56	7.07
		Rabi	1.28	1.20	1.27	1.40	1.46	1.76	1.62	1.42
		Total	8.17	8.26	8.55	8.78	8.67	9.07	9.19	8.49
7	Ragi	Kharif	1.38	1.27	1.29	1.18	1.13	1.19	1.21	1.15
	Coarse Cereals	Kharif	20.83	21.31	22.05	20.75	18.82	19.27	18.95	17.79
		Rabi	6.62	6.37	6.29	5.67	5.94	5.95	6.22	5.82
		Total	27.45	27.68	28.34	26.42	24.76	25.22	25.17	23.61
	Cereals	Kharif	61.64	58.92	60.10	60.89	57.73	58.72	58.78	57.48
		Rabi	39.10	39.13	40.17	39.40	39.78	41.11	41.97	39.64
		Total	100.74	98.05	100.27	100.29	97.52	99.83	100.75	97.12
8	Tur (Arhar)	Kharif	3.38	3.47	4.37	4.01	3.89	3.90	3.85	3.83
9	Moong	Kharif	2.24	2.46	2.85	2.61	1.97	2.34	2.03	2.75
		Rabi	0.60	0.63	0.76	0.78	0.74	1.04	0.99	0.96
		Total	2.84	3.07	3.51	3.39	2.72	3.38	3.02	3.71
10	Urad	Kharif	2.02	2.23	2.51	2.36	2.44	2.35	2.49	2.71
		Rabi	0.65	0.73	0.74	0.86	0.69	0.72	0.76	0.93
		Total	2.67	2.96	3.25	3.22	3.13	3.06	3.25	3.64
11	Gram	Rabi	7.89	8.17	9.19	8.30	8.52	9.93	8.25	8.52
12	Lentil (Masur)	Rabi	1.38	1.48	1.60	1.56	1.42	1.34	1.47	-
	Pulses	Kharif	9.81	10.58	12.32	11.19	9.95	10.33	9.99	11.20
		Rabi	12.29	12.70	14.08	13.27	13.30	14.88	13.56	13.65
		Total	22.09	23.28	26.40	24.46	23.26	25.21	23.55	24.85
	Foodgrains	Kharif	71.45	69.51	72.42	72.08	67.69	69.05	68.77	68.68
		Rabi	51.39	51.83	54.25	52.67	53.09	55.99	55.53	53.29
		Total	122.83	121.33	126.67	124.75	120.78	125.04	124.30	121.97
13	Groundnut	Kharif	5.29	4.62	4.98	4.32	3.93	4.65	4.01	3.69
		Rabi	0.88	0.86	0.88	0.95	0.79	0.86	0.76	0.71
		Total	6.16	5.48	5.86	5.26	4.72	5.51	4.77	4.41
14	Soyabean	Kharif	9.51	9.73	9.60	10.11	10.84	11.72	10.91	11.68
15	Sunflower	Kharif	0.66	0.57	0.32	0.26	0.30	0.25	0.22	0.15
		Rabi	1.15	0.91	0.61	0.47	0.53	0.42	0.37	0.34
		Total	1.81	1.48	0.93	0.73	0.83	0.67	0.59	0.49
16	Sesamum	Kharif	1.81	1.94	2.08	1.90	1.71	1.68	1.75	2.00
17	Nigerseed	Kharif	0.39	0.38	0.37	0.36	0.31	0.30	0.23	0.25
18	Rapeseed/ Mustard	Rabi	6.30	5.59	6.90	5.89	6.36	6.65	5.80	5.83
19	Safflower	Rabi	0.29	0.29	0.24	0.25	0.18	0.18	0.17	0.14
	Nine Oilseeds@	Kharif	18.53	17.97	18.23	18.42	18.32	19.65	18.21	18.89
		Rabi	9.03	7.99	9.00	7.89	8.16	8.40	7.39	7.30
		Total	27.56	25.96	27.22	26.31	26.48	28.05	25.60	26.19
20	Cotton		9.41	10.13	11.24	12.18	11.98	11.96	12.82	11.91
	Jute		0.79	0.81	0.77	0.81	0.78	0.76	0.75	0.70
	Mesta		0.12	0.09	0.10	0.10	0.09	0.08	0.06	0.05
21	Jute & Mesta		0.90	0.91	0.87	0.90	0.86	0.84	0.81	0.76
22	Sugarcane		4.42	4.17	4.88	5.04	5.00	4.99	5.07	4.96

\* : Third Advance Estimates (2015-16)

@ : Nine Oilseeds include Castorseed and Linseed also

Source : DES

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

(Million Tonnes)

S. No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Rice	Kharif	84.91	75.92	80.65	92.78	92.37	91.50	91.39	90.59
		Rabi	14.27	13.18	15.33	12.52	12.87	15.15	14.09	12.77
		Total	99.18	89.09	95.98	105.30	105.24	106.65	105.48	103.36
2	Wheat	Rabi	80.68	80.80	86.87	94.88	93.51	95.85	86.53	94.04
3	Barley	Rabi	1.69	1.35	1.66	1.62	1.75	1.83	1.61	1.62
4	Jowar	Kharif	3.05	2.76	3.44	3.29	2.84	2.39	2.30	1.87
		Rabi	4.19	3.94	3.56	2.69	2.44	3.15	3.15	2.72
		Total	7.25	6.70	7.00	5.98	5.28	5.54	5.45	4.59
5	Bajra	Kharif	8.89	6.51	10.37	10.28	8.74	9.25	9.18	8.25
6	Maize	Kharif	14.12	12.29	16.64	16.49	16.20	17.14	17.01	15.50
		Rabi	5.61	4.43	5.09	5.27	6.05	7.11	7.16	5.53
		Total	19.73	16.72	21.73	21.76	22.26	24.26	24.17	21.02
7	Ragi	Kharif	2.04	1.89	2.19	1.93	1.57	1.98	2.06	1.86
	Coarse Cereals	Kharif	28.54	23.83	33.08	32.44	29.80	31.20	30.94	27.91
		Rabi	11.49	9.72	10.32	9.58	10.25	12.09	11.92	9.87
		Total	40.04	33.55	43.40	42.01	40.04	43.29	42.86	37.78
	Cereals	Kharif	113.49	99.78	113.77	125.22	122.16	122.70	122.34	118.50
		Rabi	106.40	103.65	112.48	116.98	116.63	123.09	112.53	116.67
		Total	219.89	203.44	226.24	242.20	238.78	245.79	234.87	235.17
8	Tur (Arhar)	Kharif	2.27	2.46	2.86	2.65	3.02	3.17	2.81	2.60
9	Moong	Kharif	0.78	0.44	1.53	1.24	0.79	0.96	0.87	1.02
		Rabi	0.26	0.25	0.27	0.40	0.40	0.65	0.64	0.56
		Total	1.03	0.69	1.80	1.63	1.19	1.61	1.50	1.59
10	Urad	Kharif	0.84	0.81	1.40	1.23	1.43	1.15	1.28	1.15
		Rabi	0.33	0.43	0.36	0.53	0.47	0.55	0.68	0.73
		Total	1.17	1.24	1.76	1.77	1.90	1.70	1.96	1.88
11	Gram	Rabi	7.06	7.48	8.22	7.70	8.83	9.53	7.33	7.48
12	Lentil (Masur)	Rabi	0.95	1.03	0.94	1.06	1.13	1.02	1.04	-
	Pulses	Kharif	4.69	4.20	7.12	6.06	5.92	5.99	5.73	5.49
		Rabi	9.88	10.46	11.12	11.03	12.43	13.25	11.42	11.57
		Total	14.57	14.66	18.24	17.09	18.34	19.25	17.15	17.06
	Foodgrains	Kharif	118.14	103.95	120.85	131.27	128.07	128.69	128.06	123.99
		Rabi	116.33	114.15	123.64	128.01	129.06	136.35	123.96	128.24
		Total	234.47	218.11	244.49	259.29	257.13	265.04	252.02	252.23
13	Groundnut	Kharif	5.62	3.85	6.64	5.13	3.19	8.06	5.93	5.48
		Rabi	1.55	1.58	1.62	1.84	1.51	1.66	1.47	1.40
		Total	7.17	5.43	8.26	6.96	4.69	9.71	7.40	6.89
14	Soyabean	Kharif	9.91	9.96	12.74	12.21	14.67	11.86	10.37	8.92
15	Sunflower	Kharif	0.36	0.21	0.19	0.15	0.19	0.15	0.14	0.07
		Rabi	0.80	0.64	0.46	0.37	0.36	0.35	0.29	0.23
		Total	1.16	0.85	0.65	0.52	0.54	0.50	0.43	0.30
16	Sesamum	Kharif	0.64	0.59	0.89	0.81	0.69	0.71	0.83	0.89
17	Nigerseed	Kharif	0.12	0.10	0.11	0.10	0.10	0.10	0.08	0.08
18	Rapeseed/ Mustard	Rabi	7.20	6.61	8.18	6.60	8.03	7.88	6.28	6.85
19	Safflower	Rabi	0.19	0.18	0.15	0.15	0.11	0.11	0.09	0.06
	Nine Oilseeds@	Kharif	17.81	15.73	21.92	20.69	20.79	22.61	19.22	17.21
		Rabi	9.91	9.15	10.56	9.11	10.15	10.14	8.29	8.69
		Total	27.72	24.88	32.48	29.80	30.94	32.75	27.51	25.90
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	30.52
	Jute#		9.63	11.23	10.01	10.74	10.34	11.08	10.62	9.92
	Mesta#		0.73	0.59	0.61	0.66	0.59	0.61	0.51	0.54
21	Jute & Mesta#		10.37	11.82	10.62	11.40	10.93	11.69	11.13	10.46
22	Sugarcane		285.03	292.30	342.38	361.04	341.20	352.14	362.33	346.72

\* : Third Advance Estimates (2015-16)

@ : 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, Cotton Advisory Board.

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

(Kgs per hectare)

S. No.	Crops		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Rice	Kharif	2081	2018	2120	2311	2374	2319	2295	2283
		Rabi	3019	3064	3185	3238	3353	3232	3291	3377
		Total	2178	2125	2239	2393	2462	2416	2391	2378
2	Wheat	Rabi	2907	2839	2989	3177	3117	3145	2750	3130
3	Barley	Rabi	2394	2172	2357	2516	2521	2718	2280	2470
4	Jowar	Kharif	1055	853	1119	1257	1171	1050	1014	979
		Rabi	904	865	827	741	644	896	808	727
		Total	962	860	949	957	850	957	884	812
5	Bajra	Kharif	1015	731	1079	1171	1198	1184	1255	1176
6	Maize	Kharif	2048	1740	2285	2234	2246	2346	2249	2193
		Rabi	4387	3694	4003	3765	4152	4050	4414	3894
		Total	2414	2024	2540	2478	2566	2676	2632	2477
7	Ragi	Kharif	1477	1489	1705	1641	1396	1661	1706	1622
		Coarse Cereals	Kharif	1371	1119	1500	1563	1583	1619	1633
		Rabi	1735	1525	1641	1689	1725	2034	1915	1696
	Cereals	Total	1459	1212	1531	1590	1617	1717	1703	1600
		Kharif	1841	1693	1893	2056	2116	2089	2081	2062
		Rabi	2721	2649	2800	2969	2931	2995	2681	2943
	Total	Total	2183	2075	2256	2415	2449	2462	2331	2422
8	Tur (Arhar)	Kharif	671	711	655	662	776	813	729	680
9	Moong	Kharif	348	180	538	475	398	410	428	372
		Rabi	423	397	354	508	539	620	640	585
		Total	364	226	514	483	436	475	498	428
10	Urad	Kharif	419	363	557	523	586	490	516	425
		Rabi	506	587	489	621	679	768	891	782
		Total	440	418	542	549	606	555	604	517
11	Gram	Rabi	895	915	895	928	1036	960	889	877
12	Lentil (Masur)	Rabi	693	697	591	678	797	759	705	-
	Pulses	Kharif	478	397	578	541	594	580	573	490
		Rabi	804	823	790	831	934	891	842	848
		Total	659	630	691	699	789	763	728	687
	Foodgrains	Kharif	1654	1496	1669	1821	1892	1864	1862	1805
		Rabi	2264	2203	2279	2430	2431	2435	2232	2407
		Total	1909	1798	1930	2078	2129	2120	2028	2068
13	Groundnut	Kharif	1063	835	1335	1188	811	1735	1478	1485
		Rabi	1764	1830	1846	1938	1908	1926	1948	1964
		Total	1163	991	1411	1323	994	1764	1552	1563
14	Soyabean	Kharif	1041	1024	1327	1208	1353	1012	951	763
15	Sunflower	Kharif	540	378	608	566	622	621	660	449
		Rabi	696	700	748	783	674	826	781	689
		Total	639	576	701	706	655	750	736	615
16	Sesamum	Kharif	354	303	429	426	402	426	474	443
17	Nigerseed	Kharif	297	266	290	269	325	328	328	323
18	Rapeseed/ Mustard	Rabi	1143	1183	1185	1121	1262	1185	1083	1175
19	Safflower	Rabi	642	621	617	580	591	638	515	437
	Nine Oilseeds@	Kharif	961	875	1203	1123	1135	1151	1056	911
		Rabi	1097	1146	1174	1155	1244	1207	1122	1190
		Total	1006	958	1193	1133	1168	1168	1075	989
20	Cotton \$ Cotton\$\$		524	512	513	496	525	566	504	521
			403	403	499	491	486	510	462	436
		Jute	2207	2492	2329	2389	2396	2639	2549	2548
	Mesta		1141	1122	1115	1248	1237	1338	1525	1781
21	Jute & Mesta		2071	2349	2192	2268	2281	2512	2473	2493
22	Sugarcane		64553	70020	70091	71667	68254	70520	71512	69893

\* : Third Advance Estimates (2015-16)

@ : Nine Oilseeds include Castorseed and Linseed also

\$ : CAB estimates

\$\$ : E&S estimates

Source : DES

**Annex Table 1.4: Share of Rabi Crops (under MSP) in Total Production and Area TE 2015-16**

S. No.	Crop/State	Bihar	Chhatt	Guj	Har	Jhar	Kar	M.P.	Maha	Punjab	Raj	U. P.	U.K.	W.B.	Others	Total	(Percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(16)	(16)
1	Wheat	5.1	0.1	3.8	12.2	0.4	0.2	16.5	1.3	17.8	10.3	29.2	0.8	1.0	1.3	100.0	
2	Barley	0.8	0.2	-	6.8	-	-	8.7	-	2.9	54.5	22.2	1.5	0.2	2.2	100.0	
3	Gram	0.8	3.2	2.6	0.7	2.2	8.9	39.2	14.2	0.0	14.6	5.0	0.0	0.4	8.1	100.0	
4	Lentil*	18.0	0.6	-	0.4	3.8	-	34.1	0.1	0.1	3.1	30.9	0.9	5.9	2.1	100.0	
5	R&M	1.5	0.4	5.0	11.4	1.9	0.0	10.8	0.0	0.6	47.0	9.5	0.2	6.9	4.8	100.0	
6	Safflower	0.6	0.2	3.4	-	0.3	35.7	9.8	44.0	-	-	-	-	1.1	5.0	100.0	

\*: Production of Lentil relates to TE 2014-15

Source : DES

S. No.	Crop/State	Bihar	Chhatt	Guj	Har	Jhar	Kar	M.P.	Maha	Punjab	Raj	U. P.	U.K.	W.B.	Others	Total	(Percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(16)	(16)
1	Wheat	6.9	0.3	3.8	8.4	0.6	0.6	18.8	3.0	11.4	10.0	31.7	1.1	1.1	2.3	100.0	
2	Barley	1.6	0.4	0.0	4.7	0.0	0.0	13.1	0.0	2.0	47.2	23.2	3.1	0.3	4.3	100.0	
3	Gram	0.7	3.2	2.0	0.7	1.8	12.1	33.8	17.6	0.0	15.9	5.6	0.0	0.3	6.4	100.0	
4	Lentil*	12.1	1.1	0.0	0.3	3.0	0.0	40.5	0.2	0.1	2.5	32.6	0.8	4.6	2.3	100.0	
5	R&M	1.4	0.8	3.6	8.4	3.4	0.0	11.5	0.0	0.6	44.6	10.3	0.3	7.4	7.8	100.0	
6	Safflower	0.4	0.4	3.0	0.0	0.2	26.4	7.9	57.5	0.0	0.0	0.0	0.0	0.2	4.0	100.0	

\*: Area of Lentil relates to TE 2014-15

Source : Directorate of Economics & Statistics, Ministry of Agriculture

**Annex Table 2.1: Balance Sheet of Wheat and Total Pulses, 2012-13 to 2016-17**

(Million Tonne, Percent)

S. No.	Particulars	Wheat					Total Pulses				
		2012-13	2013-14	2014-15	2015-16	2016-17E	2012-13	2013-14	2014-15	2015-16	2016-17E
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Opening Stocks <sup>^</sup>	19.95	24.50	18.59	18.50	13.60	2.14	1.96	1.70	1.46	0.75
2	Production #	94.88	93.51	95.85	86.53	94.04	18.34	19.25	17.15	17.06	16.60
3	Imports	0.00	0.01	0.09	0.52	0.05	3.84	3.53	4.57	5.82	5.50
4	Total Supply (1+2+3)	114.83	118.02	114.54	105.54	107.69	24.32	24.74	23.42	24.34	22.85
5	Exports	6.51	5.57	2.92	0.62	0.30	0.20	0.34	0.22	0.26	0.10
6	Consumption*	83.83	93.86	93.12	91.32	89.75	22.16	22.71	21.74	22.05	22.10
7	Total Use (5+6)	90.34	99.43	96.04	91.94	90.05	22.36	23.05	21.96	22.31	22.20
8	Ending Stock (4-7)	24.50	18.59	18.50	13.60	17.64	1.96	1.69	1.46	2.04	0.65
9	Stock to Use Ratio (%) (8/7)	27.11	18.69	19.26	14.80	19.59	8.79	7.35	6.65	9.12	2.93

Notes: # : Production of wheat is of previous years

<sup>^</sup> : Opening Stock of wheat for 2012-13 (1st April) is as per DFPD and Opening Stock of Total Pulses for 2013-14 is taken from NCAER

\* : Consumption figures are from NCAER

E : Estimated

Source : NCAER, DES, DFPD and DGCIS



Annex Table 2.2: MSP, FHP and WP of Rabi Crops

(Rs per quintal)

a: Wheat									
S.No.	Year	2011-12		2012-13		2013-14		2014-15	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	MSP	1170		1285		1350		1400	
	State	FHP	WP	FHP	WP	FHP	WP	FHP	WP
1	Bihar	1070	1475	1207	1473	1260	1657	1271	1619
2	Haryana	1153	1161	1336	1359	1420	1450	1450	1404
3	Madhya Pd.	1279	1162	1557	1460	1607	1636	1523	1616
4	Punjab	1130	1125	1601	1285	1357	1350	NA	1400
5	Rajasthan	1226	1313	1467	1584	1508	1733	1490	1717
6	Uttar Pd.	1105	1147	1244	1351	1349	1496	NA	1508

b: Barley									
S.No.	Year	2011-12		2012-13		2013-14		2014-15	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	MSP	780		980		980		1100	
	State	FHP	WP	FHP	WP	FHP	WP	FHP	WP
1	Haryana	981	1052	1284	1196	1161	1151	1211	1319
2	Rajasthan	1227	1123	1175	1210	1182	1183	1209	1290
3	Uttar Pd.	1086	1113	1155	1238	1256	1324	NA	1390

c: Gram									
S.No.	Year	2011-12		2012-13		2013-14		2014-15	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	MSP	2100		2800		3000		3100	
	State	FHP	WP	FHP	WP	FHP	WP	FHP	WP
1	Karnataka	3421	2894	3440	4194	2831	2928	NA	2812
2	Madhya Pd.	3414	2482	3405	3839	3014	2715	2892	2611
3	Maharashtra	2517	NA	3768	3277	2884	3314	2758	2861
4	Rajasthan	3445	2800	3155	3894	2817	2833	3510	2847
5	Uttar Pd.	3332	3116	3004	4229	4392	3223	NA	3156

d: Rapeseed & Mustard									
S.No.	Year	2011-12		2012-13		2013-14		2014-15	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	MSP	1850		2500		3000		3050	
	State	FHP	WP	FHP	WP	FHP	WP	FHP	WP
1	Gujarat	2363	2753	3053	3650	2835	3050	3177	3166
2	Haryana	2617	2788	3712	3574	3029	3071	3365	3218
3	Rajasthan	3322	2762	3208	3562	3166	3127	3492	3276
4	Uttar Pd.	3149	2663	3064	3645	4786	3127	NA	3265
5	West Bengal	2799	3271	3209	4190	3408	3783	NA	3925

Source : DES

Annex Table 2.3: Decentralized Procurement Scheme (DCP) States for Wheat

S. No.	State/UT
(1)	(2)
1	Bihar
2	Chhattisgarh
3	Gujarat
4	Madhya Pradesh
5	Punjab (to the extent of its requirement of 8.69 LMT)
6	Rajasthan (in Alwar district only)
7	Uttarakhand
8	West Bengal

Source : FCI

Annex Table 2.4: Procurement as Percentage of Production of Rabi Crops

(Million Tonnes, Percent)

S. No.	Parameter	Wheat			Gram			Lentil			R&M			Safflower		
(1)	(2)	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	Production	95.85	86.53	94.04	9.53	7.33	7.48	1.02	1.04	NA	7.88	6.28	6.86	0.11	0.06	0.06
2	Procurement*	28.02	28.09	22.93	0.36	0.02	0.06	-	0.00	0.01	0.00	0.00	0.00	-	-	-
3	% Procurement	29.24	32.46	24.38	3.82	0.33	0.75	-	0.10	-	0.02	0.00	0.00	-	-	-
4	Stock with FCI (as on 1st July)	39.80	38.68	30.18												
5	Storage capacity with FCI (as on 1st July)	38.74	37.30	36.19												
6	Storage capacity with States (as on 1st July)	37.55	38.13	45.43												
7	Total Storage capacity (as on 1st July)	76.29	75.43	81.62												
8	Buffer Stock Norms (as on 1st July)	20.10	27.58	27.58												

Not Available

\* : As on 01.07.2016

Source : DES and DFPD

**Annex Table 2.5: Possible Savings from Taxes as a Consequence of Freezing MSP for Tax Purpose - Wheat**

S. No.	Crop Year	Haryana						M.P.						Punjab					
		MSP (Rs./ qtl)	Tax Rate (Percent)	Procurement (Million Tonne)	Total Taxes Realised (Rs. Crore)	Taxes at MSP of 2004-05 level (Rs. Crore)*	Savings {Col. (6)-col. (7)} (Rs. Crore)	Tax Rate (Percent)	Procurement (Million Tonne)	Total Taxes Realised (Rs. Crore)	Taxes at MSP of 2004-05 level (Rs. Crore)*	Savings {Col. (11)-col. (12)} (Rs. Crore)	Tax Rate (Percent)	Procurement (Million Tonne)	Total Taxes Realised (Rs. Crore)	Taxes at MSP of 2004-05 level (Rs. Crore)*	Savings {Col.(16)- col.(17)} (Rs. Crore)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
1	2004-05	640	10.5	5.11	344	344	0	2.2	0.35	4.9	4.9	0.0	11.5	9.24	680.1	680.1	0.0		
2	2005-06	650	10.5	4.53	309	304	5	2.2	0.48	6.9	6.8	0.1	11.5	9.01	673.5	663.1	10.4		
3	2006-07	700	10.5	2.23	164	150	14	2.2	0.00	0.0	0.0	0.0	11.5	6.95	559.6	511.6	48.0		
4	2007-08	1000	10.5	3.35	352	225	127	2.2	0.06	1.3	0.8	0.5	12.5	6.78	847.6	542.4	305.1		
5	2008-09	1080	10.5	5.24	594	352	242	2.2	2.41	57.3	33.9	23.3	13.5	9.94	1449.3	858.9	590.5		
6	2009-10	1100	10.5	6.92	800	465	334	2.2	1.97	47.6	27.7	19.9	13.5	10.73	1592.7	926.6	666.0		
7	2010-11	1120	10.5	6.34	745	426	319	2.2	3.54	87.2	49.8	37.4	13.5	10.21	1543.0	881.7	661.3		
8	2011-12	1285	11.5	6.93	1024	510	514	7.2	4.96	459.4	228.8	230.6	14.5	10.96	2041.7	1016.9	1024.8		
9	2012-13	1350	11.5	8.67	1345	638	708	7.2	8.49	825.5	391.3	434.2	14.5	12.83	2512.3	1191.0	1321.3		
10	2013-14	1400	11.5	5.87	946	432	513	7.2	6.36	640.6	292.8	347.7	14.5	10.90	2212.1	1011.3	1200.9		
11	2014-15	1450	11.5	6.49	1083	478	605	9.2	7.09	946.4	417.7	528.7	14.5	11.64	2447.5	1080.3	1367.2		
12	2015-16	1525	11.5	6.78	1189	499	690	9.2	7.31	1025.5	430.4	595.1	14.5	10.34	2287.3	959.9	1327.4		
13	Total				8893	4823	4071			4102	1885	2217			18847	10324	8523		

Taxes that would have been realised if MSP were frozen at 2004-05 level for tax purpose only.

Source : FCI

**Annex Table 2.6: State-wise Statutory Taxes Levied on Procurement of Wheat, 2014-15 and 2015-16**

S. No.	State	Year	VAT(%)	Market Fee (%)	Mandi Fee (%)	APMC Cess (%)	Arthiya Comm. (%)	Commission to Society	RD Cess (%)	ID Cess (%)	Nirashrit Shulk (%)	Mopari Charges (%)	Any Other Taxes (%)	Remarks	Total (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1	Bihar	2014-15	1.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	Additional tax Payable to party having annual turnover exceeding 250 crore in addition to 1% VAT	6.00
		2015-16	1.00	0.00	0.00	0.00	0.00	Rs. 27.00/Qtl	0.00	0.00	0.00	0.00	3.00	Additional tax Payable to party having annual turnover exceeding 250 crore in addition to 1% VAT	5.86
2	Haryana	2014-15	5.00	2.00	0.00	0.00	2.50		2.00	0.00	0.00	0.00	0.00	0.00	11.50
		2015-16	5.00	2.00	0.00	0.00	2.50		2.00	0.00	0.00	0.00	0.00	0.00	11.50
3	M.P	2014-15	5.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	0.20	0.00	0.00		9.20
		2015-16	5.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	0.20	0.00	0.00		9.20
4	Punjab	2014-15	5.00	2.00	0.00	0.00	2.50		2.00	3.00	0.00	0.00	0.00		14.50
		2015-16	5.00	2.00	0.00	0.00	2.50		2.00	3.00	0.00	0.00	0.00		14.50
5	Rajasthan	2014-15	Exempted	0.00	1.60	0.00	1.93								3.53
		2015-16	1.60	0.00	0.00	0.00	Rs. 27.00/Qtl							Cess @5% on purchase of Wheat, w.e.f.01.04.15 imposed by Govt. of Rajasthan as per notification No. F-12 FD/Tax/2015-3 dated 01.04.15	8.46
6	U.P	2014-15	4.00		2.00		0.00	1.93	0.50	0.00	0.00	0.00	0.00	0.00	8.43
		2015-16	4.00	2.00	0.00	0.50	0.00	Rs. 27.00/Qtl	0.00	0.00	0.00	0.00	0.00	0.00	8.36
7	Uttarakhand	2014-15	5.00	2.50	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	7.50
		2015-16	5.00	2.50	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	7.50

RD : Rural Development, ID: Infrastructural Development  
Source : FCI

Annex Table 2.7: Agency-wise Procurement of Pulses and Oilseeds, 2014-15 to 2016-17

S.No.			Crops		2014-15			2015-16				2016-17 *				(Metric Tonnes)
			NAFED	SFAC	Total	NAFED	SFAC	FCI	Total	NAFED	SFAC	FCI	Total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)			
Pulses																
1	Kharif	Arhar/Tur	1543.0	-	1543.0	20000.8	5258.1	20273.6	45532.4	-	-	-	-	-		
2		Urad	-	-	-	1764.0	3122.9	4.7	4891.7	-	-	-	-	-		
3	Rabi	Gram	313917.3	50289.7	364207.0	-	24192.8	-	24192.8	18702.4	24685.9	12902.2	56290.6			
4		Masur/Lentil	-	-	-	-	1017.5	-	1017.5	2987.7	1232.5	4335.6	8555.8			
Oilseeds																
5	Kharif	Groundnut	6229.8	-	6229.8	-	-	-	-	-	-	-	-	-		
6		Sunflower	4153.2	-	4153.2	4241.9	-	-	4241.9	4367.0	-	-	4367.0			
7	Rabi	R&M	1714.8	-	1714.8	-	-	-	-	-	-	-	-	-		

Note : FCI has been designated as an additional central nodal agency for procurement of pulses and oilseeds since Kharif 2015-16.

\* : As on 16.06.2016

Source: NAFED, FCI and SFAC



**Annex Table 2.8: Stock Limits Fixed by the States**

(in quintals)

S. No. (1)	State (2)	Dealer (3)	Commodity		
			Pulses (4)	Edible Oils (5)	Edible Oilseeds (6)
1	Andhra Pd.	Wholesaler*			2250
		Retailers*			150
		Wholesaler**			1500
		Retailers**			113
		Wholesaler#			1200
2	Chhattisgarh	Retailers#	1000	500	75
3	Gujarat		No stock limit on any commodity under ECA but it becomes applicable when price fluctuates and becomes volatile in the market. Govt. may decide when it is required under ECA.		
4	Haryana	Manufacturer (Dal Mills)			
		Dealers/ Wholesaler/ Distributors/ Agents Retailers	250		1500
5	Maharashtra		-		25
		Wholesaler	3500 (Corporation Area) 2500 (A Class City) 1500 (Other Cities)	1000 (Corporation Area) 300 (Other Cities)	20000 (Corporation Area) 8000 (Other Cities)
		Retailers	250 (Corporation Area) 150 (A Class City) 150 (Other Cities)	40 (Corporation Area) 20 (Other Cities)	2000 (Corporation Area) 2000 (Other Cities)
		Producer	1/6th of the maximum quantity of un-milled Pulses used by him in any of the last three years ending on 30th April, 2010	1/6th of the maximum production in any of the last three years ending on 30th April, 2010	1/6th of the maximum quantity of edible oilseeds used by him in any of the last three years ending on 30th April, 2010
			30th April, 2010		
6	Odisha	Dealer	750	750	500
7	Punjab	Dealers/ Wholesalers/ Distributors/ Agents Retailers	10000 500	1000 40	
8	Rajasthan	Wholesaler Retailers	2000 25	- -	- -

\* : Hyderabad, Vishakhapatnam, Vijayawada (with population of 10 lakh and more)

\*\* : Guntur, Kakinada, Rajahmundry, Nellore, Tirupati, Kurnool and Warangal (with population of 3 lakh and more but less than 10 lakhs)

# : Other areas (with population of less than 3 lakhs).

Source : State Replies

**Annex Table 2.9: Oilseeds & Edible Oil Production vis-à-vis Import of Edible Oils**

(Million Tonne, Percent)

S. No.	Year (Nov-Oct)	Oilseeds Production	Domestic Availability of Veg. Oils			Import of Veg. Oils			Self Sufficiency (%)
			Edible	Non- Edible	Total	Edible	Non- Edible	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	2015-16*	26.34	6.47	0.73	7.2	15.8	0.2	16	31
2	2014-15	27.51	6.56	0.63	7.19	14.42	0.19	14.61	33
3	2013-14	32.75	7.78	0.57	8.38	11.62	0.2	11.82	42
4	2012-13	30.94	7.35	0.68	8.03	10.4	0.29	10.68	43
5	2011-12	29.8	7.35	0.8	8.15	9.98	0.21	10.19	44
6	2010-11	32.48	7.92	0.6	8.52	8.37	0.29	8.66	50
7	2009-10	24.88	7.26	0.51	7.77	8.82	0.42	9.24	46
8	2008-09	27.72	7.71	0.5	8.21	8.18	0.46	8.64	49
9	2007-08	29.76	7.75	0.49	8.24	5.61	0.65	6.26	57
10	2006-07	24.29	7.33	0.43	7.76	4.71	0.63	5.34	59
11	2005-06	27.98	7.56	0.47	8.03	4.42	0.71	5.13	61
12	2004-05	24.35	7.16	0.43	7.59	5.04	0.41	5.45	58
13	2003-04	25.18	7.21	0.38	7.59	4.39	0.24	4.63	62
14	2002-03	14.84	4.84	0.28	5.12	5.11	0.28	5.39	49
15	2001-02	20.66	6.37	0.35	6.72	4.42	0.34	4.76	59

\*: as on 4th April, 2016

Source: SEA Data Bank

**Annex Table 2.10: States/Centres with Prices of Rabi Crops Below MSP, RMS 2016-17**

(Rs per quintal)

Crop	State	Centre	MSP	Month		
				April	May	June
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>A-Wheat</b>			<b>1525</b>			
1	Haryana	Hissar		1470	1470	1470
<b>B-Rapeseed/Mustard</b>			<b>3350</b>			
1	Assam	Dibrugarh		2500		
<b>C-Safflower</b>			<b>3300</b>			
1	Maharashtra	Jalna		2500		
2	Karnataka	Gulbarga		2501	2825	

Source : DES

**Annex Table 3.1: Benchmarking of Productivity Levels across Countries and States in India**

S. No.	Crop	Yield (TE 2015-16) (Average All-India) (tonnes/ ha)	Benchmarking States TE 2015-16	Benchmarking Countries TE 2014	Efficiency gap in India's Yield level w.r.t benchmark State (%)	Efficiency gap in India's Yield level w.r.t benchmark Country (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Wheat	3.0	Punjab (4.7, 17.8%), Haryana (4.4, 12.2%), UP (2.8, 29.2%), Rajasthan (3.1, 10.3%), Gujarat (3.0, 3.8%), MP(2.6, 16.5%), Bihar (2.2, 5.1%)	Germany (8.0, 3.6%), UK (7.5, 2.0%), France (7.4, 5.6%), Egypt (6.6, 1.3%), China (5.0, 17.5%), India (3.1, 13.4%)	35.7	61.0
2	Barley	2.5	Punjab (3.7, 2.5%), Haryana (3.6, 6.7%), UP (2.4, 21.9%), Rajasthan (2.9, 53.7%), MP (1.6, 8.5%)	Germany (6.7, 7.7%), France (6.6, 8.0%), UK (5.9, 4.6%), Denamrk (5.7, 2.7%), Sweden (4.8, 1.2%), India (2.2, 1.2%)	32.8	67.1
3	Gram	0.9	Gujarat (1.2, 2.6%), AP (1.2, 7.0%), MP (1.1, 39.0%), Jharkhand (1.1, 2.2%), Chhattisgarh (0.9, 3.2%), Rajasthan (0.8, 14.6%), UP (0.8, 5.0%), Karnataka (0.7, 8.9%), Maharastra (0.7, 14.2%)	Canada (2.1, 1.2%), UK (1.8, 1.7%), Ethiopia (1.8, 3.3%), USA (1.7,1.1%), Myanmar (1.5, 3.8%), India (0.9, 67.4%)	25.6	55.7
4	Lentil	0.8	Bihar (1.1, 18.0%), WB (1.0, 5.9%), Jharkhand (1.0, 3.8%), Rajasthan (0.9, 3.1%), UP (0.7, 31.0%), MP (0.6, 34.2%)	China (2.2, 3.0%), UK (2.0, 7.6%), Canada (1.7, 38.3%), Turkey (1.6, 8.1%), USA (1.5, 4.2%), India (0.6, 22.1%)	33.0	72.8
5	R & M	1.1	Gujarat (1.6, 5.0%), Haryana (1.6, 11.8%), Rajasthan (1.2, 47.0%), MP (1.1, 10.6%), UP (1.1, 9.6%), WB (1.1, 6.9%), Assam (0.6, 2.5%)	Germany (4.0, 8.1%), Czech Rep(3.4, 2.0%), France (3.4, 7.4%), UK (3.3, 3.4%), Poland (3.0,3.8%), India (1.1, 10.7%)	28.5	71.6
6	Safflower	0.5	Andhra Pradesh (0.8, 3.6%), Karnataka (0.7, 32.7%), Telangana (0.7, 2.6%), MP (0.7, 9.0%), Gujarat (0.6, 9.3%), Maharashtra (0.4, 40.4%),	China (1.6, 4.4%), Mexico (1.3, 20.3%), Turkey (1.4, 5.2%), USA (1.3, 11.1%), Ethiopia (0.9, 1.1%), India (0.8, 15.1%)	30.1	49.6

**Annex Table 3.2: Simulation-Impact of Oil Content on MSP of R&M**

S. No.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from Oil Cake on processing of 1 quintal of Oilseeds, assuming price of cake (Rs/qrtl.) 2450	Cost of Oil Content i.e. Oilseeds without Cake (Rs/qrtl.), assuming MSP/(Rs/qrtl.) 3600	Cost of Oil Content i.e. Oilseeds without cake for each 0.25 percent point of Oil content (Rs/qrtl.) {col(5)/col(2)}*0.25	MSP at Oil Content given in col.(2) [MSP+{Average of col.(6)* percent points of Oil content that is over & above 35%}]/(0.25)
			{col(3)*Price of Oil Cake}/100	MSP-Col(4)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	35.00	65.00	1593	2008	14.34	3600
2	35.25	64.75	1586	2014	14.28	3614
3	35.50	64.50	1580	2020	14.22	3629
4	35.75	64.25	1574	2026	14.17	3643
5	36.00	64.00	1568	2032	14.11	3657
6	36.25	63.75	1562	2038	14.06	3671
7	36.50	63.50	1556	2044	14.00	3685
8	36.75	63.25	1550	2050	13.95	3699
9	37.00	63.00	1544	2057	13.90	3713
10	37.25	62.75	1537	2063	13.84	3727
11	37.50	62.50	1531	2069	13.79	3741
12	37.75	62.25	1525	2075	13.74	3755
13	38.00	62.00	1519	2081	13.69	3768
14	38.25	61.75	1513	2087	13.64	3782
15	38.50	61.50	1507	2093	13.59	3796
16	38.75	61.25	1501	2099	13.54	3809
17	39.00	61.00	1495	2106	13.50	3823
18	39.25	60.75	1488	2112	13.45	3836
19	39.50	60.50	1482	2118	13.40	3850
20	39.75	60.25	1476	2124	13.36	3863
21	40.00	60.00	1470	2130	13.31	3877
22	40.25	59.75	1464	2136	13.27	3890
23	40.50	59.50	1458	2142	13.22	3903
24	40.75	59.25	1452	2148	13.18	3916
25	41.00	59.00	1446	2155	13.14	3930
26	41.25	58.75	1439	2161	13.09	3943
27	41.50	58.50	1433	2167	13.05	3956
28	41.75	58.25	1427	2173	13.01	3969
29	42.00	58.00	1421	2179	12.97	3982

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**Annex Table 3.2: Simulation-Impact of Oil Content on MSP of R&M**

S. No.	Oil Content (%)	Oil Cake(%) {100-col(2)}	Realisation from Oil Cake on processing of 1 quintal of Oilseeds, assuming price of cake (Rs/qlt.) 2450  {col(3)*Price of Oil Cake}/100	Cost of Oil Content i.e. Oilseeds without Cake (Rs/ qtl.), assuming MSP/(Rs/qlt.) 3600  MSP-Col(4)	Cost of Oil Content i.e. Oilseeds without cake for each 0.25 percent point of Oil content (Rs/qlt.) {col(5)/col(2)}*0.25	MSP at Oil Content given in col.(2) [MSP+{Average of col.(6)* percent points of Oil content that is over & above 35%}]/(0.25)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
30	42.25	57.75	1415	2185	12.93	3995
31	42.50	57.50	1409	2191	12.89	4008
32	42.75	57.25	1403	2197	12.85	4021
33	43.00	57.00	1397	2204	12.81	4033
34	43.25	56.75	1390	2210	12.77	4046
35	43.50	56.50	1384	2216	12.73	4059
36	43.75	56.25	1378	2222	12.70	4072
37	44.00	56.00	1372	2228	12.66	4085
38	44.25	55.75	1366	2234	12.62	4097
39	44.50	55.50	1360	2240	12.59	4110
40	44.75	55.25	1354	2246	12.55	4122
41	45.00	55.00	1348	2253	12.51	4135
42	45.25	54.75	1341	2259	12.48	4147
43	45.50	54.50	1335	2265	12.44	4160
44	45.75	54.25	1329	2271	12.41	4172
45	46.00	54.00	1323	2277	12.38	4185
46	46.25	53.75	1317	2283	12.34	4197
47	46.50	53.50	1311	2289	12.31	4209
48	46.75	53.25	1305	2295	12.27	4222
49	47.00	53.00	1299	2302	12.24	4234
50	47.25	52.75	1292	2308	12.21	4246
51	47.50	52.50	1286	2314	12.18	4259
52	47.75	52.25	1280	2320	12.15	4271
53	48.00	52.00	1274	2326	12.11	4283
Average increase in MSP with 0.25 percent increase in oil content					13.11	

(Concluded)



**Annex Table 4.1: Quarterly Domestic and International Prices of Rabi crops**

(Rs per quintal)

S. No.	Quarter	Wheat		Barley		Gram		Lentil		R&M Oilseed		R&M Oil	
		D	I	D	I	D	I	D	I	D	I	D	I
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	2011 Q1	1305	1453	1202	897	2285	2433	3440	3848	2452	3052	6067	6433
2	2011 Q2	1248	1350	1166	937	2276	2671	3241	3651	2461	3042	6055	6366
3	2011 Q3	1190	1238	1068	963	2747	3174	3303	2846	2633	2936	6576	6209
4	2011 Q4	1186	1275	1019	1074	3122	3454	3170	3149	2821	3021	6863	6479
5	2012 Q1	1229	1301	1136	1084	3164	3423	3233	3235	3164	3083	7687	6442
6	2012 Q2	1261	1362	1218	1286	3659	3859	3363	3539	3401	3379	7822	6718
7	2012 Q3	1370	1604	1199	1186	4304	4280	3692	3516	3879	3489	8423	6838
8	2012 Q4	1449	1826	1223	1350	4161	3818	3659	3177	3847	3364	7990	6489
9	2013 Q1	1495	1612	1241	1282	3571	3665	3691	3137	3465	3408	7369	6502
10	2013 Q2	1475	1538	1203	1289	3263	3654	3890	4167	3131	3202	6654	6208
11	2013 Q3	1477	1604	1211	1186	2961	3154	4026	4098	3146	3050	6756	6231
12	2013 Q4	1561	1715	1267	935	2908	3127	4087	3790	3301	3173	7152	6305
13	2014 Q1	1615	1630	1303	800	2872	3202	4303	4211	3175	3332	6833	6069
14	2014 Q2	1491	1577	1266	824	2797	3239	4687	4464	3106	3242	6546	5776
15	2014 Q3	1536	1296	1330	789	2655	3303	4780	4618	3271	2575	6872	5276
16	2014 Q4	1541	1483	1396	947	2781	3162	4970	4717	3437	2597	7089	5023
17	2015 Q1	1575	1390	1398	1175	3210	3755	5368	5185	3467	2529	7090	4716
18	2015 Q2	1519	1302	1275	1276	3963	4742	5917	5960	3762	2713	7873	4897
19	2015 Q3	1562	1276	1300	1300	4405	4648	6812	5651	4060	2692	8493	4996
20	2015 Q4	1618	1322	1421	1234	4665	5219	6824	5351	4419	2735	9577	5296
21	2016 Q1	1662	1282	1488	1234	4421	5136	6659	6025	3889	2669	7946	5234
22	2016 Q2@	1629	1276	1513	1146	5599	5185	6690	6030	3949	2798	8340	5391

D: Domestic, I: International

Notes: 1. Wheat (US)no. 2, soft red winter, export price delivered at US Gulf port for prompt or 30 days shipment

2. Barley Canadian, No. 1 Western Barley, spot price.

3. R&M Oil, Rotterdam Dutch, Ex Mill, Oil World.

4. R&M Oilseed, Hamburg CIF.

5. Domestic Price from DES.

@ International Prices of 2016 Q<sub>2</sub> is the average of April, 2016 and May, 2016

Source: DES, NAFED, SEAI, USDA, and World Bank

**Annex Table 4.2(a): India's Agricultural Exports of Major Commodities**

(Rs. Crore)

S. No.	Commodity	2014-15	2015-16	Percent increase/decrease over previous year	Share in Total Export
(1)	(2)	(3)	(4)	(5)	(6)
1	Rice	48028	37800	-21.3	17.0
2	Marine Products	33688	31183	-7.4	14.0
3	Meat & Processed Meat	30128	27526	-8.6	12.4
4	Spices	14848	16374	10.3	7.3
5	Cotton (Raw)	11643	12816	10.1	5.8
6	Sugar	5329	9772	83.4	4.4
7	Oilseeds	10637	8137	-23.5	3.7
8	Cashew	5566	5025	-9.7	2.3
9	Fresh Vegetables	4666	4763	2.1	2.1
10	Fresh Fruits	3160	3918	24.0	1.8
11	Processed Fruits and juices	3627	3761	3.7	1.7
12	Guar Gum Meal	9478	3613	-61.9	1.6
13	Oil Meals	8129	3484	-57.1	1.6
14	Wheat	4992	972	-80.5	0.4
15	Others	51541	53691	4.2	24.1
16	<b>Total</b>	<b>245460</b>	<b>222834</b>	<b>-9.2</b>	<b>100.0</b>

Source : DGCIS

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

(Rs. Crore)

S. No.	Commodity	2014-15	2015-16	Percent increase/decrease over previous year	Share in Total Import
(1)	(2)	(3)	(4)	(5)	(6)
1	Vegetable Oils	64890	68630	5.8	42.1
2	Pulses	17063	25609	50.1	15.7
3	Wood and Wood Products	17732	17269	-2.6	10.6
4	Fresh Fruits	9567	11011	15.1	6.8
5	Cashew	6600	8701	31.8	5.3
6	Spices	4393	5379	22.4	3.3
7	Sugar	3668	4038	10.1	2.5
8	Others	20935	22384	6.9	13.7
9	<b>Total</b>	<b>144847</b>	<b>163022</b>	<b>12.5</b>	<b>100.0</b>

Source : DGCIS

Annex Table 5.1: State-wise Gross and Net Returns of Rabi crops, TE 2014-15

S. No.	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	
				Rs./ha.	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)			
Wheat														
1	Bihar	19887	24216	34436	46313	26427	133	22098	91	11877	34			
2	Chhattisgarh	15066	19586	27736	26251	11186	74	6665	34	-1485	-5			
3	Gujarat	25804	31492	42399	58829	33025	128	27337	87	16431	39			
4	Haryana	25364	33380	58462	74251	48887	193	40871	122	15789	27			
5	Himachal Pradesh	11539	20123	30176	27571	16032	139	7448	37	-2605	-9			
6	Jharkhand	18775	20983	27878	32207	13431	72	11224	53	4328	16			
7	Maharashtra	28442	34677	46122	46814	18372	65	12137	35	692	2			
8	Madhya Pradesh	17951	22993	39526	54977	37026	206	31984	139	15450	39			
9	Punjab	25587	28184	52169	72748	47160	184	44564	158	20579	39			
10	Rajasthan	21450	33392	49231	71624	50173	234	38231	114	22393	45			
11	Uttarakhand	16242	23113	35559	45198	28956	178	22085	96	9639	27			
12	Uttar Pradesh	24191	30338	46774	53370	29179	121	23032	76	6595	14			
13	West Bengal	29481	35818	47395	41364	11882	40	5546	15	-6031	-13			
ALL-INDIA		22742	28879	45814	58340	35598	157	29461	102	12527	27			
Barley														
1	Rajasthan	18293	32058	45240	58017	39724	217	25960	81	12777	28			
2	Uttar Pradesh	20035	25948	41281	45508	25473	127	19560	75	4227	10			
ALL-INDIA		18898	29953	43867	53657	34759	184	23704	79	9791	22			
Gram														
1	Andhra Pradesh	24700	26681	41078	45164	20464	83	18483	69	4086	10			
2	Bihar	14563	14730	26283	39410	24847	171	24680	168	13128	50			
3	Chhattisgarh	13801	17042	24373	24922	11121	81	7880	46	549	2			
4	Haryana	10858	16702	29629	34815	23957	221	18113	108	5186	18			
5	Karnataka	16366	18587	27266	33423	17057	104	14836	80	6158	23			
6	Maharashtra	22457	26344	37118	40131	17675	79	13788	52	3013	8			
7	Madhya Pradesh	16576	20181	31231	36873	20297	122	16691	83	5642	18			
8	Rajasthan	10357	16792	24686	31968	21611	209	15176	90	7282	29			
9	Uttar Pradesh	15556	20230	29769	25278	9722	62	5048	25	-4491	-15			
ALL-INDIA		16708	20647	30871	35521	18813	113	14873	72	4650	15			

(Continued)

Annex Table 5.1: State-wise Gross and Net Returns of Rabi crops, TE 2014-15

S. No.	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	
						Rs./ha. (Col.6- Col.3)	Percent (Col.7/ Col.3*100)	Rs./ha. (Col.6- Col.4)	Percent (Col.9/ Col.4*100)	Rs./ha. (Col.6- Col.5)	Percent (Col.11/ Col.5*100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>Lentil</b>											
1	Bihar	10718	13340	24628	41373	30655	286	28033	210	16745	68
2	Madhya Pradesh	12255	15083	25094	33489	21235	173	18406	122	8396	33
3	Uttar Pradesh	13618	17619	28264	31291	17673	130	13672	78	3026	11
4	West Bengal	15203	21883	33032	42443	27241	179	20560	94	9411	28
ALL-INDIA		12728	16170	26653	34210	21482	169	18040	112	7557	28
<b>Rapeseed/Mustard</b>											
1	Assam	12258	23420	30198	22275	10017	82	-1144	-5	-7922	-26
2	Bihar	14731	18834	28121	34954	20223	137	16120	86	6833	24
3	Gujarat	18205	24202	35967	53161	34956	192	28959	120	17194	48
4	Haryana	18254	25049	46399	54041	35788	196	28992	116	7642	16
5	Madhya Pradesh	12656	17602	33064	49524	36868	291	31922	181	16460	50
6	Rajasthan	13443	22151	32989	45783	32341	241	23632	107	12795	39
7	Uttar Pradesh	15710	23573	38956	41181	25470	162	17608	75	2225	6
8	West Bengal	21806	28798	40445	43468	21662	99	14670	51	3023	7
ALL-INDIA		14813	22572	35381	45421	30607	207	22848	101	10040	28
<b>Safflower</b>											
1	Karnataka	8336	10248	18231	27247	18911	227	16999	166	9016	49
2	Maharashtra	15121	19588	24767	20649	5528	37	1061	5	-4119	-17
ALL-INDIA		14776	18815	24383	22137	7361	50	3322	18	-2246	-9

Source: CACP calculations based on CS data

(Concluded)

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

S. No. (1)	Month/Year (2)	AP (3)	ASS (4)	BH (5)	GJ (6)	HR (7)	HP (8)	KRN (9)	KER (10)	MP (11)	MH (12)	ODI (13)	Punjab (14)	RAJ (15)	TN (16)	UP (17)	WB (18)	All India (19)
1	January, 2012	177	127	113	113	205	237	137	392	99	153	135	219	162	209	126	142	148
2	February	203	131	124	115	212	241	145	420	100	153	140	235	172	231	136	151	157
3	March	195	132	126	116	213	241	147	413	106	156	140	233	198	226	135	152	161
4	April	207	132	127	117	210	241	146	417	110	156	145	256	194	231	136	159	164
5	May	198	134	129	118	210	241	148	417	108	154	148	243	202	232	138	161	164
6	June	185	134	134	118	215	246	156	420	113	165	137	223	204	238	138	160	165
7	July	191	138	138	125	219	270	163	453	116	171	140	246	223	244	146	169	174
8	August	193	138	143	126	229	246	168	453	119	170	152	241	213	253	149	167	175
9	September	205	140	144	126	229	246	170	455	121	173	143	240	214	252	153	165	177
10	October	199	145	147	126	238	246	173	461	119	174	135	278	216	251	156	165	179
11	November	210	148	148	126	233	251	178	461	120	173	137	274	217	246	158	171	180
12	December	224	145	151	127	228	260	177	461	120	182	138	273	221	247	160	173	184
13	January, 2013	224	146	162	130	246	273	184	465	126	186	136	257	219	253	163	178	187
14	February	228	157	164	130	245	259	188	465	126	192	134	260	204	259	165	180	187
15	March	221	154	166	133	245	259	189	461	130	194	136	260	208	265	166	181	189
16	April	230	153	167	130	247	264	192	478	135	195	137	284	217	265	168	182	193
17	May	223	150	167	131	245	266	192	489	138	197	141	273	244	266	169	185	197
18	June	222	162	168	132	244	262	196	483	134	189	143	290	235	271	173	185	196
19	July	221	178	175	136	258	263	203	485	132	201	150	291	220	272	174	198	198
20	August	210	183	177	137	317	284	210	487	133	200	157	279	215	275	181	200	199
21	September	213	178	176	138	312	290	212	490	138	196	150	-	219	284	181	200	192
22	October	212	175	175	139	312	298	213	487	144	199	156	283	229	294	180	199	203
23	November	247	184	205	142	328	337	235	585	140	221	196	-	248	330	192	224	214
24	December	242	181	191	165	325	356	228	580	151	216	179	278	247	352	186	229	222

(Continued)



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

S. No. (1)	Month/Year (2)	AP (3)	ASS (4)	BH (5)	GJ (6)	HR (7)	HP (8)	KRN (9)	KER (10)	MP (11)	MH (12)	ODI (13)	Punjab (14)	RAJ (15)	TN (16)	UP (17)	WB (18)	All India (19)
25	January, 2014	229	182	194	172	320	336	237	580	155	215	178	276	262	355	191	229	225
26	February	226	188	200	172	329	336	240	629	158	214	180	275	251	362	191	230	226
27	March	222	189	202	175	333	341	243	594	161	219	164	279	270	356	195	223	229
28	April	222	199	204	179	335	352	240	594	163	223	160	306	291	361	201	226	235
29	May	225	203	206	179	346	335	242	594	165	223	173	307	283	364	202	225	235
30	June	217	204	207	179	347	341	241	594	164	230	191	304	280	362	199	227	235
31	July	230	208	218	185	345	345	241	599	173	225	201	302	320	372	200	226	244
32	August	226	220	220	190	348	343	241	599	173	226	208	304	305	371	202	230	243
33	September	239	225	220	190	350	343	242	586	180	222	204	310	296	417	198	234	246
34	October	241	226	222	198	354	339	242	586	171	222	202	310	297	412	201	237	246
35	November	247	238	220	198	357	330	244	597	170	223	200	312	305	421	199	236	248
36	December	236	234	220	192	344	349	252	604	176	222	194	307	307	417	199	237	247
37	January, 2015	246	235	219	194	338	363	254	643	178	225	201	286	298	430	200	241	249
38	February	250	234	221	194	335	363	252	643	179	225	202	290	287	440	202	241	249
39	March	245	226	228	194	341	363	253	642	179	226	202	281	284	429	205	242	248
40	April	245	225	230	195	340	363	253	652	182	231	201	277	291	403	209	242	249
41	May	235	231	231	196	345	362	260	652	183	232	200	292	279	405	208	242	249
42	June	239	239	237	196	346	351	260	664	188	228	203	311	282	399	207	240	250
43	July	229	236	242	203	350	361	269	664	186	234	206	311	295	393	211	240	253
44	August	241	238	246	203	355	366	277	653	188	233	202	304	300	404	214	239	257
45	September	241	239	246	203	354	372	278	656	190	228	196	303	304	394	214	241	256
46	October	240	236	244	203	354	367	279	656	189	233	200	298	298	392	215	237	256
47	November	276	243	243	203	351	374	285	657	182	228	204	301	303	382	216	237	259
48	December	278	241	245	203	361	379	286	657	180	229	200	301	302	383	219	248	260
49	January, 2016	276	235	248	206	354	371	285	664	183	231	199	288	276	381	218	251	256
50	February	254	233	248	206	359	371	281	666	182	229	195	300	270	383	217	252	253
51	March	250	234	246	213	359	371	280	670	186	231	206	292	277	406	217	254	256
52	April	272	240	246	214	362	395	278	670	188	232	198	310	260	406	223	254	257

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

(Concluded)

**Annex Table 5.3: Farm Inputs- Wholesale Price Index (Base 2004-05=100)**

S. No.	Month/Year	Fertilisers	Electricity (Irrigation)	Pesticides	Non-Electrical Machinery	Tractors	Lubricants	HSD	Fodder	Cattle Feed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Annual Average (July - June)									
1	2012-13	151.1	170.9	122.2	123.0	142.7	248.3	192.7	237.8	220.0
2	2013-14	153.0	206.4	128.4	124.4	147.3	262.1	224.9	281.6	248.7
3	2014-15	155.6	214.1	136.6	127.5	152.3	275.2	216.6	297.9	261.5
4	2015-16*	158.6	234.3	138.4	127.6	153.3	277.5	181.4	323.1	270.4
<b>2012</b>										
5	January	139.5	135.7	115.9	123.6	137.9	236.6	167.8	198.5	187.3
6	February	140.1	135.7	115.9	124.0	138.0	236.6	167.8	197.4	191.8
7	March	141.1	135.7	116.2	122.8	138.4	236.6	167.8	202.2	197.3
8	April	142.3	135.7	118.9	122.1	138.3	236.6	167.8	205.7	195.4
9	May	142.4	135.7	118.7	122.6	138.3	236.6	167.8	203.4	195.6
10	June	144.3	166.3	117.9	122.6	140.7	241.4	167.8	196.0	199.7
11	July	148.3	166.3	120.4	122.7	140.7	241.4	167.8	208.4	199.7
12	August	149.1	166.3	121.0	122.9	140.9	241.4	168.6	217.8	199.7
13	September	150.5	166.3	122.1	122.9	141.2	241.4	182.8	228.1	201.8
14	October	150.7	166.3	122.1	123.0	141.5	241.4	192.3	236.1	209.3
15	November	151.0	166.3	122.1	123.1	142.4	241.4	192.3	239.6	214.3
16	December	152.1	166.3	122.3	123.0	143.7	253.3	192.3	237.5	225.2
<b>2013</b>										
17	January	152.6	166.3	123.0	123.0	143.7	253.3	198.8	241.9	225.2
18	February	152.5	166.3	122.9	123.5	143.7	253.3	202.7	246.2	231.1
19	March	152.3	166.3	122.5	123.1	143.7	253.3	201.7	250.4	232.2
20	April	152.4	184.8	122.0	123.0	143.7	253.3	202.3	246.0	233.8
21	May	151.5	184.8	123.0	122.9	143.7	253.3	203.4	244.2	233.3
22	June	150.5	184.8	123.5	122.9	143.7	253.3	207.0	257.1	234.1
23	July	151.5	184.8	123.6	123.1	143.7	253.3	212.0	265.3	238.2
24	August	152.0	203.0	124.5	123.8	143.8	253.3	215.4	267.6	237.7
25	September	152.4	206.9	125.7	123.9	144.3	263.9	219.8	270.1	238.8
26	October	152.7	209.1	127.7	124.1	144.7	263.9	220.4	270.7	238.4
27	November	152.8	209.1	127.9	124.1	144.7	263.9	222.4	274.1	239.0
28	December	152.6	205.5	127.5	124.3	145.0	263.9	225.0	278.3	246.6

(Continued)

**Annex Table 5.3: Farm Inputs- Wholesale Price Index (Base 2004-05=100)**

S. No.	Month/ Year	Fertilisers	Electricity (Irrigation)	Pesticides	Non- Electrical Machinery	Tractors	Lubricants	HSD	Fodder	Cattle Feed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>2014</b>										
29	January	153.0	205.5	127.2	124.3	149	263.9	226.6	285.5	244.9
30	February	152.9	205.5	128.2	124.4	149.6	263.9	228.6	299.0	251.4
31	March	153.1	211.3	130.5	124.4	150.1	263.9	231.2	316.8	259.4
32	April	154.4	212.1	130.6	124.5	150.8	263.9	230.1	296.5	263.4
33	May	154.3	212.1	131.7	124.5	150.8	263.9	232.3	275.6	263.7
34	June	154.2	212.1	135.2	126.8	150.9	263.9	235.2	280.0	262.8
35	July	154.4	211.3	135.4	127.3	151.4	263.9	238.8	277.6	262.8
36	August	154.2	211.3	135.4	127.1	151.5	263.9	240.4	285.9	262.8
37	September	154.6	211.5	137.2	127.2	152.0	275.2	242.0	308.4	262.2
38	October	154.9	211.5	136.6	127.3	152.3	277.8	239.2	313.5	264.7
39	November	155.4	211.5	136.3	127.3	152.2	277.8	218.1	318.3	262.1
40	December	155.3	211.5	137.0	127.3	152.1	277.8	210.8	322.4	260.3
<b>2015</b>										
41	January	155.3	211.5	138.6	127.8	152.2	277.8	200.7	319.6	262.9
42	February	155.6	217.9	138.1	127.9	152.3	277.8	188.4	306.6	262.9
43	March	156.3	217.9	136.7	127.5	152.9	277.5	203.2	286.1	262.7
44	April	156.1	217.9	135.9	127.6	153.0	277.5	195.6	277.4	261.1
45	May	156.7	217.9	136.2	127.6	153.0	277.5	209.6	274.9	257.5
46	June	157.8	217.9	136.1	127.6	153.0	277.5	212.0	283.5	256.4
47	July	158.2	243.5	136.5	127.5	153.0	277.5	200.8	296.2	258.4
48	August	158.3	243.5	136.4	127.4	153.1	277.5	179.4	316.0	258.5
49	September	158.9	243.5	137.0	127.4	153.2	277.5	174.0	317.4	263.4
50	October	158.9	243.5	138.7	127.5	153.2	277.5	176.5	322.2	266.6
51	November	158.5	243.5	138.6	127.5	153.3	277.5	181.7	330.9	268.4
52	December	158.5	243.5	138.6	127.8	153.3	277.5	181.7	338.6	269.2
<b>2016</b>										
53	January	158.7	220.6	139.4	127.7	153.4	277.5	174.6	333.5	271.8
54	February	158.7	220.6	140.2	127.6	153.4	277.5	173.8	326.8	280.7
55	March	158.7	220.6	139.1	127.6	153.4	277.5	183.3	328.9	284.0
56	April	159.0	220.6	139.0	127.6	153.4	277.5	187.9	320.0	282.9
% change of Apr.,2016 over Apr.,2015		1.9	1.2	2.3	0.0	0.3	0.0	-3.9	15.4	8.3

HSD: High Speed Diesel

(Concluded)

\*For 2015-16 average is from July, 2015 to April, 2016.

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 2016-17 and Production Shares**

S.No.	Crop/State	Cost of Production (Rs./qtl.)			Share in Production(%)
		$A_2$	$A_2+FL$	$C_2$	
(1)	(2)	(3)	(4)	(5)	(6)
<b>Wheat</b>					
1	Bihar	762	921	1219	5
2	Gujarat	823	1011	1320	4
3	Haryana	561	738	1216	12
4	Himachal Pradesh	778	1344	1862	1
5	Jharkhand	848	957	1240	1
6	Madhya Pradesh	597	765	1206	17
7	Maharashtra	1291	1577	2015	1
8	Punjab	569	627	1090	18
9	Rajasthan	517	804	1131	10
10	Uttar Pradesh	642	803	1183	29
11	Uttarakhand	624	889	1268	1
12	West Bengal	1551	1862	2216	1
	All India Wtd. Avg.	<b>631</b>	<b>797</b>	<b>1203</b>	
<b>Barley</b>					
1	Rajasthan	469	824	1084	71
2	Uttar Pradesh	613	797	1207	29
	All India Wtd. Avg.	<b>511</b>	<b>816</b>	<b>1119</b>	
<b>Gram</b>					
1	Andhra Pradesh	2249	2411	3490	8
2	Bihar	1552	2032	3066	1
3	Chhattisgarh	1640	2049	2853	3
4	Haryana	1364	2114	3474	1
5	Karnataka	2348	2808	3768	9
6	Madhya Pradesh	1678	2056	3058	42
7	Maharashtra	2267	2672	3560	15
8	Rajasthan	1128	1847	2617	16
9	Uttar Pradesh	1955	2532	3510	5
	All India Wtd. Avg.	<b>1799</b>	<b>2241</b>	<b>3185</b>	
<b>Lentil</b>					
1	Bihar	1398	1775	2884	21
2	Madhya Pradesh	1624	2022	3242	43
3	Uttar Pradesh	1967	2592	3842	29
4	West Bengal	1634	2616	3578	7
	All India Wtd. Avg.	<b>1674</b>	<b>2174</b>	<b>3360</b>	
<b>Rapeseed/Mustard</b>					
1	Assam	1940	3654	4502	3
2	Bihar	1670	2161	2936	2
3	Gujarat	1238	1643	2322	5
4	Haryana	1213	1661	2916	12
5	Madhya Pradesh	916	1274	2224	11
6	Rajasthan	1128	1850	2653	50
7	Uttar Pradesh	1316	1964	3059	10
8	West Bengal	1992	2623	3482	7
	All India Wtd. Avg.	<b>1232</b>	<b>1871</b>	<b>2773</b>	
<b>Safflower</b>					
1	Karnataka	969	1324	2253	45
2	Maharashtra	2971	4444	5326	55
	All India Wtd. Avg.	<b>2076</b>	<b>3049</b>	<b>3952</b>	

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

(Rs./ha.)

S. No.	Cost Items	Bihar		Gujarat		Haryana		Himachal Pd.	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Operational Cost		26816.98	23055.77	30992.83	31088.61	33124.07	34251.73	22091.19	19685.41
Human Labour									
1	Casual	4229.60	3487.00	3838.33	4401.62	3379.19	5084.91	657.04	1227.71
2	Attached	24.32	22.38	64.18	116.04	193.43	332.03	95.84	16.46
3	Family	5308.16	3933.64	5929.69	5829.01	8780.67	8514.40	10203.07	8504.07
4	Total	9562.08	7443.02	9832.20	10346.67	12353.29	13931.34	10955.95	9748.24
Bullock Labour									
5	Hired	0.00	90.87	73.92	85.95	0.00	0.13	327.22	312.76
6	Owned	15.41	381.65	227.06	508.77	5.00	202.39	349.21	263.34
7	Total	15.41	472.52	300.98	594.72	5.00	202.52	676.43	576.10
Machine Labour									
8	Hired	5550.84	4877.70	5387.27	4759.29	7349.23	6550.29	3899.98	4215.52
9	Owned	83.97	38.33	882.70	431.05	1255.49	1172.35	185.49	70.20
10	Total	5634.81	4916.03	6269.97	5190.34	8604.72	7722.64	4085.47	4285.72
11	Seed	2994.30	2546.09	4184.80	4125.54	2356.10	2375.86	1855.97	1778.59
Fertilisers and Manure									
12	Fertilisers	4317.49	4066.48	4171.95	4359.69	4280.12	4383.15	1046.62	1013.63
13	Manure	78.73	16.24	257.64	285.86	19.67	0.00	2956.96	1795.18
14	Total	4396.22	4082.72	4429.59	4645.55	4299.79	4383.15	4003.58	2808.81
15	Insecticides	62.24	0.00	462.70	386.71	887.59	748.67	79.22	92.83
16	Irrigation charges	3500.14	3015.93	4753.10	5033.64	3879.90	4107.39	74.32	56.29
17	Interest on working capital	651.78	579.46	759.49	765.44	737.68	779.92	360.25	338.83
18	Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
Fixed Cost		14632.08	9220.83	11303.25	13638.02	28194.63	26105.55	11956.74	10913.67
19	Rental value of owned land	11480.42	7546.11	7110.29	9818.52	21511.95	22944.22	6851.01	7323.46
20	Rent paid for leased-in land	0.00	0.00	1837.02	1097.12	0.00	0.00	43.66	58.20
21	Land revenue, cesses & taxes	65.20	28.12	5.22	6.36	0.00	0.00	9.39	9.21
22	Depreciation on implements & Farm buildings	589.84	398.44	164.62	165.35	524.96	343.90	722.03	703.37
23	Interest on fixed capital	2496.62	1248.16	2186.10	2550.67	6157.72	2817.43	4330.65	2819.43
Total Cost		41449.06	32276.60	42296.08	44726.63	61318.70	60357.28	34047.93	30599.08

(continued)



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

(Rs./ha.)

S. No.	Cost Items	Jharkhand		Madhya Pd.		Maharashtra		Punjab	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Operational Cost		20147.64	21021.39	25625.32	21452.27	33806.65	36208.50	23717.84	23904.98
Human Labour									
1	Casual	3857.84	3797.04	2468.46	2013.87	5084.87	3860.25	2120.71	2235.11
2	Attached	0.00	0.00	146.31	160.93	655.81	728.20	580.45	625.15
3	Family	4031.50	1440.13	5854.77	4678.97	6236.15	6293.26	2735.92	2760.61
4	Total	7889.34	5237.17	8469.54	6853.77	11976.83	10881.71	5437.08	5620.87
Bullock Labour									
5	Hired	645.99	0.00	64.17	12.14	542.48	404.55	1.37	1.04
6	Owned	353.73	0.00	710.32	511.96	1111.11	1225.41	47.82	67.39
7	Total	999.72	0.00	774.49	524.10	1653.59	1629.96	49.19	68.43
Machine Labour									
8	Hired	2994.91	7999.79	6234.68	5177.07	6358.47	7828.27	5995.54	5999.05
9	Owned	0.00	16.27	398.01	274.58	440.90	897.43	2280.70	2208.69
10	Total	2994.91	8016.06	6632.69	5451.65	6799.37	8725.70	8276.24	8207.74
11	Seed	2624.13	2726.00	2589.10	2685.59	3846.36	3604.52	1961.84	2054.19
Fertilisers and Manure									
12	Fertilisers	3153.33	3123.27	2877.00	2567.87	3730.76	4818.99	5203.53	5227.26
13	Manure	9.64	0.00	0.00	0.00	55.74	0.00	25.37	8.43
14	Total	3162.97	3123.27	2877.00	2567.87	3786.50	4818.99	5228.90	5235.69
15	Insecticides	0.00	0.00	38.72	28.47	171.04	510.55	1545.83	1679.03
16	Irrigation charges	1988.20	1325.52	3644.49	2832.35	4676.25	5130.55	498.45	350.78
17	Interest on working capital	488.37	593.37	599.11	508.28	835.47	906.52	635.82	640.74
18	Miscellaneous	0.00	0.00	0.18	0.19	61.24	0.00	84.49	47.51
Fixed Cost		8662.01	7052.34	18329.28	16052.46	12136.33	11462.39	28872.63	30941.00
19	Rental value of owned land	6631.38	5559.04	13808.68	13569.87	7019.93	8418.76	20587.25	21071.42
20	Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	3653.11	5971.40
21	Land revenue, cesses & taxes	22.46	9.92	5.24	5.31	19.00	15.26	0.00	0.00
22	Depreciation on implements & Farm buildings	688.63	427.57	590.01	327.34	449.70	341.32	401.56	343.22
23	Interest on fixed capital	1319.54	1055.81	3925.35	2149.94	4647.70	2687.05	4230.71	3554.96
Total Cost		28809.65	28073.73	43954.60	37504.73	45942.98	47670.89	52590.47	54845.98

(continued)

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

(Rs./ha.)

S. No.	Cost Items	Rajasthan		Uttar Pd.		Uttarakhand		West Bengal	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
Operational Cost		35134.58	33226.02	30543.85	27501.27	22050.27	20548.98	39977.57	34709.13
Human Labour									
1	Casual	3177.68	3035.48	3672.14	3364.80	1208.10	3274.75	13126.41	10514.44
2	Attached	260.33	171.22	9.87	32.31	29.56	1.37	2.11	132.94
3	Family	13489.59	12119.11	7314.89	5801.81	6314.61	6942.79	6678.04	5797.21
4	Total	16927.60	15325.81	10996.90	9198.92	7552.27	10218.91	19806.56	16444.59
Bullock Labour									
5	Hired	34.37	72.92	0.41	10.08	206.52	1067.72	1246.29	509.99
6	Owned	363.23	458.33	584.04	518.83	3302.09	334.95	1096.02	883.50
7	Total	397.60	531.25	584.45	528.91	3508.61	1402.67	2342.31	1393.49
Machine Labour									
8	Hired	4521.60	5153.37	5897.57	6009.35	3218.36	2069.16	3616.20	3483.14
9	Owned	1073.87	333.95	306.00	581.42	605.78	292.20	0.16	2.92
10	Total	5595.47	5487.32	6203.57	6590.77	3824.14	2361.36	3616.36	3486.06
11	Seed	3432.66	3286.77	3177.11	2788.73	2397.03	2222.92	4159.92	3466.17
Fertilisers and Manure									
12	Fertilisers	3558.17	3309.87	4836.89	4295.89	2226.04	2537.12	5598.44	5603.40
13	Manure	168.02	161.79	31.11	33.35	998.80	867.83	219.93	424.32
14	Total	3726.19	3471.66	4868.00	4329.24	3224.84	3404.95	5818.37	6027.72
15	Insecticides	95.45	16.32	41.46	114.37	303.87	298.30	31.13	146.11
16	Irrigation charges	4303.70	4467.29	3968.25	3292.77	762.67	227.56	3193.84	2865.08
17	Interest on working capital	655.91	639.60	703.91	657.56	476.84	412.31	1009.08	876.12
18	Miscellaneous	0.00	0.00	0.20	0.00	0.00	0.00	0.00	3.79
Fixed Cost		14954.89	17807.57	20536.73	18042.98	16350.25	11677.67	12570.35	12433.56
19	Rental value of owned land	10359.99	12650.92	13376.25	13001.50	13703.42	10482.76	10670.31	11129.40
20	Rent paid for leased-in land	307.09	350.76	1175.49	2029.59	0.00	0.00	0.00	24.39
21	Land revenue, cesses & taxes	12.22	10.29	4.13	6.11	3.66	1.66	36.12	33.26
22	Depreciation on implements & Farm buildings	419.04	371.60	1020.94	670.20	583.95	453.26	405.01	246.04
23	Interest on fixed capital	3856.55	4424.00	4959.92	2335.58	2059.22	739.99	1458.91	1000.47
Total Cost		50089.47	51033.59	51080.58	45544.25	38400.52	32226.65	52547.92	47142.69

Source: DES

(concluded)

### Annex Tale 5.5(b): Barley- Break-up of Cost of Cultivation

(Rs./ha.)

S. No.	Cost Items	Rajasthan		Uttar Pd.	
		2014-15	2013-14	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)	(6)
Operational Cost		34187.08	31969.46	24152.27	26510.19
Human Labour					
1	Casual	1613.95	2406.69	7103.17	2340.44
2	Attached	33.36	178.84	41.58	197.29
3	Family	14646.35	14116.04	4029.34	7752.66
4	Total	16293.66	16701.57	11174.09	10290.39
Bullock Labour					
5	Hired	46.07	26.20	0.00	0.00
6	Owned	601.70	457.44	75.07	66.69
7	Total	647.77	483.64	75.07	66.69
Machine Labour					
8	Hired	4315.85	5374.97	4211.52	3788.20
9	Owned	1418.11	183.92	1755.04	1480.70
10	Total	5733.96	5558.89	5966.56	5268.90
11	Seed	2555.02	2364.94	2161.85	2608.55
Fertilisers and Manure					
12	Fertilisers	2139.60	2091.69	2538.66	3714.13
13	Manure	622.24	185.91	0.00	0.00
14	Total	2761.84	2277.60	2538.66	3714.13
15	Insecticides	158.82	76.01	0.00	0.00
16	Irrigation charges	5443.87	3965.80	1626.25	3993.12
17	Interest on working capital	592.14	541.01	609.79	568.41
18	Miscellaneous	0.00	0.00	0.00	0.00
Fixed Cost		11013.54	14296.12	17817.97	14827.67
19	Rental value of owned land	8236.17	10596.67	14954.75	12520.80
20	Rent paid for leased-in land	0.00	86.75	13.35	0.00
21	Land revenue, cesses & taxes	11.42	13.48	15.33	9.76
22	Depreciation on implements & Farm buildings	237.77	348.14	457.19	341.99
23	Interest on fixed capital	2528.18	3251.08	2377.35	1955.12
Total Cost		45200.62	46265.58	41970.24	41337.86

Source: DES

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

(Rs./ha.)

S. No.	Cost Items	Andhra Pd.		Bihar		Chhattisgarh		Haryana	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Operational Cost		30266.34	25378.77	18584.31	13337.06	15521.70	17436.97	17863.57	16033.90
Human Labour									
1	Casual	10615.85	8104.67	4740.69	2945.09	1062.30	1461.46	4947.09	4398.04
2	Attached	202.02	42.26	6.35	62.46	0.00	0.00	249.46	0.00
3	Family	2563.41	1516.91	3487.55	1836.60	3042.55	4031.83	6525.50	6896.69
4	Total	13381.28	9663.84	8234.59	4844.15	4104.85	5493.29	11722.05	11294.73
Bullock Labour									
5	Hired	450.58	987.94	0.00	164.75	68.74	73.66	0.00	35.37
6	Owned	649.32	756.19	0.00	0.00	570.19	853.11	9.78	0.00
7	Total	1099.90	1744.13	0.00	164.75	638.93	926.77	9.78	35.37
Machine Labour									
8	Hired	4695.96	2788.01	3505.16	2756.74	3968.71	3442.16	2147.61	2701.44
9	Owned	97.67	814.73	52.17	27.33	20.18	2.58	1359.64	444.55
10	Total	4793.63	3602.74	3557.33	2784.07	3988.89	3444.74	3507.25	3145.99
11	Seed	4653.37	4348.28	3433.70	3606.58	2964.75	2952.23	1702.91	1225.88
Fertilisers and Manure									
12	Fertilisers	2581.28	2358.40	2426.17	1464.76	1505.18	2111.76	0.00	0.00
13	Manure	1280.76	1864.81	13.93	0.00	0.00	0.00	0.00	0.00
14	Total	3862.04	4223.21	2440.10	1464.76	1505.18	2111.76	0.00	0.00
15	Insecticides	1612.70	1073.48	354.48	108.22	320.44	762.24	59.95	55.04
16	Irrigation charges	23.94	0.00	106.63	16.03	1620.50	1323.07	518.05	0.00
17	Interest on working capital	839.48	723.09	457.48	348.50	378.16	406.22	343.58	276.89
18	Miscellaneous	0.00	0.00	0.00	0.00	0.00	16.65	0.00	0.00
Fixed Cost		17147.46	13091.25	14678.63	10502.20	8161.54	6304.08	14843.12	10818.41
19	Rental value of owned land	13931.58	10767.66	12987.94	9015.38	5930.61	5054.40	12496.96	6682.92
20	Rent paid for leased-in land	1731.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	Land revenue, cesses & taxes	0.55	0.07	48.94	34.37	2.34	2.34	0.00	0.00
22	Depreciation on implements & Farm buildings	335.99	355.16	396.02	293.09	447.49	319.30	129.66	288.10
23	Interest on fixed capital	1147.78	1968.36	1245.73	1159.36	1781.10	928.04	2216.50	3847.39
Total Cost		47413.80	38470.02	33262.94	23839.26	23683.24	23741.05	32706.69	26852.31

(continued)

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

(Rs./ha.)

S. No.	Cost Items	Karnataka		Madhya Pd.		Maharashtra		Rajasthan		Uttar Pd.	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Operational Cost		20686.08	17468.44	20867.48	19184.87	25655.80	27308.92	16444.00	16038.54	22024.75	18070.37
Human Labour											
1	Casual	6379.57	4334.75	2686.70	2689.27	5759.56	5594.69	1028.50	2244.03	2882.32	2850.96
2	Attached	94.89	0.00	122.76	151.71	560.67	747.47	0.00	128.08	0.00	3.17
3	Family	2703.90	2178.56	4156.71	3410.50	3607.79	3898.69	6867.87	6440.37	6353.65	3525.25
4	Total	9178.36	6513.31	6966.17	6251.48	9928.02	10240.85	7896.37	8812.48	9235.97	6379.38
Bullock Labour											
5	Hired	817.06	545.48	154.57	13.25	459.13	193.76	5.38	7.12	16.91	21.39
6	Owned	1158.68	1119.14	528.93	384.13	835.59	1732.95	427.05	113.59	202.24	66.67
7	Total	1975.74	1664.62	683.50	397.38	1294.72	1926.71	432.43	120.71	219.15	88.06
Machine Labour											
8	Hired	2560.20	1989.75	3867.03	3742.13	3848.19	4632.18	2633.63	2806.44	4323.66	4155.35
9	Owned	329.24	871.94	430.17	230.18	460.42	459.34	311.09	197.68	448.74	497.14
10	Total	2889.44	2861.69	4297.20	3972.31	4308.61	5091.52	2944.72	3004.12	4772.40	4652.49
11	Seed	2221.77	2610.89	4237.46	4041.08	3051.58	3760.88	2053.75	1972.90	5099.99	5094.83
Fertilisers and Manure											
12	Fertilisers	2093.80	1962.04	1640.34	1593.87	2542.80	2331.20	1051.18	604.44	1250.91	864.12
13	Manure	0.00	0.00	0.00	0.00	80.59	0.00	0.00	0.00	0.00	0.00
14	Total	2093.80	1962.04	1640.34	1593.87	2623.39	2331.20	1051.18	604.44	1250.91	864.12
15	Insecticides	1754.35	1338.56	916.67	736.52	989.55	890.74	2.71	40.66	10.71	23.18
16	Irrigation charges	27.71	54.00	1491.23	1659.23	2791.81	2357.62	1772.65	1192.38	960.74	527.55
17	Interest on working capital	544.91	463.33	506.39	478.00	668.12	709.40	290.19	290.85	474.88	440.76
18	Miscellaneous	0.00	0.00	128.52	55.00	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Cost		11255.97	8438.31	13084.87	8949.70	12132.99	11286.46	7558.81	8247.54	10504.97	8028.90
19	Rental value of owned land	9781.76	6911.70	10012.92	7256.55	6252.56	7204.80	4426.09	5644.37	7726.43	5313.65
20	Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.64
21	Land revenue, cesses & taxes	10.56	6.07	4.80	5.00	20.51	19.92	8.30	3.37	8.64	8.19
22	Depreciation on implements & Farm buildings	189.82	134.26	504.41	348.51	471.57	400.88	420.10	292.19	422.65	552.91
23	Interest on fixed capital	1273.83	1386.28	2562.74	1339.64	5388.35	3660.86	2704.32	2307.61	2347.25	2092.51
Total Cost		31942.05	25906.75	33952.35	28134.57	37788.79	38595.38	24002.81	24286.08	32529.72	26099.27

Source: DES

(concluded)



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

(Rs./ha.)

S. No.	Cost Items	Bihar		Madhya Pd.		Uttar Pd.		West Bengal	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Operational Cost		16109.62	11489.13	18531.08	13247.58	17844.14	17570.78	21976.59	21899.43
Human Labour									
1	Casual	4670.84	2636.21	1882.56	2461.12	2861.17	2541.47	4628.82	4281.25
2	Attached	145.89	35.81	329.61	208.36	0.00	151.16	0.00	219.52
3	Family	3302.66	2291.14	3915.31	2647.41	4233.41	4182.74	5432.34	9872.34
4	Total	8119.39	4963.16	6127.48	5316.89	7094.58	6875.37	10061.16	14373.11
Bullock Labour									
5	Hired	0.00	182.79	19.69	137.50	0.00	55.02	93.86	978.30
6	Owened	0.00	500.27	1013.00	711.01	236.63	1533.83	446.14	514.88
7	Total	0.00	683.06	1032.69	848.51	236.63	1588.85	540.00	1493.18
Machine Labour									
8	Hired	3321.85	2507.54	4073.80	2326.36	3887.22	3718.50	6257.64	2514.79
9	Owened	193.46	66.70	430.00	257.90	486.44	550.05	5.11	30.62
10	Total	3515.31	2574.24	4503.80	2584.26	4373.66	4268.55	6262.75	2545.41
11	Seed	1837.74	1545.66	2938.64	2035.84	2899.47	2672.97	2857.67	2152.40
Fertilisers and Manure									
12	Fertilisers	2089.67	1437.52	1309.88	1031.20	1121.12	641.46	1741.70	910.21
13	Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	Total	2089.67	1437.52	1309.88	1031.20	1121.12	641.46	1741.70	910.21
15	Insecticides	112.07	0.00	311.27	259.72	0.00	6.72	5.12	16.10
16	Irrigation charges	47.35	6.76	1855.89	807.88	1706.23	1111.16	6.85	44.56
17	Interest on working capital	388.09	278.73	442.90	321.22	412.45	405.70	501.34	364.46
18	Miscellaneous	0.00	0.00	8.53	42.06	0.00	0.00	0.00	0.00
Fixed Cost		13995.54	11780.95	12590.35	8473.09	12199.70	10250.01	16704.02	8107.41
19	Rental value of owned land	11340.52	10476.98	9388.68	6815.06	7703.53	8416.27	15924.61	7059.96
20	Rent paid for leased-in land	0.00	0.00	0.00	0.00	0.00	47.50	0.00	0.00
21	Land revenue, cesses & taxes	46.92	35.44	5.84	5.10	11.82	15.26	50.07	56.95
22	Depreciation on implements & Farm buildings	301.03	218.53	500.11	340.73	716.57	498.08	300.76	399.20
23	Interest on fixed capital	2307.07	1050.00	2695.72	1312.20	3767.78	1272.90	428.58	591.30
Total Cost		30105.16	23270.08	31121.43	21720.67	30043.84	27820.79	38680.61	30006.84

Source: DES

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

(Rs./ha.)

S. No.	Cost Items	Assam		Bihar		Gujarat		Haryana	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Operational Cost		26733.52	22049.45	15693.44	20747.99	26049.55	25615.68	24229.11	26817.03
Human Labour									
1	Casual	1206.68	1055.51	3139.41	5082.87	4874.23	4074.76	3609.86	4158.88
2	Attached	64.29	845.25	114.19	11.82	0.00	107.48	123.74	175.61
3	Family	13519.68	10637.20	3857.12	4692.19	5981.72	6752.38	7177.69	7479.84
4	Total	14790.65	12537.96	7110.72	9786.88	10855.95	10934.62	10911.29	11814.33
Bullock Labour									
5	Hired	142.23	24.32	0.00	0.00	31.75	568.73	5.90	21.12
6	Owned	7069.29	6013.74	42.48	0.00	440.09	358.97	33.41	50.77
7	Total	7211.52	6038.06	42.48	0.00	471.84	927.70	39.31	71.89
Machine Labour									
8	Hired	1422.82	609.07	2883.80	2378.07	4365.82	4119.46	4983.41	4709.51
9	Owned	272.81	122.21	165.32	311.88	259.41	102.61	1195.54	1450.84
10	Total	1695.63	731.28	3049.12	2689.95	4625.23	4222.07	6178.95	6160.35
11	Seed	447.62	458.60	699.96	776.94	397.17	895.85	871.17	752.75
Fertilisers and Manure									
12	Fertilisers	1053.60	984.71	2962.26	3061.18	3168.65	3645.98	3309.33	3615.58
13	Manure	1082.22	902.00	319.03	1189.84	794.12	309.01	0.00	0.00
14	Total	2135.82	1886.71	3281.29	4251.02	3962.77	3954.99	3309.33	3615.58
15	Insecticides	41.62	51.01	120.36	741.53	136.95	95.69	93.10	75.36
16	Irrigation charges	0.00	0.00	1030.83	2015.13	4991.52	4013.14	2309.25	3740.79
17	Interest on working capital	400.42	345.83	358.68	486.54	608.12	571.62	516.71	585.98
18	Miscellaneous	10.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Cost		9068.29	7058.22	13156.33	8126.39	13400.15	12484.69	23450.15	19572.67
19	Rental value of owned land	6012.75	5060.83	10727.26	6623.29	10071.48	8873.03	16386.91	16375.75
20	Rent paid for leased-in land	53.37	78.32	0.00	0.00	58.42	156.08	0.00	0.00
21	Land revenue, cesses & taxes	39.54	40.22	54.96	24.22	2.21	3.60	0.00	0.00
22	Depreciation on implements & Farm buildings	676.05	571.50	290.16	249.83	140.77	268.29	712.31	332.27
23	Interest on fixed capital	2286.58	1307.35	2083.95	1229.05	3127.27	3183.69	6350.93	2864.65
Total Cost		35801.81	29107.67	28849.77	28874.38	39449.70	38100.37	47679.26	46389.70

(Continued)

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

(Rs./ha.)

S. No.	Cost Items	Madhya Pd.		Rajasthan		Uttar Pd.		West Bengal	
		2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
(1)	(2)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Operational Cost		18366.86	17262.98	23513.59	20820.10	24184.42	23266.78	31273.25	27168.58
Human Labour									
1	Casual	2974.10	1548.87	2288.10	1826.07	2566.88	3120.34	10377.02	8173.05
2	Attached	109.21	0.00	24.82	65.77	24.63	56.10	3.17	25.23
3	Family	5470.46	5438.68	10025.43	8394.65	9921.70	7972.32	7399.35	7506.38
4	Total	8553.77	6987.55	12338.35	10286.49	12513.21	11148.76	17779.54	15704.66
Bullock Labour									
5	Hired	51.19	0.00	6.57	30.67	5.38	11.44	1397.44	725.40
6	Owned	113.37	76.37	128.78	229.33	145.81	896.84	1099.84	908.50
7	Total	164.56	76.37	135.35	260.00	151.19	908.28	2497.28	1633.90
Machine Labour									
8	Hired	4557.16	5236.76	3877.19	3676.05	4369.60	3882.99	2016.18	2260.21
9	Owned	196.48	4.67	658.30	582.89	491.34	1054.92	2.16	20.41
10	Total	4753.64	5241.43	4535.49	4258.94	4860.94	4937.91	2018.34	2280.62
11	Seed	380.70	279.77	892.15	658.31	850.18	674.26	530.64	456.15
Fertilisers and Manure									
12	Fertilisers	2839.00	2864.79	2287.37	2213.44	3038.69	3345.50	4816.97	4083.43
13	Manure	0.00	0.00	0.00	0.00	0.00	15.14	274.61	203.63
14	Total	2839.00	2864.79	2287.37	2213.44	3038.69	3360.64	5091.58	4287.06
15	Insecticides	264.26	256.15	19.84	39.66	0.00	90.49	301.80	307.74
16	Irrigation charges	1020.13	1195.64	2896.31	2726.73	2338.01	1682.97	2330.16	1896.60
17	Interest on working capital	390.80	358.31	408.73	376.53	432.20	463.47	723.45	595.82
18	Miscellaneous	0.00	2.97	0.00	0.00	0.00	0.00	0.46	6.03
Fixed Cost		16122.24	14919.52	11304.45	12071.96	17292.90	16391.32	14061.86	11000.37
19	Rental value of owned land	12066.58	12362.80	7657.15	6871.14	10888.77	12856.89	11849.09	9828.43
20	Rent paid for leased-in land	0.00	0.00	0.00	1146.06	555.82	179.43	337.51	114.94
21	Land revenue, cesses & taxes	6.66	8.22	13.88	9.50	8.54	11.00	54.45	33.78
22	Depreciation on implements & Farm buildings	300.51	241.80	397.98	347.22	872.47	609.77	575.18	300.31
23	Interest on fixed capital	3748.49	2306.70	3235.44	3698.04	4967.30	2734.23	1245.63	722.91
Total Cost		34489.10	32182.50	34818.04	32892.06	41477.32	39658.10	45335.11	38168.95

Source: DES

(concluded)

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

(Rs./ha.)

S. No.	Cost Items	Karnataka	Maharashtra	
		2014-15	2014-15	2013-14
(1)	(2)	(3)	(4)	(5)
Operational Cost		10138.16	18133.96	19647.68
Human Labour				
1	Casual	3038.68	4069.15	5875.41
2	Attached	0.00	0.00	2847.76
3	Family	1912.57	6476.14	3153.55
4	Total	4951.25	10545.29	11876.72
Bullock Labour				
5	Hired	516.76	951.55	121.48
6	Owned	517.83	3528.57	3713.69
7	Total	1034.59	4480.12	3835.17
Machine Labour				
8	Hired	1487.96	1344.01	1106.03
9	Owned	789.33	0.00	32.04
10	Total	2277.29	1344.01	1138.07
11	Seed	646.12	602.37	506.56
Fertilisers and Manure				
12	Fertilisers	484.53	703.39	1556.63
13	Manure	0.00	0.00	0.00
14	Total	484.53	703.39	1556.63
15	Insecticides	495.12	105.51	151.85
16	Irrigation charges	0.00	0.00	82.85
17	Interest on working capital	249.26	353.27	499.83
18	Miscellaneous	0.00	0.00	0.00
Fixed Cost		8093.14	4201.96	6256.69
19	Rental value of owned land	6726.96	1894.82	4575.67
20	Rent paid for leased-in land	0.00	0.00	0.00
21	Land revenue, cesses & taxes	8.29	24.96	30.90
22	Depreciation on implements & Farm buildings	102.02	332.91	281.31
23	Interest on fixed capital	1255.87	1949.27	1368.81
Total Cost		18231.30	22335.92	25904.37

Source: DES

**Annex Table 5.6: Comparison of Cost Projections of Rabi Crops- RMS 2017-18**

(qtl./ha., Rs./ha.)

S. No.	Crop/State	State Projection		CACP Projection on the basis of CS data	
		Yield	Cost of Production	Yield	Cost of Production
(1)	(2)	(3)	(4)	(5)	(6)
Wheat					
1	Bihar	30	1462	27	1219
2	Chhattisgarh	21	990	NP	
3	Punjab	47	1494	46	1090
4	Rajasthan	-	903	39	1131
5	Telangana	11	3136	NP	
6	West Bengal	-	2422	30	2216
Barley					
7	Rajasthan	-	871	37	1084
Gram					
8	Bihar	16	2957	10	3066
9	Chhattisgarh	16	1696	9	2853
10	Rajasthan	-	2276	9	2617
11	Telangana	14	4490	NP	
Lentil					
12	Bihar	12	2818	10	2884
Rapeseed/Mustard					
13	Bihar	12	3428	11	2936
14	Chhattisgarh	8	1374	NP	
15	Rajasthan	-	2052	13	2653
16	Telangana	9	3578	NP	
17	West Bengal	-	4303	13	3482
Safflower					
18	Telangana	8	3491	NP	

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

**Annex Table 5.7: All India Projected Cost of Production of Rabi Crops for 2016-17 over 2015-16 RMS**

(Rs./qtl., %)

S. No.	Crop	Cost of Production				Percentage Change in Projected Cost (2016-17 over 2015-16)	
		2016-17		2015-16		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>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Wheat	797	1203	785	1163	1.5	3.4
2	Barley	816	1119	776	1089	5.1	2.8
3	Gram	2241	3185	2124	3102	5.5	2.7
4	Lentil	2174	3360	2015	3098	7.9	8.5
5	R & M	1871	2773	1702	2605	9.9	6.5
6	Safflower	3049	3952	3057	3734	-0.3	5.8



**Annex Table 6.1: MSP Suggested by State Governments for the Rabi Crops of 2016-17  
to be Marketed in 2017-18**

(Rs./Qtl.)

S. No.	State	Remarks	Wheat	Barley	Gram	Lentil	Rapeseed/ Mustard	Safflower
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1	Andhra Pd.				6062		4924	
2	Bihar		2193		4435	4227	5142	
3	Chhattisgarh		2200	1400	3800	3800	3800	3800
4	Gujarat	Irrigated	2150		3900		3450	
		Unirrigated	2175					
5	Madhya Pd.	Grown by using local seeds	1530	1230	4000	3500	3400	
		Grown by using certified seeds	1650	1250	6500	4500	4000	
6	Odisha		1600		3700	3400	3500	3400
7	Punjab		2040	1750	3995		3850	
8	Rajasthan		1900	1700	4200		4000	
9	Telangana		4704		6735		5366	5237
10	Uttar Pd.		2645					
11	West Bengal		2400				4300	

Source : State Replies

# **Commission for Agricultural Costs and Prices**

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Department of Agriculture, Cooperation & Farmers Welfare  
Ministry of Agriculture & Farmers Welfare  
Government of India, New Delhi  
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