Price Policy for
Rabi Crops

Marketing Season 2023-24

सत्यमेव जयते

Commission for Agricultural Costs & Prices

Department of Agriculture & Farmers Welfare
Ministry of Agriculture & Farmers Welfare
Government of India, New Delhi
July 2022

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Preface

More than two years of COVID-19 and increased market uncertainties from the war in Ukraine have resulted in major disruptions to production and trade of major food commodities as well as key inputs like fertilisers, natural gas, etc. used for growing food. Global wheat (SRW) prices were more than 60 percent higher in 2022(Q2) than a year ago and exceeded $520 per tonne in May, an all-time high. Edible oils also experienced significant price increases due to supply disruptions in Ukraine, which accounts for more than 30 percent of global sunflower production, Indonesia's export ban on palm oil and lower-than-expected production of soybean in South America. According to the World Bank estimates, agricultural prices are expected to be significantly higher in 2022 than in 2021 and fall in 2023 but remain high by historical standards.

In view of these developments and to ensure remunerative prices to farmers, it is a great honour and privilege for me to submit **"Price Policy for Rabi Crops: The Marketing Season 2023-24"** report. The report contains the recommendations on Minimum Support Prices (MSP) for the mandated six *rabi* crops, namely, **wheat, barley, gram, lentil, rapeseed-mustard and safflower**, and a set of non-price recommendations. I hope that these recommendations will incentivise and encourage farmers to adopt modern technologies and practices and desirable shift in cropping pattern to improve farm income and competitiveness of Indian agriculture.

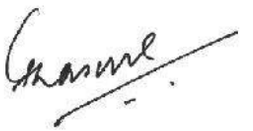
Summary of Recommendations is followed by an overview of Indian agriculture in Chapter 1. Chapter 2 of the report discusses demand-supply outlook and price trends in domestic and world markets, terms of trade and procurement operations. Trends in productivity and important drivers of productivity growth are analysed in Chapter 3. Trade patterns, comparison of domestic and world prices, a review of recent trade policy development and trade outlook are discussed in Chapter 4. Costs, returns and cost projections for Rabi Marketing Season 2023-24 including inter-crop parity issue are analysed in Chapter 5. Finally, in chapter 6, major considerations and recommendations of the Minimum Support Prices (MSP) and key non-price policy suggestions are presented.

Many people have assisted in the preparation of this report. I would like to thank State Governments, various Ministries/Departments of Government of India, farmers/farmers' associations, representatives of organizations involved in procurement, post-harvest management, processing and marketing of agricultural commodities, and various other stakeholders for providing valuable insights and suggestions in preparation of this report. Special thanks to the Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare for providing data on cost estimates for this report.

I would like to express my sincere gratitude and special word of thanks to Dr. Naveen Prakash Singh, Member (O), without whom the report would not have been possible. Thanks are also due to Sh. Anupam Mitra, Member Secretary for his contribution and support in preparation of the report.

I wish to acknowledge the extensive contributions from Advisors, Sh. D. K. Pandey, Dr. Mohammad Nazmuddin and Dr. Seema. A special word of thanks to Dr. Archana Shukla, Mrs. Leena Kumar, Mr. Chitvan Singh Dhillon, Dr. Sadhana Srivastava, Mr. Suraj Kumar Shukla, Mrs. Shivani, Mr. Prashant Kumar, Mr. Salam Shyamsunder Singh and Mrs. Anu Malhotra for their excellent contribution and support in report writing.

I gratefully acknowledge the valuable contributions of Shri Sikander, Shri Mintu Kumar, Shri Chandra Kumar, Mohd Shoeb, Shri B.K. Barnawal, Shri Ravi Kumar Sharma, Shri Ashok Kumar, Shri Mahender Kumar Gupta and Mohd. Shoeb Malik. Lastly, my gratitude and thanks to dedicated officers/officials of the Commission, who provided administrative support.



31st July 2022

(Vijay Paul Sharma)

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List of Acronyms

Acronym	Description
A_2	Paid-out cost
A_2+FL	Paid-out cost plus imputed value of family labour
AGMARKNET	Agricultural Marketing Information Network
AIDC	Agricultural Infrastructure Development Cess
APMC	Agriculture Produce Market Committee
ASEAN	Association of Southeast Asian Nations
BCD	Basic Custom Duty
BCM	Billion Cubic Meter
BE	Budget Estimates
C_2	A_2+FL cost plus imputed rental value of owned land plus interest on fixed capital
CACP	Commission for Agricultural Costs & Prices
CAGR	Compound Annual Growth Rate
CBBOs	Cluster Based Business Organizations
CFPI	Consumer Food Price Index
CHCs	Custom Hiring Centres
CIPI	Composite Input Price Index
CoC	Cost of Cultivation
CoP	Cost of Production
CPI	Consumer Price Index
CPO	Crude Palm Oil
CS	Comprehensive Scheme
CSS	Central Sector Scheme
CWC	Central Warehousing Scheme
DAP	Di-Ammonium Phosphate
DBT	Direct Benefit Transfer

DES	Directorate of Economics and Statistics
DGCIS	Directorate General of Commerce Intelligence & Statistics
DGFT	Directorate General of Foreign Trade
DIPP	Department of Industrial Policy & Promotion
DPIIT	Department of Promotion of Industry and Internal Trade
EDI	Electronic Data Interchange
e-NAM	National Agriculture Market
EU	European Union
FAI	Fertilizers Association of India
FAO	Food and Agriculture Organisation
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FAQ	Fair Average Quality
FARMS	Farm Machinery Solution App
FCI	Food Corporation of India
FLD	Field Level Demonstration
FMTTI	Farm Machinery Training and Testing Institute
FPI	Food Price Index
FPOs	Farmer Producer Organizations
FRL	Full Reservoirs Level
FSI	Food, Seed and Industrial
FY	Financial Year
GAP	Good Agricultural Practices
GCA	Gross Cropped Area
GCF	Gross Capital Formation
GDP	Gross Domestic Products
GII	Global Innovation Index

GrAM	Gramin Agricultural Markets
GVA	Gross Value Added
GVO	Gross Value of Output
HSD	High Speed Diesel
ICAR	Indian Council of Agricultural Research
IMD	Indian Metrological Department
ITC (HS)	Indian Trade Classification (Harmonized System)
KCC	Kisan Credit Card
LPA	Long Period Average
MEP	Minimum Export Price
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MICECA	Malaysia-India Comprehensive Economic Cooperation Agreement
MIF	Micro Irrigation Fund
MoRD	Ministry of Rural Development
MOSPI	Ministry of Statistics and Programme Implementation
MSP	Minimum Support Price
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation of India
NAPCC	National Action Plan on Climate Change
NCDEX	National Commodity & Derivative Exchange
NFSM	National Food Security Mission
NICRA	National Innovations in Climate Resilient Agriculture
NMAET	National Mission on Agricultural Extension and Technology
NMEO (OP)	National Mission on Edible Oils (Oil Palm)
NMOOP	National Mission on Oilseeds and Oil Palm
NMSA	National Mission for Sustainable Agriculture

OECD	Organisation for Economic Cooperation and Development
OGL	Open General License
OMSS (D)	Open Market Sale Scheme (Domestic)
OS&OP	Oilseeds & Oil Palm
PDMC	Per Drop More Crop
PEG	Private Entrepreneurs Guarantee
PKVY	Paramparagat Krishi Vikas Yojana
PM-AASHA	Pradhan Mantri Annadata Aay Sanrakshan Abhiyan
PMFBY	Pradhan Mantri Fasal Bima Yojana
PM-KISAN	Pradhan Mantri Kisan Samman Nidhi
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
PPP	Public-Private Partnership
PSS	Price Support Scheme
PWS	Private Warehousing Scheme
qt/ha	quintal per hectare
R&D	Research and Development
R&M	Rapeseed and Mustard
RBD	Refined, Bleached and Deodorized
RBI	Reserve Bank of India
RE	Revised Estimates
RMS	Rabi Marketing Season
SFAC	Small Farmers Agri-Business Consortium
SHC	Soil Health Card
SMAE	Sub- Mission on Agricultural Extension
SMAM	Sub-Mission on Agriculture Mechanisation
SMSP	Sub-Mission on Seeds and Planting Material

SPS	Sanitary & Phyto-Sanitary
SRR	Seed Replacement Rate
SRW	Soft Red Winter
SWC	State Warehousing Scheme
TE	Triennium Ending
UAE	United Arab Emirates
UN	United Nations
USA	United States of America
USD	United States Dollar
USDA	United States Department of Agriculture
WDC	Watershed Development Component
WPI	Wholesale Price Index
y-o-y	year on year

Summary of Recommendations

Price Policy Recommendations

S.1 The Commission considers the cost of production, supply and demand conditions for different crops in domestic and international markets, domestic and world prices along with trade opportunities, terms of trade between the agriculture and non-agriculture sectors, optimal use of land, water, and other production resources, likely effect of price policy on rest of the economy, and a minimum of 50 percent as the margin over the cost of production for recommending MSP. The Commission makes the following price and non-price policy recommendations in light of these factors. The recommended Minimum Support Prices (MSPs) of six rabi crops are given in Table S.1.

Table S.1 : MSPs Recommended for RMS 2023-24

(₹/qtl)

Crop	Projected A_2+FL Cost for RMS 2023-24	MSP for RMS 2022-23	MSP Recommended for RMS 2023-24	Gross Margin over A_2+FL w.r.t. Recommended MSP
Wheat	1065	2015	2125 (5.5)	99.5
Barley	1082	1635	1735 (6.1)	60.4
Gram	3206	5230	5335 (2.0)	66.4
Lentil (Masur)	3239	5500	6000 (9.1)	85.2
Rapeseed & Mustard	2670	5050	5450 (7.9)	104.1
Safflower	3765	5441	5650 (3.8)	50.0

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

Non-Price Policy Recommendations

Increasing Pulses Production

S.2 Import of pulses accounted for about 6.5 percent in India's agri-imports in 2021-22. While India is gradually moving towards self-sufficiency in pulses, it still requires sustained focus on increasing pulses acreage and yield as well as bridging yield gaps in pulses through use of new varieties, better seeds and adoption of improved scalable technology. India is one of the largest producers as well as largest consumer of pulses and thus emerging as one of the largest importers of pulses as well. As pulses are integral part of food and nutritional security, the Commission recommends that it is essential to ensure self-sufficiency by bringing more area under pulses beside yield improvements and technology adoption at field level. This has to be supplemented by attractive

remuneration, procurement and market assurance to farmers growing pulses.

S.3 Pulses crops, which are largely cultivated on marginal lands under rainfed conditions have large production risk which further translate to high price volatility. Stabilizing yield and reducing price volatility shall be the key components of the overall strategy to achieve self-sufficiency in pulses.

S.4 Efforts shall be extended to promote pulses as inter or mixed crops. This would contribute to improving soil fertility, reducing fertilizer use and improving nutritional security.

S.5 Storage capacity for pulses in the country may be improved in both public and private sectors. Storability of pulses can be improved by leveraging technologies such as passing pulses through low-intensity radiation. This would reduce inter-seasonal and inter-year fluctuations in prices.

Promote Oilseeds Production

S.6 Although there has been an impressive increase in production of rapeseed and mustard and safflower during 2021-22, the country is still heavily dependent on imports to meet its edible oil requirement. Domestic production of edible oil is insufficient to meet the growing demand owing to low productivity, growing oilseed crops in marginal lands and rainfed areas etc. The Commission has noted that oil content in rapeseed and mustard seed varies widely across different varieties and recommends that farmers should be suitably incentivized to increase area under high oil yielding varieties of rapeseed and mustard.

Crop Diversification

S.7 Analysis of cost data shows that farmers will gain more by diversifying from wheat to gram in Jharkhand and Karnataka, and gram, lentil and rapeseed & mustard in West Bengal, as returns from wheat in these States were comparatively very low. Analysis also shows that growing barley in Himachal Pradesh and rapeseed & mustard in Odisha is not profitable as paid-out costs including family labour expenses cannot be recovered by selling the produce.

S.8 All-India relative gross returns on per hectare basis show that wheat has significantly higher returns than barley, gram, lentil, rapeseed & mustard and safflower. Thus farmers prefer to grow wheat over barley, pulses and oilseeds. Therefore, the Commission recommends that there is need to promote farming of barley, pulses and oilseeds by changing their relative incentive structure through higher MSP, assured markets, improving productivity and reducing cost of cultivation.

Adoption of Quality Seeds

S.9 Quality seeds are the medium for channelizing the outcome of agrarian R&D to a farmer's field. High quality certified seeds will help in adoption of improved varieties and replacement of obsolete varieties resulting in higher yield. Although the seed replacement rate (SRR) for wheat and R&M has exceeded the target of 33 percent for the years under consideration, the SRR for barley, gram and safflower is still below target. The Commission therefore recommends that farmers should be encouraged to adopt high-quality certified seeds for barley, gram and safflower in order to improve the SRR. The Commission also recommends appropriate incentives to the private sector so that they develop and sell high quality certified seeds with commercial biotechnology traits.

Promote Balanced Use of Fertilizers

S.10 Fertilizer applied in correct dosage with good quality seed and assured irrigation will help in raising agricultural productivity. However given the current relative price of N, P and K there is a tendency to overuse urea and economize on the use phosphorus and potassic fertilizers. Hence the Commission recommends adoption of an integrated nutrient management approach to address the problem of low nutrient use efficiency and poor response ratio to fertilizers. This entails the combined use of mineral, organic, bio-fertilizers and micronutrients. Further, the Commission suggests that there is a pressing need to embrace innovative fertilizers like nano urea, other liquid fertilizers and water soluble fertilizers for increasing fertilizer use efficiency. Moreover, use of drone technology and fertigation should also be promoted in order to increase efficiency of water and fertilizers.

Climate Resilient Sustainable Agriculture

S.11 In 2022, India recorded extremely high temperature during the month of March that triggered an early onslaught of heat wave. Extreme temperature during the months of March and April has caused dry winds, high evapotranspiration and moisture stress that adversely affected rabi crops, particularly wheat crop. The Commission therefore recommends a comprehensive policy to make agricultural sector robust and climate change resilient for ensuring food and livelihood security of the country.

Rationalize Market Fee and Other Charge

S.12 Although the country has a uniform MSP across states, yet the actual cost incurred at markets/mandis varies from State to State as States charge mandi fee and other charges on the sale and purchase of agricultural commodities that vary widely across States. This restricts inter-State trade and create inefficient marketing system in the country. The Commission reiterates its recommendation that such charges should be rationalized and States be persuaded to adopt uniform tax rates across states to encourage market competition and promote free inter-state trade.

Linking of Reserve Price to MSP

S.13 Pulses procured under Price Support Scheme (PSS) are required to be disposed within 9 months from the closure of procurement. However liquidation of stocks of pulses and oilseeds by NAFED below MSP depresses market prices and discourages direct procurement by private trade. The Commission suggests that procurement agencies should avoid selling these stocks in open market below the MSP particularly during procurement season. The reserve price fixed for disposal of pulses and oilseeds may be linked to MSP as is being done for wheat and rice under OMSS(D). For improving storability of pulses/oilseeds, infrastructure for scientific storage should be improved in the country.

Review Open-ended Procurement Policy

S.14 Procurement under the MSP is open-ended, i.e. whatever foodgrains are offered by farmers, within the stipulated period and conforming to the fair average quality (FAQ) norms, are to be procured. Mandated crops are procured by the Central Government agencies through the Food Corporation of India (FCI), National Agricultural Cooperative Marketing Federation of India Ltd, (NAFED) or by State Agencies across the country. The Commission reiterates its earlier recommendation that the open-ended procurement policy for wheat may be reviewed. The buffer norms may also be revised based on evolving production and consumption pattern. In order to encourage diversification towards oilseed and pulses, farmers need to be assured of remunerative price for pulses and oilseeds through effective implementation of 'Price Deficiency Payment Scheme' and "Private Procurement and Stockist Scheme".

Awareness Creation about Export Opportunities

S.15 Quality and food safety standards of agricultural produce play a crucial role in determining export opportunities. Therefore the Commission recommends organizing awareness activities educating farmers about Sanitary & Phyto-Sanitary (SPS) standards and farming system for safe and permissible usage of pesticides so that the possibility of rejection of exports is minimized at the farm level itself.

Enabling Trade Policy

S.16 In order to facilitate international trade and improve competitiveness, investments are necessary to upgrade and modernize port infrastructure with mechanized handling and loading. It will avoid delays, reduce operational costs and help in improving export competitiveness. Moreover, to sustain the impressive agricultural export performance, Commission suggests that trade policy should also be stable with dynamic tariff structure linked to global price movement, instead of arbitrary adhoc interventions like sudden prohibition of exports.

Farm Mechanisation

S.17 Wage rates have increased significantly in most of the States during 2019-20 to 2021-22, and resulted in substantial increase in cost of cultivation/production in these States. Therefore, mechanisation of farm operations on a large scale would help in reducing human requirement in farming of rabi crops, thereby reduce cost of cultivation/production and improve profitability.

S.18 The Commission reiterates its earlier recommendation that farm mechanization should be promoted extensively among small and marginal farmers through CHCs and more awareness should be created about the new FARMS app. To ensure seamless access and to address disparity in farm mechanisation across the states, the Commission suggests to increase allocation under an umbrella schemes of farm mechanisation. R&D in customisation of farm machineries as per crop geometric and cropping system should be promoted.

Investment in Agricultural Research Development and Extension

S.19 Investments play an important role in achieving sustained agricultural growth and farm profitability. However, ratio of gross capital formation (GCF) in agriculture relative to GVA from agriculture excluding forestry and logging showed a declining trend during 2011-12 to 2015-16 and has been gradually rising since then. The share of investment by both public and private sector

has slowed down in last three years. The public spending on agricultural research and education to agricultural GVA in the country is very low at about 0.6 percent. The Commission therefore reiterates its earlier recommendations that, public spending on R&D in agriculture may be enhanced to a modest level of at least 1 percent of agricultural GVA. Conducive ecosystem should be made for fostering investment from private sector which presently is only at 2 percent of total investment.

Storage and Warehousing Infrastructure

S.20 For strengthening warehousing sector in the country, Government has launched various schemes for improving quality of storage infrastructure including specialized warehouses across the country. For creating modern storage capacity, the Government of India has approved an action plan for the construction of silos for foodgrains in PPP mode for a capacity of 10 million tonnes. However, the pace of construction of silos is very slow. Therefore, Commission recommends that the construction of silos may be expedited. In order to increase procurement in NE region, the development of storage capacity in the NE States needs a special focus and should be accelerated. In pulses and oilseed producing states, sufficient storage space need to be created in the catchment of APMCs in order to avoid long distance transport.

Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA)

S.21 Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) comprises of three components (i) Price Support Scheme, (ii) Price Deficiency Payment Scheme (PDPS) and (iii) Pilot of Private Procurement & Stockist Scheme (PPSS). After implementation of PM-AASHA, PSS has made significant stride in terms of procurement of pulses and oilseeds by NAFED, but performance of PDPS and PPSS needs to be strengthened significantly. The Commission strongly recommends strengthening PDPS and PPSS to address procurement issues of oilseeds and pulses as physical procurement of these crops is not feasible due to the absence of assured outlet, short shelf life and market infrastructure unlike wheat and paddy.

Awareness about Price Policy and FAQ Standards

S.22 Awareness about MSP and FAQ norms among farmers can make procurement operations more effective. The Commission therefore recommends that State Governments should make sincere efforts to create awareness among farmers about the MSP, quality specification, details of procurement centres, procurement period, registration/documents requirement and information about procurement agencies. The information should be disseminated in regional/vernacular languages through Krishi Mitra/Sakhi (volunteers), publicised through electronic and print media like TV, radio, newspapers and modern information & communication technology like mobile phone, WhatsApp & Facebook etc.

Publicise e-Marketing Platforms

S.23 An electronic platform, National Agriculture Market (e-NAM) was designed and launched in 2016 with the objective to link agricultural mandis electronically to bring transparency and creating a nation-wide network of markets in order to remove the existing market distortions in India. Thus, the Commission recommends publicising of e-marketing platforms in ensuring remunerative prices of farm produce especially among marginal and small farmers.

Promotion of Farmers Producer Organizations/Farmer Producer Companies

S.24 More than 86 percent of Indian farmers are small and marginal and thus, are unable to get good markets and value for their produce. Farmers Producer Organizations and Farmers Producer Companies (FPOs/FPCs) could be the engines of growth in rural areas by increasing bargaining power of farmers on price realization of agricultural commodities. The Commission proposes that commodity-specific Farmers Producer Organisations/Companies to be promoted and encouraged to take up functions of aggregation, sorting/grading and direct marketing of produce to traders, large buyers and processors. Such organisations will create more competition in the market, improve their bargaining power and ensure better prices to member producers. Promotion of FPOs would certainly help in overcoming farm gate losses and minimizing transportation & handling expenses by facilitating farmers to trade from the collection centres.

Sample Size under the Comprehensive Scheme

S.25 Under 'Comprehensive Scheme (CS)' 8100 farmers are selected throughout the country for a block of three years. A larger sample would provide more representative estimates of cost of cultivation covering all agro climatic zones more comprehensively. Therefore the Commission recommends that sample size of selected farmers at all-India level should be increased adequately.

S.26 The Commission also suggests that the sample size of wheat in Chhattisgarh and West Bengal, gram in Jharkhand, Punjab and West Bengal, lentil in Punjab and Rajasthan, rapeseed & mustard in Chhattisgarh, and safflower in Karnataka may be increased. The sample size of safflower at all-India level is too small and can undermine the reliability and representativeness of cost of production projections, therefore, sample size must be increased for this crop. Since the Commission uses three-year actual cost estimates in forecasting of cost of production, the CS data should be collected every year for wheat in Uttarakhand, gram in Jharkhand and Punjab, lentil in Punjab and Rajasthan, rapeseed & mustard in Chhattisgarh, and safflower in Karnataka for smoothing cost estimates.

Inclusion of States under Comprehensive Scheme

S.27 The Commission has also analysed State-wise area and production of the mandated rabi crops during TE2021-22 and observed that there are certain crops in States, which occupy reasonable share in the all-India area and production or area and production of a crop group in the State, but CS data for these States are not available. Inclusion of these States under Comprehensive Scheme would improve representation and reliability of cost projections at all-India level. Therefore, the Commission recommends inclusion of such States under the CS. The Commission also suggests that Comprehensive Scheme may be implemented in Jammu & Kashmir for wheat, lentil and rapeseed & mustard, and Tripura for lentil and rapeseed & mustard, as these are important crops of rabi season in the State/UT. In Uttarakhand, wheat, barley, lentil, rapeseed & mustard occupy reasonable share in all-India area and production or area and production of a crop group in the State, therefore, Uttarakhand should be brought under the Comprehensive Scheme.

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CHAPTER 1

Overview

1.1 Agriculture sector has remained resilient throughout the pandemic years registering a robust real agricultural growth of 3.3 percent in 2020-21 and 3.0 percent in 2021-22. The Third Advance Estimates expect the foodgrains production to reach a record level of 314.5 million tonnes which is 1.2 percent higher than the previous year. This record foodgrains production for a sixth consecutive year in 2021-22 is attributed to an increase in pulses and cereal production during rabi and kharif seasons, respectively. Further the total production of nine oilseeds in 2021-22 is estimated at 38.5 million tonnes with a growth rate of 7.1 percent over the previous year. The ongoing geo-political conflict of Ukraine and Russia has led to increase in the international prices of foodgrains making India's agricultural exports competitive. The agriculture exports registered a growth rate of 21.7 percent in 2021-22 over the last year mainly driven by rise in exports of wheat, non-basmati rice, and raw cotton. This chapter discusses overall production scenario of MSP mandated rabi crops and highlights key issues concerning Indian agriculture.

Production Scenario of Major Rabi Crops

1.2 As a result of various price and non-price factors, the area under mandated rabi cereals declined whereas the areas under pulses and oilseeds increased significantly during 2021-22. The area under wheat cultivation declined by 1.9 percent in 2021-22. In addition to decline in area under cultivation, unusually high temperature in north west and central parts of India during March and April 2022 resulted in drop in yield and wheat production was recorded at 1,064.1 lakh tonnes during 2021-22, 2.9 percent less than the previous year. On the other hand, despite improvement in yield level of barley crop, production is estimated to decline in 2021-22 due to large decrease in area under its cultivation. Among the mandated rabi pulses, production of gram increased by 17.4 percent during 2021-22 owing to increase in both acreage and yield level. On the contrary, production of lentil declined by 3.4 percent due to fall in yield and area under cultivation. Interestingly, production of rapeseed & mustard and safflower oilseeds also increased significantly by 15.1 percent and 24 percent, respectively during 2021-22 (Table 1.1). The trends in all India estimates of area, production and yield of major agricultural crops are presented in Annex Tables 1.1 to 1.3. Among the top producing States of rabi crops mandated under MSP, the states having more than one percentage share in total production of each crop are given in Annex Table 1.4.

Table 1.1: Performance of Major Rabi Crops during Rabi Season 2021-22

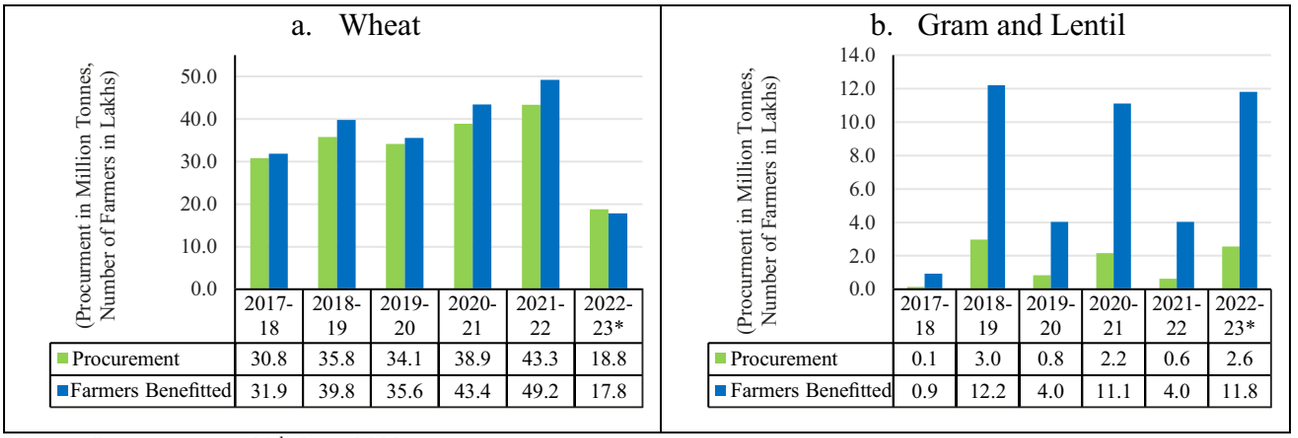
Crop	Values			Growth (Y-o-Y) (Percent)		
	A (mn ha)	P (lakh tonne)	Y (kg/ha)	A	P	Y
Wheat	30.5	1064.1	3484	-1.9	-2.9	-1.0
Barley	0.5	15.9	2930	-8.6	-4.2	4.8
Gram	11.2	139.8	1249	12.0	17.4	4.8
Lentil	1.4	14.4	1007	-2.3	-3.4	-1.1
Rapeseed & Mustard	7.7	117.5	1522	15.3	15.1	-0.1
Safflower	0.1	0.4	694	14.5	24.0	8.3

Note: 2021-22 data is based on Third Advance Estimates; A- Area, P- Production, and Y- Yield, mn- million
Source: Directorate of Economics & Statistics, Ministry of Agriculture & Farmers Welfare

Procurement and Foodgrains Management

1.3 After attaining a record procurement of wheat during Rabi Marketing Season (RMS) 2021-22 at 43.3 million tonnes benefiting over 49.2 lakh farmers, procurement has sharply declined to 18.8 million tonnes benefiting only 17.8 lakh farmers as on 30th June 2022 during RMS 2022-23 (Chart 1.1). The decline in procurement is observed in all major procuring states namely Madhya Pradesh, Uttar Pradesh, Haryana and Punjab. On the other hand, due to rise in production of gram, the prices fell which further led to increase in its procurement.

Chart 1.1: Trends in Procurement of Wheat, Gram & Lentil and Beneficiary Farmers



	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
Procurement	30.8	35.8	34.1	38.9	43.3	18.8
Farmers Benefitted	31.9	39.8	35.6	43.4	49.2	17.8

	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
Procurement	0.1	3.0	0.8	2.2	0.6	2.6
Farmers Benefitted	0.9	12.2	4.0	11.1	4.0	11.8

*Note: * Position as on 30th June 2022.*
Source: Based on Food Corporation of India and NAFED data

1.4 The current total Central Pool stocks of foodgrains were at 60.2 million tonnes (31.7 million tonnes of rice and 28.5 million tonnes of wheat) as on 1st July 2022 against the buffer norms of 41.1 million tonnes of rice and wheat as on 1st July of each year. Owing to open-ended procurement policy for foodgrains during last few years, managing excess foodgrain stocks had been a significant challenge. However, this year, there is a considerable decline in accumulation of wheat stock due to various reasons like low procurement during RMS2022-23, announcement of extension of Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY) for another 6 months i.e upto September 2022 and increase in wheat exports during 2021-22.

1.5 The Policy for sale of wheat and rice in the open market through Open Market Sale Scheme (Domestic) {OMSS (D)} for remaining period of the year 2022 (upto 31st December) was announced on 16th February 2022. Uniform reserve price for wheat across India was also discontinued from 16th February 2022. The reserve price for sale of wheat of Fair Average Quality (FAQ) from Punjab, Haryana and Madhya Pradesh for RMS2020-21, RMS2021-22 and RMS 2022-23 is fixed at ₹2,125 per qtl, ₹2,175 per qtl and ₹2,200 per qtl respectively from 1st April 2022 and these prices will be revised upward by ₹0.25 per kg (i.e ₹25 per qtl) from 1st of October 2022. For fixation of reserve price in other States, rail freight ex-Ludhiana to nearest railhead and road transportation cost from railhead to depot to be added to above reserve price, if the offered stocks have been moved from Punjab/Haryana and in case the offered stocks have been transported from Madhya Pradesh, freight ex-Bhopal will be added to above reserve price. The recent rationalisation of reserve prices may induce to increase offtake of foodgrains under the Scheme without affecting market prices.

1.6 The wheat procurement operation is subject to various statutory charges, viz Dami, Arathias charges, market fee, rural development cess, Nirashrit Shulk, commission to Societies/ Sub-Agents. These taxes and commission imposed on MSP for wheat procurement vary significantly across states. It is highest in Punjab (8.5%), followed by Haryana (6.5%), Uttar Pradesh (3.9%), Madhya Pradesh (3.6%), Uttarakhand (2.5%) and lowest in Gujarat (1%). Such high taxes have crowded out the private sector out of markets in these states and the cost of procurement by public agencies is becoming prohibitively high. Therefore, Commission suggests to adopt uniform tax rates across states.

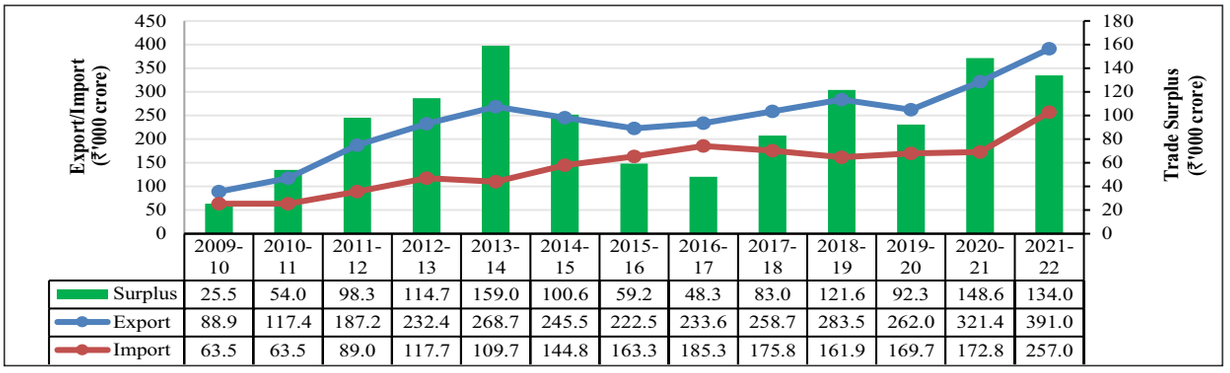
1.7 The disposal of pulses procured under Price Support Scheme (PSS) within 9 months from the closure of procurement is challenging. The limit of purchase of 25 quintals per farmer a day is also discouraging PSS. It is also observed that the liquidation of stocks of pulses and oilseeds by NAFED below MSP depresses the market prices and discourages direct procurement by private traders. The Commission suggests that government should avoid selling these stocks in open market below the MSP and particularly during the procurement season. The reserve price fixed for disposal of pulses and oilseeds be linked to MSP as is being done for wheat and rice under OMSS(D).

1.8 Notwithstanding the sharp decline in procurement of wheat in RMS 2022-23, the Commission reiterates its earlier recommendation that the open-ended procurement policy for wheat may be reviewed along with the revision of the buffer norms in order to encourage fair utilization and optimizing storage capacity keeping in view the changing production and consumption pattern. Also the effective implementation of 'Price Deficiency Payment Scheme' and 'Private Procurement and Stockist Scheme' is the key to enhance diversification towards oilseed and pulses while ensuring fair remuneration for pulses and oilseeds.

Agricultural Trade Performance

1.9 India's agricultural exports continued to sustain a robust growth of 21.7 percent in 2021-22 over the previous year (Chart 1.2) with a record all time high export value of ₹391 thousand crore. However, agricultural imports increased at the higher rate by 48.7 percent to ₹257 thousand crore in 2021-22, resulting in a decline in agricultural trade surplus at ₹134 thousand crore, less by 9.8 percent compared to previous year. The increase in exports in 2021-22 was mainly driven by the rise in exports of wheat (280%), sugar (66%), raw cotton (50%), marine products (31%), and non-basmati rice (28%). On the other hand, the import growth in 2021-22 was mainly driven by increase in imports of vegetable oils (72%), oil meals (346%), pulses (39%), and other oilseeds (99%).

Chart 1.2: India's Exports and Imports of Agricultural Commodities (2009-10 to 2021-22)



	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Surplus	25.5	54.0	98.3	114.7	159.0	100.6	59.2	48.3	83.0	121.6	92.3	148.6	134.0
Export	88.9	117.4	187.2	232.4	268.7	245.5	222.5	233.6	258.7	283.5	262.0	321.4	391.0
Import	63.5	63.5	89.0	117.7	109.7	144.8	163.3	185.3	175.8	161.9	169.7	172.8	257.0

Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

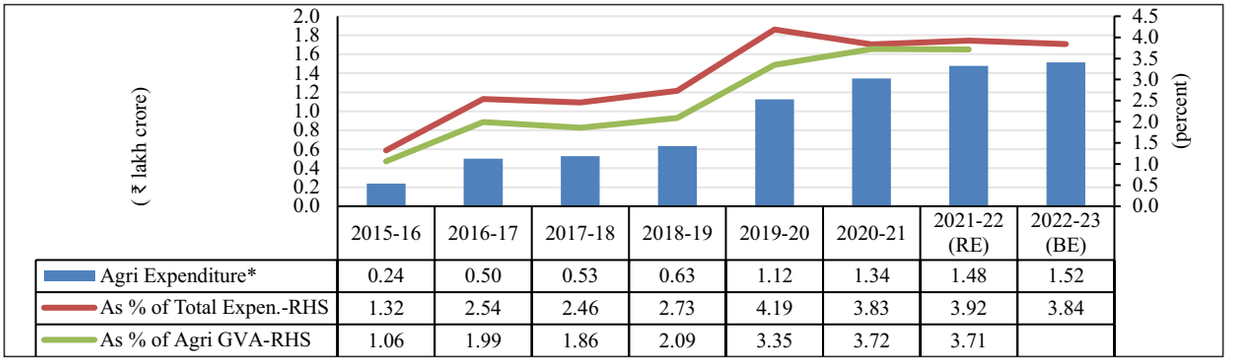
1.10 One of the prime factors impacting agricultural exports is quality of produce. It is quite certain that the quality of produce can be improved at the farm level by adopting best crop management practices. In recent time, it was reported that traceability of the origin of produce is gaining importance in overseas as they are concerned about pesticides and other related chemical residues in agricultural products. Thus, there is a need to employ, encourage and create awareness about demand for traceability (block chain based) of the produce amongst the exporters and farmers. Adequate awareness activities shall be organised at farm level by disseminating various Sanitary & Phyto-Sanitary (SPS) measures while promoting Good Agricultural Practices (GAP) amongst Indian farmers.

1.11 In order to facilitate international trade and improve competitiveness, investments are necessary to upgrade and modernize port infrastructure with mechanized handling and loading. It will avoid delays, reduce operational costs and help in improving export competitiveness. It is reported that due to shortage of modern storage facilities, pulses are prone to be infested. An emphasis needs to be laid on cold storage infrastructure. Moreover, to sustain impressive agricultural export performance, Commission suggests that trade policies should also be stable in adopting dynamic tariff structure linked to global price movement, instead of arbitrary adhoc interventions like sudden ban on exports.

Increased Liquidity in Agriculture Sector

1.12 The budgetary support for agriculture has been increasing over the years (Chart 1.3). A sudden jump in agriculture expenditure was observed during 2019-20 which was mainly due to introduction of schemes like PM-KISAN and PM-AASHA. In the subsequent years, further rise in agriculture expenditure is attributed to higher budget allocation to the Department of Agriculture and Farmers Welfare, which increased from ₹1,08,623 crore in 2020-21 to ₹1,18,294 crore in 2021-22 (RE) and further to ₹1,24,000 crore in 2022-23 (BE) as well as the rise in the allocation under the Department of Agricultural Research and Education from ₹7,686 crore in 2020-21 to ₹8,514 crore in 2021-22 (RE) but in 2022-23(BE) it was kept same at ₹8,514 crore. As per the RBI data, credit to agriculture and allied activities has significantly increased by 11.8 percent in May 2022 over corresponding period of last year. As per NABARD, during 2021-22, total agricultural credit disbursed was recorded at ₹17.1 lakh crores, out of which ₹10.2 lakh crore was crop loan. Thus, continued increase in budgetary support and credit disbursement would help in sustaining agricultural growth.

Chart 1. 3: Trend of Union Government Expenditure on Agriculture and Allied Activities



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 (RE)	2022-23 (BE)
Agri Expenditure*	0.24	0.50	0.53	0.63	1.12	1.34	1.48	1.52
As % of Total Expen.-RHS	1.32	2.54	2.46	2.73	4.19	3.83	3.92	3.84
As % of Agri GVA-RHS	1.06	1.99	1.86	2.09	3.35	3.72	3.71	

*Note: * Agriculture and allied Activities*
Source: Compiled from different Union Budget Documents and GVA data from NSO, MoSPI

Food Inflation

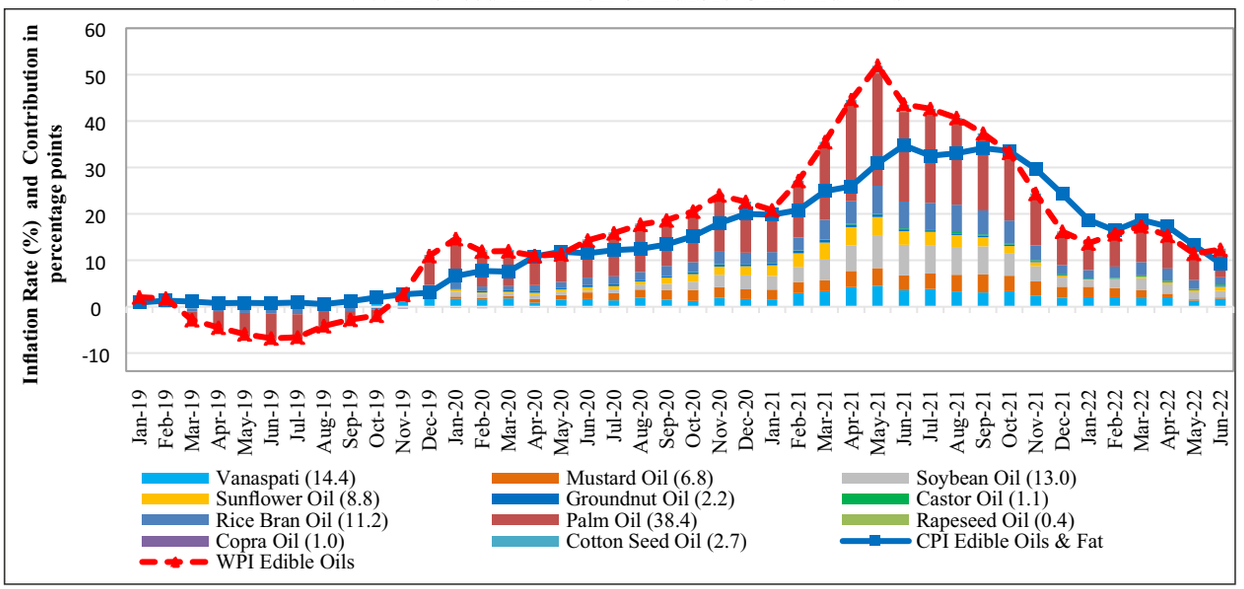
1.13 The annual rate of inflation of food articles, based on monthly Wholesale Price Index (WPI) (Base: 2011-12=100), which was negative at 2.6 percent in September 2021 has started turning positive from subsequent months and reached 14.4 percent in June 2022. The increase in inflation rate during June 2022 was mainly driven by increase in prices of fruits and vegetables (40.1%), wheat (10.3%) and spices (17.7%). The inflation rate for pulses moderated since the beginning of 2022 and stood at (-)2.8 percent in June 2022. The Consumer Food Price Index (CFPI) inflation, which remained moderate in 2021 has shown increasing trend since the beginning of 2022 and has reached at 7.8 percent in June 2022. However, oils and fats with a weight of 3.56 percent in the CPI, is yet another significant contributor to food inflation, though it has slightly declined to 17.3 percent in April 2022 and moderated further to 13.3 percent in May 2022 and 9.4 percent in June 2022 as Indonesia withdrew its export ban on crude palm oil and refined palm oil. WPI based inflation for edible oils, which was quite high during 2021 also moderated since the beginning of 2022 and was 12.4 percent in June 2022.

1.14 In order to understand main drivers of oils and fats inflation, a decomposition analysis has been done. The results presented in Chart 1.4 reveal that the palm oil was the key driver of WPI based inflation, followed by groundnut oil, and soybean oil. Similarly, in the case of CPI, refined oil (sunflower, soybean, etc.) and mustard oil were the main contributors.

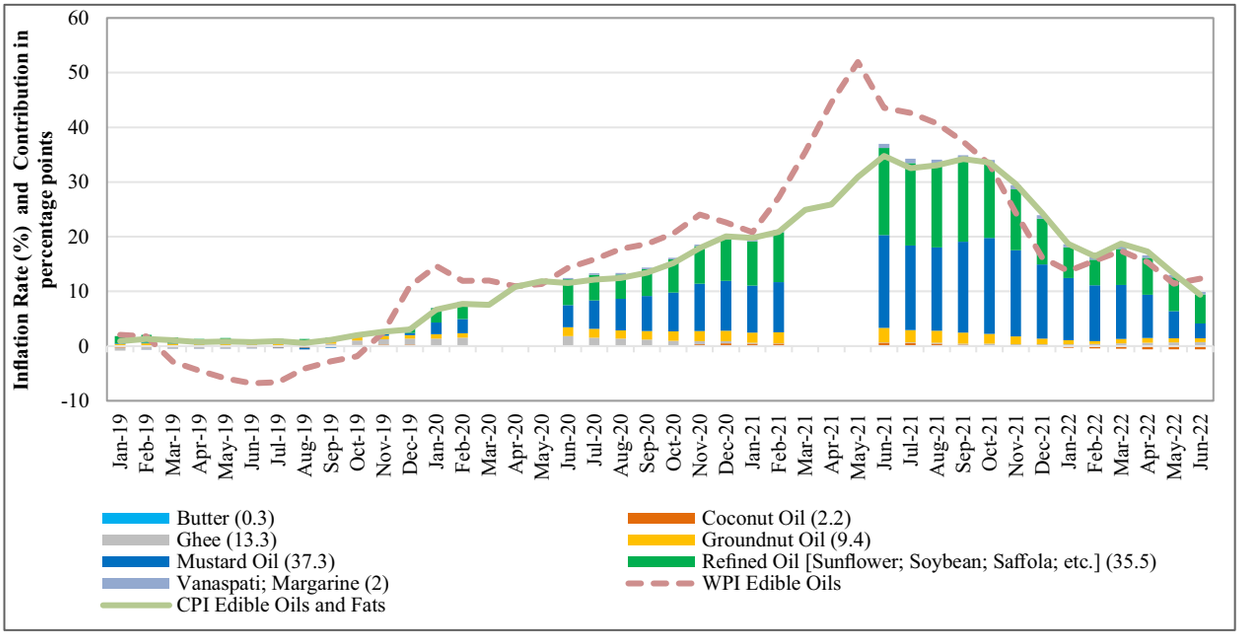
1.15 Since India imports more than 60 percent of its edible oil requirements, the government has taken multiple initiatives during 2021-22 to reduce the adverse effect of increase in global edible oil prices. Import duty on crude palm, sunflower, and soybean oil had been lowered to zero percent from 2.5 percent. Additionally, the government reduced the agricultural infrastructure cess from 20 percent to 5 percent for crude palm oil, crude soybean and sunflower oil. Further, it cut the import duty on RBD palm oil to 12.5 percent and refined soybean and sunflower oil to 17.5 percent from 32.5 percent. The Indonesian government also announced that it will bring down the combined export taxes to US$488 per tonne from US$575 per tonne to encourage shipments, which is expected to further ease edible oil prices in the global and domestic markets.

Chart 1.4 Trends and Drivers of Inflation Rate of Edible Oils and Fats

a. WPI based Inflation of Edible Oils and Fats



b. CPI based inflation of Oils and Fats



Note: 1. Figures in parentheses indicate weights in WPI- Edible Oils and CPI- Oils and Fats
2. Edible Oils and Fats refers here in the chart used the categories of "Oils and fats" in CPI index and "Manufacture of vegetable and animal oils and fats" in WPI index.

Source: 1. Ministry of Statistics and Programme Implementation for CPI data
2. Office of Economic Advisor, Department for Promotion of Industry and Internal Trade (DPIIT) for WPI data

High Dependence on Edible Oil Imports

1.16 India's vegetable (mostly edible) oil imports have increased from 8.4 million tonnes (₹46,334 crore) in 2011-12 to about 14.3 million tonnes, valued at ₹1,41,541 crore in 2021-22. India is highly dependent on imports of vegetable oils and around 60 percent of domestic demand is met through imports. Vegetable oils accounted for 55.1 percent of total agricultural imports in the country in 2021-22. The major vegetable (mostly edible) oils imported (in volume terms) during 2021-22 were crude palm oil (44.9%), soybean oil (27.2%) and sunflower oil (14.5%). The year on year growth of the imports of vegetable (mostly edible) oil during 2021-22 in value terms is 72.3 percent compared to 5.5 percent increase in volume terms reflects the significant increase in global prices of edible oils.

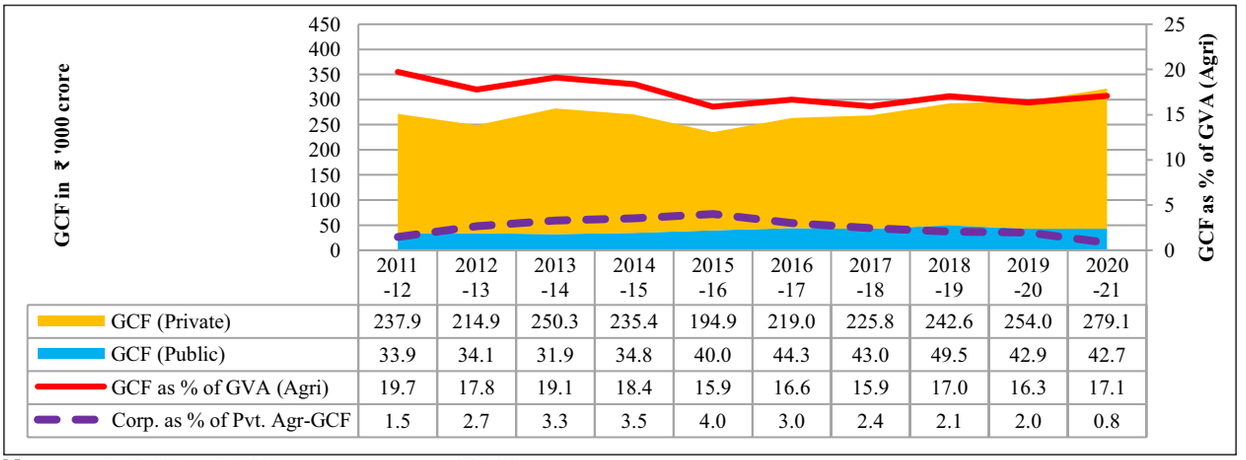
1.17 The edible oil consumption in India has been consistently rising faster than production mainly due to fast increase in population, increasing income levels and the emerging dietary changes. The most significant problem in oilseeds sector in the country is domestic supply deficit due to low productivity and production of oilseed crops, as oilseeds are typically cultivated on marginal land and largely dependent on rainfall. In order to achieve self-sufficiency in edible oils, Government of India has also launched a number of missions. The Technology Mission on Oilseeds established in 1986 had helped in achieving self-sufficiency in edible oils. The National Mission on Oilseeds and Oil Palm (NMOOP) was launched during 2014-15 with an aim to boost production of oilseeds in the country. The Government has been implementing the National Food Security Mission-Oilseeds & Oil Palm (NFSM-OS&OP) from 2018-19 onwards to increase production and productivity of oilseeds in the country. Recently the Government has launched a separate Mission for Oil Palm namely, National Mission on Edible Oils (Oil Palm) - NMEO (OP) in 2021-22.

1.18 The existing NFSM-oilseeds has been merged with NMEO. In the Union Budget 2022-23, Hon'ble Finance Minister announced to implement a rationalised and comprehensive scheme to increase domestic production of oilseeds and reduce dependence on imports. To enhance production and productivity and make India self-sufficient by 2025-26, the focus is being given on Edible Oil-Oilseeds with production target of 54.1 million tonnes with productivity target of 1,676 kg per ha. Additional area of 3.5 million ha will be brought under oilseeds cultivation through rice fallow, inter cropping, high potential districts and non-traditional states/season.

Investment in Agriculture

1.19 Investment plays an important role in achieving sustained agricultural growth and farm profitability. However, ratio of Gross Capital Formation (GCF) in agriculture to GVA from agriculture excluding forestry and logging showed a declining trend during 2011-12 to 2015-16, when it declined to 15.9 percent and has been gradually rising since then, reaching 17 percent in 2020-21 (Chart 1.5). The share of public investment in total investment in agriculture has increased gradually from 11.3 percent in 2013-14 to 17.0 percent in 2018-19, however this has slowed down in last three years and it was 13.3 percent in 2020-21. The share of private sector, particularly the household sector, in total investment in agriculture has declined from 88.7 percent in 2013-14 to 86.7 percent in 2020-21. The private corporate sector investment is essential for improving economic efficiency and productivity in agriculture but the share of corporate sector in total private investment has declined from a high of 4 percent in 2015-16 to a meagre low of 0.8 percent in 2020-21. On the other hand, despite India's improvement in the Global Innovation Index (GII) ranking in 2021, public spending on agricultural research and education to agricultural GVA in the country was very low at about 0.6 percent. Given the large untapped potential in agriculture and allied sectors, large scale investment in agricultural R&D and infrastructure development plays a crucial role to achieve new heights in growth and sustainability in agriculture. The Commission reiterates its earlier recommendations that, public spending on Agri R&D may be enhanced to a modest level of at least 1 percent of Agri GVA.

Chart 1.5: Trends in Public and Private Sector Gross Capital Formation in Indian Agriculture: 2011-12 to 2020-21



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
GCF (Private)	237.9	214.9	250.3	235.4	194.9	219.0	225.8	242.6	254.0	279.1
GCF (Public)	33.9	34.1	31.9	34.8	40.0	44.3	43.0	49.5	42.9	42.7
GCF as % of GVA (Agri)	19.7	17.8	19.1	18.4	15.9	16.6	15.9	17.0	16.3	17.1
Corp. as % of Pvt. Agr-GCF	1.5	2.7	3.3	3.5	4.0	3.0	2.4	2.1	2.0	0.8

Note: 1. GCF and GVA are at constant 2011-12 prices.
2. Forestry & logging are excluded from Agriculture
Source: National Account Statistics, Ministry of Statistics and Programme Implementation (MOSPI)

Enhancing Fertilizer Use Efficiency and Subsidy Reforms

1.20 Fertilizers is one of the critical factors affecting crop yields. After two years of continuous increase in consumption of fertilizers in terms of nutrients ($N+P_2O_5+K_2O$), the fertilizer consumption was estimated at 29.8 million tonnes in 2021-22, which is 8.4 percent less as compared to 2020-21. Nutrient-wise, N consumption dropped by 4.7 percent, P_2O_5 by 12.8 percent and K_2O by 19.8 percent during 2021-22. However, the country continues to face challenges such as non-judicious fertilizer use, soil fertility depletion, low nutrient use efficiency, declining crop response to fertilizer, etc. Nutrient use efficiency of N is 30-50 percent, P is 15-25 percent and K is 50-60 percent. Low nutrient use efficiency affects crop yields and significantly reduces the farmers' profits and is a threat to environment and associated ecosystem in the long term. During 1960-69, with 1 kg of fertilizer application, farmer used to get 12 kg foodgrains. However, this crop response to fertilizer has come down to 5 kg grains during 2010-17. Imbalanced and inefficient use of fertilizer is mainly responsible for this declining crop response to fertilizers.

1.21 As per recent estimates, NPK use ratio in 2021-22 was 7.7:3.1:1 against the ideal NPK use ratio of 4:2:1. In fact the nutrient use is skewed in favour of nitrogen as urea is heavily subsidized vis-à-vis P and K fertilizers resulting in distorted nutrient prices. Fertilizer subsidy has increased from ₹72,415 in 2015-16 to ₹1,27,922 in 2020-21, registering a compound annual average growth of 12 percent per annum. Increase in the fertilizer subsidy has primarily been due to increase in consumption and prices of finished fertilizers. As per UN Report (2022), higher energy costs, trade restrictions and a loss of fertilizer supply from the Russian Federation and Belarus have led to significant increase in fertilizer prices. Therefore, Commission suggests enhancing fertilizer use efficiency and rationalize fertilizer subsidy.

Promoting Mechanization

1.22 Farm mechanization can help redress the problem of high labour cost and labour shortage during peak agriculture operations especially during sowing and harvesting as well as increase input use efficiency and better product handling during harvesting operations. However, for small and marginal farmers, owning farm machineries would not be as viable as large farmers. Government had initiated a Centrally Sponsored Scheme 'Sub-Mission on Agricultural Mechanization (SMAM)' w.e.f. April 2014 with the objectives of increasing the reach of farm mechanization to small and marginal farmers and to the regions where availability of farm power is low, by promoting 'Custom Hiring Centres (CHCs)' to offset the adverse economies of scale arising due to small landholding and high cost of individual ownership, creating awareness among stakeholders through demonstration and capacity building and ensuring performance testing and certification at designated testing centres located all over the country.

1.23 In order to make effective use of machines available with the CHCs and farmers, a multi-lingual mobile app based aggregator platform 'FARMS' App (Farm Machinery Solutions App) which connects the farmers with Custom Hiring Service Centres in their area has been developed and launched. This mobile app encompasses a fair and transparent rental process while focusing on quality, dependability and timely delivery of services. So far more than 70,382 CHCs/Service Providers are registered on this App to rent out more than 1,64,011 agricultural machines benefiting more than 5.24 crore farmers. The farm mechanization should be promoted extensively among small and marginal farmers through CHCs and more awareness should be created about the new FARMs app. To ensure seamless access and to address disparity in farm mechanization across the states, the Commission suggests to increase allocation under an umbrella schemes of farm mechanization.

Collective Aggregation and Connecting Farmers to Market

1.24 To improve bargaining power and ensure better prices for farmers, collectivization power of the farmers needs to be utilized. In India, more than 86 percent of farmers are small and marginal. There is a need to facilitate farmers with access to improved technology, credit, better inputs and more markets to incentivize them to produce better quality produce. For this, aggregation of small, marginal and landless farmers into Farmer Producer Organizations (FPOs) will help building economic strength and market linkages of farmers for enhancing their income. Keeping this in mind, Government had launched a Central Sector Scheme for "Formation and Promotion of 10,000 FPOs" to form and promote 10,000 new FPOs with a total budgetary support of ₹6,865 Crores. Under this Central Sector Scheme, FPOs will be provided financial assistance upto ₹18 lakh per FPO for a period of 3 years. In addition to this, provision has been made for matching equity grant upto ₹2,000 per farmer member of FPO with a limit of ₹15 lakh per FPO and a credit guarantee facility of upto ₹2crore of project loan per FPO from eligible lending institution to ensure institutional credit accessibility to FPOs. Formation & promotion of FPOs are to be done through Implementing Agencies (IAs), which further engage Cluster Based Business Organizations(CBBOs) to form and provide professional hand holding support to FPO's for a period of five years. Under this Scheme, Implementing Agencies (IAs) have been allocated a total of 4,965 FPO produce clusters, out of which 2,315 number of FPOs have been registered. As on 21st April 2022, more than 5.87 lakh farmers have been mobilized under the Scheme. About 3 lakh farmers have been registered as shareholders of the FPOs. Equity contribution by farmer members' amounts to ₹36.8 crores. Total equity base of the FPOs, including the Equity Grant released, amounts to ₹50 crores. Combined 96 FPOs of both SFAC and NAFED have made transactions worth ₹9.8 crore. However, there is a need for a convergence of FPOs promoted by multiple implementing agencies and support these FPOs as most of these are at a nascent stage and would need continuous support in terms of human resources, capital and infrastructure facilities.

1.25 In order to strengthen the Rural Haats and Gramin Agricultural Markets (GrAM), Agri - Market Infrastructure Fund with a corpus of ₹2000 crore was announced in Budget 2018-19. As per Ministry of Rural Development (MoRD), 1351 rural haats have been developed while developmental work is in progress in 1632 rural haats under MGNREGS since inception till 7th February, 2022.

1.26 In order to provide a digital platform for agriculture sector and creating a unified national market for agricultural commodities, electronic-National Agriculture Market (e-NAM) was launched on 14th April 2016. Since the inception, the e-NAM has made significant progress as 1,000 mandis have been linked to the platform. About 1.73 crore farmers, 2.2 lakh traders, 1.03 lakh Commission Agents and 2,140 Farmer Producer Organisations were registered on e-NAM (as on 30th April 2022), which facilitated trade worth ₹1.96 lakh crore. The trade volume has increased from 5.4 million tonnes in 2016-17 to 13.3 million tonnes in 2021-22, while trade value has increased from ₹13 thousand crore to ₹56.7 thousand crore during this period. The platform has the potential to create a competitive national agricultural market but issues related to dispute settlement mechanism, aggregation of produce at farm level through farmer groups, participation of major logistics and supply chain players for transport of produce, need to be addressed.

Storage and Warehousing Infrastructure

1.27 The total covered storage capacity available in the country as on 1st May 2022 for keeping the Central pool stock with FCI and with State agencies was 795.1 lakh tonnes against which total stock of 636.1 lakh tonnes was available. For strengthening the warehousing sector in the country, Government has launched various schemes for improving the quality of storage infrastructure including specialized warehouses across the country. FCI is augmenting its storage capacity through many schemes viz. (i) Private Entrepreneurs Guarantee (PEG) Scheme under Public Private Partnership (PPP) mode (ii) Central Sector Scheme (CSS) (iii) Construction of silos under PPP mode (iv) Hiring of godown under Private Warehousing Scheme (PWS) (v) Hiring of godown from Central Warehousing Corporation (CWC)/State Warehousing Corporations (SWCs)/State Agencies. Under PEG scheme, out of a sanctioned capacity of 152.9 lakh tonnes, a storage capacity of 144.7 lakh tonnes has been completed as on 31st May 2022.

1.28 The CWC is operating 424 warehouses with a capacity 101.5 lakh tonnes across India as on 1st April, 2022. Beside this, CWC creates storage capacity infrastructure on annual target basis. CWC has created 6.1 lakh tonnes of capacity during last four years. For creating modern storage capacity, the Government of India has approved an action plan for the construction of silos for foodgrains in PPP mode for a capacity of 100 lakh tonnes. However, the pace of construction of silos is very slow, and only 12.3 lakh tonnes capacity has been created upto 31st May 2022. Therefore, Commission suggests that the construction of silos may be expedited. In order to increase procurement in NE region, the development of storage capacity in the NE States also need to be accelerated. In the pulses & oilseed producing states, sufficient storage space need to be created in the nearby APMCs in order to avoid long distance transport and loss of quality.

Risk Management

1.29 Due to weather, disease, pests, and other factors like natural calamities, agriculture is exposed to production risks. Addressing agricultural risk management through Government intervention and policies have played a significant role in sustained increase in farm production and overall agricultural growth. In February 2016, the Government launched Pradhan Mantri Fasal Bima Yojana (PMFBY) to provide financial support to farmers suffering crop loss/damage arising out of natural calamities. Over 36 crore farmers have been insured under PMFBY and over ₹1,07,059 crores of claims have already been paid under the scheme as on 4th February, 2022. The scheme was revamped in 2020 enabling voluntary participation of farmers. Through Crop Insurance App, it was also made convenient for the farmer to report crop loss within 72 hours of the occurrence of any event, with claim benefit transferred electronically into the bank accounts of the eligible farmer.

1.30 It is to be noted that the scheme will be launching a doorstep distribution drive to deliver crop insurance policies to the farmers 'Meri Policy Mere Hath' in all implementing States with an aim to ensure that all farmers are well aware and equipped with all information on their policies, land records, the process of claim and grievance redressal under PMFBY. However, there are still many challenges in the implementation like timely crop loss assessment, delay in settlement of claims, delay in payment of State share of the premium, etc. The recent Budget 2022-23 announcement on the use of drones for crop insurance will further strengthen the integration of technology for smooth implementation of the scheme on the ground.

1.31 In order to protect the farmers from market price risk, hedging strategies like put options could be explored to reduce their exposure to price risk in the event that farm produce is subject to a sudden price decline. For this, linking farmers to agricultural commodity derivative markets need to be popularised. Put options are ideal instruments for farmers as buyers of put options can lock-in price and also benefit from favourable price movements. The future and options trading for chana, wheat and mustard seed were suspended in December 2021 in order to check inflation. Such sudden disruptive measures may be avoided. Though, the National Commodity & Derivative Exchange (NCDEX), has launched Option Familiarization Programme for FPOs on 9th November 2020 and 420 FPOs are on boarded in exchange platform as on 31st May 2022 representing 10,16,163 farmers from 14 states. Out of these, only 152 FPOs have traded on the exchange on 18 commodities and hedged 1,07,811 tonnes of their products. Since majority of India's farmers are small and marginal, Government may promote educating farmers about derivative market platform and also incentivising with subsidy for the option premium paid by farmers to widen the reach and coverage.

Promoting Climate Resilient Agriculture

1.32 The threat of climate change creates vulnerability to Indian agriculture. The Indian Council of Agricultural Research (ICAR) has launched a flagship network project "National Innovations in Climate Resilient Agriculture (NICRA)" aiming at strategic research on adaptation & mitigation, demonstration of technologies on farmers' fields and creating awareness among various stakeholders. Under this network project, climate resilient varieties for different abiotic and biotic stresses in major crops have been developed. In addition, the climate smart agriculture is being promoted under the Paramparagat Krishi Vikas Yojana (PKVY). The National Mission for Sustainable Agriculture (NMSA), which is one of the eight Missions under the National Action Plan on Climate Change (NAPCC) has also been launched.

1.33 Climate-related hazards in Indian states could have potentially adverse effects on national food supply, affecting both local production and interstate trade. Some studies found that the largest climate hazard risks to state food supply are in Bihar, Madhya Pradesh, and Assam. As per research study a 1°C increase in temperature would cause yield loss of about 3 to 7 percent in wheat, soybean, mustard and groundnut. The productivity of major crops will further see a 10 to 40 percent loss due to rise in temperature, rainfall variability, and decrease in irrigation water by the year 2100. Wheat growth in India could be affected under increasing temperature i.e. more than 34°C (Lobell, Sibley, & Ortiz-Monsasterio, 2012) and the same has been witnessed in the recent rabi season when wheat yield declined in major producing states due to rise in temperature. The study by ICAR – Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad on "Heat Wave 2022 Causes, impacts and way forward for Indian Agriculture" also predicted that extreme events such as the recent heat wave will occur more frequently and severely in the years to come due to climate change. Therefore more focus should be given on climate resilient sustainable agricultural practices and also developing climate resilient crop varieties and technologies, which can minimise the climate change impact.

Outlook for Indian Agriculture

1.34 It was observed that the bumper harvest of foodgrains in the last four successive years were mainly a result of normal and near uniform rainfall distribution. As per the Indian Meteorological Department (IMD) Monsoon forecast dated 31st May 2022, the overall rainfall from Southwest Monsoon (June to September) for the 2022 is most likely to be normal at 96 percent to 104 percent of Long Period Average (LPA). Based on Central Water Commission data, as on 16th June 2022, the total live storage in 143 important reservoirs in India was 51.1 Billion Cubic Meter (BCM) which is 29 percent of the storage capacity at Full Reservoirs Level (FRL). This storage level was

105 percent of the last year's storage on the corresponding date and 133 percent of average storage of the previous ten years. The agriculture sector is yet again poised to make a sustainable contribution to growth with sufficient water levels in reservoirs and expected normal rainfall, and the year 2022 could get again bumper harvest.

World Outlook

1.35 According to FAO's Food Outlook Report (June 2022), Global wheat production in 2022 is predicted to decline from the 2021 record level by 0.8 percent, reaching 771 million tonnes. World trade in wheat in 2022-23 (July/June) is pegged at 188.9 million tonnes, down by 3.2 million tonnes (1.7%) from the current season's estimated record level. While world food consumption of wheat is projected to expand, albeit at a below-average pace, a decrease in the feed use, driven by high prices and, to a lesser extent, industrial use of wheat is anticipated to cause a 0.4 percent decline in total wheat utilization in 2022-23 to 769 million tonnes. The contraction mainly stems from an anticipated significant reduction in exports from Ukraine. World barley stocks are also forecast to decline and a steep fall in maize and barley exports from Ukraine is anticipated. Global oilseed production is forecast to contract in 2021-22, primarily driven by expected lower soybean and rapeseed outputs, with reduced yield levels seen more than offsetting a further expansion in harvested areas. Global consumption of vegetable oils is forecast to stagnate at the 2020-21 level, as demand rationing is anticipated for both food and non-food uses owing to elevated prices, supported by a weakening outlook tied to COVID-19-related lockdowns in China.

1.36 The FAO Food Price Index (FFPI) with the base period 2014-16 averaged 154.2 points in June 2022, increased by 23.1 percent over its value in the corresponding month last year. The FAO Cereal Price Index averaged 166.3 points in June 2022, higher by 27.6 percent above its June 2021 value. International wheat prices increased by 48.5 percent above their value last year due to reduced production prospects in Ukraine because of the war. The FAO Vegetable Oil Price Index averaged 211.8 points in June, down by 17.4 points (7.6 percent) month-on-month, driven by lower prices across palm, sunflower, soy and rapeseed oils. Apart from demand rationing, the removal of Indonesia's short-lived export ban on palm oil exerted additional downward pressure on prices, although a further price drop was contained by lingering uncertainties over the country's export prospects.

★★★★★

CHAPTER 2

Supply-Demand Scenario, Price Trends and Procurement Operations in Rabi Crops

2.1 Global wheat production is forecast to decline in 2022-23 as compared to the previous year due to decline in precipitation and unprecedented high temperature in March and April 2022 that resulted in lower than expected yield and crop losses. In India too, wheat production is forecast at 106.51 million tonnes in 2021-22, down nearly 4 per cent from the record crop production in 2020-21 despite considerable improvements in average planted area, government price and procurement policy. While FAO also forecast a 0.8 percent year-on-year decrease in the global wheat production at 770.8 million tonne in 2022, the first fall after three consecutive years of growth. The international wheat prices saw a record increase in 2021-22 after a gap of 13 years. This chapter deals with global supply and demand outlook of rabi crops. The chapter also discusses the domestic price trends with respect to MSP. Lastly, procurement of MSP mandated crops by government agencies is also discussed in the present chapter.

Global Outlook

Wheat

2.2 Global wheat prices have considerably increased over the last year. The US wheat price (Hard Red Winter, f.o.b Gulf, which sets the bench mark price for wheat markets) averaged at US$ 521 per tonne in May 2022, 82.5 percent above the June 2021 value of US$ 286 per tonne. FAO forecast a 0.8 percent year-on-year decrease in the global wheat production at 770.8 million tonne in 2022 and is the first fall after three consecutive years of growth. About 70 percent area under winter wheat in the United States has been exposed to dry weather. The war in Ukraine has significantly affected the country's wheat production outlook. The disruptions to agriculture operations caused by the war, sharp reductions in the area harvested and yields are seen resulting into reduction in wheat production by 38 per cent in 2022 in Ukraine.

2.3 FAO's forecast for world trade in wheat in 2022-23 (July – June) is pegged at 188.9 million tonnes, down by 3.2 million tonnes (1.7 per cent) from the current season's estimated record level. As world trade is expected to contract in 2022-23 owing to disruption caused by Russia-Ukraine conflict, the wheat exports by Ukraine, a major wheat exporter, are forecast to fall nearly 50 per cent (down 9 million tonnes) of the previous year. The export infrastructure in Ukraine have been severely affected and thus dampening the export prospect, while the other significant wheat producers across the world are unable to export their wheat to global market owing to lack of exportable surplus and lower yield levels year-on-year.

2.4 In India, a ban on wheat exports (introduced in May 2022) is expected to limit the shipments in 2022-23 with considerable increase in market share in 2021-22. This increase is mainly attributed to lower exports from Ukraine, high domestic supplies following a record production in 2021, and competitive prices that helped to open trade with new markets including Egypt and Vietnam. However, exceptions to the export ban include previous contractual commitments, governments to government sale and food security purpose.

2.5 World wheat utilisation in 2022-23 has seen a slight decline of 0.4 per cent to 768.6 million tonnes from the record level estimated for 2021-22 as per FAO. World wheat stocks are predicted to reach 297.8 million tonnes by the close of season in 2022, up 1.3 million tonnes (0.4 percent) from their opening levels and establishing a new record. The projected increase in stocks will be mostly concentrated in China (up 6.8 million tonnes based on expectation of a fall in utilisation amid steady production), the Russian Federation (up 5.1 million tonnes stemming from an expected rise in production) and Ukraine (up 2.0 million tonnes as a result of export disruptions due to the war). These increases exceed anticipated drawdowns in several countries, including India and Morocco due to production down turns. At the current levels, the world wheat stocks – to use ratio in 2022-23 would stand at 38.7 percent, as compared to 38.4 in 2021-22.

2.6 The global wheat outlook for 2022-23 is of lower supplies, reduced consumption, fractionally lower trade, and slightly lower ending stocks as per USDA (WASDE, June 2022). Supplies are decreased by 1.7 percent to 1052.8 million tonnes as lower production in India more than offsets an increase for Russia. As per International Grain Council (IGC), production of wheat is estimated to decline by 1.5 percent in 2022-23 as compared to 2021-22. IGC projects decline in trade (0.3 percent) in 2022-23 with reference to the previous year. The Council, however, forecast marginal increase in global consumption of wheat. All the three forecasts predict lower production, supply and consumption. Hence, international wheat prices are estimated to be higher in the next year.

Table 2.1: Global Supply and Demand Outlook for Wheat

(Million tonnes)

	USDA			FAO-AMIS			IGC		
	2020-21	2021-22 (Est.)	2022-23 (Proj.)	2020-21	2021-22 (Est.)	2022-23 (F'cast)	2020-21	2021-22 (Est.)	2022-23 (F'cast)
Production	775.7	779.0	773.4	776.7	776.8	770.8	774.3	781	769.3
Supply[a]	1073.9	1070.6	1052.8	1054.4	1068.2	1067.3	1049.4	1059.5	1051.7
Trade[b]	203.3	199.4	204.6	189.2	192.1	188.9	190.3	194.1	193.5
Utilisation	782.3	791.2	786.0	762.4	771.7	768.6	770.9	777.1	778.8
Ending Stocks	291.6	279.4	266.9	291.4	296.5	297.8	278.5	282.4	272.9
Stock-to-Use Ratio	37.3	35.3	34.0	38.2	38.4	38.7	24.7	36.3	35.0

Note: 1. [a] Production plus opening stocks [b] Trade data refer to export estimate

Source: 1. USDA World Agricultural Supply and Demand (WASDE) Report, June 2022
2. FAO Food Outlook-June 2022
3. International Grains Council - June 2022

Barley

2.7 As per FAO prediction, the global barley production in 2022 is expected to be 147.9 million tonnes, up by 2.6 percent over the previous year and rise in production is driven by expected production increase in North America while the production in Canada is expected to decline this

year. Further the global barely stocks are also expected to decline by 3.2 percent, to 26.6 million tonnes with consecutive second year decline. The global barley trade is expected to fall by 8.6 percent during 2022-23 as compared to 2021-22 due to reduction in imports by China, Islamic Republic of Iran and Turkey.

Pulses

2.8 Pulses play an important role in healthy diet, sustainable food production and food security. India, Canada, Myanmar and China are major producers of pulses in the world. India is the largest producer as well as importer of pulses. However, in the last 2-3 years imports have declined due to increased domestic production. India imports pulses majorly from Canada, Myanmar and Australia. Canada, which is the largest exporter of pulses to India, produces about 8.5 million tonnes in 2020-21 and exports nearly 79.4 percent of production. Table 2.2 shows scenario of pulses production including lentil and dry peas of Canada. China, Bangladesh, India, USA, Turkiey, UAE and EU are major markets for Canadian exports. Production of pulses in Canada is forecast to increase to 6.87 million tonnes in 2022-23, which is an increase of 50 percent as compared to 2021-22. This increase is also attributed to low base effect on production of pulses, which declined by 46.4 percent in 2021-22 over the previous year. For 2022-23, Canada's exports are also expected to increase to 5.5 million tonnes, up 27.4 percent over previous year. On account of increase in production and supply, the ending stocks in Canada are expected to rise by about 25.7 percent to 10.50 million tonnes for 2022-23.

2.9 Canada is the largest producer as well as exporter of lentil in the world. Main markets for Canadian lentil are India, Turkey and the UAE. For 2022-23, lentil supply is expected to rise to 2.87 million tonnes, up by 39.4 percent compared to 2021-22 owing to rise in production by 58.8 percent. Exports are expected to be higher than 2021-22 level to 2.1 million tonnes in 2022-23. The ending stocks are forecast to be about 350 thousand tonnes which is about 100 thousand tonnes higher than that in 2021-22. Average price, therefore, is forecast to decline to US$ 835 per tonne in 2022-23, a decline of 16.5 percent as compared to 2021-22.

2.10 Production and supply of dry peas in Canada are also expected to rise in 2022-23. The production is forecast to increase to 3.5 million tonnes, an increase of 55.0 percent, due to which supply is also expected to rise by 31.06 percent to 3.73 million tonnes. Canada's exports of dry peas are expected to increase by 28.6 percent to 2.7 million tonnes in 2022-23 over the previous year. Average price is expected to decline to $480 per tonne in 2022-23 compared to the price of $600 projected in 2021-22.

Table 2.2: Pulses Demand-Supply Situation in Canada

('000 tonnes)

Group and Crop Year	Total Pulses			Lentils			Dry Peas		
	2020-21	2020-22	2020-23	2020-21	2020-22	2020-23	2020-21	2020-22	2020-23
Production	8545	4577	6873	2868	1606	2550	4594	2258	3500
Imports	338	230	312	110	50	75	81	30	80
Total Supply	9778	6340	8020	3187	2063	2875	4909	2846	3730
Exports	6784	4360	5555	2326	1500	2100	3582	2100	2700
Domestic Use	1461	1145	1415	454	313	425	768	596	730
Ending Stocks	1533	835	1050	407	250	350	559	150	300
Stocks-to-Use Ratio %	-	-	-	15	14	14	13	6	9
Average Price ($/t)	-	-	-	645	1000	835	340	600	480

Source: Agricultural and Agri-Food Canada - June 20, 2022

Oilseeds

2.11 Global oilseeds production is expected to reach 646.8 million tonnes in 2022-23, an increase of 8.0 percent as compared to previous year. As per USDA Oil Crops Outlook, the increase mainly driven by rise in soybean output in South America and United States, as well as rapeseed production in Canada and the European Union. Global rapeseed production is expected to reach the record level of 30.7 million tonnes in 2022-23. Despite this, the supplies are expected to remain tight with rising consumption and tight supplies of other countries. According to the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), total oilseeds production would reach at 647 million tonnes in 2022-23 (an increase of 8.4 percent over the previous year) besides the expected increase in consumption to the level of 627 million tonnes. The oilseeds market is expected to have improvement in the global supply-demand picture. Global outlook for oilseeds is given in Table 2.3.

Table 2.3: World Oil Crops Market Outlook

(Million tonnes)

	USDA			ABARES		
	2020-21	2021-22 (f)	2022-23 (f)	2020-21	2021-22 (f)	2022-23 (f)
Oilseeds						
Production	606.6	599.0	646.8	607.0	597.0	647.0
Supply	718.6	714.2	751.7	-	616.1	750.0
Utilization	508.0	511.1	528.3	602.0	607.0	627.0
Trade	191.4	178.6	197.0	191.0	178.0	196.0
Ending Stocks	115.1	104.9	200.0	115.0	103.0	119.0

Note: f-Forecast

Source: 1. USDA Oilseeds: WASDE Report - June 2022
2. Australian Bureau of Agricultural and Resource Economics and Sciences, Agricultural Commodities June Quarter 2022

Domestic Market Scenario

Wheat

2.12 Wheat is a major food grain in India and throughout the world. India is the second largest producer of wheat in the world. As per the third advance estimate wheat production is estimated at 106.51 million tonnes in 2021-22 which is 2.8 percent less than the previous year due to decline in precipitation and unreasonably high temperature witnessed in March and April 2022 (Table 2.4). While the stocks are close to the prescribed buffer norms of 27.6 million tonnes under the Central Pool, yet huge decline of 51.3 percent in wheat stocks has been recorded in the country. Wheat stocks in central pool are only 29.4 million tonnes as on 30th June, 2022. Due to higher production, wheat exports from India increased to 2.2 million tonnes in 2020-21 from 0.3 million tonnes in 2019-20. Wheat exports witnessed a sharp increase to about 7.2 million tonnes in 2021-22 (an increase of 236.1 %) on account of sharp increase in international prices.

Table 2.4: Domestic Supply Situation of Wheat in India

(Million tonnes)

Particulars	2019-20	2020-21	2021-22	% change over previous year	
				2020-21	2021-22
Production	107.86	109.59	106.51^	1.6	-2.8
Stocks in Central Pool*	54.99	60.36	29.4(P)	9.8	-51.3
Exports	0.22	2.154	7.239	879.1	236.1
Imports	0	0	0	0	0

Note: **As on 30th June, 2020, 2021 and 2022*
^Production as per 3rd advance estimate
P-projected

Source: *1. Food Corporation of India*
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Pulses

2.13 Production of pulses in the country has been steadily increasing in the last three years reaching to a record high of 27.75 million tonnes in 2021-22 with a growth rate of about 9 percent (Table 2.5). Amongst rabi pulses, production of gram is estimated to show a significant increase of about 17.4 percent in 2021-22 in comparison to the previous year. Increase in gram production is mainly contributed by the States of Gujarat, Karnataka, Punjab and Maharashtra. There was only a 0.6% increase in production in MP between 2021-22 and 2020-21. Year on Year (YoY) increase in Maharashtra is 29.6%, Punjab 53% and Karnataka 55.3%. Gujarat showed about 68 percent increase in gram production during RMS 2021-22. In case of lentil, Madhya Pradesh is the leading producer with 39 percent share in total lentil production in India. Supply of pulses in India is mainly driven by domestic production followed by significant quantity of imports depending upon domestic deficits and international prices. Imports of pulses in 2021-22 is found to be around 2.7 million tonnes, which is 8% percent higher than the previous year imports of 2.5 million tonnes. In case of stocks, due to lesser procurement of pulses in the recent marketing season, the availability of pulses has been reduced to 17.3 lakh tonnes in 2021-22.

Table 2.5: Domestic Supply Situation of Pulses in India

(lakh tonnes)

Particulars	2019-20	2020-21	2021-22	% change over previous years	
				2020-21	2021-22
Production	230.3	254.6	277.5	10.6	9.0
Imports	29.4	25.0	27.7	-15.0	10.8
Exports	2.3	2.9	4.1	25.0	41.4
Stocks*	13.3	7.8	17.3	-40.9	121.1

Note: **As on 1st May, 2020, 2021 and 2022*

Source: *1. Directorate General of Commercial Intelligence and Statistics (DGCIS) for data on exports and imports*
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare
3. NAFED for data on stocks

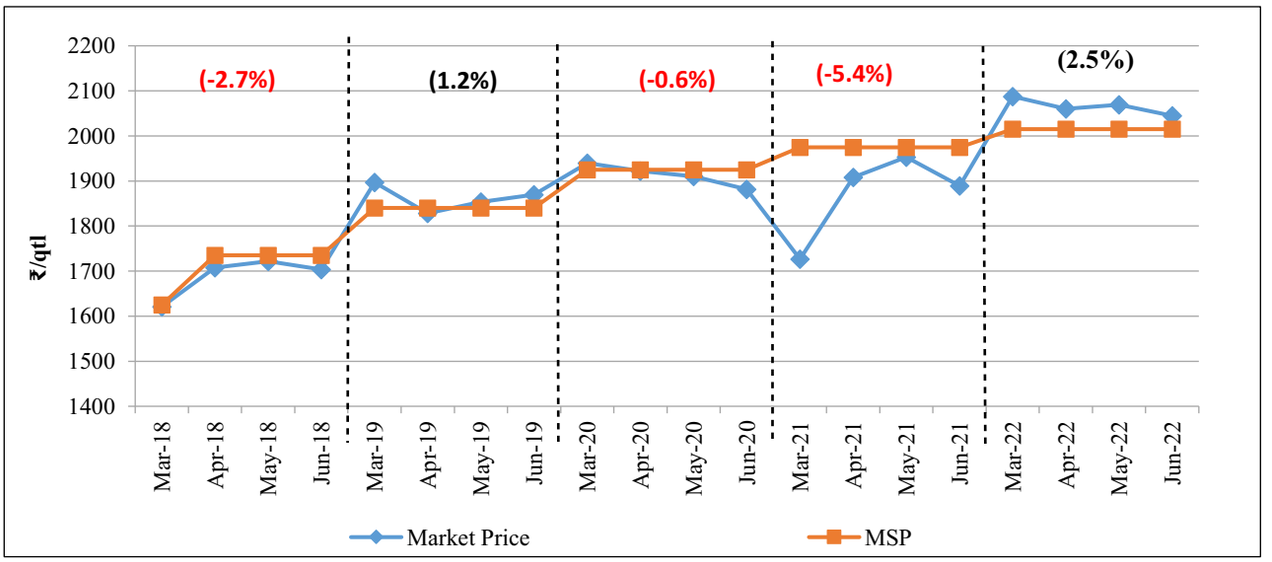
Trends in Domestic Market Prices

2.14 Market price trends essentially signal the farmer and consumer about the possible prevailing price of commodities in near term. In this context, market prices refer the prices reported in agricultural markets commonly known as "mandi prices" at which farmers sell their farm produce to traders. The domestic market price data have been compiled from AGMARKNET, which reports daily prices and market arrivals collected from APMC markets in different States/UTs. State weighted average daily price of a commodity has been computed by taking average of modal price prevailing in various centres weighted by market arrivals in the centre. All-India daily average market price has been computed by taking average of all States weighted by share of the State in total production of a crop. Finally, monthly average price at all-India level is computed by taking simple average of daily all-India prices.

Wheat

2.15 The all-India weighted average monthly market prices of wheat for last five marketing seasons depicted in Chart 2.1. In the RMS 2019-20, the market prices are marginally higher than the MSP with an average difference of 1.2 percent. The market price was less than the MSP during the RMS 2020-21 with an average difference of (-) 0.6 percent. However, the later period of RMS 2021-22 witnessed a sudden fall in the average market prices below MSP and the gap widened to (-) 5.4 percent. For the current RMS 2022-23, the market prices are higher than the MSP with an average difference of 2.5 percent.

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

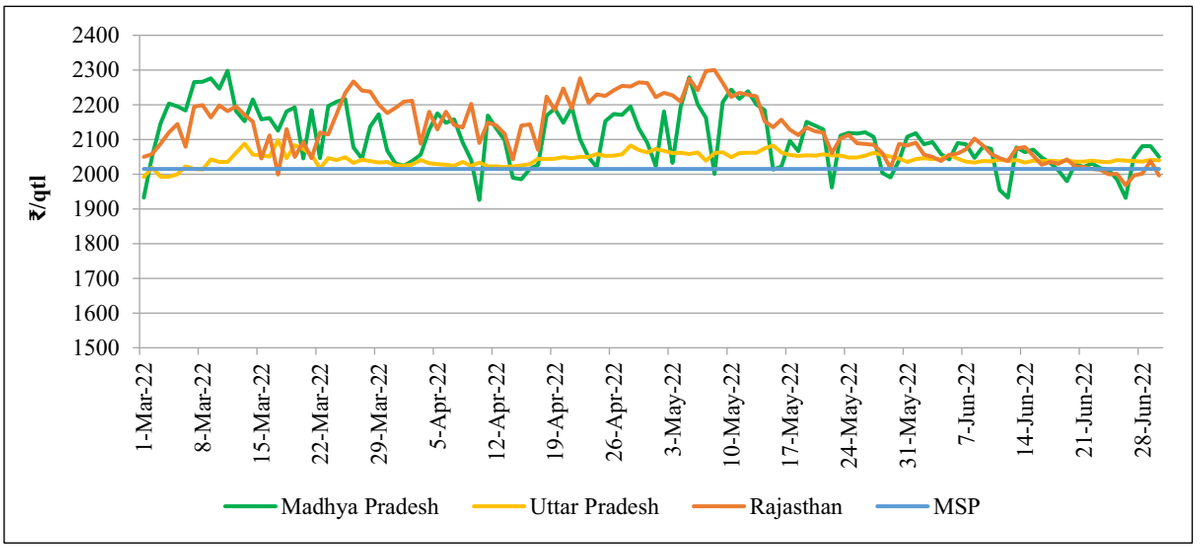


Note: 1. Figures in parentheses show the percentage difference between average Market Price and MSP for each marketing season

Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare

2.16 The trend of daily market prices of the major wheat producing states such as Madhya Pradesh, Uttar Pradesh and Rajasthan for RMS 2022-23 during March, 2022 to June 2022 is shown in Chart 2.2. Market prices in all the States under reference are found to be higher than the MSP except few days in the State of Madhya Pradesh. There were wide fluctuations in market prices in Madhya Pradesh and Rajasthan recorded during the period. The average market prices in Uttar Pradesh are reported to be marginally higher than the MSP.

Chart 2.2: Comparison of Market Prices and MSP of Wheat in Madhya Pradesh, Uttar Pradesh and Rajasthan during RMS 2022-23



Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.17 It is evident from the Table 2.6 that in Madhya Pradesh, Uttar Pradesh, Rajasthan, Haryana and Punjab, the market prices on most of the reported days, were observed to be higher than the MSP. In Madhya Pradesh, market prices remained above or equal to MSP on most of the days for which the data were available. The highest average difference in market prices as compared to the MSP is reported in Rajasthan with 5.8 percent followed by Madhya Pradesh with an average of 4.4 percent.

Table 2.6: Market Prices vis-a-vis MSP of Wheat in Major Producing States in RMS 2022-23 (March-June 2022)

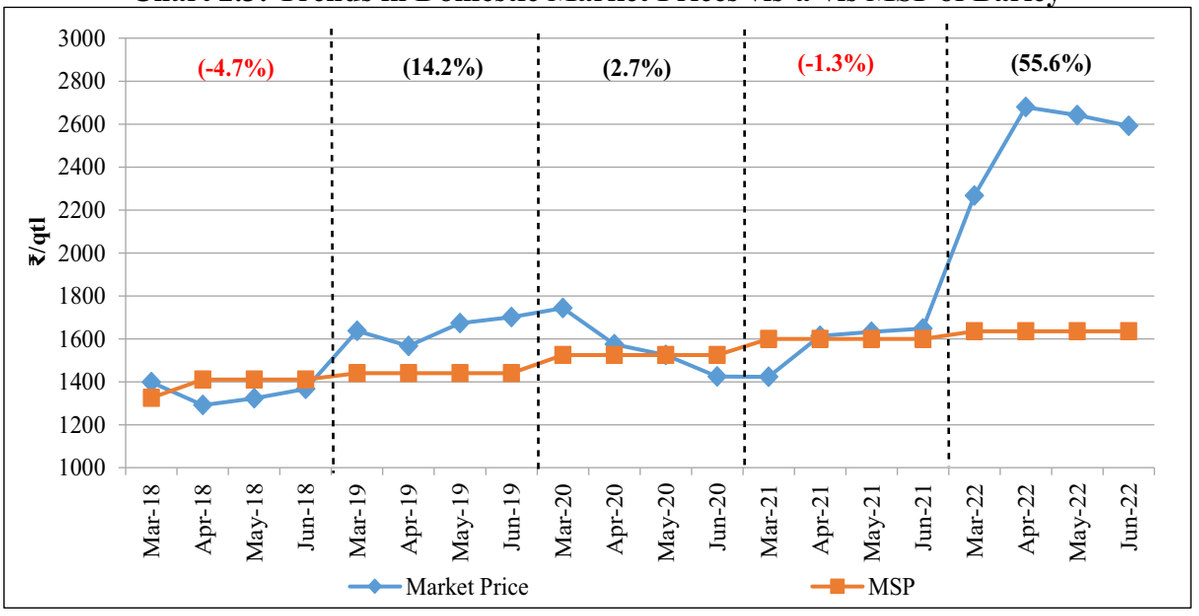
States	No. of days market prices reported	No. of days market prices were above/equal to MSP	No. of days market prices were below MSP				Average difference (%) between Market Price & MSP
			<5%	5- 10%	10-15%	>15%	
Madhya Pradesh	122	105	17	0	0	0	4.4
Uttar Pradesh	122	117	5	0	0	0	1.4
Rajasthan	122	114	8	0	0	0	5.8
Haryana	79	78	1	0	0	0	1.4
Punjab	65	63	2	0	0	0	0.1

Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Barley

2.18 Market price of barley witnessed a declining trend during the 2018-19 season. However, market prices of barley steadily increased in RMS 2019-20 before falling below MSP during RMS 2020-21 (Chart 2.3). Market prices showed an increasing trend during RMS 2021-22 and surpassed MSP in April, 2021. For the current RMS, the market prices of barley are much higher than the MSP with an average difference of 55.6 percent. The highest average market price was recorded as ₹2679 per quintal in April, 2022 against the MSP of ₹1635. It declined subsequently and was reported at ₹2541 in June, 2022.

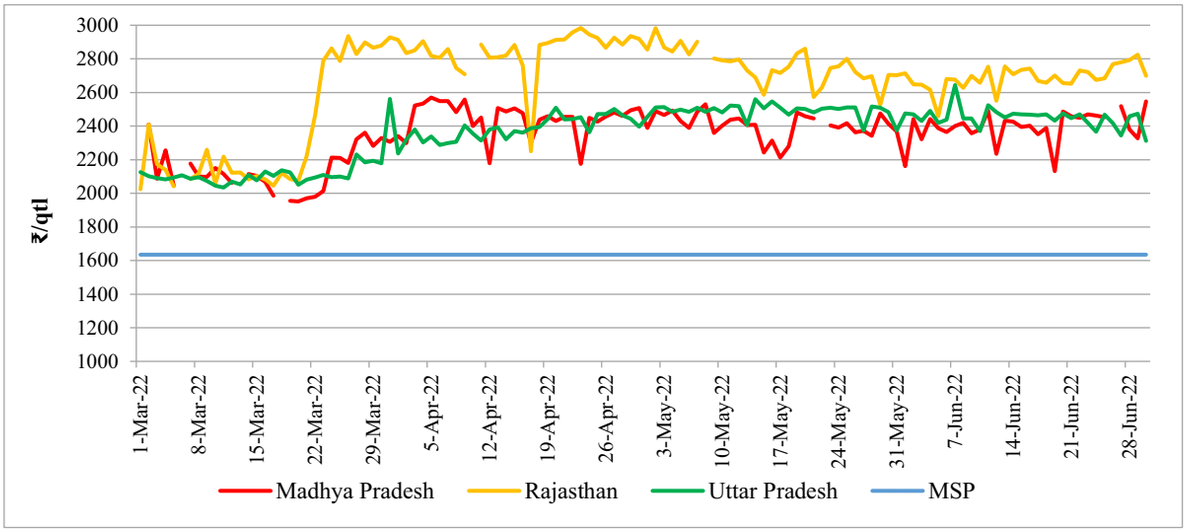
Chart 2.3: Trends in Domestic Market Prices vis-à-vis MSP of Barley



Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.19 The daily trends in market prices in Uttar Pradesh, Rajasthan and Madhya Pradesh for barley in RMS 2022-23 are shown in Chart 2.4. Market prices in all the three states are recorded as higher than MSP throughout the reference period. Among reported states, market prices in Rajasthan were much higher as compared to Uttar Pradesh and Madhya Pradesh. However, the market price of barley has been reported to be much above the MSP throughout the marketing season, and the volatility in the market prices is observed to be higher in the State of Rajasthan.

Chart 2.4: Comparison of Market Prices and MSP of Barley in Madhya Pradesh, Rajasthan and Uttar Pradesh during RMS 2022-23



Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.20 The average difference between market price and MSP in Rajasthan is estimated to be 62.9 percent, followed by Uttar Pradesh (44.4 percent) and Madhya Pradesh (43.8 percent) during RMS 2022-23 (Table 2.7).

Table 2.7: Market Prices vis-a-vis MSP of Barley in Major Producing States in RMS 2022-23 (March-June 2022)

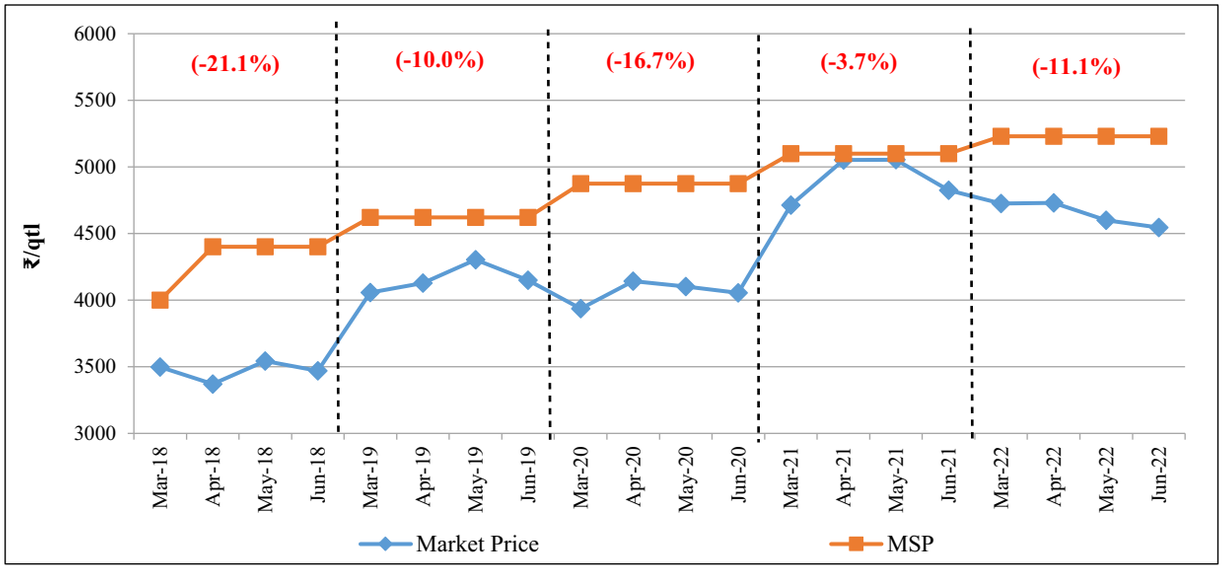
States	No. of days market prices reported	No. of days market prices were above/equal to MSP	No. of days market prices were below MSP				Average difference (%) between Market Price & MSP
			<5%	5- 10%	10-15%	>15%	
Madhya Pradesh	116	116	0	0	0	0	43.8
Rajasthan	119	119	0	0	0	0	62.9
Uttar Pradesh	122	122	0	0	0	0	44.4

Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Gram

2.21 The average market prices of gram during five marketing seasons can be seen in Chart 2.5. The market price of gram has remained always below the MSP during the period under study but roughly following increasing trend of MSP. The market price was less (₹3371/qtl) in April, 2018. Since then, the market prices have shown an increasing trend in every marketing season, however their prices are reported to be lower than the MSP throughout the period except in the month of April and May 2021. In current RMS 2022-23, market prices are again below the MSP and decreasing. The gap between the two has widened by an average of (-) 11.1 percent. The lowest price was reported in the month of June 2022 at ₹4545 per quintal.

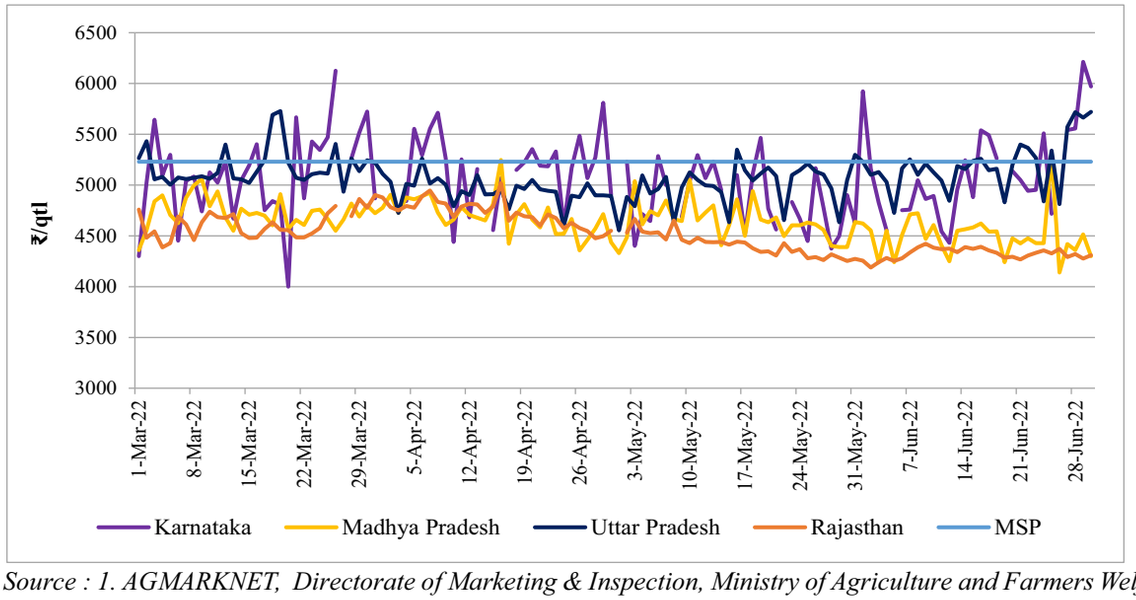
Chart 2.5: Trends in Domestic Prices vis-à-vis MSP of Gram



Note: 1. MSP is inclusive of bonus.
Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.22 Chart 2.6 shows the relationship between the market prices and MSP of gram in major producing States during the RMS 2022-23. It is evident from the Chart that market prices remained below MSP in all the States during the month of March, 2022 except for few days in the state of Karnataka and Uttar Pradesh. However, the market prices have started increasing from April, 2022 onwards and hovered along with or below MSP during the rest of the marketing season, except Rajasthan and Madhya Pradesh, where the market prices are recorded below the MSP throughout the month. In RMS 2022-23, the market price volatility was found to be higher in Karnataka and Uttar Pradesh as compared to other States viz., Madhya Pradesh and Rajasthan.

Chart 2.6: Comparison of Market Prices and MSP of Gram in Karnataka, Madhya Pradesh, Uttar Pradesh and Rajasthan during RMS 2022-23



Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.23 The number of reported days when market prices of gram were above or below the MSP in major producing States can be seen in Table 2.8. Uttar Pradesh has reported market prices equal to or above MSP on 23 days and the remaining reported days the variation is found to be mostly less than 5 percent of the MSP. Similar trend has been observed in Karnataka, where market prices in 38 out of 109 reported days marked above or equal to MSP. The average difference between market prices and MSP is found to be (-) 3.1 percent in Karnataka. For Madhya Pradesh and Rajasthan, market prices were below MSP on almost all days and the average difference between market price and MSP in these States were (-) 11.3 percent and (-) 13.6 percent respectively.

2.24 Over the past few years, the MSP of pulses has been substantially increased to incentivize a shift of cropping pattern from cereals to pulses whilst encouraging crop diversification. This was in keeping with the Government's stated objective of achieving self-sufficiency in pulses production. As discussed in the previous para, number of days when market prices were lower than the MSP was very high (87 percent), announcement of high MSP without being supported by robust procurement systems slackens the pace of achieving the objective of promoting rational cropping patterns, and the ultimate objective of ensuring higher income to farmers.

Table 2.8: Market Prices vis-a-vis MSP of Gram in Major Producing States in RMS 2022-23 (March-June 2022)

States	No. of days market prices reported	No. of days market prices were above/equal to MSP	No. of days market prices were below MSP				Average difference (%) between Market Price & MSP
			<5%	5- 10%	10-15%	>15%	
Karnataka	109	38	26	24	15	6	-3.1
Madhya Pradesh	122	2	4	36	59	21	-11.3
Uttar Pradesh	122	23	64	29	6	0	-2.9
Rajasthan	120	0	1	24	42	53	-13.6

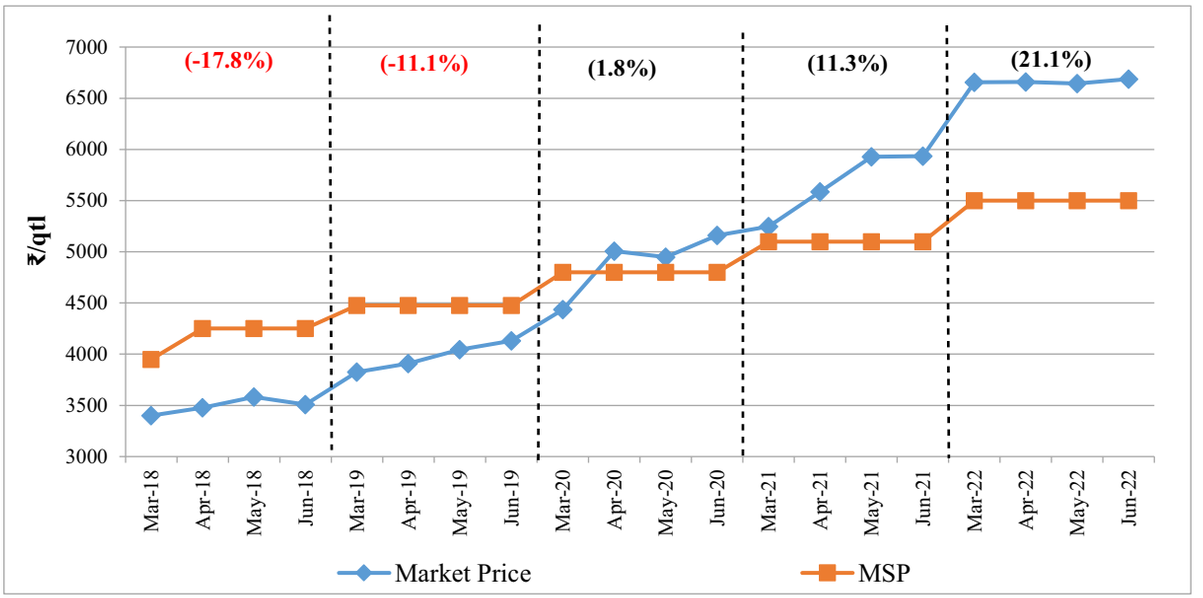
Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Lentil

2.25 Market prices of lentil showed an increasing trend since RMS 2018-19, but the prices were reported lower than MSP till March, 2020 (Chart 2.7). In RMS 2021-22, the average market price was reported at 11.3 percent higher than MSP, which increased further and reported at 21.1 percent during the RMS 2022-23.

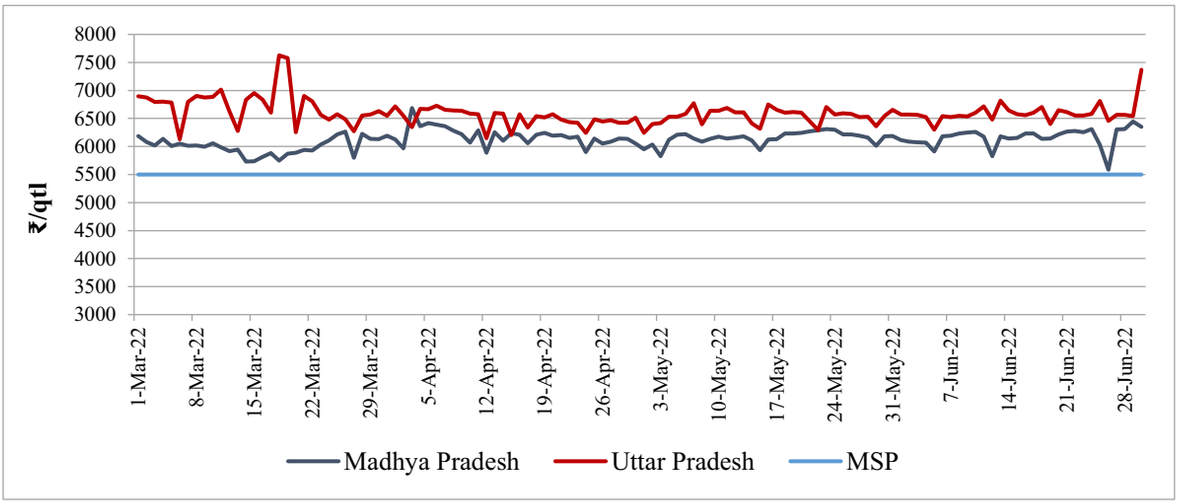
2.26 The daily market prices of lentil in Madhya Pradesh and Uttar Pradesh during RMS 2022-23 is shown in Chart 2.8. Market prices of lentil in Uttar Pradesh have remained much above the MSP on all the reported days. In case of Madhya Pradesh also, the market prices were above the MSP during the RMS 2022-23. In both the States, Madhya Pradesh and Uttar Pradesh, average price difference with the MSP reported at 11.4 percent and 19.9 percent, respectively during the RMS 2022-23 (Table 2.9).

Chart 2.7: Trends in Domestic Market Prices vis-à-vis MSP of Lentil



Note: 1. MSP is inclusive of bonus.
Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare,
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Chart 2.8: Comparison of Market Prices and MSP of Lentil in Madhya Pradesh and Uttar Pradesh during RMS 2022-23



Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Table 2.9: Market Prices vis-a-vis MSP of Lentil in Major Producing States in RMS 2022-23 (March-June 2022)

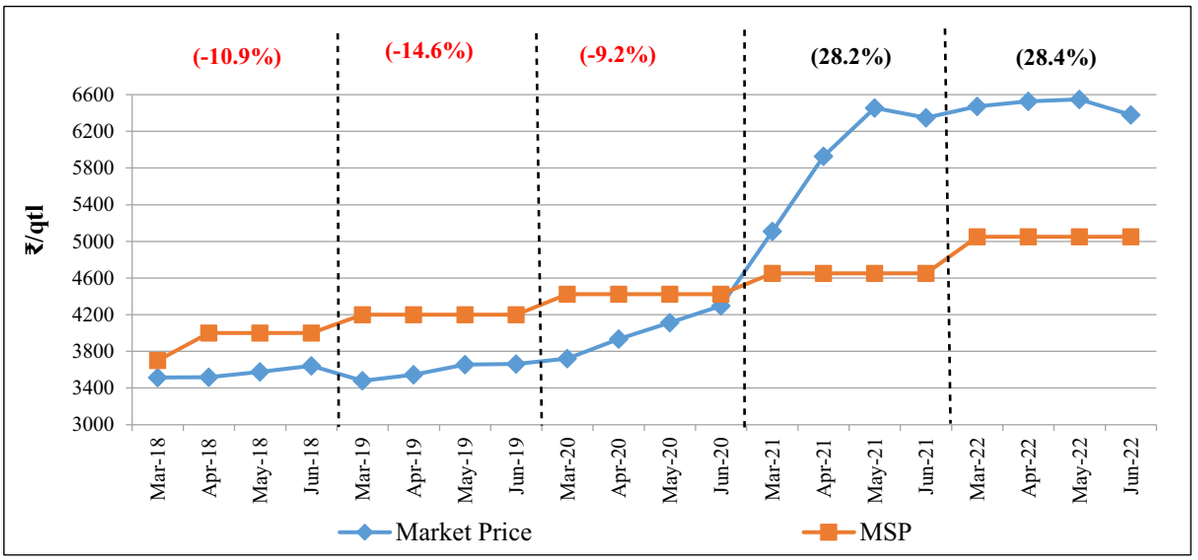
States	No. of days market prices reported	No. of days market prices were above/equal to MSP	No. of days market prices were below MSP				Average difference (%) between Market Price & MSP
			<5%	5-10%	10-15%	>15%	
Madhya Pradesh	122	122	0	0	0	0	11.4
Uttar Pradesh	122	122	0	0	0	0	19.9

Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Rapeseed & Mustard

2.27 The average market prices of R&M have remained below MSP till RMS 2020-21 (Chart 2.9), but in subsequent period, market prices reported to be higher. The gap between market price and MSP reduced to (-) 9.2 percent during RMS 2020-21, as the market prices significantly increased in this period. From the last two marketing seasons, the average market prices have surged to a record high at ₹6483 as compared to MSP (₹4650), which is about 28.2 percent higher than MSP for RMS 2021-22. For the current RMS 2022-23, the average market price is reported at ₹6548 as compared to MSP (₹5050), which is still higher at 28.4 percent than the MSP.

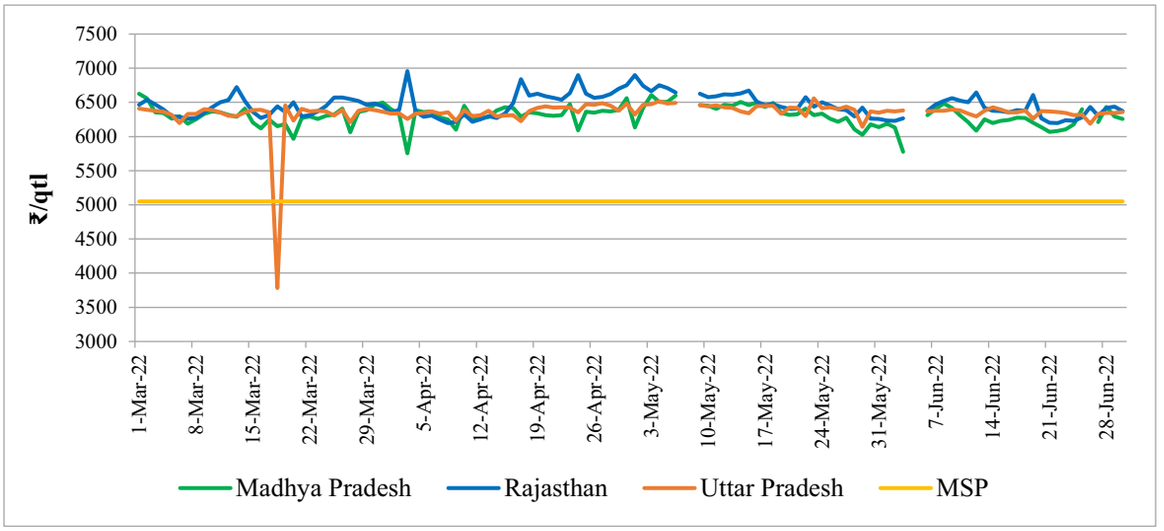
Chart 2.9: Trends in Domestic Market Prices vis-à-vis MSP of R&M



Note: 1. MSP is inclusive of bonus.
Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

2.28 The relationship between daily market prices and MSP for R&M in major producing States during RMS 2022-23 is depicted in Chart 2.10. It is clear from the chart, the market prices in all the reported States remained above MSP except on March 18, 2022 when the market price of R & M crashed in UP. The average difference between market price and MSP for RMS 2022-23 was about 27.9 percent in Rajasthan and Haryana, where as it was 24.9 and 25.7 percent in Madhya Pradesh & Uttar Pradesh respectively.

Chart 2.10: Comparison of Market Prices and MSP of R&M in Madhya Pradesh, Rajasthan and Uttar Pradesh during RMS 2022-23



Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Table 2.10: Market Prices vis-a-vis MSP of R&M in Major Producing States in RMS 2022-23 (March-June 2022)

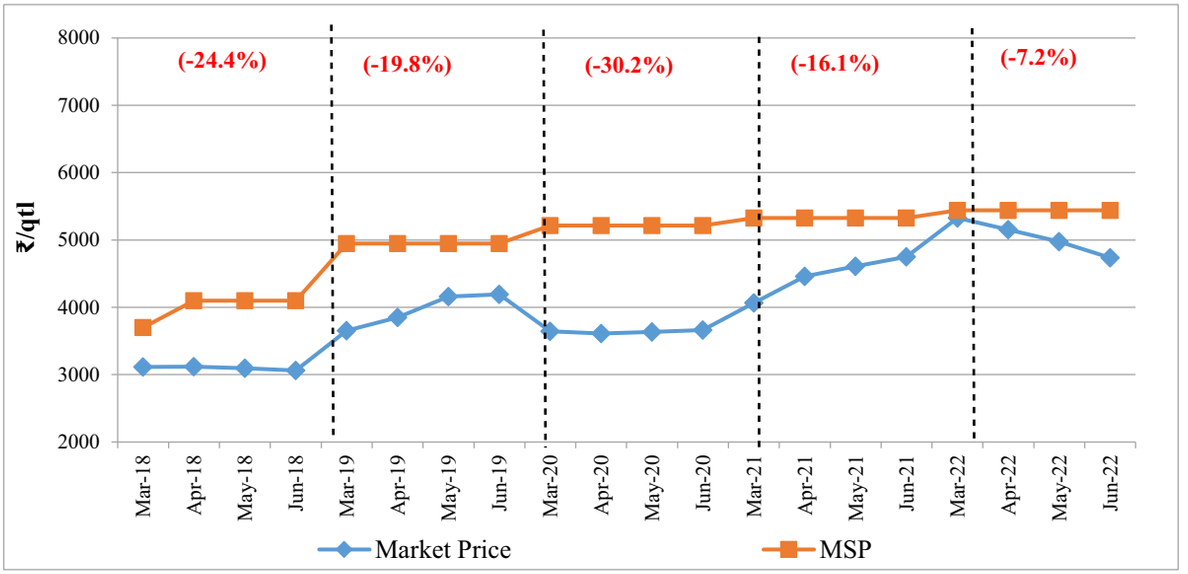
States	No. of days market prices reported	No. of days market prices were above/equal to MSP	No. of days market prices were below MSP				Average difference (%) between Market Price & MSP
			<5%	5-10%	10-15%	>15%	
Haryana	115	115	0	0	0	0	27.9
Madhya Pradesh	117	117	0	0	0	0	24.9
Rajasthan	118	118	0	0	0	0	27.9
Uttar Pradesh	118	117	0	0	0	1	25.7

Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Safflower

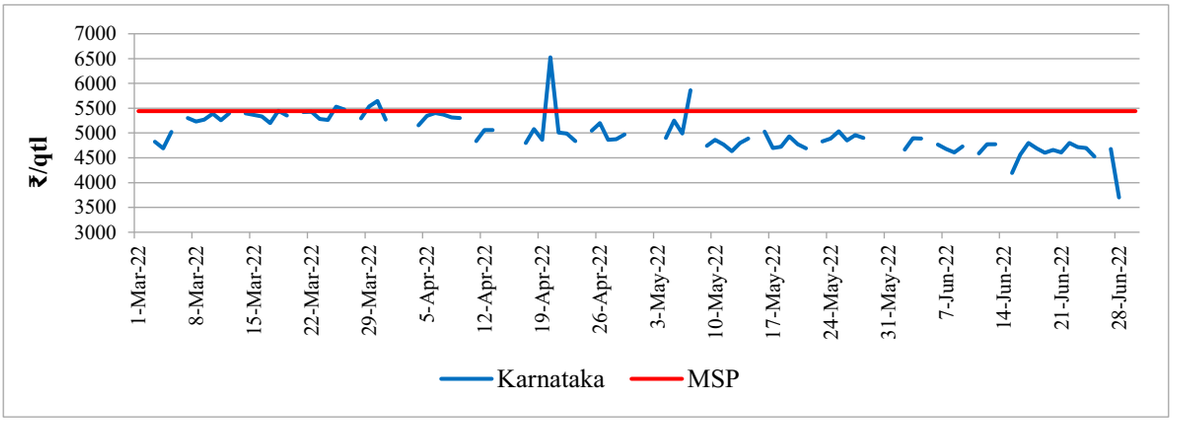
2.29 Chart 2.11 clearly depicts that the market prices of safflower seeds were reported to be much lower as compared to the MSP during last five marketing seasons. However, the market prices of safflower registered a steady rise during the RMS 2021-22, but the increase was not sufficient to bridge the gap with MSP. For the current marketing season 2022-23, the gap between the market prices of Safflower and MSP has reduced to (-) 7.2 percent. Chart 2.12 compares daily market prices with the MSP for RMS 2022-23 in Karnataka, the largest producer of safflower. The market prices of safflower are hovering around the MSP except in April 20, 2022 and touched ₹6526 (20% higher of MSP), then declined subsequently.

Chart 2.11: Trends in Domestic Market Prices vis-à-vis MSP of Safflower



Note: 1. MSP is inclusive of bonus.
Source : 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Chart 2.12: Comparison of Market Prices and MSP of Safflower in Karnataka during RMS 2022-23



Source: 1. AGMARKNET, Directorate of Marketing & Inspection, Ministry of Agriculture and Farmers Welfare
2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Trends in Wholesale Prices

2.30 Wholesale Price Index (WPI) is the best indicator to track the changes or compare the prices of commodities at Wholesale market and to understand demand-supply situation in the market as they capture price movements across States. Analysing the trend of wholesale prices will be helpful to deciding the price policies required for rabi crops. This section examines the recent trends in inflation in food commodities including rabi crops in India.

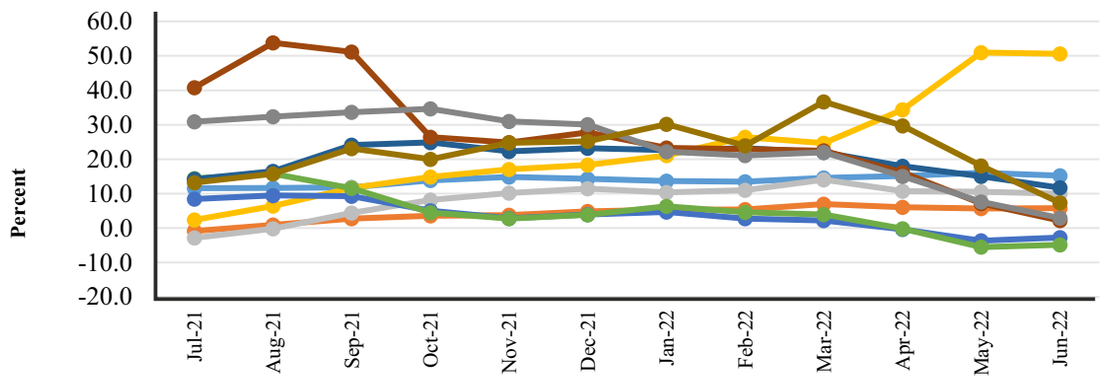
2.31 The rate of inflation based on wholesale prices, during the past year (July 2021 to June 2022) for all commodities as well as major rabi commodities can be seen in Chart 2.13. The WPI (base 2011-12) for foodgrains is reported to be 165.9, for the period July 2021-June 2022, with an increase of 4.2 percent, over the corresponding period of previous year. It is evident from the Chart that the gap in the annual rate of inflation between all commodities category and foodgrains is found to be continuously increasing since July, 2021 as compared to previous year indices. At the end of the season (June 2022), except for pulses and gram, all other categories showed an increasing trend in their index. Barley exhibited more than 50 percent increase in annual rate of WPI.

2.32 In case of rabi cereals, the rate of WPI for wheat is found to be increasing since September 2021 to June 2022 with the highest increase reported in March 2022 (14.0 percent) in comparison to the corresponding month in the previous year. Similarly, the change in barley WPI is also found to be positively increasing throughout the period under consideration and the highest increase was reported in the month of May 2022 (51.0 percent). In respect of pulses, the average annual increase in the index was reported to be within the range of 2-10 percent during the period (July 2021 to March 2022) and subsequent dip in prices recorded since April 2022 and highest is in the month of May, 2022 i.e. (-3.7 percent). The key drivers of inflation in pulses were gram, lentil and other pulses. Among the rabi pulses, the change in WPI of gram is observed to be increasing and its highest increase was reported in the month of August 2021 (15.7 percent). On the other side, lentil has also shown continuous increase in its index as compared to previous year, with highest increase (24.9 percent) reported in the month of October 2021, and reported at 11.7 percent in June 2022.

2.33 Inflation in oilseed was at 40.8 percent in July 2021 and rose further to 53.8 percent in August 2021. Though still elevated inflation declined to 26.4 percent in October 2021 and gradually declined to 22.5 percent by March 2022. Inflation oilseed declined steadily thereafter and was 2.2 percent in June 2022. Inflation in R&M ranged from 30.1 percent to 34.6 percent between July 21 and Dec 21. Inflation in R&M declined to 22.1 percent in January 22. After remaining around 20 percent till March 2022. Inflation in R&M declined to 2.9 percent in June 2022. Inflation in safflower has been very volatile and increased from 13.2 percent in June 21 to 30.1 percent in Jan 2022 and further to 36.7 percent in March 2022. Inflation started declining thereafter and reached 7.3 percent in June 2022

2.34 It is clearly evident from the Chart 2.13 that for all the agricultural commodities, except for few initial months for the rabi cereals viz., wheat and barley, the WPI price level in the last one year has shown a general upward trend as compared to the previous year. Among the rabi pulses and oilseeds, highest increase of WPI was found in lentil and safflower, respectively. During the period July 2021 to June 2022, inflation of pulses ranged between a low of (-0.3) percent in April, 2022 and a high of 9.5 percent in August, 2021. Over the same period, oilseeds inflation ranged between a low of 7.1 percent in May, 2022 and a high of 53.8 percent in August, 2021. The WPI index for major agricultural commodities and groups/sub-groups for the last five years are given in Annex Table 2.1.

Chart 2.13: Trends in WPI based Inflation for Important Agricult ural Commodities/Groups



	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
All commodities	11.6	11.6	11.8	13.8	14.9	14.3	13.7	13.4	14.5	15.1	16.1	15.2
Foodgrains	-0.9	0.9	2.8	3.5	3.7	4.9	5.3	5.4	7.0	6.1	5.7	5.8
Wheat	-2.9	-0.2	4.4	8.1	10.1	11.4	10.4	11.0	14.0	10.7	10.5	10.0
Barley	2.4	6.5	11.6	14.9	17.0	18.4	21.1	26.4	24.7	34.4	51.0	50.6
Pulses	8.4	9.5	9.3	5.0	2.8	3.9	4.6	2.7	2.2	-0.3	-3.7	-2.8
Gram	14.3	15.7	11.5	4.5	2.7	3.9	6.3	4.5	3.9	-0.2	-5.5	-4.8
Lentil	14.2	16.5	24.1	24.9	22.3	23.1	22.7	23.2	22.0	18.0	15.0	11.7
Oilseeds	40.8	53.8	51.1	26.4	24.9	27.8	23.3	22.9	22.5	16.1	7.1	2.2
R&M Seed	30.9	32.4	33.6	34.6	30.9	30.1	22.1	21.1	22.0	15.0	7.6	2.9
Safflower	13.2	15.8	23.1	20.0	24.8	25.2	30.1	23.9	36.7	29.7	18.1	7.3

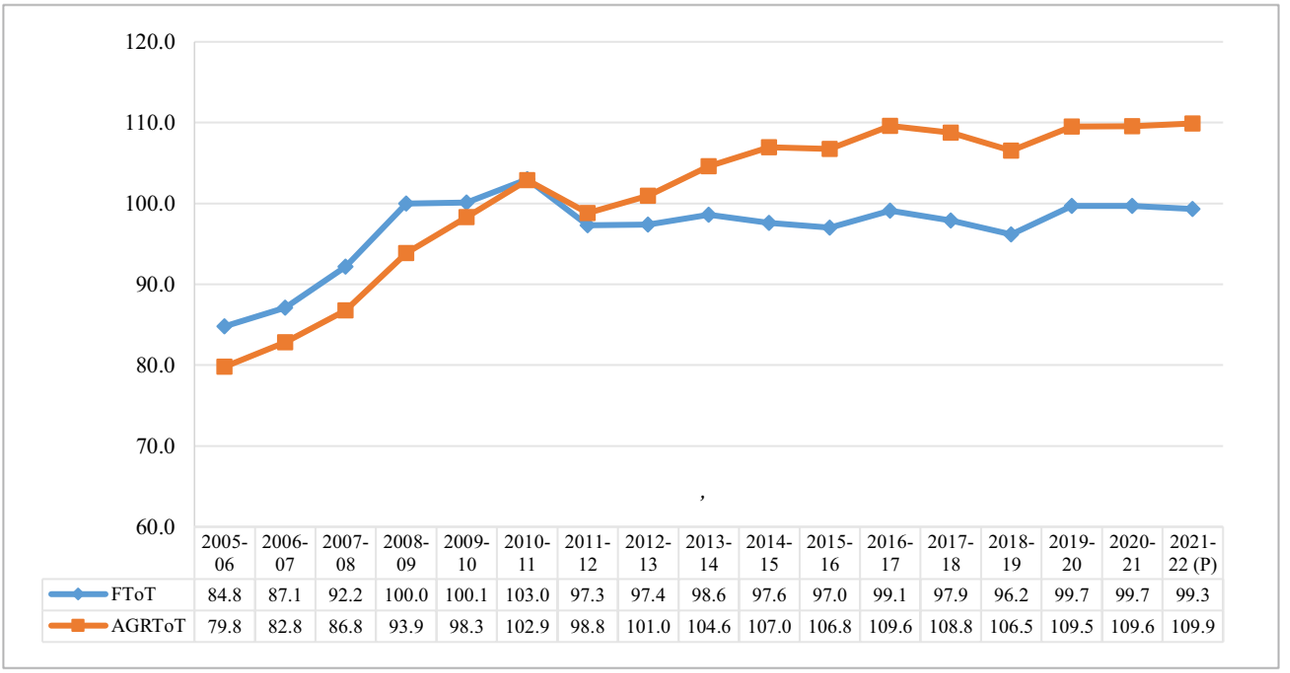
Source: Office of Economic Adviser, Ministry of Commerce and Industry

Trends in Domestic Terms of Trade

2.35 The interaction between prices received and prices paid by the farmers is explained in terms of Farmers' Terms of Trade (FToT) in India. This index is useful indicator to provide information about profitability of the sector, structural change pressures and optimum level of resource allocation within the sector. Agriculture Terms of Trade (AGRToT) refers to the ratio of prices in agricultural sector to non-agricultural sector and is a good indicator of change in relative prices. AGRToT between agriculture and non-agricultural sector is calculated as the ratio of the combined indices of prices received in agriculture (prices of agricultural products) to the combined indices of prices paid for different items purchased for agriculture like farm inputs. Similarly, FToT between farmers and non-farmers is computed as a ratio of the index of prices received by the farmers to the prices paid by them (and received by non-farmers). If the price index of agricultural goods is higher vis-à-vis non-agricultural goods, the index is more than 100 and is said to be favourable to agriculture.

2.36 It can be seen from the Chart 2.14 that the FToT is observed to be relatively unfavourable to the farmers, trending below the threshold of 100 during the last decade except during 2008-09 to 2010-11. The FToT is 99.3 in the year 2021-22 (P) as compared to 99.7 in 2020-21. However, AGRToT was above the threshold of 100 since 2012-13 indicating the increasing trend in profitability of the agriculture sector as compared to non-agriculture sector. Hence, the long term sectoral and individual profit-making activities such as food processing, new marketing avenues, scientific storage infrastructure, etc, may be strengthened.

Chart 2.14: Farmers' Terms of Trade and Agriculture Terms of Trade



	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 (P)
FToT	84.8	87.1	92.2	100.0	100.1	103.0	97.3	97.4	98.6	97.6	97.0	99.1	97.9	96.2	99.7	99.7	99.3
AGRToT	79.8	82.8	86.8	93.9	98.3	102.9	98.8	101.0	104.6	107.0	106.8	109.6	108.8	106.5	109.5	109.6	109.9

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

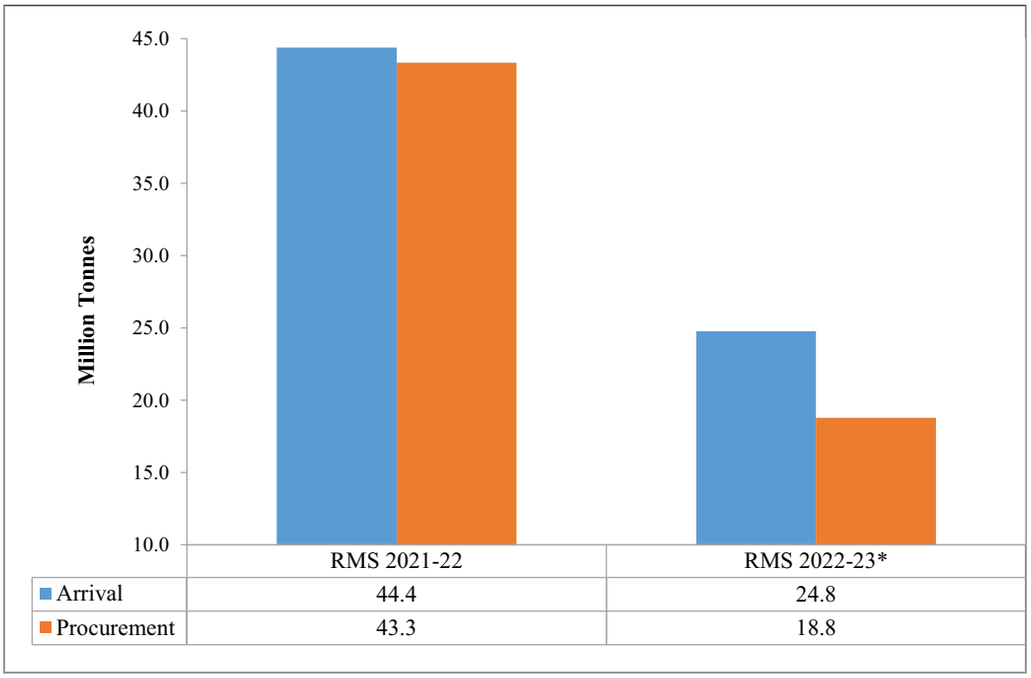
Procurement Policy and Operations

2.37 The procurement policy of Central Government is an effective market intervention with the aim of ensuring remunerative prices to farmers' produce, providing food grains to consumers and weaker sections at affordable prices and maintaining buffer stocks to ensure food security while checking on undue price rise. Procurement under the MSP is open ended, i.e. whatever amount of food grains are offered by farmers, within the stipulated period and conforming to the fair average quality (FAQ) norms, are to be procured. Mandated crops are procured by the Central Government agencies through the Food Corporation of India (FCI), National Agricultural Cooperative Marketing Federation of India Ltd (NAFED) or by State Agencies across the country. FCI undertakes procurement of wheat and paddy whereas NAFED undertakes procurement of oilseeds and pulses under Price Support Scheme (PSS), if market price of a commodity falls below the MSP. Procurement of coarse cereals is done by State government agencies for central pool as per the directions issued by the Government of India from time to time. In 1997-98, Decentralized Procurement Policy (DCP) was introduced in order to improve efficiency in procurement operations, expand reach in non-traditional States and crops to reduce transit losses and transport costs. Under the DCP, the State government, or its agencies procure, store and distribute (against allocation for NFSA/TPDS and OWS) within the State and excess stocks are handed over to FCI for central pool. The expenditure incurred by the State Governments on procurement, storage and distribution of DCP stocks are reimbursed by the Central Government on the laid down principles. At present, 15 States for rice and 8 States for wheat are under the DCP system. The list of DCP and Non-DCP States is given in Annex Table 2.2.

Wheat Procurement

2.38 It is clearly evident from the Chart 2.15 that the total wheat arrivals is only 55.9 percent in current season compared to previous season. The procurement of wheat remained only 18.8 million tonnes in RMS2022-23, just 43.4 percent of the previous season. During RMS2022-23, wheat procurement was 75.8 percent of market arrival, compared to 97.5 percent in the previous season. Among major states, Punjab recorded the highest share of 41.4 percent, followed by Madhya Pradesh (27.9%), Haryana (16.95%) and Uttar Pradesh (9.63%). The cumulative share of these four states is about 96 percent. It is observed that Delhi reported a significant increase of about 300 percent in market arrival in RMS2022-23 over the previous marketing season, but its share in procurement is just 0.18 percent in the country. Maharashtra, Bihar, Jammu & Kashmir and Gujarat showed decrease of about 100 percent in market arrivals during RMS2022-23 as compared to previous season.

Chart 2.15: Wheat Arrivals and Procurement in RMS2021-22 and RMS2022-23

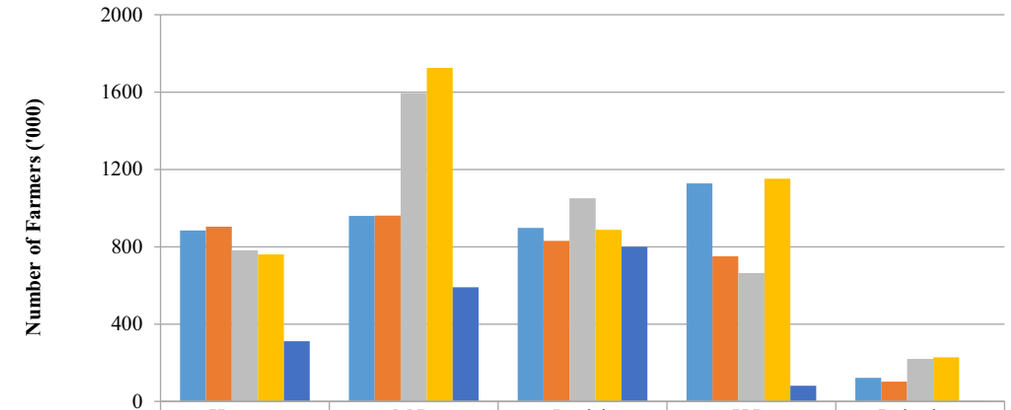


	RMS 2021-22	RMS 2022-23*
Arrival	44.4	24.8
Procurement	43.3	18.8

*Note: *As on 30.06.2022*
Source: Food Corporation of India

2.39 Chart 2.16 shows the number of farmers benefitted from wheat procurement operations in major producing States during the last five marketing seasons. As on 30th June, 2022, the number of benefitted farmers was 17.9 lakh. In order to have smooth wheat procurement, 21035 procurement centres have been operated across India during current season. Number of beneficiary farmers declined to 7.9 lakh in Punjab during RMS2022-23, nearly 9.9 percent decrease compared to RMS2021-22. The number of beneficiary farmers decreased by 99.6 percent in Rajasthan, 92.9 percent in Uttar Pradesh and 65.7 percent in Madhya Pradesh in current season. However, Haryana reported comparatively lower decline in beneficiary farmers i.e at 59.1 percent. Uttar Pradesh, the largest wheat producing State of the country, has witnessed a significant decrease in percentage of farmers benefitted (92.9 percent) as compared to previous season. Since RMS2020-21, Punjab and Haryana witnessed a continuous fall in number of farmers benefitting from procurement operations.

Chart 2.16: Number of Farmers Benefitted from Procurement Operations in Major Wheat Producing States

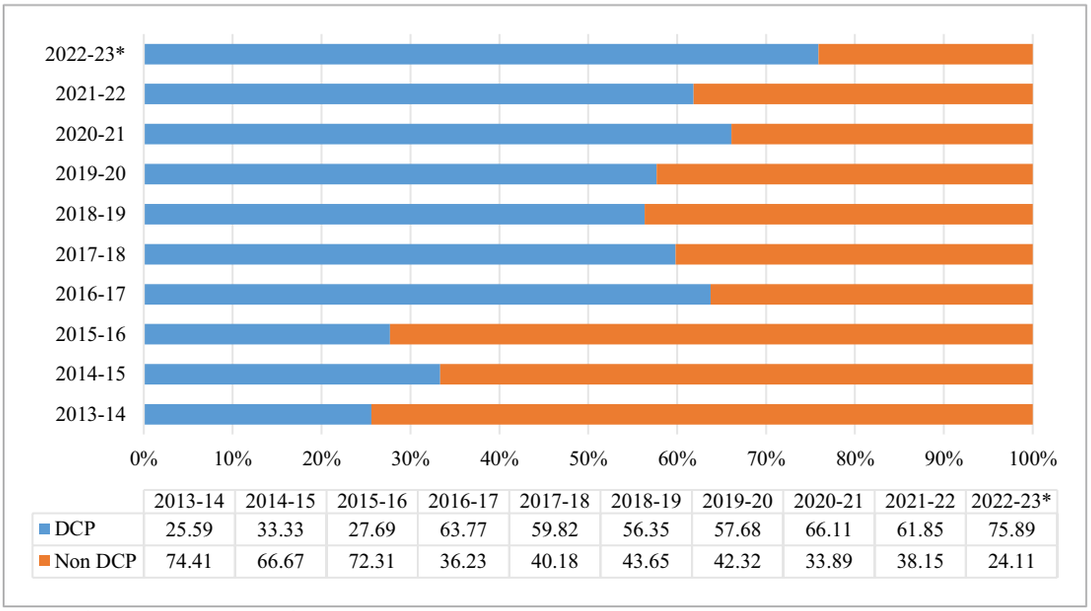


	Haryana	M.P.	Punjab	U.P.	Rajasthan
RMS 2018-19	884	960	898	1128	122
RMS 2019-20	903	961	831	750	102
RMS 2020-21	781	1594	1050	664	220
RMS 2021-22	761	1725	888	1152	227
RMS 2022-23*	311	591	799	81	0.9

Note: **As on 30.06.2022*
Source: Food Corporation of India

2.40 It is evident from Chart 2.17 that the share of DCP States in total procurement of wheat was more than 50 percent from RMS2016-17 onward. The share was recorded at 66.1 percent in 2020-21 and then declined to 61.9 percent in 2021-22. It was noticed that the procurement reached to the level of 75.9 percent in RMS2022-23. The share of DCP States crossed more than 75 percent during the current marketing season. The share of DCP and Non-DCP States in total wheat procurement was 75.9 percent and 24.1 percent in RMS 2022-23 respectively. Punjab has adopted DCP system of procurement for wheat from RMS2014-15, but on request of State Government, FCI is participating in procurement operations. Among DCP States, Punjab shows highest share in procurement, which is 67.8 percent. The share of Madhya Pradesh is about 32.3 percent in procurement of wheat. Among the Non-DCP States, Haryana has shown relatively higher proportion in procurement of wheat during the same period which was 92.3 percent, whereas, Uttar Pradesh, was only 7.4 percent (Annex Table 2.3).

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



	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
DCP	25.59	33.33	27.69	63.77	59.82	56.35	57.68	66.11	61.85	75.89
Non DCP	74.41	66.67	72.31	36.23	40.18	43.65	42.32	33.89	38.15	24.11

*Note: *As on 30.06.2022 for RMS 2022-23*
Source: Food Corporation of India

Procurement vis-à-vis Production/ Marketed Surplus

2.41 Table 2.11 reveals that, in TE2021-22, Uttar Pradesh recorded 25.1 percent of total marketed surplus of wheat in the country followed by Punjab sharing 19.8 percent. Madhya Pradesh, Haryana, Rajasthan and Bihar shared 17.9 percent, 12.7 percent, 9.1 percent and 6.3 percent of marketed surplus respectively. Share of Uttar Pradesh, largest wheat producer in the country has share of only 9.5 percent in the total procurement. Punjab which has accounted for 19.8 percent marketed surplus, has highest procurement share of 35.2 percent. Madhya Pradesh is the second largest contributor to wheat procurement with a share of 30 percent in total procurement during TE2022-23 but it's share in marketed surplus has reached at the level of 17.9 percent followed by Uttar Pradesh (25.1%). Haryana, which contributes around 10 percent of total wheat production and 12.7 percent of marketed surplus, had a much larger share in procurement at 19.8 percent.

Table 2.11: Marketed Surplus of Wheat

(Million tonnes)

States	Marketed Surplus				Share in % total marketed surplus
	2018-19	2019-20	2020-21	TE2020-21	
Punjab	16.21	15.63	15.17	**15.7**	19.8
Haryana	10.15	9.58	10.42	**10.1**	12.7
Madhya Pradesh	12.16	14.43	15.77	**14.1**	17.9
Rajasthan	7.89	8.55	5.24	**7.2**	9.1
Uttar Pradesh	17.92	18.51	22.99	**19.8**	25.1
Bihar	5.32	4.59	4.97	**5.0**	6.3
All India	**76.43**	**79.58**	**80.93**	**79.0**	**100.0**

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

2.42 It is evident from Table 2.12 that the share of Rajasthan in total procurement (4.5%) was about half of its share in total marketed surplus (9.2%). Bihar, which has 6.3 percent share in marketed surplus, had a very negligible share in procurement. The Chart 2.18 clearly describes the uneven procurement operations as compared to the marketed surplus reported by the major wheat producing States. Hence, it is suggested to make procurement operations more robust and widespread among participating states and farmers.

Table 2.12: Procurement of Wheat

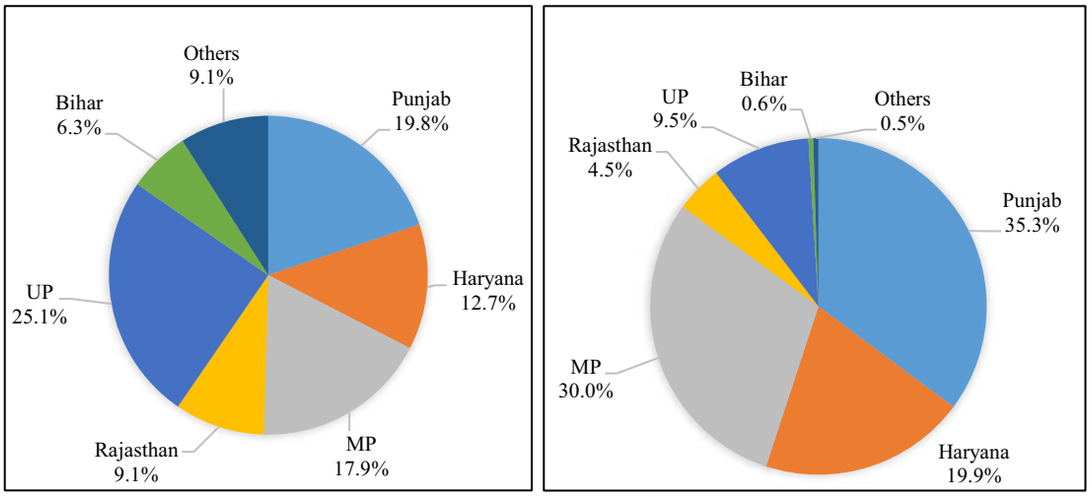
(lakh tonnes)

State	2020-21	2021-22	2022-23*	TE2022-23	Share in %
Punjab	127.1	132.2	96.5	**118.6**	35.3
Haryana	74.0	84.9	41.8	**66.9**	19.9
Madhya Pradesh	129.4	128.2	46.0	**101.2**	30.0
Rajasthan	22.3	23.4	0.1	**15.3**	4.5
Uttar Pradesh	35.8	56.4	3.4	**31.9**	9.5
Bihar	0.1	4.6	0.04	**1.6**	0.6
All India	**389.9**	**433.4**	**187.9**	**337.1**	**100.0**

*Note: * As on 30.06.2022*
Source: Food Corporation of India

Chart 2.18: Share of Major States in Marketed Surplus and Procurement of Wheat

(a) Marketed Surplus (TE2020-21) **(b) Procurement (TE2022-23)**



Sources: 1. Directorate of Economics & Statistics, Ministry of Agriculture & Farmers Welfare
2. Food Corporation of India

2.43 It is observed from the table 2.13 that Punjab, the third largest wheat producer has become the largest contributor to procurement in the country during RMS2022-23 with a share of 51.4 percent. Around 63.6 percent of the marketed surplus of Punjab's was procured by the Government. Madhya Pradesh recorded a decrease of 64.1 percent in procurement during current marketing season as compared to the previous season. During RMS2022-23, Madhya Pradesh shared around 30 percent of total procurement following Punjab. In case of Haryana, there was a significant decrease in procurement, from 84.9 lakh tonnes in RMS2021-22 to 41.8 lakh tonnes in RMS 2022-23, a decrease of 51.1 percent. It is evident from the Table 2.13, that Punjab procured 66.6 percent, Haryana 39 percent and Madhya Pradesh 20.4 percent of their total production in current marketing season.

2.44 At all India level, total wheat procurement decreased from 433.4 lakh tonnes in RMS2021-22 to 187.9 lakh tonnes in RMS2022-23. Uttar Pradesh, the largest producer of wheat registered a significant decline in procurement and only 0.8 percent of the total wheat produced in the State was procured in the current marketing season. Similarly, Punjab, Haryana and Madhya Pradesh recorded 66.6 percent, 39.0 percent and 20.4 percent procurement of total wheat production respectively. Rajasthan and Bihar also show decline in wheat procurement during RMS2022-23 as compared to the last season.

Table 2.13: Procurement of Wheat in Leading Wheat Producing States

(Lakh tonnes)

State	RMS 2020-21			RMS 2021-22			RMS 2022-23		
	Procurement	Production	% of Prod.	Procurement	Production	% of Prod.	Procurement*	Production#	% of Prod.
Punjab	127.1	176.16	72.2	132.2	171.9	76.9	96.5	144.6	66.6
Haryana	74.0	118.76	62.3	84.9	123.9	68.5	41.8	106.2	39.0
Madhya Pradesh	129.4	196.07	66.0	128.2	181.8	70.5	46.0	224.2	20.4
Rajasthan	22.3	109.16	20.4	23.4	110.4	21.2	0.1	98.2	0.0
Uttar Pradesh	35.8	338.15	10.6	56.4	355.1	15.9	3.4	341.6	0.8
Bihar	0.05	55.80	0.1	4.6	61.5	7.4	0.04	56.0	0.1
All India	**389.9**	**1078.61**	**36.2**	**433.4**	**1095.9**	**39.6**	**187.9**	**1064.1**	**17.5**

*Note: *As on 30.06.2022, # As per 3rd Advance Estimates of 2021-22*
Source: Food Corporation of India

2.45 It is evident from the above analysis that Government has become the single largest buyer and virtually a monopsonist in wheat market. Nearly 70 percent of total wheat production was procured by Government agencies in major wheat producing States like Punjab, Madhya Pradesh and Haryana.

Pulses

2.46 Table 2.14 shows the procurement figures for gram and lentil, major rabi pulses, for the last three marketing seasons. The total procurement of gram was 631.2 thousand tonnes during RMS2021-22 (5.7 percent of production). In RMS2022-23, the procurement of gram has increased to 2554.7 thousand tonnes which is 19.3 percent of total production. Hence procurement of gram witnessed more than four-fold increase in RMS2022-23 over the previous season. The share of procurement as percent of total production ranged from 3.3 percent in Uttar Pradesh to 28.7 percent in Telangana. The all-India average of procurement is recorded 19.3 percent in RMS2022-23, which is much lower than the existing procurement limit of 25 percent of production. The State governments have been demanding enhancement of procurement limit from 25 percent to 50 percent but it is evident from the above results that existing limit of 25 percent is not a constraint but there is need to strengthen procurement operations of pulses so as to ensure remunerative prices to farmers. In case of lentil, no procurement was recorded in RMS2022-23 as market prices remained higher than the MSP.

Table 2.14: Procurement of Gram and Lentil in Major Producing States

(000 tonnes)

Crop	State	Procurement (in thousand tonnes)			Procurement as a % of total production		
		RMS2020-21	RMS2021-22	RMS2022-23*	RMS2020-21	RMS2021-22	RMS2022-23*
Gram	Telangana	47.6	16.7	58.5	23.9	7.0	28.7
	Rajasthan	615.7	17.5	298.7	23.2	0.8	12.0
	Maharashtra	370.7	219.0	686.6	16.6	9.1	22.1
	Andhra Pradesh	127.9	10.1	71.8	22.9	1.9	13.7
	Madhya Pradesh	706.3	194.4	802.0	25.9	6.0	24.8
	Gujarat	124.0	151.4	536.2	19.5	11.8	25.0
	Haryana	10.6	0	1.2	22.5	0.0	3.0
	Uttar Pradesh	38.5	0	25.9	4.5	0.0	3.3
	Karnataka	101.8	22.0	73.8	15.1	4.9	10.7
	All India	**2143.1**	**631.2**	**2554.7**	**19.3**	**5.7**	**19.3**
Lentil	Madhya Pradesh	1.4	0.02	0	0.5	0	0
	Uttar Pradesh	0	0	0	0	0	0
	All India	**1.4**	**0.02**	**0**	**0.1**	**0**	**0**

*Note: *As on 30.06.2022*
Source: National Agricultural Cooperative Marketing Federation of India

2.47 The number of farmers benefitted, at all India level, from procurement operations of pulses in RMS2022-23 increased to 11.8 lakh (as on 30th June, 2022) as compared to 4 lakh in the previous season. In the current marketing season, Maharashtra has the highest number of beneficiaries, followed by Gujarat and Madhya Pradesh as far as procurement of gram is concerned. The State-wise breakup of number of farmers benefitted during the last three seasons is given in Annex Table 2.4.

2.48 The procurement of pulses can be enhanced by addressing institutional and infrastructure constraints in procurement operations. However, disposal/ liquidation of stocks of pulses procured under PSS by NAFED has been a challenge as NAFED incurs heavy losses in open market and sale of stocks in the market depresses market prices and sentiments. Therefore, there is an urgent need to address the institutional and infrastructure constraints that hinder price support linked procurement and to have a long- term sustainable policy for disposal of stocks.

Table 2.15: Procurement of Pulses under Price Support Scheme (PSS)

(lakh tonnes)

Crop	(KMS 2020-21& RMS 2021-22)		(KMS 2021-22 & RMS 2022-23*)		% increase in Procurement
	Sanctioned Quantity	Procurement	Sanctioned Quantity	Procurement	
Gram	30.45	6.31	33.10	25.55	304.7
Lentil	2.59	-	3.38	-	-
Tur	7.20	0.11	7.10	0.36	229.3
Moong	6.50	1.67	5.19	0.81	-51.3
Urad	2.85	0.01	3.89	0.02	60.6
Total	**49.60**	**8.11**	**52.66**	**26.74**	**229.7**

*Note: *As on 30.06.2022*
Source: National Agricultural Cooperative Marketing Federation of India

2.49 In terms of overall procurement of pulses, procurement under the PSS was around 26.74 lakh tonnes during 2021-22 (as on 30th June 2022), an impressive increase of 229.9 percent over 2020-21 (Table 2.15). This was mainly due to a significant increase in procurement of gram, from 6.31 lakh tonnes in RMS2021-22 to 25.55 lakh tonnes in RMS2022-23. Further, procurement of kharif pulses viz tur, moong and urad witnessed a significant change in RMS2022-23 as compared to the previous year. Procurement of moong was decreased to 0.81 lakh tonnes in RMS2021-22 as compared to 1.67 lakh tonnes in 2020-21. Overall, the total procurement of pulses is found to be 50.8 percent of the sanctioned quantity in 2022-23. The procurement of 26.74 lakh tonnes in the current marketing season, however, is more than tripled compared to the previous season.

Oilseeds

2.50 In case of mustard seeds, market prices have remained well above the MSP in the current marketing season and surged drastically to about 38 percent as compared to MSP during the last marketing season. In RMS2022-23, due to higher market prices than MSP, the procurement was reported as nil in major producing States, whereas in RMS2021-22, 68 tonnes mustard seeds were procured in Madhya Pradesh. In terms of the number of beneficiary farmers, it is observed that 2,713 sunflower growing farmers and 1,297 groundnut growing farmers were benefitted from procurement during RMS 2021-22. In RMS2022-23, 1439 farmers were benefited from procurement of oilseeds as on 30th June, 2022. The State-wise breakup of number of farmers benefitted during the last three seasons is given in Annex Table 2.5.

2.51 State Governments may take adequate measures to undertake procurement when bumper harvest lowers market price compared to MSP. The Commission strongly feels that procurement agencies may not liquidate stocks in open market below the MSP particularly during the procurement season. A viable alternate would be to fix a reserve price linked to MSP for disposal of stocks as is being done for wheat and rice under Open Market Sales Scheme (Domestic). The major constraints in procurement and disposal of agricultural commodities such as difficulties in arranging storage space near procurement centres and disposal within 9 months under the PSS when huge procurement is made are to be adequately addressed by the Government.

Remunerative Prices to Farmers: PM-AASHA

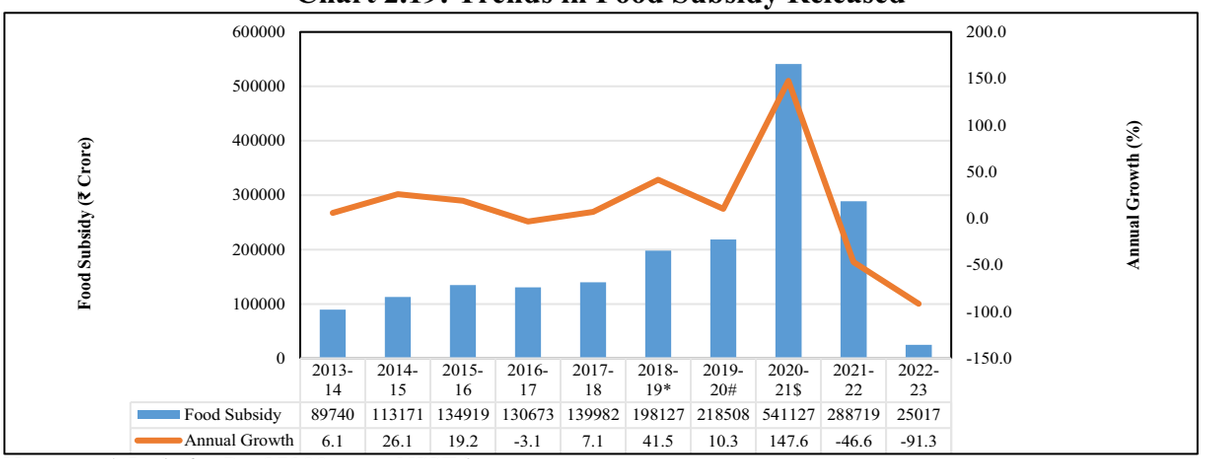
2.52 An umbrella Scheme named 'Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) was launched by the Government of India in September 2018 to ensure remunerative prices to farmers. This Scheme comprises of three components (i) Price Support Scheme, (ii) Price Deficiency Payment Scheme and (iii) Pilot of Private Procurement & Stockist Scheme. Under the PSS, overall quantity of procurement by Central Government is restricted to 25 percent of actual production of the commodity for that particular season. If State/UT Government intends to procure beyond 25 percent but to a maximum of 40 percent of production through Central agencies, then the quantity will be utilised by the State Government for its PDS and other welfare schemes at its own cost.

2.53 After implementation of PM-AASHA, PSS has made a significant stride in terms of procurement of pulses and oilseeds by NAFED, but PDPS and PPSS have not made much progress. The Commission strongly recommends that PDPS and PPSS can be strengthened in addressing the procurement issues of oilseeds and pulses as physical procurement of these crops is not feasible due to the absence of procurement and market infrastructure unlike that of wheat and paddy.

Food Subsidy and Economic Cost of Grains

2.54 Food subsidy has three components, (i) consumer subsidy (difference between Economic cost and Central Issue Price), (ii) buffer subsidy consisting of operational cost of buffer stock and carryover charges paid to the State Agencies for holding wheat stock beyond 30th June of each RMS and (iii) subsidy for losses in the process of procurement, storage and distribution of food grains due to multiple handling, transportation and long storage. The trends in total food subsidy during 2013-14 to 2022-23 are presented in Chart 2.19. Food subsidy has increased significantly during the 2013-14 to 2020-21 due to rising difference between economic cost and Central Issue Price (CIP) of grains. During 2020-21, food subsidy was ₹5.41 lakh crore owing to free distribution of food to poor under PMGKY to fight Covid-19 pandemic which declined to ₹2.88 lakh crore in 2021-22, and further likely to be declined to ₹2.50lakh crore in 2022-23. Food subsidy is estimated at ₹0.25 lakh crores in 2022-23 a decline of 91.3 percent as compared to previous year. The economic cost of wheat is expected to increase from ₹2500 per quintal in 2021-22 to ₹2589 per quintal in 2022-23, which is higher than 28.5 percent of MSP.

Chart 2.19: Trends in Food Subsidy Released



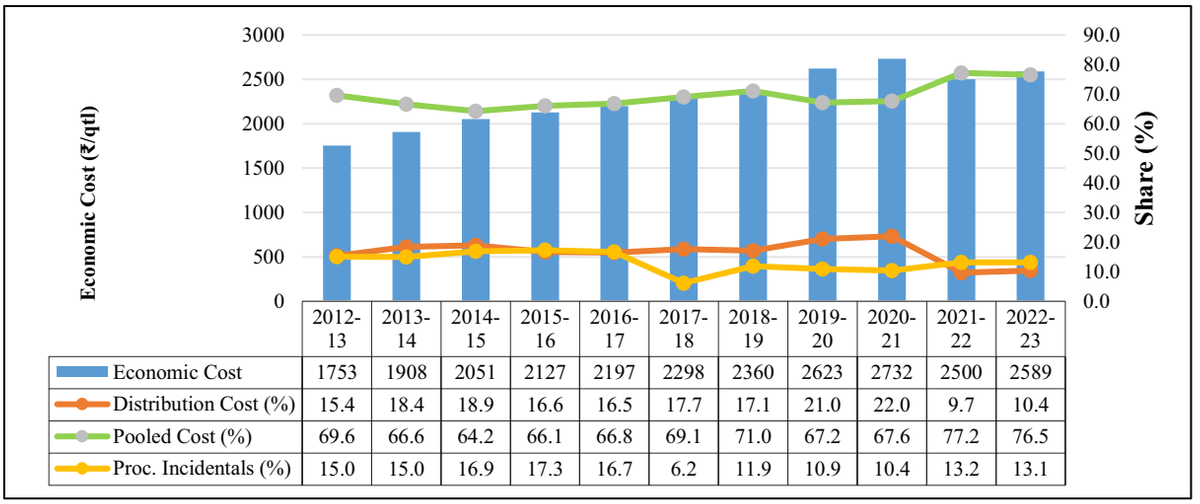
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19*	2019-20#	2020-21$	2021-22	2022-23
Food Subsidy	89740	113171	134919	130673	139982	198127	218508	541127	288719	25017
Annual Growth	6.1	26.1	19.2	-3.1	7.1	41.5	10.3	147.6	-46.6	-91.3

Note: ** Includes Rs. 97000 crore NSSF loan*
 # Includes Rs. 97000 crore NSSF loan
$ Includes Rs. 118712 crore allotments to FCI for repayment of NSSF loan

Source: Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution

2.55 Economic cost of procuring food grains by FCI has three main components (i) pooled cost of grains, (ii) procurement incidentals consisting of statutory charges, gunny cost, labour, transportation, storage, interest etc. and (iii) distribution costs consisting of freight, handling, storage and interest etc. The pooled cost of grain accounts for over two-third of economic cost (Chart 2.20). The share of pooled cost was 67.6 percent in RMS2020-21 which increased to 77.2 percent of Economic Cost in RMS2021-22 and subsequently declined to 76.5 percent in RMS2022-23. The distribution cost increased considerably from ₹241.5 per quintal in RMS2021-22 to ₹268.2 per quintal in RMS2022-23. However, the share of procurement incidentals is reported to be consistent at 13.1 percent in RMS2022-23 with reference to the previous year.

Chart 2.20: Economic Cost of Wheat and Share of Different Components of Economic Cost



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Economic Cost	1753	1908	2051	2127	2197	2298	2360	2623	2732	2500	2589
Distribution Cost (%)	15.4	18.4	18.9	16.6	16.5	17.7	17.1	21.0	22.0	9.7	10.4
Pooled Cost (%)	69.6	66.6	64.2	66.1	66.8	69.1	71.0	67.2	67.6	77.2	76.5
Proc. Incidentals (%)	15.0	15.0	16.9	17.3	16.7	6.2	11.9	10.9	10.4	13.2	13.1

Source: Food Corporation of India

2.56 Economic cost of wheat has recorded average annual growth rate of 2.6 percent while growth rate of procurement incidentals and pooled cost recorded 23.8 percent and 4.5 percent respectively followed by -(0.8) percent growth rate in distribution cost during 2018-19 to 2022-23. Increase in pooled cost of grains is in line with increase in MSP of wheat and lower growth rate in procurement incidentals is due to reduction in statutory charges after introduction of GST. However, these charges are still high in some States. There is a need to reduce procurement incidentals by reducing mandi fee and other charges in States like Punjab and Haryana. Distribution costs also need to be reduced through strengthening procurement operations in major wheat producing States like Uttar Pradesh, Bihar and Rajasthan.

Distortions in Agricultural Markets

2.57 In India, agricultural markets suffer from various restrictions and distortions related to price & trade policies such as over-regulation, barriers in expanding modern storage and other infrastructure, limited reach of price support schemes, lack of awareness among farmers, high statutory taxes and charges, export restrictions etc. Such market distortions have manifested in overproduction of certain agricultural commodities in some States and underproduction of some crops like oilseeds, nutri-cereals, etc. In 2018-19, Standing Committee of Parliament on Agriculture observed that the APMC laws are not implemented in their true sense. Issues identified by the Committee include: (i) most of APMCs have a limited number of traders operating, which leads to cartelization and reduces competition, and (ii) undue deductions in the form of

commission charges and market fees. Traders, commission agents, and other functionaries organise themselves into associations, which do not allow easy entry of new comers into market yards, stifling competition.

High Market Fee and Commission Charges

2.58 The country has a uniform MSP across states, yet the actual cost incurred by the farmers at markets/mandis varies from State to State. States impose mandi fee and other charges on the sale and purchase of agricultural produce for development of infrastructure such as market yards, rural roads, storage etc. for efficient marketing of agricultural produce. The statutory charges vary widely across States, which restrict inter-State trade and create inefficient marketing system in the country. These charges are found to be high and uneven across the States. It is evident from the Table 2.16 that Punjab charges 3 percent of value of transaction as market/ mandi fee and rural development cess each and a total of about 8.5 percent are taken away through various taxes/commission, which is the highest in the country. Haryana, on the other hand, charges 2.5 percent of the value of produce as commission for agents and the total cost incurred is reported at 6.50 percent. In Rajasthan the commission charge for agent is at the rate of 2.25 percent and the total cost incurred is reported at 4.35 percent. Uttar Pradesh and Madhya Pradesh have reported the total cost incurred at 3.87 and 3.57 percent respectively. The Commission had recommended in the earlier reports that such charges should be rationalized to encourage market competition and to promote free inter-state trade. It will help to achieve the objective of national agricultural market. However, States are unwilling to reduce these statutory and other charges and to amend their existing restrictive legislations.

Table 2.16: Market Fees/Taxes/ Charges levied on Procurement of Rabi Crops in major States during RMS 2022-23

(In percent)

State	Market/ Mandi fee	Commission for Agents/ Ahratiyas	Rural Development Cess	Infrastructure Development Cess and others	Total
Haryana	2	2.5	2	-	6.50
Rajasthan	1.6	2.25	-	0.5	4.35
Punjab	3	2.5	3	-	8.50
Madhya Pradesh	2	1.37	-	0.2	3.57
Uttar Pradesh	2.5	1.37	-	-	3.87

Source: *1. Concerned State Governments*
2. Food Corporation of India
3. Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution

Awareness about Price Policies and FAQ Standards

2.59 Awareness about MSP and FAQ norms among farmers can make procurement operations more effective. Farmers in many States are not aware about the MSP and the mandated crops under procurement due to lack of publicity and inadequate extension services provided by State Governments. Knowledge about FAQ standards can reduce instances of rejection of farmers' produce at APMC mandis/procurement centres. Grain drying & cleaning facilities and laboratories for the purpose of quality checks may be established near mandis. State Government should make sincere efforts to create awareness among farmers about the MSP, quality

specification, details of procurement centres, procurement period, registration/ documents requirement and information about procurement agencies. The information should be disseminated at an appropriate time in regional/ vernacular languages through Krishi Mitra/ Sakhi (volunteers), published through electronic and print media like TV, radio, newspapers and modern information & communication technology like mobile phone, WhatsApp & Facebook etc.

Role of e-Marketing Platforms

2.60 An electronic platform, National Agriculture Market (e-NAM) was designed and launched in 2016 with the objective to link agricultural mandis electronically to bring transparency and creating a nation-wide network of markets in order to remove the existing market distortions in India. The e-NAM is a pan-India electronic trading portal aimed at networking the existing mandis to "One Nation One Market" for agricultural commodities in the country. It is presently progressing successfully in India. The electronic trading platforms is now the need of the time as it plays very vital role to augment farmers' welfare by providing the benefits such as access to better price discovery, access to more markets, real time information on prices in nearby markets, transparency in trade, quick online payment and generating a healthy financial profile.

2.61 The entities such as an electronic trading and transaction platform may include companies, partnership firms, or registered societies, having permanent account number under the Income Tax Act, 1961 and farmer producer organisations or agricultural cooperative societies. However, the role of e-marketing platforms in ensuring remunerative prices to farm produce shall be widely publicized especially among marginal and small farmers.

Promotion of Farmers Producer Organizations / Farmers Producers Companies

2.62 More than 86 percent of Indian farmers are small and marginal and thus, are unable to get good markets and value for their produce. Organizing them into groups will help them to benefit from economies of scale and scope in sourcing of inputs, marketing and value-addition of their produce. Commodity- specific farmers Producer Organisations/ Companies should be promoted and encouraged to take up functions of aggregation, sorting/ grading and direct marketing of produce to traders, large buyers and processors. Such organisations will create more competition in the market, improve their bargaining power and ensure better prices to member producers. Farmers Producer Organizations / and Farmers Producers Companies (FPOs/FPCs) are the engines of growth in rural areas by increasing bargaining power of farmers on price realization of agricultural commodities. Through Custom Hiring Centres (CHC) and other farm mechanization schemes, the FPOs have considerably reduced their cost of production in major crops. In India, the number of registered FPOs was reported to be 7059, with Karnataka having 578 registered FPOs followed by Maharashtra with 569 registered FPOs as on 9th March, 2022. Small Farmers Agribusiness Consortium (SFAC) has developed FPOs and Farm gate modules under e-NAM enabling farmers to trade on real time and uploading details of their produce for better market prices. Promotion of FPOs would certainly help in overcoming farm gate losses and minimizing transportation & handling expenses by facilitating farmers to trade from their collection centres.

Recapitulation

2.63 As per USDA global wheat production is forecast to decline by less than 1 percent i.e. from 1070.5 million tonnes in 2021-22 to 1054.4 million tonnes in 2022-23. The international wheat prices are expected to be stable on account of expected record supplies and carryover stocks with higher consumption in the world market. The global barley production in 2022-23 is forecast to be 147.9 million tonnes which is about 2.6 percent above as compared to last year. On the other hand, there is an increase is recorded in global production and supply of pulses in 2022-23 due to record

production in Canada. Combined with increased demand for pulses in India and China, prices of pulses in 2022-23 are expected to increase. In case of oilseeds, total production is expected to recover in 2020-21 from a marked drop in the previous year reaching above 610 million tonnes. Hence, a tight market outlook for oilseeds and derived products in 2022-23, is expected with a slight improvement in the global supply-demand picture, including moderate stock replenishments

2.64 In India, wheat production is likely to reach at level of 106.4 million tonnes in 2021-22. The sufficient production of wheat and larger stocks will put downward pressure on wheat prices unless export avenues open up with export promotion policies/ incentives. Pulses production in the country has been steadily increasing in the last two years reaching a record high of 154.3 million tonnes in 2021-22. Amongst rabi pulses, production of gram is estimated to increase by 17.4 percent in 2021-22 in comparison to the previous year while lentil production is expected to decline by of 3.4 percent. Hence, an effective procurement policy has to be formulated for robust procurement besides opening up of export opportunities.

2.65 Price Deficiency Payment Scheme and Private Procurement & Stockist Scheme should be strengthened in order to complement the Government's direct procurement operations for better price discovery. There is a need to augment high MSPs with strengthening of procurement operations to make the price support policy more effective besides identifying the export opportunities. This should be combined with increasing awareness about MSP and FAQ norms among farmers. Since only 25 percent of the production is allowed under PSS, a long-term sustainable policy for disposal of pulses and oilseeds stocks needs to be devised for better outreach to entire farming community.

2.66 In order to reduce distortions in agricultural markets and to rationalize fees/taxes and other charges imposed by States during sale and purchase of agricultural produce, the role of e-marketing platforms in ensuring remunerative prices shall be widely publicized among farmers of marginal and small category. FPOs/FPCs are to be promoted across the country for making uniform long term plan starting from selection of crops to development of marketing infrastructure at farm gates.

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CHAPTER 3

Crop Yield: Trends and Drivers

3.1 India is a major food producing country in the world. The country has witnessed a significant improvement in crop yield over the last seven decades. Rise in crop yield of cereals and pulses have helped in achieving food security in order to meet the growing demands of a rising population. Increasing productivity of farms significantly contributes to rural prosperity and competitiveness in the agricultural market. Augmenting agricultural productivity is determined by several factors such as the availability and quality of agricultural inputs like land, water, seeds, fertilizers, access to credit & insurance. This chapter delves into the growth patterns in the yield levels & cross country comparisons in terms of productivity of major rabi crops. Further, this chapter elaborately covers the recent trends in inter-state and inter-district yield levels along with their respective yield gap and also analyses the drivers of yield growth.

Triennial Yield Growth Trends

Table 3.1 presents growth rates of area, production and yield of rabi crops for the triennium ending (TE) 2011-12, TE2016-17 and TE2021-22.

Cereals

3.2 For the TE2021-22, the production growth of rabi cereals stood at 2.7 per cent, which was substantially higher than the growth witnessed in the previous period (TE2016-17). The increase in production can be attributed to a 2.4 percent growth in the area under cereals for the same period. In the curious case of barley, for the TE2021-22, in spite of improvement in yield by 1.2 per cent, the area under barley reduced. This resulted in a negative growth of 0.8 per cent. On the contrary, area under wheat increased by 1.4 percent and yet the yield declined by 0.4 percent due to which production registered an increase of only 0.9 percent for the TE2021-22 as against 1.2 percent growth in the previous period. In the case of wheat, a comparative decline in area (-) 0.02 per cent and yield (-) 0.01 per cent, coupled with high temperature, led to a decline in production to 0.03 per cent in 2021-22.

Pulses

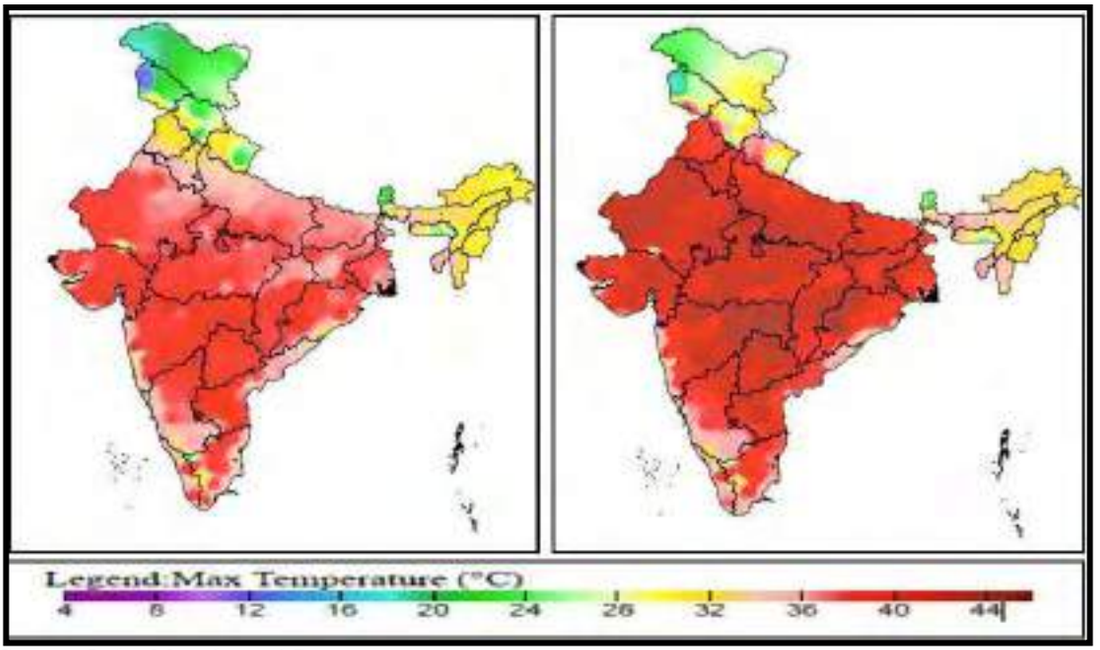
3.3 For the TE2021-22, encouraging trends have been observed in the area, production and yield of Rabi pulses. Production growth for Rabi pulses was 11.8 percent during this period. The reasons that can be attributed to the same are an increase in area by 6.2 percent and improvement in yield by 5.2 percent. Further, 12.1 percent production growth in gram is noteworthy and contributed to the growth of rabi pulses.

Box: 3.1

Impact of Heat Wave on Productivity

In 2022, India recorded extremely high temperature for the month of March that triggered an early onslaught of heat waves. These deadly heat-waves went on to engulf several States across North, Central and East India from March-May. Extreme temperature during the months of March and April has caused dry winds, high evapotranspiration and moisture stress that adversely affected the rabi crops, particularly the wheat crop. Furthermore, the wheat crop which was sown late (covering about 6-7 million ha area) was affected unfavourably.

Heat Waves during March 2022 and April 2022



Source: India Metrological Department

As reported in the special report "Heat Wave 2022" prepared by ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, Telangana, India, several districts of Punjab, Haryana, Himachal Pradesh, Madhya Pradesh, Uttar Pradesh and Rajasthan have been adversely affected due to the unusual heat wave experienced in the month of March this year. Rise in temperature has caused yellowing and shriveling of wheat grain and an early maturity that resulted in yield loss up to 25 percent in Punjab and up to 10 to 15 percent in Haryana. Madhya Pradesh, Uttar Pradesh and Rajasthan have also faced yield loss in wheat due to rise in temperature. Moreover, other crops such as chickpea, maize, and mustard have also been adversely affected due to extreme temperature.

Intense extreme weather events are being observed across India which pose a stiff challenge for achieving sustainable agricultural growth. A robust and climate change resilient agricultural sector and policy thereon is an essential pre-requisite for ensuring the food and livelihood security of the country.

Oilseeds

3.4 As against negative growth witnessed in area and production for the TE2016-17, oilseeds recorded a positive increase in both area and production for the TE2021-22. For instance, the area under rabi oilseeds increased by 8.3 percent as against (-) 3.4 percent in the previous period. Further, rabi oilseeds also registered a production growth of 8.5 percent as against (-) 0.3 percent in the previous period. Yield growth in rabi oilseeds, however, stood at 0.5 per cent for the TE2021-22, which was lower as compared to 2.8 percent growth for the TE2016-17. During the current period, safflower registered spectacular growth in area, production and yield by 11.8 per cent, 27.9 per cent and 13.8 per cent, respectively. In the case of rapeseed & mustard, both the area and production improved significantly for the TE2021-22 as compared to the TE2016-17. However, the yield growth was comparatively lower as opposed to the previous period.

Table 3.1: Triennial Trends in Growth Rate of Major Rabi Crops

Period	Cereals				Pulses			
	Wheat	*Barley*	*Rabi*	*Total*	*Gram*	*Lentil*	*Rabi*	*Total*
Area								
TE2021-22	1.4	-1.9	2.4	1.4	5.6	2.0	6.2	2.5
TE2016-17	0.4	-0.1	-0.1	0.0	-0.2	3.6	0.8	5.8
TE2011-12	2.5	-2.4	0.3	-0.1	2.1	4.4	2.8	3.8
All period	*0.8*	*-1.6*	*0.4*	*-0.1*	*3.2*	*0.7*	*2.9*	*3.0*
Production								
TE2021-22	0.9	-0.8	2.7	2.9	12.1	7.3	11.8	8.0
TE2016-17	1.2	-0.4	0.3	0.9	2.0	7.1	2.0	8.6
TE2011-12	5.6	0.1	3.3	3.6	3.2	4.0	3.8	6.3
All period	*2.3*	*0.2*	*2.2*	*2.2*	*6.4*	*4.6*	*6.0*	*6.0*
Yield								
TE2021-22	-0.4	1.2	0.4	1.6	6.3	4.4	5.2	5.5
TE2016-17	1.1	0.0	0.5	1.0	1.0	3.6	0.6	1.7
TE2011-12	3.1	2.0	3.0	3.6	1.3	0.0	1.2	2.1
All period	*1.6*	*1.8*	*1.9*	*2.2*	*2.9*	*3.7*	*2.9*	*2.7*

Period	Foodgrains		Oilseeds			
	Rabi	*Total*	*R&M*	*Safflower*	*Rabi*	*Total*
Area						
TE2021-22	3.4	1.6	8.3	11.8	8.3	5.2
TE2016-17	0.1	1.1	-2.6	-5.2	-3.4	-2.2
TE2011-12	0.9	0.6	-0.8	-5.0	-3.8	-1.4
All period	*1.0*	*0.5*	2.1	-8.6	0.3	0.5

Production						
TE2021-22	3.6	3.3	8.5	27.9	8.5	6.9
TE2016-17	0.4	1.4	1.5	5.2	-0.3	-0.1
TE2011-12	3.3	3.7	-1.2	-8.3	-2.0	4.0
All period	*2.6*	*2.4*	4.8	-3.3	3.1	3.3
Yield						
TE2021-22	0.2	1.7	0.8	13.8	0.5	1.8
TE2016-17	0.3	0.2	3.6	6.0	2.8	1.9
TE2011-12	2.5	3.1	-0.6	-3.3	1.7	4.9
All period	*1.6*	*1.9*	2.6	3.3	2.8	2.7

Note: Average growth is average of last three year annual growth rate, for eg. TE 2011-12 is average of annual growth between 2009-10 over 2008-09 , 2010-11 over 2009-10 and 2011-12 over 2010-11

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

3.5 The above analysis shows that the growth rates in the production levels for most of the rabi crops improved for the TE2021-22 as compared to the TE2016-17. This improvement in production is attributable to the increase in area and yield levels of pulses and oilseeds. However, in the case of wheat, a comparative decline in area and yield, coupled with high temperature, led to a decline in production in 2021-22.

Benchmarking Productivity: Country Comparisons of Crop Yield

3.6 Juxtaposing India's crop productivity performance vis-à-vis other countries can aid in assessing India's global competitiveness. Table 3.2 contrasts the productivity levels of major crops cultivated during the rabi season with the world average productivity for the year 2020. It is encouraging to note that the all India average of wheat, barley and gram almost runs parallel to the world average in 2020. However, one can find a huge gap in the productivity levels of wheat, barley and gram between the world's highest producers and the all-India productivity levels. For example, in the case of wheat, the all India average (3,474 kg/ha) was just 50 percent of the yield reported in Germany (7,819.5 kg/ha). The average yield of Punjab (4,868 kg/ha) which was reported to be the highest in the country, was notably below than the world's highest average yield (62.25 per cent). Similar trends can also be observed in the case of barley and gram. For lentil, there was a considerable yield gap between the all India average (871.5 kg/ha) and the world average (1,305 kg/ha). Given the fact that India remains a leading consumer for pulses in the world, this is an area of concern. Although the western State of Rajasthan (1,332 kg/ha), which recorded the highest yield for lentil, was above the world average but it was nearly half of the world's highest yield [China (2,511.7 kg/ha)].

Table 3.2: International Comparisons of Yield of Major Rabi Crops (2020)

(kg/ha)

Crop	World Average	World Highest (except India)	All-India Average	State Highest
Wheat	3474	7819.5 (Germany) (2.91%)	3431.1 (14.14%) {43.88%}	4868 [PB] {62.25%}
Barley	3043	6459.1 (Germany) (6.86%)	2782.8 (1.1%) {43.08%}	3777 [PB] {58.48%}
Gram	1016	2072 (Ethiopia) (3.03%)	1012 (73.46%) {48.84%}	1667 [TG] {80.45%}
Lentil	1305	2511.7 (China) (2.51%)	871.5 (18.05%) {34.70%}	1332 [RJ] {53.03%}
Rapeseed	2039	3683.1 (Germany) (4.87%)	1216.5^ (12.61%) {33.03%}	2028 [HR] {55.06%}
Mustard	872	1091.4 (Nepal) (39.61%)		
Safflower	800	1721.6 (Mexico) (13.29%)	514.8 (6.74%) {29.90%}	931 [TG] {54.08%}

*Note : *Figures in parentheses show share of the country in total world production of the crop*
**Figures in Curly Brackets { } shows percentage comparison with worlds highest yield*
^All-India average yield is for rapeseed. Figures in parentheses show India's production of rapeseed as a percentage of world rapeseed production.

Sources: 1. FAOSTAT for World Average, World Highest and All-India Average.
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare for the State Highest

3.7 The highest yield of rapeseed & mustard (2,028 kg/ha) was observed in the northern State of Haryana which was 55.1 percent of the rapeseed yield in Germany (3,683.1 kg/ha). In the case of safflower, the all India average was 514.8 kg/ha which was just 64.4 percent of the world average of 800 kg/ha. The highest yield of safflower (931 kg/ha) was reported from the southern State of Telangana, which was 54.1 percent of the world's highest yield reported from Mexico (1,721.6 kg/ha).

3.8 Table 3.2 lays threadbare the fact that productivity levels in India for most of the rabi crops are low. Reasons behind the low yield levels of rabi crops in India include, but are not limited to, lack of adequate irrigation facilities, decline in soil-fertility, lack of support services and subsistence nature of farming. There remains tremendous potential to enhance the yield levels in order to reduce import dependency and ensure food security for our growing population. With adequate irrigation facilities, timely supply of quality seeds, nutrients & planting material; mechanization; optimal utilization of resources and adoption of efficient management practices; yield levels may witness an improvement in the near future. This will ultimately aid in catapulting India to a higher position on the world agricultural map.

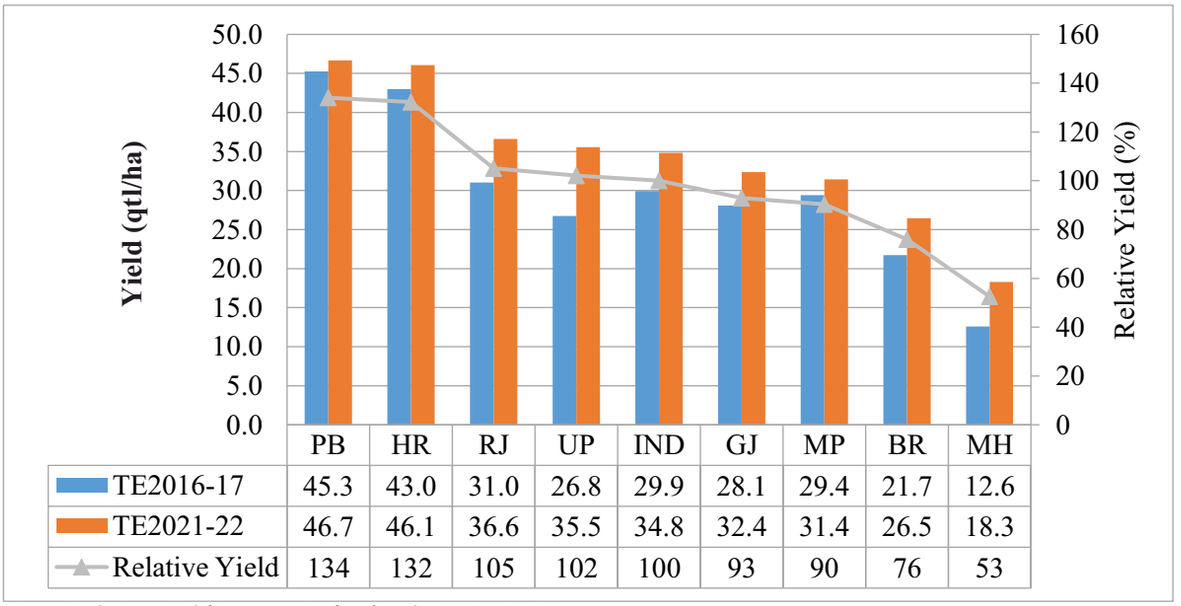
Crop Yield Analysis in Major Producing States

3.9 In order to understand the key trends and contrast inter-State variations, yield levels of major rabi crops in the major producing States for the TE2016-17 and the TE2021-22 have been examined and analysed in this section.

Wheat

3.10 Chart 3.1 shows the yield trends of major wheat producing States. At the all India level, the yield increased by 16.4 percent, from 29.9 qtl/ha for the TE2016-17 to 34.8 qtl/ha for the TE2021-22. Maharashtra, which had the lowest yield in both the periods, has shown a significant growth in yield by 45.2 percent, going up from 12.6 qtl/ha to 18.3 qtl/ha. On the other hand, Punjab which had the highest yield in both the periods, attained a marginal growth of only 3.1 percent in yield between the two periods. The eastern State of Uttar Pradesh which clocked the largest production share in the production of wheat, has shown a significant improvement in yield by 32.5 percent going up from 26.8 qtl/ha for the TE2016-17 to 35.5 qtl/ha for the TE2021-22. Other major States like, Bihar, Rajasthan and Gujarat performed well by attaining significant growth in yield by 22.1%, 18.1% and 15.3%, respectively. However, there remains massive scope for improvement in the yield of wheat for the State of Madhya Pradesh.

Chart 3.1: Average Yields in Major Wheat Producing States



	PB	HR	RJ	UP	IND	GJ	MP	BR	MH
TE2016-17	45.3	43.0	31.0	26.8	29.9	28.1	29.4	21.7	12.6
TE2021-22	46.7	46.1	36.6	35.5	34.8	32.4	31.4	26.5	18.3
Relative Yield	134	132	105	102	100	93	90	76	53

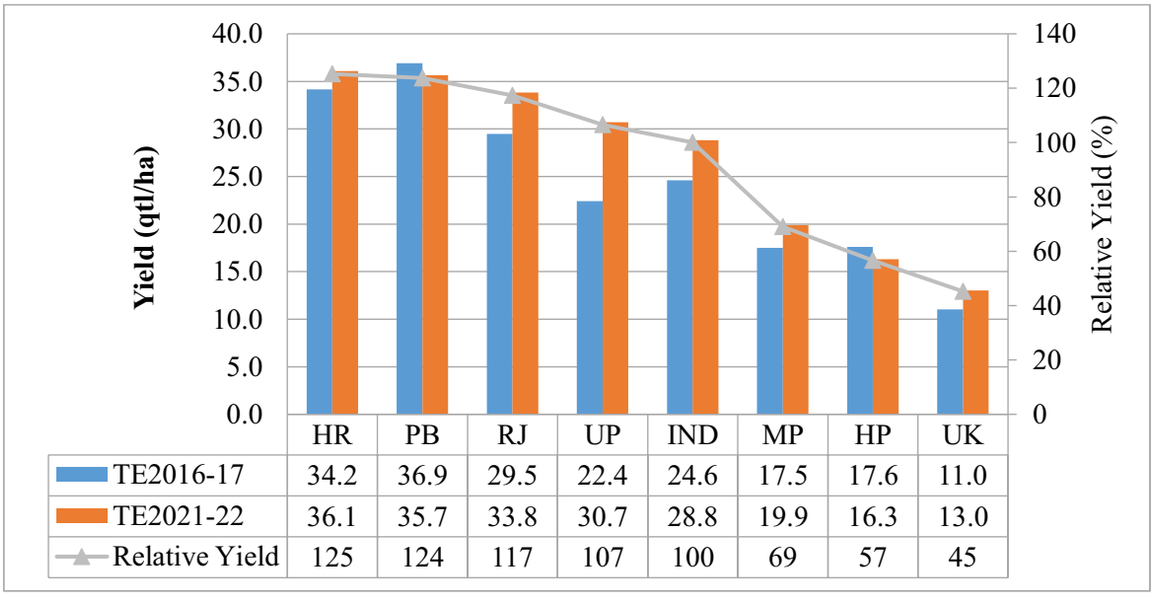
Note: Relative yield is w.r.t. India for the TE2021-22
Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Barley

3.11 The yield trends for barley in major barley producing States have been presented in Chart 3.2. The western State of Rajasthan which has a more than 50 percent share in the production of barley has shown further improvement by 14.6 percent for the TE2021-22 as compared to the previous period. Uttar Pradesh, the second largest producer of barley, has achieved the highest yield growth of 37.1 percent among all the major barley producing States. For the TE2021-22, Haryana

registered the highest average yield (36.1 qt/ha) while Uttarakhand recorded the lowest average yield (13.0 qtl/ha). Further, while Haryana registered a 5.6 percent yield growth, the hilly State of Uttarakhand recorded a noticeable growth in yield by 18.2 percent in the current period. Barring the States of Punjab and Himachal Pradesh, yield levels witnessed an improvement in all other major barley producing States which helped in improving the yield level at the all India level. The yield level saw a 17.1 percent increase for the TE2021-22.

Chart 3.2: Average Yields in Major Barley Producing States



	HR	PB	RJ	UP	IND	MP	HP	UK
TE2016-17	34.2	36.9	29.5	22.4	24.6	17.5	17.6	11.0
TE2021-22	36.1	35.7	33.8	30.7	28.8	19.9	16.3	13.0
Relative Yield	125	124	117	107	100	69	57	45

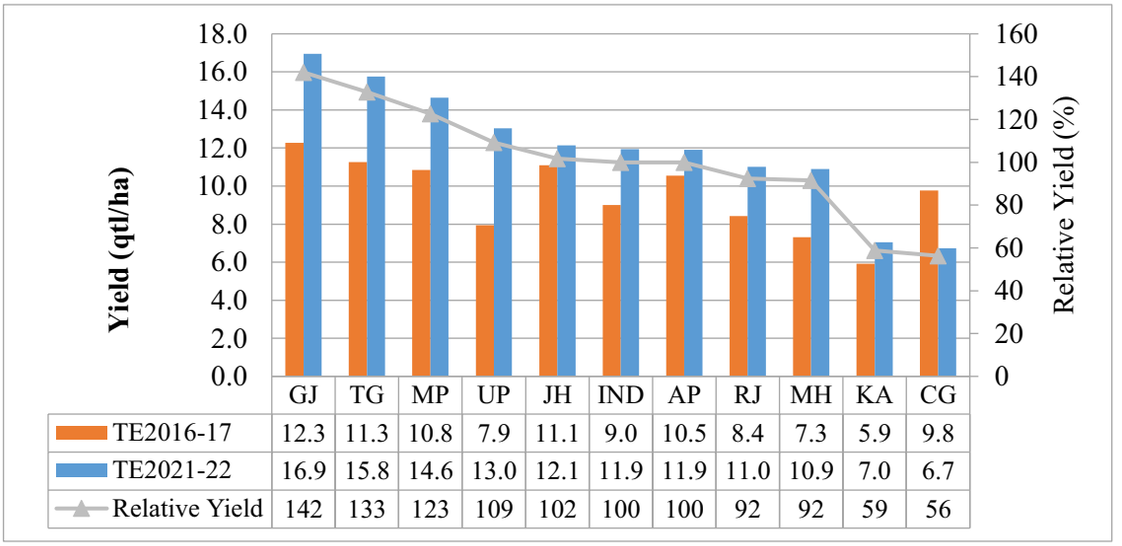
Note : Relative yield is w.r.t. India for the TE2021-22

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

Gram

3.12 Yield trends for major gram producing States have been presented in Chart 3.3. At the all India level, the average yield of gram increased from 9.0 qtl/ha for the TE2016-17 to 11.9 qtl/ha for the TE2021-22 registering an impressive growth of 32.2 percent. The yield improved in almost all the major gram producing States except for Chhattisgarh where the yield declined from 9.8 qtl/ha to 6.7 qtl/ha, recording a decline of 31.6 percent. The maximum rise in yield was observed in the case of Uttar Pradesh (64.6%), followed by Maharashtra (49.3%).The States of Gujarat, Telangana, Madhya Pradesh and Rajasthan also showed significant growth in gram yield by more than 30 percent.

Chart 3.3: Average Yields in Major Gram Producing States



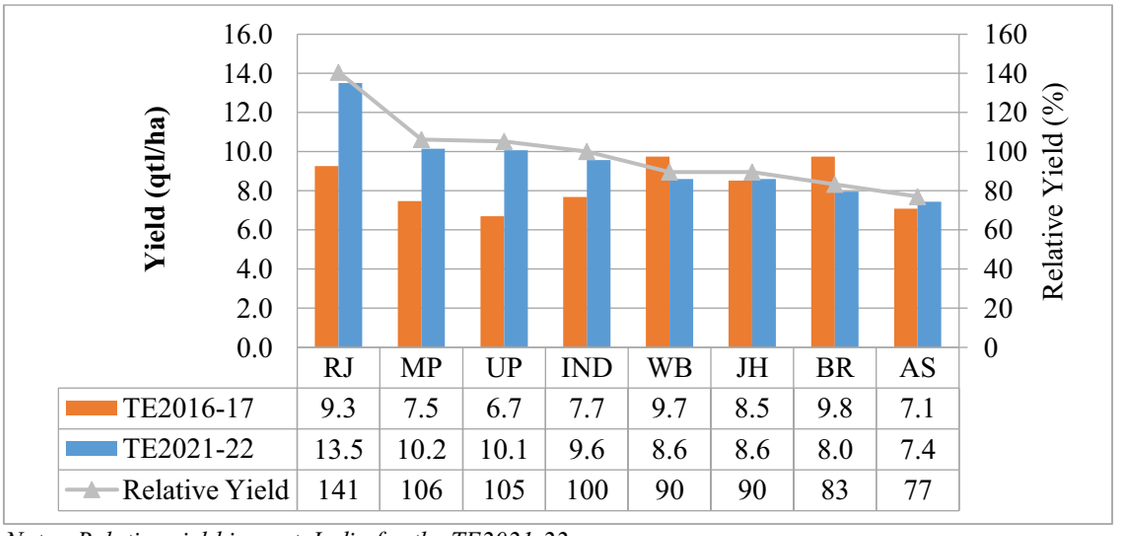
	GJ	TG	MP	UP	JH	IND	AP	RJ	MH	KA	CG
TE2016-17	12.3	11.3	10.8	7.9	11.1	9.0	10.5	8.4	7.3	5.9	9.8
TE2021-22	16.9	15.8	14.6	13.0	12.1	11.9	11.9	11.0	10.9	7.0	6.7
Relative Yield	142	133	123	109	102	100	100	92	92	59	56

Note : Relative yield is w.r.t. India for the TE2021-22
Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Lentil

3.13 Chart 3.4 illustrates the average yield of lentil in major lentil producing States. Madhya Pradesh, for instance, which has the largest production share of 41.2 per cent, achieved a 35.9 percent growth for the TE2021-22 as compared to the previous period. Uttar Pradesh, with a share of 32.0 percent and the second largest producer of lentils in the country, registered the highest growth of 50.7 percent, followed by the western State of Rajasthan (45.2%). Assam showed little improvement in lentil yield with a 5.0 percent growth rate while Jharkhand showed slight improvement in yield clocking a negligible 0.8 percent. The eastern States of Bihar and West Bengal witnessed a sharp decline in the yield of lentil during the current period by registering a negative growth of 18.3 percent and 11.3 percent, respectively.

Chart 3.4: Average Yields in Major Lentil Producing States



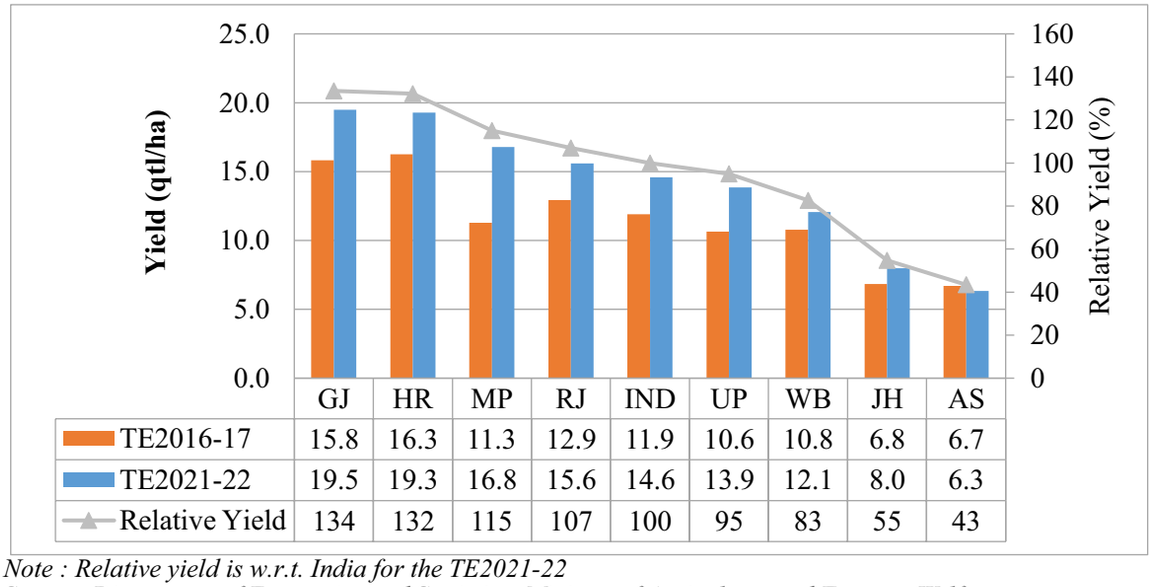
	RJ	MP	UP	IND	WB	JH	BR	AS
TE2016-17	9.3	7.5	6.7	7.7	9.7	8.5	9.8	7.1
TE2021-22	13.5	10.2	10.1	9.6	8.6	8.6	8.0	7.4
Relative Yield	141	106	105	100	90	90	83	77

Note : Relative yield is w.r.t. India for the TE2021-22
Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Rapeseed and Mustard

3.14 The average yield levels of R&M in major producing States has been depicted in Chart 3.5. During the current period, the highest yield (19.5 qtl/ha) was observed in the case of Gujarat while the lowest yield was observed in the case of Assam (6.3 qtl/ha). Except for the eastern State of Assam [(-) 5.4 per cent], all the other major R&M producing States saw a substantial increase in the yield levels of R&M for the TE2021-22. Consequently, the yield of R&M at the all India level improved significantly from 11.9 qtl/ha for the TE2016-17 to 14.6 qtl/ha for the TE2021-22, thereby clocking an increase of 22.7 percent. Madhya Pradesh exhibited laudable progress in improving the yield levels of R&M by attaining a yield growth of 48.7 percent. The eastern State of Uttar Pradesh also registered decent growth in R&M yield by 30.3 percent. Rajasthan, which has about 45 percent share in R&M production, showed further improvement in yield by attaining an impressive growth rate of 20.6 percent. Haryana, the second largest producer of R&M in the country, also registered a growth of 18.4 per cent in the yield of R&M during the periods under consideration.

Chart 3.5: Average Yields in Major Rapeseed and Mustard Producing States



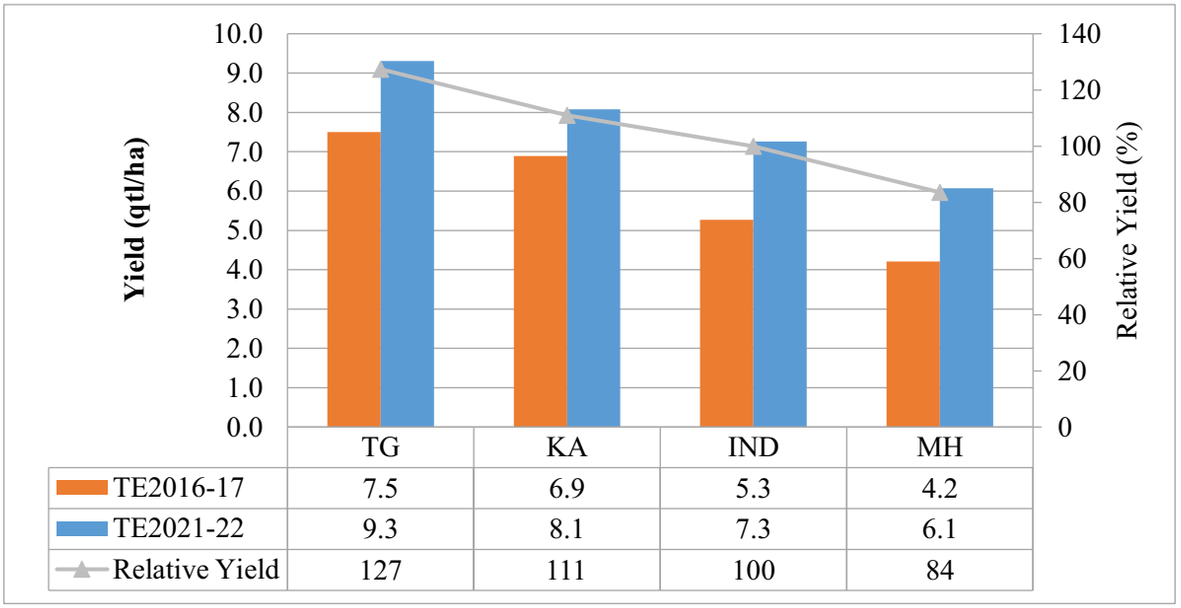
	GJ	HR	MP	RJ	IND	UP	WB	JH	AS
TE2016-17	15.8	16.3	11.3	12.9	11.9	10.6	10.8	6.8	6.7
TE2021-22	19.5	19.3	16.8	15.6	14.6	13.9	12.1	8.0	6.3
Relative Yield	134	132	115	107	100	95	83	55	43

Note : Relative yield is w.r.t. India for the TE2021-22
Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Safflower

3.15 Yield levels of safflower in major safflower producing States have been illustrated in Chart 3.6. Karnataka, which has more than 50 percent production share showed further improvement in yield by 17.4 percent. Maharashtra, the second largest producer of safflower in the country (34 per cent share), registered the highest growth of 44.3 percent for the TE2021-22 as compared to the previous period. The southern State of Telangana also showed a considerable improvement in yield for the TE2021-22 by registering a positive increase of 24 percent. Overall, the yield of safflower witnessed a 37.7 percent increase at the all India level for the TE2021-22.

Chart 3.6: Average Yields in Major Safflower Producing States



	TG	KA	IND	MH
TE2016-17	7.5	6.9	5.3	4.2
TE2021-22	9.3	8.1	7.3	6.1
Relative Yield	127	111	100	84

Note : Relative yield is w.r.t. India for the TE2021-22
Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Yield Gap Analysis in Major Producing States

3.16 The difference between the actual or realized yield vis-à-vis the potential yield for rabi crops in major producing States has been discussed in this section. For this analysis, Front Line Demonstration (FLD) and realised yield data supplied by various ICAR research institutes has been used. Different yield gap methods with varying definitions for potential and actual yields are being adopted by various research institutions and international organizations. Two major types of yield gaps have been considered namely, Yield Gap (A) and Yield Gap (B). The same have been succinctly defined as follows:

I. **Yield Gap (A):** Difference between potential farm yield (yield achieved under FLD where best scientific and management practices are followed) and realized farm yield under farmers' practices.

ii. **Yield Gap (B):** Compares State average yield with potential yield achieved under FLD.

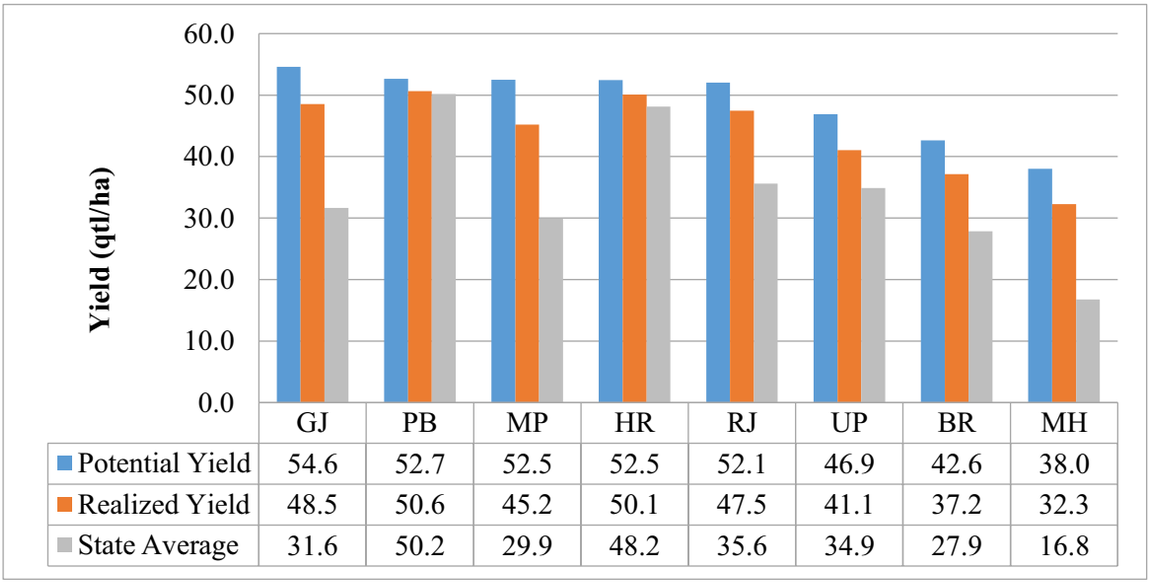
Yield Gap (A) is primarily due to technical constraints and inappropriate farm management practices such as inadequacy of high yielding varieties of seeds, absence of improved technology, poor input management, etc. Yield Gap (B) essentially occurs due to technological and management constraints coupled with socio-economic constraints faced by the farmers. Socio-economic constraints include, but are not limited to, non-availability of inputs and credit, risk averse behaviour of farmers, fragmented land holdings, lack of farm mechanization, etc. Yield Gap (B) also encompasses the regional differences in farm management practices.

Wheat

3.17 Chart 3.7 presents the yield gap analysis for wheat in the leading wheat producing States. The highest and lowest yield gap (A) was recorded in the States of Maharashtra and Punjab at 15 percent and 4.0 percent respectively while Yield gap (B) had a similar pattern with lowest gap recorded in the case of Punjab (4.8%) and the highest gap was observed in the case of Maharashtra (55.8%).Uttar Pradesh which has the largest production share exhibited a significantly high yield gap (B) at 25.5 percent. This indicates that there is further scope to improve the average yield in the State in order to improve the overall production of wheat in the country.

3.18 The large yield gaps in the aforementioned States may be reduced by adopting newly released varieties which have been tested under high fertility conditions having high potential yields such as UP 2938, DBW 327, CG 1029 (Kanishka), etc. The existing network of "Krishi Vigyan Kendras" should be leveraged in order to educate farmers about these varieties. Further, availability of latest and sophisticated technology, high quality seeds, inputs and extension services needs to be prioritised in order to bridge the existing yield gaps.

Chart 3.7: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Wheat Growing States, TE2020-21



	GJ	PB	MP	HR	RJ	UP	BR	MH
Potential Yield	54.6	52.7	52.5	52.5	52.1	46.9	42.6	38.0
Realized Yield	48.5	50.6	45.2	50.1	47.5	41.1	37.2	32.3
State Average	31.6	50.2	29.9	48.2	35.6	34.9	27.9	16.8

Note: Wheat FLD was not conducted during 2020-21

Sources: 1. Indian Institute of Wheat and Barley Research, Karnal

2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

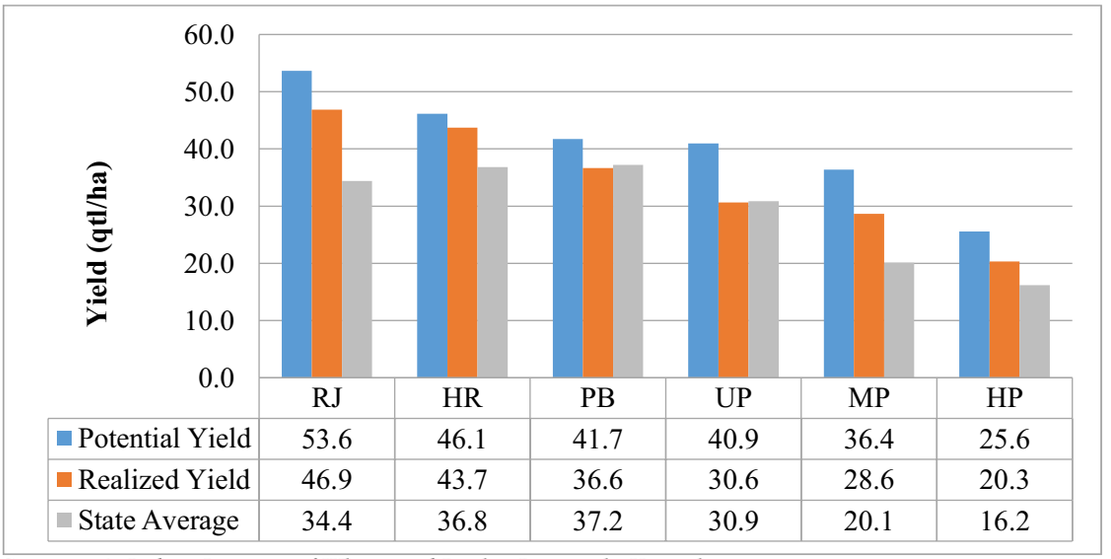
Barley

3.19 Chart 3.8 portrays the comparison of Potential, Realized and State Average Yields of Barley in selected States. Potential yield of barley ranged between 25.6 qtl/ha in Himachal Pradesh to 53.6 qtl/ha in Rajasthan. Further, the State average yield varied from 16.2 qtl/ha in Himachal Pradesh to 37.2 qtl/ha in Punjab. There was a sizeable gap between the potential yield and the State average yield that created a large yield gap (B) in the selected States that ranged between 10.8 percent in Punjab to 36.7 percent in Himachal Pradesh. Rajasthan which has 56.5 percent production share in

barley production had a significant yield gap (B) at 35.8 percent. Uttar Pradesh, which has around 30 percent production share, also had a significant yield gap (A) at 25.2 percent and a yield gap (B) at 24.4 percent. The States of Rajasthan and Uttar Pradesh have more than 80 percent in barley production share. Therefore, efforts should be made to fill the yield gap in these States on priority basis in order to enhance the barley yield at the national level. Further, concerted efforts are required to augment the yield levels in other States as well in order to meet the ever growing demand for barley.

3.20 Zone specific high yielding varieties of barley have been developed by various research institutions. For instance, the HBL 713 (25.63 qtl/ha) at Bajaura centre in Northern Hills Zone (NHZ), RD 2907 (48.88 qtl/ha) at Mirzapur in North Eastern Plains Zone (NEPZ), RD 2907 (66.25 qtl/ha) at Durgapura Jaipur in North Western Plains Zone (NWPZ), RD 2899 (50.50 qtl/ha) at Vidisha in Central Zone (CZ) and DWRB 137 (23.75 qtl/ha) at Dharwad in Peninsular Zone (PZ) are the highest average yielding varieties.

Chart 3.8: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Barley Growing States, TE2020-21



	RJ	HR	PB	UP	MP	HP
Potential Yield	53.6	46.1	41.7	40.9	36.4	25.6
Realized Yield	46.9	43.7	36.6	30.6	28.6	20.3
State Average	34.4	36.8	37.2	30.9	20.1	16.2

Sources: 1. Indian Institute of Wheat and Barley Research, Karnal
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

3.21 There remains tremendous scope to delve into the untapped potential for further improvement in the yield levels and production of rabi cereals in the country, particularly in the areas showing evidence of higher yield gaps. Table 3.3 presents the estimated increase in production of rabi cereals that can be attained as a result of bridging the existing yield gaps. For illustration, if yield gap (B) in wheat is reduced by 5 percent, additional production is estimated to be around 8.19 lakh tonnes. Further, by reducing the yield gap (B) by 25 percent, an additional 40.93 lakh tonnes of wheat production may be achieved. In the case of barley, if yield gap (B) is reduced by 25 percent, then an additional production of 2.89 lakh tonnes is estimated.

Table 3.3: Estimated Additional Production of Wheat and Barley by Bridging Yield Gaps

(Lakh tonne)

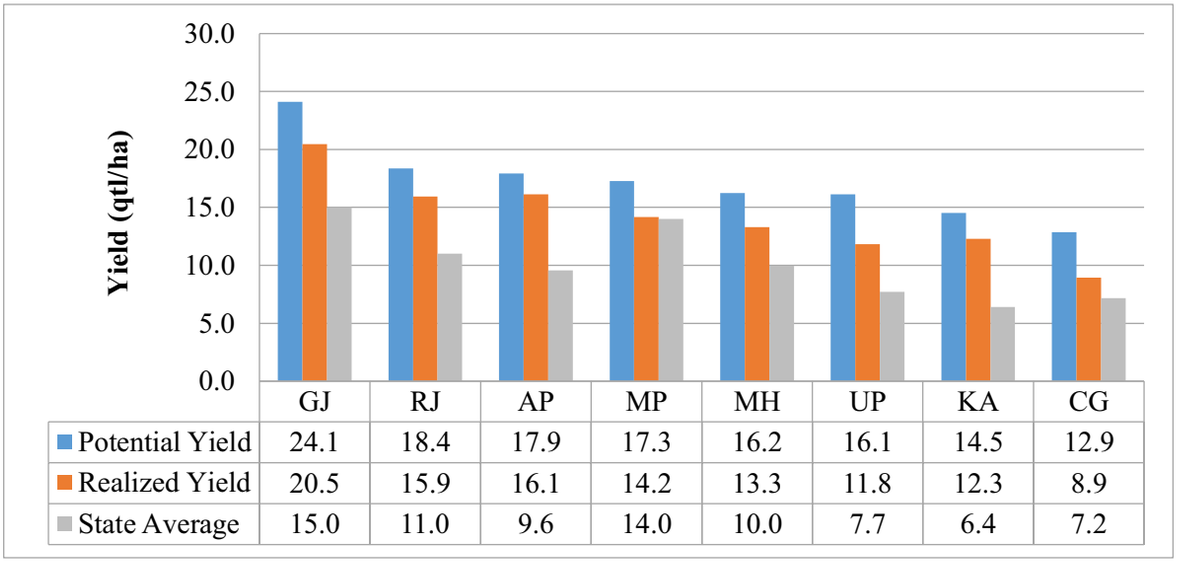
Crop	Reduction in yield gap (A)				Reduction in yield gap (B)			
	5%	10%	15%	25%	5%	10%	15%	25%
Wheat	6.93	13.86	20.79	34.65	8.19	16.37	24.56	40.93
Barley	0.23	0.45	0.68	1.14	0.58	1.16	1.73	2.89

Source: Estimated by CACP

Gram

3.22 Yield gaps in major gram growing States have been presented in Chart 3.9. For the States of Gujarat and Chhattisgarh, the potential yield and the State average yield of gram varied between 24.1 qtl/ha & 12.9 qtl/ha and 20.5 qtl/ha & 8.9 qtl/ha, respectively. The huge gap between the potential yield and State average yield has led to a considerable yield gap (B) in almost all major States. The highest yield gap (B) was observed in case of Karnataka (55.9%), followed by Uttar Pradesh (52.2%) and Chhattisgarh (44.2%). Madhya Pradesh, the largest producer of gram, reported the lowest yield gap (B) at 19.1 percent while Maharashtra, the second largest producer, had a significant yield gap (B) at 38.3 percent. As far as yield gap (A) is concerned, it ranged between 10.1 percent in case of Andhra Pradesh to 31.0 percent in the case of Chhattisgarh.

Chart 3.9: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Gram Growing States, TE2020-21



	GJ	RJ	AP	MP	MH	UP	KA	CG
Potential Yield	24.1	18.4	17.9	17.3	16.2	16.1	14.5	12.9
Realized Yield	20.5	15.9	16.1	14.2	13.3	11.8	12.3	8.9
State Average	15.0	11.0	9.6	14.0	10.0	7.7	6.4	7.2

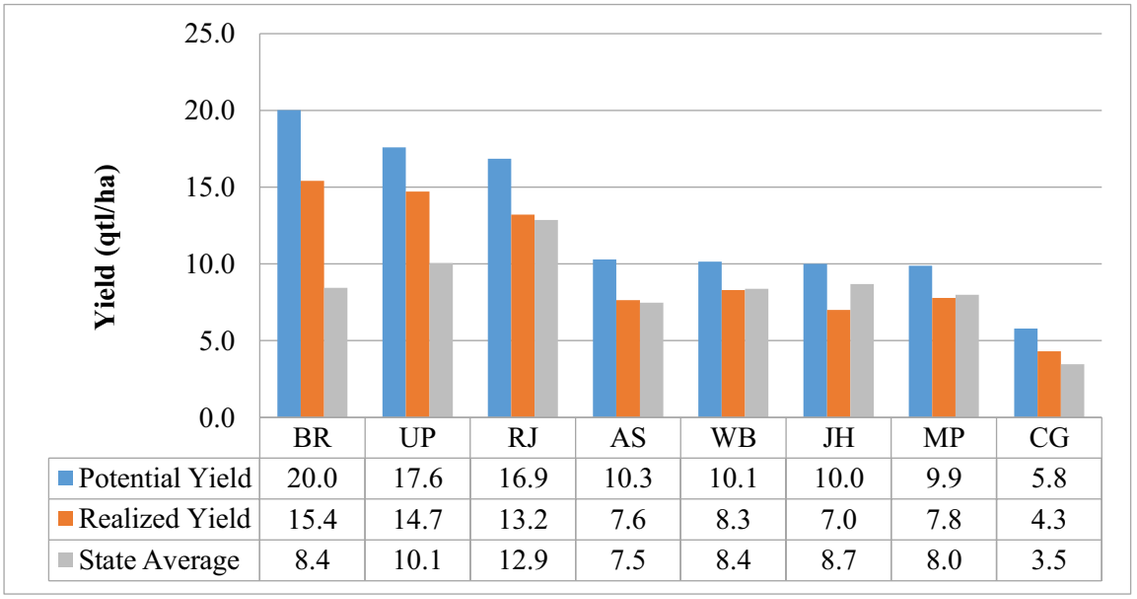
Sources: 1.Indian Institute of Pulses Research, Kanpur
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Lentil

3.23 In the case of lentil, the lowest potential yield was observed in Chhattisgarh (5.8 qtl/ha) and the highest in case of Bihar (20 qtl/ha) among the selected States. The highest State average yield was recorded for the State of Rajasthan (12.9 qtl/ha) while the lowest was for the State of Chhattisgarh (3.5 qtl/ha). Large differences between potential and State average yield have been observed in the case of major lentil growing States. Consequently, yield gap (B) was fairly high in almost all the

selected States ranging between 13 percent in Jharkhand to 58 percent in Bihar. Madhya Pradesh, the largest lentil producing State recorded yield gaps (A) & (B) at 21.2 percent and 19.1 percent, respectively. The eastern State of Uttar Pradesh which is the second largest producer of lentil in the country, has yield gap (A) at 16.5 percent while yield gap (B) is 42.6 percent.

Chart 3.10: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Lentil Growing States, TE2020-21



	BR	UP	RJ	AS	WB	JH	MP	CG
Potential Yield	20.0	17.6	16.9	10.3	10.1	10.0	9.9	5.8
Realized Yield	15.4	14.7	13.2	7.6	8.3	7.0	7.8	4.3
State Average	8.4	10.1	12.9	7.5	8.4	8.7	8.0	3.5

Sources: 1. Indian Institute of Pulses Research, Kanpur
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

3.24 Large yield gaps in major States indicate a huge scope to augment the yield in these States. Adoption of zone specific suitable varieties tolerant to pests & diseases and matching agro-technologies are recommended to reduce the yield gaps. For illustration, Table 3.4 shows the estimated additional production of rabi pulses when bridging the yield gaps by 5%, 10%, 15 % and 25%. For gram, by bridging the yield gap (A) by 25 percent, the production may witness an increase upto 7.3 lakh tonnes. Similarly, bridging the yield gap (B) by 25%, an additional production to the tune of 15.8 lakh tones is estimated. Further, the additional production of lentil may be increased upto 1.44 lakh tonne, if yield gap (B) is reduced by 25 percent.

Table 3.4: Estimated Additional Production of Gram and Lentil by Bridging Yield Gaps

(Lakh tonne)

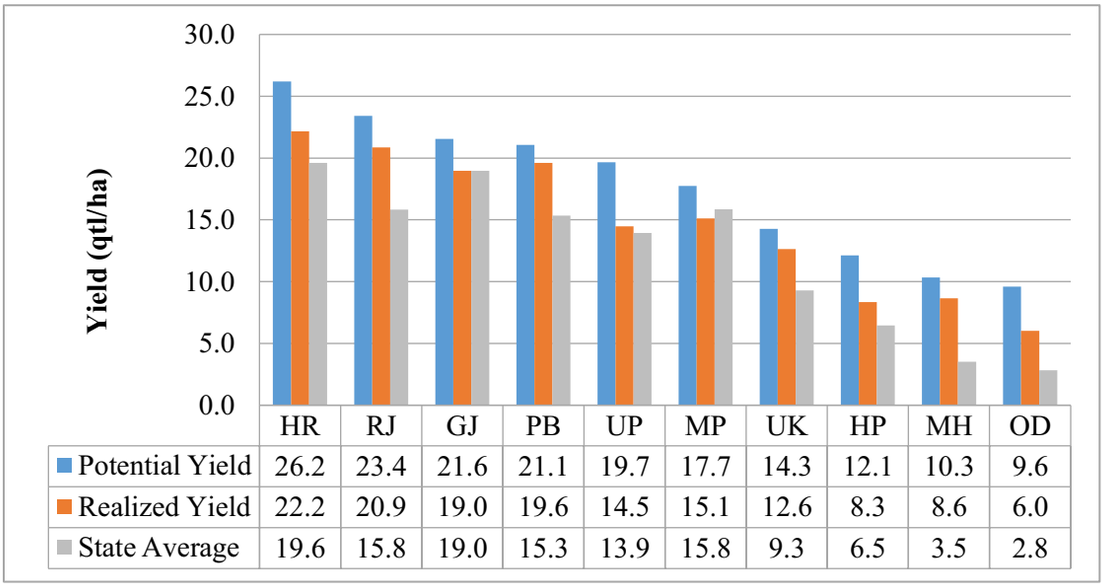
Crop	Reduction in yield gap (A)				Reduction in yield gap (B)			
	5%	10%	15%	25%	5%	10%	15%	25%
Gram	1.46	2.92	4.38	7.30	3.17	6.34	9.51	15.84
Lentils	0.18	0.36	0.54	0.90	0.29	0.57	0.86	1.44

Source: Computed by CACP

Rapeseed and Mustard

3.25 Chart 3.11 presents the yield gap analysis for R&M for selected States. Different measures of yield vary widely across major producing States. For example, the highest yield gap (A) was found in Odisha (37.5%) followed by Himachal Pradesh (31.4%). Similarly, the lowest yield gap (A) was found in the case of Punjab (7.1%). As far as yield gap (B) is concerned, it was highest for the State of Odisha (70.8%) followed by Maharashtra (66.0%) and was found to be the lowest in the case of Madhya Pradesh (10.7%). Rajasthan which has the largest production share reported a fairly high yield gap (B) of 32.5 percent.

Chart 3.11: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Rapeseed and Mustard Growing States, TE2020-21



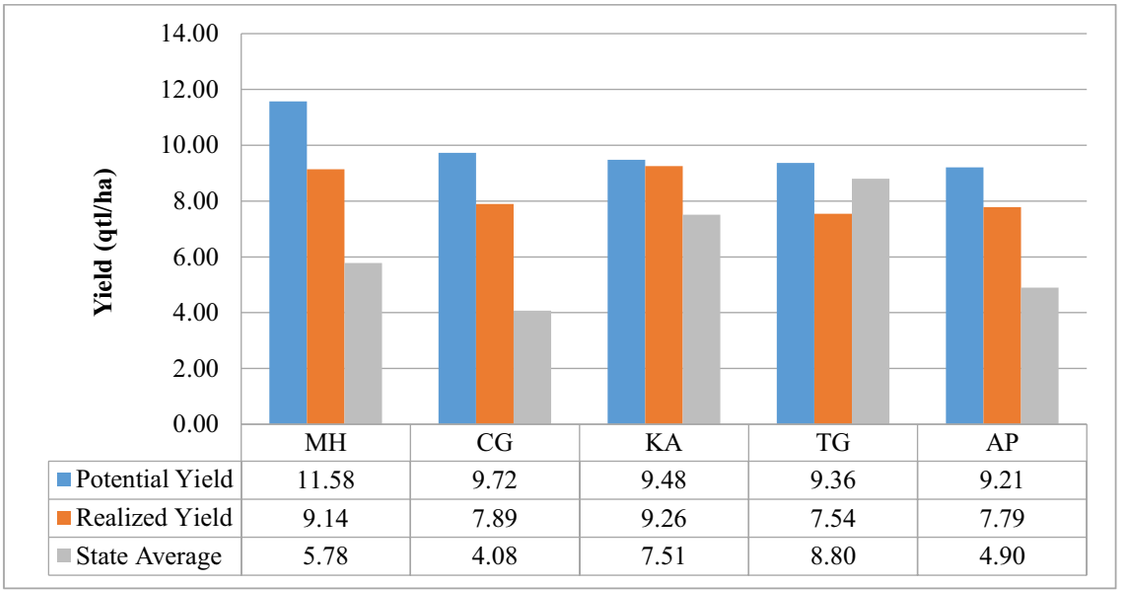
	HR	RJ	GJ	PB	UP	MP	UK	HP	MH	OD
Potential Yield	26.2	23.4	21.6	21.1	19.7	17.7	14.3	12.1	10.3	9.6
Realized Yield	22.2	20.9	19.0	19.6	14.5	15.1	12.6	8.3	8.6	6.0
State Average	19.6	15.8	19.0	15.3	13.9	15.8	9.3	6.5	3.5	2.8

Source: 1. Indian Institute of Oilseeds Research, Hyderabad
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Safflower

3.26 In the case of safflower, the highest potential yield was found in Maharashtra at 11.58 qtl/ha while the State average yield was 5.78 qtl/ha. This created a fairly high yield gap (B) at 50 percent for the State of Maharashtra. The highest yield gap (B) was observed in the case of Chhattisgarh at 57.7 percent and the lowest yield gap was observed in the case of Telangana at 6.38 percent. Karnataka, the largest producer of safflower, had the lowest yield gap (A) at 2.11 percent while yield gap (B) was at 21.05 percent.

Chart 3.12: Comparison of Potential Yield, Realized Yield and State Average Yield in Major Safflower Growing States, TE2020-21



	MH	CG	KA	TG	AP
Potential Yield	11.58	9.72	9.48	9.36	9.21
Realized Yield	9.14	7.89	9.26	7.54	7.79
State Average	5.78	4.08	7.51	8.80	4.90

Source: 1. Indian Institute of Oilseeds Research, Hyderabad
2. Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

3.27 Table 3.5 presents the estimated additional production of R&M and safflower that can be achieved by reducing the yield gaps. To illustrate, narrowing down the yield gap (B) by 25% may lead to an additional increase in R&M production by about 781.39 thousand tonnes. Similarly, safflower production may also be further increased upto 2.97 thousand tonnes by bridging the yield gap (B) by 25 percent. However, there is a pressing need to expand the overall area under safflower for incremental production to take place. Hence, farmers should be suitably incentivised for actively engaging in the production of safflower.

Table 3.5: Estimated Additional Production of Major Rabi Oilseeds by Bridging Yield Gaps

(Thousand tonne)

Crops	Reduction in yield gap (A)				Reduction in yield gap (B)			
	5%	10%	15%	25%	5%	10%	15%	25%
Rapeseed & Mustard	101.17	202.35	303.52	505.87	156.28	312.55	468.83	781.39
Safflower	0.29	0.59	0.88	1.47	0.59	1.19	1.78	2.97

Source: Computed by CACP

District Level Yield Trends

3.28 This section delves into the yield performance of rabi crops at the district level for two time periods, i.e., TE2010-11 and TE2019-20. Only those districts which at least have one percent share in the total production in the State have been considered for this analysis. Tables 3.6 to 3.8 show the number of districts and the area under different productivity bands for major rabi crops in leading producing States.

Wheat

3.29 The performance of districts in the major wheat producing States, namely Punjab, Madhya Pradesh, Rajasthan and Uttar Pradesh have been shown in Table 3.6. Four yield bands viz., <2t/ha, 2-3 t/ha, 3-4 t/ha and >4 t/ha have been considered for this analysis. It is observed that the yield performance of the all selected States has improved in the period under consideration. As a result, the area share in the highest yield band has increased. In the case of Punjab, no district in yield bands (<2 t/ha and 2-3 t/ha) has been reported for both the time periods. During TE2010-11, there were only 2 districts with an acreage of 6.2 percent in the yield band (3-4 t/ha) which had shifted towards highest yield band for the TE2019-20. In the case of Madhya Pradesh also, districts and acreage in the yield band (<2 t/ha and 2-3 t/ha) reduced and saw a shift towards higher yield bands (3-4 t/ha and >4 t/ha) between the reference periods. Consequently, the number of districts in the yield band (3-4 t/ha) increased from 4 to 25 along with a 60.3 percent area share. Similarly, the number of districts in the highest yield band (>4 t/ha) increased from zero to 9 with an 18 percent acreage for the TE2019-20.

3.30 In Rajasthan, the number of districts and the area share in the yield bands (<2t/ha, 2-3 t/ha, 3-4 t/ha) decreased for the TE2019-20 as compared to the TE2010-11 and saw a shift towards the highest yield band (>4 t/ha). As a result, the number of districts in the highest yield band increased from 1 to 14 along with the maximum increase in area share from 5.8 to 61.4 percent for the corresponding periods. In the case of Uttar Pradesh, the number of districts in the yield band (2-3 t/ha) decreased from 23 to just 2 and consequently, acreage reduced from 39.2 percent to just 3.3 percent between the two time periods. The number of districts in yield bands (3-4 t/ha and >4 t/ha) increased too. It shows a gradual yet steady movement of districts from lower yield bands to higher yield bands due to a significant improvement in the yield levels.

Table 3.6: Mobility of Districts in Yield Ladder: Case of Wheat

State/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 (%)*
Punjab								
TE2010-11	0	0.0	0	0.0	2	6.2	18	93.8
TE2019-20	0	0.0	0	0.0	0	0.0	21	98.8
Madhya Pradesh								
TE2010-11	17	47.4	15	31.3	4	12.2	0	0.0
TE2019-20	0	0.0	6	13.8	25	60.3	9	18.0
Rajasthan								
TE2010-11	1	3.1	8	17.0	15	66.2	1	5.8
TE2019-20	0	0.0	6	15.6	6	16.1	14	61.4
Uttar Pradesh								
TE2010-11	0	0.0	23	39.2	26	42.0	0	0.0
TE2019-20*	0	0.0	2	3.3	30	51.3	18	27.1

Note : The figures for Area (in %) could be less than 100% as the districts where production of the crop is less than 1% of total production in the respective State have not been considered.
**Data is not Available for 2019-20*

Source: Computed by CACP using data of Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Gram

3.31 From Table 3.7, we infer that, as compared to the previous period, all the major gram producing States have reported an increase in the number of districts and acreage under the highest yield band for the TE2019-20. At the same time, the number of districts and area share reduced in the lower bands in all the selected States which indicates a favourable shift towards the highest yield band. While Rajasthan registered the maximum increase in the number of districts from 7 to 18, Uttar Pradesh reported the highest increase in the proportion of area from 37.4 percent to 91.6 percent. Maharashtra also showed a significant improvement in the yield level of gram that resulted in an increase in the number of districts in the highest yield band from 4 to 9. A similar trend can be delineated for the State of Karnataka, where the number of districts and the area share has been reduced in the lowest and middle yield band. The yield performance of Karnataka was comparatively poor vis-à-vis other major gram producing States. Thus, concerted efforts are required to enhance the yield levels in the State.

Table 3.7: Mobility of Districts in Yield Ladder: Case of Gram

State/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 (%)*
Karnataka						
TE2010-11	5	21.5	12	74.7	0	0.0
TE2019-20	2	16.9	9	68.5	1	12.5
Maharashtra						
TE2010-11	0	0.0	21	81.7	4	16.1
TE2019-20	0	0.0	16	64.8	9	33.2
Rajasthan						
TE2010-11	1	20.6	11	53.5	7	20.4
TE2019-20	1	11.6	3	30.0	18	54.2
Uttar Pradesh						
TE2010-11	0	0.0	7	52.9	9	37.4
TE2019-20*	0	0.0	0	0.0	17	91.6

Note: The figures for Area (in %) could be less than 100% as the districts where production of the crop is less than 1% of total production in the respective State have not been considered.

**Data is not Available for 2019-20*

Source: Computed by CACP using data of Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Rapeseed and Mustard

3.32 Table 3.8 presents the yield trends of R&M in the selected districts for three States namely, Rajasthan, Uttar Pradesh and West Bengal. Noteworthy increase in acreage and the number of districts in the highest yield band (>1 t/ha) has been observed in all the three selected States.

3.33 In Rajasthan, for example, the number of districts decreased from 2 to 1 with less acreage in the middle band while 5 additional districts were added in the highest yield band with an increased area share for the TE2019-20 from 89.7 per cent to 96.5 per cent. In the case of Uttar Pradesh, the number of districts decreased in the middle band from 12 to 4 along with reduction in area share from 30.2 percent to 13.2 percent. At the same time, the number of districts in the highest yield band increased from 17 to 24 with an increased area share of 62.2 percent from 48.9 per cent. In the case of West Bengal, a significant increase in area share has been observed, going up from 38.7 percent in TE2010-11 to 77.2 percent in TE2019-20 while the proportion of area in the middle band decreased from 58.3 percent to 17.7 percent during the same period. Further, the number of districts in West Bengal in the middle band declined from 10 for the TE2010-11 to 5 for the TE2019-20. For the same time periods, the number of districts in the highest yield band went up from 4 to 7.

Table 3.8: Mobility of Districts in Yield Ladder: Case of Rapeseed & Mustard

State/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 (%)*
Rajasthan						
TE2010-11	0	0.0	2	4.0	20	89.7
TE2019-20	0	0.0	1	1.8	25	96.5
Uttar Pradesh						
TE2010-11	0	0.0	12	30.2	17	48.9
TE2019-20*	0	0.0	4	13.2	24	62.2
West Bengal						
TE2010-11	1	2.3	10	58.3	4	38.7
TE2019-20	0	0.0	5	17.7	7	77.2

Note: The figures for Area (in %) could be less than 100% as the districts where production of the crop is less than 1% of total production in the respective State have not been considered.

**Data is not Available for 2019 -20*

Source: Computed by CACP using data of Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

Drivers of Yield Growth

3.34 There are numerous factors that are considered to be critical as far as yield enhancement and quality improvement is concerned. These include: timely availability of superior quality seeds, optimum use of fertilizers and pesticides, adoption of improved farm technologies, farm mechanization, satisfactory and timely availability of credit and sophisticated irrigation facilities along with an efficient utilization of water resources. Key policy initiatives and interventions taken in this regard have been discussed at length in this section.

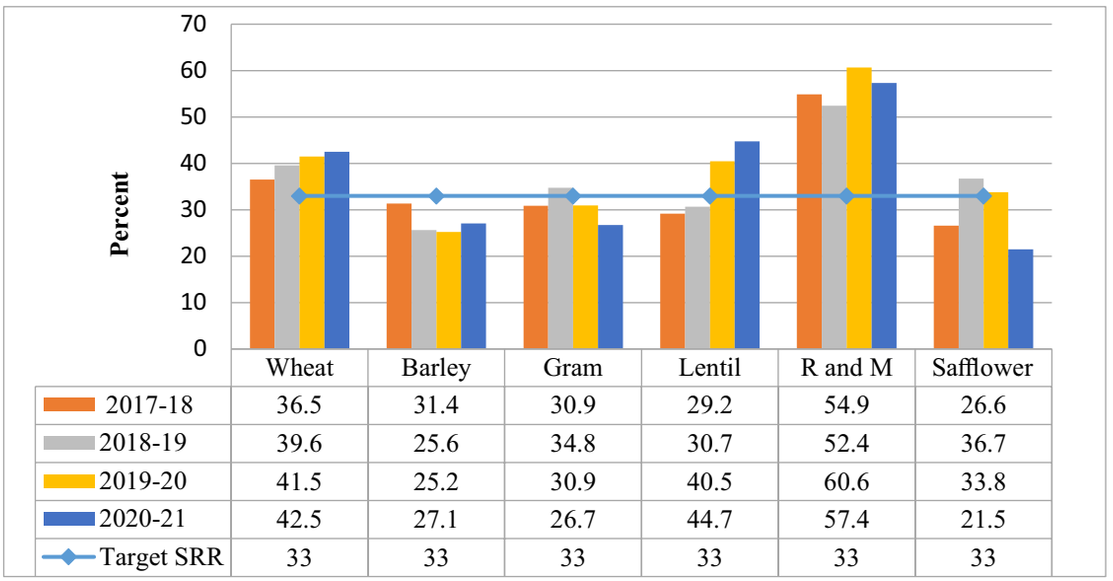
Quality Seeds

3.35 Quality seeds are a pre-requisite for sustainable production, productivity and profitability of agricultural crops. Depending upon the crop, the quality of seed alone contributes 15-20 percent to the total production. To a large extent, agricultural production and productivity are dependent on the development of new and improved varieties of crops and on timely supply of superior quality

seeds to farmers. In order to ensure production and multiplication of high yielding certified and quality seeds of all crops in sufficient quantity and to make them available to all farmers, the Government of India has undertaken two major initiatives. They are the Sub-mission on Seeds and Planting Material (SMSP) and National Mission on Agricultural Extension and Technology (NMAET).

3.36 Adoption of improved varieties and replacement of obsolete varieties will aid in attaining the desired outcomes. Chart 3.13 illustrates the seed replacement rate (SRR) of major rabi crops at the all India level. The seed replacement rate for wheat and R&M has exceeded the target of 33 percent for the years under consideration. In the case of lentil, the SRR has steadily improved over the years and has also surpassed the target in 2019-20. In 2017-18, in the case of safflower, the SRR was below the target. Thereafter, it improved and was above the target in 2018-19 as well as in 2019-20. However, subsequently it went down in the succeeding year. In the case of barley and gram, it continues to remain below the target for all the years under reference. Therefore, the need of the hour is that farmers should be persuaded to adopt high-quality certified seeds for barley, gram and safflower in order to improve the SRR. This will also provide a much needed fillip to boost the yield level of these crops. Annex Table 3.1 presents the inter-State and inter-crop variations in the seed replacement rate for rabi crops among major States.

Chart 3.13: Seed Replacement Rate of Rabi Crops (2017-18 to 2020-21)



	Wheat	Barley	Gram	Lentil	R and M	Safflower
2017-18	36.5	31.4	30.9	29.2	54.9	26.6
2018-19	39.6	25.6	34.8	30.7	52.4	36.7
2019-20	41.5	25.2	30.9	40.5	60.6	33.8
2020-21	42.5	27.1	26.7	44.7	57.4	21.5
Target SRR	33	33	33	33	33	33

Source: Seed Division, Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare

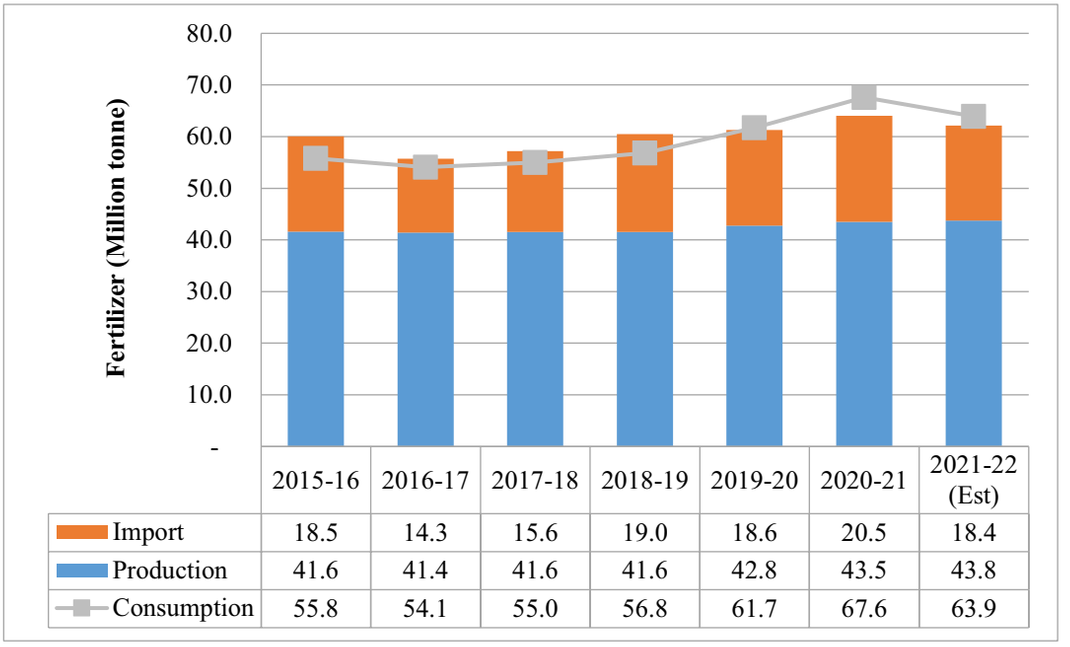
Fertilizer Use

3.37 Fertilizer is another crucial and valued input for enhancing the production levels by providing key nutrients for the crop growth. India continues to remain as the third largest producer and the second largest consumer of fertilizers in the world. Major trends of fertilizer consumption, production and import in the country have been illustrated in Chart 3.14. It can be inferred from the chart that the production of fertilizers in India has increased gradually from 41.6 million tonnes in 2015-16 to 43.8 million tonnes in 2021-22. As on 01.04.2022, there were 165 number of plants in the country,

having a production capacity of 57.2 million tonnes. As far as consumption is concerned, after a continuous increase in total consumption of fertilizer nutrients from 55.8 million tonnes in 2015-16 to 67.6 million tonnes in 2020-21, it dropped by 5.5 percent in 2021-22 over the previous years. India continues to remain dependent on import of raw materials and finished products because there is a constraint of adequate availability of raw material for the production of fertilizers. For instance, the total import of nutrients hovered around 14.3 million tonnes to 20.5 million tonnes over the period 2015-16 to 2021-22. It however, declined by 10.2 percent during 2021-22 over the previous year. Plausible reasons that can be attributed to this trend are an unusual spurt in the international prices of fertilizers and raw materials due to the conflict between Russia and Ukraine and also hitherto disruptions in the supply chains owing to pandemic. As a result, the total consumption is also expected to fall in 2021-22.

3.38 At present, India's dependency on import is to the tune of 25 percent of our requirement of urea, 90 percent in case of Phosphates, either as raw material or finished fertilizers (DAP/MAP/TSP) and 100 percent in case of Potash. In order to cut down our import dependency, the Government of India has been encouraging Indian companies to enter into joint ventures abroad particularly in countries which are rich in fertilizer resources for production facilities with buy back arrangements. Further, companies are being incentivised to enter into long term agreements for supplying fertilizers and fertilizer inputs to India.

Chart 3.14: Trends in Fertilizer Consumption, Production and Import (From 2015-16 to 2021-22)



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 (Est)
Import	18.5	14.3	15.6	19.0	18.6	20.5	18.4
Production	41.6	41.4	41.6	41.6	42.8	43.5	43.8
Consumption	55.8	54.1	55.0	56.8	61.7	67.6	63.9

Source: Fertilizers Association of India

3.39 Fertilizer use in agriculture is affected by several issues. These include: excessive and non-judicious fertilizer use, soil fertility exhaustion, low nutrient use efficiency and deteriorating crop response to fertilizers. However, the difficulty of low nutrient use efficiency and poor response ratio can be addressed by adopting an integrated nutrient management approach. This entails the combined use of mineral, organic, bio-fertilizers and micronutrients. The Soil Health Card Scheme (SHC) was introduced with an objective to promote scientific and evidence based

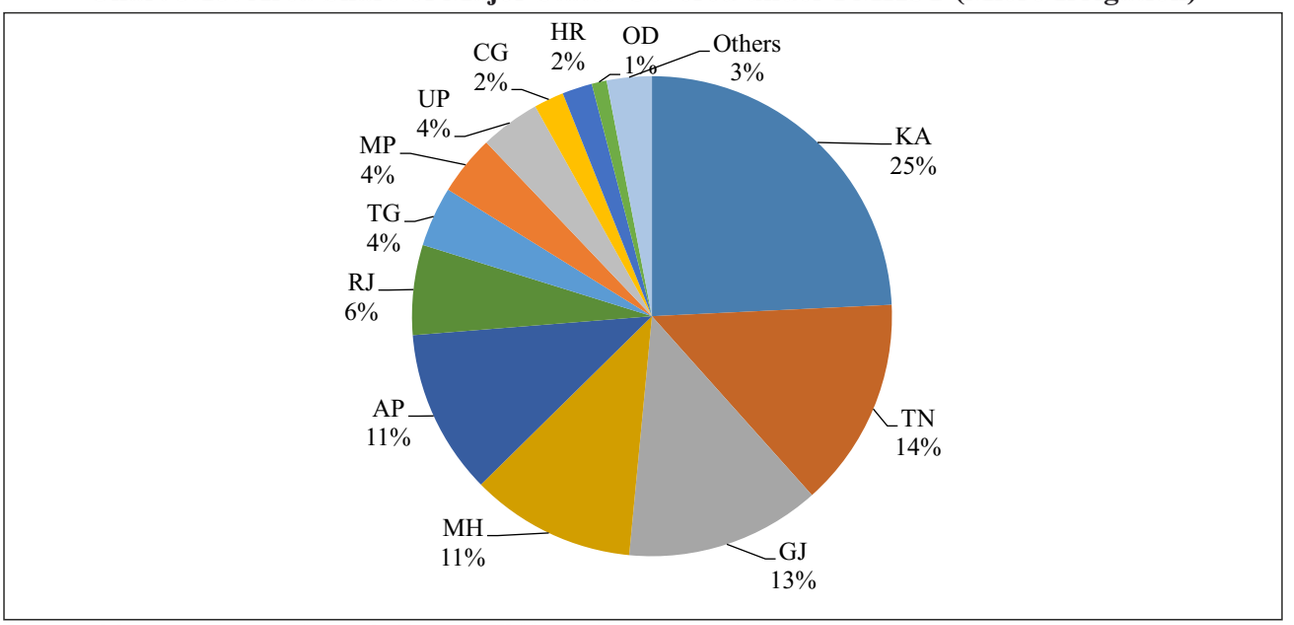
integrated nutrient management. An exclusive policy intervention to address the nutritional deficiencies in crop production in scientific manner may be explored. Further, there is a pressing need to promote the use of innovative fertilizers like nano urea, other liquid fertilizers and water soluble fertilizers for increasing the fertilizer use efficiency. Use of drone technology and fertigation should be endorsed in order to increase the efficiency of water and fertilizers.

Availability of Water and Irrigation

3.40 Water is a critical input in agricultural production for enabling intercropping and crop diversification. It is an established fact that irrigated agriculture is more productive as it permits product intensification and crop diversification. Agriculture accounts for about 80 percent of the water use in the country. The share of net irrigated area accounts for about 49 percent of the total sown area in the country, out of which 40 percent is irrigated through the canal system and 60 percent through groundwater. Water is a scarce resource and its availability is limited. However, it is declining with sustained increase in demand as a result of population growth, rapid urbanisation and industrialization. Therefore, efficient use of water is crucial as availability of surface water is limited.

3.41 Increased coverage under micro irrigation is an important policy intervention for overcoming the problem of the looming water crisis in the country. The Government of India has made several noteworthy endeavours in this regard. One of them is encouraging the use of Drip and Sprinkler Systems in the country for enhancing water use efficiency at farm level under 'Per Drop More Crop' component of the "Pradhan Mantri Krishi Sinchayee Yojana" (PMKSY-PDMC) from 2015-16 onwards. Under this scheme, a total area of 67.3 lakh ha has been covered under micro irrigation in the country till 31.03.2022. Area share of States covered under micro irrigation has been illustrated in Chart 3.15. As shown in the chart, only five States namely Karnataka (25%), Tamil Nadu (14%), Gujarat (13%), Maharashtra (11%) and Andhra Pradesh (11%) have more than 70 percent area coverage under micro irrigation upto 31.03.2022. As the water crisis is only intensifying, there is a need for other States to follow suit.

Chart 3.15: Area Share of Major States Covered under PMKSY (Micro Irrigation)



Source: Ministry of Agriculture & Famers Welfare, data accessed from <https://pmksy.gov.in/mis/rptAchievement.aspx> on 14th June 2022

3.42 Rainfed and degraded areas are being re-developed under the Watershed Development Component of PMKSY (PMKSY-WDC) by the Department of Land Resources (DoLR). Under this component, from 2015-16 to 2021-22, approximately 6.56 lakh water harvesting structures have been created or rejuvenated, as the case maybe. Further, an additional area of about 14.54 lakh ha has been brought under protective irrigation, and it is heartening to note that about 31.94 lakh farmers have been benefited from this intervention. Further, during FY2018-19 to FY2021-22, about 1.63 lakh ha area has been brought under plantation, and about 3.36 lakh ha area of cultivable wasteland has been treated in completed projects. Additionally, about 388.66 lakh number of man-days employment has been generated. State and UT–wise details have been placed in the Annex Table 3.2.

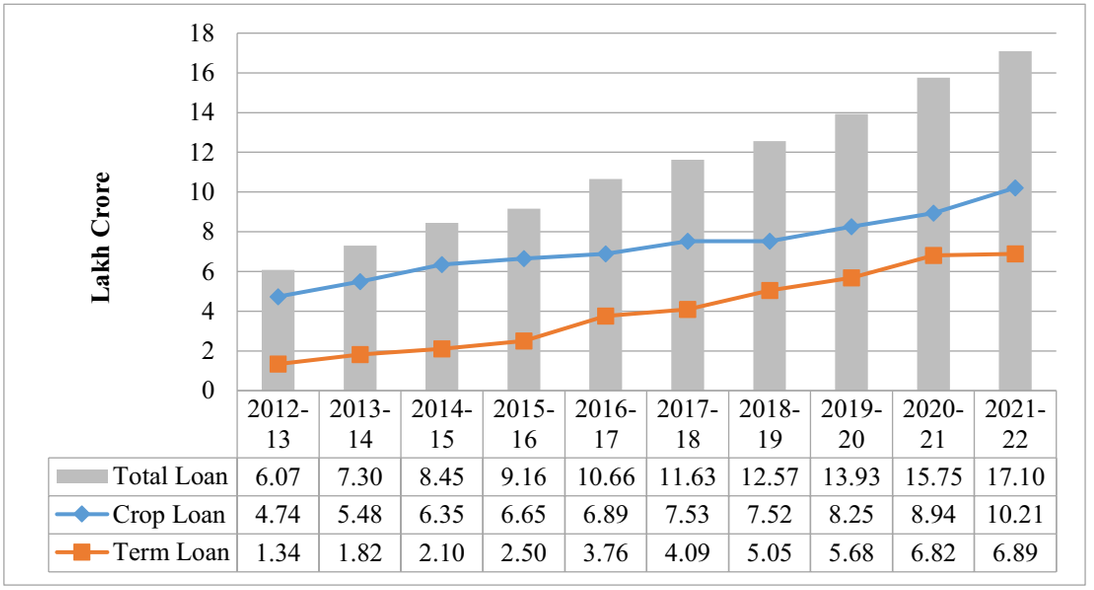
3.43 Moreover, a dedicated Micro Irrigation Fund (MIF) with a corpus of ₹ 5,000 crore was created with the National Bank for Agriculture and Rural Development (NABARD) during 2018-19. Its objective is to facilitate the States in mobilising resources for expanding the coverage under micro irrigation. As on 31.03.2022, cumulative loan released was to the tune of ₹2,083.7 crore against the sanctioned amount of ₹3,970.2 crore under MIF.

Agricultural Credit

3.44 Timely, sufficient and equitable access to credit is one of the essential pre-requisites for raising the agricultural productivity and profitability. Broad trends in institutional agricultural credit flow along with crop loan and term loan have been presented in Chart 3.16. The chart drives home an important finding: between 2012-13 and 2021-22, there has been an appreciable increase in the flow of institutional credit to the agriculture sector going up from 6.1 lakh crore to 17.1 lakh crore between the two periods. If we dig deeper, we find that both the crop loan and the term loan have increased over the years, but the share of crop loan and term loan revealed reverse trends. The share of crop loan declined from 78 percent in 2012-13 to 57 percent in 2020-21. On the contrary, the share of term loan increased from 22 percent to 43 percent for the same time period. The increase in the share of term loan points towards the fact that long term investment in agriculture has gone up. However, one finds that the share of term loan dipped marginally in 2021-22.

3.45 Although there has been a sizeable increase in the flow of institutional credit to the agricultural sector, regional disparities in loan distribution continues to remain the proverbial Achilles heel as far as equitable distribution of credit is concerned. Regrettably, a fairly large number of small and marginal farmers are still bereft of institutional credit. Several steps have been taken to enlarge the institutional credit net. For example, the Government of India introduced the "Kisan Credit Card" (KCC) scheme for the farmers to enable them to purchase agriculture inputs such as seeds, pesticides etc. Joint Liability Groups have been promoted by banks to bring small, marginal, tenant farmers into the fold of institutional credit. The RBI has decided to raise the limit for collateral-free agriculture loans from ₹ 1 lakh to ₹ 1.6 lakh in order to usher more and more small and marginal farmers into the formal credit system.

Chart 3.16: Crop Loan and Term Loan in Total Agricultural Credit



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total Loan	6.07	7.30	8.45	9.16	10.66	11.63	12.57	13.93	15.75	17.10
Crop Loan	4.74	5.48	6.35	6.65	6.89	7.53	7.52	8.25	8.94	10.21
Term Loan	1.34	1.82	2.10	2.50	3.76	4.09	5.05	5.68	6.82	6.89

Source: National Bank for Agriculture and Rural Development (NABARD)

Mechanization

3.46 Farm mechanization not only stimulates productivity, but also minimizes human drudgery and brings down the cost of cultivation and profitability. It also helps in improving the utilization efficiency of other inputs. In addition, it aids in improving the quality and value addition of the produce. It enables the farmers to broaden their horizons by moving towards multi-cropping and inter-cropping.

3.47 The Government of India has integrated various schemes and programmes aiming at catalyzing an inclusive growth of agricultural mechanization. With a special emphasis on 'reaching the unreached' and to bring small and marginal farmers' to the fore, a 'Sub-mission on Agriculture Mechanization (SMAM)' was launched in 2014-15. Under the aegis of this unique Mission, performance testing is being done at the Farm Machinery Training and Testing Institutes (FMTTIs), designated State Agricultural Universities (SAUs) and ICAR institutions in order to ensure the quality of farm machinery and implements. Further, a subsidy is being provided to the farmers in order to procure machinery. It also provides financial assistance to set up 'Farm Machinery Banks for Custom Hiring' for various locations and crops.

3.48 Under the SMAM, a total of 36,018 CHCs were established up to 31.03.2022. The Government has also developed and launched a multi-lingual mobile app called 'Farm Machinery Solutions (FARMS)' which helps the farmers in getting rented farm machinery and implements through CHC in their area. About 70,382 CHCs/Service Providers have been registered on this mobile app to rent out around 1.64 lakh agricultural machines. It is reassuring to note that more than 5 crore farmers have been registered on this app till 31.03.2022.

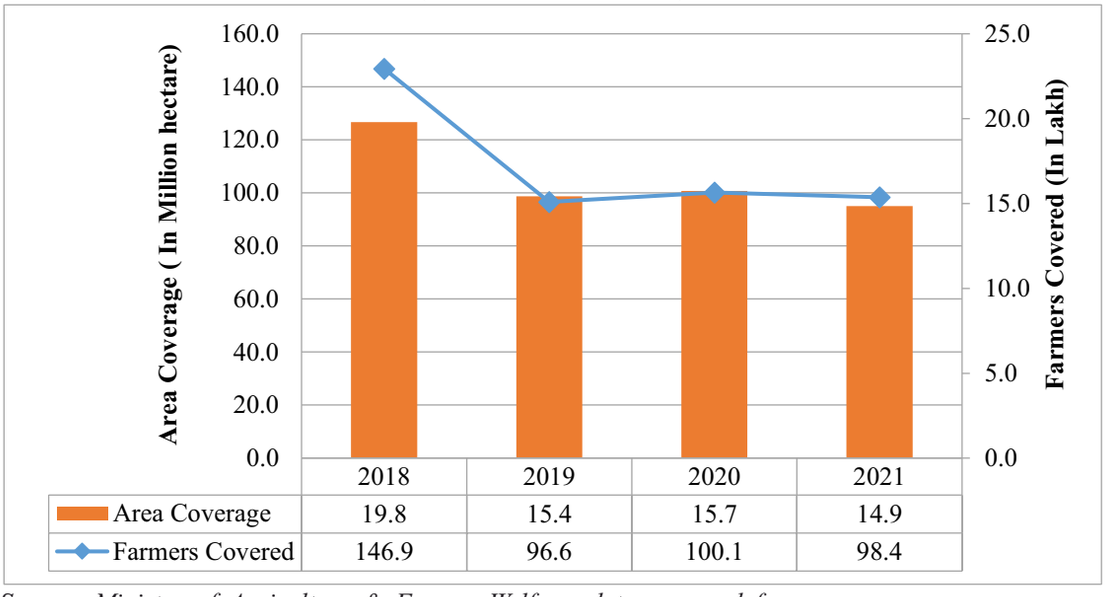
3.49 Majority of farmers in India are marginal farmers having the land holdings less than 1 hectare. Therefore, 'Custom Hiring Centres of Agricultural Machineries' operated by various Cooperative Societies, Self Help Groups and private/rural entrepreneur are a viable alternative as far as easy availability of farm machineries to these category of farmers is concerned.

Crop Insurance

3.50 The Indian farmer is the only 'entrepreneur' who is exposed to the vagaries of nature. Crop production in India is greatly influenced by unpredictable weather patterns and pests and plant diseases infestation. As a result, farmers have to face massive yield loss and the duo continues to affect the farmers income over the past several years. Crop insurance is an effective tool that helps the farmers to hedge these risks. Besides, it also adds to the risk bearing capacity of the farmers, encouraging them to invest in new technologies. "The Pradhan Mantri Fasal Bima Yojana (PMFBY)" was started by the Government of India in 2016 with the objectives of providing insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities; pests and diseases; to stabilise the income of farmers in order to ensure their continuance in farming; to encourage farmers to adopt innovative and modern agricultural practices and to ensure flow of credit to agricultural sector. The progress made under this scheme in the States have been presented in Annex Table 3.3.

3.51 The area and the number of farmers covered under the scheme PMFBY since 2018 has been displayed in Chart 3.17. It is evident from the chart that insured area under the scheme reduced to 14.9 million hectare in 2022 as compared to19.8 million hectares in 2018, recording a decline of 24.8 percent. Similarly, between 2018 and 2021, farmers covered under the scheme recorded a decline of 33 percent, from 1.46 crore to just 0.98 crore. Thus, in spite of several measures taken by the Government of India for expanding the coverage of the farmers under crop insurance, it is found that farmers are not subscribing to agricultural insurance policies. Plausible reasons for the same include: delay in the distribution of compensation, inadequacy of the compensation compared to the costs, high premium rate and inadequate funds allocated under the finance insurance. Moreover, some States such as Andhra Pradesh, Jharkhand, Telangana, Bihar, Gujarat, Punjab and West Bengal discontinued this scheme in their States as these States have their own crop insurance schemes which are more attractive to the farmers.

Chart 3.17: Coverage of Farmers and Area under PMFBY (From 2018 to 2021)



	2018	2019	2020	2021
Area Coverage	19.8	15.4	15.7	14.9
Farmers Covered	146.9	96.6	100.1	98.4

Source: Ministry of Agriculture & Famers Welfare, data accessed from <https://pmfby.gov.in/adminStatistics/dashboard> on 14th June 2022

Box: 3.2

Farmer Producer Organisations (FPOs)

Indian agriculture is predominantly characterised by small and fragmented land holdings. For perspective, around 86 percent of the small and marginal farmers possess land holdings less than two hectares. Due to the small size of land holdings, these farmers have an extremely low individual market surplus and consequently they are unable to realize a fair value for their products. These farmers are also unorganised and have a poor access to quality inputs, institutional credit, organised markets, latest farm technologies, etc. Therefore, it becomes imperative to enhance productivity through efficient, cost-effective and sustainable resource use. In order to make small and marginal farmers realize higher returns through better liquidity and market linkages, a Central Sector Scheme of "Formation and Promotion of 10,000 Farmers Producer Organizations" was launched to form and promote 10,000 new FPOs till 2027-28 with a total budgetary outlay of ₹6865 Cr. This scheme is based on Produce Cluster Area approach and Specialized Commodity based approach.

Income Enhancement of FPO Members

(Avg. Annual Income in Rs.)

Name of State	Pre/Non-FPO	Post-FPO	Increase (%)
Odisha	79,557	90,247	13.4
Kerala	85,114	1,42,038	66.9
Madhya Pradesh	1,54,640	1,79,548	16.1
Total	3,19,311	4,11,833	29.0

Source: Field Study conducted by NABARD in 2019-20 in different States.

NABARD has conducted an internal study in three States viz. Madhya Pradesh, Odisha and Kerala in 2019-20, and the outcome of the study is shown in the Table above. It may be clearly seen from the table that the net annual income of the FPO members has increased. Kerala witnessed the highest increase of 66.9 percent. Madhya Pradesh also registered an increase of 16.1 percent in the net income of the FPO members. It is also reported that farmers have been getting the higher average prices for their produce after associating themselves with FPOs. The average price was reported to have increased by around 45 percent in Kerala. Further, farmers in Madhya Pradesh reported an increase in average price by about 7.5 percent in Kharif (2019) and 12.5 percent in the Rabi (2018) season. Consequently, net income increased in all selected States. The study also revealed a declining dependence on informal sources of credit in the post FPO phase.

The evaluation report of Price Waterhouse Coopers on FPO component titled "Impact Study 7- Enhanced realisation of Agriculture Produce Marketed through PCs/FCSCs under Maharashtra Agricultural Competitiveness Project" has highlighted the benefits like: (i) sale through FPOs has resulted in increased price realisation by members by 22 percent, (ii) incidence of cost of marketing is 31 percent lower than other channels (iii) 28 percent of members have purchased inputs from PCs and it has resulted into net savings of ₹ 1384 per acre. Other evaluation studies also reported an increase in net income & productivity; better access to quality seeds and other inputs; decline in informal credit and cost of production. However, the performance of FPOs varies across different States.

The study also revealed that the success of FPOs depends on various factors. These include: adoption of efficient cropping pattern and management, effective marketing strategies, convergence with Government schemes, creation of need based infrastructure, timely and adequate credit, achievement of forward and backward linkage, need based capacity building and handholding, adoption of new technologies, value addition and standardisation of products, etc. Hence, an effective management system with efficient coordination of stakeholders is required for expected performance of FPOs in the country. Moreover, robust infrastructural facilities, access to market and credit, efficient commodity pricing mechanism, affordable and timely credit, holistic development and empowerment of small holders, convergence with other schemes, digitization by creating database and linking FPOs to e-NAM are suggested measures to improve the performance of the FPOs and to make agriculture more remunerative for small and marginal farmers.

(Source: "Understanding of FPOs' Business Ecosystem and Strategies To Tap Potential" By Ashutosh Kumar & Vinod Kumar, NABARD.)

Recapitulation

3.52 Growth rates in production and yield levels for most of the rabi crops, have improved for the TE2020-21 as compared to the previous period. Yet, sizeable inter-State and inter-District variations in the yield levels are discernible. The probable reasons that can be attributed to the same are technological differences, spatial and socio-economic constraints etc. Therefore, there remains a tremendous scope to bridge the yield gaps by embracing state-of-the-art yield gap bridging strategies. Furthermore, in order to minimize inter-state yield disparities, it is necessary to ensure that various government schemes have a considerable impact across India.

3.53 As compared to quite a few countries across the globe, the yield levels of major rabi crops are inadequate. The factors responsible for low yields in India are primarily inadequate nutrient supply, fragmented land holdings, monsoon dependency, inefficient water use, low seed replacement rate and varietal replacement rate, non-availability of quality seeds, poor extension services, and sub-optimal utilization of resources, etc.

3.54 Analysis of various drivers of yield growth shows that significant progress has been made by various States to improve yields. Also, visible gains are being made in expansion of agricultural credit and increased coverage under micro irrigation. As far as crop insurance is concerned, the trends are discouraging and there remains scope for improvement.

★★★★★

CHAPTER 4

Trade Performance, Competitiveness and Outlook for Indian Agriculture

4.1 India's agricultural exports performance showed an impressive growth in 2021-22 over previous year mainly driven by the record high exports of wheat. The high export growth is resulted from geopolitical conflict between Russia and Ukraine beginning in the last quarter of 2021-22. This further helped India to reposition itself as a key supplier of food grains and to stabilize global market for food supplies. However, for imported commodities, mainly the oilseeds, uptrend in global commodity prices has led to increase in the country's agricultural import bill. Nonetheless, India's agricultural trade prospects over the past several years and farm sector reforms to improve export competitiveness will enable to firmly establish its position as a valued trade partner for agricultural commodities across the globe. This chapter discusses recent patterns in India's agricultural trade, price trends in domestic and international market and deliberates on the changes in trade policy with respect to major rabi crops viz. wheat, barley, gram, lentil, rapeseed & mustard. In addition, the outlook for global trade for these commodities has also been deliberated.

Global Trade Performance

4.2 According to World Trade Statistical Review 2021, world merchandise trade in 2020 registered a value of USD17.58 trillion, a decline of nearly 8 percent over 2019 mainly due to COVID-19 pandemic led demand shock. The share of agricultural commodities in total merchandise exports was 10.5 percent. European Union, the United States and Brazil were the leading exporters of agricultural products in 2020. The top ten exporting nations of agri-products together accounted for about 70.5 percent of world exports. The highest increase in exports of agricultural products among the top ten exporters were recorded by Canada (7%), Indonesia (7%) and Brazil (5%) while Argentina experienced the biggest decline (-6%), followed by China (-4%) and Thailand (-4%). It is noteworthy that while the world merchandise exports increased on an average by 3.6 percent per year during 2010-2020, the exports of agricultural products grew at a faster pace of 4.3 percent growth during the same period.

India's Agricultural Trade Performance

4.3 As per Directorate General of Commercial Intelligence and Statistics (DGCIS), in 2020-21, India's agri-exports had grown by more than 20 percent despite COVID-19 induced contraction in global merchandise trade. Subsequently, in 2021-22 also, India's agri-exports increased by an impressive rate of 21.7 percent over the previous year and stood at ₹391 thousand crore. On the other hand, imports of agricultural products increased sharply by 48.7 percent and stood at₹ 257 thousand crore in 2021-22. Accordingly, the trade surplus in agriculture narrowed from ₹148.6 thousand crore in 2020-21 to ₹134 thousand crore in 2021-22. The share of agri-exports in total exports of the country decreased from 14.9 percent in 2020-21 to 12.4 percent in 2021-22. At the same time, the share of agricultural imports in total imports declined marginally from 5.9 percent in 2020-21 to 5.6 percent in 2021-22.

4.4 The composition of agricultural trade by main commodity groups is presented in Chart 4.1(a) and 4.1(b). During 2021-22, rice (basmati and non-basmati) was the largest export item with a share of 18.4 percent, followed by marine products which accounted for 14.8 percent of agri-exports. Sugar (8.8%), spices (7.5%) and meat (6.3%) were the other major items in the agri-export basket of India. Top ten exported products accounted for almost 73 percent of total agri-exports.

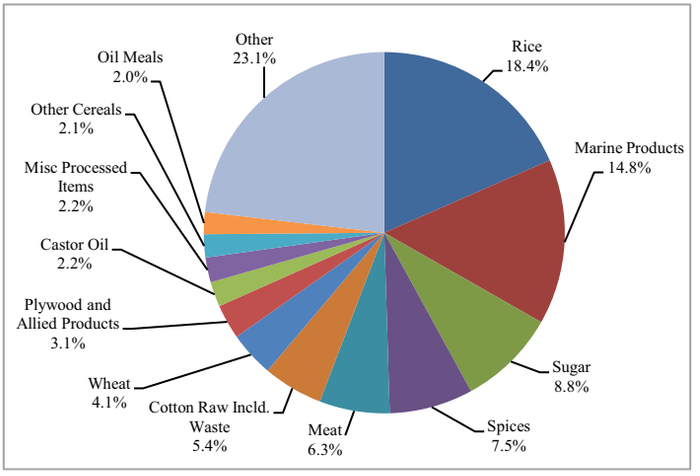
4.5 It is worth noting that exports of wheat, which accounted for a mere 1.3 percent of total agricultural exports from India in 2020-21, increased to 4.1 percent in 2021-22. It is indeed four-fold increase in earnings from wheat exports from India resulted from Russia-Ukraine geopolitical tensions. The conflict between the major global exporters of wheat adversely affected the international supplies of wheat and India played an important role in plugging the gap between world demand and supply, backed with surplus stocks of wheat. This led to quantum jump in India's wheat exports in 2021-22. In fact, the spike in wheat exports from India led to sharp rise in domestic prices of wheat in 2022, whereby the wholesale prices of wheat surpassed the MSP in April 2022. However, this sudden spurt in wheat exports created concerns over domestic price stability. Further, the heat wave in second quarter of 2022 in major wheat producing states also dampened the production prospects of wheat for following year. This prompted the Government to take the regulatory measure of restricting wheat exports in May 2022.

4.6 It is also noteworthy that while the share of sugar in total agri-exports of India increased from 6.4 percent in 2020-21 to 8.8 percent in 2021-22, the export earnings from sugar have increased by over 66 percent during this period. While the growth in export earnings is a positive development, however it is equally important to ensure that these are ecologically and environmentally sustainable too given the varied resources use as sugar and rice crops are water guzzlers. Thus, limited encouragement of these crops shall be affected in a due course while ensuring the domestic and global demand and supply.

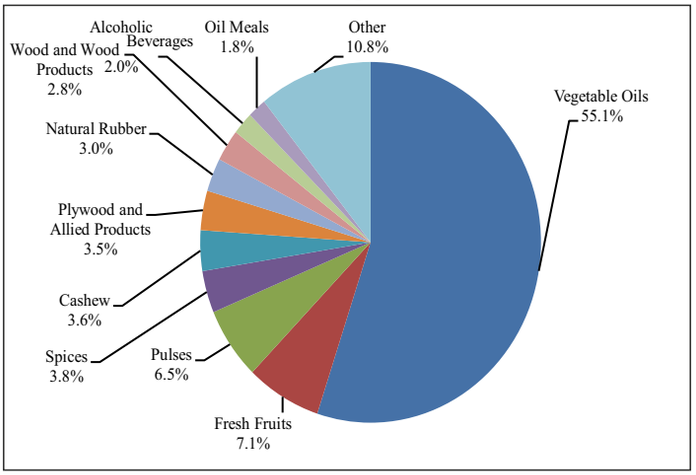
4.7 On the other hand, main commodities that India imported in 2021-22(in value) include vegetable oils (55.1%), fresh fruits (7.1%) and pulses (6.5%) (Chart 4.1(b)).In fact, the share of vegetable oils in the total agricultural imports of India has increased from 47.5 percent in 2020-21 to 55.1percent in 2021-22 indicating that domestic demand for vegetable oils has been on continued upward trend, outpacing the domestic supplies. Top ten imported products accounted for almost 90 percent of India's agricultural imports in 2021-22.

Chart 4.1: Value Share of India's Agricultural Exports and Imports, by Commodity/Group, 2021-22

(a) Exports



(b) Imports



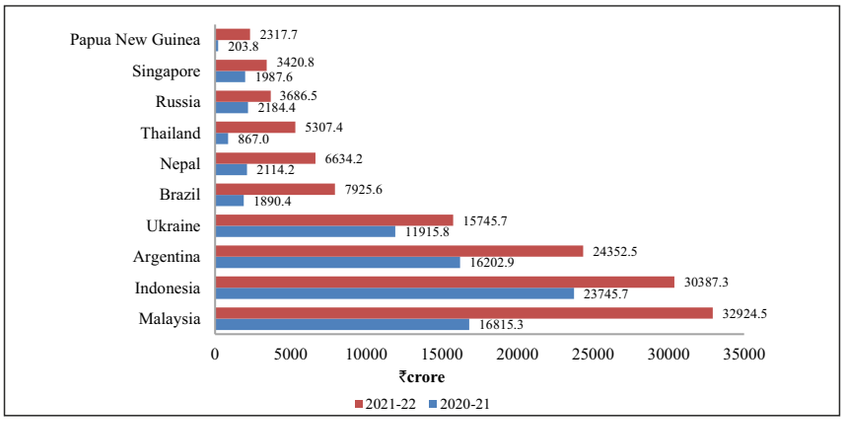
Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.8 Chart 4.2 illustrates the top 10 nations from which India imports vegetable oils and pulses. The countries are ranked based on the value of imports of the respective commodity in 2021-22. It is observed that India's imports of vegetable oils from each of these top ten nations in 2021-22 exceeded that of the previous year. Malaysia became the largest exporter of vegetable oils to India in 2021-22, replacing Indonesia which was the largest exporter in 2020-21. The four nation viz., Indonesia, Malaysia, Argentina and Ukraine dominate India's vegetable oil import with a sizable share of 73 percent (in value) in 2021-22.

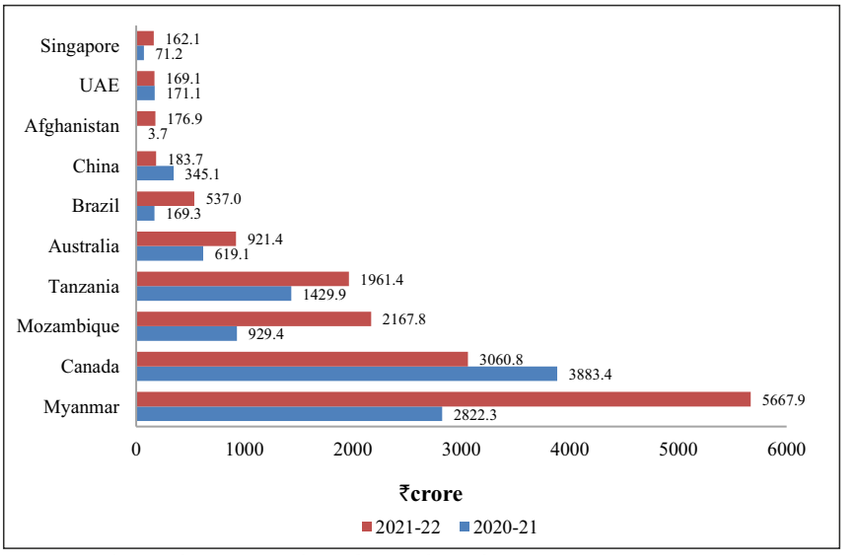
4.9 India is one of the largest producers of pulses. However, country is also the largest consumer of pulses and thus emerging as one of the largest importers of the pulses. India's imports of pulses increased from 25 lakh tonnes in 2020-21 to 27.7 lakh tonnes in 2021-22. India imports pulses mainly from Myanmar, Canada, Mozambique and Tanzania (Chart 4.2 (b)) and these four nations accounted for about 75 percent of total pulses imports in 2021-22. In the same year, India's pulses imports from Myanmar more than doubled making it the largest exporter of pulses to India. As pulses are integral part of food and nutritional security, it is essential to ensure self-sufficiency by bringing more area under pulses beside yield improvements and technology adoption at field level. In addition, there shall be renewed focus on price remuneration, procurement and market assurance to pulses growing farmers.

Chart 4.2: Top 10 Import Sources of Vegetable Oils and Pulses for India in 2020-21 and 2021-22

(a) Vegetable Oils



(b) Pulses



Note: Ranking of Countries based on value of import in 2021-22
Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.10 Annex Table 4.1shows the top destinations for major items of agricultural exports from India in 2021-22. It is observed that marine products are being exported mainly to USA, China and Japan. Basmati rice is exported mainly to middle-east countries viz. Iran, Saudi Arabia and Iraq whereas top three export destinations for non-basmati rice are Bangladesh, Benin and China in 2021-22. Major destinations for Indian spices are China, USA and Bangladesh. Egypt, Vietnam and Malaysia are the major destinations of meat exports from India. In 2021-22, Indian sugar had a good demand in Indonesia, Bangladesh and Sudan. Cotton from India is being imported mainly by Bangladesh, China and Vietnam. Bangladesh, Sri Lanka and UAE are the top three importers of Indian wheat in 2021-22.

Trade Performance and Price Trends

Cereals

Wheat

Global Wheat Production and Trade

4.11 As per United States Department of Agriculture (USDA), the global production of wheat in TE2021-22 has been 772.1 million tonnes, out of which about 25.7 percent was traded (traded ratio is percentage calculated as ratio of global exports to global production). China and European Union (EU) have been leading global producers of the wheat with China having a share of 17.5 percent in TE2021-22, closely followed by EU (17.4%), India (13.9%) and Russia (10.1%). Russia is now the largest exporter of wheat. In TE2021-22, Russia accounted for a share of 17.9 percent in global wheat exports, followed by EU(16.6%), USA(12.6%) and Canada (11.1%). Egypt continues to be the largest importer of wheat with a share of 6.2 percent, followed by Indonesia (5.4%) and Turkey (4.8%). It is pertinent to note that wheat exports are more concentrated and less diversified than its imports, as the share of top five exporters of wheat is 67.8 percent, while top five importers account for about one-fourth of total imports (24.5%).

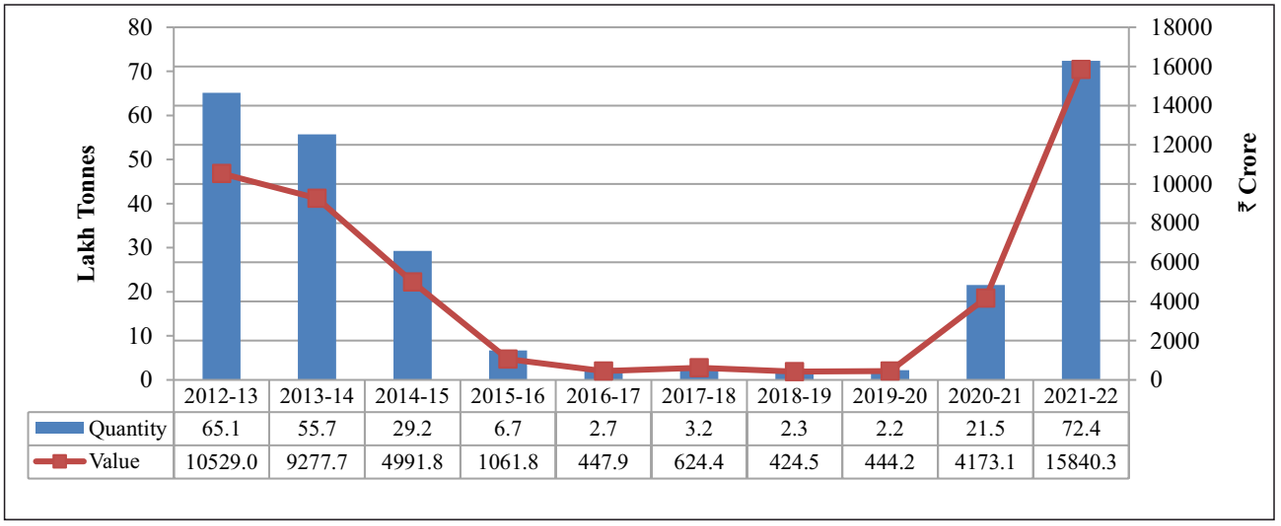
India's Trade in Wheat

4.12 India's exports of wheat were at a record level of 65.1 lakh tonnes during 2012-13. However, exports steadily declined thereafter due to stiff competition from Australian and Ukrainian wheat (Chart 4.3). Other factors like higher domestic prices and falling global prices (from as high as USD 360 per tonne for Wheat (U.S.), No 2, Soft Red Winter (SRW) in November 2012 to about USD 140 per tonne in December 2016 followed by slight recovery to US$181 per tonne in August 2019) also contributed to the decline in wheat exports. As a result, Indian wheat exports remained uncompetitive in the international markets till 2019-20.

4.13 However, in 2020-21, wheat exports from India witnessed a record jump to 21.5 lakh tonnes, mainly on account of steep increase in international prices of wheat and surplus wheat production domestically. As seen in chart 4.5, international wheat prices started increasing since 2020(Q3) and domestic wholesale prices of wheat went below international prices in 2020(Q4), making India's wheat export-competitive.

4.14 In 2021-22, in the backdrop of geopolitical tensions between Russia and Ukraine, the international supplies of wheat went down and India filled the vacuum, exporting 72.4 lakh tonnes of wheat, which is more than three times the volumes of wheat exported in the previous year.

Chart 4.3: India's Exports of Wheat, 2012-13 to 2021-22

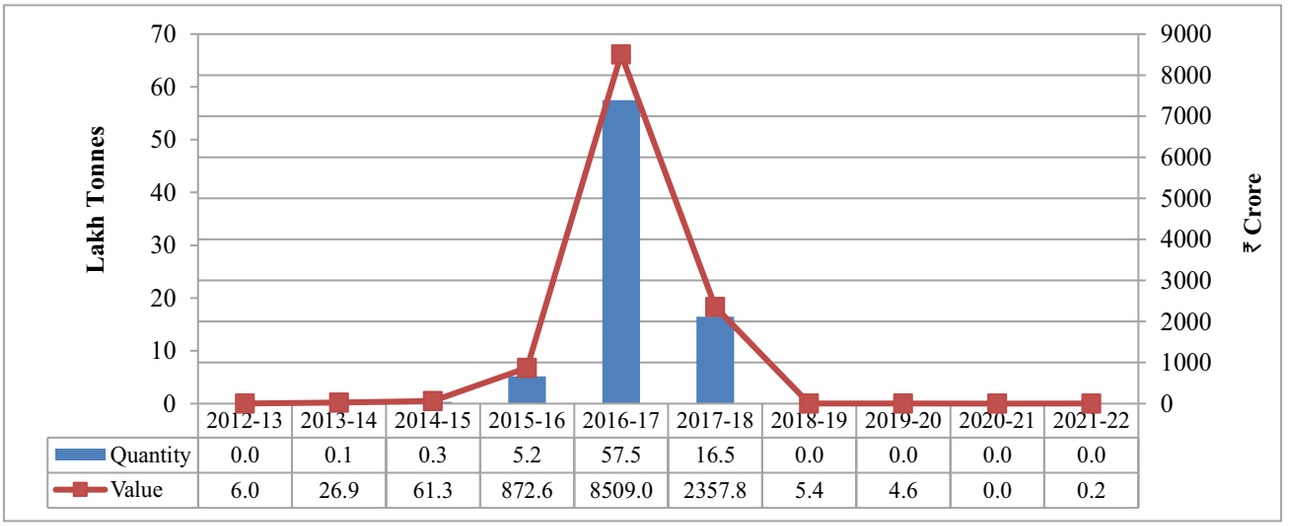


	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	65.1	55.7	29.2	6.7	2.7	3.2	2.3	2.2	21.5	72.4
Value	10529.0	9277.7	4991.8	1061.8	447.9	624.4	424.5	444.2	4173.1	15840.3

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.15 India's wheat imports have been negligible in the last one decade of 2012-13 to 2021-22, except during the years 2015-16, 2016-17 and 2017-18. In 2016-17, India imported over 57.5 lakh tonnes of wheat valued at ₹8,509 crore, the highest quantity in the last 10 years (Chart 4.4) mainly on account of low domestic production in the preceding year. These imports were mainly from Australia, Russia and Ukraine. Although India was a net importer of wheat for two consecutive years (2016-17 and 2017-18), imports were insignificant in later years as the country's wheat production prospects improved.

Chart 4.4: India's Imports of Wheat, 2012-13 to 2021-22



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	0.0	0.1	0.3	5.2	57.5	16.5	0.0	0.0	0.0	0.0
Value	6.0	26.9	61.3	872.6	8509.0	2357.8	5.4	4.6	0.0	0.2

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

Trade Policy of Wheat

4.16 India has become a major player in global wheat trade and only in last couple of years. Historically, India's trade policy in wheat has mainly relied on the domestic demand-supply situation and world prices. In August 2003, the Government of India had prohibited exports of wheat from Central Pool due to significant fall in wheat production in 2002-03. In February 2007, exports of wheat from private account were also prohibited. The ban on exports was lifted in September 2011 when export of 20 lakh tonnes of wheat was allowed under Open General License (OGL) from privately held stocks through Electronic Data Interchange (EDI) enabled ports. Since February 2012, unrestricted exports of wheat under OGL were allowed and wheat was under "free" category with no export authorization required from DGFT.

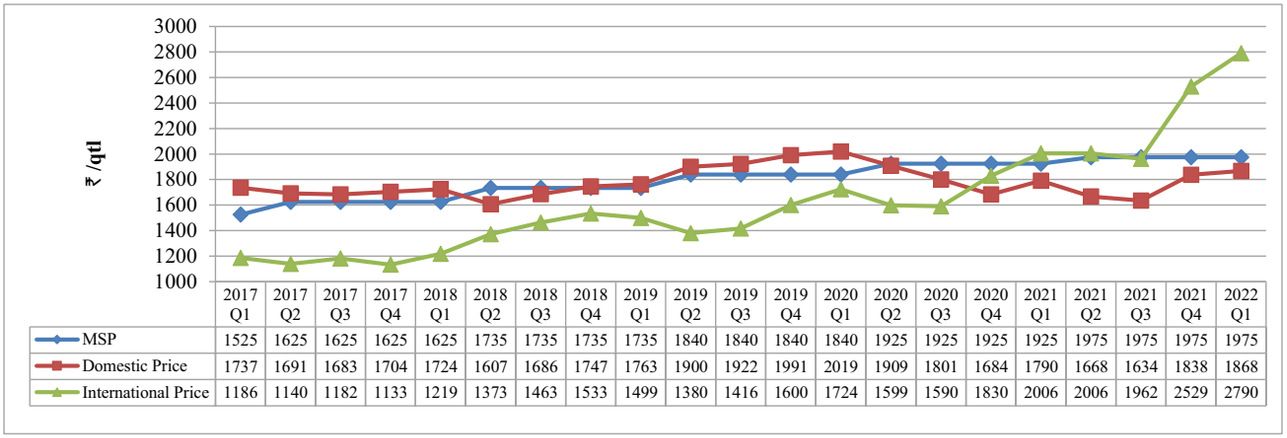
4.17 However, in May 2022, the export policy of wheat was revised from "free" to "restricted" vide DGFT notification dated 13th May 2022 in light of sudden spike in global prices of wheat and lower domestic production anticipated on account of severe heat wave in the major wheat producing states in the country. However, shipments of wheat exports were allowed in cases where Irrevocable Letter of Credit had been issued before and in cases where Governments of other countries, depending upon their food security concerns, request for wheat exports from India.

4.18 As regards the import policy of wheat, during 2006-07, wheat stocks in the Central Pool went below the Buffer Stock Norms. As a result, 60.8 lakh tonnes and 17.9 lakh tonnes of wheat was imported during 2006-07 and 2007-08, respectively. However, no imports of wheat have been made for the Central Pool thereafter. In order to control rising prices and to meet domestic demand due to lower production during 2014-15 and 2015-16, the Government reduced import duty on wheat from 25 percent to 10 percent on 23rd September 2016 and thereafter to zero percent on 8th December 2016. However, due to significant increase in production in 2016-17 and to protect interest of wheat growers, Government imposed 10 percent import duty in March 2017, which was further raised to 20 percent in November 2017. Thereafter, in May 2018, import duty on wheat was further raised to 30 percent. The import duty on wheat was again increased to 40 percent in April 2019 in order to restrict cheaper imports of wheat due to decline in global prices and to support local farmers. The tariff rate on wheat imports continues to be 40 percent at present. Import of certain varieties of wheat is restricted and allowed only through Food Corporation of India.

Comparative Price Trends in Wheat

4.19 Chart 4.5 shows the comparative price trends of domestic prices, MSP and international prices of wheat during 2017-2022(Q1). It is observed that during the period 2017-2020 (Q3), the international prices have been lower than the domestic prices as well as MSP of wheat. However, from 2020 (Q4) onwards, the international prices of wheat surpassed the domestic prices. The international prices again spiked 2021(Q3) onwards mainly owing to general commodity prices inflation witnessed globally. However, with the Russia-Ukraine conflict disrupting wheat supplies globally, the international wheat prices continued to rise even till 2022(Q1). In fact, the international wheat prices rose by 39.1 percent in 2022(Q1) vis-à-vis 2021(Q1). This sharp rise in international prices made exports of Indian wheat competitive in the international market.

Chart 4.5: MSP, Domestic and International Prices of Wheat, 2017 to 2022 (Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
MSP	1525	1625	1625	1625	1625	1735	1735	1735	1735	1840	1840	1840	1840	1925	1925	1925	1925	1975	1975	1975	1975
Domestic Price	1737	1691	1683	1704	1724	1607	1686	1747	1763	1900	1922	1991	2019	1909	1801	1684	1790	1668	1634	1838	1868
International Price	1186	1140	1182	1133	1219	1373	1463	1533	1499	1380	1416	1600	1724	1599	1590	1830	2006	2006	1962	2529	2790

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

2. Wholesale prices are weighted average prices of major producing states namely Haryana, MP, Punjab, Rajasthan and UP.

Source : 1. AGMARKNET, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices

2. World Bank for International prices.

Barley

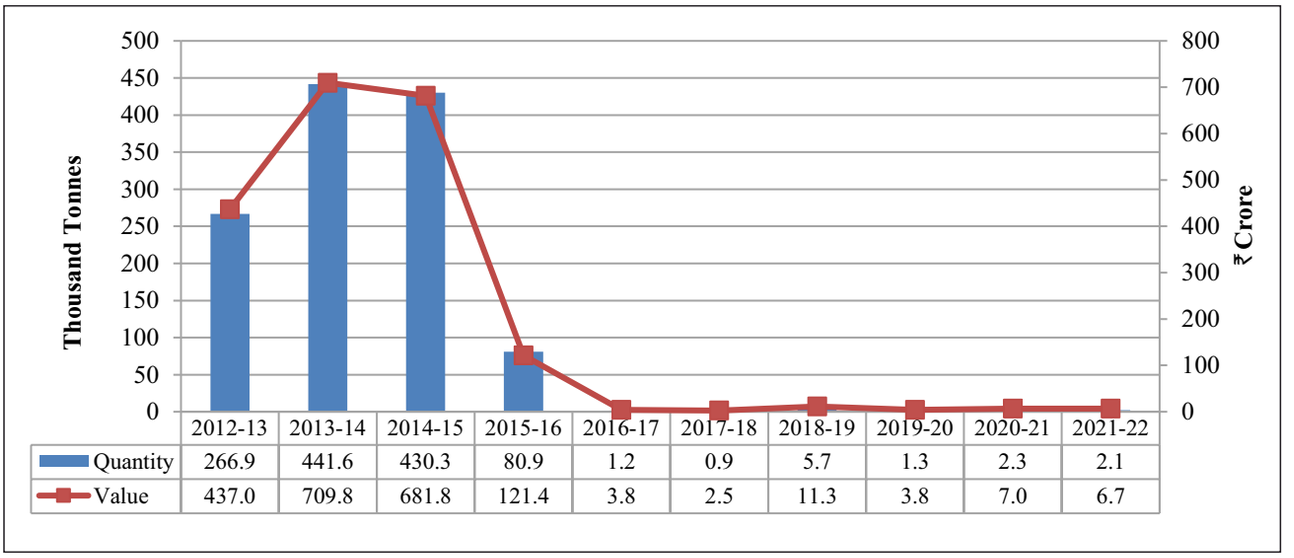
Global Barley Production and Trade

4.20 As per USDA, global production of barley was 154.3 million tonnes in TE2021-22, out of which 21 percent were traded. EU has been the largest producer of barley in TE2021-22 with a share of about 34.9 percent in TE2021-22, followed by Russia (12.5%) and Australia (8%). EU is also the largest exporter with a share of 24.3 percent, followed by Australia (20.8%) and Russia (15.2%). On the other hand, China (27.3%) and Saudi Arabia(18.9%) are the major importers of barley, followed by Iran (8.4%) and EU (3.2%). Top three exporters and importers account for more than half of the global exports and imports of barley.

India's Trade in Barley

4.21 During last 10 years, the highest exports of barley from India were registered at around 442 thousand tonnes in 2013-14 (Chart 4.6). Since 2016-17, exports of barley from India have been negligible mainly due to domestic prices of barley being consistently higher than international prices (Chart 4.8). This makes Indian barley exports uncompetitive in the international market.

Chart 4.6: India's Exports of Barley, 2012-13 to 2021-22

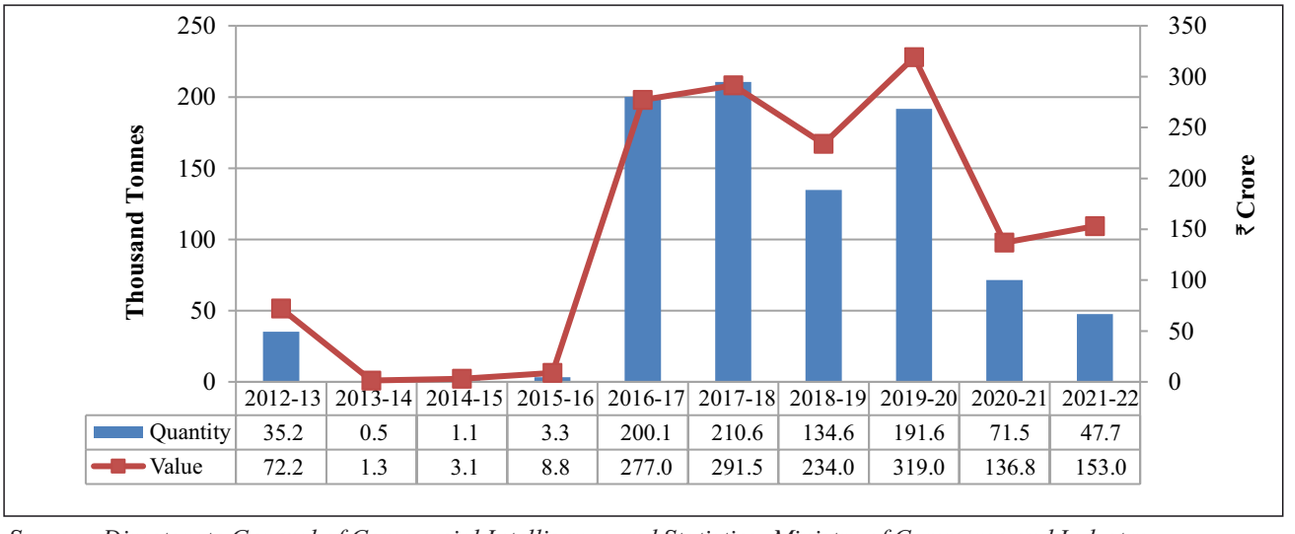


	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	266.9	441.6	430.3	80.9	1.2	0.9	5.7	1.3	2.3	2.1
Value	437.0	709.8	681.8	121.4	3.8	2.5	11.3	3.8	7.0	6.7

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.22 Barley is mainly used in malted beverages and malting industry. India's requirement of barley for beer and distilled beverages is met mainly from imports, which have become substantial since 2016-17. In fact, India has become net importer of barley since 2016-17. The country has been importing an average of 131 thousand tonnes of barley every year during 2017-18 to 2021-22. Argentina has been the major exporter of barley to India.

Chart 4.7: India's Imports of Barley, 2012-13 to 2021-22



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	35.2	0.5	1.1	3.3	200.1	210.6	134.6	191.6	71.5	47.7
Value	72.2	1.3	3.1	8.8	277.0	291.5	234.0	319.0	136.8	153.0

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

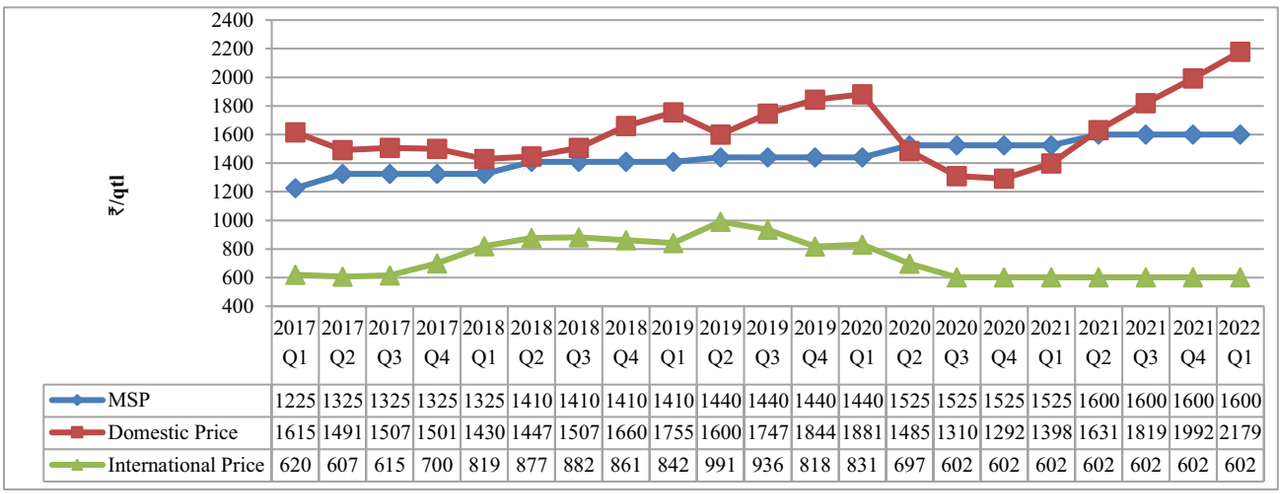
Trade Policy of Barley

4.23 Currently, barley exports are under "free" category do not require export authorization from DGFT. The quantitative restrictions on imports of barley were removed in 2002 and presently, imports of barley are "free" under existing trade policy norms with nil import duty. However, the imports of seed quality of barley are "restricted".

Comparative Price Trends in Barley

4.24 Trends in MSP, domestic wholesale prices and international prices of barley during 2017 to 2022 (Q1) are presented in Chart 4.8.Thedomestic wholesale prices and MSP of barley have consistently been higher than the international prices. Accordingly, Indian barley exports are not competitive in the international market and India has been a net importer of barley since 2016-17.

Chart 4.8: MSP, Domestic and International Prices of Barley, 2017 to 2022 (Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
MSP	1225	1325	1325	1325	1325	1410	1410	1410	1410	1440	1440	1440	1440	1525	1525	1525	1525	1600	1600	1600	1600
Domestic Price	1615	1491	1507	1501	1430	1447	1507	1660	1755	1600	1747	1844	1881	1485	1310	1292	1398	1631	1819	1992	2179
International Price	620	607	615	700	819	877	882	861	842	991	936	818	831	697	602	602	602	602	602	602	602

Note: 1. International prices are of the variety (USA) feed, No. 2, spot, 20 days To-Arrive, delivered Minneapolis.
2. Wholesale prices are weighted average prices of major producing states, namely, Haryana, MP, Rajasthan and UP
Source : 1. AGMARKNET, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices
2. World Bank for International prices.

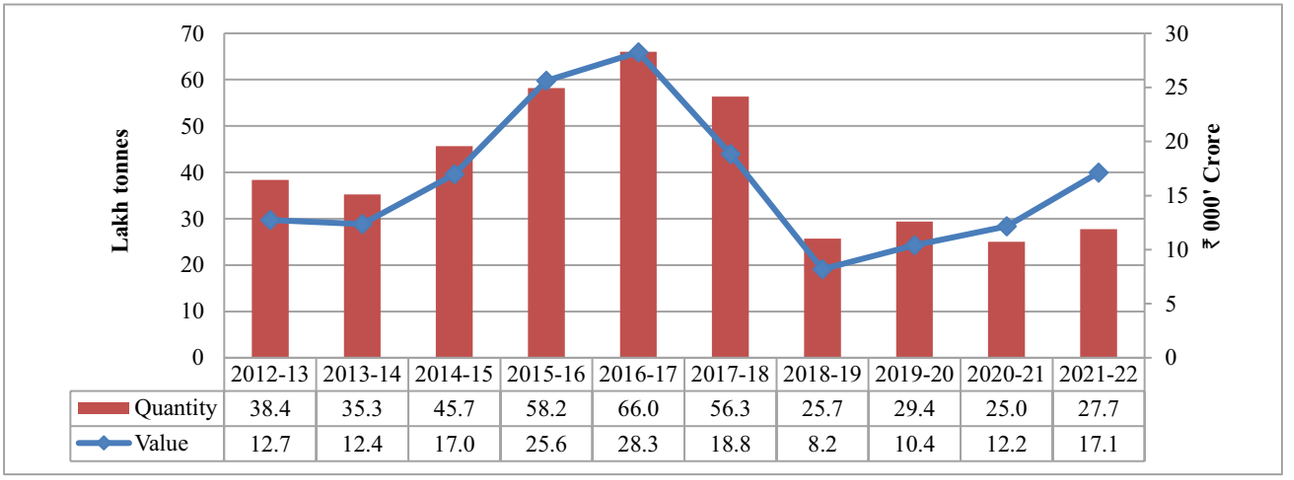
Pulses

India's Trade in Pulses

4.25 Pulses constitute a major source of proteins in the vegetarian diet in India. As per the trade data published by Directorate General of Commercial Intelligence and Statistics, the imports of pulses in the country had been consistently rising from 38.4 lakh tonnes in 2012-13 to 66 lakh tonnes in 2016-17(Chart 4.9). However, due to record production of pulses in the country in the subsequent years and interventions such as high import tariffs, imports of pulses showed a steady decline after 2016-17 and reduced to 25.7 lakh tonnes two years later in 2018-19. It is observed that in the last four years, while the imports of pulses have been volatile and hovered around an average of 27 lakh tonnes, the import bill has been continuously increasing, indicating sustained rise in international prices of pulses.

4.26 Import of pulses accounted for about 6.5 percent in India's agri-imports in 2021-22. While India is gradually moving towards self-sufficiency in pulses, it still requires sustained focus on increasing pulses acreage as well as bridging yield gaps in pulses through use of new varieties, better seeds and adoption of improved scalable technology.

Chart 4.9: India's Imports of Pulses, 2012-13 to 2021-22

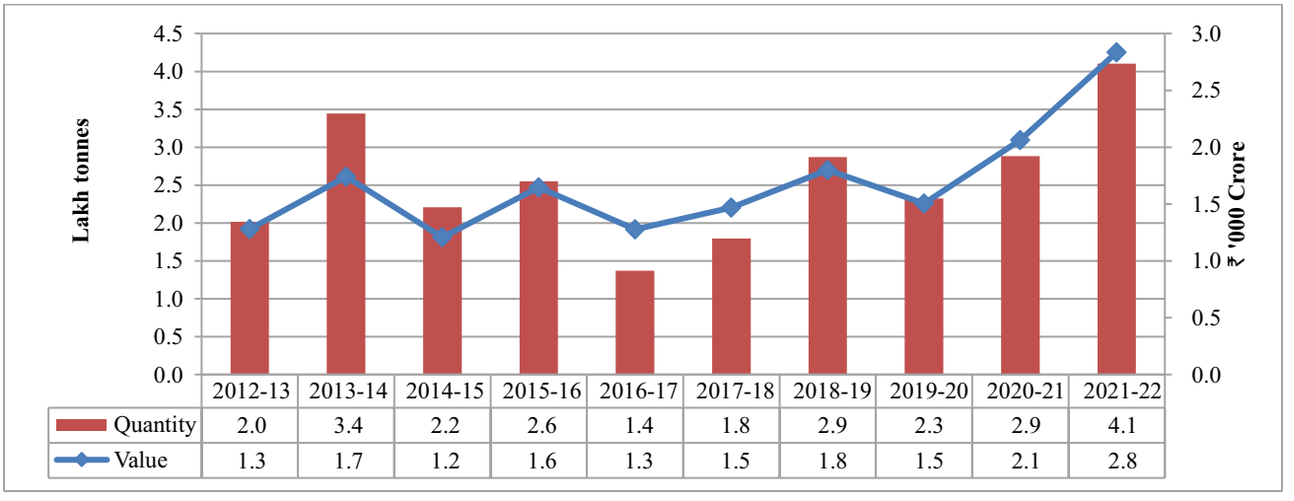


	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	38.4	35.3	45.7	58.2	66.0	56.3	25.7	29.4	25.0	27.7
Value	12.7	12.4	17.0	25.6	28.3	18.8	8.2	10.4	12.2	17.1

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.27 Chart 4.10 depicts the trends in exports of pulses from India during the period 2012-13 to 2021-22. For the period 2012-13 to 2019-20, the export of pulses was meager and volatile. However, it is interesting to note that in the past three years, the exports of pulses from India have been on an uptrend though these exports are roughly one-ninth of the total imports of pulses in the country. Major export destinations for Indian pulses are USA, China, Nepal, UAE and Algeria.

Chart 4.10 : India's Exports of Pulses, 2012-13 to 2021-22



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	2.0	3.4	2.2	2.6	1.4	1.8	2.9	2.3	2.9	4.1
Value	1.3	1.7	1.2	1.6	1.3	1.5	1.8	1.5	2.1	2.8

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.28 As regards composition of India's imports of pulses, as shown in Table 4.1, tur constituted the largest share (30.3%) in total imports of pulses in 2021-22, followed by lentil (24.1%), urad (22.1%) and gram (7.3%).The major import origins of Tur are Mozambique, Myanmar and Tanzania. Canada is single largest exporter of lentil to India while most of the urad is sourced from Myanmar.

Table 4.1: Leading Country Sources of India's Pulses Imports, 2021-22

Name	Imports (Lakh tonnes)	Share (%) in total pulses imports	Key Origins (Share in %)
Tur	8.4	30.3	Mozambique (38.1), Myanmar (24.3), Tanzania (22.8)
Urad	6.1	22.1	Myanmar (96.0), Singapore (2.8), UAE (1.0)
Lentil	6.7	24.1	Canada (78.4), Australia (20.2), UAE (0.7)
Gram	2.0	7.3	Tanzania (62.2), Sudan (19.7), Myanmar (8.8)
Moong	2.0	7.1	Mozambique (31.6), Tanzania (16.4), Myanmar (16.2)
Others	2.5	9.1	-

Trade Policy of Pulses

4.29 India has been one of the largest importer of pulses in the world. The import duties on pulses are actively calibrated in order to balance the twin goals of meeting domestic demand as well as protecting farmers from cheap imports of pulses. As regards the rabi pulses, namely gram and lentil, the import duty on gram was kept nil during the period June 2006 to December 2017 in order to ensure sufficient supplies to meet domestic demand. However, owing to bumper production of gram in 2016-17, in order to curb imports and contain the fall in domestic prices of gram, the import duty of 30 percent was imposed on gram in December 2017. This was hiked in quick succession to 40 percent in February 2018 and further to 60 percent in March 2018. In February 2021, this 60 percent import duty was replaced by 10 percent Basic Customs Duty (BCD) and 50 percent Agriculture Infrastructure and Development Cess (AIDC), which continues to be unchanged till date.

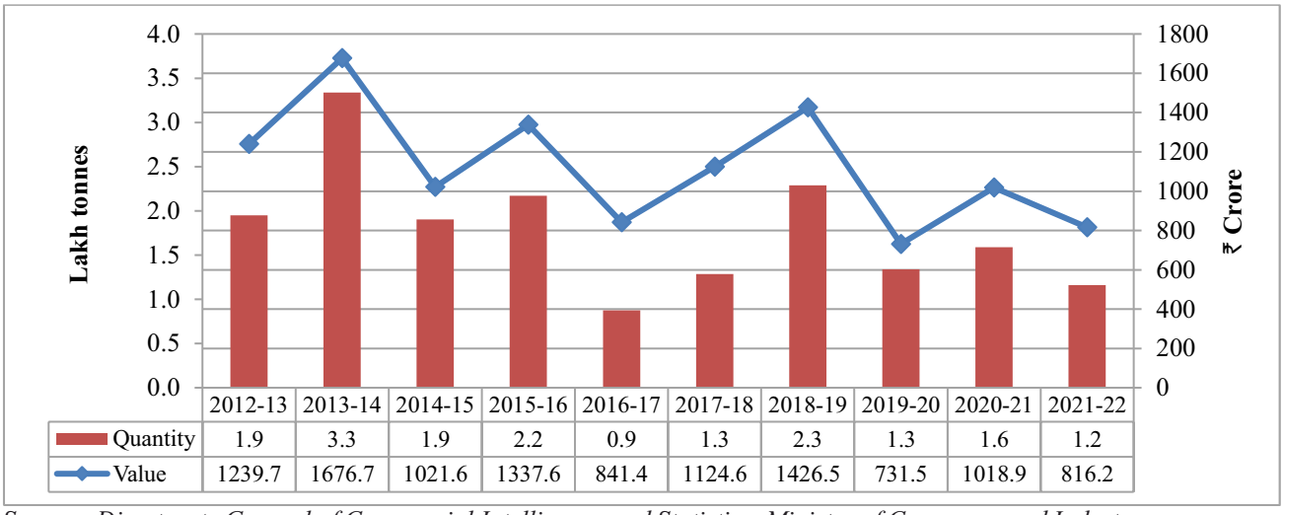
4.30 Similar to gram, import duty on lentil was also raised to 30 percent in December 2017, which was further increased to 50 percent for lentil of USA origin in June 2019. On 2nd June 2020, Government of India reduced the basic import duty on lentil to 10 percent (30% for lentil of USA origin) until 31st August 2020 to comply with its commitment of free pulse distribution program during COVID-19 lockdown. While tariff reduction on import of lentil was ought to be a temporary measure, the lower tariff rate of 10 percent was extended till 31st December 2020 but was reverted to 30 percent on 1st January 2021. Thereafter, on 2nd February 2021, as announced in the Union Budget, the 30 percent import duty on lentil was replaced by 10 percent Basic Customs Duty (BCD) and 20 percent Agriculture Infrastructure and Development Cess (AIDC). In July 2021, the BCD on lentil was slashed and AIDC on lentil was reduced to 10 percent in anticipation of lower production expected from major producing seeds and inflationary tendencies. W.e.f 13th February 2022, in order to boost imports, the AIDC of 10 percent on lentil was also slashed altogether till 30th September 2022. At present, the import duty on lentil is nil, except lentil of USA origin on which 20 percent import duty is levied.

4.31 As regards the export policy of rabi pulses, as per existing ITC (HS) Export Policy - 2018, both gram and lentil exports are currently under "free" category and do not require any export authorization from DGFT and the policy remains the same for the last four years.

India's Trade in Gram (Chickpea)

4.32 Gram accounted for about 29 percent share in the value of total pulses exported from India during 2021-22. India's exports mainly kabuli chana to the rest of the word. Gram exports from India in value and volume terms during the period 2012-13 to 2021-22 are shown in Chart 4.11. It is observed that both, volume and value of gram exports, have been volatile, In the last ten years, gram exports have been fluctuating around an annual average of 1.8 lakh tonnes with the highest volume of 3.3 lakh tonnes in the year 2013-14. Major destinations for gram exports from India are UAE, Iran and Saudi Arabia.

Chart 4.11: India's Exports of Gram, 2012-13 to 2021-22



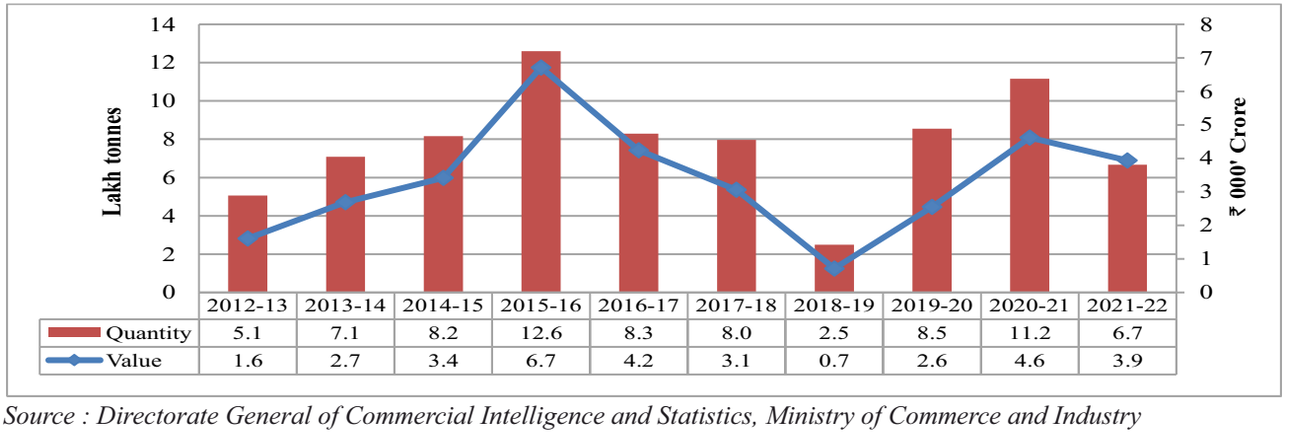
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	1.9	3.3	1.9	2.2	0.9	1.3	2.3	1.3	1.6	1.2
Value	1239.7	1676.7	1021.6	1337.6	841.4	1124.6	1426.5	731.5	1018.9	816.2

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

India's Trade in Lentil (Masur)

4.33 Chart 4.12 depicts the trends in imports of lentil during the period 2012-13 to 2021-22. It is observed that the imports of lentil were on a secular uptrend from 2012-13 to 2015-16 due to high domestic demand and fluctuating domestic production. However, imports declined thereafter for three consecutive years from 12.6 lakh tonnes in 2015-16 to 2.5 lakh tonnes in 2018-19 owing to higher domestic production and due to increase in import duty in December 2017. Imports of lentil in 2020-21 have sharply increased to 11.2 lakh tonnes as the basic import duty on lentil were temporarily reduced from 30 percent to 10 percent between June 2020 and December 2020. In 2021-22, the lentil imports have moderated to 6.7 lakh tonnes.

Chart 4.12: India's Imports of Lentil, 2012-13 to 2021-22



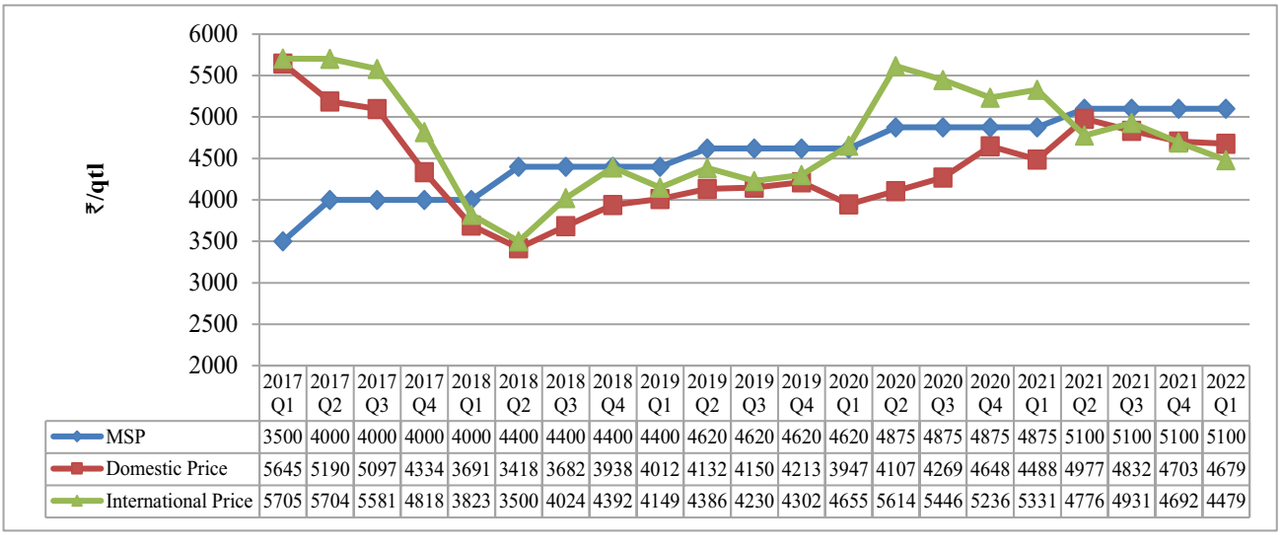
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	5.1	7.1	8.2	12.6	8.3	8.0	2.5	8.5	11.2	6.7
Value	1.6	2.7	3.4	6.7	4.2	3.1	0.7	2.6	4.6	3.9

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

Comparative Price Trends in Gram and Lentil

4.34 Chart 4.13 compares the trends in domestic wholesale prices of gram with MSP and international prices for the period 2017 to 2022(Q1). The domestic and international prices of gram have moved largely in close tandem during this period except the divergence seen in 2020. It is seen that domestic and international prices of gram gradually fell from the beginning of 2017 till 2018(Q2) and plummeted below MSP in 2018. The domestic and international prices of gram began to recover in 2018(Q3). The international prices thereafter surpassed MSP in 2020(Q1). On the other hand, domestic prices of gram even though increased gradually but remained below MSP. Since 2021(Q2), the domestic and international prices of gram have been gradually declining and have reached the levels below MSP. This highlights the need for strengthening procurement of gram in domestic wholesale markets,in order to give remunerative prices to farmers and to promote higher production of gram.

Chart 4.13: MSP, Domestic and International Prices of Gram, 2017 to 2022 (Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
MSP	3500	4000	4000	4000	4000	4400	4400	4400	4400	4620	4620	4620	4620	4875	4875	4875	4875	5100	5100	5100	5100
Domestic Price	5645	5190	5097	4334	3691	3418	3682	3938	4012	4132	4150	4213	3947	4107	4269	4648	4488	4977	4832	4703	4679
International Price	5705	5704	5581	4818	3823	3500	4024	4392	4149	4386	4230	4302	4655	5614	5446	5236	5331	4776	4931	4692	4479

Note: 1. *International prices are for Australian Gram till 2021 (Q1) and Tanzanian Gram from 2021 (Q2) to 2022 (Q1), delivered at Mumbai port.*

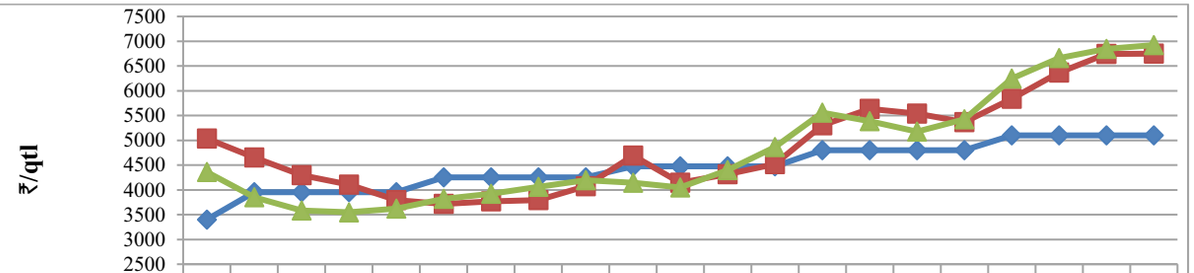
2. *Wholesale prices are weighted prices of major producing states, namely, AP, Karnataka, MP, Maharashtra and UP.*

Source : 1. AGMARKNET, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices.

2. Agriwatch for International prices.

4.35 In case of lentil, both domestic and international prices showed a declining trend throughout the year 2017 and began to recover in 2018. The domestic and international prices of lentil hovered around MSP during the period 2018 and 2019. However, 2020 onwards, the prices of lentil surpassed MSP in domestic and international markets and have been on a gradual rise since then. The domestic and international prices of lentil are observed to be highly correlated with a correlation coefficient of 94 percent during 2017 to 2022(Q1).

Chart 4.14: MSP, Domestic and International Prices of Lentil, 2017 to 2022 (Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
MSP	3400	3950	3950	3950	3950	4250	4250	4250	4250	4475	4475	4475	4475	4800	4800	4800	4800	5100	5100	5100	5100
Domestic Price	5037	4651	4296	4104	3791	3716	3771	3796	4073	4694	4142	4316	4521	5305	5637	5540	5365	5838	6368	6747	6749
International Price	4359	3852	3586	3548	3622	3820	3923	4062	4195	4141	4046	4397	4866	5561	5384	5179	5423	6246	6662	6843	6923

Note: *1. International prices are of Canadian Lentil delivered at Mumbai port.*
2. Wholesale prices are weighted average prices of major producing states, namely, Bihar, MP, UP and West Bengal.

Source : 1. AGMARKNET, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices.
2. Agriwatch for International prices.

Edible Oils and Oilseeds

Global Production and Trade in Major Oilseeds and Vegetable Oils

4.36 As per USDA June 2022 report, global production of major oilseeds was 595.4 million tonnes in TE2021-22, out of which about 31 percent was traded., Brazil was the largest producer of major oilseeds in TE2021-22 with a share of about 22.9 percent, closely followed by USA (20.3%), China (10.6%), Argentina (8.6%) and India (6.5%). Brazil and USA accounted for about 76 percent of the global exports, with a share of 45.9 percent and 30.3 percent, respectively. Canada (6.9%) is another major exporter of oilseeds. China is the single largest importer of oilseeds accounting for more than half of the global imports (54.3%), followed by EU (12%) and Mexico (4.1%).

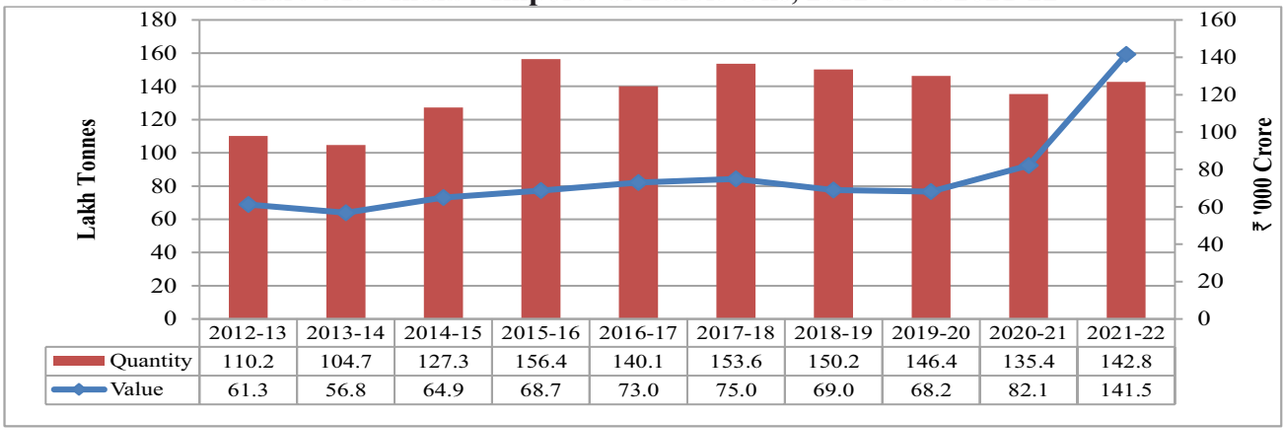
4.37 Global production of vegetable oils during TE2021-22, as per USDA, was 208.5 million tonnes. Out of this, about 40 percent was traded. Indonesia was the largest producer, accounting for 23.9 percent of the world production of vegetable oil in TE2021-22, followed by China (13.2%), Malaysia (10%) and EU (8.6%).Indonesia (33.3%) and Malaysia (21.1%) together account for 54.4 percent of global exports in TE2021-22. India remains the largest importer of vegetable oils with a share of about 17 percent, followed by China (14.2%) and EU (13.1%).

India's Trade in Edible Oils

4.38 India is heavily dependent on imports to meet its edible oil requirements. About 60 percent of country's edible oils requirement is met through imports. The current consumption of level of edible oils in India is estimated at 19 kg per person per year. Although country is known for cultivation of various oil seed crops, domestic production and edible oil supply doesn't meet the demand owing to low productivity, growing oil seed crops in marginal lands and rain-fed areas and others.

4.39 India is likely to remain world's leading importer of edible oils to fill supply-demand gap in the coming years. As per DGCIS statistics, India's imports of edible oils increased from 110.2 lakh tonnes (valued at ₹61.3 thousand crore) in 2012-13 to a record of 156.4 lakh tonnes (₹68.7 thousand crore) in 2015-16 (Chart 4.15). Since 2016-17, the edible oils imports by India have moderated and have hovered around 140 lakh tonnes. However, the edible oil import bill has steeply risen in the recent years from ₹68.2 thousand crore in 2019-20 to an all-time high of ₹141.5 thousand crore in 2021-22, more than doubling in a span of just two years. This has been mainly due to increase in international prices of edible oil since the beginning of 2020. This has commensurately reflected in the high share of edible oils (55.1%) in the agri-import bill of India in 2021-22 (Chart 4.1(b)).

Chart 4.15: India's Imports of Edible Oils, 2012-13 to 2021-22

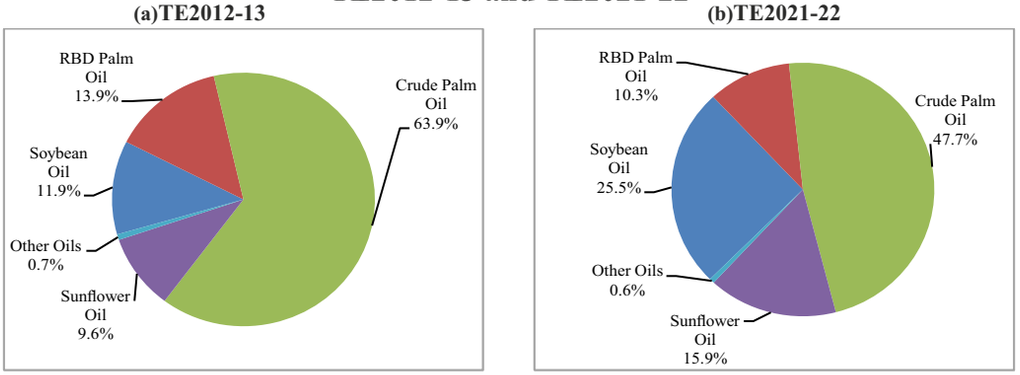


	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	110.2	104.7	127.3	156.4	140.1	153.6	150.2	146.4	135.4	142.8
Value	61.3	56.8	64.9	68.7	73.0	75.0	69.0	68.2	82.1	141.5

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

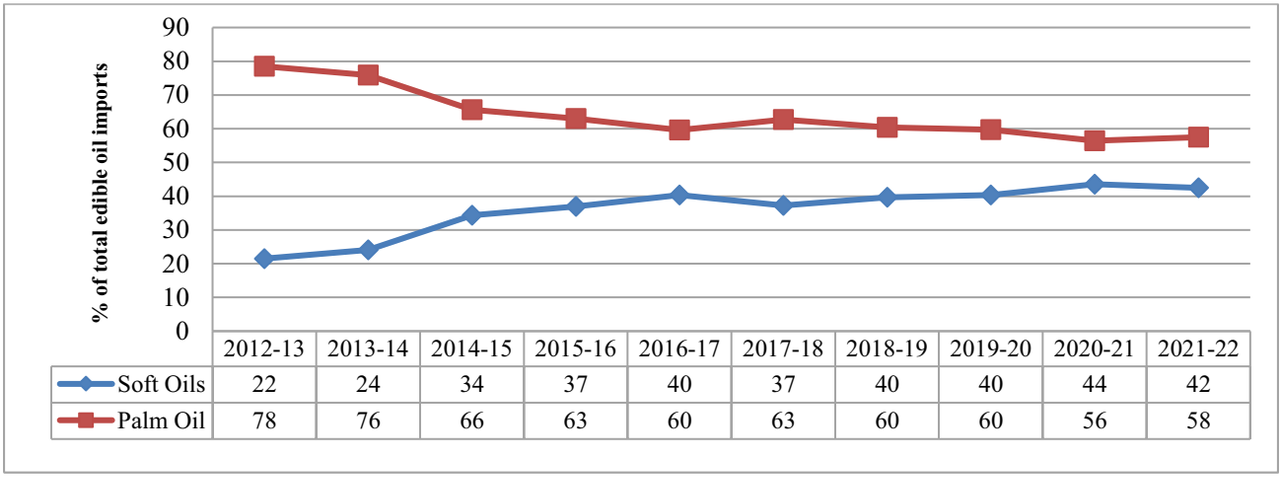
4.40 As regards the composition of edible oil imports in India, Chart 4.16 depicts the shares of various kinds of imported edible oils for TE2012-13 and TE2021-22. It is observed that the share of soybean oil in total volume of edible oil imports has increased from 11.9 percent to 25.5 percent during this period and the share of sunflower oil has increased from 9.6 percent to 15.9 percent. Simultaneously, the share of crude palm oil in total volume of edible oil imports has declined significantly from 63.9 percent in TE2012-13 to 47.7 percent in TE2021-22. The share of RBD palm oil has also decreased from 13.9 percent to 10.3 percent during the same period. This is also reflected in Chart 4.17 whereby it is shown that the share of palm oil (both, crude and refined variants) in the import basket of edible oils has gradually fallen from 78 percent in 2012-13 to 58 percent in 2021-22. At the same time, the share of soft oils (edible oils other than palm oils) has increased from 22 percent in 2012-13 to 42 percent in 2021-22.

Chart 4.16: Share of Major Edible Oils in Total Edible Oil Imports (in volume terms): TE2012-13 and TE2021-22



Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

Chart 4.17: Rising Shares of Soft Oils in Total Edible Oil Imports (in volume terms): 2012-13 to 2021-22



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Soft Oils	22	24	34	37	40	37	40	40	44	42
Palm Oil	78	76	66	63	60	63	60	60	56	58

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

4.41 As the edible oil imports in the recent years constituted more than half of the agri-import bill of India, there is a need to increase domestic availability of edible oils and to reduce import dependency. Accordingly, a National Mission on Edible Oils – Oil Palm (NMEO-OP) has been launched by the Government with the objective of expanding supplies of palm oil by replanting of old oil palm gardens, providing inputs for establishment of seed gardens, custom hiring centre etc. The total approved cost of the NMEO (Oil Palm) Scheme is ₹ 11,040 crore, out of which ₹8,844 crore is Central share and ₹2,196 crore States' share. For the year 2021-22, a total of ₹104.2 crore has been approved for various state annual action plans.

Rapeseed and Mustard (R&M) Seed

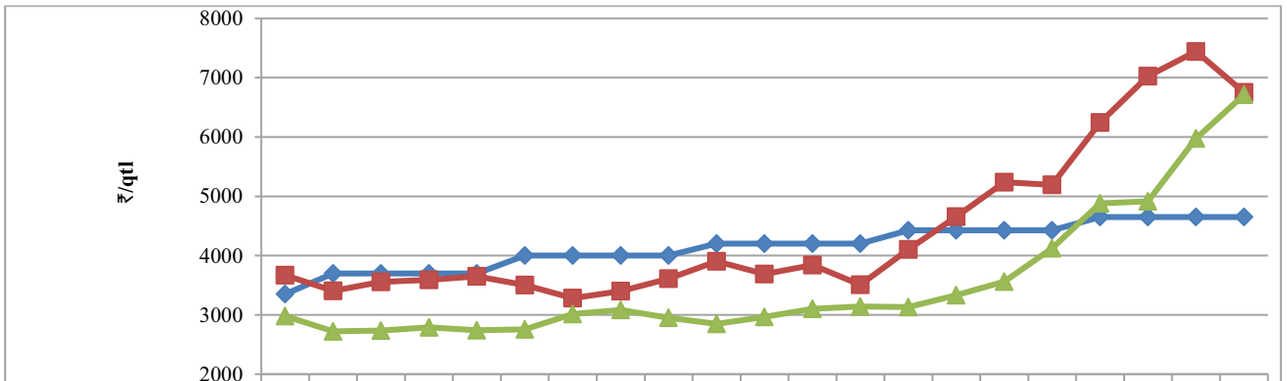
Global Production and Trade

4.42 According to USDA, the global production of R&M seed was 71.4 million tonnes in TE2021-22, out of which about 22 percent was traded. Canada was the largest producer of R&M seed in TE2021-22 with a share of 24.1percent, followed by EU (23%), China (19.4%) and India (12.6%). Canada continues to be the largest exporter with a share of 54 percent, while EU was the largest importer with a share of 36.9 percent. In the year 2021-22, Canada witnessed a sharp fall of over one-third of its production of R&M seed owing to rainfall being well below its long-term average in major growing areas. On the other hand, India's production of the oilseed increased by an impressive 29 percent.

Comparative Trends in Prices of Rapeseed/ Mustard Seed

4.43 Chart 4.18 illustrates the comparative trends in MSP, domestic and international prices of rapeseed & mustard seed during the period 2017 to 2022(Q1). It is seen that during the period 2017 to 2022(Q1), domestic wholesale prices of R&M seeds have been consistently higher than international prices. Both domestic and international prices of R&M seed have been steeply rising since the onset of 2020. The domestic prices surpassed MSP in 2020(Q3) while the international prices surpassed MSP in 2021(Q2). It is noteworthy that in 2022(Q1), while the domestic prices of R&M seed have moderated to ₹6,753/qtl from the recent peak of ₹7,444/qtl in 2021(Q4), the international prices of the oilseed are still inching up.

Chart 4.18: MSP, Domestic and International Prices R&M Seed, 2017 to 2022(Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
MSP	3350	3700	3700	3700	3700	4000	4000	4000	4000	4200	4200	4200	4200	4425	4425	4425	4425	4650	4650	4650	4650
Domestic Price	3667	3406	3556	3592	3647	3504	3282	3401	3609	3904	3691	3842	3506	4105	4656	5236	5193	6244	7028	7444	6753
International Price	2980	2722	2737	2789	2742	2756	3014	3084	2952	2848	2963	3101	3143	3131	3334	3563	4125	4882	4916	5977	6711

Note: 1. International prices are R&M Oilseed, Hamburg CIF.
2. Wholesale prices are weighted average prices of major producing states, namely, Gujarat, Haryana, Rajasthan, UP and West Bengal
Source :1. AGMARKNET, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices
2. USDA for International prices.

Rapeseed/Mustard Oil

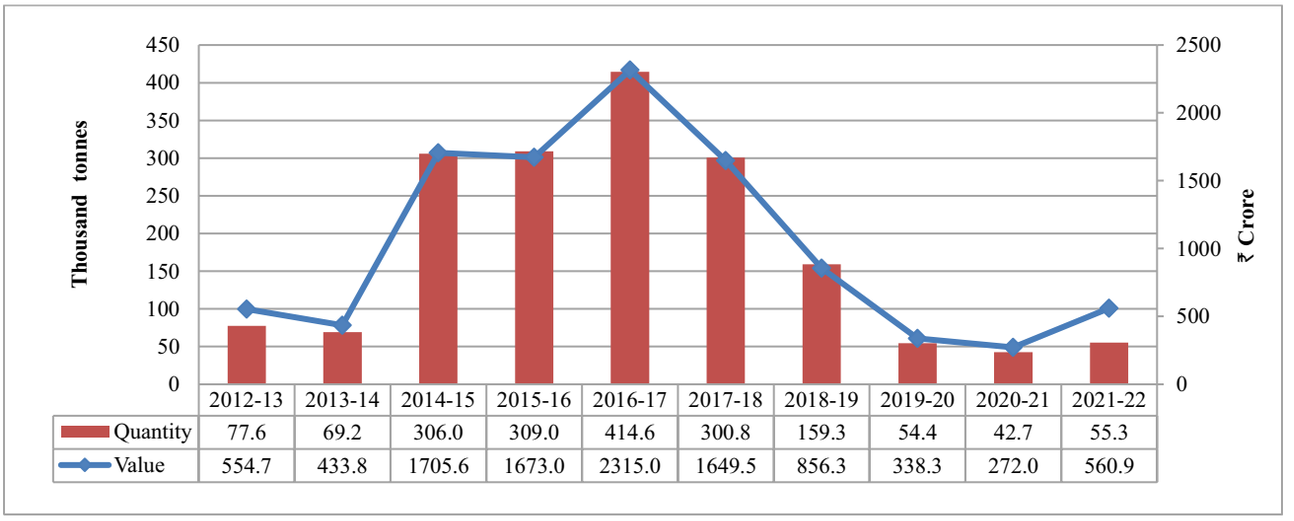
Global Production and Trade

4.44 According to USDA, global production of rapeseed/mustard oil was 28.6 million tonnes in TE2021-22, out of which 20.4 percent was traded. In TE2021-22, EU was the largest producer of rapeseed/mustard oil with a share of 31.8 percent in global production, followed by China (21.6%), Canada (14.6%) and India (10.8%). Canada was the largest exporter of R&M oil, accounting for more than half (53.7%) of the global exports. China was the largest importer R&M oil with roughly one-third share (32.6%) in TE2021-22.

India's Trade in Rapeseed/ Mustard Oil

4.45 India's exports of rapeseed/mustard oil have been negligible. Chart 4.19 depicts the trends in India's imports of R&M oil during the period 2012-13 to 2021-22. It is seen that imports of R&M oil increased more than five-fold in volume terms from 2012-13 to 2016-17. However, with the increase in import duty on edible oils in November 2017 and gradual increase in domestic production, imports of rapeseed & mustard oil subsequently fell for four consecutive years from 2017-18 to 2020-21. However, in 2021-22, while the R&M oil imports grew by 29.5 percent in volume, its import bill more than doubled owing to global inflation in oilseeds and edible oils persisting since the onset of 2021 (Chart 4.20).

Chart 4.19: India's Imports of R&M Oil, 2012-13 to 2021-22



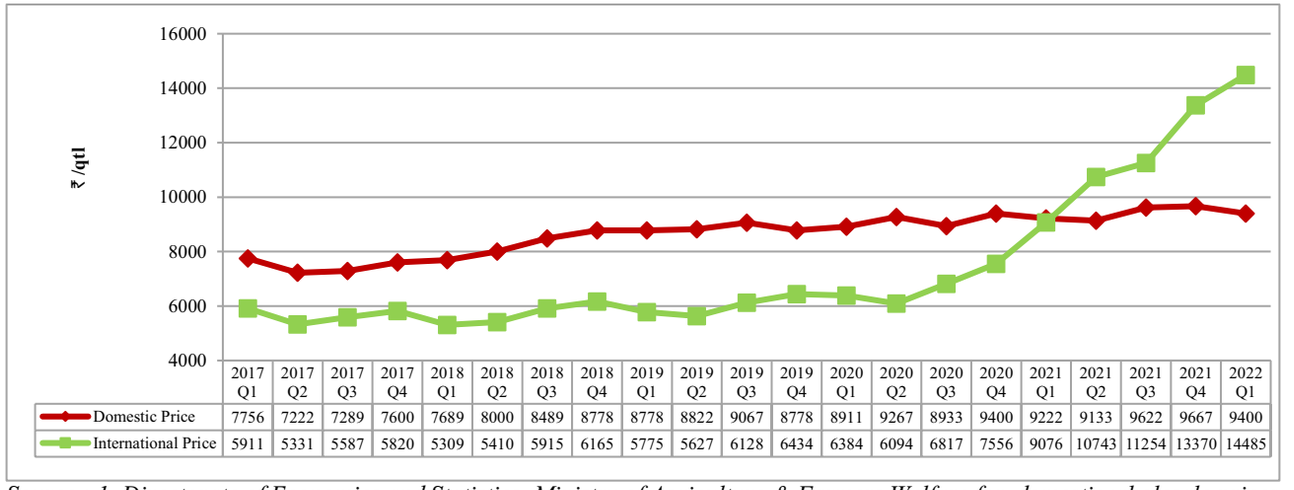
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Quantity	77.6	69.2	306.0	309.0	414.6	300.8	159.3	54.4	42.7	55.3
Value	554.7	433.8	1705.6	1673.0	2315.0	1649.5	856.3	338.3	272.0	560.9

Source : Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

Comparative Trends in Prices of Rapeseed/ Mustard Oil

4.46 Chart 4.20 illustrates the comparative trends in domestic and international prices of rapeseed/ mustard oil during the period 2017 to 2022(Q1). It is observed that the domestic prices of rapeseed/mustard oil have been consistently higher than international prices from 2017 to 2020. However, the international prices have surpassed domestic prices since the beginning of 2021 primarily because of the global price rise across all edible oils. The international prices of R&M oil grew by a steep 60 percent from 2021(Q1) to 2022(Q1) while the domestic prices rose only by 2 percent over the same period. This has been primarily due to the increase in domestic production of mustard oilseed in RMS 2022-23 and hence R&M oil.

Chart 4.20: Domestic and International Prices of R&M Oil, 2017 to 2022 (Q1)



	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
Domestic Price	7756	7222	7289	7600	7689	8000	8489	8778	8778	8822	9067	8778	8911	9267	8933	9400	9222	9133	9622	9667	9400
International Price	5911	5331	5587	5820	5309	5410	5915	6165	5775	5627	6128	6434	6384	6094	6817	7556	9076	10743	11254	13370	14485

Source : 1. Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare for domestic wholesale prices.
2. World Bank for International prices.

Trade Policy of Oilseeds and Edible Oils

4.47 India is one of the largest importers of edible oils, meeting more than 60 percent of its domestic requirement through imports. In order to improve self-sufficiency in edible oils and ensure remunerative prices to oilseeds farmers in the country, the import duty structure of edible oils has been reviewed from time to time.

Import Policy and Import Duty rates for R&M and Safflower

4.48 Since the year 2017, the oilseeds viz. rapeseed, mustard oilseed and safflower oilseed attract an import duty of 30 percent. However, a concessional Basic Customs Duty (BCD) of 5 percent ad valorem is available to these oilseeds subject to the condition that these are imported for sowing purpose only. As regards the oils of R&M and safflower, since June 2018, the crude varieties of R&M oil and safflower oil attract an import duty of 35 percent while the refined varieties attract an import duty of 45 percent.

Import Policy and Import Duty rates for Palm Oil

4.49 Import duty on crude palm oil (CPO) of edible grade was raised from 15 percent to 30 percent, in November 2017 and 44 percent in March 2018 but reduced to 40 percent in January 2019. Similarly, import duty on RBD palmolein was increased from 25 percent to 40 percent in November 2017 and 54 percent in March 2018 but reduced to 45 percent for imports from Malaysia and 50 percent for shipments from Indonesia in January 2019. However, a safeguard duty of 5 percent was imposed on imports of RBD palmolein from Malaysia under Malaysia-India Comprehensive Economic Cooperation Agreement (MICECA) from 4th September 2019 but imports under ASEAN agreement did not attract 5 percent safeguard duty.

4.50 W.e.f 1st January 2020, the import duty on refined palm oil was lowered to 45 percent while that on crude palm oil was reduced from 45 percent to 37.5 percent under Association of Southeast Asian Nations (ASEAN) agreement and Malaysia - India Comprehensive Economic Cooperation Agreement (MICECA). The import policy of refined palm oil was amended from 'Free' to 'Restricted' category in January 2020. Further, w.e.f 27th November, 2020, the basic import duty on crude palm oil was reduced from 37.5 percent to 27.5 percent in order to control the rise in price of palm oil and allow greater availability of oil in the market for consumption.

4.51 In the Union Budget 2021-22, the basic import duty on crude palm oil was cut from 27.5 percent to 15 percent. In addition, 17.5 percent AIDC was also imposed on the imports of crude palm oil in order to improve agricultural infrastructure. The duty increase narrowed the duty gap between palm oil and other edible oils.

4.52 In 2021, series of changes have been made in the import duty structure of various forms of palm oil as also for other edible oils. In June 2021, the basic import duty on crude palm oil was reduced from 15 percent to 10 percent and that on refined variants of palm oil was reduced to 37.5 percent. In the same month, the import policy for refined palm oils was revised from "restricted" to "free" till 31st December 2021 with the exception on imports of these oils through any port in Kerala. Subsequently, in September 2021, the basic import duty on crude palm oil was further reduced from 10 percent to 2.5 percent and that on refined palm oils from 37.5 percent to 32.5 percent. At the same time, the AIDC on crude palm oil was increased to 20 percent.

4.53 In a bid to further control the landed price of imported vegetable oils in the country, the Government slashed the basic import duty on crude palm oil from 2.5 percent to 'nil' and AIDC on crude palm oil from 20 percent to 7.5 percent w.e.f 14th October 2021. At the same time, the basic import duty on refined palm oils was reduced from 32.5 percent to 17.5 percent (applicable till 31st March 2022) and further to 12.5 percent w.e.f 21st December 2021. Thereafter, w.e.f 12th February 2022, the AIDC on crude palm oil has been further reduced from 7.5 percent to 5 percent and the duty cuts on all the above crude and refined edible oils have been extended till 30th September 2022.

Export Policy for Oilseeds and Edible Oils

4.54 Oilseed exports continue to be under 'free category' except breeder/foundation/wild variety seeds that are not allowed for export from India. As regards the edible oils, the export of rice bran oil in bulk was permitted from India w.e.f 6th February 2015 and export of groundnut oil, sesame oil, soybean oil and maize (corn) oil was subsequently permitted w.e.f 27th March 2017. Since April 2018, exports of all varieties of edible oils are free, except mustard oil. Export of mustard oil is permitted in packs of up to 5 kg with a Minimum Export Price (MEP) of USD 900 per tonne. Table 4.2 below tabulates the present export and import policy and tariff rates applicable on all rabi crops including palm oil variants. Annexure Table 4.2 presents key changes in trade policy for pulses and oilseeds/oils since April 2021.

Table 4.2: India's Trade Policy - Rabi Crops

Commodity	Import Policy			Export Policy	
	OGL/Import ban	Import duty (percent)	Bound duty (percent)	OGL/Export ban	Export duty (percent)
Cereals					
Wheat	OGL/ Restricted for Seed	40	100	Prohibited	N.A.
Barley	OGL/ Restricted for Seed	Zero	100	OGL	Zero
Pulses					
Gram	OGL	60	100	OGL	Zero
Lentil	OGL	20* and Zero**	100	OGL	Zero
Oilseeds & Oils					
Rapeseed & Mustard Seed	OGL/ Restricted for Mustard of seed quality	30	100	OGL	Zero
Crude R&M Oil	OGL	35	75	Restricted#	Zero
Refined R&M Oil	OGL	45	75	Restricted#	Zero

Crude Palm Oil	OGL (Tariff value – USD 1401per metric tonne) ##	5$	300	OGL	Zero
RBD Palmolein	OGL	12.5$	300	OGL	Zero
	(Tariff value – USD 1548 per metric tonne) ##				
RBD Palm Oil	OGL (Tariff value – USD 1482 per metric tonne) ##	12.5$	300	OGL	Zero

Note: 1. # Export of edible oils in branded, consumer packs up to 5 kg is permitted with a MEP of USD 900 per tonne.
2. ##Price on 30th June 2022.
*3. *Duty of 20 percent on lentils originating in or exported from USA*
*4. **Nil import duty on lentils imported from any country other than USA.*
5. $ Applicable till 30th September 2022.
6. Social welfare cess of 10 percent is also imposed on imported goods listed above.
Source: Central Board of Indirect Taxes & Customs, Department of Revenue

Global Externalities from Russia-Ukraine Geopolitical Conflict

4.55 In view of the unprecedented situation arising out of the geopolitical conflict between Russia and Ukraine in the year 2022, the countries all over the globe witnessed disruptions in supply chains of various commodities including agriculture. The rise in commodity prices and the ensuing food inflation across countries has been a natural corollary to these disruptions. The United Nations Brief of April 2022 highlights this with facts viz. Ukraine and the Russian Federation are among the world's bread baskets. They provide around 30 per cent of the world's wheat and barley, one-fifth of its maize, and over half of its sunflower oil. At the same time, the Russian Federation is the world's top natural gas exporter, and second-largest oil exporter. Together, with neighboring Belarus and the Russian Federation also export around a fifth of the world's fertilizers. The negative spillovers of the geopolitical conflict may continue for a few more months before finally subsiding. Accordingly, the risks to the food and energy security of nations call for close cooperation among various stakeholder nations at this juncture.

World Trade Outlook and Projections

Cereals

Wheat

4.56 Wheat is an important source of vegetable protein and food calories at the global level. As per the June 2022 estimates of USDA, the global production of wheat is forecast to decrease in 2022-23 by 0.7 percent, to 773.4 million tonnes. This is mainly on account of projected fall in wheat production in Ukraine, Australia, Morocco, Argentina, European Union, India and China. USDA, in its May 2022 Report also indicated that the global wheat consumption in 2022-23 is expected to be lower, resulting from lower wheat demand for feed and residual use and limited rise in consumption of wheat for Food, Seed and Industrial (FSI) use. It is anticipated by USDA that high global food inflation will impact consumers' ability to purchase wheat and wheat products in developing markets and may direct them to alternate foodgrains.

4.57 Global exports of wheat, according to USDA, are forecast at a record 205 million tonnes as robust import demand and high prices are expected to lead major exporters to prioritize ample supplies for export. Russia is forecast to be the largest exporter for the third year in a row on account of higher production and strong global demand for affordable Black Sea wheat. Exports from Ukraine are currently limited as Ukraine is unable to export via sea ports because of the ongoing geopolitical conflict with Russia but is seeking to use alternative routes, primarily by rail and export through neighboring European countries.

4.58 According to FAO Food Outlook June 2022, the global wheat markets are embarking on the 2022-23 season with a great deal of uncertainty amid the impacts of the ongoing war in Ukraine, trade policy changes, near-record high prices and a forecast fall in global production in wheat from the 2021 record level. On the same lines as USDA, the FAO also estimates that while world food consumption of wheat is projected to expand, a decrease in the feed use, mainly driven by high prices is anticipated to cause a 0.4 percent decline in total wheat utilization in 2022-23. On the trade front, FAO anticipates a contraction in global wheat trade mainly stemming from reduction in exports from Ukraine as a result of the blockade of its ports by Russia and smaller shipments from Argentina, Australia and India, stemming from lower production on top of an export ban in India.

4.59 In the long term, the OECD-FAO Agricultural Outlook 2021-2030 forecasts that global wheat production is projected to reach 840 million tonnes by 2030 and China is expected to be the largest wheat producer by 2030. Growth in global wheat consumption is mainly expected in the India, China, Pakistan and Egypt.

Barley

4.60 The global outlook for barley, as per USDA June 2022 Report, indicates an increase in global production in 2022-23 by 1.6 percent on account of higher production in Canada, Russia, and Turkey. In its May 2022 report, USDA has already indicated that barley consumption for feed use is expected to fall marginally in 2022-23, but food use is forecast to grow. Global trade in barley is expected to shrink due to smaller exports from EU, Australia and Ukraine.

4.61 Similar to the USDA projections, as per the FAO Food Outlook June 2022, global barley production is set to increase by 2.6 percent in 2022 vis-à-vis previous year, to 147.9 million tonnes. The anticipated production upturn is underpinned by good prospects in North America, where yields in Canada are expected to rebound from the last year's low levels and high prices are anticipated to prompt a substantial increase in barley sowing in the United States.

Pulses

4.62 Pulses have remained an important source of protein in developing countries, and average global per capita consumption has been gradually increasing. The OECD-FAO Agricultural Outlook 2021-2030 notes that India is by far the largest producer of pulses, accounting for about 24 percent of global production in the past decade, followed by Canada (8%) and the European Union (5%). Africa has further expanded its production and consumption in the past decade, and has remained largely self-sufficient. The Asian market is the most significant import destination for pulses as it accounts for more than half of the global consumption, and about 45 percent of global pulses production.

4.63 In the long term, the OECD-FAO Agricultural Outlook 2021-2030 forecasts that global supply of pulses is projected to increase by 22 million tonnes and global average annual per capita pulses use to increase from current level of 8 kg to 9 kg by 2030. Almost half of the increase in global production of pulses is expected to come from Asia, particularly India, the world's largest producer. It is expected that sustained yield improvements are projected to raise India's domestic production by an additional 6.6 million tonnes by 2030.

Edible Oils and Oilseeds

4.64 According to USDA June 2022 Report, global oilseeds production is expected to increase by 8 percent in 2022-23, to about 647 million tonnes. This is primarily expected from higher oilseeds production in Brazil and United States. Oilseed exports are also expected to increase in 2022-23 on account of higher production of rapeseed in Australia and soybeans in Ukraine which offset the reduction in sunflower seed production in Argentina. Global trade in vegetable oils is however expected to reduce on account of lower exports of sunflower seed oil from Ukraine.

4.65 FAO Food Outlook June 2022 forecasts that in 2022-23, with international oilseed prices hitting record highs, the total area planted with oilseed crops could continue to expand, while yield levels are also expected to recover assuming normal growing conditions. As a result, global oilseed production in 2022-23 could possibly rebound to a new record high.

4.66 In the long term, according to OECD-FAO Agricultural Outlook 2021-2030, Indonesia and Malaysia, the world's leading suppliers of palm oil, will continue to dominate the vegetable oil trade, exporting over 70 percent of their combined production and jointly accounting for nearly 60 percent of global exports of vegetable oil. Vegetable oil has one of the highest trade shares (41%) of production among all agricultural commodities. India, the world's biggest importer of vegetable oil, is also projected to maintain its high annual edible oil import growth rate of 3.4 percent due to growing domestic demand and limited production.

4.67 Vegetable Oils constitute the single largest item in India's agri-imports basket. While domestic production of oilseeds and edible oils is gradually rising with MSP nudging the farmers to shift acreage towards oilseeds, the productivity gaps in its cultivation are significant. The long-term solution for reducing country's import dependence on edible oils lies in improving productivity and also in leveraging secondary sources like cottonseed oil and rice bran oil to reduce import dependency in edible oils.

Recapitulation

4.68 India's trade performance in the agricultural sector has been promising in the last two years despite the effect of pandemic and geopolitical tensions. The conflict between Russia and Ukraine has put India on the center-stage as regards the global market for wheat. After sizeable exports of wheat in the last quarter of 2021-22, India eventually banned wheat exports in May 2022 in anticipation of domestic production shortfall owing to severe heat-wave in major producing States. Notwithstanding this, the long term prospects of India's agricultural trade are assuring, provided India is able to moderate its imports of edible oils and pulses over the coming years. In order to strengthen the oilseeds and pulses value chain, the country needs dedicated adoption of high yielding varieties in these crops and renewed focus on their procurement, especially pulses. With closely aligned price policy and trade policy, India has a comparative advantage in achieving trade potential in the international markets.

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CHAPTER 5

Costs, Returns and Inter-Crop Parity

5.1 While recommending MSPs of mandated rabi crops, the Commission considers the cost of production and other important factors such as demand and supply situation, trends in domestic and international prices, inter-crop price parity, terms of trade between agriculture and non-agriculture sectors, the likely impact of MSP on consumers and overall economy along with rational utilization of land, water and other production resources, and a minimum of 50 percent as the margin over cost of production.

5.2 The Commission uses crop-wise, State-wise cost estimates provided by the Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India compiled under 'Comprehensive Scheme (CS) for studying the Cost of Cultivation of Principal Crops in India'. Since CS data is available upto 2020-21, it needs to be projected for crop season 2022-23. Based on CS data, crop-wise and State-wise projections of cost of cultivation (CoC) are made for the ensuing season.

5.3 The projected CoC estimates for rabi crops for 2022-23 crop season are based on the latest three years' actual cost estimates from 2018-19 to 2020-21, for most of the States. However, for wheat in Uttarakhand and barley in Madhya Pradesh, CoC estimates are based on actual cost estimates available for the latest two years viz. 2018-19 and 2019-20, as data for 2020-21 were not available; and in case of gram for Jharkhand and safflower for Karnataka, CoC estimates are based on actual cost estimates available for the year 2018-19 and 2020-21, as data for 2019-20 were not available. The CoC estimates are not projected for a crop in the State, where either share of the State in all-India production or share of a particular crop in total production of the crop group in the State is negligible or number of sample holdings under CS for the crop is inadequate.

5.4 The estimates of CoC projections capture movement in overall input cost separately, for the year 2022-23 over each of three years viz. 2018-19, 2019-20 and 2020-21, where projections are based on three years; two years viz. 2018-19 and 2019-20 for wheat in Uttarakhand and barley in Madhya Pradesh, and 2018-19 and 2020-21 for gram in Jharkhand and safflower in Karnataka, where projections are based on respective these two years, for each State.

5.5 An assessment of likely changes in input costs for the crop year 2022-23 with reference to each of the three consecutive years ending with 2020-21, where projections are based on three years, two years viz. 2018-19 and 2019-20 for wheat in Uttarakhand and barley in Madhya Pradesh, and 2018-19 and 2020-21 for gram in Jharkhand and safflower in Karnataka, where projections are based on respective two years, is made by constructing the Composite Input Price Indices (CIPIs) (base 2011-12=100), for each State. The CIPIs are based on latest prices of different inputs like human labour, bullock labour, machine labour, fertilisers and manures, seeds, pesticides and irrigation as per latest data from Labour Bureau, Ministry of Labour and Employment, State Governments and Office of the Economic Adviser, Ministry of Commerce and Industry. Based on the CIPIs, the Commission projects State-wise CoC A_2, A_2+FL and C_2 for each mandated crop.

5.6 The State-wise cost of production (CoP) A_2, A_2+FL & C_2 estimates for the mandated crops are then derived by using respective projected CoC estimates, ratio of main product (MP) to gross value of output (GVO) and projected yield, for each crop. Subsequently, based on State-wise projected CoPs of crops and their production shares in total production, all-India estimates of CoP A_2, A_2+FL and C_2 are derived. These projected all-India estimates of CoPs are considered by the Commission while formulating price policy recommendations.

5.7 The Commission has undertaken cost projection exercise under certain implicit assumptions. One, it is assumed that fixed cost components would not, in all likelihood, undergo any significant change in the intervening period between 2020-21 for which actual cost estimates are available for most of States of crops, 2019-20 for which actual cost estimates are available for wheat in Uttarakhand and barley in Madhya Pradesh, and the crop year 2022-23 for which cost projections are made. Two, since yield varies from year to year due to various factors, three-year average yield where projections are based on three years, and two-year average yield where projections are based on two years, has been taken for smoothing fluctuations in yield and hence in CoP. However, in cases where there are wide fluctuations in the yield, Olympic average yield (Olympic average yield is calculated by dropping the highest and the lowest yield from latest five-year yields and calculating the average of the remaining three-year yields) has been used. Due to large variations in yield and cost data under CS, the yields of barley in Himachal Pradesh, gram in Jharkhand, and safflower in Karnataka have been projected based on yield data published in 'Agricultural Statistics at a Glance 2021' by Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Government of India. Similarly, due to large variation in cost data under CS, yield of rapeseed & mustard for Odisha was projected by using yield data under CS and trend in growth of yield data published in 'Agricultural Statistics at a Glance 2021'.

Costs and Returns of Rabi Crops during TE2020-21

5.8 The all-India average costs, GVO and gross returns during TE2020-21 in respect of mandated rabi crops have been analysed and are given in Table 5.1. However, average costs, GVO and gross returns during 2018-19 and 2019-20 for wheat in Uttarakhand and barley in Madhya Pradesh, and 2018-19 and 2020-21 for gram in Jharkhand and safflower in Karnataka, have been used in derivation of average costs, GVO and gross returns of respective States and crops. It is pertinent to note that the gross value of output (GVO) is estimated at prevailing market prices of main product and by-products during harvest season in village/cluster of villages where the crops are grown and harvested.

Cost of Cultivation of Rabi Crops

5.9 Among all crops, per hectare all-India average A_2 cost of cultivation (CoC) during TE2020-21 was highest for wheat at ₹31,900 and A_2+FL CoC was highest for barley at ₹44,824, whereas, A_2 and A_2+FL CoC were lowest for lentil at ₹18,121 per hectare and safflower at ₹24,423 per hectare, respectively. Among cereals, per hectare A_2 cost was higher for wheat than barley (₹29,246/ha), while A_2+FL cost was higher for barley than wheat (₹40,287/ha). Increasing trends have been observed in costs of barley during TE2020-21, whereas, costs of wheat decreased marginally in 2019-20 and then increased in 2020-21 over respective preceding years. In wheat cultivation, A_2 and A_2+FL costs were highest for Maharashtra (₹39,249/ha) and Rajasthan (₹54,602/ha), respectively, while these were lowest for Karnataka at ₹20,496 per hectare and ₹24,165 per hectare, respectively. In cultivation of barley, per hectare A_2 and A_2+FL costs were highest for Rajasthan at ₹29,612 and ₹49,390, respectively, while A_2 cost was lowest for Himachal Pradesh (₹26,878/ha), and A_2+FL cost was lowest for Madhya Pradesh (₹34,629/ha).

5.10 Among pulses, per hectare A_2 and A_2+FL costs were higher for gram at ₹24,208 and ₹31,533, respectively than lentil at ₹18,121 and ₹24,475, respectively. Cost of each crop of pulses recorded an increasing trend during TE2020-21. In cultivation of gram, per hectare highest A_2 and A_2+FL costs were recorded for Andhra Pradesh (₹32,515/ha) and Jharkhand (₹36,487/ha), respectively, while lowest A_2 cost was registered in Haryana (₹16,214/ha) and A_2+FL cost in Karnataka (₹25,202/ha). In lentil cultivation, per hectare highest A_2 and A_2+FL costs were realised at ₹19,872 and ₹30,453, respectively for West Bengal, whereas, lowest A_2 cost was recorded at ₹16,613 per hectare for Uttar Pradesh, and A_2+FL cost at ₹22,642 per hectare for Bihar.

5.11 In case of oilseeds, per hectare A_2 and A_2+FL costs at ₹23,601 and ₹34,402 were higher for rapeseed & mustard than respective costs of safflower. Costs for rapeseed & mustard have shown increasing trends during TE2020-21, however declining trend has been realised in costs for safflower. In cultivation of rapeseed & mustard, per hectare A_2 and A_2+FL costs were highest for Gujarat at ₹34,271 and ₹42,952, respectively, and lowest for Odisha at ₹9,650 and ₹20,795, respectively. The details of average gross returns over actual CoC A_2 and A_2+FL of mandated rabi crops during TE2020-21 at all-India and State levels are given in Annex Table 5.1 and Annex Table 5.2, respectively.

Gross Value of Output of Rabi Crops

5.12 All-India average GVO during TE2020-21 among rabi crops was highest for wheat at ₹83,836 per hectare and lowest for safflower at ₹25,592 per hectare. For cereals, GVO for wheat was higher than barley (₹72,517/ha). Over respective last years, GVO increased in 2019-20 for each crop of cereals, while it decreased in 2020-21. Highest GVO was realised for Haryana (₹1,09,481/ha), and lowest for Karnataka (₹29,554/ha) in case of wheat cultivation, while in barley, the highest GVO was recorded for Uttar Pradesh (₹78,838/ha) and lowest for Himachal Pradesh (₹30,298/ha). Among pulses, GVO for gram (₹53,870/ha) was higher than lentil (₹50,845/ha). Increasing trend was observed in GVOs for each crop of pulses during TE2020-21. Highest GVO was realised for Bihar (₹68,003/ha) and lowest for West Bengal (₹39,123/ha) in gram cultivation. In lentil, GVO was highest at ₹63,071 per hectare for West Bengal, and lowest at ₹46,221 for Bihar. For oilseeds, GVO of rapeseed & mustard (₹70,646/ha) was significantly higher than safflower (₹25,592/ha). GVO for rapeseed & mustard has an increasing trend, while GVO for safflower has declining trend. The highest GVO at ₹91,370 per hectare was recorded for Haryana and the lowest for Odisha at ₹18,514 per hectare for rapeseed & mustard.

Table 5.1: All-India Average Costs and Gross Returns over Actual Cost of Cultivation of Rabi Crops (Average from 2018-19 to 2020-21)

Crop	CoC A_2	CoC A_2+FL	GVO	Gross Returns over CoC A_2		Gross Returns over CoC A_2+FL	
	₹/ha			₹/ha (Col.4 - Col.2)	Percent (Col.5 / Col.2)*100	₹/ha (Col.4 - Col.3)	Percent (Col.7 / Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Cereals							
Wheat	31900	40287	83836	51936	162.8	43549	108.1
Barley	29246	44824	72517	43271	148.0	27693	61.8
B. Pulses							
Gram	24208	31533	53870	29662	122.5	22337	70.8
Lentil	18121	24475	50845	32724	180.6	26370	107.7
C. Oilseeds							
Rapeseed & Mustard	23601	34402	70646	47046	199.3	36244	105.4
Safflower	19399	24423	25592	6193	31.9	1169	4.8

Note 1: Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for 2018-19 and 2020-21 for gram in Jharkhand and for safflower in Karnataka, due to unavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns of projected States.

Source: CACP calculation using CS data

Gross Returns of Rabi Crops

5.13 The all-India average gross returns over actual CoC A_2 and A_2+FL during TE2020-21 for mandated rabi crops have been presented in Chart 5.1. The average gross returns over CoC A_2 and A_2+FL during TE2020-21 were highest for wheat at ₹51,936 per hectare and ₹43,549 per hectare, respectively, while these were lowest for safflower at ₹6,193 per hectare and ₹1,169 per hectare, respectively. It is observed that all-India average gross returns as percentage of CoC A_2 were highest at 199.3 percent for rapeseed & mustard, and lowest for safflower (31.9%), whereas, returns as percentage of CoC A_2+FL were highest at 108.1 percent for wheat, and lowest at 4.8 percent in safflower. It is evident that there is a need for enhancing productivity, reducing costs and ensuring better prices to farmers growing barley, pulses and oilseeds for improving profitability.

5.14 Among cereals, per hectare all-India average gross returns over CoC A_2 and A_2+FL during TE2020-21 for barley were substantially lower than returns for wheat owing to significantly lower yield and prices for barley. Returns of each crop of cereals at all-India level increased during 2019-20 mainly due to increase in prices and then decreased during 2020-21 mainly due to decrease in yields, over respective previous years. For wheat, per hectare returns over A_2 and A_2+FL costs were highest for Haryana at ₹76,798 and ₹70,298, while lowest returns over A_2 cost were for Karnataka (₹9,058/ha) due to lowest yield, and A_2+FL cost for Jharkhand (₹1,257/ha) because of significantly low yield and high paid-out cost of production. Returns over A_2 and A_2+FL costs of wheat for Haryana and Punjab and returns over A_2 cost for Rajasthan were higher than all-India owing to higher yields and prices in these States than all-India, whereas, returns over A_2+FL cost for Madhya Pradesh were higher than all-India mainly due to lower cost of cultivation in Madhya Pradesh than all-India.

5.15 In case of barley, per hectare returns over A_2 and A_2+FL costs for Uttar Pradesh were highest at ₹49,888 and ₹39,382, respectively mainly due to highest prices. Lowest returns over A_2 cost were for Himachal Pradesh (₹3,420/ha) because of lowest yield and highest cost of production, and A_2+FL cost for Madhya Pradesh (₹14,346/ha) mainly due to lowest prices. Due to substantially low productivity and high cost of production, the farmers of Himachal Pradesh incurred net loss of ₹12,965 per hectare over A_2+FL cost in barley cultivation. Returns over A_2 costs of barley for Rajasthan were higher than all-India because of higher yield in Rajasthan than all-India, while returns over A_2 and A_2+FL costs for Uttar Pradesh were higher than all-India because of higher yield and prices in Uttar Pradesh, than all-India.

5.16 Among pulses, per hectare all-India returns over CoC A_2 and A_2+FL of lentil at ₹32,724 and ₹26,370 were higher than gram at ₹29,662 and ₹22,337 mainly due to higher prices of lentil. Returns of pulses at all-India level registered an increasing trend during TE2020-21. For gram, over the respective previous years, returns were higher during 2019-20 mainly due to rise in yield level, while further enhancement in returns during 2020-21 was observed mainly due to significant hike in prices. Per hectare returns of gram over A_2 and A_2+FL costs were highest for Bihar at ₹48,306 and ₹42,406, respectively mainly due to lowest cost of production, while these were lowest for Jharkhand at ₹18,824 and ₹8,036, respectively mainly due to highest cost of production. Returns of gram for Bihar, Telangana and Uttar Pradesh were higher than all-India owing to higher yield and prices in these States, than all-India, whereas, returns of gram for Haryana, Madhya Pradesh, and Rajasthan were higher than all-India mainly due to higher yield in these States, than all-India.

5.17 In case of lentil's cultivation, returns at all-India level increased substantially during 2019-20 and 2020-21 mainly due to significant increase in prices during these years over corresponding last years. Per hectare returns of lentil over A_2 and A_2+FL costs were highest for West Bengal at ₹43,200 and ₹32,618, respectively because of highest yield and prices, and these were lowest for Madhya Pradesh at ₹27,354 and ₹23,260, respectively mainly due to lowest prices. Returns of lentil for Uttar Pradesh were higher than all-India mainly due to higher prices in Uttar Pradesh than all-India, and returns for West Bengal were higher than all-India because of rise in yield and prices in West Bengal than all-India.

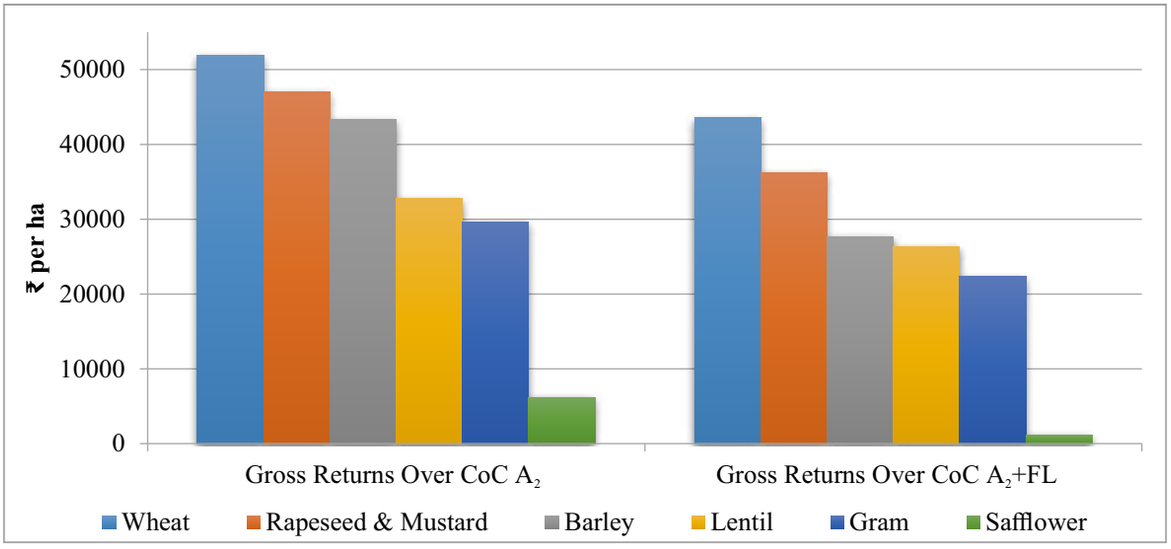
5.18 Among oilseeds, returns over CoC A_2 and A_2+FL were significantly higher for rapeseed & mustard than safflower mainly due to very low productivity and high cost of production of safflower. In case of rapeseed & mustard, returns substantially increased during 2019-20 because of enhancement in yield and prices, and further increased during 2020-21 mainly due to significant hike in prices. Per hectare maximum returns over A_2 and A_2+FL costs at ₹65,681 and ₹59,211 for rapeseed & mustard were registered for Haryana owing to highest yield and lowest paid-out cost of production including family labour, whereas, minimum returns were realised over A_2 cost at ₹8,864 for Odisha because of lowest yield and highest paid-out cost of production, and A_2+FL cost at ₹6,666 for Assam mainly due to lowest prices. However, due to significantly low productivity and highest cost of production, the farmers of rapeseed & mustard in Odisha realised net loss of ₹2,281 per hectare over A_2+FL cost. In comparison with all-India, returns from rapeseed & mustard for Haryana were higher due to higher yield and price and lower cost of production, while returns for Madhya Pradesh were higher because of higher yield and lower cost of production, and returns for Rajasthan were higher because of higher yield and price, than all-India.

5.19 For safflower, returns over CoC A_2 and A_2+FL for Karnataka were at ₹6,193 per hectare and ₹1,169 per hectare, respectively. Although prices of safflower increased during 2020-21 over 2018-19, yet realisation of returns of safflower during 2020-21 declined substantially due to significant fall in yield in 2020-21 over 2018-19.

5.20 Returns from cereals were higher than pulses and oilseeds mainly due to significantly higher yield and lower cost of production of crop under cereals, while due to reasonably high productivity and low cost of production, rapeseed & mustard has registered higher returns than pulses.

5.21 Due to assured MSP, low production risks and high profitability, wheat production has increased significantly in the country, while production of barley and oilseeds has declined or remained almost stagnant due to lower yields and market prices. Crop diversification from wheat to barley, pulses and oilseeds is needed to improve nutritional security, sustainability, and maintain demand-supply balance. In order to enhance farmers' income, efforts are needed to reduce cost of cultivation/production, improve yield, ensure remunerative prices and provide assured market to farmers, particularly in barley, pulses and oilseeds.

Chart 5.1: All-India Average Gross Returns of Rabi Crops, TE2020-21



Note 1: Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for 2018-19 and 2020- 21 for gram in Jharkhand and for safflower in Karnataka, due to unavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns of projected States.

Source: CACP calculation using CS data

Movement in Agricultural Wages and Farm Input Prices

Growth in Daily Wage Rates of Agricultural Labourers

5.22 Average annual growth in daily wage rates of agricultural labour during rabi season in major States and at all-India level at current prices and constant prices (2021-22=100) during 2019-20 to 2021-22 are given in Table 5.2. At all-India level, agricultural wage rate increased by 6 percent in 2019-20, 4 percent in 2020-21 and 5.6 percent in 2020-21, respectively over preceding years at current prices. While real daily wage rate declined by 3.2 percent in 2019-20, it increased marginally by 0.7 percent in 2020-21 and 0.6 percent in 2021-22, over respective preceding years.

5.23 The highest increase in average daily wage rate (at current prices) in 2021-22 over 2020-21 was recorded in Rajasthan at 9.5 percent, and lowest with a negligible growth in Himachal Pradesh and Punjab. During this period real daily wage rate registered highest increase in Rajasthan (2.9%) and lowest (0.4%) in Gujarat and Karnataka. On the other hand, there was decline in real wage rate in Bihar, Haryana, Himachal Pradesh, Maharashtra, Punjab, and West Bengal with maximum decline in Himachal Pradesh (-5.8%) and minimum decline in Maharashtra (-0.3%). Andhra Pradesh, Karnataka, Madhya Pradesh, Odisha, Rajasthan and Uttar Pradesh have recorded higher growth in average daily wages as compared to all-India average at current prices, while Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Kerala, Maharashtra, Punjab, Tamil Nadu and West Bengal have registered lower growth, than all-India during 2021-22 over 2020-21.

Table 5.2: Average Growth Rate of Daily Wage Rates of Agricultural Labour in Major States and at All-India Level during Rabi Season

State	Growth (%) at Current Prices			Growth (%) at Constant Prices (2021-22=100)		
	2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
Andhra Pradesh	12.0	3.6	7.2	0.9	-0.8	2.5
Assam	14.7	-0.4	5.3	5.1	-6.1	2.4
Bihar	9.9	1.4	5.6	-1.9	0.0	-1.4
Gujarat	2.5	1.6	5.2	-7.4	-1.5	0.4
Haryana	1.7	1.1	4.6	-5.8	-1.4	-1.1
Himachal Pradesh	8.1	-1.6	0.0	2.2	-4.9	-5.8
Karnataka	3.7	3.4	6.0	-4.3	-3.0	0.4
Kerala	0.7	1.4	5.6	-4.6	0.3	0.6
Madhya Pradesh	2.9	3.7	6.3	-3.0	0.4	0.5
Maharashtra	8.9	7.4	3.5	-4.8	3.6	-0.3
Odisha	5.1	9.2	6.7	-3.0	4.6	2.6
Punjab	1.8	7.6	0.0	-5.5	4.3	-4.9
Rajasthan	5.2	-1.4	9.5	-3.5	-1.0	2.9
Tamil Nadu	6.8	10.8	3.1	-3.9	3.7	0.7
Uttar Pradesh	4.8	5.5	6.6	-3.9	4.0	1.4
West Bengal	4.2	8.2	3.5	-1.6	3.9	-2.5
All-India	**6.0**	**4.0**	**5.6**	**-3.2**	**0.7**	**0.6**

Note 1: Average from October to April

2: All-India daily wage rate was weighted average of daily wage rates of States mentioned in the Table

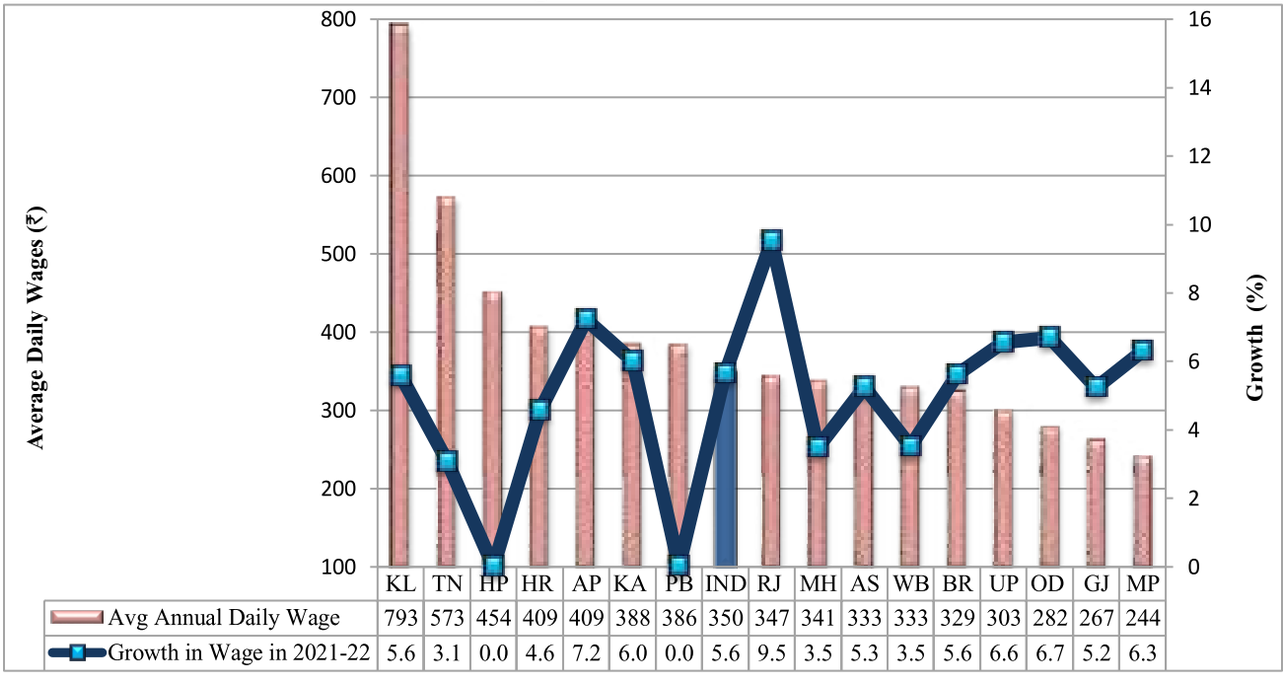
Source: Labour Bureau, Ministry of Labour and Employment, Government of India

Daily Wages of Agriculture Labour

5.24 Chart 5.2 depicts State-wise average daily wages of agricultural labour during rabi season (October to April) in 2021-22 and growth in wages during rabi season in 2021-22 over 2020-21. All-India average daily wages of agricultural labour were ₹350 during rabi season in 2021-22. Average daily wages of agricultural labour were highest in Kerala at ₹793, and lowest in Madhya Pradesh (₹244). Andhra Pradesh, Haryana, Himachal Pradesh, Karnataka, Kerala, Punjab and Tamil Nadu have higher average daily wages as compared to all-India average, while Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Uttar Pradesh and West Bengal registered lower average daily wages than all-India during rabi season in 2021-22 over 2020-21.

5.25 It is evident that wage rates have increased significantly in most of the States during 2019-20 to 2021-22, and resulted in substantial increase in cost of cultivation/production in these States. Therefore, mechanisation of farm operations on a large scale would help in reducing human labour requirement in farming of rabi crops, thereby reduce cost of cultivation/production and improve profitability in the country. The monthly average of daily wage rates for agricultural labour at current prices for major rabi crops producing States from 2012 to 2022 are given in Annex Table 5.3

Chart 5.2: Average Daily Wage Rates and Growth in Wages in Selected States during Rabi Season 2021-22



	KL	TN	HP	HR	AP	KA	PB	IND	RJ	MH	AS	WB	BR	UP	OD	GJ	MP
Avg Annual Daily Wage	793	573	454	409	409	388	386	350	347	341	333	333	329	303	282	267	244
Growth in Wage in 2021-22	5.6	3.1	0.0	4.6	7.2	6.0	0.0	5.6	9.5	3.5	5.3	3.5	5.6	6.6	6.7	5.2	6.3

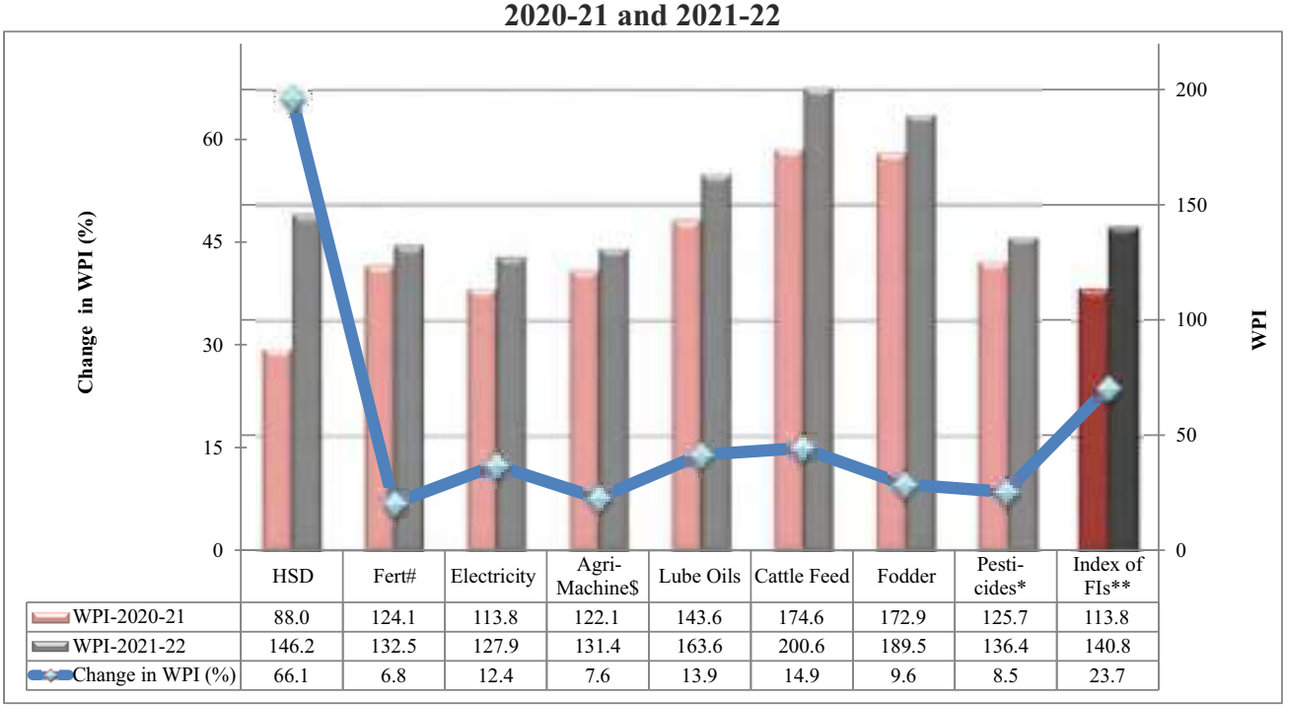
Note 1: Average from October, 2021 to April, 2022
2: All-India daily wage rate was weighted average of daily wage rates of States mentioned in the Graph
Source: Labour Bureau, Ministry of Labour and Employment, Government of India

Movement in Farm Input Prices

5.26 The changes in Wholesale Price Index (WPI) with base 2011-12 of major farm inputs during rabi season in 2021-22 over 2020-21 are given in Chart 5.3. The price index for HSD increased from 88 in 2020-21 to 146.2 in 2021-22, registering a huge growth of 66.1 percent in 2021-22. WPI of other farm inputs have also increased in 2021-22 over 2020-21, and ranged from 6.8 percent for fertilizers and nitrogen compounds to 14.9 percent in cattle feed. The indices for manufacture of agricultural and forestry machinery[1], pesticides and other agrochemical products, fodder, electricity, and lube oils moved up by 7.6 percent, 8.5 percent, 9.6 percent, 12.4 percent and 13.9 percent, respectively, in 2021-22 over 2020-21. The weighted index of above mentioned selected farm input prices in 2021-22 registered an increase of 23.7 percent over preceding year. The monthly wholesale price indices of various farm inputs from 2012 to 2022 are given in Annex Table 5.4.

[1]Manufacture of agricultural and forestry machinery consist of 'agricultural tractors', 'harvesters', 'agriculture implements', 'threshers' and 'soil preparation & cultivation machinery (other than tractors)'.

Chart 5.3: Movement in WPI of Farm Inputs during Rabi Season in 2020-21 and 2021-22



	HSD	Fert#	Electricity	Agri-Machine$	Lube Oils	Cattle Feed	Fodder	Pesti-cides*	Index of FIs**
WPI-2020-21	88.0	124.1	113.8	122.1	143.6	174.6	172.9	125.7	113.8
WPI-2021-22	146.2	132.5	127.9	131.4	163.6	200.6	189.5	136.4	140.8
Change in WPI (%)	66.1	6.8	12.4	7.6	13.9	14.9	9.6	8.5	23.7

Note 1: WPI of a farm input shown in graph was average of monthly WPIs from October to April of that farm input

2: WPI of Farm Inputs was weighted average of WPIs of farm inputs mentioned in Graph

 # : Fertilizers and Nitrogen Compounds

$: Manufacture of Agricultural and Forestry Machinery

** : Pesticides and other Agrochemical Products*

*** : Index of Farm Inputs*

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

Cost Projections for Rabi Marketing Season, 2023-24

Projection of Farm Input Price Index of Rabi Crops

5.27 The Commission has computed farm input-wise all-India weighted 'input weights' for crop season 2018-19 to 2020-21 and composite input price indices (CIPIs) from crop season 2019-20 to 2022-23 (RMS 2023-24) for mandated rabi crops with base 2011-12, and are given in Table 5.3. For this, based on actual 'weights' and 'input price indices' for crop season 2020-21, and using latest input prices; 'input price indices' and 'CIPIs' for crop season 2021-22 and 2022-23 for a State, have been constructed. Subsequently, based on these State-wise 'actual weights' and 'input price indices', crop-wise all-India weighted average 'input weights' and 'CIPIs', respectively, for all inputs, with weights being relative shares of States in all-India area under the crop during TE2021-22, have been computed. Further, these crop-wise all-India weighted average 'input weights' and 'CIPIs' have been used to compute input-wise all-India weighted average 'input weights' and 'CIPIs', respectively, for all rabi crops, with weights being relative shares of crops in total production of mandated rabi crops at all-India level during TE2021-22. Finally, these input-wise all-India weighted average 'input weights' and 'CIPIs' have been used to compute all-India weighted average 'composite input price index (CIPI)' for all inputs of mandated rabi crops.

5.28 It may be observed from the Table 5.3 that all-India CIPI for rabi crops showed an increase of 6.9 percent in 2020-21, 7.6 percent in 2021-22 and 8.6 percent in 2022-23, while CIPI for rabi crops for crop season 2022-23 registered the lowest increase (4.1%) in insecticides and highest increase (10.9%) in bullock labour over 2021-22. As human labour accounted for more than one-third of total cost of production of mandated rabi crops compared to about one-fourth for machine labour during TE2020-21, it is imperative to encourage farmers to adopt farm mechanisation to reduce cost of cultivation/production and improve profitability.

Table 5.3: Trends in All-India Rabi Crops Farm Input Price Indices (Base 2011-12)

Inputs	Weights (TE2020-21)	Crops Input Price Index (CIPI)				Percentage Change in Input Price Index 2022-23 over 2021-22
		2019-20	2020-21	2021-22	2022-23	
Human Labour (HL)	0.356	199.50	210.87	224.31	241.57	7.7
Bullock Labour (BL)	0.018	331.18	356.06	389.30	431.79	10.9
Machine Labour (ML)	0.263	154.30	168.61	185.21	204.98	10.7
Seeds	0.099	181.04	196.48	215.57	238.92	10.8
Fertilizers	0.114	138.37	145.70	154.26	164.28	6.5
Manures	0.004	186.98	195.39	207.37	221.61	6.9
Insecticides	0.017	140.62	146.02	151.77	157.94	4.1
Irrigation Charges	0.131	159.35	170.23	182.00	194.77	7.0
Composite Input Price Index (CIPI)		174.90	187.05	201.32	218.68	8.6
Percentage Change		-	6.9	7.6	8.6	-

Note: All-India Weights and CIPIs were weighted average of respective weights and CIPIs of projected States
Source: CACP Calculation using CS data

Projection of Cost of Production of Rabi Crops

5.29 Based on State-wise actual cost estimates during TE2020-21 and projected CIPIs, State-wise estimates of cost of cultivation (CoC) A_2, A_2+FL and C_2 for each mandated rabi crop were projected. Using these estimates of CoC, average ratios of main product (MP) to gross value of output (GVO) during TE2020-21, and projected yields, State-wise cost of production (CoP) A_2, A_2+FL and C_2 for each crop were projected. However, actual cost estimates and average ratios of main product (MP) to gross value of output (GVO), during 2018-19 and 2019-20 for wheat in Uttarakhand and barley in Madhya Pradesh, and 2018-19 and 2020-21 for gram in Jharkhand and safflower in Karnataka, have been used in projection of CoC/CoP of these States and crops. Subsequently, crop-wise all-India weighted average projected CoP A_2, A_2+FL and C_2, with weights being the respective share of the State in all-India production during TE2021-22, have been worked out for rabi crops for crop season 2022-23 (marketing season 2023-24), and are given in Table 5.4.

5.30 All-India per quintal lowest projected CoP A_2 for crop year 2022-23 was for barley at ₹704, A_2+FL was for wheat (₹1,065/qtl) and C_2 was for barley(₹1,487/qtl), whereas, projection of these costs per quintal were highest for safflower at ₹2,954, ₹3,765 and ₹5,135, respectively mainly due to lowest yield among mandated rabi crops. Among cereals, projected CoP A_2 and C_2 costs for wheat at ₹851 and ₹1,575 were higher than respective costs for barley mainly due to lower cost of cultivation of wheat, while owing to lower yield and higher cost of family labour in barley, A_2+FL CoP for barley was projected higher than wheat.

5.31 For pulses, projected A_2 CoP was higher for gram (₹2,476/qtl) than lentil (₹2,399/qtl) mainly due to higher cost of cultivation of gram, whereas, per quintal A_2+FL and C_2 costs at ₹3,239 and ₹4,608, respectively for lentil were projected higher than respective costs at ₹3,206 and ₹4,341 for gram mainly due to lower yield of lentil. In case of oilseeds, projected A_2, A_2+FL and C_2 CoP per quintal for rapeseed & mustard at ₹1,831, ₹2,670 and ₹3,740, respectively were significantly lower than respective costs for safflower, mainly due to significantly higher yield of rapeseed & mustard. Projected costs of cereals were substantially lower than pulses and oilseeds mainly due to significantly higher productivity of cereals. Rapeseed & mustard has lower projected cost than pulses, mainly due to higher yield of rapeseed & mustard, while safflower has higher projected cost than pulses, mainly due to lower yield of safflower.

5.32 Cost of production in some crops and States were high due to low yields, therefore, efforts are needed to improve productivity to reduce cost of production and improve profitability, especially for pulses and oilseeds. State-wise and all-India projected costs of mandated rabi crops for RMS 2023-24 and production shares during TE2021-22 are given in Annex Table 5.5. State-wise break-up of actual CoC estimates for 2018-19, 2019-20 and 2020-21 in respect of wheat, barley, gram, lentil, rapeseed & mustard, and safflower are given in Annex Tables 5.6a to 5.5f, respectively.

Table 5.4: Projected Cost of Production (CoP) of Mandated Rabi Crops, RMS 2023-24

Crops	Cost of Production for Crop Season 2022-23 (₹/qtl)		
	A_2	A_2+FL	C_2
Wheat	851	1065	1575
Barley	704	1082	1487
Gram	2476	3206	4341
Lentil	2399	3239	4608
Rapeseed & Mustard	1831	2670	3740
Safflower	2954	3765	5135

Note: All-India CoP of a crop is weighted average of CoPs of projected States
Source: CACP Calculation using CS data

Production vis-a-vis Cost Projection of Rabi Crops

5.33 Charts 5.4(a) to (e) show crop-wise supply curves[2] for A_2+FL CoP by States in ascending order with their corresponding relative shares in all-India production. The supply curve presented in Chart 5.4(a) shows that projected A_2+FL cost of production (CoP) for wheat for RMS 2023-24 was lowest at ₹786 per quintal in Punjab mainly due to highest yield, and highest (₹2,115/qtl) in Maharashtra. Among top-five producers of wheat in the country, which account for 86.9 percent production share of projected States, Punjab has the lowest projected CoP, while Uttar Pradesh has the highest CoP (₹1,129/qtl). Projected CoP in Haryana, Madhya Pradesh and Punjab are lower than all-India projected costs, whereas, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, Uttarakhand and West Bengal have higher cost than all-India projected cost of production.

[2]Supply curves for different crops are graphical representation of CoP, which represent the quantum of production of crop produced at different levels of CoP in various States.

5.34 For barley, projected A_2+FL CoP at ₹1,053 per quintal was lowest in Uttar Pradesh, and highest (₹1,882/qtl) in Himachal Pradesh mainly due to significantly lowest yield. Between top-two barley producers comprising 94.7 percent national production share, Uttar Pradesh has lower projected cost than Rajasthan (₹1,070/qtl), mainly due to lower cost of cultivation in Uttar Pradesh. Projected costs for barley were lower in Rajasthan and Uttar Pradesh, and higher in Himachal Pradesh and Madhya Pradesh, than all-India weighted average cost. (Chart 5.4(b)).

5.35 In case of gram as presented in Chart 5.4(c), Bihar has lowest projected A_2+FL CoP at ₹2,255 per quintal, and highest cost was in West Bengal (₹3,901/qtl). Among top-five producers of gram in the country, which account for 83.5 percent of production of projected States, Gujarat has the lowest projected CoP (₹2,705/qtl) and Maharashtra has the highest projected CoP (₹3,769/qtl). Projected cost of largest gram producing State Madhya Pradesh was at ₹3,015 per quintal. Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Rajasthan and Telangana have lower projected costs for gram, while Andhra Pradesh, Karnataka, Maharashtra, Uttar Pradesh and West Bengal have higher costs, than all-India projected cost.

5.36 Supply curve for Lentil presented in Chart 5.4(d) shows that projected A_2+FL cost was lowest in Bihar (₹2,456/qtl) mainly due to lowest paid-out cost including family labour, and highest in Uttar Pradesh (₹3,849/qtl). Between top-two lentil producers comprising production share of 79.5 in national production, Madhya Pradesh (₹2,808/qtl) has lower projected cost than Uttar Pradesh, owing to higher yield and lower paid-out cost including family labour in Madhya Pradesh. Projected costs were lower in Bihar and Madhya Pradesh and higher in Uttar Pradesh and West Bengal than all-India.

5.37 For rapeseed & mustard as shown in Chart 5.4(e), Madhya Pradesh has lowest projected CoP at ₹1,851 per quintal, and highest cost (₹4,557/qtl) in Assam. Among top-five producers of rapeseed & mustard in the country, which account for 92.4 percent production of projected States, Madhya Pradesh has the lowest projected CoP mainly due to lowest paid-out cost including family labour, and West Bengal has the highest projected CoP (₹3,658/qtl) because of lowest yield and highest paid-out cost including family labour. Projected CoP of largest rapeseed & mustard producing State Rajasthan was at ₹2,799 per quintal. Bihar, Gujarat, Haryana, Madhya Pradesh and Punjab have lower projected cost for rapeseed & mustard, while Assam, Odisha, Rajasthan, Uttar Pradesh and West Bengal have higher CoPs, than all-India projected cost.

5.38 Among cereals, increase in projected A_2+FL cost of production for crop year 2022-23 over 2021-22 was higher for barley at 6.2 percent than wheat (5.7%). In case of pulses, lower increase at 5.2 percent was registered in projected CoP of lentil than gram (6.7%), while for oilseeds, higher increase of 5.8 percent was recorded in rapeseed & mustard than safflower (3.8%). All-India projected cost of production of rabi crops for crop year 2022-23 and 2021-22 are given in Annex Table 5.7.

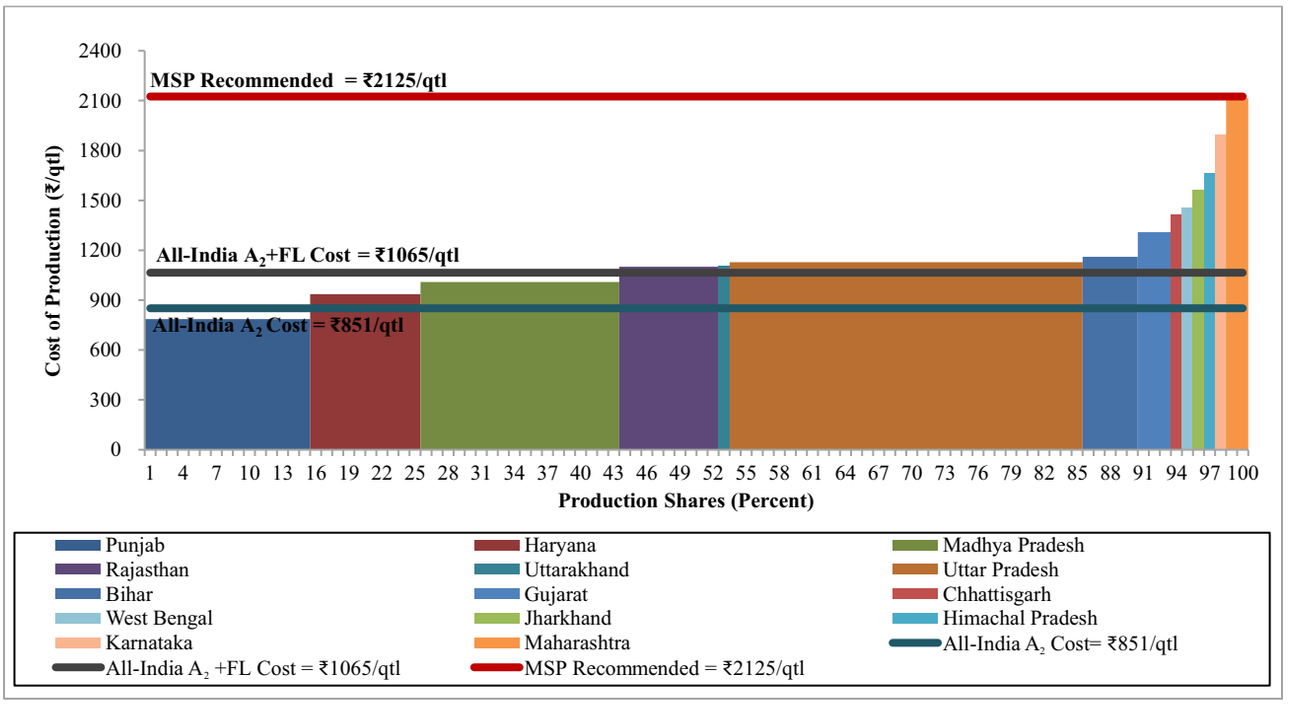
5.39 Projected A_2+FL cost of production was lower than all-India weighted CoP A_2+FL in three out of 14 States for wheat, two out of four States for barley, eight out of 13 States for gram, two out of four States for lentil, and five out of 10 States for rapeseed & mustard. Projected C_2 cost was lower than all-India C_2 CoP in four out of 14 States for wheat, two out of four States for barley, six out of 13 States for gram, one out of four States for lentil, and four out of 10 States for rapeseed & mustard. Therefore, holistic and coordinated efforts are needed to reduce costs and improve productivity in high-cost States to remain competitive and profitable.

5.40 Year-wise projected cost of production, minimum support price and percent margin in MSP over cost of production for the crop year of rabi crops are given Annex Table 5.8. The share of production covered at the recommended MSP was 100 percent for all mandated rabi crops except barley (97.8%). The MSP margin over all-India projected A_2+FL cost of production was highest for rapeseed & mustard at 104.1 percent, followed by wheat (99.5%), lentil (85.2%), gram (66.4%), barley (60.4%) and 50 percent for safflower. The MSP margins over all-India projected C_2 cost of production was highest for rapeseed & mustard at 45.7 percent, followed by wheat (34.9%), lentil (30.2%), gram (22.9%), barley (16.7%) and safflower (10%).

5.41 The highest MSP margin over projected CoP A_2+FL for wheat was in Punjab (167.3%), barley in Uttar Pradesh (64.8%), gram (136.6%) and lentil (144.3%) in Bihar, and rapeseed & mustard in Madhya Pradesh (194.4%). The highest MSP margin over projected CoP C_2 for wheat (47.8%), lentil (56.5%) and rapeseed & mustard (92.3%) was in Madhya Pradesh, barley in Rajasthan (22.7%), and gram in Bihar (49.4%)

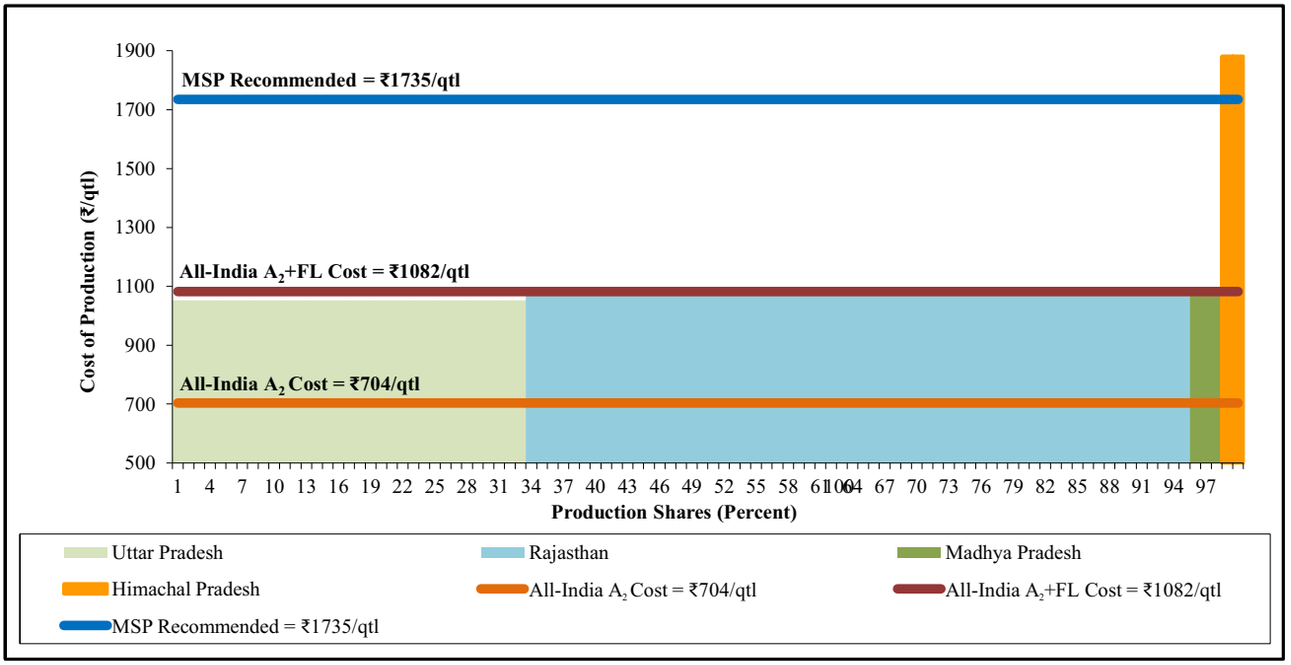
Chart 5.4: Supply Curve and Projected CoP for Mandated Rabi Crops, RMS 2023-24

(a) Wheat



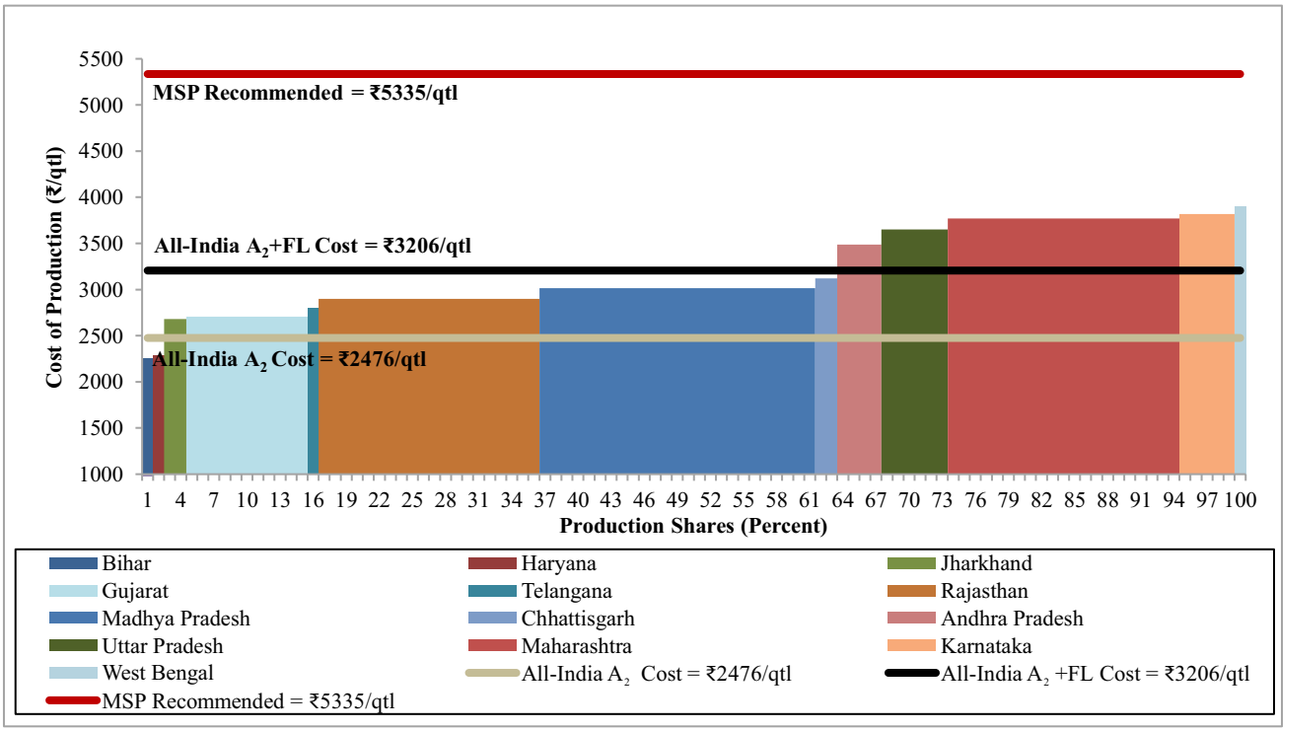
Note: All-India CoP was weighted average of CoPs of States mentioned in the Graph
Source: CACP

(b) Barley



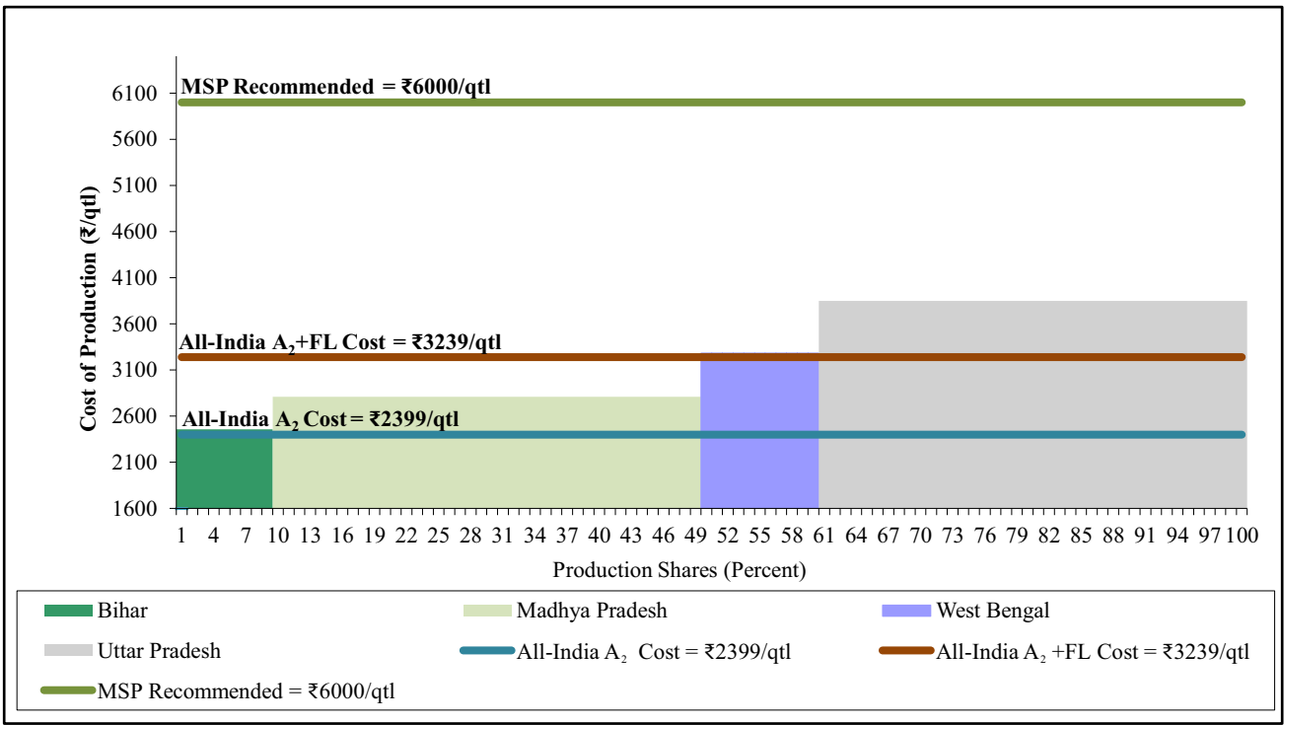
Note: All-India CoP was weighted average of CoPs of States mentioned in the Graph
Source: CACP

(c) Gram



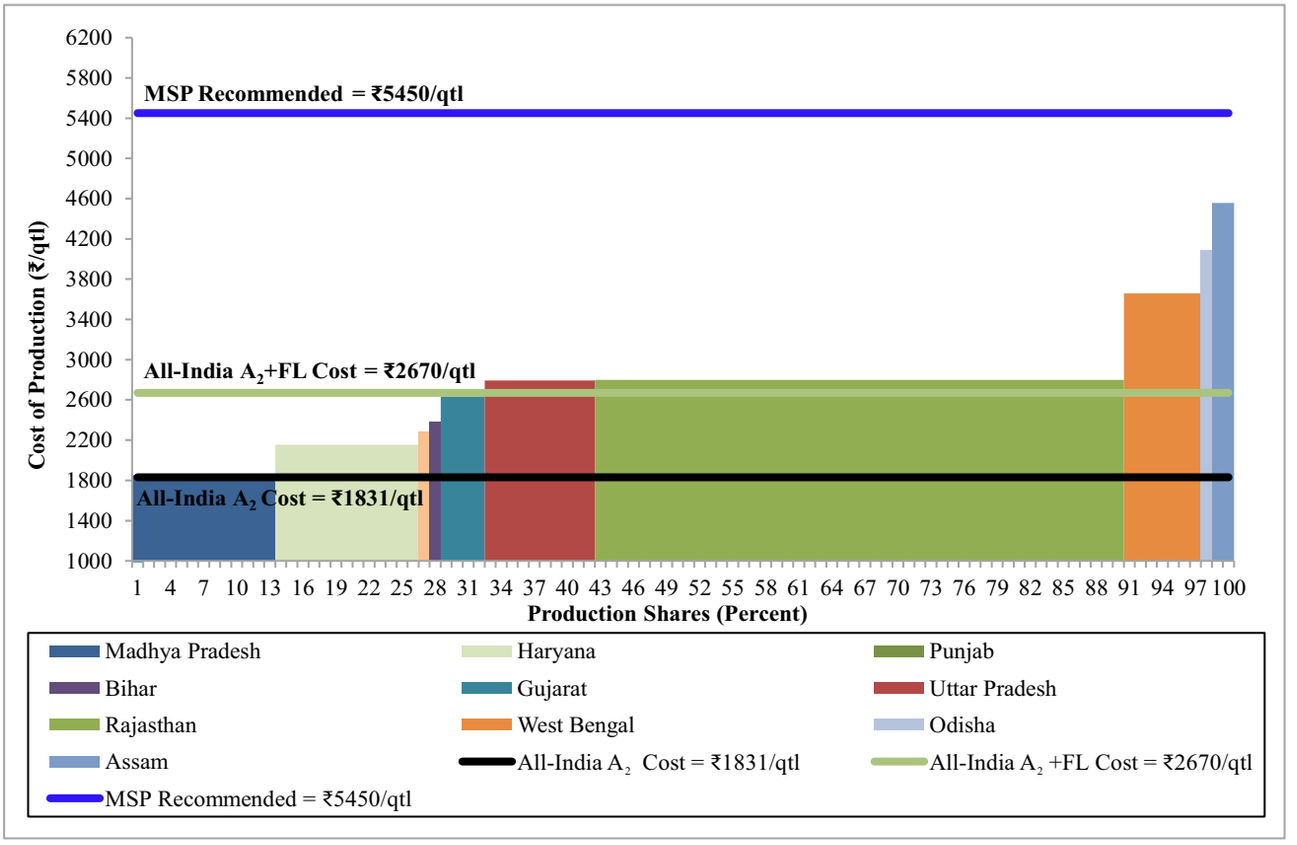
Note: All-India CoP was weighted average of CoPs of States mentioned in the Graph
Source: CACP

(d) Lentil



Note: All-India CoP was weighted average of CoPs of States mentioned in the Graph
Source: CACP

(e) Rapeseed & Mustard



Note: All-India CoP was weighted average of CoPs of States mentioned in the Graph
Source: CACP

Inter-Crop Parity of Rabi Crops

Inter-Crop Parity in Returns among Crops

5.42 Inter-crop parity being an important factor for determination of MSP, the Commission analysed per hectare relative average gross returns from different competing crops. The basic idea behind analysis is that area allocation amongst different crops be such that their respective per hectare returns are more or less balanced and thus helps in align production pattern keeping in view changing demand patterns. Relative average gross returns over CoC A_2+FL per hectare measured in percentage terms for each of mandated rabi crop with reference to wheat during TE2020-21 are presented in Table 5.5 and Chart 5.5. However, average costs, GVO and gross returns during 2018-19 and 2019-20 for wheat in Uttarakhand and barley in Madhya Pradesh, and 2018-19 and 2020-21 for gram in Jharkhand and safflower in Karnataka, have been used in estimation of relative average gross returns of respective States and crops.

5.43 Wheat has the highest relative average gross returns during TE2020-21, while safflower has lowest returns at 2.7 percent because of lowest yield and highest cost of production. Cereals have higher relative returns than pulses and safflower. Among cereals, relative returns of barley were 36.4 percent less than wheat, while for pulses, lentil has marginally higher returns at 60.6 percent than gram (51.3%). Relative returns of wheat were 20.2 percent higher than rapeseed & mustard, owing to higher yield and lower cost of production of wheat, whereas, returns of pulses were lower than rapeseed & mustard, mainly because of lower yield and higher cost of production of pulses. The relative gross returns on per hectare basis show that wheat has comparatively much higher returns than pulses and oilseeds, which reveals that the cultivation of pulses and oilseed is less profitable than cultivation of wheat. This indicates that if gram or lentil or rapeseed & mustard or safflower is to be promoted, the relative incentive structure has to be changed, or yields levels should be increased or both.

5.44 All-India relative average gross returns of rabi crops for 2018-19, 2019-20 & 2020-21 with respect to wheat over actual cost of cultivation are placed in Annex Table 5.9. Relative returns over A_2+FL cost with respect to wheat during the period TE2020-21 depict increasing trends in gram mainly due to increasing trend in GVO, and rapeseed & mustard mainly due to increasing trend in prices, and declining trend in safflower mainly due to declining trend in yield. However, relative returns of barley were increased during 2019-20 because of increase in yield and prices, and then declined during 2020-21 mainly due to fall in yield, over respective preceding years. The relative returns of lentil decreased in 2019-20 owing to decline in yield and increase in cost of production, and then increased in 2020-21 because of increase in yield and prices, over previous years.

Inter-Crop Parity in Returns among States

5.45 Relative average gross returns of rabi crops in selected States during TE2020-21 with respect to wheat over actual cost of cultivation are placed in Annex Table 5.10. Among cereals, wheat was the most profitable crop in Assam, Haryana, Himachal Pradesh, Madhya Pradesh, Odisha, Punjab, Rajasthan and Uttar Pradesh among mandated rabi crops of respective States during TE2020-21, while more profitability was realized for wheat than lentil and rapeseed & mustard in Bihar, gram in Gujarat, and safflower in Karnataka. Highest returns of wheat were realized in Haryana, and lowest in Jharkhand. Relative returns of gram in Jharkhand and Karnataka were 5.4 times and 2.3 times higher than wheat in respective States, while returns from gram, lentil and rapeseed & mustard were 25.7 percent, 3.2 times and 1.3 times more than wheat in West Bengal, therefore, farmers of Jharkhand, Karnataka and West Bengal may be discouraged to grow wheat.

5.46 Barley has the lowest profitability in Madhya Pradesh among mandated rabi crops grown in the State, while it was more profitable than gram in Rajasthan, and gram, lentil and rapeseed & mustard in Uttar Pradesh. Crop diversification from wheat to barley may not be feasible in Himachal Pradesh as relative returns of barley were 1.5 times less than wheat, thereby farmers incurred a net loss of ₹12,965 per hectare in barley farming.

5.47 In case of pulses, gram was the most profitable crop in Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Karnataka, Maharashtra and Telangana among mandated rabi crops grown in respective States; and more profitable than barley and lentil in Madhya Pradesh, and lentil in Uttar Pradesh. Lentil has highest profitability among mandated rabi crops grown in West Bengal, and more profitabile than rapeseed & mustard in Bihar.

5.48 Rapeseed & mustard was most profitable crop among mandated rabi crops in Gujarat, while it is more profitable than gram in Haryana and Rajasthan, gram and lentil in Madhya Pradesh and Uttar Pradesh, barley in Madhya Pradesh and Rajasthan, wheat and gram in West Bengal. In Odisha, relative returns of rapeseed & mustard were 1.3 times less than wheat and farmers incurred net loss of ₹2,281 per hectare in rapeseed & mustard farming, therefore, farmers may diversify towards more profitable crops in place of rapeseed & mustard in Odisha.

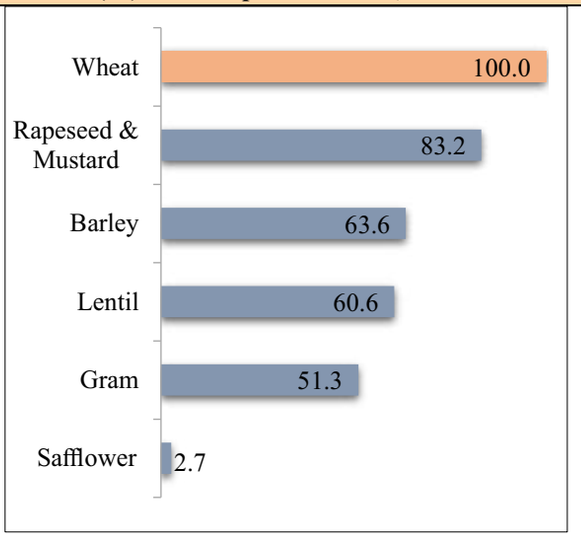
5.49 The above analysis reveals that farmers' income may be increased substantially by shifting to other crops in place of wheat, barley and rapeseed & mustard in some States. Through diversification from wheat farming, farmers may earn more income by growing more gram in Andhra Pradesh, Bihar, Chhattisgarh, Maharashtra, and Telangana, and rapeseed & mustard in Gujarat. However, farmers may be discouraged to grow wheat in Jharkhand, Karnataka and West Bengal, and encouraged to grow gram in Jharkhand and Karnataka, and gram, lentil and rapeseed & mustard in West Bengal, as returns of wheat for these States were comparatively very low than other mandated rabi crops of respective States. Besides, farmers may be discouraged to grow barley in Himachal Pradesh and rapeseed & mustard in Odisha, as paid-out costs including family labour have not met by selling the produces.

5.50 All-India relative gross returns on per hectare basis show that wheat has significantly higher returns than barley, gram, lentil, rapeseed & mustard and safflower. Due to reasonably higher returns and assured market in wheat, and high production and market/price risks in barley, pulses and oilseeds, farmers prefer to grow wheat over barley, pulses and oilseeds. Therefore, there is need to promote cultivation of barley, pulses and oilseeds by changing their relative incentive structure through higher MSP, assured markets, improving productivity and reducing cost of cultivation.

Table 5.5: Crop-wise Relative Average Gross Returns (%) with Respect to Wheat, TE2020-21

Crops	Relative Average Gross Returns over CoC A_2+FL with respect to wheat
A. Cereals	
Wheat	100.0
Barley	63.6
B. Pulses	
Gram	51.3
Lentil	60.6
C. Oilseeds	
Rapeseed & Mustard	83.2
Safflower	2.7

Chart 5.5: Crop-wise Relative Average Gross Returns (%) with Respect to Wheat, TE2020-21



Note 1: Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for 2018-19 and 2020-21 for gram in Jharkhand and for safflower in Karnataka, due to, unavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns of projected States.

Source: CACP calculation using CS data

Comparison of CACP Cost Estimates with State Estimates

5.51 Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Maharashtra, Odisha, Punjab, Rajasthan, Telangana, Uttarakhand, Uttar Pradesh and West Bengal have provided the estimates of cost of cultivation/production along with suggestion for minimum support prices (MSPs) for major rabi crops. CACP projections and projected cost of production/cultivation and yields along with suggested MSPs provided by States for mandated rabi crops for crop season 2022-23 (RMS 2023-24) are given in Annex Table 5.11. There are variations in cost estimates provided by the States and CACP cost estimates. The main reasons for variations in these two sets of estimates are different methodologies and cost concepts used by the States and CACP.

5.52 In cereals, estimates of projected cost of production for wheat by Bihar, Chhattisgarh, Gujarat, Maharashtra, Punjab, Rajasthan and West Bengal were higher than CACP projections, while cost estimates by Jharkhand and Uttar Pradesh were lower than CACP estimates. For barley, estimates of CoP by Rajasthan and Uttar Pradesh were lower than CACP projections. In case of pulses, cost of production estimates by Andhra Pradesh, Bihar, Maharashtra and Telangana for gram were higher than CACP cost of production projections, while cost estimates by Chhattisgarh, Gujarat, Jharkhand, Karnataka, Rajasthan and Uttar Pradesh for gram, and Bihar and Uttar Pradesh for lentil were lower than CACP estimates. For rapeseed & mustard, cost estimates by Bihar and West Bengal were higher than CACP estimates, while Assam, Gujarat, Odisha, Punjab, Rajasthan and Uttar Pradesh cost estimates were less than CACP projected costs.

5.53 In case of wheat in Punjab, projected cost by State was higher than CACP projection, as State Government has taken 33.7 percent higher cost on labour (human, bullock, machine), 37.8 percent higher on seed, fertiliser, manure, insecticides, irrigation and miscellaneous charges, 64.2 percent higher on rental value of owned land and rent paid for leased-in land, 67.1 percent higher on depreciation on implements & farm buildings, and 38.4 percent higher on interest paid for working capital & fixed capital than CACP estimates. For gram in Bihar, projected cost estimate by State was higher than CACP projection as besides inclusion of 10 percent risk cost over cost of cultivation/production, State Government estimated 86.3 percent more cost on labour (human, bullock, machine), 110.9 percent more on seed, fertiliser, manure, insecticides, irrigation and miscellaneous charges, 100.5 percent more on depreciation on implements & farm buildings, and 2.2 times more on interest paid for working capital & fixed capital than CACP projection.

5.54 The comparison of cost estimates provided by Assam for wheat and lentil; Telangana for wheat, rapeseed & mustard and safflower; Odisha for gram; Punjab for barley, gram; Jharkhand for lentil; Andhra Pradesh and Chhattisgarh for rapeseed & mustard; and Maharashtra for safflower, could not be carried out as cost projections for these crops and States have not been undertaken by CACP due to either non-availability of cost data under the Comprehensive Scheme or number of sample holdings under CS for the crop was inadequate.

5.55 The CACP has projected cost of production of wheat for Haryana, Karnataka and Uttarakhand, wheat and barley for Himachal Pradesh and Madhya Pradesh and gram for Haryana, gram and lentil for Madhya Pradesh and West Bengal, rapeseed & mustard for Haryana and Madhya Pradesh, and safflower for Karnataka, but cost comparison could not be done as cost estimates for these crops were not provided by States. Cost comparison of lentil for Punjab and Rajasthan could not be made as neither cost projections were made by CACP due to unavailability of CS data nor cost estimates were provided by the States for RMS 2023-24. The State reply of Himachal Pradesh has been received by CACP without details of cost of cultivation/production for RMS 2023-24. Other States/UTs have not provided cost estimates for RMS 2023-24.

Issue Related to Sample Size under Comprehensive Scheme

5.56 Presently, under 'Comprehensive Scheme (CS) for studying the Cost of Cultivation of Principal Crops in India', 8100 farmers are selected throughout the country for a block of three years. The actual cost of cultivation/production of the crops grown by selected farmers are taken into consideration for deriving the State-wise actual estimates of cost of cultivation/production of the crops. There is possibility that selected farmers of State would not grow or only few selected farmers would grow a mandated rabi crop, while that mandated rabi crop occupies reasonable share in the all-India area and production or area and production of a crop group in the State. Under this scenario, actual cost estimates of that mandated rabi crop of that State would not be generated or would be generated with thin/small sample size. Therefore, for generation of representative and reliable actual cost estimates of each of the mandated rabi crop within a State and at all-India level, the Commission recommends that existing sample size of selected farmers at all-India level should be increased adequately.

5.57 The Commission has analysed the actual cost estimates under Comprehensive Scheme for making projections for the RMS 2023-24, and observed that there are certain crops in some States whose share in the all-India crop area/production as well as in the area and production of crop group in the State are very low. There are also instances, where sample size for certain crops in the State and all-India is inadequate, and may not be a representative sample for cost projections (Annex Table 5.12 & 5.13).

5.58 The Commission suggests that the sample size of wheat in Chhattisgarh and West Bengal, gram in Jharkhand, Punjab and West Bengal, lentil in Punjab and Rajasthan, rapeseed & mustard in Chhattisgarh, and safflower in Karnataka may be increased. The sample size of safflower at all-India level is too small and can undermine the reliability and representativeness of cost projections, therefore, sample size must be increased for this crop. Since the Commission uses three-year actual cost estimates in forecasting of cost of production, the CS data should be collected every year for wheat in Uttarakhand, gram in Jharkhand and Punjab, lentil in Punjab and Rajasthan, rapeseed & mustard in Chhattisgarh, and safflower in Karnataka for smoothing cost estimates.

5.59 The Commission has also analysed State-wise area and production of the mandated rabi crops during TE2021-22 and observed that there are certain crops in States, which occupy reasonable share in the all-India area and production or area and production of a crop group in the State, but CS data for these States are not available (Annex Table 5.14). Inclusion of these States under Comprehensive Scheme would improve representation and reliability of cost projections at all-India level. Therefore, the Commission recommends inclusion of such States under the CS. The Commission also suggests that Comprehensive Scheme may be implemented in Jammu & Kashmir for wheat, lentil and rapeseed & mustard, and Tripura for lentil and rapeseed & mustard, as these are important crops of rabi season in the State/UT. Wheat, barley, lentil, rapeseed & mustard occupy reasonable share in the all-India area and production or area and production of a crop group in the State, therefore, Uttarakhand should be brought under Comprehensive Scheme.

Recapitulation

5.60 Average CoC A_2+FL per hectare during TE2020-21 was ₹40,287 for wheat and ₹44,824 for barley in cereals, ₹31,533 for gram and ₹24,475 for lentil in pulses, and ₹34,402 for rapeseed & mustard and ₹24,423 for safflower in oilseeds. Average GVO per hectare was ₹83,836 for wheat, ₹72,517 for barley, ₹53,870 for gram, ₹50,845 for lentil, ₹70,646 for rapeseed & mustard and ₹25,592 for safflower. Average gross returns over CoC A_2+FL per hectare during TE2020-21were ₹43,549 for wheat and ₹27,693 for barley in cereals, ₹22,337 for gram and ₹26,370 for lentil in pulses, and ₹36,244 for rapeseed & mustard and ₹1,169 for safflower in oilseeds. Efforts should be made to reduce cost, improve crop yields and ensure remunerative prices to farmers, particularly barley, pulses and oilseeds growers, to improve farmers' income and global competitiveness.

5.61 The all-India average daily wage rate of agricultural labour (at current prices) during rabi season of 2021-22 registered an increase of 5.6 percent, while weighted index of selected farm inputs increased by 23.7 percent. The all-India CIPI for mandated rabi crops registered a growth of 8.6 percent in crop season 2022-23 (RMS 2023-24). As labour availability and rising wages have become a constraint and all-India weighted share of human labour (35.6%) in rabi crops during TE2020-21 was reasonably higher than machine labour (26.3%), farmers should be encouraged to adopt farm mechanisation to reduce cost of cultivation/production and improve profitability.

5.62 The all-India per quintal A_2+FL cost of production for crop season 2022-23 (RMS 2023-24) was projected at ₹1,065 for wheat, ₹1,082 for barley, ₹3,206 for gram, ₹3,239 for lentil, ₹2,670 for rapeseed & mustard, and ₹3,765 for safflower. All-India per quintal C_2 cost of production was projected at ₹1,575 for wheat, ₹1,487 for barley, ₹4,341 for gram, ₹4,608 for lentil, ₹3,740 for rapeseed & mustard, and ₹5,135 for safflower. The increase in projected CoP A_2+FL during crop season 2022-23 over 2021-22 varied from 3.8 percent in safflower to 6.7 percent in gram, while CoP C_2 varied from 1.7 percent in safflower to 6.7 percent in rapeseed & mustard. The relative

average gross returns were highest for wheat, followed by rapeseed & mustard, barley, lentil, gram, and lowest for safflower. As wheat production has increased substantially in the country, production of other rabi crop has either declined or remained almost stagnant, farmers should be encouraged to grow barley, oilseeds and pulses by improving relative returns through assured market and prices, reducing cost of cultivation and improving yields of these crops.

5.63 Per quintal MSP recommended at ₹2,125 for wheat, ₹1,735 for barley, ₹5,335 for gram, ₹6,000 for lentil, ₹5,450 for rapeseed & mustard, and ₹5,650 for safflower, would cover projected A_2+FL CoP for all States for wheat, gram, lentil, rapeseed & mustard and safflower, and 3 out of 4 States for barley; whereas, these MSPs would cover projected C_2 CoP for all states for lentil and safflower, and 10 out of 14 States for wheat, 3 out of 4 States for barley, 12 out 13 States for gram and 9 out of 10 States for rapeseed & mustard. The margins over A_2+FL CoP varied from 104.1 percent in rapeseed & mustard to 50 percent in safflower.

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CHAPTER 6

Considerations and Recommendations for Price Policy

6.1 Wheat, barley, gram, lentil, rapeseed & mustard, and safflower are the mandated Rabi crops for which the Commission for Agricultural Costs and Prices (CACP) recommends Minimum Support Price (MSP). The Commission also suggests non-price measures that would inter-alia increase productivity and improve efficiency by encouraging farmers to use new technologies, diversify cropping patterns to meet shifting consumer demand, and ensure efficient use of land, water, and other production resources. Based on data collected under "Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India", the Commission determines the cost of cultivation of specified crops at the State level for the forthcoming rabi marketing season. Analysis of demand-supply situation, crop productivity, trends in agricultural exports and imports, intercrop price parity, the likely impact of price policy on the Indian economy, and to ensure a minimum of 50 percent as the margin over the cost of production are all considered in addition to cost estimates before arriving at price and non-price recommendations. The Commission held extensive discussions and considered comments and suggestions from State Governments, Central Ministries/Departments, farmers/Farmers Associations and research institutions while making price and non-price policy recommendations.

Global Scenario

6.2 Global production of wheat in TE2021-22 was 772.1 million tonnes. USDA and FAO have estimated that global wheat production in 2022-23 will be lower by about 6 million tonnes compared to 2021-22 while IGC has predicted a decline of around 12 million tonnes. The disruptions in agriculture operations caused by the geopolitical conflict between Russia and Ukraine, resulting in sharp reduction in the area harvested and subdued yields have resulted in lower wheat production in 2022.

6.3 According to USDA June 2022 Report, global oilseeds production is expected to increase by 8 percent in 2022-23, to about 647 million tonnes. This is primarily expected from higher oilseeds production in Brazil and United States. Oilseed exports are also expected to increase in 2022-23 because of higher production of rapeseed in Australia and soybean in Ukraine, which offset the reduction in sunflower seed production in Argentina. Global trade in vegetable oils is however expected to reduce because of lower exports of sunflower seed oil from Ukraine.

6.4 FAO Food Outlook June 2022 forecasts that in 2022-23, with international oilseed prices hitting record highs, the total area planted with oilseed crops could continue to expand, while yield levels are also expected to recover assuming normal growing conditions. As a result, global oilseed production in 2022-23 could possibly rebound to a new record high.

Demand-Supply Scenario

6.5 As per the third advance estimates, wheat output in the country is estimated at 106.51 million tonnes in 2021-22, down 2.8 percent from the previous year due to unusual high temperatures in March and April. While wheat stocks have declined drastically by 51.3 percent to only 28.5 million tonnes as on 30th June, 2022, marginlly larger than the stocking norms (27.6 million tonnes) for Central Pool. Because of steep increase in international prices, wheat exports witnessed a record increase to about 7.2 million tonnes in 2021-22.

6.6 In the last four years, production of pulses has increased gradually, hitting a record high of 27.75 million tonnes in 2021-22. Amongst rabi pulses, production of gram is estimated to show a significant increase (17.4%) in 2021-22 compared to the previous year.

Trends in Productivity

6.7 Wheat yield at all India level increased by 16.4 percent, from 29.9 qtl/ha for the TE2016-17 to 34.8 qtl/ha for the TE2021-22. Over the same period, the yield of barley increased from 24.6 qtl/ha to 28.8 qtl/ha. All-India average yield of gram increased by 32.2 percent from 9.0 qtl/ha in TE2016-17 to 11.9 qtl/ha in TE2021-22. Rapeseed & mustard yield at the all-India level improved significantly from 11.9 qtl/ha for the TE2016-17 to 14.6 qtl/ha for the TE2021-22, thereby clocking an increase of 22.7 percent.

6.8 Although growth rates in production and yield levels for most of the rabi crops, have improved for the TE2020-21 as compared to the TE2016-17, yet yield levels of rabi crops in India are significantly lower than key producing countries of the world and the potential yield of the crop in India.

Terms of Trade

6.9 Farmer's Term of Trade (FToT) increased from 84.8 in 2005-06 to 103 in 2010-11 but from 2010-11 onwards, it fell below 100 and reached 99.3 in 2021-22. However, AGRToT was above the threshold of 100 since 2012-13 indicating an increasing trend in profitability of agriculture sector as compared to non-agriculture sector.

Trade Performance

6.10 India's agricultural exports rose impressively by 21.7 percent to ₹391 thousand crore in 2021–2022 compared to the previous year. On the other hand, imports of agricultural products increased sharply by 48.7 percent and stood at ₹257 thousand crore in 2021-22. Accordingly, the trade surplus in agriculture narrowed from ₹148.6 thousand crore in 2020-21 to ₹134 thousand crore in 2021-22. The share of agri-exports in total exports of the country decreased from 14.9 percent in 2020-21 to 12.4 percent in 2021-22. At the same time, the share of agricultural imports in total imports declined marginally from 5.9 percent in 2020-21 to 5.6 percent in 2021-22. During 2021-22, rice (basmati and non-basmati) was the largest export item with a share of 18.4 percent, followed by marine products (14.8 %), sugar (8.8%), spices (7.5%) and meat (6.3%). The principal imports of India in 2021-22 (in value) include vegetable oils (55.1%), fresh fruits (7.1%), pulses (6.5%) and spices (3.8%).

6.11 The exports of wheat increased sharply from 21.5 lakh tonnes in 2020-21 to 72.4 lakh tonnes in 2021-22 due to disrupted international supply of wheat because of conflict between Russia and Ukraine. Import of pulses increased marginally from 25 lakh tonnes in 2020-21 to 27.7 lakh tonnes in 2021-22. In particular, for Rabi pulses, imports of lentil significantly decreased from 11.2 lakh tonnes last year to 6.7 lakh tonnes in 2021-22. Exports of gram have decreased marginally from 1.6 lakh tonnes in 2020-21 to 1.2 lakh tonnes in 2021-22. In 2021-22, the import of edible oils increased to 142.8 lakh tonnes from 135.4 lakh tonnes in 2020-21.

Price Trends

6.12 Since RMS 2018-19, domestic market price of wheat has been above MSP only during RMS 2019-20 and RMS 2022-23. During RMS 2022-23, domestic market price of wheat was 2.5 percent above MSP on an average.

6.13 During RMS 2018-19 to 2021-22, domestic market prices of barley were above MSP in RMS 2019-20 and 2020-21 while it was below MSP in 2018-19 and 2021-22. In RMS 2022-23 domestic market prices have been higher than MSP by 55 percent on an average.

6.14 During the last five marketing seasons MSP of gram has always been higher than domestic market prices. MSP of lentil has been higher than domestic market prices for RMS 2018-19 and RMS 2019-20 while domestic market prices have been higher than MSP since RMS 2020-21. During RMS 2022-23 domestic market prices have been higher than MSP by about 21 percent on an average.

6.15 MSP of rapeseed and mustard has been higher than domestic market price during RMS 2018-19 to 2020-21 while domestic market price reigned above MSP during 2021-22 and 2022-23. During RMS 2022-23 domestic market prices, on an average, were 28 percent higher than MSP.

6.16 International prices for wheat have remained lower than the domestic prices as well as MSP during the period 2017-2020. However, from 2020 (Q3) onwards, the international prices of wheat surpassed the MSP and domestic prices until 2021. However, with the Russia-Ukraine conflict disrupting wheat supplies globally, the international wheat prices continued to rise by 39.1 percent in 2022 (Q1) vis-à-vis 2021 (Q1). This sharp rise in international prices made exports of Indian wheat competitive in the international market. The international prices of barley have consistently been lower than domestic wholesale prices and MSP during the last five marketing seasons and the gap has widened during last two seasons.

6.17 The international prices of gram were above MSP until first quarter of 2018. It fell below MSP and remained below until first quarter of 2019. After that international prices of gram were above MSP but fell below MSP since second quarter of 2021. The international prices of lentil hovered around MSP during the period 2018 and 2019. However, 2020 onwards, the prices of lentil surpassed MSP in domestic and international markets and have been on a gradual rise since then. In case of oilseeds, international prices of rapeseed & mustard remained below MSP until second quarter of 2021. After that, international prices have risen above MSP.

Procurement Operations and Efficacy

6.18 The procurement of wheat was 18.8 million tonnes in RMS 2022-23, a sharp decline from previous season's 43.3 million tonnes. During RMS 2022-23, wheat procurement was 75.8 percent of market arrival, while it was 97.5 percent in the previous season, in rabi pulses total procurement of gram increased to 25.55 lakh tonnes from previous years 6.31 lakh tonnes. In RMS 2022-23, due to higher market prices than MSP, there was no procurement of mustard seeds in major producing States.

Cost of Production and Inter-Crop Parity

6.19 Among all crops, per hectare all-India average A_2+FL CoC was highest for barley at ₹44,824 and lowest for safflower at ₹24,423. Average GVO per hectare was highest for wheat at ₹83,836 and lowest for safflower at ₹25,592. The average gross returns over CoC A_2 and A_2+FL during TE2020-21 were highest for wheat at ₹51,936 per hectare and ₹43,549 per hectare, respectively, while these were lowest for safflower at ₹6,193 per hectare and ₹1,169 per hectare, respectively. It is observed that all-India average gross returns as percentage of CoC A_2 were highest at 199.3 percent for rapeseed & mustard, and lowest for safflower (31.9%), whereas, returns as percentage of CoC A_2+FL were highest at 108.1 percent for wheat, and lowest at 4.8 percent in safflower. Analysis of inter-crop price parity shows that wheat has the highest relative average gross returns during TE2020-21, while safflower has lowest returns at 2.7 percent because of lowest yield and highest cost of production. Cereals have higher relative returns than pulses and safflower. The all-India per quintal A_2+FL cost of production for crop season 2022-23 (RMS 2023-24) was projected at ₹1,065 for wheat, ₹1,082 for barley, ₹3,206 for gram, ₹3239 for lentil, ₹2,670 for rapeseed & mustard, and ₹3,765 for safflower.

Non-Price Policy Recommendations

Increasing Production of Pulses

6.20 India is one of the largest producer of as well as the largest consumer of pulses, and thus emerging as one of the largest importer of pulses. Import of pulses accounted for about 6.5 percent in India's agri-imports in 2021-22. While India is gradually moving towards attaining self-sufficiency in pulses, it still requires sustained interventions. The Commission recommends increasing pulses acreage as well as bridging yield gaps in pulses through use of new varieties, better seeds and adoption of improved scalable technologies supplemented by supportive procurement policy.

Promote Oilseeds Production

6.21 Although there has been an impressive increase in production of rapeseed and mustard and safflower during 2021-22, the country is still heavily dependent on imports to meet its edible oil requirement. Domestic production of edible oil is insufficient to meet the demand owing to low productivity, growing oilseed crops in marginal lands and rainfed areas etc. The Commission has noted that oil content in rapeseed and mustard seed varies widely across different varieties. The Commission recommends that farmers should be suitably incentivized to increase area under high oil yielding varieties of rapeseed and mustard.

Crop Diversification

6.22 Analysis of cost data shows that growing gram in Andhra Pradesh, Bihar, Chhattisgarh, Maharashtra, and Telangana, and rapeseed & mustard in Gujarat is profitable for farmer, while growing wheat in Jharkhand, Karnataka and West Bengal is not profitable. Farmers will gain more by diversifying from wheat to gram in Jharkhand and Karnataka, and gram, lentil and rapeseed & mustard in West Bengal, as returns from wheat in these States were comparatively very low. Similarly growing barley in Himachal Pradesh and rapeseed & mustard in Odisha is not profitable as paid-out costs including family labour expenses cannot be recovered by selling the produce.

6.23 All-India relative gross returns on per hectare basis show that wheat has significantly higher returns than barley, gram, lentil, rapeseed & mustard and safflower. Due to reasonably higher returns and assured procurement in wheat, and high production and market/price risks in barley, pulses and oilseeds, farmers prefer to grow wheat over barley, pulses and oilseeds. Therefore, the Commission recommends that there is need to promote farming of barley, pulses and oilseeds by changing their relative incentive structure through higher MSP, assured markets, improving productivity and reducing cost of cultivation.

Adoption of Quality Seeds

6.24 Largely, agricultural production and productivity are dependent on the development of new and improved varieties of crops and on timely supply of superior quality seeds to farmers. The Commission has noted the two major initiatives by Government in the form of the Sub-Mission on Seeds and Planting Material (SMSP) and National Mission on Agricultural Extension and Technology (NMAET) to ensure production and multiplication of high yielding certified and quality seeds of all crops in sufficient quantity and to make them available to farmers.

6.25 The seed replacement rate for wheat, lentil and R&M have exceeded the target of 33 percent for the years under consideration; the SRR for barley, gram and safflower is yet to achieve the target. Therefore, the Commission recommends that farmers should be persuaded to adopt high-quality certified seeds for barley, gram and safflower in order to improve the SRR. This will also provide much needed fillip to boost the yield level of these crops. The private sector may be encouraged to undertake R&D to develop high yielding seeds with desirable commercial traits.

Promoting Balanced Use of Fertilizers

6.26 Fertilizer is another crucial and critical input for enhancing fertility of soil. Although India continues to remain the third largest producer and the second largest consumer of fertilizers in the world, India is dependent on imports to the tune of 25 percent of its requirement of urea, 90 percent in case of phosphates, either as raw material or finished fertilizers (DAP/MAP/TSP) and 100 percent in case of potash. The Commission endorses the initiative of Government of India to encourage Indian companies to enter into joint ventures abroad particularly in countries, which are rich in fertilizer resources for production facilities with buy back arrangements. Further, companies may be incentivised to enter into long term agreements for supplying fertilizers and fertilizer inputs to India.

6.27 However, excessive and non-judicious fertilizer use, soil fertility exhaustion, low nutrient use efficiency and deteriorating crop response to fertilizers are major challenges confronting the agrarian economy. Hence, the Commission recommends adoption of an integrated nutrient management approach to address the issue of low nutrient use efficiency and poor response ratio. This entails the combined use of mineral, organic fertilizers, bio-fertilizers and micronutrients. The Soil Health Card Scheme (SHC) was introduced with an objective to promote scientific and evidence based integrated nutrient management. There is a pressing need to popularize innovative fertilizers like nano urea, other liquid fertilizers and water-soluble fertilizers for increasing fertilizer use efficiency. Moreover, use of drone technology and fertigation should be equally encouraged to achieve higher water and fertilizer use efficiency.

Promoting Climate Resilient Sustainable Agriculture

6.28 In 2022, India recorded extremely high temperature during the month of March that triggered an early onslaught of heat waves causing high evapotranspiration and moisture stress that adversely affected rabi crops, particularly wheat crop. Rise in temperature has caused yellowing and shrivelling of wheat grain and an early maturity that resulted in yield loss. Moreover, other crops such as gram, maize, and mustard have also got adversely affected due to extreme temperatures. Intense extreme weather events are being observed across India, which pose a stiff challenge for achieving sustainable agricultural growth. The Commission therefore recommends a comprehensive initiative to promote Climate Resilient Agriculture (CRA) for ensuring food and livelihood security in the country. This interalia includes promoting heat tolerant crops, agroforestry, early sowing of crops, crop rotation, minimum tillage, use of biofertilisers etc.

Rationalisation of Market Fee and Other Charges

6.29 The country has a uniform MSP across States, yet the actual cost incurred at markets/mandis varies from State to State as States charge mandi fee and other charges on the sale and purchase of agricultural produce that vary widely across States. Such fee/charges restrict inter-State trade and create inefficient marketing system in the country. The charges levied on procurement of Rabi crops in major States vary from a high of 8.5 percent in Punjab to 3.6 percent in Madhya Pradesh. The Commission thus reiterates its recommendation that such charges should be rationalized and States may be urged to adopt uniform tax rates to encourage market competition and to promote free inter-State trade. This will help to achieve the objective of national agricultural market.

Linking of Reserve Price to MSP

6.30 As per extant procedure, pulses procured under Price Support Scheme (PSS) are required to be disposed within 9 months from the closure of procurement. It is also observed that the liquidation of stocks of pulses and oilseeds by NAFED below MSP depresses market prices and discourages direct procurement by private trade. The Commission suggests that procurement agencies should avoid selling these stocks in open market below the MSP and particularly during the procurement season. The Commission further suggests that reserve price may be fixed for disposal of pulses and oilseeds and may be linked to MSP as is being done for wheat and rice under OMSS(D).

Review Open-ended Procurement Policy for Wheat

6.31 Procurement under the MSP is open ended, i.e. whatever foodgrains are offered by farmers, within the stipulated period and conforming to the fair average quality (FAQ) norms, are to be procured. The Commission reiterates its earlier recommendation that the open-ended procurement policy for wheat may be reviewed. The buffer norms may be revised in order to encourage evolving production and consumption pattern and food security needs. In order to encourage diversification towards oilseed and pulses, farmers need to be assured of remunerative price for pulses and oilseeds through effective implementation of "Price Deficiency Payment Scheme" and "Private Procurement and Stockist Scheme".

Awareness Creation about Agricultural Exports

6.32 Demand for export of agricultural products is determined by several factors but with a very high emphasis on quality of produce. Quality can be improved at the farm level if suitable inputs are used, and best agronomic practices are adopted. Some overseas customers have started to demand traceability of the origin of produce. The importing countries are always concerned about the pesticides residues in agricultural products being supplied by other countries. Thus, it is also necessary to create awareness among growers about quality requirements of export markets. Therefore, the Commission recommends that various awareness activities may be organized to educate farmers about safe and permissible usage of pesticides so the possibility of rejection of export consignment is minimized at the farm level itself. By disseminating various Sanitary & Phyto-Sanitary (SPS) standards, it is possible to promote Good Agricultural Practices (GAP) amongst Indian farmers. The Commission further recommends that measures may be taken to adequately leverage block chain technology for traceability of agricultural commodities.

Trade Policy

6.33 In order to facilitate international trade and improve competitiveness, investments are necessary to upgrade and modernize port infrastructure with mechanized handling and loading. It will avoid delays, reduce operational costs and help in improving the export competitiveness. Thus, an emphasis needs to be laid on state of the art storage infrastructure. Moreover, to sustain the impressive agricultural export performance, Commission suggests that trade policies should also be stable, adopting dynamic tariff structure linked to global price movement, instead of arbitrary adhoc interventions like sudden prohibition of exports.

Promoting Farm Mechanisation

6.34 Wage rates have increased significantly in most of the States during 2019-20 to 2021-22, and resulted in substantial increase in cost of cultivation/production in these States as well as labour shortage during peak agricultural season. Therefore, mechanisation of farm operations on a large scale would help in reducing human requirement in farming of rabi crops, thereby reducing cost of cultivation/production and improving profitability of rabi farming in the country. As human labour accounted for more than one-third of total cost of production of mandated rabi crops compared to about one-fourth for machine labour during TE2020-21, it is imperative to encourage farmers to adopt farm mechanization to reduce cost of cultivation/production and improve their profitability.

6.35 Though mechanization is desirable for reducing cost and improving profitability, affordability of machines is an issue especially for small and marginal farmers. In order to make effective use of machines available with the CHCs and farmers, a multi-lingual mobile app based aggregator platform 'FARMS' App (Farm Machinery Solutions App) which connects the farmers with Custom Hiring Service Centres in their area has been developed and launched. This mobile app encompasses a fair and transparent rental process while focusing on quality, dependability and timely delivery of the services. So far more than 70,382 CHCs/Service Providers are registered on this App to rent out more than 1,64,011 agricultural machines benefiting more than 5.24 crore farmers. The Commission reiterates its earlier recommendation that farm mechanization should be promoted extensively among small and marginal farmers through CHCs and more awareness should be created about the new FARMS app. To ensure seamless access and to address disparity in farm mechanisation across the States, the Commission recommends increase in allocation for farm mechanisation.

Investment in Agricultural Research , Development and Extension

6.36 Investment plays an important role in achieving sustained agricultural growth and farm profitability. However, ratio of gross capital formation (GCF) in agriculture relative to GVA from agriculture excluding forestry and logging showed a declining trend during 2011-12 to 2015-16, when it declined to 15.9 percent and has been gradually rising since then, reaching 17 percent in 2020-21. The share of public investment in total investment in agriculture has increased gradually, though this has slowed down in last three years. The share of private sector, particularly the household sector, in total investment in agriculture has also declined. The private corporate sector spending is essential for improving economic efficiency and productivity in agriculture but the share of corporate sector in total private investment has declined to a low of 0.8 percent in 2020-21. On the other hand, despite improvement of India in the overall Global Innovation Index (GII) ranking in 2021 , the public spending on agricultural research and education to agricultural GVA in the country was very low at about 0.6 percent. Given the large untapped potential in agriculture and allied sectors, the large scale investment in agricultural R&D and infrastructure development play a crucial role to achieve new heights in growth and sustainability in agriculture. The Commission reiterates its earlier recommendations that public spending on agri R&D may be enhanced to modest level of at least 1 percent of agri GVA.

Storage and Warehousing Infrastructure

6.37 The total covered storage capacity available in the country as on 1st May 2022 for keeping the Central pool stock with FCI and with State agencies was 795.1 lakh tonnes against which total stock of 636.1 lakh tonnes was available. For strengthening the warehousing sector in the country, Government has launched various schemes for improving the quality of storage infrastructure including specialized warehouses across the country. The CWC is operating 424 warehouses with 101.5 lakh tonnes across India as on 1st April, 2022. Beside this, CWC creates storage capacity infrastructure on annual target basis and has created 6.1 lakh tonnes of capacity during last four years.

6.38 For creating modern storage capacity, the Government of India has approved an action plan for the construction of silos for foodgrains in PPP mode for a capacity of 10 million tonnes. However, the pace of construction of steel silos is very slow, and only 12.3 lakh tonne capacity has been created upto 31st May 2022. Therefore, Commission suggests that the construction of steel silos may be expedited. In order to increase procurement in NE region, development of storage capacity in the NE States also needs to be accelerated. In pulses & oilseed producing States, sufficient storage space needs to be created in the catchment of APMCs to avoid long distance transportation.

Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA)

6.39 An umbrella Scheme named 'Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) was launched by the Government of India in September 2018 to ensure remunerative prices to farmers. This Scheme comprises of three components (i) Price Support Scheme, (ii) Price Deficiency Payment Scheme and (iii) Pilot of Private Procurement & Stockist Scheme. Under the PSS, overall quantity of procurement by Central Government is restricted to 25 percent of actual production of the commodity for that particular season. If State/UT Government intends to procure beyond 25 percent but to a maximum of 40 percent of production through Central agencies, then the quantity will be utilised by the State Government for its PDS and other welfare schemes at its own cost.

6.40 After implementation of PM-AASHA, PSS has made a significant progress in terms of procurement of pulses and oilseeds by NAFED, but PDPS and PPSS have not made much progress. The Commission strongly recommends that PDPS and PPSS can be strengthened in addressing the procurement issues of oilseeds and pulses as physical procurement of these crops by public agencies is not feasible unlike wheat and paddy.

Awareness about Price Policy and FAQ Standards

6.41 Awareness about MSP and FAQ norms among farmers can make procurement operations more effective. Farmers in many States are not aware about the MSP and the mandated crops under procurement due to lack of publicity and inadequate extension services provided by State Governments. Knowledge about FAQ standards can reduce instances of rejection of farmers' produce at APMC mandis/procurement centres. The Commission therefore recommends that State Government should make sincere efforts to create awareness among farmers about the MSP, quality specification, details of procurement centres, procurement period, registration/ documents requirement and information about procurement agencies. The information should be disseminated in regional/vernacular languages through Krishi Mitra/Sakhi (volunteers), publicized through electronic and print media like TV, radio, newspapers and modern information & communication technology like mobile phone, WhatsApp & Facebook etc.

Publicising e-Marketing Platforms

6.42 The e-NAM is a pan-India electronic trading portal aimed at networking the existing mandis to a unified platform for trade in agricultural commodities across the country. The electronic trading platforms plays a very vital role in augmenting farmers' welfare by providing benefits such as access to better price discovery, more markets, real time information on prices in nearby markets, transparency in trade, quick online settlement and payment. The Commission recommends publicising of e-marketing platforms especially among marginal and small farmers for ensuring remunerative prices to their farm produce .

Promotion of Farmers Producer Organizations / Farmers Producers Companies

6.43 More than 86 percent of Indian farmers are small and marginal and thus, are unable to get good markets and value for their produce. Farmer Producer Organizations / and Farmer Producers Companies (FPOs/FPCs) are the engines of growth in rural areas by increasing bargaining power of farmers leading to better price realization of agricultural commodities.

6.44 The Commission proposes that commodity- specific Farmer Producer Organisations/ Companies may be promoted and encouraged to take up functions of aggregation, sorting/grading and direct marketing of produce to traders, large buyers and processors. Such organisations will create more competition in the market, improve bargaining power of farmers and ensure better prices to member producers. Promotion of FPOs would also help in overcoming farm gate losses and minimizing transportation & handling expenses through economies of scale and by facilitating farmers to trade from their collection centres.

Sample Size under Comprehensive Scheme

6.45 Presently, under 'Comprehensive Scheme (CS) for studying the Cost of Cultivation of Principal Crops in India', 8100 farmers are selected throughout the country for a block of three years. Given the diversity of agro climatic zones and edaphic factors across India, the Commission recommends that existing sample size of selected farmers at all-India level should be increased adequately so that reasonable and representative cost estimates are generated for all crops. In particular, the Commission suggests that the sample size of wheat in Chhattisgarh and West Bengal, gram in Jharkhand, Punjab and West Bengal, lentil in Punjab and Rajasthan, rapeseed & mustard in Chhattisgarh, and safflower in Karnataka may be increased. The sample size of safflower at all-India level is too small and can undermine the reliability and representativeness of cost of production projections, therefore, sample size must be increased for the crop. Since the Commission uses three-year actual cost estimates in forecasting the cost of production, the CS data should be collected every year in the mandeted crops in major producing States.

Inclusion of States under Comprehensive Scheme

6.46 The Commission has analysed State-wise area and production of the mandated rabi crops during TE2021-22 and observed that there are certain crops in States, which occupy reasonable share in the all-India area and production or area and production of a crop group in the State, but CS data for these States are not available. Inclusion of these States under Comprehensive Scheme (CS) would improve representation and reliability of cost projections at all-India level. Therefore, the Commission recommends inclusion of such States under the CS. The Commission also suggests that Comprehensive Scheme may be implemented in Jammu & Kashmir for wheat, lentil and rapeseed & mustard, and Tripura for lentil and rapeseed & mustard, as these are important crops of rabi season in the State/UT. In Uttarakhand, wheat, barley, lentil, rapeseed & mustard occupy reasonable share in the all-India area and production or area and production of a crop group in the State and should be covered under Comprehensive Scheme.

Minimum Support Price (MSP) Recommendations

The Commission recommends the following MSP of different Crops for RMS 2023-24.

(₹/qtl)

Crop	Projected A_2+FL Cost for RMS 2023-24	MSP for RMS 2022-23	MSP Recommended for RMS 2023-24	Gross Margin over A_2+FL w.r.t. Recommended MSP
Wheat	1065	2015	2125 (5.5)	99.5
Barley	1082	1635	1735 (6.1)	60.4
Gram	3206	5230	5335 (2.0)	66.4
Lentil (Masur)	3239	5500	6000 (9.1)	85.2
Rapeseed & Mustard	2670	5050	5450 (7.9)	104.1
Safflower	3765	5441	5650 (3.8)	50.0

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

The Commission believes that these non-price and price policy recommendations will encourage farmers to adopt new technologies, boost crop production patterns to suit changing consumer demand and preferences and create market opportunities, and make *Indian Krishi and Kisan Aatmanirbhar.*

(Vijay Paul Sharma)
Chairman

(Naveen Prakash Singh)
Member (Official)

(Anupam Mitra)
Member Secretary

★★★★★

Annex Tables

Annex Tables

Annex Table 1.1: All India Estimates of Area under Principal Crops

(Million hectares)

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22**
Rice	Kharif	37.62	38.05	40.14	38.91	39.45	39.83	39.66	39.85	39.35	39.96	39.01	40.36	41.05
	Rabi	4.30	4.81	3.87	3.84	4.69	4.28	3.84	4.15	4.42	4.19	4.65	5.41	5.23
	Total	41.92	42.86	44.01	42.75	44.14	44.11	43.50	43.99	43.77	44.16	43.66	45.77	46.28
Wheat	Rabi	28.46	29.07	29.86	30.00	30.47	31.47	30.42	30.79	29.65	29.32	31.36	31.13	30.54
Jowar	Kharif	3.24	3.07	2.62	2.43	2.28	2.27	2.14	2.06	2.06	1.75	1.76	1.64	1.46
	Rabi	4.55	4.31	3.63	3.79	3.52	3.89	3.94	3.57	2.96	2.34	3.07	2.74	2.52
	Total	7.79	7.38	6.25	6.21	5.79	6.16	6.08	5.62	5.02	4.09	4.82	4.38	3.99
Bajra	Kharif	8.90	9.61	8.78	7.30	7.81	7.32	7.13	7.46	7.48	7.11	7.54	7.65	6.67
Maize	Kharif	7.06	7.28	7.38	7.21	7.31	7.56	7.18	7.84	7.43	7.33	7.55	7.76	7.99
	Rabi	1.20	1.27	1.40	1.46	1.76	1.62	1.63	1.79	1.95	1.70	2.02	2.14	1.93
	Total	8.26	8.55	8.78	8.67	9.07	9.19	8.81	9.63	9.38	9.03	9.57	9.89	9.91
Ragi	Kharif	1.27	1.29	1.18	1.13	1.19	1.21	1.14	1.02	1.19	0.89	1.00	1.16	1.17
Barley	Rabi	0.62	0.71	0.64	0.70	0.67	0.71	0.59	0.66	0.66	0.58	0.59	0.59	0.54
Nutri/Coarse Cereals	Kharif	21.31	22.05	20.75	18.82	19.27	18.95	18.23	18.99	18.71	17.53	18.31	18.65	17.69
	Rabi	6.37	6.29	5.67	5.94	5.95	6.22	6.15	6.01	5.57	4.61	5.67	5.46	4.99
	Total	27.68	28.34	26.42	24.76	25.22	25.17	24.39	25.01	24.29	22.15	23.99	24.12	22.68
Cereals	Kharif	58.92	60.10	60.89	57.73	58.72	58.78	57.89	58.84	58.06	57.50	57.33	59.01	58.74
	Rabi	39.13	40.17	39.40	39.78	41.11	41.97	40.42	40.95	39.65	38.12	41.68	42.00	40.76
	Total	98.05	100.27	100.29	97.52	99.83	100.75	98.31	99.79	97.71	95.62	99.01	101.01	99.50
Tur (Arhar)	Kharif	3.47	4.37	4.01	3.89	3.90	3.85	3.96	5.34	4.44	4.55	4.53	4.72	4.91
Gram	Rabi	8.17	9.19	8.30	8.52	9.93	8.25	8.40	9.63	10.56	9.55	9.70	10.00	11.20
Urad	Kharif	2.23	2.51	2.36	2.44	2.35	2.49	2.72	3.48	4.35	4.73	3.70	3.21	3.63
	Rabi	0.72	0.74	0.86	0.69	0.72	0.76	0.90	1.00	0.93	0.88	0.83	0.93	1.01
	Total	2.96	3.25	3.22	3.13	3.06	3.25	3.62	4.48	5.28	5.60	4.53	4.14	4.64
Moong	Kharif	2.46	2.85	2.61	1.97	2.34	2.03	2.76	3.37	3.26	3.83	3.52	3.82	3.83
	Rabi	0.61	0.66	0.78	0.74	1.04	0.99	1.07	0.96	0.98	0.92	1.06	1.31	1.75
	Total	3.07	3.51	3.39	2.72	3.38	3.02	3.83	4.33	4.24	4.75	4.58	5.13	5.59
Lentil (Masur)	Rabi	1.48	1.60	1.56	1.42	1.34	1.47	1.28	1.46	1.55	1.36	1.30	1.47	1.43
Pulses	**Kharif**	**10.58**	**12.32**	**11.19**	**9.95**	**10.33**	**9.99**	**11.31**	**14.36**	**13.93**	**14.83**	**13.54**	**13.43**	**14.10**
	Rabi	**12.68**	**14.06**	**13.25**	**13.28**	**14.88**	**13.56**	**13.60**	**15.08**	**15.88**	**14.33**	**14.45**	**15.35**	**17.14**
	Total	**23.26**	**26.38**	**24.44**	**23.23**	**25.21**	**23.55**	**24.91**	**29.45**	**29.81**	**29.16**	**27.99**	**28.78**	**31.24**
Foodgrains	**Kharif**	**69.51**	**72.42**	**72.08**	**67.69**	**69.05**	**68.77**	**69.21**	**73.20**	**72.00**	**72.33**	**70.86**	**72.44**	**72.84**
	Rabi	**51.81**	**54.23**	**52.65**	**53.06**	**55.99**	**55.53**	**54.01**	**56.03**	**55.53**	**52.45**	**56.13**	**57.35**	**57.90**
	Total	**121.31**	**126.65**	**124.73**	**120.75**	**125.04**	**124.30**	**123.22**	**129.23**	**127.52**	**124.78**	**126.99**	**129.80**	**130.75**
Groundnut	Kharif	4.62	4.98	4.32	3.93	4.64	4.01	3.84	4.58	4.14	4.13	4.16	5.17	4.89
	Rabi	0.86	0.88	0.95	0.79	0.86	0.76	0.76	0.76	0.75	0.60	0.66	0.84	0.85
	Total	5.48	5.86	5.26	4.72	5.51	4.77	4.60	5.34	4.89	4.73	4.83	6.01	5.74
Sesamum	Kharif	1.94	2.08	1.90	1.71	1.68	1.75	1.95	1.67	1.58	1.42	1.62	1.72	1.58
Nigerseed	Kharif	0.38	0.37	0.36	0.31	0.30	0.23	0.25	0.26	0.22	0.16	0.14	0.13	0.11
Soybean	Kharif	9.73	9.60	10.11	10.84	11.72	10.91	11.60	11.18	10.33	11.13	12.19	12.92	12.27
Sunflower	Kharif	0.57	0.32	0.26	0.27	0.25	0.21	0.16	0.17	0.14	0.12	0.13	0.10	0.14
	Rabi	0.91	0.61	0.47	0.56	0.42	0.38	0.33	0.21	0.15	0.14	0.10	0.13	0.13
	Total	1.48	0.93	0.73	0.83	0.67	0.59	0.49	0.38	0.28	0.26	0.23	0.23	0.27
Rapeseed & Mustard	Rabi	5.59	6.90	5.89	6.36	6.65	5.80	5.75	6.07	5.98	6.12	6.86	6.70	7.72
Safflower	Rabi	0.29	0.24	0.25	0.18	0.18	0.17	0.13	0.14	0.08	0.05	0.05	0.06	0.06
Total Nine Oilseeds	**Kharif**	**17.97**	**18.23**	**18.42**	**18.30**	**19.65**	**18.20**	**18.86**	**18.67**	**17.23**	**17.71**	**19.28**	**20.93**	**19.80**

continued

(Million hectares)

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22**
	Rabi	**7.99**	**9.00**	**7.89**	**8.19**	**8.40**	**7.40**	**7.22**	**7.51**	**7.28**	**7.09**	**7.86**	**7.90**	**8.96**
	Total	**25.96**	**27.22**	**26.31**	**26.48**	**28.05**	**25.60**	**26.09**	**26.18**	**24.51**	**24.79**	**27.14**	**28.83**	**28.76**
Sugarcane		4.17	4.88	5.04	5.00	4.99	5.07	4.93	4.43	4.74	5.06	4.60	4.85	5.10
Cotton		10.13	11.24	12.18	11.98	11.96	12.82	12.29	10.83	12.59	12.61	13.48	13.29	12.05
Jute		0.81	0.77	0.81	0.78	0.76	0.75	0.73	0.71	0.69	0.67	0.63	0.62	0.64
Mesta		0.09	0.10	0.10	0.09	0.08	0.06	0.05	0.06	0.06	0.04	0.04	0.04	0.04
Jute & Mesta		0.91	0.87	0.90	0.86	0.84	0.81	0.78	0.76	0.74	0.70	0.67	0.66	0.69

*Note: ** Third Advance Estimates*

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

Annex Tables

Annex Tables

Annex Table 1.2: All India Estimates of Production of Principal Crops

(Million tonnes)

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 **
Rice	Kharif	75.92	80.65	92.78	92.36	91.50	91.39	91.41	96.30	97.14	102.04	102.28	105.21	111.04
	Rabi	13.18	15.33	12.52	12.87	15.15	14.09	13.00	13.40	15.62	14.44	16.59	19.16	18.62
	Total	89.09	95.98	105.30	105.23	106.65	105.48	104.41	109.70	112.76	116.48	118.87	124.37	129.66
Wheat	Rabi	80.80	86.87	94.88	93.51	95.85	86.53	92.29	98.51	99.87	103.60	107.86	109.59	106.41
Jowar	Kharif	2.76	3.44	3.29	2.84	2.39	2.30	1.82	1.96	2.27	1.74	1.70	1.99	1.57
	Rabi	3.93	3.56	2.69	2.44	3.15	3.15	2.42	2.60	2.53	1.74	3.08	2.83	2.94
	Total	6.70	7.00	5.98	5.28	5.54	5.45	4.24	4.57	4.80	3.48	4.77	4.81	4.51
Bajra	Kharif	6.51	10.37	10.28	8.74	9.25	9.18	8.07	9.73	9.21	8.66	10.36	10.86	9.42
Maize	Kharif	12.29	16.64	16.49	16.20	17.15	17.01	16.05	18.92	20.12	19.41	19.43	21.56	22.65
	Rabi	4.43	5.09	5.27	6.05	7.11	7.16	6.51	6.98	8.63	8.30	9.34	10.09	10.53
	Total	16.72	21.73	21.76	22.26	24.26	24.17	22.57	25.90	28.75	27.72	28.77	31.65	33.18
Ragi	Kharif	1.89	2.19	1.93	1.57	1.98	2.06	1.82	1.39	1.99	1.24	1.76	2.00	1.64
Barley	Rabi	1.35	1.66	1.62	1.75	1.83	1.61	1.44	1.75	1.78	1.63	1.72	1.66	1.59
Nutri/Coarse Cereals	Kharif	23.83	33.08	32.44	29.79	31.20	30.94	28.15	32.44	34.03	31.38	33.61	36.75	35.64
	Rabi	9.72	10.32	9.58	10.24	12.09	11.92	10.37	11.33	12.94	11.67	14.13	14.57	15.06
	Total	33.55	43.40	42.01	40.04	43.30	42.86	38.52	43.77	46.97	43.06	47.75	51.32	50.70
Cereals	Kharif	99.75	113.73	125.22	122.15	122.70	122.34	119.56	128.74	131.16	133.42	135.89	141.96	146.67
	Rabi	103.70	112.52	116.98	116.63	123.09	112.53	115.66	123.24	128.44	129.71	138.59	143.32	140.09
	Total	203.45	226.25	242.20	238.78	245.79	234.87	235.22	251.98	259.60	263.14	274.48	285.28	286.77
Tur	Kharif	2.46	2.86	2.65	3.02	3.17	2.81	2.56	4.87	4.29	3.32	3.89	4.32	4.35
Gram	Rabi	7.48	8.22	7.70	8.83	9.53	7.33	7.06	9.38	11.38	9.94	11.08	11.91	13.98
Urad	Kharif	0.81	1.40	1.23	1.50	1.15	1.28	1.25	2.18	2.75	2.36	1.33	1.51	1.80
	Rabi	0.42	0.36	0.53	0.47	0.55	0.68	0.70	0.66	0.74	0.70	0.75	0.72	0.96
	Total	1.24	1.76	1.77	1.97	1.70	1.96	1.95	2.83	3.49	3.06	2.08	2.23	2.76
Moong	Kharif	0.44	1.53	1.24	0.79	0.96	0.87	1.00	1.64	1.43	1.78	1.83	2.00	1.48
	Rabi	0.25	0.27	0.40	0.40	0.65	0.64	0.59	0.52	0.59	0.67	0.68	1.09	1.37
	Total	0.69	1.80	1.63	1.19	1.61	1.50	1.59	2.17	2.02	2.46	2.51	3.09	2.85
Lentil (Masur)	Rabi	1.03	0.94	1.06	1.13	1.02	1.04	0.98	1.22	1.62	1.23	1.10	1.49	1.44
Total Pulses	**Kharif**	**4.20**	**7.12**	**6.06**	**5.92**	**6.00**	**5.73**	**5.53**	**9.58**	**9.31**	**8.09**	**7.92**	**8.62**	**8.25**
	Rabi	**10.46**	**11.12**	**11.03**	**12.43**	**13.26**	**11.42**	**10.79**	**13.55**	**16.11**	**13.98**	**15.10**	**16.84**	**19.50**
	Total	**14.66**	**18.24**	**17.09**	**18.34**	**19.26**	**17.15**	**16.32**	**23.13**	**25.42**	**22.08**	**23.03**	**25.46**	**27.75**
Total Foodgrains	**Kharif**	**103.95**	**120.85**	**131.27**	**128.07**	**128.69**	**128.07**	**125.09**	**138.33**	**140.47**	**141.52**	**143.81**	**150.58**	**154.93**
	Rabi	**114.15**	**123.64**	**128.01**	**129.05**	**136.35**	**123.96**	**126.45**	**136.78**	**144.55**	**143.70**	**153.69**	**160.17**	**159.59**
	Total	**218.11**	**244.49**	**259.29**	**257.12**	**265.05**	**252.02**	**251.54**	**275.11**	**285.01**	**285.21**	**297.50**	**310.74**	**314.51**

continued

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 **
Groundnut	Kharif	3.85	6.64	5.13	3.19	8.06	5.93	5.37	6.05	7.60	5.39	8.39	8.53	8.37
	Rabi	1.58	1.62	1.84	1.51	1.66	1.47	1.37	1.41	1.66	1.34	1.56	1.72	1.72
	Total	5.43	8.26	6.96	4.70	9.71	7.40	6.73	7.46	9.25	6.73	9.95	10.24	10.09
Sesamum	Kharif	0.59	0.89	0.81	0.69	0.71	0.83	0.85	0.75	0.76	0.69	0.66	0.82	0.86
Nigerseed	Kharif	0.10	0.11	0.10	0.10	0.10	0.08	0.07	0.09	0.07	0.05	0.04	0.04	0.04
Soybean	Kharif	9.96	12.74	12.21	14.67	11.86	10.37	8.57	13.16	10.93	13.27	11.23	12.61	13.83
Sunflower	Kharif	0.21	0.19	0.15	0.19	0.17	0.14	0.08	0.11	0.08	0.09	0.09	0.08	0.11
	Rabi	0.64	0.46	0.37	0.36	0.34	0.29	0.21	0.14	0.14	0.13	0.12	0.15	0.14
	Total	0.85	0.65	0.52	0.54	0.50	0.43	0.30	0.25	0.22	0.22	0.21	0.23	0.25
Rapeseed & Mustard	Rabi	6.61	8.18	6.60	8.03	7.88	6.28	6.80	7.92	8.43	9.26	9.12	10.21	11.75
Safflower	Rabi	0.18	0.15	0.15	0.11	0.11	0.09	0.05	0.09	0.06	0.02	0.04	0.04	0.04
Total Nine Oilseeds	**Kharif**	**15.73**	**21.92**	**20.69**	**20.79**	**22.62**	**19.22**	**16.70**	**21.53**	**21.01**	**20.68**	**22.25**	**23.72**	**24.71**
	Rabi	**9.15**	**10.56**	**9.11**	**10.15**	**10.13**	**8.29**	**8.55**	**9.75**	**10.45**	**10.85**	**10.97**	**12.22**	**13.79**
	Total	**24.88**	**32.48**	**29.80**	**30.94**	**32.75**	**27.51**	**25.25**	**31.28**	**31.46**	**31.52**	**33.22**	**35.95**	**38.50**
Sugarcane		292.30	342.38	361.04	341.20	352.14	362.33	348.45	306.07	379.90	405.42	370.50	405.40	430.50
Cotton #		24.02	33.00	35.20	34.22	35.90	34.81	30.01	32.58	32.81	28.04	36.07	35.25	31.54
Jute # #		11.23	10.01	10.74	10.34	11.08	10.62	9.94	10.43	9.59	9.50	9.45	8.95	9.82
Mesta # #		0.59	0.61	0.66	0.59	0.61	0.51	0.58	0.53	0.44	0.32	0.43	0.40	0.41
Jute & Mesta # #		11.82	10.62	11.40	10.93	11.69	11.13	10.52	10.96	10.03	9.82	9.88	9.35	10.22

*Note: # million bales of 170 kgs. each, # # million bales of 180 kgs. each, ** Third Advance Estimates*

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

Annex Tables

Annex Table 1.3: All India Estimates of Yield of Principal Crops

(kg per hectare)

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 **
Rice	Kharif	2018	2120	2311	2373	2319	2295	2305	2417	2469	2553	2622	2607	2705
	Rabi	3064	3184	3238	3353	3232	3291	3382	3230	3531	3445	3569	3541	3562
	Total	2125	2239	2393	2461	2416	2391	2400	2494	2576	2638	2722	2717	2802
Wheat	Rabi	2839	2989	3177	3117	3145	2750	3034	3200	3368	3533	3440	3521	3484
Jowar	Kharif	853	1119	1257	1171	1050	1014	850	954	1104	989	967	1210	1072
	Rabi	865	827	741	644	896	808	615	730	853	744	1002	1033	1165
	Total	860	949	957	850	957	884	697	812	956	849	989	1099	1131
Bajra	Kharif	731	1079	1171	1198	1184	1255	1132	1305	1231	1219	1374	1420	1414
Maize	Kharif	1740	2285	2234	2246	2346	2249	2236	2413	2706	2648	2572	2779	2835
	Rabi	3694	4003	3765	4152	4050	4414	4006	3896	4436	4893	4631	4723	5469
	Total	2024	2540	2478	2566	2676	2632	2563	2689	3065	3070	3006	3199	3347
Ragi	Kharif	1489	1705	1641	1392	1661	1706	1601	1363	1662	1390	1747	1724	1397
Barley	Rabi	2172	2357	2516	2518	2718	2280	2439	2663	2695	2837	2920	2796	2930
Nutri/Coarse Cereals	Kharif	1119	1500	1563	1583	1619	1633	1544	1708	1818	1790	1836	1970	2014
	Rabi	1525	1641	1689	1724	2034	1915	1686	1885	2323	2532	2491	2667	3017
	Total	1212	1531	1590	1617	1717	1703	1579	1750	1934	1944	1991	2128	2235
Cereals	Kharif	1693	1892	2056	2116	2089	2081	2065	2188	2259	2320	2370	2406	2497
	Rabi	2650	2801	2969	2931	2995	2681	2862	3010	3239	3403	3325	3412	3437
	Total	2075	2256	2415	2449	2462	2331	2393	2525	2657	2752	2772	2824	2882
Tur (Arhar)	Kharif	711	655	662	776	813	729	646	913	967	729	859	914	885
Gram	Rabi	915	895	928	1036	960	889	840	974	1078	1041	1142	1192	1249
Urad	Kharif	363	557	523	615	490	516	459	626	632	500	359	469	496
	Rabi	586	489	621	682	768	891	773	656	798	796	904	778	953
	Total	418	542	549	630	555	604	537	632	662	546	459	538	595
Moong	Kharif	180	538	475	400	409	428	363	488	440	466	519	522	386
	Rabi	409	404	508	538	620	640	554	546	600	727	645	833	780
	Total	226	513	483	438	474	498	416	500	477	516	548	601	510
Lentil (Masur)	Rabi	697	591	678	797	759	705	765	838	1047	901	847	1017	1007
Total Pulses	**Kharif**	**397**	**578**	**541**	**594**	**581**	**574**	**489**	**667**	**668**	**546**	**585**	**642**	**585**
	Rabi	**825**	**791**	**832**	**936**	**891**	**842**	**794**	**898**	**1015**	**976**	**1045**	**1097**	**1138**
	Total	**630**	**691**	**699**	**790**	**764**	**728**	**655**	**786**	**853**	**757**	**823**	**885**	**888**
Total Foodgrains	**Kharif**	**1496**	**1669**	**1821**	**1892**	**1864**	**1862**	**1808**	**1890**	**1951**	**1957**	**2029**	**2079**	**2127**
	Rabi	**2203**	**2280**	**2431**	**2432**	**2435**	**2232**	**2341**	**2441**	**2603**	**2740**	**2738**	**2793**	**2756**
	Total	**1798**	**1930**	**2079**	**2129**	**2120**	**2028**	**2041**	**2129**	**2235**	**2286**	**2343**	**2394**	**2406**
Groundnut	Kharif	835	1335	1188	811	1736	1478	1399	1321	1834	1304	2016	1649	1711
	Rabi	1830	1846	1938	1908	1919	1948	1801	1861	2222	2238	2352	2034	2024
	Total	991	1411	1323	995	1764	1552	1465	1398	1893	1422	2063	1703	1758
Sesamum	Kharif	303	429	426	402	426	474	436	448	478	485	405	474	542
Nigerseed	Kharif	266	290	269	325	328	328	295	332	321	290	303	317	339
Soybean	Kharif	1024	1327	1208	1353	1012	951	738	1177	1058	1192	921	976	1127
Sunflower	Kharif	378	608	566	682	670	697	538	638	627	766	731	785	801
	Rabi	700	748	783	642	798	757	641	677	924	874	1174	1187	1129
	Total	576	701	706	655	751	736	608	660	782	826	931	1011	956
Rapeseed & Mustard	Rabi	1183	1185	1121	1262	1185	1083	1183	1304	1410	1511	1331	1524	1522
Safflower	Rabi	621	617	580	591	638	515	416	651	673	536	843	640	694
Total Nine Oilseeds	**Kharif**	**875**	**1203**	**1123**	**1136**	**1151**	**1056**	**885**	**1153**	**1219**	**1168**	**1154**	**1133**	**1248**

continued

(kg per hectare)

Crop	Season	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 **
	Rabi	**1146**	**1174**	**1155**	**1240**	**1205**	**1120**	**1184**	**1298**	**1436**	**1531**	**1397**	**1547**	**1540**
	Total	**958**	**1193**	**1133**	**1168**	**1168**	**1075**	**968**	**1195**	**1284**	**1271**	**1224**	**1247**	**1339**
Sugarcane		70020	70091	71668	68254	70522	71512	70720	69156	80198	80105	80497	83566	84443
Cotton		403	499	491	486	510	462	415	512	443	378	455	451	445
Jute		2492	2329	2389	2396	2639	2549	2457	2660	2517	2569	2706	2591	2749
Mesta		1121	1115	1248	1237	1338	1525	1945	1664	1420	1471	1728	1782	1714
Jute & Mesta		2349	2192	2268	2281	2512	2473	2421	2585	2435	2508	2641	2542	2685

*Note: ** Second Advance Estimates*

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

Annex Tables

Annex Tables

Annex Table 1.4: Share of Rabi Crops (under MSP) in Major Producing States in Total Production, TE2021-22

Wheat		Barley		Gram		Lentil		Rapeseed and Mustard		Safflower	
State	Share (%)	State	Share (%)	State	Share (%)	State	Share (%)	State	Share (%)	State	Share (%)
UP	32.0	RJ	57.1	MP	24.8	MP	36.4	RJ	45.9	KA	56.2
MP	18.6	UP	30.2	MH	20.9	UP	35.6	MP	12.7	MH	32.3
PB	15.2	MP	2.9	RJ	20.0	WB	10.2	HR	12.5	TG	7.6
HR	10.8	HR	2.2	GJ	11.0	BR	8.3	UP	9.9	AP	1.2
RJ	9.8	HP	2.0	UP	6.5	JH	4.3	WB	7.0	Oth*	2.6
BR	5.4	UK	1.7	KA	4.9	RJ	1.9	GJ	4.0		
GJ	3.1	PB	1.4	AP	4.4	AS	1.3	JH	2.9		
MH	1.9	MH	1.1	JH	2.5	Oth*	1.9	AS	1.8		
Oth*	3.3	Oth*	1.3	CG	1.8			Oth*	3.4		
				TG	1.7						
				Oth*	1.4						

Note: 1. Data used in calculation for TE2021-22 for the year 2021-22 is of Third Advance Estimates

*2. * States having less than 1 percent share in total production has been clubbed as others*

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

Annexure Table 2.1 : Annual Average Wholesale Price Index (Base 2011-12) of major Agricultural Commodities

Commodity Name	2017	2018	2019	2020	2021
Food Articles	142.8	142.3	152.9	160.4	163.8
Food Grains (Cereals+Pulses)	145.0	143.5	157.2	160.6	161.2
CEREALS	143.6	147.8	160.3	160.6	158.2
Paddy	148.0	154.1	159.3	163.4	162.1
Wheat	140.5	145.6	156.6	157.0	155.7
Jowar	127.5	122.9	156.0	158.6	143.6
Bajra	144.8	138.3	189.5	173.0	157.4
Maize	129.2	123.3	172.6	151.3	145.4
Barley	145.3	144.6	168.1	162.4	160.0
Ragi	242.4	212.6	223.3	224.6	230.2
PULSES	151.2	124.3	143.5	160.8	174.6
Gram	182.5	133.2	145.8	149.4	165.7
Arhar	121.1	114.4	144.7	160.9	176.3
Moong	115.0	116.1	135.5	167.0	166.6
Masur	143.9	121.4	135.3	155.3	183.1
Urad	139.6	111.8	135.5	182.5	188.1
OIL SEEDS	128.0	138.3	149.4	155.8	204.3
Groundnut Seed	127.6	115.6	137.8	150.0	163.1
Rape & Mustard Seed	135.4	140.8	143.1	157.2	200.9
Cotton Seed	148.0	139.1	148.2	155.7	170.9
Gingelly Seed (Sesamum)	117.7	138.6	171.3	185.6	179.9
Linseed	160.2	145.7	157.3	168.7	202.2
Safflower (Kardi Seed)	129.9	140.6	178.5	166.4	184.2
Sunflower	101.6	107.2	121.7	119.9	168.1
Soyabean	124.4	148.1	160.6	167.2	260.1

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

Annex Tables

Annexure Table 2.2 : List of Decentralized Procurement (DCP) States for Rice and Wheat

State	DCP adopted for	
	Rice	Wheat
Andaman & Nicobar Islands	√	x
Andhra Pradesh	√	x
Bihar	√	√
Chhattisgarh	√	√
Gujarat	√	√
Karnataka	√	x
Kerala	√	x
Madhya Pradesh	√	√
Maharashtra	√	√
Odisha	√	x
Punjab	x	√
Tamil Nadu	√	x
Telangana	√	x
Tripura	√	x
Uttarakhand	√	√
West Bengal	√	√

Source: Food Corporation of India

Annexure Table 2.3 : Share of major DCP and Non-DCP States in Total Procurement of Wheat

SL No	STATES/ Uts	RMS 2018-19	RMS 2019-20	RMS 2020-21	RMS 2021-22	RMS 2022-23
DCP States						
1	Gujarat	0.37	0.05	0.77	1.71	-
2	Punjab	126.92	129.12	127.14	132.22	96.5
3	Rajasthan	0	0	0	0	-
4	Madhya Pradesh	73.13	67.25	129.42	128.16	46.03
5	Uttrakhand	1.1	0.42	0.38	1.44	0.02
6	West Bengal	0	0	0	0	-
7	Bihar	0.18	0.03	0.05	4.56	0.04
8	Maharashtra	0	0	0	0.01	-
DCP Total		**201.7**	**196.87**	**257.76**	**268.1**	**142.59**
(% share of Total)		**56.35**	**57.68**	**66.11**	**61.85**	**75.89**
Non DCP States						
1	Bihar	0	0	0	0	-
2	Chandigarh	0.14	0.13	0.11	0.17	0
3	Delhi	0	0	0	0.06	-
4	Himachal Pradesh	0.01	0.01	0.03	0.13	0.03
5	Haryana	87.84	93.2	74	84.93	41.81
6	Punjab	0	0	0	0	-
7	Rajasthan	15.32	14.11	22.25	23.4	0.1
8	Uttar Pradesh	52.94	37	35.77	56.41	3.35
9	Jammu & Kashmir	0	0	0	0.24	-
10	Maharashtra	0	0	0	0	-
Non-DCP Total		**156.25**	**144.45**	**132.16**	**165.34**	**45.29**
(% share of Total)		**43.65**	**42.32**	**33.89**	**38.15**	**24.11**
Grand total		**357.95**	**341.32**	**389.92**	**433.44**	**187.88**

Note: As on 30.06.2022

Source: Food Corporation of India

Annex Tables

Annexure Table 2.4 : Number of Pulses farmers Benefitted during Last Three Rabi Marketing Seasons

Crop	State	Number of Farmers Benefitted		
		RMS 2020-21	RMS 2021-22	RMS 2022-23*
Gram	Andhra Pradesh	71769	6455	41399
	Gujarat	126898	158705	283054
	Haryana	6119	0	687
	Karnataka	123254	18265	60470
	Madhya Pradesh	262795	69609	245639
	Maharashtra	226759	130760	366824
	Rajasthan	238259	8593	129957
	Telangana	30903	10307	39315
	Uttar Pradesh	21758	0	12391
	Total	**1108514**	**402694**	**1179736**
Masoor	Madhya Pradesh	1898	39	0
	Uttar Pradesh	0	0	0
	Total	**1898**	**39**	**0**
Moong	Andhra Pradesh	0	0	479
	Gujarat	0	0	0
	Odisha	6196	240	1670
	Tamil nadu	79	3703	2376
	Total	**6275**	**3943**	**4525**
Urad	Andhra Pradesh	0	0	0
	Odisha	0	0	1
	Tamil nadu	0	0	0
	Telangana	0	0	160
	Total	**0**	**0**	**161**
Grand Total		**1116687**	**406676**	**1184422**

*Note: * As on 30.06.2022*

Source: National Agricultural Cooperative Marketing Federation of India

Annexure Table 2.5 : Number of Oilseeds farmers Benefitted during Last Three Rabi Marketing Seasons

Crop	State	Number of Farmers Benefitted		
		RMS 2020-21	RMS 2021-22	RMS 2022-23*
Mustard	Gujarat	15826	0	0
	Haryana	120700	0	0
	Madhya Pradesh	42603	4	0
	Rajasthan	139151	0	0
	Uttar Pradesh	197	0	0
	Total	**318477**	**4**	**0**
Sunflower	Haryana	1466	2359	1136
	Odisha	291	354	56
	Telangana	1344	0	0
	Total	**3101**	**2713**	**1192**
Groundnut	Odisha	997	1297	247
	Total	**997**	**1297**	**247**
Grand Total		**322575**	**4014**	**1439**

*Note: * As on 30.06.2022*

Source: National Agricultural Cooperative Marketing Federation of India

Annex Tables

Annex Table 3.1 : Seed Replacement Rate of Major Rabi Crops (2021-22)

State	Wheat	Barley	Gram	Lentil	R&M	Safflower
Chhattisgarh	50.9	-	29.0	33.1	55.8	36.7
Gujarat	44.0	-	46.0	-	100.0	-
Himachal Pradesh	29.2	18.2	96.0	79.0	41.2	-
Jammu Division (J&K - UT)	42.8	-	2.3	-	-	-
Jharkhand	27.9	-	13.2	27.5	25.3	-
Karnataka	33.0	-	33.1	-	-	30.6
Maharastra	19.0	-	38.0	-	-	38.0
Odisha	-	-	13.8	-	6.9	-
Punjab	34.1	55.2	35.5	38.3	53.5	-
Rajasthan	37.5	33.1	14.6	-	81.5	-
Telangana	-	-	85.2	-	-	100.0
Uttar Pradesh	47.4	28.9	32.5	24.6	78.8	-
Uttarakhand	40.5	-	8.8	27.1	80.4	-
West Bengal	56.2	-	36.1	36.1	51.4	-

Source: State Replies

Annex Table 3.2: State-Wise details of WHS Created/Rejuvenated, Additional Area Brought under Irrig ation, Farmers Benefitted, Area Brought under Plantation, Area of Culturable Wasteland Treated and Employment Generated under WDC -PMKSY

Sr. No.	State / UT	2015-16 to 2021-22			2018-19 to 2021-22: Indicators given by NITI Aayog		
		WHS Created / Rejuvenated (in Nos.)	Additional Area Brought under Irrigation (Ha)	Farmers Benefitted (in Nos.)	Area Brought under Plantation (Horti. Afforestation) in Ha	Area of Culturable Wasteland Treated in Completed Project (in Ha)	Employment Generated (No. of Mandays)
1	Andhra Pradesh	183462	281151	266257	655	9835	932934
2	Arunachal Pradesh	560	4817	17133	5296	65	720575
3	Assam	7984	124701	290915	2400	11105	3149297
4	Bihar	6824	25809	78852	160	3659	396070
5	Chhattisgarh	8705	25325	51487	977	1041	2274110
6	Gujarat	41651	25511	77262	10085	6065	111582
7	Haryana	3800	44793	35463	435	10	61246
8	Himachal Pradesh	8294	6547	50602	614	0	753658
9	Jharkhand	4506	4853	113326	4	26954	626415
10	Karnataka	25348	70609	175074	58159	16880	6341454
11	Kerala	29629	35926	191226	2510	426	559260
12	Madhya Pradesh	33828	150222	170679	26	6736	8201286
13	Maharashtra	13547	111497	172090	1832	11216	327696
14	Manipur	6836	2076	125994	1841	11681	447495
15	Meghalaya	1522	3304	14355	3099	2	270760
16	Mizoram	9092	50882	56363	3035	1759	18463
17	Nagaland	2534	4460	14200	43179	4666	725805
18	Odisha	23201	52916	82608	529	8351	1906585
19	Punjab	559	6897	6047	0	4468	130381
20	Rajasthan	120307	95712	342221	8098	134970	1988656
21	Sikkim	125	33	785	123	0	13524
22	Tamil Nadu	40221	103185	154824	12959	30744	3397556
23	Telangana	21057	61880	81065	0	4486	108834
24	Tripura	3028	3661	13472	1289	2541	774137
25	Uttar Pradesh	20307	105915	306981	941	25732	1085829
26	Uttarakhand	15010	1867	35059	74	0	264370
27	West Bengal	14820	17868	80891	2982	10854	2361517
28	UT of Jammu & Kashmir	9684	31679	186554	1376	2211	909008
29	UT of Ladakh	39	193	1822	12	16	7920
	Total	**656480**	**1454287**	**3193607**	**162688**	**336475**	**38866423**

Source: Ministry of Rural Development, Government of India

Annex Tables

Annex Table 3.3: Crop Insurance under PMFBY During Rabi Season 2021

State/UT	Area Insured (000 ' hectares)	Premium (In Lakh)				Sum Insured (in Lakh)	Nos of Farmers Benefitted	Type of Farmers (%)		
		Farmers	State	Centre	Gross			Marginal	Small	Others
Andaman & Nicobar Islands	0	0	3	2	5	38	169	10.0	90.0	0.0
Assam	385	101	4680	5203	9984	270702	594007	33.9	65.0	1.1
Chhattisgarh	349	1832	7829	7829	17490	122108	222860	21.2	53.8	25.0
Goa	0	0	0	0	0	1	12	0.0	100.0	0.0
Haryana	825	7604	13635	13627	34866	506908	512804	22.1	56.7	21.3
Himachal Pradesh	31	139	543	543	1225	9247	84175	37.3	57.3	5.4
Jammu And Kashmir	21	247	715	715	1676	16433	37549	40.0	55.7	4.4
Kerala	4	58	60	60	178	3584	4799	36.9	60.5	2.7
Madhya Pradesh	5229	30976	108750	108750	248476	2065066	2007574	13.4	48.0	38.6
Maharashtra	846	4873	34246	28599	67717	295313	661615	10.0	80.8	9.2
Manipur	0	1	0	0	1	23	123	26.4	71.2	2.4
Odisha	42	415	434	434	1282	28343	34892	17.0	71.1	11.9
Puducherry	11	0	349	217	566	7560	10719	6.1	91.6	2.3
Rajasthan	4048	43219	110148	102662	256029	2304736	2363149	20.7	53.1	26.2
Sikkim	0	0	0	0	1	16	100	90.5	9.5	0.0
Tamil Nadu	1622	17216	174031	109927	301174	1068078	1388688	9.2	87.5	3.3
Tripura	15	12	161	142	316	10416	74703	27.5	70.8	1.8
Uttar Pradesh	1420	14058	30429	30429	74915	888766	1675184	32.0	59.1	8.9
Uttarakhand	10	92	159	159	410	6107	34650	24.0	73.6	2.4

Source: Ministry of Agriculture & Famers Welfare, data accessed from <https://pmfby.gov.in/adminStatistics/dashboard> on 8th June 2022

Annex Table 4.1 : Top Exporting Nations for Major Agricultural Products in India's Export Basket, 2021-22

Product	Export Markets (₹ crore)
Marine Products	USA (24757), China (8372), Japan (3339)
Rice (Non- Basmati)	Bangladesh (4541), Benin (3965), China (3712)
Basmati Rice	Iran (6111), Saudi Arabia (4825), Iraq (2986)
Spices	China (6640), USA (4655), Bangladesh (1718)
Meat	Egypt (5509), Vietnam (3637), Malaysia (3318)
Sugar	Indonesia (6518), Bangladesh (4220), Sudan (4168)
Cotton (raw including waste)	Bangladesh (12264), China (3490), Vietnam (2559)
Wheat	Bangladesh (8894), Sri Lanka (1288), UAE (1022)
Plywood and products	USA (5710), Germany (945), Netherlands (848)
Castor Oil	China (3842), Netherlands (1306), USA (1029)

Source: Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry

Annex Tables

Annex Table 4.2 (a) : Trade Policy of Pulses for the period from April 2021 to June 2022

Month	Trade Policy	Product	Description
24-Jun-2021	Memorandum of Understanding (MOU) between India and Myanmar	Tur, Urad	India will provide an annual quota of 1 lakh tonnes of Tur and 2.5 lakh tonnes of Urad, to be imported from Myanmar, through private trade over the next five financial years (2021-22 to 2025-26).
24-Jun-2021	Memorandum of Understanding (MOU) between India and Malawi	Tur	India will provide an annual quota of 50,000 tonnes of Tur to be imported from Malawi, through private trade over the next five financial years (2021 -22 to 2025-26).
7-Dec-2021	Supply of essential commodities to Maldives	Dal	Export of 213.79 tonnes of dal from India to Maldives has been permitted under by lateral trade agreement for each financial year 2021-22, 2022-23 and 2023-24.
29-Mar-2022	Extension of "free" import policy	Tur, Urad	"Free" import policy of given pulses is extended up to 31-Mar-2023.

Source: Directorate General of Foreign Trade, Ministry of Commerce and Industry

Annex Table 4.2(b) : Trade Policy of Edible oils/Oilseeds for the period from April 2021 to June 2022

Month	Trade Policy	Product	Description
30-Jun-2021	Import Policy modified from "Restricted" to "Free" Category	RBD Palm oil, Palmolein and Other variants of palm oil in HS code 151190	Import Policy of different variants of refined palm oil revised from "Restricted" to "Free" category for a period up to 31-Dec-2021subject to prohibition of imports through any port in Kerala.
20-Dec-2021	Extension of "free" import policy	RBD Palm oil, Palmolein and Other variants of palm oil in HS code 151190	"Free" import policy of different variants of refined palm oil extended up to 31-Dec-2022.
24-May-2022	Allocation of Tariff Rate Quota(TRQ)	Crude Soybean Oil and Crude Sunflower Oil	Provisions notified for allocation of 20 Lakh Tonnes of TRQ for crude soybean oil and 20 lakh tonnes of crude sunflower oil for the years 2022-23 and 2023-24.

Source: Directorate General of Foreign Trade, Ministry of Commerce and Industry

Annex Tables

Annex Table 5.1 : Actual Costs and Gross Returns over Actual Cost of Cultivation of Rabi Crops for 2018-19, 2019-20 and 2020-21

Year	CoC A_2	CoC A_2+FL	GVO	Gross Returns over CoC A_2		Gross Returns over CoC A_2+FL	
	₹/ha			₹/ha (Col.4-Col.2)	Percent (Col.5/Col.2)*100	₹/ha (Col.4-Col.3)	Percent (Col.7/Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wheat							
2018-19	31705	39829	83612	51907	163.7	43783	109.9
2019-20	31070	39439	85814	54744	176.2	46375	117.6
2020-21	32924	41594	82082	49158	149.3	40488	97.3
TE2020-21	31900	40287	83836	51936	162.8	43549	108.1
Barley							
2018-19	28040	40905	69575	41535	148.1	28670	70.1
2019-20	28601	44428	76462	47861	167.3	32033	72.1
2020-21	31096	49138	71513	40417	130.0	22375	45.5
TE2020-21	29246	44824	72517	43271	148.0	27693	61.8
Gram							
2018-19	22678	29025	48829	26152	115.3	19804	68.2
2019-20	24038	31528	52629	28590	118.9	21101	66.9
2020-21	25908	34047	60152	34244	132.2	26105	76.7
TE2020-21	24208	31533	53870	29662	122.5	22337	70.8
Lentil							
2018-19	17143	22752	45883	28741	167.7	23132	101.7
2019-20	17750	24234	48243	30494	171.8	24010	99.1
2020-21	19472	26439	58408	38936	200.0	31969	120.9
TE2020-21	18121	24475	50845	32724	180.6	26370	107.7
Rapeseed & Mustard							
2018-19	22626	32829	60288	37662	166.5	27460	83.6
2019-20	23580	34312	64293	40713	172.7	29981	87.4
2020-21	24596	36064	87357	62762	255.2	51293	142.2
TE2020-21	23601	34402	70646	47046	199.3	36244	105.4
Safflower							
2018-19	25290	32131	36051	10761	42.5	3920	12.2
2019-20	-	-	-	-	-	-	-
2020-21	13509	16715	15134	1625	12.0	-1582	-9.5
TE2020-21	19399	24423	25592	6193	31.9	1169	4.8

Note: 1. Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for2018-19 and 2020- 21 for gram in Jharkhand and for safflower in Karnataka, due to unavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns ofprojected States.

Source: CACP calculation using CS data

Annex Table 5.2 : Average Gross Returns over Actual Cost of Cultivation of Rabi Crops in Selected States, TE2020-21

State	CoC A_2	CoC A_2+FL	GVO	Gross Returns over CoC A_2		Gross Returns over CoC A_2+FL	
	₹/ha			₹/ha (Col.4-Col.2)	Percent (Col.5/Col.2)*100	₹/ha (Col.4-Col.3)	Percent (Col.7/Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wheat							
Bihar	27954	34737	62130	34176	122.3	27393	78.9
Chhattisgarh	27503	33383	47958	20455	74.4	14575	43.7
Gujarat	30796	37325	70122	39326	127.7	32797	87.9
Haryana	32683	39183	109481	76798	235.0	70298	179.4
Himachal Pradesh	22676	35262	59386	36710	161.9	24124	68.4
Jharkhand	27819	37127	38385	10566	38.0	1257	3.4
Karnataka	20496	24165	29554	9058	44.2	5389	22.3
Madhya Pradesh	26754	33791	77487	50733	189.6	43696	129.3
Maharashtra	39249	48420	58633	19383	49.4	10212	21.1
Punjab	34284	37258	102771	68487	199.8	65514	175.8
Rajasthan	33260	54602	94442	61182	184.0	39840	73.0
Uttar Pradesh	34506	42494	83761	49255	142.7	41267	97.1
Uttarakhand	28785	39445	67033	38248	132.9	27588	69.9
West Bengal	31799	42640	50320	18522	58.2	7680	18.0
All-India	**31900**	**40287**	**83836**	**51936**	**162.8**	**43549**	**108.1**
Barley							
Himachal Pradesh	26878	43263	30298	3420	12.7	-12965	-30.0
Madhya Pradesh	28539	34629	48975	20435	71.6	14346	41.4
Rajasthan	29612	49390	75406	45793	154.6	26016	52.7

continued

Annex Tables

State	CoC A_2	CoC A_2+FL	GVO	Gross Returns over CoC A_2		Gross Returns over CoC A_2+FL	
	₹/ha			₹/ha (Col.4-Col.2)	Percent (Col.5/Col.2)*100	₹/ha (Col.4-Col.3)	Percent (Col.7/Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Uttar Pradesh	28950	39457	78838	49888	172.3	39382	99.8
All-India	**29246**	**44824**	**72517**	**43271**	**148.0**	**27693**	**61.8**
Gram							
Andhra Pradesh	32515	34772	56464	23948	73.7	21692	62.4
Bihar	19697	25597	68003	48306	245.3	42406	165.7
Chhattisgarh	26578	32121	53166	26588	100.0	21046	65.5
Gujarat	27764	35497	53274	25510	91.9	17777	50.1
Haryana	16214	25251	63571	47357	292.1	38320	151.8
Jharkhand	25700	36487	44523	18824	73.2	8036	22.0
Karnataka	22020	25202	42769	20749	94.2	17567	69.7
Madhya Pradesh	24267	29634	55444	31176	128.5	25810	87.1
Maharashtra	28903	34634	52567	23663	81.9	17933	51.8
Rajasthan	18455	31511	55773	37318	202.2	24263	77.0
Telangana	26567	29979	61496	34929	131.5	31517	105.1
Uttar Pradesh	20031	31413	60028	39996	199.7	28615	91.1
West Bengal	19955	29469	39123	19169	96.1	9655	32.8
All-India	**24208**	**31533**	**53870**	**29662**	**122.5**	**22337**	**70.8**
Lentil							
Bihar	18149	22642	46221	28072	154.7	23579	104.1
Madhya Pradesh	19018	23112	46372	27354	143.8	23260	100.6
Uttar Pradesh	16613	24265	52679	36066	217.1	28414	117.1

continued

State	CoC A_2	CoC A_2+FL	GVO	Gross Returns over CoC A_2		Gross Returns over CoC A_2+FL	
	₹/ha			₹/ha (Col.4-Col.2)	Percent (Col.5/Col.2)*100	₹/ha (Col.4-Col.3)	Percent (Col.7/Col.3)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
West Bengal	19872	30453	63071	43200	217.4	32618	107.1
All-India	**18121**	**24475**	**50845**	**32724**	**180.6**	**26370**	**107.7**
Rapeseed & Mustard							
Assam	16833	26975	33641	16809	99.9	6666	24.7
Bihar	17536	23503	42625	25088	143.1	19122	81.4
Gujarat	34271	42952	78540	44269	129.2	35588	82.9
Haryana	25689	32160	91370	65681	255.7	59211	184.1
Madhya Pradesh	22511	29895	70927	48416	215.1	41032	137.3
Odisha	9650	20795	18514	8864	91.9	-2281	-11.0
Punjab	23749	32367	66265	42516	179.0	33899	104.7
Rajasthan	22811	36248	74746	51935	227.7	38498	106.2
Uttar Pradesh	24574	31880	64689	40115	163.2	32809	102.9
West Bengal	25830	39385	57057	31227	120.9	17672	44.9
All-India	**23601**	**34402**	**70646**	**47046**	**199.3**	**36244**	**105.4**
Safflower							
Karnataka	19399	24423	25592	6193	31.9	1169	4.8
All-India	**19399**	**24423**	**25592**	**6193**	**31.9**	**1169**	**4.8**

Note: 1. Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for2018-19 and 2020- 21 for gram in Jharkhand and for safflower in Karnataka, due to unavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns of projected States.

Source: CACP calculation using CS data

Annex Tables

Annex Tables

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
2012																	
April	207	132	127	117	210	241	146	417	110	156	145	256	194	231	136	159	164
May	198	134	129	118	210	241	148	417	108	154	148	243	202	232	138	161	164
June	185	134	134	118	215	246	156	420	113	165	137	223	204	238	138	160	165
July	191	138	138	125	219	270	163	453	116	171	140	246	223	244	146	169	174
August	193	138	143	126	229	246	168	453	119	170	152	241	213	253	149	167	175
September	205	140	144	126	229	246	170	455	121	173	143	240	214	252	153	165	177
October	199	145	147	126	238	246	173	461	119	174	135	278	216	251	156	165	179
November	210	148	148	126	233	251	178	461	120	173	137	274	217	246	158	171	180
December	224	145	151	127	228	260	177	461	120	182	138	273	221	247	160	173	184
2013																	
January	224	146	162	130	246	273	184	465	126	186	136	257	219	253	163	178	187
February	228	157	164	130	245	259	188	465	126	192	134	260	204	259	165	180	187
March	221	154	166	133	245	259	189	461	130	194	136	260	208	265	166	181	189
April	230	153	167	130	247	264	192	478	135	195	137	284	217	265	168	182	193
May	223	150	167	131	245	266	192	489	138	197	141	273	244	266	169	185	197
June	222	162	168	132	244	262	196	483	134	189	143	290	235	271	173	185	196
July	221	178	175	136	258	263	203	485	132	201	150	291	220	272	174	198	198
August	210	183	177	137	317	284	210	487	133	200	157	279	215	275	181	200	199
September	213	178	176	138	312	290	212	490	138	196	150		219	284	181	200	192
October	212	175	175	139	312	298	213	487	144	199	156	283	229	294	180	199	203
November	247	184	205	142	328	337	235	585	140	221	196		248	330	192	224	214
December	242	181	191	165	325	356	228	580	151	216	179	278	247	352	186	229	222
2014																	
January	229	182	194	172	320	336	237	580	155	215	178	276	262	355	191	229	225

continued

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
February	226	188	200	172	329	336	240	629	158	214	180	275	251	362	191	230	226
March	222	189	202	175	333	341	243	594	161	219	164	279	270	356	195	223	229
April	222	199	204	179	335	352	240	594	163	223	160	306	291	361	201	226	235
May	225	203	206	179	346	335	242	594	165	223	173	307	283	364	202	225	235
June	217	204	207	179	347	341	241	594	164	230	191	304	280	362	199	227	235
July	230	208	218	185	345	345	241	599	173	225	201	302	320	372	200	226	244
August	226	220	220	190	348	343	241	599	173	226	208	304	305	371	202	230	243
September	239	225	220	190	350	343	242	586	180	222	204	310	296	417	198	234	246
October	241	226	222	198	354	339	242	586	171	222	202	310	297	412	201	237	246
November	247	238	220	198	357	330	244	597	170	223	200	312	305	421	199	236	248
December	236	234	220	192	344	349	252	604	176	222	194	307	307	417	199	237	247
2015																	
January	246	235	219	194	338	363	254	643	178	225	201	286	298	430	200	241	249
February	250	234	221	194	335	363	252	643	179	225	202	290	287	440	202	241	249
March	245	226	228	194	341	363	253	642	179	226	202	281	284	429	205	242	248
April	245	225	230	195	340	363	253	652	182	231	201	277	291	403	209	242	249
May	235	231	231	196	345	362	260	652	183	232	200	292	279	405	208	242	249
June	239	239	237	196	346	351	260	664	188	228	203	311	282	399	207	240	250
July	229	236	242	203	350	361	269	664	186	234	206	311	295	393	211	240	253
August	241	238	246	203	355	366	277	653	188	233	202	304	300	404	214	239	257
September	241	239	246	203	354	372	278	656	190	228	196	303	304	394	214	241	256
October	240	236	244	203	354	367	279	656	189	233	200	298	298	392	215	237	256
November	276	243	243	203	351	374	285	657	182	228	204	301	303	382	216	237	259
December	278	241	245	203	361	379	286	657	180	229	200	301	302	383	219	248	260

continued

Annex Tables

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
2016																	
January	276	235	248	206	354	371	285	664	183	231	199	288	276	381	218	251	256
February	254	233	248	206	359	371	281	666	182	229	195	300	270	383	217	252	253
March	250	234	246	213	359	371	280	670	186	231	206	292	277	406	217	254	256
April	272	240	246	214	362	395	278	670	188	232	198	310	260	406	223	254	257
May	256	241	248	214	368	369	283	665	186	247	199	312	266	400	223	256	258
June	254	255	249	214	368	370	288	665	190	249	210	321	265	396	222	259	260
July	257	255	251	219	368	373	295	665	189	238	207	313	289	408	225	259	264
August	262	253	252	219	368	379	293	665	188	246	213	296	283	411	225	258	264
September	263	254	247	219	368	379	293	665	192	248	209	288	284	412	221	254	263
October	263	254	247	219	368	391	290	665	199	249	203	306	284	409	221	257	265
November	271	254	247	219	368	387	297	665	199	255	207	307	281	406	227	260	267
December	284	259	247	219	368	387	298	665	201	255	217	305	279	406	225	263	269
2017																	
January	286	259	249	225	362	417	303	675	204	255	222	321	272	412	226	265	271
February	286	261	251	227	363	387	302	675	207	259	220	318	281	413	229	264	273
March	290	256	250	227	363	417	300	675	208	262	223	318	293	413	231	264	276
April	291	257	251	229	361	408	300	682	210	269	227	326	283	413	270	232	280
May	288	256	251	229	363	406	301	687	214	275	229	335	266	413	232	265	275
June	269	256	251	229	363	404	300	687	215	280	227	335	281	410	233	264	276
July	281	252	255	230	373	425	301	687	217	277	235	327	288	415	241	268	280
August	276	258	258	230	365	423	305	687	216	271	231	327	290	412	247	268	280
September	280	272	260	234	365	429	306	687	215	265	227	345	287	416	248	270	281
October	277	282	259	234	367	399	306	687	211	265	226	348	279	416	246	275	279
November	282	281	261	234	367	423	310	687	208	269	222	342	289	417	244	277	281

continued

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
December	291	275	262	234	367	419	315	687	209	268	225	349	291	417	243	279	282
2018																	
January	312	277	264	236	367	439	321	691	212	268	226	349	267	424	243	275	283
February	308	278	269	236	367	439	322	691	214	267	225	341	283	444	243	277	286
March	320	278	270	238	368	445	320	698	216	273	223	332	279	445	240	278	287
April	321	280	271	238	367	445	322	698	217	272	223	341	294	445	239	277	290
May	327	279	269	238	368	410	324	698	220	277	229	339	315	445	240	276	294
June	294	282	270	239	368	439	329	719	216	276	227	351	311	440	242	278	291
July	305	289	271	241	376	436	333	719	219	280	229	355	325	440	249	280	297
August	308	289	274	241	383	451	336	726	217	282	231	355	326	449	258	278	299
September	309	291	275	241	380	454	336	726	220	284	230	353	312	452	257	278	298
October	316	277	276	241	373	418	339	735	218	282	231	355	315	460	257	281	299
November	318	280	276	242	371	425	341	735	215	281	230	358	322	460	254	283	300
December	321	277	276	242	376	421	343	735	213	280	232	350	308	469	256	284	298
2019																	
January	333	279	280	244	380	421	342	737	214	281	231	348	296	469	257	287	299
February	336	277	283	244	388	421	342	737	214	282	232	355	295	476	259	287	300
March	338	277	283	244	387	439	341	737	217	283	229	350	302	479	259	288	302
April	339	274	282	244	387	439	341	737	217	282	229	351	300	479	259	288	301
May	345	274	286	244	390	438	342	737	217	291	226	348	313	482	260	289	305
June	332	312	285	245	386	428	341	741	216	297	230	349	316	479	261	292	306
July	331	313	296	247	387	453	346	741	217	305	234	355	324	487	260	289	310
August	340	314	299	247	396	469	348	741	222	306	239	368	308	495	261	289	311
September	346	319	298	249	392	469	350	741	222	305	236	353	307	496	264	290	312
October	348	319	303	249	394	440	351	741	221	308	237	356	321	492	266	291	314
November	357	322	304	247	394	446	352	741	218	308	237	358	326	496	266	291	316

continued

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
December	370	323	302	250	384	443	353	741	218	307	239	357	326	497	269	297	317
2020																	
January	376	322	311	250	384	477	355	741	221	309	242	360	326	500	273	299	321
February	377	313	310	250	384	474	357	741	225	305	242	360	327	506	271	302	321
March	374	314	310	250	384	474	355	741	225	305	250	361	311	512	272	301	319
April	374	314	310	250	384	474	355	741	225	305	250	361	311	512	272	301	319
May	374	314	310	250	384	474	355	741	225	305	250	361	311	512	272	301	319
June	370	377	311	244	384	538	373	763	281	314	254	372	324	523	274	306	334
July	364	315	311	248	392	477	367	744	252	315	244	370	326	528	279	339	329
August	356	316	310	248	395	479	357	744	248	315	255	370	315	529	278	315	325
September	363	313	310	252	394	319	356	744	234	324	252	375	315	530	280	308	323
October	367	316	311	252	389	450	358	744	229	329	255	380	314	530	280	309	325
November	373	317	311	252	391	450	362	744	227	329	261	387	315	543	284	314	328
December	383	324	310	252	391	457	367	744	226	326	266	388	311	546	283	320	329
2021																	
January	388	319	310	252	391	457	366	756	228	327	270	388	316	563	282	322	331
February	385	316	312	252	391	455	370	756	229	330	274	386	315	564	285	328	332
March	377	314	313	257	391	453	370	756	232	331	265	389	324	574	288	329	334
April	395	312	312	257	392	453	369	756	237	335	262	384	323	574	290	329	337
May	385	315	315	257	392	463	367	756	239	340	256	379	331	574	288	330	337
June	383	315	314	259	397	484	369	756	236	342	252	384	332	573	291	330	338
July	392	316	317	262	401	498	367	756	240	336	281	384	325	570	297	334	340
August	390	322	318	263	402	513	369	756	242	340	280	381	346	572	295	335	343
September	393	329	320	263	404	458	376	792	242	346	275	381	339	570	296	332	344
October	405	329	321	263	406	453	380	792	240	343	271	382	352	574	295	332	346
November	405	333	323	263	405	453	380	792	238	338	270	382	357	572	298	331	347

continued

Annex Table 5.3: Monthly Average Daily Wage Rates for Agricultural Labour (Man) at Current Prices in Major Rabi Crops Producing States

₹/day

Year/Month	AP	AS	BR	GJ	HR	HP	KA	KL	MP	MH	OD	PB	RJ	TN	UP	WB	IND
December	407	337	327	265	407	458	386	792	241	339	291	381	356	571	301	332	349
2022																	
January	395	338	330	266	407	453	387	792	246	340	292	381	341	571	303	334	348
February	400	339	330	268	407	453	395	792	247	342	283	389	349	575	305	332	351
March	417	330	335	268	410	453	395	794	248	342	281	392	337	575	308	333	351
April	433	330	336	273	420	453	394	794	251	344	289	396	337	575	314	336	355

Note : 1: Daily Wage rate -Average of five operations i.e. Ploughing, Sowing, Weeding, Transplanting and Harvesting

2: State-wise data for agricultural wage rate for April and May, 2020 have not been released/published by Labour Bureau. Hence, the wage rate data for March,2020 have been taken for April and May, 2020 for maintaining continuity in the data

3: All-India daily wage rate was weighted average of daily wage rates of States mentioned in the Table

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

Annex Table 5.4: Monthly Wholesale Price Index (Base: 2011-12) of Major Farm Inputs during 2012 to 2022

Year/Month	High Speed Diesel	Fertilizers and nitrogen compounds	Electricity	Manufacture of Agricultural and Forestry Machinery	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products	Index of Farm Inputs
2012									
April	111.9	108.1	97.4	103.1	106.0	106.7	107.9	105.9	105.4
May	111.5	109.7	100.8	103.7	106.0	109.8	105.3	106.4	106.5
June	109.6	111.8	102.5	104.0	110.3	112.6	101.7	106.1	106.8
July	108.5	113.5	101.8	104.7	110.3	118.3	107.0	106.5	107.0
August	111.0	113.6	98.5	104.5	110.3	123.3	111.3	107.9	107.1
September	114.3	114.5	97.4	104.5	110.3	128.7	118.6	109.1	108.5
October	108.4	114.6	101.4	104.9	110.3	131.1	122.8	108.3	108.2
November	108.0	115.4	101.6	105.0	110.3	131.9	125.0	108.9	108.4
December	108.1	114.9	101.3	105.0	110.3	130.9	124.9	108.1	108.2
2013									
January	112.0	114.6	104.5	105.3	110.3	129.7	121.9	107.5	110.2
February	117.6	114.9	100.6	105.5	110.3	130.5	127.4	107.3	111.1
March	118.4	116.1	98.2	105.8	110.3	133.8	128.9	107.5	110.9
April	114.6	115.3	101.1	106.8	112.1	138.2	126.3	109.1	110.7
May	112.1	115.4	101.0	103.8	112.1	139.5	124.7	105.4	109.4
June	117.1	116.2	101.5	104.5	112.1	140.0	131.9	107.0	111.8
July	123.4	116.7	102.3	104.8	112.1	140.2	136.2	109.7	114.4
August	126.3	116.5	103.1	105.4	115.3	140.4	137.1	111.1	115.8
September	132.8	116.7	104.6	105.2	115.3	142.0	138.2	112.3	118.5
October	130.1	116.4	103.3	105.3	115.3	142.8	138.6	113.0	117.3
November	130.3	116.8	103.1	105.5	115.3	143.4	140.2	113.1	117.4
December	132.5	116.6	105.6	106.0	115.3	142.3	141.6	113.8	119.0

continued

Annex Table 5.4: Monthly Wholesale Price Index (Base: 2011-12) of Major Farm Inputs during 2012 to 2022

Year/Month	High Speed Diesel	Fertilizers and nitrogen compounds	Electricity	Manufacture of Agricultural and Forestry Machinery	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products	Index of Farm Inputs
2014									
January	131.8	116.7	105.8	106.0	115.3	140.6	144.3	113.2	118.9
February	131.6	117.0	105.9	106.2	115.3	140.8	149.5	110.9	119.1
March	133.1	117.7	106.4	106.5	115.3	141.8	156.0	115.1	120.4
April	130.0	116.9	106.0	107.7	117.0	144.0	147.5	118.6	119.1
May	131.2	117.8	102.7	107.5	117.0	147.5	139.3	118.6	118.2
June	129.0	118.6	101.9	107.5	117.0	146.6	142.3	120.7	117.7
July	131.6	118.6	102.7	108.2	117.0	146.0	142.0	120.3	118.7
August	130.9	118.6	106.1	108.5	117.0	144.2	145.5	118.3	119.6
September	129.6	118.8	104.9	107.7	120.0	141.5	154.1	124.0	119.6
October	125.8	119.1	104.3	107.6	120.0	138.9	155.0	121.9	118.2
November	112.7	119.4	106.5	108.4	120.0	137.1	156.1	121.9	114.9
December	103.5	119.6	108.4	108.9	120.0	137.2	156.9	118.6	112.6
2015									
January	87.9	119.0	109.1	108.9	120.0	138.4	155.8	122.9	108.0
February	79.1	119.5	107.8	109.5	120.0	139.0	150.8	122.5	104.7
March	86.6	120.3	107.5	109.7	120.1	138.7	143.1	119.6	106.6
April	83.3	120.5	108.0	111.1	120.8	140.8	139.5	121.6	105.8
May	91.7	120.9	106.1	111.0	120.8	143.5	138.4	122.9	108.0
June	92.7	120.7	105.9	110.7	120.8	144.8	142.8	122.7	108.4
July	86.5	120.9	106.5	111.7	120.8	145.0	150.5	124.9	107.3
August	73.1	121.7	105.4	110.8	120.8	147.2	165.9	122.7	103.6
September	71.3	122.3	106.3	110.5	120.8	148.8	166.6	123.6	103.5
October	73.8	122.1	103.1	111.5	120.8	150.6	168.7	124.1	103.5
November	74.2	121.4	104.5	111.5	120.8	150.4	172.9	123.1	104.1
December	72.3	121.4	104.9	111.6	120.8	150.3	176.2	121.6	103.8
2016									
January	57.1	121.6	105.9	111.3	120.8	151.3	173.3	122.6	99.3

continued

Annex Tables

Annex Table 5.4: Monthly Wholesale Price Index (Base: 2011-12) of Major Farm Inputs during 2012 to 2022

Year/Month	High Speed Diesel	Fertilizers and nitrogen compounds	Electricity	Manufacture of Agricultural and Forestry Machinery	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products	Index of Farm Inputs
February	50.3	121.6	103.5	111.2	120.8	153.8	170.3	121.8	96.3
March	54.9	121.3	102.9	111.8	120.8	154.4	171.6	119.5	97.5
April	59.1	121.3	101.1	112.6	120.8	155.4	167.1	116.7	98.0
May	66.5	121.1	102.2	112.3	120.8	155.9	161.4	118.8	100.4
June	75.0	121.0	102.8	112.2	120.8	158.9	170.2	117.7	103.6
July	74.7	120.3	102.7	112.3	120.8	161.3	170.1	117.1	103.4
August	67.0	119.1	103.2	112.0	114.8	161.8	162.7	116.0	100.4
September	70.7	118.3	103.8	112.3	114.8	160.9	162.9	116.5	101.6
October	72.6	118.3	103.9	112.6	114.8	159.0	165.4	115.3	102.3
November	76.5	117.8	105.9	112.3	114.8	158.6	163.5	115.3	104.0
December	77.3	116.7	106.2	112.2	114.8	157.9	163.5	115.5	104.1
2017									
January	83.4	117.0	107.9	112.5	114.8	157.3	163.0	117.9	106.7
February	85.0	116.7	107.4	112.2	114.8	157.6	165.9	117.0	107.1
March	84.9	116.8	102.7	111.5	114.8	155.2	159.8	117.2	105.2
April	81.5	117.1	103.3	112.0	114.8	155.7	159.5	116.8	104.4
May	81.3	117.2	102.8	112.4	114.0	156.4	157.4	117.2	104.1
June	80.0	116.4	102.0	112.3	113.3	155.4	157.2	116.9	103.3
July	78.8	116.0	102.0	111.9	112.9	154.5	162.4	115.3	103.0
August	80.9	116.5	100.6	112.3	112.9	154.6	163.1	114.9	103.3
September	82.5	116.5	106.1	112.5	112.9	154.9	160.2	113.7	105.3
October	84.5	116.8	106.1	112.7	112.9	154.0	154.7	112.9	105.6
November	85.8	116.7	102.7	112.8	112.9	152.9	143.9	114.0	104.5
December	87.1	116.8	102.4	112.8	112.9	151.2	132.7	114.8	104.2
2018									
January	89.5	117.4	105.0	114.3	114.0	150.6	132.3	115.3	106.0
February	91.3	118.6	105.4	113.8	117.3	154.3	134.3	114.8	107.0
March	90.1	118.9	105.4	113.9	117.3	154.4	136.3	117.0	106.9

continued

Annex Table 5.4: Monthly Wholesale Price Index (Base: 2011-12) of Major Farm Inputs during 2012 to 2022

Year/Month	High Speed Diesel	Fertilizers and nitrogen compounds	Electricity	Manufacture of Agricultural and Forestry Machinery	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products	Index of Farm Inputs
April	92.5	118.3	104.9	114.5	117.3	154.7	137.0	118.2	107.6
May	95.4	118.8	110.7	114.2	117.3	154.8	135.2	118.2	110.2
June	97.5	118.7	109.6	114.6	117.3	154.9	134.6	117.9	110.5
July	96.8	119.3	109.6	115.5	117.3	154.5	128.8	119.1	110.2
August	97.0	120.0	109.4	116.7	117.3	156.1	131.0	119.1	110.6
September	100.8	120.5	112.4	117.3	130.2	155.1	131.7	120.4	113.2
October	104.9	121.6	112.4	117.6	130.2	155.2	130.8	119.9	114.6
November	103.1	123.4	109.3	117.9	130.2	159.4	130.5	121.0	113.5
December	93.9	123.6	110.7	118.0	130.2	159.6	131.0	119.7	111.1
2019									
January	91.2	122.7	110.7	118.7	130.2	160.9	132.7	122.5	110.4
February	94.8	123.0	108.2	118.5	130.2	162.3	136.3	123.5	111.1
March	96.7	123.0	107.3	119.4	130.2	161.7	138.1	122.8	111.5
April	95.5	122.9	107.3	119.3	130.5	165.7	139.0	123.0	111.3
May	96.6	123.1	110.7	119.3	131.5	169.0	140.7	124.0	112.9
June	94.9	123.4	108.3	119.7	131.6	171.9	147.5	121.9	112.1
July	93.2	123.5	108.3	120.1	131.6	175.5	149.2	124.2	111.9
August	93.5	123.0	110.7	120.6	131.6	176.8	148.4	122.9	112.6
September	93.6	123.1	110.0	121.1	131.6	178.2	146.1	122.8	112.4
October	94.9	122.9	110.0	121.3	131.6	178.5	146.3	123.0	112.8
November	93.6	123.4	110.0	120.9	131.6	178.0	147.5	122.9	112.5
December	94.1	123.9	117.9	121.1	131.6	177.8	152.1	121.8	115.3
2020									
January	96.0	122.7	117.9	121.1	131.6	178.5	152.5	121.5	115.8
February	91.9	122.4	116.6	121.4	133.0	174.9	150.2	121.7	113.9
March	86.5	123.2	113.9	121.5	133.0	171.7	151.1	122.0	111.5
April	76.0	123.4	113.9	121.6	133.0	173.6	152.8	120.3	108.4
May	62.9	123.7	105.0	121.1	133.0	172.2	150.0	120.8	101.4

continued

Annex Tables

Annex Table 5.4: Monthly Wholesale Price Index (Base: 2011-12) of Major Farm Inputs during 2012 to 2022

Year/Month	High Speed Diesel	Fertilizers and nitrogen compounds	Electricity	Manufacture of Agricultural and Forestry Machinery	Lube Oils	Cattle Feed	Fodder	Pesticides and other agrochemical products	Index of Farm Inputs
June	71.6	123.4	101.0	120.6	133.0	171.7	148.6	123.2	102.8
July	79.2	123.4	101.0	120.6	133.0	170.1	150.4	124.2	105.3
August	80.1	123.7	103.4	121.5	133.5	170.1	148.1	125.3	106.4
September	77.8	123.1	105.3	121.7	134.1	169.1	146.3	125.4	106.1
October	75.2	123.1	105.3	121.2	136.1	169.1	163.8	125.6	106.2
November	75.4	123.0	117.4	121.6	136.1	170.0	175.6	125.8	110.7
December	79.8	123.7	116.9	121.3	138.7	171.7	176.4	125.8	112.1
2021									
January	86.1	123.6	116.9	122.7	139.6	173.2	176.5	125.3	114.2
February	94.8	124.0	117.6	122.4	144.3	174.2	172.2	125.2	117.1
March	103.6	124.7	111.1	122.7	151.8	178.3	172.6	125.4	118.3
April	101.0	126.5	111.1	122.9	158.9	185.4	173.2	126.7	118.2
May	106.4	127.6	105.2	124.4	162.3	190.7	172.3	127.3	118.6
June	114.5	126.4	98.2	124.8	162.3	194.5	172.8	128.4	119.0
July	121.8	127.3	98.2	126.4	162.3	199.2	173.8	128.9	121.7
August	120.7	128.1	106.4	127.0	162.3	206.0	174.6	130.1	124.3
September	118.1	127.7	116.7	129.0	162.3	205.6	176.4	129.9	126.8
October	131.7	128.3	116.7	129.4	162.3	196.7	178.3	131.6	131.1
November	141.1	129.6	131.5	129.8	162.3	194.1	176.8	131.4	138.7
December	136.1	131.1	135.3	130.5	162.3	198.1	183.9	133.2	139.1
2022									
January	141.2	133.4	135.3	131.9	162.3	197.1	189.1	136.2	141.6
February	147.5	133.8	131.8	132.1	162.3	200.5	192.1	139.7	142.9
March	157.8	135.1	122.2	132.8	162.3	207.0	203.1	141.4	144.2
April	167.8	136.5	122.2	133.3	171.6	210.9	203.4	141.1	147.9

Note : 1: WPI of Farm Inputs was weighted average of WPIs of farm inputs mentioned in Graph
Source: Office of the Economic Adviser, Ministry of Commerce & Industry, Government of India

Annex Table 5.5: State-wise Projected Cost of Production (A_2, A_2+FL & C_2) of Rabi Crops for RMS 2023-24 and Production Shares during TE2021-22

State	Cost of Production for Crop Season 2022-23 (₹/qtl)			State Shares in all-India Production during TE2021-22 (%)
	A_2	A_2+FL	C_2	
Wheat				
Bihar	935	1160	1624	5.4
Chhattisgarh	1166	1418	1836	0.2
Gujarat	1081	1309	1766	3.1
Haryana	780	937	1563	10.8
Himachal Pradesh	1074	1666	2250	0.5
Jharkhand	1170	1561	2160	0.5
Karnataka	1568	1898	2581	0.2
Madhya Pradesh	797	1008	1421	18.7
Maharashtra	1715	2115	2655	1.9
Punjab	722	786	1425	15.3
Rajasthan	671	1101	1504	9.9
Uttar Pradesh	918	1129	1635	32.1
Uttarakhand	809	1110	1686	0.8
West Bengal	1090	1455	1845	0.5
All India	**851**	**1065**	**1575**	**100**
Barley				
Himachal Pradesh	1163	1882	2528	2
Madhya Pradesh	893	1084	1432	3
Rajasthan	642	1070	1414	62
Uttar Pradesh	774	1053	1560	33
All India	**704**	**1082**	**1487**	**100**
Gram				
Andhra Pradesh	3284	3488	4783	4.4
Bihar	1737	2255	3572	0.4
Chhattisgarh	2583	3121	3952	1.8
Gujarat	2121	2705	3778	11.0
Haryana	1478	2284	3690	0.3
Jharkhand	1887	2680	4434	2.5
Karnataka	3347	3818	5356	4.9
Madhya Pradesh	2469	3015	4015	24.9
Maharashtra	3163	3769	4817	21.0
Rajasthan	1702	2901	3950	20.1
Telangana	2475	2801	4365	1.7
Uttar Pradesh	2349	3650	5246	6.5

continued

State	Cost of Production for Crop Season 2022-23 (₹/qtl)			State Shares in all-India Production during TE2021-22 (%)
	A_2	A_2+FL	C_2	
West Bengal	2658	3901	5057	0.4
All India	**2476**	**3206**	**4341**	**100**
Lentil				
Bihar	1970	2456	4053	9.2
Madhya Pradesh	2318	2808	3835	40.2
Uttar Pradesh	2646	3849	5518	39.3
West Bengal	2176	3284	4637	11.3
All India	**2399**	**3239**	**4608**	**100**
Rapeseed & Mustard				
Assam	2853	4557	5422	1.8
Bihar	1784	2382	3645	0.9
Gujarat	2106	2632	3653	4.2
Haryana	1720	2156	3601	13.1
Madhya Pradesh	1392	1851	2833	13.3
Odisha	1896	4089	5672	0.0
Punjab	1677	2281	4020	0.6
Rajasthan	1767	2799	3757	48.2
Uttar Pradesh	2159	2794	4028	10.4
West Bengal	2391	3658	4719	7.4
All India	**1831**	**2670**	**3740**	**100**
Safflower				
Karnataka	2954	3765	5135	100
All India	**2954**	**3765**	**5135**	**100**

Note 1: Production shares were related to production of projected States only

2: All-India CoP of a crop was weighted average of CoPs of projected States

Source: CACP calculations using CS data

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Bihar					Chhattisgarh					Gujarat				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**33113**	**33158**	**36042**	**0.1**	**8.7**	**33214**	**34878**	**30417**	**5.0**	**-12.8**	**35870**	**36279**	**36623**	**1.1**	**0.9**
Human Labour															
Casual	5809	6118	6662	5.3	8.9	3601	3937	1362	9.3	-65.4	5287	5183	5406	-2.0	4.3
Attached	5	20	296	309.2	1353.1	0	165	0	-	-	69	101	146	45.9	44.6
Family	6511	6544	7295	0.5	11.5	5634	5960	6046	5.8	1.5	6537	6554	6496	0.3	-0.9
Total	12325	12682	14254	2.9	12.4	9234	10062	7409	9.0	-26.4	11894	11838	12047	-0.5	1.8
Bullock Labour															
Hired	0	0	0	-	-	0	0	0	-	-	149	121	232	-19.0	92.1
Owned	12	9	0	-22.3	-	3850	0	0	-	-	153	275	148	79.5	-46.1
Total	12	9	0	-22.3	-	3850	0	0	-	-	303	396	381	30.9	-3.9
Machine Labour															
Hired	6290	6362	7525	1.2	18.3	7563	11495	10233	52.0	-11.0	5914	6288	6976	6.3	10.9
Owned	198	144	66	-27.5	-54.0	369	169	847	-54.3	402.6	1670	1490	1616	-10.8	8.4
Total	6488	6506	7591	0.3	16.7	7932	11664	11080	47.0	-5.0	7584	7778	8592	2.6	10.5
Seed	3822	3792	4210	-0.8	11.0	3157	2992	3054	-5.2	2.1	4365	4788	4630	9.7	-3.3
Fertilisers and Manure															
Fertilisers	4510	4251	4396	-5.7	3.4	3527	4000	3895	13.4	-2.6	4292	4215	4443	-1.8	5.4
Manure	30	26	291	-15.0	1039.0	0	0	0	-	-	157	314	251	100.4	-20.1
Total	4540	4277	4688	-5.8	9.6	3527	4000	3895	13.4	-2.6	4449	4529	4694	1.8	3.6
Other Inputs															
Insecticides	47	40	103	-15.4	159.4	103	274	100	165.3	-63.6	367	385	519	4.8	35.0
Irrigation charges	5064	5039	4311	-0.5	-14.5	4362	4713	4020	8.1	-14.7	5887	5472	4661	-7.1	-14.8

Annex Tables

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Bihar					Chhattisgarh					Gujarat				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on working capital	806	806	871	0.0	8.0	836	876	738	4.9	-15.7	889	901	913	1.3	1.4
Miscellaneous	8	6	15	-27.8	150.6	32	35	64	11.3	81.1	133	192	187	44.9	-2.8
Crop insurance	0	0	0	-	-	182	262	57	44.2	-78.1	-	0	0	-	-
Fixed Cost	**15404**	**17138**	**21811**	**11.3**	**27.3**	**11795**	**10343**	**12242**	**-12.3**	**18.4**	**15720**	**15356**	**14370**	**-2.3**	**-6.4**
Rental value of owned land	13072	14971	18312	14.5	22.3	9323	7669	9934	-17.7	29.5	11425	11259	10697	-1.5	-5.0
Rent paid for leased-in land	0	0	0	-	-	0	0	0	-	-	847	1083	364	27.9	-66.4
Land revenue, cesses & taxes	109	111	184	2.0	66.2	1	1	5	-11.0	298.5	8	8	9	-2.7	21.0
Depreciation on implements & Farm buildings	504	464	526	-7.9	13.4	692	603	338	-12.9	-44.0	319	276	288	-13.7	4.4
Interest on fixed capital	1720	1592	2789	-7.5	75.2	1778	2070	1965	16.4	-5.1	3121	2730	3012	-12.5	10.3
Total Cost (C_2/ha)	**48518**	**50295**	**57853**	**3.7**	**15.0**	**45009**	**45222**	**42659**	**0.5**	**-5.7**	**51590**	**51634**	**50994**	**0.1**	**-1.2**
A_2 (₹/ha)	**27215**	**27189**	**29458**	**-0.1**	**8.3**	**28274**	**29523**	**24713**	**4.4**	**-16.3**	**30507**	**31092**	**30788**	**1.9**	**-1.0**
A_2+FL (₹/ha)	**33726**	**33732**	**36753**	**0.0**	**9.0**	**33908**	**35482**	**30759**	**4.6**	**-13.3**	**37044**	**37645**	**37284**	**1.6**	**-1.0**
Yield (qtl/ha)	**29.85**	**29.42**	**29.87**	**-1.5**	**1.5**	**26.13**	**17.10**	**27.35**	**-34.6**	**59.9**	**34.00**	**35.20**	**32.21**	**3.5**	**-8.5**
A_2 (₹/qtl)	**730**	**729**	**766**	**0.0**	**5.0**	**932**	**1430**	**863**	**53.4**	**-39.7**	**784**	**778**	**829**	**-0.8**	**6.6**
A_2+FL (₹/qtl)	**905**	**909**	**956**	**0.4**	**5.2**	**1126**	**1690**	**1090**	**50.0**	**-35.5**	**962**	**950**	**1012**	**-1.2**	**6.5**
C_2 (₹/qtl)	**1302**	**1355**	**1505**	**4.0**	**11.1**	**1482**	**2178**	**1497**	**46.9**	**-31.2**	**1333**	**1293**	**1376**	**-3.0**	**6.5**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Haryana					Himachal Pradesh					Jharkhand				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**37326**	**38764**	**37972**	**3.9**	**-2.0**	**33001**	**34465**	**35865**	**4.4**	**4.1**	**36159**	**30008**	**43308**	**-17.0**	**44.3**
Human Labour															
Casual	1913	2032	2152	6.2	5.9	1090	1057	820	-3.1	-22.4	7771	9256	6871	19.1	-25.8
Attached	248	197	200	-20.6	1.4	0	0	7	-	-	0	0	0	-	-
Family	6563	6669	6267	1.6	-6.0	11459	12595	13706	9.9	8.8	9965	5350	12610	-46.3	135.7
Total	8725	8898	8619	2.0	-3.1	12548	13652	14534	8.8	6.5	17735	14606	19481	-17.6	33.4
Bullock Labour															
Hired	0	1	0	-	-	327	297	158	-9.2	-46.6	58	74	0	26.7	-
Owned	22	22	5	0.2	-79.6	2280	1791	2688	-21.4	50.1	3648	66	4935	-98.2	7399.9
Total	22	23	5	2.5	-80.1	2606	2088	2847	-19.9	36.4	3706	140	4935	-96.2	3432.3
Machine Labour															
Hired	10713	11861	11467	10.7	-3.3	7919	7840	7009	-1.0	-10.6	5693	5945	5542	4.4	-6.8
Owned	3141	3477	2583	10.7	-25.7	588	730	975	24.2	33.6	57	65	287	14.5	341.4
Total	13853	15338	14050	10.7	-8.4	8506	8570	7985	0.7	-6.8	5750	6010	5829	4.5	-3.0
Seed	2991	2965	3032	-0.9	2.3	2295	2607	2670	13.6	2.4	2768	3018	4041	9.0	33.9
Fertilisers and Manure															
Fertilisers	5114	4957	4767	-3.1	-3.8	1870	1964	2003	5.0	2.0	2989	3095	4381	3.5	41.6
Manure	0	0	0	-	-	3740	4216	4263	12.7	1.1	514	517	760	0.5	46.9
Total	5114	4957	4767	-3.1	-3.8	5610	6180	6266	10.1	1.4	3503	3612	5141	3.1	42.3
Other Inputs															
Insecticides	1144	1463	1641	27.8	12.2	230	259	317	12.7	22.4	0	0	0	-	-
Irrigation charges	4476	4081	4566	-8.8	11.9	523	400	519	-23.5	29.6	1903	1876	2951	-1.4	57.3

continued

Annex Tables

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Haryana					Himachal Pradesh					Jharkhand				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on working capital	932	973	961	4.3	-1.2	653	663	671	1.5	1.3	794	747	930	-5.9	24.5
Miscellaneous	62	67	118	7.6	75.8	27	47	56	72.9	20.1	0	0	0	-	-
Crop insurance	7	0	214	-	-	2	1	0	-74.1	-	0	0	0	-	-
Fixed Cost	**38085**	**37038**	**35564**	**-2.7**	**-4.0**	**18616**	**19315**	**18447**	**3.8**	**-4.5**	**11226**	**13413**	**17299**	**19.5**	**29.0**
Rental value of owned land	29280	29085	29515	-0.7	1.5	14179	15043	12983	6.1	-13.7	8492	11164	12463	31.5	11.6
Rent paid for leased-in land	29	118	131	309.1	10.6	225	248	72	10.4	-70.9	0	0	0	-	-
Land revenue, cesses & taxes	0	4	0	-	-	11	11	10	0.2	-2.1	54	55	57	2.2	3.8
Depreciation on implements & Farm buildings	1466	1173	566	-19.9	-51.8	600	596	683	-0.6	14.5	457	521	761	13.9	46.1
Interest on fixed capital	7310	6658	5353	-8.9	-19.6	3602	3418	4698	-5.1	37.5	2222	1673	4018	-24.7	140.1
Total Cost (C_2/ha)	**75410**	**75802**	**73536**	**0.5**	**-3.0**	**51617**	**53781**	**54312**	**4.2**	**1.0**	**47385**	**43421**	**60606**	**-8.4**	**39.6**
A_2 (₹/ha)	**32257**	**33391**	**32402**	**3.5**	**-3.0**	**22378**	**22725**	**22925**	**1.6**	**0.9**	**26706**	**25234**	**31516**	**-5.5**	**24.9**
A_2+FL (₹/ha)	**38820**	**40059**	**38669**	**3.2**	**-3.5**	**33836**	**35320**	**36631**	**4.4**	**3.7**	**36671**	**30585**	**44126**	**-16.6**	**44.3**
Yield (qtl/ha)	**51.06**	**48.03**	**49.17**	**-5.9**	**2.4**	**24.43**	**23.04**	**21.44**	**-5.7**	**-7.0**	**13.37**	**17.81**	**21.43**	**33.2**	**20.3**
A_2 (₹/qtl)	**553**	**606**	**567**	**9.6**	**-6.5**	**666**	**736**	**787**	**10.5**	**7.0**	**1674**	**1145**	**1070**	**-31.6**	**-6.6**
A_2+FL (₹/qtl)	**663**	**724**	**676**	**9.2**	**-6.7**	**1032**	**1148**	**1267**	**11.3**	**10.3**	**2230**	**1383**	**1509**	**-38.0**	**9.1**
C_2 (₹/qtl)	**1289**	**1371**	**1288**	**6.3**	**-6.1**	**1571**	**1747**	**1874**	**11.2**	**7.2**	**2959**	**1971**	**2074**	**-33.4**	**5.3**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Karnataka					Madhya Pradesh					Maharashtra				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**17470**	**24322**	**29815**	**39.2**	**22.6**	**32944**	**33457**	**32590**	**1.6**	**-2.6**	**47384**	**46622**	**49945**	**-1.6**	**7.1**
Human Labour															
Casual	2671	5041	9344	88.7	85.4	3495	3925	3307	12.3	-15.8	4772	4993	3841	4.6	-23.1
Attached	681	0	0	-	-	136	137	127	0.7	-7.1	359	603	931	67.9	54.4
Family	3029	4899	3080	61.7	-37.1	6772	7349	6990	8.5	-4.9	8738	9582	9193	9.7	-4.1
Total	6381	9940	12424	55.8	25.0	10403	11411	10424	9.7	-8.6	13869	15179	13966	9.4	-8.0
Bullock Labour															
Hired	214	941	227	338.8	-75.9	52	38	26	-27.1	-30.4	622	456	673	-26.7	47.6
Owned	278	482	166	73.3	-65.5	746	396	555	-47.0	40.2	1627	1989	1513	22.3	-24.0
Total	492	1423	393	188.9	-72.4	798	434	581	-45.7	34.0	2249	2445	2186	8.7	-10.6
Machine Labour															
Hired	3452	3306	3590	-4.2	8.6	7938	8408	8702	5.9	3.5	10512	9682	11291	-7.9	16.6
Owned	1617	1663	4281	2.8	157.5	719	717	664	-0.3	-7.4	1373	622	1724	-54.7	177.1
Total	5069	4968	7872	-2.0	58.4	8657	9125	9366	5.4	2.6	11886	10304	13015	-13.3	26.3
Seed	2785	3379	4082	21.3	20.8	3176	3380	3379	6.4	0.0	4337	4011	5172	-7.5	29.0
Fertilisers and Manure															
Fertilisers	1976	3159	3598	59.9	13.9	3741	3436	3266	-8.2	-4.9	6078	4693	5133	-22.8	9.4
Manure	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
Total	1976	3159	3598	59.9	13.9	3741	3436	3266	-8.2	-4.9	6078	4693	5133	-22.8	9.4
Other Inputs															
Insecticides	0	54	249	-	364.4	137	198	176	44.2	-11.2	756	592	700	-21.8	18.3
Irrigation charges	279	696	309	149.1	-55.6	4908	4400	4257	-10.4	-3.2	6944	8207	8480	18.2	3.3

continued

Annex Tables

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Karnataka					Madhya Pradesh					Maharashtra				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on working capital	438	589	810			793	791	776	-0.2	-1.9	1171	1122	1235	-4.2	10.0
Miscellaneous	50	115	78	131.4	-32.4	94	103	111	9.3	7.8	93	69	58	-25.1	-16.6
Crop insurance	0	0	0	-	-	236	180	255	-23.7	41.4	0	0	0	-	-
Fixed Cost	**7549**	**9959**	**10116**	**31.9**	**1.6**	**18340**	**18896**	**18899**	**3.0**	**0.0**	**16221**	**13381**	**14817**	**-17.5**	**10.7**
Rental value of owned land	5633	7797	7802	38.4	0.1	14167	15042	14832	6.2	-1.4	11467	8223	9632	-28.3	17.1
Rent paid for leased-in land	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
Land revenue, cesses & taxes	9	8	5	-8.6	-42.5	4	4	4	-6.0	7.4	17	18	21	8.4	13.4
Depreciation on implements & Farm buildings	405	275	187	-32.0	-32.0	926	889	554	-3.9	-37.7	496	437	321	-12.0	-26.4
Interest on fixed capital	1502	1878	2122	25.0	13.0	3244	2961	3509	-8.7	18.5	4241	4702	4843	10.9	3.0
Total Cost (C_2/ha)	**25019**	**34281**	**39931**	**37.0**	**16.5**	**51284**	**52354**	**51489**	**2.1**	**-1.7**	**63604**	**60003**	**64762**	**-5.7**	**7.9**
A_2 (₹/ha)	**14854**	**19707**	**26927**	**32.7**	**36.6**	**27102**	**27001**	**26158**	**-0.4**	**-3.1**	**39159**	**37495**	**41094**	**-4.2**	**9.6**
A_2+FL (₹/ha)	**17884**	**24606**	**30007**	**37.6**	**22.0**	**33873**	**34350**	**33148**	**1.4**	**-3.5**	**47897**	**47077**	**50287**	**-1.7**	**6.8**
Yield (qtl/ha)	**8.80**	**11.07**	**12.96**	**25.8**	**17.1**	**37.65**	**39.71**	**36.97**	**5.5**	**-6.9**	**27.63**	**22.47**	**27.61**	**-18.7**	**22.9**
A_2 (₹/qtl)	**1298**	**1575**	**1759**	**21.4**	**11.7**	**633**	**604**	**623**	**-4.5**	**3.1**	**1394**	**1607**	**1456**	**15.3**	**-9.4**
A_2+FL (₹/qtl)	**1564**	**1975**	**1959**	**26.3**	**-0.8**	**791**	**760**	**785**	**-4.0**	**3.3**	**1691**	**2019**	**1780**	**19.3**	**-11.8**
C_2 (₹/qtl)	**2220**	**2773**	**2610**	**24.9**	**-5.9**	**1196**	**1157**	**1220**	**-3.3**	**5.5**	**2242**	**2571**	**2291**	**14.7**	**-10.9**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Punjab					Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**30197**	**29677**	**30779**	**-1.7**	**3.7**	**51617**	**55477**	**53938**	**7.5**	**-2.8**	**40456**	**37585**	**45339**	**-7.1**	**20.6**
Human Labour															
Casual	1996	1945	1227	-2.6	-36.9	3767	4174	4607	10.8	10.4	6526	6288	5842	-3.6	-7.1
Attached	635	524	635	-17.5	21.2	154	137	181	-10.8	32.0	19	23	6	22.3	-75.6
Family	3009	2839	3072	-5.6	8.2	21711	22657	19658	4.4	-13.2	7465	7242	9258	-3.0	27.8
Total	5641	5309	4933	-5.9	-7.1	25632	26969	24447	5.2	-9.4	14009	13552	15106	-3.3	11.5
Bullock Labour															
Hired	8	7	1	-12.7	-81.6	6	13	5	134.0	-61.9	4	2	10	-62.8	520.7
Owned	30	28	6	-5.0	-78.6	365	296	436	-18.9	47.3	42	26	69	-38.0	164.1
Total	38	35	7	-6.6	-79.2	370	309	441	-16.6	42.7	46	28	79	-40.4	185.3
Machine Labour															
Hired	8103	8029	8708	-0.9	8.5	6881	7609	7847	10.6	3.1	8361	8496	10482	1.6	23.4
Owned	3763	3867	4129	2.8	6.8	1656	1525	1822	-7.9	19.5	580	473	595	-18.4	25.8
Total	11866	11896	12837	0.3	7.9	8537	9134	9668	7.0	5.8	8940	8969	11077	0.3	23.5
Seed	2670	2864	3066	7.2	7.1	4141	4616	4344	11.5	-5.9	3426	3604	4203	5.2	16.6
Fertilisers and Manure															
Fertilisers	6176	5680	5793	-8.0	2.0	3829	3603	3692	-5.9	2.5	4963	4307	4777	-13.2	10.9
Manure	29	5	19	-82.9	298.2	632	453	496	-28.3	9.5	19	26	30	37.0	15.2
Total	6205	5685	5812	-8.4	2.2	4461	4056	4188	-9.1	3.3	4982	4332	4806	-13.0	10.9
Other Inputs															
Insecticides	2070	2197	2312	6.2	5.2	213	257	335	21.0	30.1	96	128	189	33.4	47.8
Irrigation charges	652	657	738	0.8	12.2	7284	9051	9400	24.3	3.9	7945	6008	8713	-24.4	45.0

continued

Annex Tables

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Punjab					Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on working capital	824	813	840	-1.3	3.2	906	995	1039	9.7	4.4	1000	919	1093	-8.0	18.9
Miscellaneous	232	221	234	-4.9	6.2	73	91	77	24.7	-16.0	9	44	74	381.5	66.3
Crop insurance	0	0	0	-	-	0	0	0	-	-	1	0	0	-	-
Fixed Cost	**40907**	**42559**	**41471**	**4.0**	**-2.6**	**22614**	**21982**	**20114**	**-2.8**	**-8.5**	**24745**	**23834**	**27209**	**-3.7**	**14.2**
Rental value of owned land	29408	29684	30343	0.9	2.2	15858	16583	14240	4.6	-14.1	18931	18970	22688	0.2	19.6
Rent paid for leased-in land	5952	6965	5471	17.0	-21.5	242	153	285	-36.9	86.4	820	721	181	-12.0	-74.9
Land revenue, cesses & taxes	0	0	0	-	-	11	10	1	-7.7	-86.4	4	4	2	-12.8	-37.0
Depreciation on implements & Farm buildings	1040	1181	512	13.6	-56.7	845	702	524	-16.9	-25.3	966	722	684	-25.2	-5.3
Interest on fixed capital	4507	4729	5146	4.9	8.8	5658	4534	5063	-19.9	11.7	4025	3418	3655	-15.1	6.9
Total Cost (C_2/ha)	**71103**	**72236**	**72251**	**1.6**	**0.0**	**74231**	**77459**	**74052**	**4.3**	**-4.4**	**65201**	**61419**	**72549**	**-5.8**	**18.1**
A_2 (₹/ha)	**34179**	**34984**	**33690**	**2.4**	**-3.7**	**31004**	**33685**	**35091**	**8.6**	**4.2**	**34780**	**31790**	**36948**	**-8.6**	**16.2**
A_2+FL (₹/ha)	**37188**	**37823**	**36761**	**1.7**	**-2.8**	**52715**	**56342**	**54749**	**6.9**	**-2.8**	**42245**	**39032**	**46206**	**-7.6**	**18.4**
Yield (qtl/ha)	**51.95**	**49.05**	**48.07**	**-5.6**	**-2.0**	**40.13**	**42.71**	**38.55**	**6.4**	**-9.7**	**39.50**	**38.38**	**38.27**	**-2.8**	**-0.3**
A_2 (₹/qtl)	**577**	**652**	**648**	**13.0**	**-0.5**	**601**	**633**	**728**	**5.2**	**15.2**	**724**	**691**	**784**	**-4.5**	**13.5**
A_2+FL (₹/qtl)	**652**	**704**	**708**	**8.0**	**0.5**	**1014**	**1046**	**1140**	**3.1**	**9.0**	**875**	**844**	**981**	**-3.6**	**16.3**
C_2 (₹/qtl)	**1246**	**1345**	**1391**	**7.9**	**3.4**	**1418**	**1432**	**1534**	**1.0**	**7.1**	**1352**	**1330**	**1541**	**-1.6**	**15.9**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Uttarakhand			West Bengal				
	2018-19	2019-20	% change in 2019-20 over 2018-19	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**38879**	**37658**	**-3.1**	**35171**	**42899**	**48643**	**22.0**	**13.4**
Human Labour								
Casual	3045	2418	-20.6	3996	1890	4386	-52.7	132.0
Attached	50	50	0.1	0	0	0	-	-
Family	10698	10621	-0.7	4948	13716	13860	177.2	1.0
Total	13793	13089	-5.1	8944	15606	18246	74.5	16.9
Bullock Labour								
Hired	9671	9816	1.5	0	0	7	-	-
Owned	36	38	6.0	0	0	510	-	-
Total	9707	9854	1.5	0	0	517	-	-
Machine Labour								
Hired	4126	3807	-7.7	9628	8916	10721	-7.4	20.2
Owned	1814	1818	0.2	0	0	117	-	-
Total	5940	5626	-5.3	9628	8916	10838	-7.4	21.6
Seed	3113	3405	9.4	3582	3982	5148	11.2	29.3
Fertilisers and Manure								
Fertilisers	4290	4016	-6.4	4681	5756	6715	23.0	16.7
Manure	0	0	-	2242	1515	847	-32.4	-44.1
Total	4290	4016	-6.4	6923	7271	7562	5.0	4.0
Other Inputs								
Insecticides	249	272	9.2	0	7	122	-	1579.4
Irrigation charges	928	569	-38.6	5044	5731	5153	13.6	-10.1
Interest on working capital	854	819	-4.1	916	884	1054	-3.4	19.2
Miscellaneous	5	8	59.9	135	500	3	268.9	-99.4
Crop insurance	0	0	-	0	0	0	-	-
Payment to Contractor	-	0	-	-	0	0	-	-
Fixed Cost	**22000**	**22334**	**1.5**	**11910**	**14250**	**14092**	**19.6**	**-1.1**
Rental value of owned land	18350	19104	4.1	11541	13210	12622	14.5	-4.5
Rent paid for leased-in land	0	0	-	0	0	454	-	-

continued

Annex Tables

Annex Table 5.6 (a) : Wheat : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Uttarakhand			West Bengal				
	2018-19	2019-20	% change in 2019-20 over 2018-19	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Land revenue, cesses & taxes	1	2	51.9	0	0	0	-	-
Depreciation on implements & Farm buildings	1196	1153	-3.6	129	316	307	145.2	-2.8
Interest on fixed capital	2453	2074	-15.4	241	724	708	200.8	-2.2
Total Cost (C_2/ha)	**60879**	**59992**	**-1.5**	**47081**	**57149**	**62735**	**21.4**	**9.8**
A_2 (₹/ha)	**29378**	**28193**	**-4.0**	**30352**	**29499**	**35545**	**-2.8**	**20.5**
A_2+FL (₹/ha)	**40076**	**38814**	**-3.2**	**35300**	**43215**	**49405**	**22.4**	**14.3**
Yield (qtl/ha)	**32.05**	**32.68**	**2.0**	**28.73**	**29.20**	**36.24**	**1.6**	**24.1**
A_2 (₹/qtl)	**795**	**757**	**-4.7**	**943**	**961**	**1029**	**1.9**	**7.1**
A_2+FL (₹/qtl)	**1100**	**1064**	**-3.2**	**1097**	**1415**	**1239**	**29.0**	**-12.5**
C_2 (₹/qtl)	**1647**	**1623**	**-1.4**	**1463**	**1871**	**1621**	**27.9**	**-13.4**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Tale 5.6 (b) : Barley : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Himachal Pradesh					Madhya Pradesh		
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	% change in 2019-20 over 2018-19
Operational Cost	**43892**	**45957**	**37888**	**4.7**	**-17.6**	**33096**	**36019**	**8.8**
Human Labour								
Casual	5	202	147	4249.9	-27.2	5640	6412	13.7
Attached	0	0	26	-	-	0	0	-
Family	15759	17972	15424	14.0	-14.2	5236	6944	32.6
Total	15764	18174	15598	15.3	-14.2	10875	13356	22.8
Bullock Labour								
Hired	828	1710	310	106.6	-81.9	0	0	-
Owned	15944	15529	12317	-2.6	-20.7	0	0	-
Total	16771	17239	12627	2.8	-26.8	0	0	-
Machine Labour								
Hired	4202	2908	4194	-30.8	44.2	10964	12526	14.2
Owned	238	144	247	-39.7	72.1	0	0	-
Total	4440	3052	4441	-31.3	45.5	10964	12526	14.2
Seed	1795	1942	1886	8.2	-2.9	3593	3668	2.1
Fertilisers and Manure								
Fertilisers	66	57	78	-14.4	38.6	3497	3076	-12.1
Manure	4198	4639	2557	10.5	-44.9	0	0	-
Total	4264	4695	2636	10.1	-43.9	3497	3076	-12.1
Other Inputs								
Insecticides	0	0	0	-	-	0	0	-
Irrigation charges	0	0	0	-	-	3191	2381	-25.4
Interest on working capital	853	848	681	-0.5	-19.7	844	881	4.4
Miscellaneous	1	7	20	371.8	185.2	131	131	-0.5
Crop insurance	4	0	0	-	-	0	0	-
Payment to Contractor	-	0	0	-	-	-	0	-
Fixed Cost	**12128**	**12341**	**9051**	**1.8**	**-26.7**	**11893**	**12687**	**6.7**
Rental value of owned land	8152	8150	6132	0.0	-24.8	11384	12264	7.7
Rent paid for leased-in land	0	0	0	-	-	0	0	-
Land revenue, cesses & taxes	14	12	10	-15.9	-14.3	4	3	-6.2

continued

Annex Tables

(₹/ha)

Cost Items	Himachal Pradesh					Madhya Pradesh		
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	% change in 2019-20 over 2018-19
Depreciation on implements & Farm buildings	745	758	513	1.7	-32.3	69	66	-4.2
Interest on fixed capital	3216	3422	2396	6.4	-30.0	436	353	-19.0
Total Cost (C_2/ha)	**56020**	**58298**	**46939**	**4.1**	**-19.5**	**44989**	**48076**	**6.9**
A_2 (₹/ha)	**28892**	**28755**	**22987**	**-0.5**	**-20.1**	**27934**	**29145**	**4.3**
A_2+FL (₹/ha)	**44651**	**46726**	**38411**	**4.6**	**-17.8**	**33169**	**36089**	**8.8**
Yield (qtl/ha)	**13.35**	**13.47**	**9.62**	**0.9**	**-28.6**	**27.22**	**27.99**	**2.8**
A_2 (₹/qtl)	**1534**	**1527**	**1680**	**-0.5**	**10.0**	**803**	**826**	**2.8**
A_2+FL (₹/qtl)	**2370**	**2485**	**2754**	**4.8**	**10.8**	**953**	**1022**	**7.2**
C_2 (₹/qtl)	**2933**	**3111**	**3377**	**6.1**	**8.6**	**1293**	**1380**	**6.7**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Tale 5.6 (b) : Barley : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**46296**	**47078**	**53013**	**1.7**	**12.6**	**35299**	**39499**	**42446**	**11.9**	**7.5**
Human Labour										
Casual	4150	4075	4697	-1.8	15.3	7135	5683	6163	-20.3	8.4
Attached	1071	850	73	-20.6	-91.5	0	0	0	-	-
Family	18457	19196	21680	4.0	12.9	8303	11083	12132	33.5	9.5
Total	23678	24122	26450	1.9	9.7	15438	16767	18295	8.6	9.1
Bullock Labour										
Hired	19	40	0	106.9	-	0	0	0	-	-
Owned	162	75	350	-53.7	366.0	0	0	0	-	-
Total	181	115	350	-36.8	205.2	0	0	0	-	-
Machine Labour										
Hired	6227	6711	8282	7.8	23.4	6356	9015	7485	41.8	-17.0
Owned	1944	2193	1754	12.8	-20.0	1028	905	3638	-12.0	302.1
Total	8171	8903	10036	9.0	12.7	7384	9919	11123	34.3	12.1
Seed	3244	3854	2973	18.8	-22.9	3368	3044	3239	-9.6	6.4
Fertilisers and Manure										
Fertilisers	2871	2306	2328	-19.7	1.0	4273	3999	3933	-6.4	-1.6
Manure	1238	93	850	-92.5	809.5	0	0	0	-	-
Total	4109	2399	3179	-41.6	32.5	4273	3999	3933	-6.4	-1.6
Other Inputs										
Insecticides	232	289	382	24.9	32.1	0	0	0	-	-
Irrigation charges	5786	6444	8598	11.4	33.4	3987	4830	4865	21.1	0.7
Interest on working capital	844	845	949	0.2	12.4	818	861	919	5.3	6.7
Miscellaneous	51	106	97	108.2	-8.9	31	78	74	155.8	-4.9
Crop insurance	0	0	0	-	-	0	0	0	-	-
Payment to Contractor	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**18020**	**18078**	**16359**	**0.3**	**-9.5**	**22774**	**21123**	**24950**	**-7.3**	**18.1**
Rental value of owned land	12307	13531	11628	9.9	-14.1	20714	19137	21835	-7.6	14.1
Rent paid for leased-in land	0	55	125	-	125.3	0	188	0	-	-
Land revenue, cesses & taxes	12	10	2	-14.0	-82.9	19	20	13	3.4	-35.1
Depreciation on implements & Farm buildings	638	417	524	-34.5	25.6	298	288	300	-3.6	4.3

continued

Annex Tables

(₹/ha)

Cost Items	Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on fixed capital	5063	4065	4080	-19.7	0.4	1743	1490	2802	-14.5	88.1
Total Cost (C_2/ha)	**64315**	**65156**	**69372**	**1.3**	**6.5**	**58073**	**60622**	**67396**	**4.4**	**11.2**
A_2 (₹/ha)	**28489**	**28364**	**31984**	**-0.4**	**12.8**	**27313**	**28911**	**30627**	**5.9**	**5.9**
A_2+FL (₹/ha)	**46946**	**47561**	**53664**	**1.3**	**12.8**	**35616**	**39995**	**42759**	**12.3**	**6.9**
Yield (qtl/ha)	**35.14**	**40.66**	**33.99**	**15.7**	**-16.4**	**38.19**	**34.00**	**34.52**	**-11.0**	**1.5**
A_2 (₹/qtl)	**606**	**532**	**710**	**-12.4**	**33.6**	**578**	**673**	**696**	**16.4**	**3.4**
A_2+FL (₹/qtl)	**994**	**888**	**1154**	**-10.6**	**29.9**	**761**	**949**	**960**	**24.7**	**1.2**
C_2 (₹/qtl)	**1342**	**1208**	**1494**	**-10.0**	**23.7**	**1243**	**1441**	**1517**	**15.9**	**5.3**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Andhra Pradesh					Bihar					Chhattisgarh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**26403**	**35109**	**37056**	**33.0**	**5.5**	**24831**	**23618**	**26544**	**-4.9**	**12.4**	**30951**	**30850**	**32138**	**-0.3**	**4.2**
Human Labour															
Casual	3463	7377	6695	113.0	-9.2	6197	7109	6413	14.7	-9.8	2534	3036	4149	19.8	36.6
Attached	203	270	151	32.8	-44.2	0	0	0	-	-	136	126	0	-6.9	-
Family	1687	2091	2992	23.9	43.1	6119	5062	6520	-17.3	28.8	7068	5460	4100	-22.7	-24.9
Total	5353	9737	9837	81.9	1.0	12316	12171	12933	-1.2	6.3	9737	8623	8249	-11.4	-4.3
Bullock Labour															
Hired	10	66	537	541.4	715.4	0	0	0	-	-	0	0	0	-	-
Owned	6	58	1680	864.7	2820.0	0	0	0	-	-	683	63	5	-90.8	-92.4
Total	16	123	2217	660.3	1697.0	0	0	0	-	-	683	63	5	-90.8	-92.4
Machine Labour															
Hired	7180	7894	8822	10.0	11.7	3990	3011	4644	-24.5	54.2	7270	7688	6589	5.7	-14.3
Owned	2083	2448	1772	17.5	-27.6	772	268	65	-65.3	-75.8	623	484	911	-22.4	88.3
Total	9262	10342	10594	11.7	2.4	4762	3279	4709	-31.1	43.6	7893	8171	7500	3.5	-8.2
Seed	4553	5481	6168	20.4	12.5	4525	5042	5398	11.4	7.1	4206	5040	6458	19.8	28.1
Fertilisers and Manure															
Fertilisers	3929	5111	4519	30.1	-11.6	2118	2007	2053	-5.2	2.3	2874	3601	2930	25.3	-18.6
Manure	766	1386	136	81.0	-90.2	113	112	101	-0.9	-10.0	0	0	0	-	-
Total	4694	6497	4655	38.4	-28.3	2231	2119	2154	-5.0	1.7	2874	3601	2930	25.3	-18.6
Other Inputs															
Insecticides	1691	1797	2420	6.3	34.6	332	355	473	6.7	33.4	1675	1181	2055	-29.5	74.0
Irrigation charges	27	58	3	111.6	-95.2	87	74	270	-15.3	265.1	2803	2978	3484	6.2	17.0
Interest on working capital	749	1001	1032	33.6	3.2	567	562	607	-0.8	7.9	724	769	850	6.3	10.4
Miscellaneous	58	73	131	25.8	79.0	10	15	0	47.8	-	34	19	51	-44.5	173.1
Crop insurance	0	0	0	-	-	0	0	0	-	-	321	405	555	26.2	37.2
Payment to Contractor	-	-	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**9520**	**18845**	**27307**	**98.0**	**44.9**	**18907**	**15955**	**23851**	**-15.6**	**49.5**	**11348**	**9225**	**16366**	**-18.7**	**77.4**
Rental value of owned land	6836	14460	26106	111.5	80.5	16291	14147	20766	-13.2	46.8	8924	6691	11330	-25.0	69.3

continued

Annex Tables

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Andhra Pradesh					Bihar					Chhattisgarh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Rent paid for leased-in land	1714	3489	0	103.6	-	0	0	0	-	-	0	0	0	-	-
Land revenue, cesses & taxes	0	0	0	-	-	92	100	109	8.0	9.5	1	1	1	5.2	-37.3
Depreciation on implements & Farm buildings	168	205	172	22.0	-15.7	607	509	380	-16.2	-25.3	839	907	675	8.1	-25.6
Interest on fixed capital	802	691	1029	-13.8	48.8	1917	1199	2595	-37.5	116.5	1584	1626	4360	2.7	168.1
Total Cost (C_2/ha)	**35923**	**53953**	**64363**	**50.2**	**19.3**	**43738**	**39573**	**50395**	**-9.5**	**27.3**	**42299**	**40075**	**48503**	**-5.3**	**21.0**
A_2 (₹/ha)	**26598**	**36712**	**34236**	**38.0**	**-6.7**	**19412**	**19164**	**20514**	**-1.3**	**7.0**	**24723**	**26298**	**28713**	**6.4**	**9.2**
A_2+FL (₹/ha)	**28285**	**38802**	**37228**	**37.2**	**-4.1**	**25531**	**24226**	**27034**	**-5.1**	**11.6**	**31791**	**31758**	**32813**	**-0.1**	**3.3**
Yield (qtl/ha)	**5.40**	**14.71**	**18.19**	**172.3**	**23.7**	**13.89**	**12.82**	**14.98**	**-7.7**	**16.8**	**13.17**	**11.72**	**13.76**	**-11.0**	**17.4**
A_2 (₹/qtl)	**4738**	**2518**	**1874**	**-46.9**	**-25.6**	**1349**	**1449**	**1338**	**7.4**	**-7.7**	**1758**	**2054**	**2007**	**16.9**	**-2.3**
A_2+FL (₹/qtl)	**5087**	**2634**	**2034**	**-48.2**	**-22.8**	**1776**	**1832**	**1763**	**3.2**	**-3.7**	**2260**	**2480**	**2293**	**9.8**	**-7.5**
C_2 (₹/qtl)	**6441**	**3662**	**3515**	**-43.1**	**-4.0**	**3040**	**2991**	**3289**	**-1.6**	**10.0**	**3007**	**3130**	**3390**	**4.1**	**8.3**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Gujarat					Haryana					Jharkhand		
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2020-21	% change in 2020-21 over 2018-19
Operational Cost	**31312**	**36359**	**37404**	**16.1**	**2.9**	**20747**	**26975**	**27425**	**30.0**	**1.7**	**28503**	**42921**	**50.6**
Human Labour													
Casual	7225	8200	10048	13.5	22.5	5608	3386	2330	-39.6	-31.2	3951	7186	81.9
Attached	0	0	0	-	-	0	0	0	-	-	0	0	-
Family	7022	8817	7361	25.6	-16.5	5837	10762	10511	84.4	-2.3	8742	12832	46.8
Total	14247	17017	17409	19.4	2.3	11445	14149	12841	23.6	-9.2	12694	20019	57.7
Bullock Labour													
Hired	310	98	160	-68.3	63.3	0	0	0	-	-	0	0	-
Owned	1063	1368	496	28.6	-63.7	0	0	0	-	-	2124	9716	357.4
Total	1373	1466	656	6.7	-55.2	0	0	0	-	-	2124	9716	357.4
Machine Labour													
Hired	3312	4636	5500	40.0	18.6	5586	6290	6774	12.6	7.7	5350	4331	-19.0
Owned	1438	1504	2389	4.6	58.8	1330	1205	102	-9.4	-91.6	0	0	-
Total	4749	6139	7888	29.3	28.5	6916	7494	6876	8.4	-8.3	5350	4331	-19.0
Seed	3017	3528	4306	16.9	22.0	1875	2102	2305	12.1	9.6	4638	3675	-20.8
Fertilisers and Manure													
Fertilisers	2315	2169	1807	-6.3	-16.7	0	675	1968	-	191.6	1963	3000	52.8
Manure	0	0	147	-	-	0	0	0	-	-	143	0	-
Total	2315	2169	1954	-6.3	-9.9	0	675	1968	-	191.6	2106	3000	42.4
Other Inputs													
Insecticides	2178	2175	1919	-0.2	-11.8	0	899	0	-	-	602	1268	110.6
Irrigation charges	2607	2949	2281	13.1	-22.6	59	1164	2897	1875.4	148.8	390	0	-
Interest on working capital	736	835	910	13.4	9.1	452	491	513	8.7	4.3	599	912	52.3
Miscellaneous	89	81	80	-9.5	-0.6	0	0	26	-	-	0	0	-
Crop insurance	0	0	0	-	-	0	0	0	-	-	0	0	-
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	-
Fixed Cost	**11722**	**14187**	**13229**	**21.0**	**-6.8**	**20841**	**21565**	**16582**	**3.5**	**-23.1**	**15804**	**14559**	**-7.9**

continued

Annex Tables

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Gujarat					Haryana					Jharkhand		
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2020-21	% change in 2020-21 over 2018-19
Rental value of owned land	6971	9498	9371	36.2	-1.3	18987	19842	14892	4.5	-24.9	10868	12615	16.1
Rent paid for leased-in land	30	106	603	248.0	470.2	0	0	0	-	-	0	0	-
Land revenue, cesses & taxes	3	3	3	-1.4	-12.8	0	0	0	-	-	38	73	92.4
Depreciation on implements & Farm buildings	209	208	251	-0.5	21.1	266	210	130	-21.0	-38.0	926	512	-44.7
Interest on fixed capital	4508	4373	3001	-3.0	-31.4	1589	1513	1560	-4.7	3.1	3972	1359	-65.8
Total Cost (C_2/ha)	**43034**	**50546**	**50633**	**17.5**	**0.2**	**41588**	**48540**	**44007**	**16.7**	**-9.3**	**44307**	**57481**	**29.7**
A_2 (₹/ha)	**24533**	**27858**	**30900**	**13.6**	**10.9**	**15175**	**16422**	**17044**	**8.2**	**3.8**	**20724**	**30675**	**48.0**
A_2+FL (₹/ha)	**31555**	**36675**	**38261**	**16.2**	**4.3**	**21012**	**27185**	**27555**	**29.4**	**1.4**	**29467**	**43507**	**47.6**
Yield (qtl/ha)	**8.46**	**13.26**	**12.22**	**56.7**	**-7.9**	**18.91**	**14.58**	**8.48**	**-22.9**	**-41.8**	**10.29**	**6.35**	**-38.3**
A_2 (₹/qtl)	**2580**	**1943**	**2401**	**-24.7**	**23.5**	**774**	**1062**	**1848**	**37.2**	**74.0**	**1947**	**4641**	**138.3**
A_2+FL (₹/qtl)	**3440**	**2628**	**3016**	**-23.6**	**14.8**	**1071**	**1757**	**2993**	**64.0**	**70.3**	**2769**	**6583**	**137.8**
C_2 (₹/qtl)	**4728**	**3619**	**3996**	**-23.5**	**10.4**	**2120**	**3138**	**4783**	**48.0**	**52.4**	**4163**	**8697**	**108.9**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Karnataka					Madhya Pradesh					Maharashtra				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**23342**	**25007**	**26659**	**7.1**	**6.6**	**28322**	**29340**	**29295**	**3.6**	**-0.2**	**30389**	**34404**	**37617**	**13.2**	**9.3**
Human Labour															
Casual	3532	5331	5746	50.9	7.8	4420	4768	4168	7.9	-12.6	6357	7679	8397	20.8	9.3
Attached	20	31	31	54.5	0.1	300	129	112	-57.2	-12.7	188	328	208	74.2	-36.6
Family	2915	2610	4020	-10.5	54.1	5365	5684	5051	5.9	-11.1	5828	6287	5076	7.9	-19.3
Total	6468	7971	9797	23.2	22.9	10085	10581	9331	4.9	-11.8	12374	14294	13681	15.5	-4.3
Bullock Labour															
Hired	640	714	687	11.7	-3.8	36	24	27	-32.6	12.6	326	503	443	54.1	-11.9
Owned	2523	3112	2463	23.4	-20.9	237	146	676	-38.2	362.3	1855	2025	1131	9.1	-44.2
Total	3162	3827	3149	21.0	-17.7	273	171	704	-37.5	312.4	2182	2528	1574	15.9	-37.7
Machine Labour															
Hired	5504	3959	4309	-28.1	8.8	5198	6508	6656	25.2	2.3	5150	5118	7878	-0.6	53.9
Owned	575	660	887	14.7	34.5	545	603	360	10.5	-40.3	1184	1093	1786	-7.7	63.4
Total	6079	4619	5196	-24.0	12.5	5743	7110	7016	23.8	-1.3	6335	6211	9664	-1.9	55.6
Seed	3379	3307	3551	-2.1	7.4	5268	4951	5300	-6.0	7.0	3658	4478	4848	22.4	8.2
Fertilisers and Manure															
Fertilisers	1570	2577	2627	64.2	1.9	2235	1984	1977	-11.2	-0.4	1767	2536	3171	43.6	25.0
Manure	0	0	0	-	-	0	0	0	-	-	0	0	327	-	-
Total	1570	2577	2627	64.2	1.9	2235	1984	1977	-11.2	-0.4	1767	2536	3498	43.6	37.9
Other Inputs															
Insecticides	1516	1872	1348	23.4	-28.0	1260	1256	1452	-0.4	15.6	1344	1050	978	-21.9	-6.9
Irrigation charges	423	40	193	-90.5	379.4	2509	2423	2533	-3.4	4.5	1913	2370	2318	23.9	-2.2
Interest on working capital	619	679	686	9.6	1.1	696	717	735	3.0	2.5	744	852	986	14.5	15.7
Miscellaneous	125	115	111	-8.1	-3.3	61	77	86	25.5	12.3	41	63	71	52.8	12.2
Crop insurance	0	0	0	-	-	190	69	162	-63.5	133.1	31	21	0	-32.8	-
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**11345**	**10493**	**11537**	**-7.5**	**10.0**	**13975**	**14751**	**13905**	**5.6**	**-5.7**	**12050**	**12479**	**15281**	**3.6**	**22.5**

continued

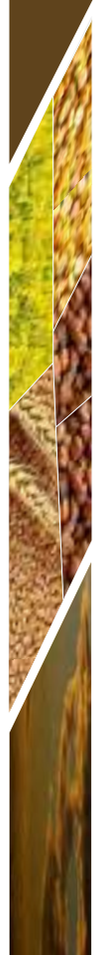
Annex Tables

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Karnataka					Madhya Pradesh					Maharashtra				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Rental value of owned land	9963	9379	10023	-5.9	6.9	10997	12153	11543	10.5	-5.0	7549	8156	10584	8.0	29.8
Rent paid for leased-in land	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
Land revenue, cesses & taxes	6	5	6	-21.0	14.3	5	4	4	-19.0	-4.2	22	17	22	-21.2	25.6
Depreciation on implements & Farm buildings	276	174	131	-36.8	-25.1	721	686	528	-4.8	-23.1	470	456	504	-3.1	10.6
Interest on fixed capital	1100	934	1377	-15.1	47.5	2252	1908	1831	-15.3	-4.0	4009	3850	4172	-4.0	8.4
Total Cost (C_2/ha)	**34687**	**35499**	**38196**	**2.3**	**7.6**	**42296**	**44091**	**43200**	**4.2**	**-2.0**	**42438**	**46884**	**52898**	**10.5**	**12.8**
A_2 (₹/ha)	**20709**	**22577**	**22775**	**9.0**	**0.9**	**23682**	**24345**	**24776**	**2.8**	**1.8**	**25053**	**28591**	**33066**	**14.1**	**15.7**
A_2+FL (₹/ha)	**23624**	**25186**	**26795**	**6.6**	**6.4**	**29047**	**30030**	**29826**	**3.4**	**-0.7**	**30881**	**34877**	**38142**	**12.9**	**9.4**
Yield (qtl/ha)	**6.71**	**4.96**	**9.61**	**-26.1**	**93.8**	**12.62**	**14.33**	**11.62**	**13.5**	**-18.9**	**10.72**	**11.80**	**13.22**	**10.1**	**12.0**
A_2 (₹/qtl)	**2989**	**4605**	**2328**	**54.1**	**-49.4**	**1756**	**1606**	**2050**	**-8.6**	**27.6**	**2257**	**2352**	**2452**	**4.2**	**4.3**
A_2+FL (₹/qtl)	**3333**	**4622**	**2727**	**38.7**	**-41.0**	**2154**	**1967**	**2450**	**-8.7**	**24.6**	**2814**	**2887**	**2834**	**2.6**	**-1.9**
C_2 (₹/qtl)	**4934**	**6548**	**3889**	**32.7**	**-40.6**	**3137**	**2888**	**3548**	**-7.9**	**22.9**	**3861**	**3876**	**3928**	**0.4**	**1.3**

Note: Total cost may not match due to rounding off the figures.
Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India



Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Rajasthan					Telangana					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**30064**	**30395**	**32318**	**1.1**	**6.3**	**31482**	**30223**	**27867**	**-4.0**	**-7.8**	**27949**	**28181**	**35948**	**0.8**	**27.6**
Human Labour															
Casual	4578	3832	2337	-16.3	-39.0	6225	7647	7337	22.8	-4.1	4272	5499	2421	28.7	-56.0
Attached	134	19	141	-85.9	646.9	0	229	898	-	292.2	6	21	0	270.5	-
Family	11523	12708	14936	10.3	17.5	3251	5201	1784	60.0	-65.7	8528	8074	17543	-5.3	117.3
Total	16236	16559	17414	2.0	5.2	9476	13077	10018	38.0	-23.4	12805	13594	19965	6.2	46.9
Bullock Labour															
Hired	0	64	7	-	-89.8	95	0	25	-	-	0	0	0	-	-
Owned	460	562	106	22.1	-81.1	939	1035	1072	10.2	3.6	7	5	0	-30.2	-
Total	460	626	113	35.9	-81.9	1033	1035	1096	0.1	6.0	7	5	0	-30.2	-
Machine Labour															
Hired	3422	3326	4461	-2.8	34.1	8679	5678	4693	-34.6	-17.3	4506	5224	5101	15.9	-2.3
Owned	1932	1497	1300	-22.5	-13.1	101	484	1439	379.1	197.5	1120	653	909	-41.7	39.2
Total	5354	4796	5762	-10.4	20.1	8780	6162	6132	-29.8	-0.5	5626	5877	6011	4.5	2.3
Seed	3513	3644	3894	3.7	6.9	3936	3606	4860	-8.4	34.8	5187	4418	5476	-14.8	23.9
Fertilisers and Manure															
Fertilisers	895	943	897	5.3	-4.8	3713	2188	2689	-41.1	22.9	1570	1224	1319	-22.0	7.8
Manure	0	0	0	-	-	0	0	0	-	-	0	510	0	-	-
Total	895	943	897	5.3	-4.8	3713	2188	2689	-41.1	22.9	1570	1733	1319	10.4	-23.9
Other Inputs															
Insecticides	159	222	82	40.1	-63.1	3543	3278	1891	-7.5	-42.3	347	229	0	-33.8	-
Irrigation charges	2869	3036	3604	5.8	18.7	31	14	313	-55.0	2109.5	1816	1691	2603	-6.9	53.9
Interest on working capital	562	536	527	-4.6	-1.7	855	758	790	-11.4	4.2	589	609	558	3.5	-8.5
Miscellaneous	17	34	25	102.9	-25.3	113	105	77	-7.8	-26.8	4	25	16	492.8	-33.3
Crop insurance	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-

continued

Annex Tables

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Rajasthan					Telangana					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Payment to Contractor	-	0	0	-	-	-	-	0	-	-	-	0	0	-	-
Fixed Cost	**13699**	**13362**	**14546**	**-2.5**	**8.9**	**17696**	**20635**	**21525**	**16.6**	**4.3**	**22947**	**19595**	**17679**	**-14.6**	**-9.8**
Rental value of owned land	8728	9246	9546	5.9	3.3	16639	19744	18964	18.7	-4.0	18255	16041	14181	-12.1	-11.6
Rent paid for leased-in land	0	58	292	-	402.0	0	0	0	-	-	0	414	14	-	-96.5
Land revenue, cesses & taxes	6	7	1	14.9	-87.3	0	0	0	-	-	5	9	4	66.2	-57.6
Depreciation on implements & Farm buildings	459	407	523	-11.4	28.5	73	55	236	-24.8	327.8	742	435	536	-41.4	23.3
Interest on fixed capital	4506	3644	4183	-19.1	14.8	984	835	2325	-15.1	178.3	3944	2696	2944	-31.6	9.2
Total Cost (C_2/ha)	**43763**	**43757**	**46864**	**0.0**	**7.1**	**49179**	**50858**	**49392**	**3.4**	**-2.9**	**50896**	**47776**	**53627**	**-6.1**	**12.2**
A_2 (₹/ha)	**19006**	**18160**	**18198**	**-4.5**	**0.2**	**28305**	**25077**	**26319**	**-11.4**	**5.0**	**20169**	**20965**	**18959**	**3.9**	**-9.6**
A_2+FL (₹/ha)	**30529**	**30868**	**33134**	**1.1**	**7.3**	**31556**	**30278**	**28103**	**-4.0**	**-7.2**	**28697**	**29039**	**36502**	**1.2**	**25.7**
Yield (qtl/ha)	**11.80**	**12.27**	**11.08**	**4.0**	**-9.7**	**12.08**	**13.63**	**12.33**	**12.9**	**-9.5**	**14.17**	**10.43**	**10.28**	**-26.4**	**-1.4**
A_2 (₹/qtl)	**1397**	**1337**	**1616**	**-4.3**	**20.9**	**2344**	**1838**	**2133**	**-21.6**	**16.1**	**1419**	**2136**	**1744**	**50.5**	**-18.4**
A_2+FL (₹/qtl)	**2388**	**2301**	**2778**	**-3.6**	**20.8**	**2613**	**2214**	**2280**	**-15.3**	**3.0**	**1931**	**2635**	**3393**	**36.4**	**28.7**
C_2 (₹/qtl)	**3414**	**3247**	**3919**	**-4.9**	**20.7**	**4072**	**3719**	**4007**	**-8.7**	**7.7**	**3430**	**4346**	**4987**	**26.7**	**14.7**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**26368**	**33172**	**32410**	**25.8**	**-2.3**
Human Labour					
Casual	12088	10714	5386	-11.4	-49.7
Attached	0	0	0	-	-
Family	8392	9555	14574	13.9	52.5
Total	20479	20269	19960	-1.0	-1.5
Bullock Labour					
Hired	0	0	0	-	-
Owned	0	0	3988	-	-
Total	0	0	3988	-	-
Machine Labour					
Hired	927	4312	0	365.4	-
Owned	0	0	3167	-	-
Total	927	4312	3167	365.4	-26.5
Seed	3827	5396	3138	41.0	-41.8
Fertilisers and Manure					
Fertilisers	590	2479	1616	320.4	-34.8
Manure	0	0	0	-	-
Total	590	2479	1616	320.4	-34.8
Other Inputs					
Insecticides	0	0	0	-	-
Irrigation charges	0	0	0	-	-
Interest on working capital	545	716	540	31.4	-24.5
Miscellaneous	0	0	0	-	-
Crop insurance	0	0	0	-	-
Payment to Contractor	-	0	0	-	-
Fixed Cost	**10608**	**7025**	**18631**	**-33.8**	**165.2**
Rental value of owned land	10331	6807	12205	-34.1	79.3
Rent paid for leased-in land	0	0	0	-	-

continued

Annex Tables

Annex Table 5.6 (c) : Gram : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Land revenue, cesses & taxes	0	0	0	-	-
Depreciation on implements & Farm buildings	87	68	282	-21.8	316.3
Interest on fixed capital	191	150	6144	-21.2	3988.6
Total Cost (C_2/ha)	**36975**	**40197**	**51040**	**8.7**	**27.0**
A_2 (₹/ha)	**18062**	**23684**	**18118**	**31.1**	**-23.5**
A_2+FL (₹/ha)	**26454**	**29261**	**32691**	**10.6**	**11.7**
Yield (qtl/ha)	**11.13**	**7.08**	**10.81**	**-36.4**	**52.7**
A_2 (₹/qtl)	**1602**	**3218**	**1591**	**101.0**	**-50.6**
A_2+FL (₹/qtl)	**2294**	**3976**	**2870**	**73.3**	**-27.8**
C_2 (₹/qtl)	**3203**	**4922**	**4481**	**53.7**	**-8.9**

Note: Total cost may not match due to rounding off the figures.
Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (d) : Lentil (Masur) : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Bihar					Madhya Pradesh					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19 19	% change in 2020-21 over 2019-20 20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**20622**	**22165**	**23416**	**7.5**	**5.6**	**20857**	**22731**	**24154**	**9.0**	**6.3**	**23113**	**22197**	**25272**	**-4.0**	**13.9**
Human Labour															
Casual	6620	7640	6706	15.4	-12.2	3841	4181	5158	8.8	23.4	3744	3204	3246	-14.4	1.3
Attached	12	0	51	-	-	846	49	0	-94.2	-	0	23	0	-	-
Family	4305	4734	4439	10.0	-6.2	3695	4766	3820	29.0	-19.8	6538	6766	9651	3.5	42.6
Total	10938	12374	11196	13.1	-9.5	8382	8996	8978	7.3	-0.2	10282	9993	12897	-2.8	29.1
Bullock Labour															
Hired	0	0	0	-	-	0	141	134	-	-5.1	0	19	29	-	46.7
Owned	8	0	0	-	-	256	69	298	-73.0	330.0	0	0	108	-	-
Total	8	0	0	-	-	256	210	432	-18.0	105.2	0	19	136	-	601.1
Machine Labour															
Hired	4101	3682	4781	-10.2	29.8	3393	5074	6522	49.5	28.5	5964	3596	3521	-39.7	-2.1
Owned	243	232	89	-4.5	-61.8	809	1102	126	36.2	-88.6	70	1877	2195	2572.5	16.9
Total	4343	3914	4869	-9.9	24.4	4202	6176	6647	47.0	7.6	6034	5473	5716	-9.3	4.4
Seed	1865	2124	3590	13.9	69.0	2435	2394	2717	-1.7	13.5	3314	3077	2789	-7.2	-9.4
Fertilisers and Manure															
Fertilisers	2362	2670	2299	13.0	-13.9	1958	1742	1278	-11.0	-26.7	1064	1531	940	44.0	-38.6
Manure	77	94	491	21.9	422.2	0	0	0	-	-	0	0	0	-	-
Total	2439	2763	2790	13.3	0.9	1958	1742	1278	-11.0	-26.7	1064	1531	940	44.0	-38.6
Other Inputs															
Insecticides	148	140	338	-5.2	141.6	440	635	898	44.3	41.4	0	136	0	-	-
Irrigation charges	379	309	48	-18.5	-84.5	2500	1952	2414	-21.9	23.7	1914	1475	2301	-22.9	56.0
Interest on working capital	494	528	575	6.8	8.9	520	544	616	4.7	13.2	502	468	473	-6.9	1.2
Miscellaneous	8	13	10	65.5	-23.6	54	70	53	29.3	-23.3	3	24	20	640.1	-16.3
Crop insurance	0	0	0	-	-	110	10	120	-90.6	1064.7	0	0	0	-	-

continued

Annex Tables

Annex Table 5.6 (d) : Lentil (Masur) : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Bihar					Madhya Pradesh					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**17018**	**17719**	**16469**	**4.1**	**-7.1**	**12606**	**12239**	**11263**	**-2.9**	**-8.0**	**15566**	**16160**	**23354**	**3.8**	**44.5**
Rental value of owned land	13402	14303	14584	6.7	2.0	9282	10140	9801	9.2	-3.3	12675	13355	20751	5.4	55.4
Rent paid for leased-in land	0	0	0	-	-	0	0	0	-	-	454	0	614	-	-
Land revenue, cesses & taxes	109	109	150	0.0	37.9	3	3	4	-1.2	4.7	9	9	8	2.6	-11.1
Depreciation on implements & Farm buildings	570	494	292	-13.2	-41.0	638	545	402	-14.6	-26.3	422	365	331	-13.4	-9.3
Interest on fixed capital	2938	2813	1444	-4.3	-48.7	2683	1551	1056	-42.2	-31.9	2006	2431	1650	21.2	-32.1
Total Cost (C_2/ha)	**37640**	**39883**	**39886**	**6.0**	**0.0**	**33463**	**34970**	**35416**	**4.5**	**1.3**	**38679**	**38357**	**48626**	**-0.8**	**26.8**
A_2 (₹/ha)	**16995**	**18033**	**19418**	**6.1**	**7.7**	**17804**	**18513**	**20738**	**4.0**	**12.0**	**17460**	**15805**	**16574**	**-9.5**	**4.9**
A_2+FL (₹/ha)	**21300**	**22767**	**23858**	**6.9**	**4.8**	**21499**	**23279**	**24559**	**8.3**	**5.5**	**23998**	**22571**	**26225**	**-5.9**	**16.2**
Yield (qtl/ha)	**10.70**	**9.94**	**9.34**	**-7.1**	**-6.0**	**11.39**	**10.58**	**9.48**	**-7.1**	**-10.4**	**9.93**	**9.11**	**11.40**	**-8.3**	**25.2**
A_2 (₹/qtl)	**1529**	**1756**	**1983**	**14.9**	**12.9**	**1448**	**1671**	**2090**	**15.4**	**25.1**	**1672**	**1618**	**1452**	**-3.2**	**-10.3**
A_2+FL (₹/qtl)	**1921**	**2215**	**2461**	**15.3**	**11.1**	**1729**	**2050**	**2461**	**18.6**	**20.1**	**2327**	**2380**	**2246**	**2.3**	**-5.6**
C_2 (₹/qtl)	**3396**	**3879**	**4114**	**14.2**	**6.1**	**2698**	**3083**	**3550**	**14.3**	**15.1**	**3749**	**4043**	**4163**	**7.8**	**3.0**

Note: Total cost may not match due to rounding off the figures.
Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (d) : Lentil (Masur) : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**23397**	**31736**	**35345**	**35.6**	**11.4**
Human Labour					
Casual	7222	10141	8100	40.4	-20.1
Attached	0	0	0	-	-
Family	8877	10965	11901	23.5	8.5
Total	16099	21106	20001	31.1	-5.2
Bullock Labour					
Hired	14	50	266	251.9	433.0
Owned	918	580	686	-36.8	18.2
Total	932	630	952	-32.4	51.1
Machine Labour					
Hired	2146	4332	5905	101.9	36.3
Owned	54	293	0	442.8	-
Total	2200	4625	5905	110.2	27.7
Seed	2431	2768	3946	13.9	42.6
Fertilisers and Manure					
Fertilisers	1243	1830	3070	47.2	67.8
Manure	0	0	108	-	-
Total	1243	1830	3178	47.2	73.7
Other Inputs					
Insecticides	41	62	257	52.3	314.9
Irrigation charges	0	67	377	-	465.6
Interest on working capital	440	629	710	43.1	12.9
Miscellaneous	11	20	18	83.9	-8.0
Crop insurance	-	0	0	-	-
Payment to Contractor	-	0	0	-	-
Fixed Cost	**13336**	**15747**	**20665**	**18.1**	**31.2**
Rental value of owned land	12691	14915	19697	17.5	32.1

continued

Annex Tables

Annex Table 5.6 (d) : Lentil (Masur) : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Rent paid for leased-in land	0	0	0	-	-
Land revenue, cesses & taxes	0	0	0	-	-
Depreciation on implements & Farm buildings	227	296	358	30.2	21.1
Interest on fixed capital	418	536	610	28.4	13.7
Total Cost (C_2/ha)	**36733**	**47483**	**56010**	**29.3**	**18.0**
A_2 (₹/ha)	**14747**	**21067**	**23801**	**42.9**	**13.0**
A_2+FL (₹/ha)	**23624**	**32032**	**35703**	**35.6**	**11.5**
Yield (qtl/ha)	**9.79**	**13.40**	**11.67**	**36.9**	**-12.9**
A_2 (₹/qtl)	**1676**	**1626**	**1913**	**-3.0**	**17.7**
A_2+FL (₹/qtl)	**2306**	**2291**	**2947**	**-0.6**	**28.6**
C_2 (₹/qtl)	**3584**	**3396**	**4624**	**-5.2**	**36.2**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Assam					Bihar					Gujarat				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**24965**	**27695**	**26846**	**10.9**	**-3.1**	**21430**	**22157**	**25287**	**3.4**	**14.1**	**39619**	**41276**	**45372**	**4.2**	**9.9**
Human Labour															
Casual	2998	4450	2442	48.4	-45.1	5598	5088	6429	-9.1	26.4	7803	8788	11721	12.6	33.4
Attached	143	131	18	-8.7	-85.9	8	158	300	1901.3	90.2	0	0	0	-	-
Family	9162	9477	11790	3.4	24.4	5123	5766	7010	12.6	21.6	8076	8372	9596	3.7	14.6
Total	12303	14058	14250	14.3	1.4	10729	11012	13739	2.6	24.8	15879	17159	21317	8.1	24.2
Bullock Labour															
Hired	37	85	39	127.6	-54.0	0	0	0	-	-	251	243	70	-3.2	-71.3
Owned	2578	2000	2501	-22.4	25.0	0	0	0	-	-	5	7	1	39.0	-91.2
Total	2616	2086	2540	-20.3	21.8	0	0	0	-	-	256	250	70	-2.4	-71.9
Machine Labour															
Hired	5317	6594	6333	24.0	-4.0	3730	3915	3946	5.0	0.8	5090	5368	4675	5.5	-12.9
Owned	679	583	493	-14.1	-15.4	127	192	247	51.0	28.6	1998	2664	3031	33.3	13.8
Total	5995	7177	6825	19.7	-4.9	3857	4107	4194	6.5	2.1	7088	8032	7706	13.3	-4.1
Seed	514	494	563	-3.8	14.0	825	893	1275	8.3	42.8	1496	1964	2369	31.3	20.6
Fertilisers and Manure															
Fertilisers	2238	2568	1877	14.7	-26.9	3307	3700	3620	11.9	-2.2	4095	3442	3890	-15.9	13.0
Manure	704	648	190	-7.9	-70.7	16	19	84	18.6	340.7	1351	1456	1283	7.7	-11.9
Total	2941	3216	2067	9.3	-35.7	3323	3719	3704	11.9	-0.4	5446	4898	5173	-10.1	5.6
Other Inputs															
Insecticides	80	79	98	-1.2	24.7	78	42	57	-46.1	36.8	335	411	459	22.5	11.7

continued

Annex Tables

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Assam					Bihar					Gujarat				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Irrigation charges	0	0	3	-	-	2115	1877	1762	-11.3	-6.1	7930	7328	7004	-7.6	-4.4
Interest on working capital	479	552	456	15.3	-17.4	494	497	554	0.5	11.5	956	997	1084	4.3	8.7
Miscellaneous	38	35	43	-7.5	21.9	10	11	2	9.8	-79.3	232	236	190	1.8	-19.7
Crop insurance	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**8148**	**8503**	**9741**	**4.3**	**14.6**	**12435**	**13290**	**18800**	**6.9**	**41.5**	**18858**	**19607**	**21998**	**4.0**	**12.2**
Rental value of owned land	6753	7027	8308	4.1	18.2	10799	10922	16121	1.1	47.6	10264	11376	16931	10.8	48.8
Rent paid for leased-in land	22	24	0	5.3	-	0	0	0	-	-	406	630	78	55.4	-87.7
Land revenue, cesses & taxes	100	105	128	4.7	22.0	130	157	189	20.8	20.2	2	2	3	5.8	11.0
Depreciation on implements & Farm buildings	301	350	389	16.2	11.3	406	371	381	-8.6	2.6	468	494	505	5.5	2.3
Interest on fixed capital	971	997	915	2.7	-8.3	1100	1840	2109	67.2	14.7	7718	7104	4481	-8.0	-36.9
Total Cost (C_2/ha)	**33114**	**36198**	**36587**	**9.3**	**1.1**	**33865**	**35447**	**44087**	**4.7**	**24.4**	**58477**	**60883**	**67370**	**4.1**	**10.7**
A_2 (₹/ha)	**16227**	**18697**	**15574**	**15.2**	**-16.7**	**16843**	**16919**	**18846**	**0.4**	**11.4**	**32420**	**34031**	**36362**	**5.0**	**6.8**
A_2+FL (₹/ha)	**25389**	**28174**	**27363**	**11.0**	**-2.9**	**21966**	**22685**	**25857**	**3.3**	**14.0**	**40495**	**42403**	**45958**	**4.7**	**8.4**
Yield (qtl/ha)	**9.75**	**9.48**	**9.54**	**-2.8**	**0.6**	**11.53**	**10.47**	**10.97**	**-9.2**	**4.8**	**17.51**	**17.68**	**19.13**	**1.0**	**8.2**
A_2 (₹/qtl)	**1644**	**1971**	**1610**	**19.9**	**-18.3**	**1436**	**1559**	**1690**	**8.5**	**8.4**	**1790**	**1837**	**1820**	**2.6**	**-0.9**
A_2+FL (₹/qtl)	**2595**	**2962**	**2859**	**14.2**	**-3.5**	**1840**	**2091**	**2294**	**13.6**	**9.8**	**2235**	**2289**	**2301**	**2.4**	**0.5**
C_2 (₹/qtl)	**3383**	**3805**	**3825**	**12.5**	**0.5**	**2836**	**3265**	**3911**	**15.1**	**19.8**	**3226**	**3286**	**3372**	**1.8**	**2.6**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Haryana					Madhya Pradesh					Odisha				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**28949**	**31570**	**30494**	**9.1**	**-3.4**	**29354**	**30031**	**28334**	**2.3**	**-5.6**	**19221**	**20638**	**21035**	**7.4**	**1.9**
Human Labour															
Casual	4557	5327	3878	16.9	-27.2	2494	2999	5773	20.3	92.5	2229	1691	1130	-24.2	-33.1
Attached	32	35	3	9.2	-92.6	0	0	0	-	-	2	2	2	-29.5	39.0
Family	6007	5790	7615	-3.6	31.5	8398	8180	5573	-2.6	-31.9	8973	11340	13122	26.4	15.7
Total	10596	11152	11496	5.2	3.1	10891	11179	11346	2.6	1.5	11205	13032	14255	16.3	9.4
Bullock Labour															
Hired	0	0	0	-	-	0	0	0	-	-	0	133	202	-	51.6
Owned	0	0	23	-	-	0	0	14	-	-	4402	4507	2826	2.4	-37.3
Total	0	0	23	-	-	0	0	14	-	-	4402	4640	3027	5.4	-34.8
Machine Labour															
Hired	6154	7493	7227	21.8	-3.6	9029	8550	8253	-5.3	-3.5	576	370	726	-35.7	96.2
Owned	3662	2842	2148	-22.4	-24.4	223	182	79	-18.5	-56.6	528	343	172	-35.1	-49.9
Total	9816	10336	9375	5.3	-9.3	9252	8732	8332	-5.6	-4.6	1104	713	898	-35.4	26.0
Seed	1250	1629	1516	30.3	-6.9	3045	2931	2918	-3.8	-0.4	734	618	788	-15.8	27.4
Fertilisers and Manure															
Fertilisers	3879	3885	3395	0.2	-12.6	3219	2853	2682	-11.4	-6.0	731	782	831	7.0	6.2
Manure	0	0	0	-	-	0	1257	0	-	-	125	223	0	79.1	-
Total	3879	3885	3395	0.2	-12.6	3219	4110	2682	27.7	-34.7	855	1005	831	17.5	-17.4
Other Inputs															
Insecticides	49	178	325	267.0	82.3	330	354	204	7.1	-42.4	244	140	300	-42.6	114.4
Irrigation charges	2597	3558	3451	37.0	-3.0	1861	1947	1945	4.6	-0.1	357	199	681	-44.1	241.5
Interest on working capital	695	781	693	12.4	-11.3	635	662	690	4.3	4.2	311	282	240	-9.3	-14.9
Miscellaneous	67	52	81	-21.6	55.6	69	85	98	21.9	15.8	11	9	16	-17.5	81.4
Crop insurance	0	0	139	-	-	51	32	106	-38.0	232.5	0	0	0	-	-

continued

Annex Tables

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Haryana					Madhya Pradesh					Odisha				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**34432**	**33898**	**25564**	**-1.6**	**-24.6**	**17315**	**19718**	**20747**	**13.9**	**5.2**	**6593**	**6808**	**5992**	**3.3**	**-12.0**
Rental value of owned land	24205	21995	20263	-9.1	-7.9	13023	15372	17022	18.0	10.7	5002	4777	4107	-4.5	-14.0
Rent paid for leased-in land	0	1228	45	-	-96.3	0	0	0	-	-	0	0	0	-	-
Land revenue, cesses & taxes	0	0	0	-	-	7	8	8	7.1	6.0	10	8	12	-18.9	47.2
Depreciation on implements & Farm buildings	1708	1636	849	-4.2	-48.1	669	668	606	-0.2	-9.1	471	641	350	36.2	-45.5
Interest on fixed capital	8518	9038	4407	6.1	-51.2	3616	3670	3111	1.5	-15.3	1110	1382	1524	24.4	10.3
Total Cost (C_2/ha)	**63380**	**65468**	**56058**	**3.3**	**-14.4**	**46669**	**49748**	**49081**	**6.6**	**-1.3**	**25814**	**27445**	**27027**	**6.3**	**-1.5**
A_2 (₹/ha)	**24649**	**28645**	**23774**	**16.2**	**-17.0**	**21632**	**22525**	**23376**	**4.1**	**3.8**	**10728**	**9947**	**8275**	**-7.3**	**-16.8**
A_2+FL (₹/ha)	**30657**	**34435**	**31388**	**12.3**	**-8.8**	**30030**	**30706**	**28948**	**2.3**	**-5.7**	**19701**	**21287**	**21397**	**8.0**	**0.5**
Yield (qtl/ha)	**20.40**	**19.16**	**19.21**	**-6.1**	**0.3**	**16.37**	**17.84**	**18.00**	**9.0**	**0.9**	**4.37**	**4.01**	**3.10**	**-8.2**	**-22.6**
A_2 (₹/qtl)	**1163**	**1431**	**1201**	**23.1**	**-16.1**	**1212**	**1160**	**1217**	**-4.2**	**4.9**	**2485**	**2444**	**2625**	**-1.7**	**7.4**
A_2+FL (₹/qtl)	**1445**	**1721**	**1579**	**19.1**	**-8.2**	**1670**	**1576**	**1502**	**-5.6**	**-4.7**	**4508**	**5309**	**6896**	**17.8**	**29.9**
C_2 (₹/qtl)	**2987**	**3271**	**2820**	**9.5**	**-13.8**	**2596**	**2554**	**2548**	**-1.6**	**-0.2**	**5907**	**6845**	**8711**	**15.9**	**27.3**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Punjab					Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**28353**	**28880**	**31416**	**1.9**	**8.8**	**33403**	**34559**	**37829**	**3.5**	**9.5**	**27635**	**28285**	**32271**	**2.4**	**14.1**
Human Labour															
Casual	2747	2927	3583	6.6	22.4	3376	3277	3287	-2.9	0.3	5714	5441	5088	-4.8	-6.5
Attached	3096	2716	3368	-12.3	24.0	177	810	73	357.4	-91.0	42	2	18	-95.0	741.9
Family	7292	9785	8776	34.2	-10.3	12594	13089	14628	3.9	11.8	6367	7224	8326	13.5	15.3
Total	13135	15428	15727	17.5	1.9	16147	17176	17988	6.4	4.7	12123	12667	13432	4.5	6.0
Bullock Labour															
Hired	19	11	0	-43.1	-	4	0	13	-	-	0	0	0	-	-
Owned	47	5	23	-89.9	382.3	3	1	38	-62.5	3119.7	34	67	74	98.2	10.2
Total	66	16	23	-76.2	44.8	7	1	51	-82.4	4249.6	34	67	74	98.2	10.2
Machine Labour															
Hired	2328	1671	1506	-28.2	-9.8	6043	6374	5693	5.5	-10.7	6381	6971	7769	9.2	11.4
Owned	5261	4856	7554	-7.7	55.6	1182	1225	2387	3.7	94.8	641	796	691	24.3	-13.2
Total	7588	6527	9061	-14.0	38.8	7225	7599	8080	5.2	6.3	7021	7767	8460	10.6	8.9
Seed	1497	1887	1440	26.1	-23.7	1807	2331	2027	29.0	-13.1	1268	1284	1940	1.3	51.1
Fertilisers and Manure															
Fertilisers	3651	2753	2772	-24.6	0.7	2805	2488	2415	-11.3	-2.9	3402	2996	4009	-11.9	33.8
Manure	0	0	7	-	-	150	0	20	-	-	0	1	0	-	-
Total	3651	2753	2779	-24.6	1.0	2955	2488	2435	-15.8	-2.1	3402	2997	4009	-11.9	33.8

continued

Annex Tables

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	Punjab					Rajasthan					Uttar Pradesh				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Other Inputs															
Insecticides	1024	1034	915	1.0	-11.5	107	99	72	-7.9	-27.2	31	36	104	15.0	188.8
Irrigation charges	428	475	562	11.2	18.2	4498	4161	6429	-7.5	54.5	3098	2807	3478	-9.4	23.9
Interest on working capital	638	579	686	-9.3	18.6	631	651	703	3.2	8.1	644	638	726	-1.0	13.7
Miscellaneous	325	181	223	-44.2	23.2	27	53	44	96.5	-17.4	12	22	48	79.6	115.3
Crop insurance	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
Payment to Contractor	-	0	0	-	-	-	0	0	-	-	-	0	0	-	-
Fixed Cost	**28376**	**23436**	**33473**	**-17.4**	**42.8**	**15691**	**14955**	**21055**	**-4.7**	**40.8**	**21380**	**19787**	**27810**	**-7.5**	**40.5**
Rental value of owned land	20434	16629	25094	-18.6	50.9	10653	11181	14893	5.0	33.2	15124	14473	23610	-4.3	63.1
Rent paid for leased-in land	51	1609	3731	3071.5	131.9	330	573	419	73.7	-26.9	2398	2478	703	3.4	-71.6
Land revenue, cesses & taxes	0	0	0	-	-	9	9	2	-3.8	-74.0	9	9	8	-0.5	-9.9
Depreciation on implements & Farm buildings	1291	1014	755	-21.5	-25.6	663	417	533	-37.1	27.8	661	524	658	-20.7	25.5
Interest on fixed capital	6600	4184	3894	-36.6	-6.9	4035	2776	5208	-31.2	87.6	3188	2302	2831	-27.8	23.0
Total Cost (C_2/ha)	**56728**	**52316**	**64889**	**-7.8**	**24.0**	**49093**	**49514**	**58884**	**0.9**	**18.9**	**49014**	**48072**	**60080**	**-1.9**	**25.0**
A_2 (₹/ha)	**22403**	**21719**	**27126**	**-3.1**	**24.9**	**21811**	**22469**	**24155**	**3.0**	**7.5**	**24336**	**24073**	**25314**	**-1.1**	**5.2**
A_2+FL (₹/ha)	**29695**	**31503**	**35902**	**6.1**	**14.0**	**34405**	**35557**	**38783**	**3.3**	**9.1**	**30703**	**31297**	**33640**	**1.9**	**7.5**
Yield (qtl/ha)	**15.37**	**11.57**	**15.88**	**-24.7**	**37.3**	**17.18**	**17.37**	**14.97**	**1.1**	**-13.8**	**15.06**	**14.91**	**16.24**	**-1.0**	**8.9**
A_2 (₹/qtl)	**1400**	**1928**	**1698**	**37.7**	**-12.0**	**1208**	**1252**	**1595**	**3.7**	**27.3**	**1517**	**1488**	**1508**	**-1.9**	**1.3**
A_2+FL (₹/qtl)	**1848**	**2622**	**2234**	**41.9**	**-14.8**	**1901**	**1953**	**2499**	**2.7**	**28.0**	**1878**	**1935**	**1968**	**3.1**	**1.7**
C_2 (₹/qtl)	**3550**	**4367**	**4038**	**23.0**	**-7.5**	**2717**	**2720**	**3798**	**0.1**	**39.6**	**3002**	**2969**	**3513**	**-1.1**	**18.3**

Note: Total cost may not match due to rounding off the figures.
Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Operational Cost	**36643**	**37120**	**42249**	**1.3**	**13.8**
Human Labour					
Casual	9744	8180	10361	-16.0	26.7
Attached	0	7	0	-	-
Family	13941	13145	13579	-5.7	3.3
Total	23685	21333	23940	-9.9	12.2
Bullock Labour					
Hired	413	209	149	-49.4	-28.8
Owned	344	245	391	-28.8	59.7
Total	757	454	540	-40.0	18.9
Machine Labour					
Hired	2445	6267	7099	156.3	13.3
Owned	48	97	56	101.8	-42.7
Total	2494	6365	7154	155.2	12.4
Seed	680	813	773	19.5	-4.9
Fertilisers and Manure					
Fertilisers	5097	4879	5026	-4.3	3.0
Manure	183	36	398	-80.5	1013.2
Total	5280	4915	5423	-6.9	10.3
Other Inputs					
Insecticides	376	341	509	-9.5	49.5
Irrigation charges	2638	2147	3030	-18.6	41.1

continued

Annex Tables

Annex Table 5.6 (e) : Rapeseed & Mustard : Break-up of Cost of Cultivation

(₹/ha)

Cost Items	West Bengal				
	2018-19	2019-20	2020-21	% change in 2019-20 over 2018-19	% change in 2020-21 over 2019-20
Interest on working capital	688	727	869	5.6	19.6
Miscellaneous	46	27	11	-41.3	-59.9
Crop insurance	0	0	0	-	-
Payment to Contractor	-	0	0	-	-
Fixed Cost	**12725**	**14382**	**20000**	**13.0**	**39.1**
Rental value of owned land	10800	12388	19050	14.7	53.8
Rent paid for leased-in land	597	602	117	0.9	-80.6
Land revenue, cesses & taxes	14	0	0	-98.7	-
Depreciation on implements & Farm buildings	267	248	298	-7.1	20.0
Interest on fixed capital	1048	1144	535	9.1	-53.2
Total Cost (C_2/ha)	**49369**	**51503**	**62249**	**4.3**	**20.9**
A_2 (₹/ha)	**23580**	**24826**	**29084**	**5.3**	**17.2**
A_2+FL (₹/ha)	**37521**	**37971**	**42663**	**1.2**	**12.4**
Yield (qtl/ha)	**12.50**	**12.75**	**15.07**	**2.0**	**18.2**
A_2 (₹/qtl)	**1807**	**1878**	**1863**	**4.0**	**-0.8**
A_2+FL (₹/qtl)	**2858**	**2864**	**2746**	**0.2**	**-4.1**
C_2 (₹/qtl)	**3760**	**3882**	**4007**	**3.2**	**3.2**

Note: Total cost may not match due to rounding off the figures.
Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

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

(₹/ha)

Cost Items	Karnataka		
	2018-19	2020-21	% change in 2020-21 over 2018-19
Operational Cost	**32056**	**16609**	**-48.2**
Human Labour			
Casual	5063	3521	-30.4
Attached	0	0	-
Family	6841	3207	-53.1
Total	11903	6728	-43.5
Bullock Labour			
Hired	625	668	6.8
Owned	142	305	115.1
Total	767	972	26.8
Machine Labour			
Hired	5463	1971	-63.9
Owned	0	2338	-
Total	5463	4310	-21.1
Seed	1094	402	-63.3
Fertilisers and Manure			
Fertilisers	4238	1710	-59.6
Manure	0	0	-
Total	4238	1710	-59.6
Other Inputs			
Insecticides	619	1898	206.7
Irrigation charges	7085	79	-98.9
Interest on working capital	764	406	-46.8
Miscellaneous	125	104	-16.4
Crop insurance	0	0	-
Payment to Contractor	-	0	-
Fixed Cost	**10011**	**5929**	**-40.8**

continued

Annex Tables

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

(₹/ha)

Cost Items	Karnataka		
	2018-19	2020-21	% change in 2020-21 over 2018-19
Rental value of owned land	9013	3783	-58.0
Rent paid for leased-in land	0	0	-
Land revenue, cesses & taxes	13	5	-64.0
Depreciation on implements & Farm buildings	61	101	64.9
Interest on fixed capital	925	2039	120.6
Total Cost (C_2/ha)	**42068**	**22538**	**-46.4**
A_2 (₹/ha)	**25290**	**13509**	**-46.6**
A_2+FL (₹/ha)	**32131**	**16715**	**-48.0**
Yield (qtl/ha)	**8.69**	**3.54**	**-59.3**
A_2 (₹/qtl)	**2894**	**3724**	**28.7**
A_2+FL (₹/qtl)	**3678**	**4600**	**25.1**
C_2 (₹/qtl)	**4814**	**6210**	**29.0**

Note: Total cost may not match due to rounding off the figures.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India

Annex Table 5.7: All-India Projected Cost of Production of Rabi Crops for Crop Season 2021-22 and 2022-23

Crop	Cost of Production during Crop Season (₹/qtl)						Change (%) in Projected Cost of Production during Crop Year 2022-23 over 2021-22		
	2021-22			2022-23					
	A_2	A_2+FL	C_2	A_2	A_2+FL	C_2	A_2	A_2+FL	C_2
Wheat	807	1008	1518	851	1065	1575	5.5	5.7	3.8
Barley	673	1019	1439	704	1082	1487	4.6	6.2	3.3
Gram	2346	3004	4117	2476	3206	4341	5.5	6.7	5.4
Lentil	2303	3079	4422	2399	3239	4608	4.2	5.2	4.2
Rapeseed & Mustard	1724	2523	3506	1831	2670	3740	6.2	5.8	6.7
Safflower	3013	3627	5050	2954	3765	5135	-2.0	3.8	1.7

Note: All-India CoP of a crop was weighted average of CoPs of projected States

Source: CACP calculations using CS data

Annex Tables

Annex Table 5.8: Year-wise Projected Cost of Production (A_2, A_2+FL & C_2), Minimum Support Price (MSP) and Percent Margin in MSP over Cost of Production for the Crop Year of Rabi Crops

Crop	Crop Year 2013-14							Crop Year 2014-15						
	Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP			Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP		
	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2
Wheat	-	679.25	1108.57	1400	-	106.1	26.3	-	744	1147	1450	-	94.9	26.4
Barley	-	676.43	1034.90	1100	-	62.6	6.3	-	735	1065	1150	-	56.5	8.0
Gram	-	1786.24	2865.30	3100	-	73.5	8.2	-	1902	2981	3175	-	66.9	6.5
Lentil	-	1798.73	2760.10	2950	-	64.0	6.9	-	1860	2952	3075	-	65.3	4.2
Rapeseed & Mustard	-	1306.71	2368.07	3050	-	133.4	28.8	-	1504	2455	3100	-	106.1	26.3
Safflower	-	2558.35	3501.21	3000	-	17.3	-14.3	-	3025	3685	3050	-	0.8	-17.2

continued

Crop	Crop Year 2015-16							Crop Year 2016-17						
	Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP			Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP		
	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2
Wheat	631	785	1163	1525	141.7	94.3	31.1	631	797	1203	1625	157.6	103.9	35.1
Barley	486	776	1089	1225	152.1	57.9	12.5	511	816	1119	1325	159.3	62.4	18.4
Gram	1724	2124	3102	3500$	103.0	64.8	12.8	1799	2241	3185	4000§	122.4	78.5	25.6
Lentil	1573	2015	3098	3400$	116.1	68.7	9.7	1674	2174	3360	3950µ	135.9	81.7	17.5
Rapeseed & Mustard	1138	1702	2605	3350	194.4	96.8	28.6	1232	1871	2773	3700¤	200.3	97.7	33.4
Safflower	2574	3057	3734	3300	28.2	7.9	-11.6	2076	3049	3952	3700¤	78.3	21.4	-6.4

continued

Annex Table 5.8: Year-wise Projected Cost of Production (A_2, A_2+FL & C_2), Minimum Support Price (MSP) and Percent Margin in MSP over Cost of Production for the Crop Year of Rabi Crops

Crop	Crop Year 2017-18							Crop Year 2018 -19						
	Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP			Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP		
	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2
Wheat	642	817	1256	1735	170.2	112.4	38.1	673	866	1339	1840	173.2	112.5	37.4
Barley	522	845	1190	1410	170.4	66.9	18.5	540	860	1247	1440	166.6	67.5	15.4
Gram	1977	2461	3526	4400µ	122.6	78.8	24.8	2144	2637	3838	4620	115.5	75.2	20.4
Lentil	1845	2366	3727	4250¤	130.4	79.6	14.0	1945	2532	4215	4475	130.1	76.8	6.2
Rapeseed & Mustard	1354	2123	3086	4000¤	195.4	88.4	29.6	1385	2212	3277	4200	203.4	89.9	28.2
Safflower	2216	3125	3979	4100¤	85.0	31.2	3.0	2503	3294	4072	4945	97.5	50.1	21.5

continued

Crop	Crop Year 2019 -20							Crop Year 2020 -21						
	Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP			Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP		
	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2
Wheat	724	923	1425	1925	166.0	108.5	35.1	763	960	1467	1975	158.8	105.7	34.6
Barley	585	919	1347	1525	160.8	65.9	13.2	629	971	1404	1600	154.5	64.7	14.0
Gram	2267	2801	4023	4875	115.1	74.0	21.2	2296	2866	4012	5100	122.1	77.9	27.1
Lentil	2034	2727	4286	4800	136.0	76.0	12.0	2169	2864	4204	5100	135.1	78.1	21.3
Rapeseed & Mustard	1495	2323	3401	4425	195.9	90.5	30.1	1603	2415	3470	4650	190.0	92.5	34.0
Safflower	2951	3470	4593	5215	76.7	50.3	13.5	2939	3551	4908	5327	81.3	50.0	8.5

continued

Annex Table 5.8: Year-wise Projected Cost of Production (A_2, A_2+FL & C_2), Minimum Support Price (MSP) and Percent Margin in MSP over Cost of Production for the Crop Year of Rabi Crops

Crop	Crop Year 2021-22							Crop Year 2022 -23						
	Cost of Production (CoP) (₹/qtl)			MSP (₹/qtl)	Margin (%) in MSP over CoP			Cost of Production (CoP) (₹/qtl)			MSP @ (₹/qtl)	Margin (%) in MSP over CoP @		
	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2	A_2	A_2+FL	C_2		A_2	A_2+FL	C_2
Wheat	807	1008	1518	2015	149.7	99.9	32.7	851	1065	1575	2125	149.7	99.5	34.9
Barley	673	1019	1439	1635	142.9	60.5	13.6	704	1082	1487	1735	146.4	60.4	16.7
Gram	2346	3004	4117	5230	122.9	74.1	27.0	2476	3206	4341	5335	115.5	66.4	22.9
Lentil	2303	3079	4422	5500	138.8	78.6	24.4	2399	3239	4608	6000	150.1	85.2	30.2
Rapeseed & Mustard	1724	2523	3506	5050	192.9	100.2	44.0	1831	2670	3740	5450	197.7	104.1	45.7
Safflower	3013	3627	5050	5441	80.6	50.0	7.7	2954	3765	5135	5650	91.3	50.0	10.0

Note: All-India CoP of a crop was weighted average of CoPs of projected States

#: This is derived by subtracting the cost on transportation, marketing and crop insurance premium (₹45.67) from all-India modified cost of production A_2+FL (₹2754.08)

$: Including bonus of ₹75 per quintal

µ: Including bonus of ₹150 per quintal

¤ : Including bonus of ₹100 per quintal

§: Included Bonus ₹200 per quintal

@: Recommended MSP

Source: CACP Calculations and MSPs

Annex Table 5.9: All-India Relative Average Gross Returns with respect to Wheat of Rabi Crops for 2018-19, 2019-20 and 2020-21

Year	Average Gross Returns over actual CoC (₹/ha)		Relative Average Gross Returns Over actual CoC (%)	
	A_2	A_2+FL	A_2	A_2+FL
Wheat				
2018-19	51907	43783	100.0	100.0
2019-20	54744	46375	100.0	100.0
2020-21	49158	40488	100.0	100.0
TE2020-21	51936	43549	100.0	100.0
Barley				
2018-19	41535	28670	80.0	65.5
2019-20	47861	32033	87.4	69.1
2020-21	40417	22375	82.2	55.3
TE2020-21	43271	27693	83.3	63.6
Gram				
2018-19	26152	19804	50.4	45.2
2019-20	28590	21101	52.2	45.5
2020-21	34244	26105	69.7	64.5
TE2020-21	29662	22337	57.1	51.3
Lentil				
2018-19	28741	23132	55.4	52.8
2019-20	30494	24010	55.7	51.8
2020-21	38936	31969	79.2	79.0
TE2020-21	32724	26370	63.0	60.6
Rapeseed & Mustard				
2018-19	37662	27460	72.6	62.7
2019-20	40713	29981	74.4	64.6
2020-21	62762	51293	127.7	126.7
TE2020-21	47046	36244	90.6	83.2
Safflower				
2018-19	10761	3920	20.7	9.0
2019-20	-	-	-	-
2020-21	1625	-1582	3.3	-3.9
TE2020-21	6193	1169	11.9	2.7

Note: 1. Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for 2018-19 and 2020-21 for gram in Jharkhand and for safflower in Karnataka, due toUnavailability of data.

2: All-India CoC, GVO and gross returns of a crop were weighted average of respec tive CoC, GVO and gross returnof projected States.

Source: CACP calculations using CS data

Annex Table 5.10: Relative Average Gross Returns with respect to Wheat of Rabi Crops in Selected States, TE2020-21

Crop	Actual Average Gross Returns Over CoC (₹/ha)		Relative Average Gross Returns Over CoC (%)	
	A_2	A_2+FL	A_2	A_2+FL
Andhra Pradesh				
Wheat*	9058	5389	100.0	100.0
Gram	23948	21692	264.4	402.5
Assam				
Wheat#	18522	7680	100.0	100.0
Rapeseed & Mustard	16809	6666	90.8	86.8
Bihar				
Wheat	34176	27393	100.0	100.0
Gram	48306	42406	141.3	154.8
Lentil	28072	23579	82.1	86.1
Rapeseed & Mustard	25088	19122	73.4	69.8
Chhattisgarh				
Wheat	20455	14575	100.0	100.0
Gram	26588	21046	130.0	144.4
Gujarat				
Wheat	39326	32797	100.0	100.0
Gram	25510	17777	64.9	54.2
Rapeseed & Mustard	44269	35588	112.6	108.5
Haryana				
Wheat	76798	70298	100.0	100.0
Gram	47357	38320	61.7	54.5
Rapeseed & Mustard	65681	59211	85.5	84.2
Himachal Pradesh				
Wheat	36710	24124	100.0	100.0
Barley	3420	-12965	9.3	-53.7
Jharkhand				
Wheat	10566	1257	100.0	100.0
Gram	18824	8036	178.2	639.1
Karnataka				
Wheat	9058	5389	100.0	100.0
Gram	20749	17567	229.1	326.0
Safflower	6193	1169	68.4	21.7
Madhya Pradesh				
Wheat	50733	43696	100.0	100.0
Barley	20435	14346	40.3	32.8
Gram	31176	25810	61.5	59.1
Lentil	27354	23260	53.9	53.2
Rapeseed & Mustard	48416	41032	95.4	93.9
Maharashtra				
Wheat	19383	10212	100.0	100.0

continued

Annex Table 5.10: Relative Average Gross Returns with respect to Wheat of Rabi Crops in Selected States, TE2020-21

Crop	Actual Average Gross Returns Over CoC (₹/ha)		Relative Average Gross Returns Over CoC (%)	
	A_2	A_2+FL	A_2	A_2+FL
Gram	23663	17933	122.1	175.6
Odisha				
Wheat#	18522	7680	100.0	100.0
Rapeseed & Mustard	8864	-2281	47.9	-29.7
Punjab				
Wheat	68487	65514	100.0	100.0
Rapeseed & Mustard	42516	33899	62.1	51.7
Rajasthan				
Wheat	61182	39840	100.0	100.0
Barley	45793	26016	74.8	65.3
Gram	37318	24263	61.0	60.9
Rapeseed & Mustard	51935	38498	84.9	96.6
Telangana				
Wheat$	19383	10212	100.0	100.0
Gram	34929	31517	180.2	308.6
Uttar Pradesh				
Wheat	49255	41267	100.0	100.0
Barley	49888	39382	101.3	95.4
Gram	39996	28615	81.2	69.3
Lentil	36066	28414	73.2	68.9
Rapeseed & Mustard	40115	32809	81.4	79.5
Uttarakhand				
Wheat	38248	27588	100.0	100.0
West Bengal				
Wheat	18522	7680	100.0	100.0
Gram	19169	9655	103.5	125.7
Lentil	43200	32618	233.2	424.7
Rapeseed & Mustard	31227	17672	168.6	230.1

** Average gross returns of Karnataka have been taken, as CS data for wheat were not collected from Andhra Pradesh*
** Average gross returns of West Bengal have been taken, as CS data for wheat were not collected from Assam and Odisha*
$ Average gross returns of Maharashtra have been taken, as CS data for wheat were not collected from Assam and Telangana
Note: 1. Average Gross Returns were for 2018-19 and 2019-20 for wheat in Uttarakhand and for barley in Madhya Pradesh, and for 2018-19 and 2020-21 for gram in Jharkhand and for safflower in Karnataka, due to unavailability of data.
2: All-India CoC, GVO and gross returns of a crop were weighted average of respective CoC, GVO and gross returns of projected States.
Source: CACP calculations using CS data

Annex Table 5.11: Comparison of CACP and State Projected Cost of Production (C_2) and Yield, and suggested Minimum Support Price by State for Rabi Crops for RMS 2023-24

State	CACP Projections on the basis of CS data		State Projections		Suggested Minimum Support Price by State (₹/qtl)
	Yield (qtl/ha)	Cost of Production (₹/qtl)	Yield (qtl/ha)	Cost of Production (₹/qtl)	
Wheat					
Assam*	CS data are not available		13.79	3015	No Suggestion
Bihar	30.20	1624	32.00	1809	2174
Chhattisgarh	23.53	1836	16.00	1838	2250
Gujarat	33.80	1766	32.05	2104	3500
Haryana	49.42	1563	Cost estimates are not provided		No Suggestion
Himachal Pradesh	22.97	2250	Cost estimates are not provided		No Suggestion
Jharkhand$	19.37	2160	20.85	1397	2673
Karnataka	10.94	2581	Cost estimates are not provided		No Suggestion
Madhya Pradesh	38.17	1421	Cost estimates are not provided		No Suggestion
Maharashtra	26.00	2655	24.24	2846	3796
Punjab	49.98	1425	48.70	2027	3040
Rajasthan	40.88	1504	38.06	1633	2450
Telangana	CS data are not available		15.00	3506	5259
Uttar Pradesh	38.72	1635	35.78	1594	No Suggestion
Uttarakhand	35.41	1686	Cost estimates are not provided		No Suggestion
West Bengal	31.39	1845	30.28	2556	3140
Barley					
Himachal Pradesh	18.62	2528	Cost estimates are not provided		No Suggestion
Madhya Pradesh	27.61	1432	Cost estimates are not provided		No Suggestion
Punjab	CS data are not available		25.92	1503	2255
Rajasthan	36.60	1414	36.07	1293	1940
Uttar Pradesh	35.57	1560	29.70	1399	No Suggestion
Gram					
Andhra Pradesh	12.77	4783	16.00	5038	7558
Bihar	15.09	3572	16.00	4037	6056
Chhattishgarh	12.88	3952	10.00	3060	5330
Gujarat	13.94	3778	17.62	3572	6100
Haryana	13.99	3690	Cost estimates are not provided		No Suggestion
Jharkhand$	13.17	4434	11.88	3048	4743
Karnataka#	7.95	5356	14.30	4494	5720
Madhya Pradesh	13.51	4015	Cost estimates are not provided		No Suggestion
Maharashtra	12.28	4817	11.47	4890	6425
Odisha^	CS data are not available		15.00	3897	No Suggestion
Punjab	Not Projected		11.41	4090	6135
Rajasthan	12.16	3950	12.63	3592	5390
Telangana	12.68	4365	15.00	5980	8969
Uttar Pradesh	11.63	5246	13.25	3223	No Suggestion
West Bengal	9.67	5057	Cost estimates are not provided		No Suggestion

continued

Annex Table 5.11: Comparison of CACP and State Projected Cost of Production (C_2) and Yield, and suggested Minimum Support Price by State for Rabi Crops for RMS 2023-24

State	CACP Projections on the basis of CS data		State Projections		Suggested Minimum Support Price by State (₹/qtl)
	Yield (qtl/ha)	Cost of Production (₹/qtl)	Yield (qtl/ha)	Cost of Production (₹/qtl)	
Lentil					
Assam*	CS data are not available		7.29	4086	No Suggestion
Bihar	10.40	4053	12.00	3960.00	5940
Jharkhand&	CS data are not available		8.50	3464	5384
Punjab	Not Projected		Cost estimates are not provided		No Suggestion
Rajasthan	Not Projected		Cost estimates are not provided		No Suggestion
Madhya Pradesh	10.48	3835	Cost estimates are not provided		No Suggestion
Uttar Pradesh	10.15	5518	11.03	3119	No Suggestion
Uttarakhand**	CS data are not available		8.70	5110	6531
West Bengal	11.89	4637	Cost estimates are not provided		No Suggestion
Rapeseed & Mustard					
Andhra Pradesh	CS data are not available		10.00	5006	6381
Aasam*	9.59	5422	6.47	4640	No Suggestion
Bihar	11.36	3645	13.00	4102	6153
Chhattisgarh	Not Projected		7.50	2707	5200
Gujarat	18.11	3653	19.76	3606	6200
Haryana	19.59	3601	Cost estimates are not provided		No Suggestion
Madhya Pradesh	18.00	2833	Cost estimates are not provided		No Suggestion
Odisha@	5.10	5672	15.00	4231	5400
Punjab	15.44	4020	13.45	3772	5658
Rajasthan	16.51	3757	17.24	3063	5300
Telangana	CS data are not available		9.00	4384	6577
Uttar Pradesh	15.79	4028	13.34	3148	No Suggestion
Uttarakhand**	CS data are not available		7.34	5156	5612
West Bengal	13.44	4719	11.68	5121	6020
Safflower					
Karnataka	7.35	5135	Cost estimates are not provided		No Suggestion
Maharashtra	CS data are not available		6.42	4517	5945
Telangana	CS data are not available		6.50	5788	8683

** Main Product Ratio under CS of West Bengal was used for calculating CoP from CoC of State Government*
$ Main Product Ratio under CS of Jharkhand was used for calculating CoP from CoC of State Government
^ Ratio of CoC C_2 and CoC A_2+FL and Main Product Ratio under CS of West Bengal were used for calculating CoP from CoC of State Government
 # Main Product Ratio under CS of Karnataka was used for calculating CoP from CoC of State Government
& Main Product Ratio under CS of Bihar was used for calculating CoP from CoC of State Government
***Main Product Ratio under CS of Uttar Pradesh was used for calculating CoP from CoC of State Government*
@ Ratio of CoC C_2 and CoC A_2+FL and Main Product Ratio under CS of Odisha were used for calculating CoP
Source: State Governments and CACP calculations

Annex Tables

Annex Table 5.12 : Crop-wise Projections of States having small Productions and Samples of Rabi Crops for Marketing Season -2023-24

Crop	State	Reasons for inclusion in Projection	Action and Recommendation
Wheat	Chhattisgarh	Although State area and production shares of Wheat at national level were low, yet there were 100% area and production shares of Wheat in Rabi cereals at State level during TE2021-22. State sample size of Wheat under CS during TE2020-21 was 0.6% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals. However, State sample size should be increased.
	Himachal Pradesh	Although State area and production shares of Wheat at national level were low, yet area and production of Wheat in Rabi cereals at State level during TE2021-22 were 94.0% and 94.5%, respectively. State sample size of Wheat under CS during TE2020-21 was 8.9% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals.
	Jharkhand	Although State area and production shares of Wheat at national level were low, yet there were 100% area and production shares of Wheat in Rabi cereals at State level during TE2021-22. State sample size of Wheat under CS during TE2020-21 was 1.1% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals.
	Karnataka	Although State area and production shares of Wheat at national level were low, yet there were 100% area and production shares of Wheat in Rabi cereals at State level during TE2021-22. State sample size of Wheat under CS during TE2020-21 was 1.1% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals.
	Uttarakhand	Although State area and production shares of Wheat at national level were low, yet area and production of Wheat in Rabi cereals at State level during TE2021-22 were 93.3% and 96.9%, respectively. State average sample size of Wheat under CS during 2018-19 and 2019-20 was 1.2% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals. However, CS data should be collected every year.
	West Bengal	Although State area and production shares of Wheat at national level were low, yet area and production of Wheat in Rabi cereals at State level during TE2021-22 were 99.8% and 99.9%, respectively. State Sample size of Wheat under CS during TE2020-21 was 1.0% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Wheat in State Rabi cereals. However, State sample size should be increased.
Gram	Bihar	Although State area and production shares of Gram at national level were low, yet area and production of Gram in Rabi pulses at State level during TE2021-22 were 20.7% and 22.2%, respectively. State sample size of Gram under CS during TE2020-21 was 5.9% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Gram in State Rabi pulses.

Annex Table 5.12: Crop-wise Projections of States having small Productions and Samples of Rabi Crops for Marketing Season 2023-24

Crop	State	Reasons for inclusion in Projection	Action and Recommendation
Gram	Haryana	Although State area and production shares of Gram at national level were low, yet area and production of Gram in Rabi pulses at State level during TE2021-22 were 91.5% and 91.8%, respectively. State sample size of Gram under CS during TE2020-21 was 1.1% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Gram in State Rabi pulses.
	Jharkhand	Although State area and production shares of Gram at national level were low, yet area and production of Gram in Rabi pulses at State level during TE2021-22 were 61.9% and 67.4%, respectively. State average sample size of Gram under CS during 2018-19 and 2020-21was 0.9% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Gram in State Rabi pulses. However, CS data should be collected every year with increased sample size.
	West Bengal	Although State area and production shares of Gram at national level were low, yet area and production of Gram in Rabi pulses at State level during TE2021-22 were 12.4% and 16.1%, respectively. State sample size of Gram under CS during TE2020-21 was 0.5% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Gram in State Rabi pulses. However, State sample size should be increased.
Rapeseed & Mustard	Odisha	Although State area and production shares of Rapeseed & Mustard at national level were low, yet area and production of Rapeseed & Mustard in Rabi oilseeds at State level during TE2021-22 were 48.1% and 34.6%, respectively. State sample size of Rapeseed & Mustard under CS during TE2020-21 was 4.3% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Rapeseed & Mustard in State Rabi oilseeds.
	Punjab	Although State area and production shares of Rapeseed & Mustard at national level were low, yet there were 100% area and production shares of Rapeseed & Mustard in Rabi oilseeds at State level during TE2021-22. State sample size of Rapeseed & Mustard under CS during TE2020-21 was 3.0% of all-India sample size.	**Projected.** Projection was made in State having reasonable area and production shares of Rapeseed & Mustard in State Rabi oilseeds.
Safflower	Karnataka	State area and production shares of Safflower at national level were adequate, and area and production of Rapeseed & Mustard in Rabi oilseeds at State level during TE2021-22 were 96.2% and 97.3%, respectively. State average sample size of Safflower under CS during 2018-19 and 2020-21 was 4 (100% of all-India sample size).	**Projected.** Projection was made in State having reasonable area and production shares of Safflower in State Rabi oilseeds. However, CS data should be collected every year with increased sample size.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India, and CACP calculations

Annex Tables

Annex Table 5.13: Crop-wise States not-included in Projection of Rabi Crops for Marketing Season 2023-24

Crop	State	Reasons for Non-inclusion in Projection	Action and Recommendation
Gram	Punjab	Although area and production shares of Gram in Rabi pulses at State level during TE2021-22 were 45.8% and 56.9%, respectively, yet sample size was thin and CS data were available only for one year.	**Not Projected.** CS data should be collected every year with increased sample size.
Lentil	Punjab	Although area and production shares of Lentil in Rabi pulses at State level during TE2021-22 were 16.9% and 9.7%, respectively, yet sample size was small and CS data were available only for one year.	**Not Projected.** CS data should be collected every year with increased sample size.
	Rajasthan	Although State area and production shares of Lentil at national level during TE2021-22 were 1.4% and 1.9%, respectively, yet sample size was small and CS data were available only for one year.	**Not Projected.** CS data should be collected every year with increased sample size.
Rapeseed & Mustard	Chhattisgarh	Although area and production shares of Rapeseed & Mustard in Rabi oilseeds at State level during TE2021-22 were 72.8% and 79.3%, respectively and CS data were available for two years, yet average sample size during 2018-19 and 2019-20 was thin.	**Not Projected.** CS data should be collected every year with increased sample size.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India, and CACP calculations

Annex Table 5.14: Crop-wise Inclusion of States under Comprehensive Scheme

Crop	State/Union Territory	Reasons for Inclusion under Comprehensive Scheme	Action and Recommendation
Wheat	Assam	Although State area and production shares of Wheat at national level during TE2021-22 were only 0.04% and 0.01%, respectively, yet there were 100% State area and production shares of Wheat in State Rabi cereals. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Jammu & Kashmir	Although State area and production shares of Wheat at national level during TE2021-22 were only 0.78% and 0.45%, respectively, yet State area and production shares of Wheat in State Rabi cereals were 97.70% and 99.31%, respectively, which were reasonably adequate. But, there was no implementation of Comprehensive Scheme within the State.	Comprehensive Scheme should be implemented within the State.
	Telangana	Although State area and production shares of Wheat at national level during TE2021-22 were only 0.02% and 0.01%, respectively, yet there were 100% State area and production shares of Wheat in State Rabi cereals. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
Barley	Bihar	Although State area and production shares of Barley in State Rabi cereals during TE2021-22 were very low, yet State area and production shares of Barley at national level were 1.44% and 0.84%, respectively, which were adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Haryana	Although State area and production shares of Barley in State Rabi cereals during TE2021-22 were very low, yet State area and production shares of Barley at national level were 1.76% and 2.22%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Maharashtra	Although State area and production shares of Barley in State Rabi cereals during TE2021-22 were very low, yet State area and production shares of Barley at national level were 5.22% and 1.11%, respectively, which were adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Punjab	Although State area and production shares of Barley in State Rabi cereals during TE2021-22 were very low, yet State area and production shares of Barley at national level were 1.11% and 1.37%, respectively, which were adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Uttarakhand	Although State area and production shares of Barley in State Rabi cereals during TE2021-22 were small, yet State area and production shares of Barley at national level were 3.83% and 1.74%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data under Comprehensive Scheme should be collected for the State.
Gram	Kerala	Although State area and production shares of Gram at national level during TE2021-22 were low, yet State area and production shares of Gram in State Rabi pulses were 37.01% and 33.40%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.

Annex Tables

Annex Table 5.14: Crop-wise Inclusion of States under Comprehensive Scheme

Crop	State/Union Territory	Reasons for Inclusion under Comprehensive Scheme	Action and Recommendation
Gram	Odisha	Although State area and production shares of Gram at national level during TE2021-22 were only 0.30% and 0.19%, respectively, yet State area and production shares of Gram in State Rabi pulses were 16.54% and 20.97%, respectively, which were reasonable. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Tamil Nadu	Although State area and production shares of Gram at national level during TE2020-21 were only 0.05% and 0.04%, respectively, yet State area and production shares of Gram in State Rabi pulses were 4.45% and 5.76%, respectively, which were reasonable. The quantum of State production of Gram during TE2021-22 was adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
Lentil	Assam	State area and production shares of Lentil at national level during TE2021-22 were 1.72% and 1.33%, respectively, and State area and production shares of Lentil in State Rabi pulses were 34.58% and 30.49%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Jammu & Kashmir	Although State area and production shares of Lentil at national level during TE2021-22 were are low, yet State area and production shares of Lentil in State Rabi pulses were 17.92% and 17.53%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	Comprehensive Scheme should be implemented within the State.
	Jharkhand	State area and production shares of Lentil at national level during TE2021-22 were 4.76% and 4.26%, respectively, and State area and production shares of Lentil in State Rabi pulses were 16.39% and 12.63%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Tripura	Although State area and production shares of Lentil at national level during TE2021-22 were 0.13% and 0.10%, respectively, yet State area and production shares of Lentil in State Rabi pulses were 30.74% and 27.47%, respectively, which were reasonably adequate. But, there was no implementation of Comprehensive Scheme within the State.	Comprehensive Scheme should be implemented within the State.
	Uttarakhand	Although State area and production shares of Lentil at national level during TE2021-22 were only 0.76% and 0.67%, respectively, yet State area and production shares of Lentil in State Rabi pulses were 57.14% and 56.86%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
Rapeseed & Mustard	Andhra Pradesh	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.02% and 0.01%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 62.50% and 62.80%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.

Annex Table 5.14: Crop-wise Inclusion of States under Comprehensive Scheme

Crop	State/Union Territory	Reasons for Inclusion under Comprehensive Scheme	Action and Recommendation
Rapeseed & Mustard	Himachal Pradesh	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.12% and 0.06%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 95.86% and 97.48%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Jammu & Kashmir	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.66% and 0.35%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 99.55% and 99.73%, respectively, which were reasonably adequate. But, there was no implementation of Comprehensive Scheme within the State.	Comprehensive Scheme should be implemented within the State.
	Jharkhand	State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were 5.29% and 2.90%, respectively, and State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 88.90% and 91.36%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Maharashtra	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.31% and 0.07%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 43.62% and 33.55%, respectively, which were reasonable. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Tamil Nadu	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were low, yet there were 100% State area and production shares of Rapeseed & Mustard under State Rabi oilseeds, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Telangana	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.01% and 0.01%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 21.58% and 30.38%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Tripura	Although State area and production shares of Rapeseed & Mustard at national level during TE2021-22 were only 0.11% and 0.06%, respectively, yet State area and production shares of Rapeseed & Mustard in State Rabi oilseeds were 99.40% and 100.0%, respectively, which were reasonably adequate. But, there was no implementation of Comprehensive Scheme within the State.	Comprehensive Scheme should be implemented within the State.
	Uttarakhand	Although State area and production shares of Rapeseed& Mustard at national level during TE2021-22 were only 0.23% and 0.15%, respectively, yet there were 100% State area and production shares of Rapeseed & Mustard in State Rabi oilseeds. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.

Annex Tables

Annex Table 5.14: Crop-wise Inclusion of States under Comprehensive Scheme

Crop	State/Union Territory	Reasons for Inclusion under Comprehensive Scheme	Action and Recommendation
Safflower	Andhra Pradesh	State area and production shares of Safflower at national level during TE2021-22 were 1.74% and 1.25%, respectively, and State area and production shares of Safflower in State Rabi oilseeds were 37.50% and 37.20%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Jharkhand	Although State area and production shares of Safflower in State Rabi oilseeds were very low, yet State area and production shares of Safflower at national level during TE2020-21 were 0.89% and 0.61%, respectively, which were reasonable. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Maharashtra	State area and production shares of Safflower at national level during TE2021-22 were 38.38% and 32.27%, respectively, and State area and production shares of Safflower in State Rabi oilseeds were 44.20% and 57.93%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.
	Telangana	State area and production shares of Safflower at national level during TE2021-22 were 6.34% and 7.62%, respectively, and State area and production shares of Safflower in State Rabi oilseeds were 78.42% and 69.62%, respectively, which were reasonably adequate. But, there was no cost data under Comprehensive Scheme for the State.	CS data should be collected for the State.

Source: Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare, Government of India, and CACP calculations

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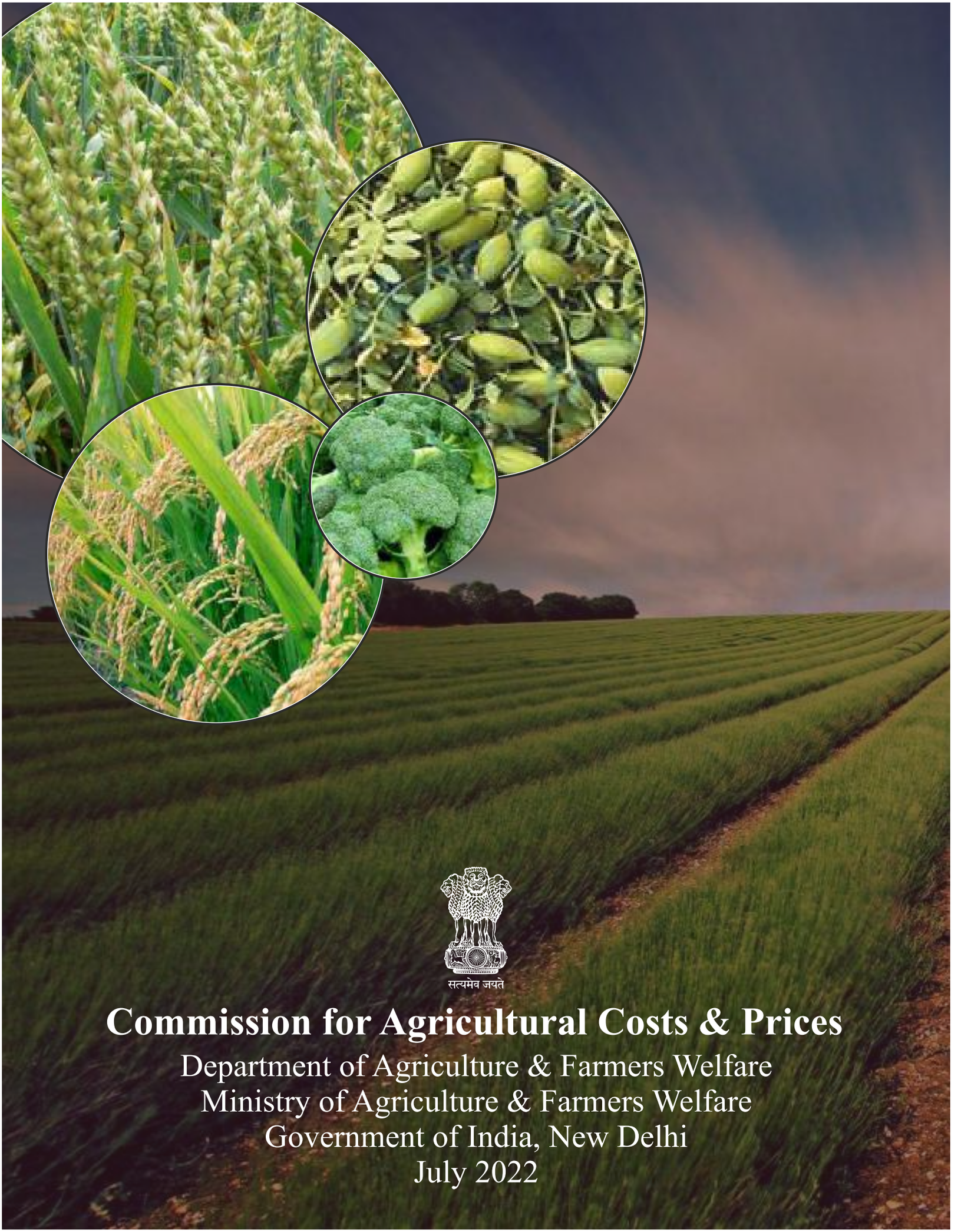

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