# AGRICULTURAL SITUATION IN INDIA

# JUNE, 2014


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# *Agricultural Situation in India*

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**Contents**

**Part I**



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## NOTE TO CONTRIBUTORS

Articles on the State of Indian Agriculture and allied sectors are accepted for publication in the Directorate of Economics & Statistics, Department of Agriculture & Cooperation monthly Journal "Agricultural Situation in India". The Journal intends to provide a forum for scholarly work and also to promote technical competence for research in agricultural and allied subjects. The articles in Hard Copy as well as Soft Copy in MS Word, not exceeding five thousand words, may be sent in duplicate, typed in double space on one side of fullscape paper in Times New Roman font size 12, addressed to the Economic & Statistical Adviser, Room No.145, Krishi Bhawan, New Delhi-11 0001, alongwith a declaration by the author(s) that the article has neither been published nor submitted for publication elsewhere. The author(s) should furnish their e-mail address, Phone No. and their permanent address only on the forwarding letter so as to maintain anonymity of the author while seeking comments of the referees on the suitability of the article for publication.

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## PART II

## *STATISTICAL TABLES*



**Abbreviations used**

N.A. —Not Available.
N.Q. —Not Quoted.
N.T. —No Transactions.
N.S. —No Supply/No Stock.
R. —Revised.
M.C. —Market Closed.
N.R. —Not Reported.
Neg. —Negligible.
Kg. —Kilogram.
Q. —Quintal.
(P) —Provisional.
Plus (+) indicates surplus or increase.
Minus (–) indicates deficit or decrease.

# A. General Survey

## Agriculture

**Rainfall:** With respect to rainfall situation in India, the year is categorized into four seasons : winter season (January-February); pre monsoon (March-May); south west monsoon (June-September) and post monsoon (October-December). South west monsoon accounts for more than 75 per cent of annual rainfall. The actual rainfall received during the Monsoon period 01.06.2014- 16.07.2014, has been 196.9 mm as against the normal at 308.2 mm.

As per seasonal outlook of the Bureau of Meteorology (Australia) (15th July, 2014), "while the majority of climate models suggest El Niño remains likely for the spring of 2014, most have eased their predicted strength. If an El Niño were to occur, it is increasingly unlikely to be a strong event".

**All India production of foodgrains:** As per the 3rd advance estimates released by Ministry of Agriculture on 15.05.2014, production of total foodgrains during 2013-14 is estimated at 264.38 million tonnes compared to 257.13 million tonnes in 2012-13.

TABLE 1 : PRODUCTION OF MAJOR AGRICULTURAL CROPS (IN MILLION TONNES)

| Crop | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | (3rd advance estimates) |
|---|---|---|---|---|---|---|
| Rice | 99.18 | 89.09 | 95.98 | 105.30 | 105.24 | 106.29 |
| Wheat | 80.68 | 80.80 | 86.87 | 94.88 | 93.51 | 95.85 |
| Total Pulses | 14.57 | 14.66 | 18.24 | 17.09 | 18.34 | 19.57 |
| Total Food-grains | 234.47 | 218.11 | 244.49 | 259.29 | 257.13 | 264.38 |
| Total Oilseeds | 27.72 | 24.88 | 32.48 | 29.79 | 30.94 | 32.41 |
| Sugarcane | 285.03 | 292.30 | 342.38 | 361.04 | 341.20 | 348.38 |

**Procurement:** During the Kharif Marketing Season 2013-14, (which spans from October 2013 to September 2014), the procurement of rice stood at 31.06 million tonnes as on 18.07.2014. During Rabi Marketing Season 2014-15 (which spans from April 2014 to March 2015), the procurement of wheat was 28.02 million tonnes as on 11.07.2014.

TABLE 2— PROCUREMENT IN MILLION TONNES

| Crop | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 |
|---|---|---|---|---|---|
| Rice | 34.20 | 35.04 | 34.04 | 31.06* | |
| Wheat | 22.51 | 28.34 | 38.15 | 25.09 | 28.02** |
| **Total** | **56.71** | **63.38** | **72.19** | **56.15** | |

* Position as on 18-07-2014

** Position as on 11-07-2014

## Off-take

Off-take of rice during the month of May, 2014 was 23.22 lakh tonnes. This comprises 20.12 lakh tonnes under TPDS and 3.10 lakh tonnes under other schemes. In respect of wheat, the total off take was 20.17 lakh tonnes in May 2014, comprising 18.32 lakh tonnes under TPDS and 1.85 lakh tonnes under other schemes.

## Stocks:

Stocks of food grains (rice and wheat) held by FCI as on July 1, 2014 were 65.34 million tonnes, which is lower by 11.6 per cent compared to the level of 73.91 million tonnes as on July 1, 2013, but higher than the buffer stock norm of 31.90 million tonnes as on July 1, 2014.

TABLE 3 : OFF-TAKE AND STOCKS OF FOODGRAINS (MILLION TONNES)

| Crop | Off-take | | | | Stocks | |
|---|---|---|---|---|---|---|
| | 2011-12 | 2012-13 | 2013-14 | 2014-15 (Till May) | July 1, 2013 | July 1, 2014# |
| Rice | 32.12 | 32.64 | 29.20 | 4.48 | 31.51 | 21.24 |
| Unmilled Paddy in terms of Rice | | | | | | 4.30 |
| Wheat | 24.26 | 33.21 | 30.62 | 3.80 | 42.40 | 39.80 |
| **Total** | 56.38 | 65.85 | 59.82 | 8.28 | 73.91 | 65.34 |

Note: Buffer Norms for Rice & Wheat are 11.80 Million Tonnes & 20.10 Million Tonnes as on 1.7.2014 respectively.
# Since September, 2013, FCI gives separate figures for rice and unmilled paddy lying with FCI &state agencies in terms of rice.

**Economic Growth**

As per the Provisional Estimates of the Central Statistics Office (CSO), the growth in Gross Domestic Product (GDP) at factor cost at constant (2004-05 prices) is estimated at 4.7 per cent:in 2013-14 with agriculture, industry and services registering growth rates of 4.7 per cent, and 0.4 per cent and 6.8 per cent respectively. The GDP growth rate is placed at 4.7 per cent and 5.2 per cent in the first and second quarters respectively and 4.6 per cent each in the third and fourth quarters of 2013-14.

TABLE 4: GROWTH OF GDP AT FACTOR COST BY ECONOMIC ACTIVITY (AT 2004-05 PRICES)

| Sector | Growth (in Per cent) | | | Percentage Share in GDP | | |
|---|---|---|---|---|---|---|
| | 2011- 12 | 2012-13(1R) | 2013-14 (PE) | 2011-12 | 2012-13(1R) | 2013-14(PE) |
| 1 Agriculture, forestry & fishing | 5.0 | 1.4 | 4.7 | 14.4 | 13.9 | 13.9 |
| 2 Industry | 7.8 | 1.0 | 0.4 | 28.2 | 27.3 | 26.1 |
| a Mining & quarrying | 0.1 | -2.2 | -1.4 | 2.1 | 2.0 | 1.9 |
| b Manufacturing | 7.4 | 1.1 | -0.7 | 16.3 | 15.8 | 14.9 |
| c Electricity, gas & water supply | 8.4 | 2.3 | 5.9 | 1.9 | 1.9 | 1.9 |
| d Construction | 10.8 | 1.1 | 1.6 | 7.9 | 7.7 | 7.4 |
| 3 Services | 6.6 | 7.0 | 6.8 | 57.4 | 58.8 | 59.9 |
| a Trade, hotels, transport & Communication | 4.3 | 5.1 | 3.0 | 26.7 | 26.9 | 26.4 |
| b Financing, insurance, real estate and business services | 11.3 | 10.9 | 12.9 | 18.0 | 19.1 | 20.6 |
| c Community, social & personal services | 4.9 | 5.3 | 5.6 | 12.7 | 12.8 | 12.9 |
| 4 GDP at factor cost | 6.7 | 4.5 | 4.7 | 100 | 100 | 100 |

1R : 1st Revised Estimates; PE: Provisional Estimates. Source: CSO.

TABLE 5 : GROWTH OF QUARTERLY ESTIMATES OF GDP AT CONSTANT (2004-05) PRICES

| Sector | | 2011-12 | | | | 2012-13 | | | | 2013-14 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | QI | Q2 | Q3 | Q4 |
| I | Agritculture, forestry & fishing | 6.5 | 4.0 | 5.9 | 3.4 | 1.8 | 1.8 | 0.8 | 1.6 | 4.0 | 5.0 | 3.7 | 6.3 |
| 2 | Industry | 10.1 | 8.2 | 6.9 | 6.3 | 0.3 | -0.4 | 1.7 | 2.1 | -0.4 | 2.6 | -0.4 | -0.2 |
| a | Mining & quarrying | 0.3 | -4,6 | -1.9 | 5.8 | -1.1 | -0.1 | -2.0 | -4.8 | -3.9 | 0.0 | -1.2 | -0.4 |
| b | Manufacturing | 12.4 | 7.8 | 5.3 | 4.7 | -1.1 | 0.0 | 2.5 | 3.0 | -1.2 | 1.3 | -1.5 | -1.4 |
| c | Electricity, gas & water supply | 8.5 | 10.3 | 9.6 | 5.4 | 4.2 | 1.3 | 2.6 | 0.9 | 3.8 | 7.8 | 5.0 | 7.2 |
| d | Construction | 8.9 | 11.9 | 12.2 | 10.2 | 2.8 | -1.9 | 1.0 | 2.4 | 1.1 | 4.4 | 0.6 | 0.7 |
| 3 | Services | 6.7 | 7.0 | 6.5 | 6.1 | 7.2 | 7.6 | 6.9 | 6.3 | 7.2 | 6.3 | 7.2 | 6.4 |
| a | Trade, hotels, transport & communication | 5.5 | 4.7 | 4.0 | 3.3 | 4.0 | 5.6 | 5.9 | 4.8 | 1.6 | 3.6 | 2.9 | 3.9 |
| b | Financing, insurance, real estate and business services | 11.3 | 12.0 | 11.1 | 11.0 | 11.7 | 10.6 | 10.2 | 11.2 | 12.9 | 12.1 | 14.1 | 12.4 |
| c | Community, social & personal services | 2.4 | 5.4 | 5.7 | 5.7 | 7.6 | 7.4 | 4.0 | 2.8 | 10.6 | 3.6 | 5.7 | 3.3 |
| 4 | GDP at factor cost | 7.6 | 7.0 | 6.5 | 5.8 | 4.5 | 4.6 | 4.4 | 4.4 | 4.7 | 5.2 | 4.6 | 4.6 |

*Source*: CSO.

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## *B. Articles*

# Agricultural Diversification Towards Horticulture in Rajasthan Prospects and Challenges

MRUTYUNJAY SWAIN[1], S.S. KALAMKAR[2], MANISH KANT OJHA[3] AND SHREEKANT SHARMA[4]

**Abstract**

The paper examines the nature and pattern of growth in area and production of horticultural crops in Rajasthan. The prospects and constraints in agricultural diversification towards horticulture in the state have been analyzed covering a period of last three decades. The study reveals that there is a clear shift in area from cereals and fodder to oilseeds, guar and horticultural crops. However, there has been wide temporal and spatial variation in growth of area and production of horticultural crops. Most of the districts with larger share in horticultural area have not performed well with respect to production and yield levels. The rainfall deficiency and its erratic pattern and low irrigation coverage have posed great difficulty for horticultural growth in the state. Higher production and yield risks due to frequent pest attack, poor crop insurance coverage, insufficient post-harvest management and marketing facilities and poor rural infrastructure (like rural roads and electricity in remote rural areas of the state) have also hindered the process of agricultural diversification towards horticultural crops.

Key words: Crop Diversification, Horticultural Crops, Growth Constraints

## 1. Introduction

Agriculture and allied sector forms the backbone of overall development of Rajasthan though its contribution in net state domestic product (NSDP) has fallen from about 35 per cent in 1990-91 to around 23 per cent in 2011-12. Around two third of state's population (56.5 million) is still dependent on agricultural activities for their livelihood. Thus, a higher priority has been given to agriculture in successive plan periods to achieve the goals of reducing poverty and malnutrition as well as of promoting inclusive growth. Since agriculture forms the resource base for a number of agro-based industries and agro-services, agriculture is viewed not as farming alone but as a holistic value chain, which includes farming, wholesaling, warehousing, processing, and retailing. This holistic value chain has helped a lot in gradual diversification of cropping pattern in favour of high value crops (HVCs). The state is the largest one in India accounting for about 11.2 per cent of country's reporting area and 13.5 per cent of country's gross cropped area (GCA). The share of area under horticultural crops in the state was about 5.2 per cent of the country in 2010-11. The share of horticultural crops to state's GCA has been doubled (from 2.2 per cent in 1990-91 to 4.4 per cent in 2010-11) in last two decades. Though Rajasthan occupies 11th position in the country in terms of area under horticultural crops (NHB, 2011), it has huge potential for horticultural development as the diverse agro-climatic conditions are very much favoring growing of large number of horticultural crops like fruits, vegetables, spices, flowers and medicinal & aromatic plants throughout the year. It is 3rd largest producer of spices (after Andhra Pradesh and Gujarat) with largest share (20.4%) in country's total area under spices. The state ranks first in the production of three spices (viz., coriander, fennel and fenugreek), isabgol and total medicinal and aromatic plants (2011-12). About 46.6 per cent of country's area under coriander (55.79 thousand ha) and 58.4 per cent of its production (53.29 thousand metric tonnes) owed to Rajasthan. About 89.0 per cent of area and 75.4 per cent of country's total production of fenugreek are also realized in Rajasthan. The state is the second largest producer of cumin with area and production of 22.0 thousand ha (37.0%) and 11.1 thousand metric tonnes (28.2%) respectively. The state is the 4th largest producer of aonla (after Uttar Pradesh, Tamil Nadu, and Madhya Pradesh) with 12.6 per cent of country's total production.

The state has vast potential of export of seed spices, garlic, red chilies, dry roses and rose products, citrus fruits & their products, onion & other processed vegetables, medicinal plant produce (e.g., isabgol, mehandi or henna) and senna etc. Given the conducive agro-ecological conditions and vast export potentials, there is huge scope for further expansion of area under horticulture in the state. It is thus necessary to examine the pattern of growth in area and production of horticultural crops and to explore

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the factors that inhibit the growth of horticulture sector in the state. In this context, the present study analyses the changing share of horticultural crops in overall diversification of the cropping pattern in the state that has taken place during last three decades. It examines the pattern and sources of growth in area, yield and production of horticultural crops in the state. The major challenges for further growth of the horticulture sector have been critically assessed.

**2. Data and Methodology**

The paper is based on secondary data for a period of wider technology dissemination (1980-81 to 2010-11) with three sub periods: Sub Period I (1980-81 to 1990-91), Sub Period II (1990-91 to 2000-01) and Sub Period III (2000-01 to 2010-11). Data were analyzed using simple statistical tools such as averages, percentages and growth rates. The compound annual growth rate (CAGR) was estimated by fitting a semi-log trend equation by applying Ordinary Least Square (OLS) method.

**2.1 Decomposition of Output Growth of Horticultural Crops**

To measure the relative contribution of area and yield towards the change in total production of categories of horticultural crops, the decomposition analysis was performed. Several researchers have used this model to study growth performance of the crops (Bhatnagar and Nandal, 1994; Gupta and Saraswat, 1997; Kalamkar, 2003). With the help of three factor decomposition analysis, the relative contribution of area and yield towards the total change in production of major horticultural crops has been assessed. The analysis helped in identifying the sources of growth in output by breaking the change in production into three effects i.e., area effect, yield effect and interaction effect.

$$(P_n - P_0) = A_0(Y_n - Y_0) + Y_0(A_n - A_0) + (A_n - A_0)(Y_n - Y_0) \quad \ldots(1)$$

$$\Delta P = A_0 \Delta Y + Y_0 \Delta A + \Delta A \Delta Y \quad \ldots (2)$$

Where, P, A and Y stand for production, area and yield respectively. The subscript 'n' stands for the current year and subscript '0' stands for the base year. The change parameter '$\Delta$' subtracts base year value from the current year value.

The equation-2 states that,

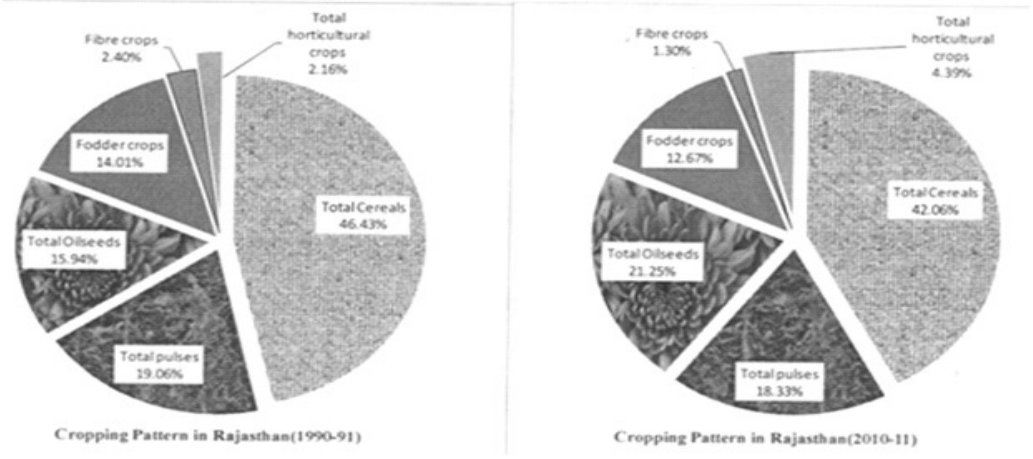
Change in production = Yield effect + Area effect + Interaction effect

Thus, the total change in production is attributed due to area and yield that can be decomposed into three effects viz. yield, area and interaction effects. The decomposition analysis was carried out on total horticultural crops and its sub-groups, viz., fruits, vegetables, spices and condiments, medicinal and aromatic crops and flowers for the whole period and sub-periods.

**3. Nature of Crop Diversification in Rajasthan**

The major crops grown in different parts of Rajasthan are bajra, wheat, jowar, maize, cotton, rapeseed-mustard, groundnut and horticultural crops. As per the cropping pattern in the state (2010-11), the crop groups such as total cereals, total oilseeds, total pulses, fodder crops and horticultural crops accounted for about 42.0 per cent, 21.2 per cent, 18.3 per cent, 12.6 per cent and 4.4 per cent of GCA, respectively (Figure 1). It is evident that the share of total cereals has declined by 4.3 per cent points (from 46.3 per cent in 1990-91 to 42.0 per cent in 2010-11); while the share of oilseeds has increased by 5.3 percent points (from 15.9 per cent in 1990-91 to 21.2 per cent in 2010-11). Similarly, there has been a marginal decline in area under fodder crops (from 14.0 per cent in 1990-91 to 12.6 per cent in 2010-11) and significant increase in area under horticultural crops (from 2.2 per cent in 1990-91 to 4.4 per cent in 2010-11). Guar crop with its increasing demand has occupied considerably larger area during 2000-01 and 2010-11 over 1990-01. The area under guar crop has increased by 42.7 per cent during last two decades. Thus, there is a clear-cut shift in area from cereals and fodder to high value crops like oilseeds, guar and horticultural crops in the state during last two decades.

**Figure 1. Change in Cropping Pattern in Rajasthan (1990-91 & 2010-11)**



Out of total area of 1139.1 thousand ha under horticultural crops in 2010-11, about 63.4 per cent area was under spices and condiments. The area under vegetables and medicinal plants was 12.6 per cent and 21.0 per cent respectively in the corresponding year. The area under spices and condiments has steadily increased from 273.8 thousand ha in 2000-01 to 441.4 thousand ha in 2000-01 and further to 719.1 thousand ha (2.8% of GCA) in 2010-11. Among spices, coriander and cumin are the major crops grown in Rajasthan, both together accounted for about 74.5 percent of total area under spices in 2010-11(Table 1). It may be observed that the share of coriander has constantly declined (from 48.1 % in 1990-91 to 27.5% in 2010-11) whereas that of cumin has increased (from 17.8% in 1990-91 to 46.0% in 2010-11).

The area under medicinal and narcotic plants has also significantly increased from 63.4 thousand ha in 1990-91 to 239.7 thousand ha in 2010-11, registering an increase of 278.0 per cent Similarly the area under vegetables has increased by 143.8 per cent (from 59.0 thousand ha in 1990-91 to 143.9 thousand ha in 2010-11).

TABLE 1 : CHANGES IN AREA UNDER MAJOR HORTICULTURAL CROPS IN RAJASTHAN

(Area in thousand hectares)

| Crops | 1990-91 | 2000-01 | 2010-11 | % Change | | |
|---|---|---|---|---|---|---|
| | | | | ( 1990-91 to 2000-01) | ( 2000-01 to 2010-11) | (1990-91 to (2010-11) |
| Coriander | 131.7 (48.1) | 145.2 (32.9) | 198.1 (27.5) | 10.3 | 36.4 | 50.4 |
| Cumin | 48.6 (17.8) | 199.8 (45.3) | 330.6 (46.0) | 311.0 | 65.5 | 580.0 |
| Chilli | 38.6 (14.1) | 3l.3 (7.1) | 13.8 (1.9) | -18.7 | -55.8 | -64.1 |
| Methi | 33.7 (12.3) | 29.7 (6.7) | 80.4 (11.2) | -12.0 | 171.0 | 138.5 |
| Other spices | 21.2 (7.7) | 35.3 (8.0) | 96.2 (13.4) | 66.5 | 172.7 | 354.1 |
| Total condiments | 273.8 (100.0) | 441.4 (100.0) | 719.1 (100.0) | 61.2 | 62.9 | 162.7 |
| & spices | (65.6) | (63.4) | (63.1) | -3.4 | -0.4 | -3.8 |
| Mango | 7.3 (34.4) | 6.5 (31.5) | 6.3 (20.4) | -10:6 | -3.0 | -13.4 |
| Orange | 1.9 (9.1) | 5.6 (26.9) | 9.0 (29.1) | 188.5 | 61.7 | 366.4 |
| Lemon | 3.4 (15.9) | 2.8 (13.6) | 1.6 (5.1) | -16.6 | -43.8 | -53.1 |
| Kinnow | 2.9 (13.6) | 1.8 (8.6) | 1.1 (3.4) | -38.4 | -40.7 | -63.5 |
| Aonla | 0.03 (0.1) | 0.3 (1.3) | 1.7 (5.5) | 76l.3 | 540.1 | 5412.9 |
| Guava | 1.7 (8.0) | 1.9 (9.1) | 3.1 (10.0) | 12.0 | 64.3 | 84.0 |
| Papaya | 0.38 (1.8) | 0.39 (1.9) | 0.8 (2.6) | 2.4 | 104.6 | 109.4 |
| Total Fruits | 21.1 (100.0) | 20.7 (100.0) | 30.9 (100.0) | -2.1 | 49.4 | 46.2 |
| | (5.1) | (3.0) | (2.7) | -4l.3 | -8.7 | -46.4 |
| Potato | 1.8 (3.0) | 3.9 (4.3) | 10.5 (7.3) | 119.7 | 170.5 | 494.4 |
| Onion | 17.0 (28.7) | 26.6 (29.4) | 49.0 (34.0) | 56.7 | 84.3 | 88.8 |
| Brinjal | 5.2 (8.8) | 5.1 (5.7) | 6.3 (4.4) | -1.5 | 23.0 | 21.1 |
| Pea | 1.4 (2.4) | 10.5 (11.6) | 3.6 (2.5) | 640.4 | -65.7 | 153.7 |
| Others | 33.7 (57.1) " | 44.3 (49.0) | 79.7 (55.4) | 31.5 | 80.1 | 136.7 |
| Total Vegetables | 59.0 (100.0) | 90.4 (100.0) | 143.9 (100.0) | 53.1 | 59.2 | 143.8 |
| | (14.1) | (13.0) | (12.6) | -8.2 | -2.7 | -10.7 |
| Isabgul | 52.8 (83.2) | 121.0 (85.3) | 215.0 (89.7) | 129.3 | 77.7 | 307.5 |
| Opium | 8.9 (14.1) | 6.9 (4.9) | 8.5 (3.6) | -22.1 | 22.7 | -4.4 |
| Total medicinal & | 63.4, (100.0) | 141.8 (100.0) | 239.7 (100.0) | 123.6 | 69.1 | 278.0 |
| narcotic plants | (15.2) | (20.4) | (21.0) | 34.0 | 3.4 | 38.5 |
| Other | NA | 2.1 (1.5) | 5.4 (2.3) | NA | 154.8 | NA |
| horticultural | . | (0.3) | | | | |
| crops | NA | | (0.5) | NA | 55.8 | NA |
| Total horticultural | 417.4 | 696.3 | 1139.1 | 66.8 | 63.6 | 172.9 |
| crops | (100.0) | (100.0) | (100.0) | | | |

**NOTE :** Figures in parentheses to the right are percentages of respective category total and the figures in parentheses below the category total are percentages of total area under horticultural crops.

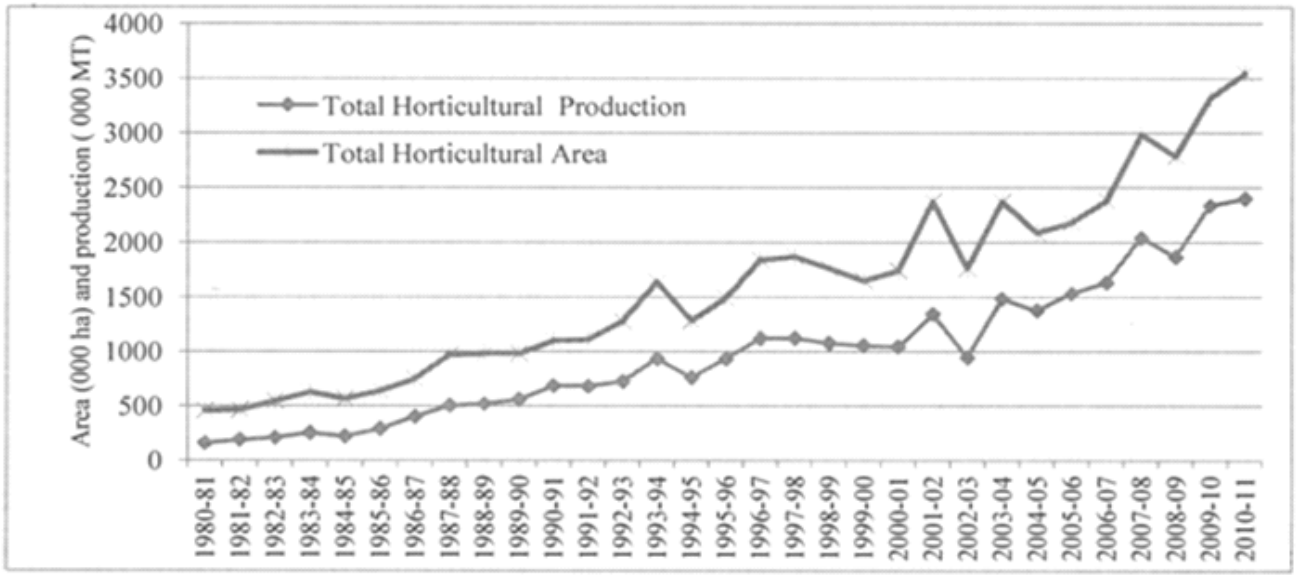
**Sources:** GoR(2000); GoR(2003); GoR(2012a); NHB(2011).

It is a matter of concern that the area under fruits has not grown satisfactorily during last two decades. The share of area under fruits in total horticultural area has declined from 5.1 per-cent in 1990-91 to around 2.7 per cent in 2010-11. Among fruits, the area under mango has declined drastically (from 34.4 per cent in 1990-91 to 20.4 per cent in 2010-11) whereas that of orange, lemon and guava has increased.

**4. Spatial and Temporal Variation in Growth of Horticultural Crops**

The decadal analysis reveals the remarkable growth in area and production of horticultural crops during the reference periods in Rajasthan (Figure 2). The total production from all horticultural crops has increased from 160.0 thousand metric tonnes (MT) in l980-81 to 685.3 thousand MT in 1990-91 ( by 328.4%) which has further increased to 2403.9 thousand MT in 2010-11 (i.e., 250.8 % in later decade) (Table 2).

**Figure 2. Trend in Total Area and Production of Horticultural Crops in Rajasthan**




The annual growth rate of area and yield of all horticultural crops was 4.5 per cent and 11.0 per cent respectively during the period of 1980-81 to 1990-91(1980s). The annual growth in area under all horticultural crops· has marginally increased by 4.6 per cent during 1990-91 to 2000-01. However, it has declined by 2.6 per cent in the next decade (2000-01 to 2010-11). On the other hand, the annual yield growth of horticultural crops has been very poor during 1990s (0.7%) over 1980s (11.0%) and 2000s (6.0%).

TABLE 2 : AREA, PRODUCTION AND YIELD OF HORTICULTURAL CROPS IN RAJASTHAN (1980-81 TO 2010-11)

(Area in 000 ha, Production in 000 metric tonnes and Yield in Tonnes/ha)

Part A: Area and production of horticulture crops

| Year | Fruits | | Vegetables | | Spices and condiments | | Flowers | | Medicinals | | Total Horti. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area | Prod. | Area | Prod. | Area | Prod. | Area | Prod. | Area | Prod. | Area | Prod. |
| 1980-81 | 11.21 | 0.00 | 37.98 | 105.21 | 227.55 | 52.24 | NA | NA | 19.93 | 2.53 | 296.68 | 159.97 |
| | (3.78) | (0.00) | (12.80) | (65.77) | (76.70) | (32.65) | NA | NA | (6.72) | (1.58) | (100.00) | (100.00) |
| 1990-91 | 21.11 | 104.58 | 59.04 | 300.03 | 273.79 | 280.68 | NA | NA | 63.42 | 0.00 | 417.35 | 685.29 |
| | (5.06) | (15.26) | (14.15) | (43.78) | (65.60) | (40.96) | NA | NA | (15.19) | (0.00) | (100.00) | (100.00) |
| 2000-01 | 20.66 | 238.04 | 90.39 | 364.55 | 441.36 | 357.85 | 2.12 | 2.46 | 141.77 | 82.21 | 696.30 | 1045.11 |
| | (2.97) | (22.78) | (12.98) | (34.88) | (63.39) | (34.24) | (0.30) | (0.24) | (20.36) | (7.87) | (100.00) | (100.00) |
| 2004-05 | 23.84 | 256.98 | 122.89 | 614.19 | 416.09 | 424.29 | 3.31 | 2.60 | 148.93 | 78.90 | 715.05 | 1376.96 |
| | (3.33) | (18.66) | (17.19) | (44.61) | (58.19) | (30.81) | (0.46) | (0.19) | (20.83) | (5.73) | (100.00) | (100.00) |

TABLE 2 : AREA, PRODUCTION AND YIELD OF HORTICULTURAL CROPS IN RAJASTHAN (1980-81 TO 2010-11)–*CONTD*

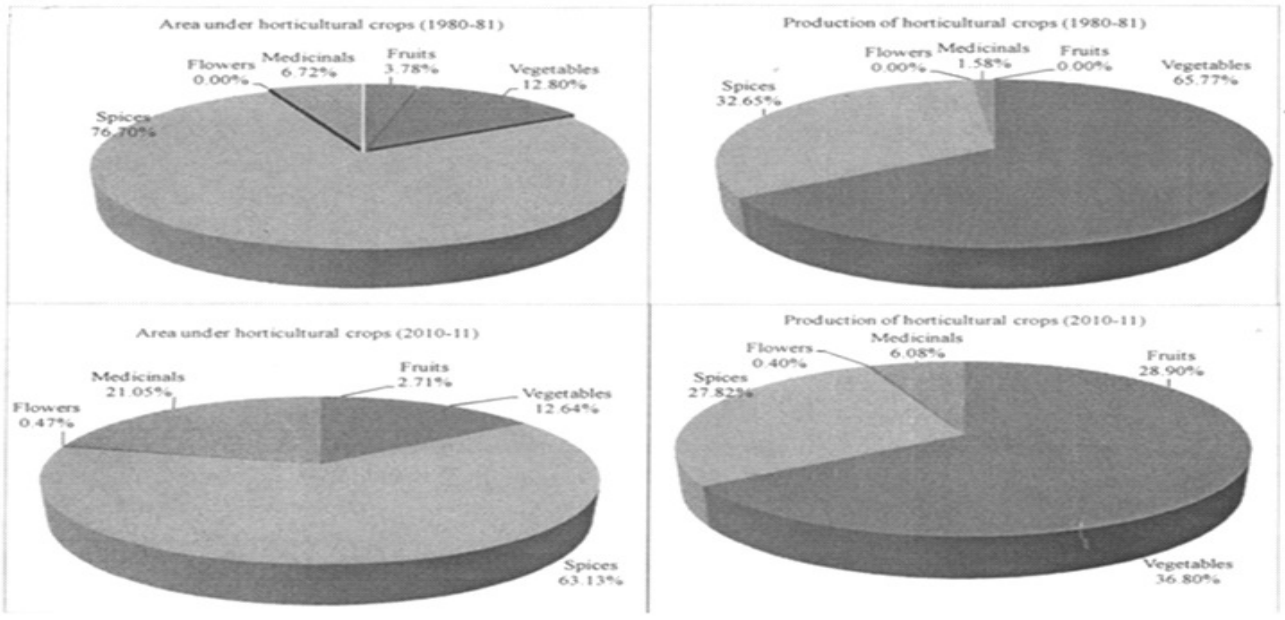
(Area in 000 ha, Production in 000 metric tonnes and Yield in Tonnes/ha)

| Part A: Area and production of horticulture crops | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Fruits | | Vegetables | | Spices and condiments | | Flowers | | Medicinals | | Total Horti. | |
| 2010-11 | 51.10 | 695.10 | 140.30 | 885.00 | 598.90 | 668.00 | 5.40 | 9.60 | 239.74 | 146.20 | 1139.06 | 2403.90 |
| | (4.49) | (28.92) | (12.32) | (36.82) | (52.58) | (27.79) | (0.47) | (0.40) | (21.05) | (6.08) | (100.00) | (100.00) |
| Part B: Growth rate in area and yield of horticultural crops in Rajasthan(%) | | | | | | | | | | | | |
| | Area | Yield | Area | Yield | Area | Yield | Area | Yield | Area | Yield | Area | Yield |
| 1980-81 to 1990-91 * | 3.78 | -6.35 | 4.00 | 7.19 | 3.55 | 14.93 | NA | NA | 11.67 | -8.71 | 4.47 | 11.015 |
| | (0.75) | (-1.84) | (6.94) | (5.82) | (2.66) | (6.50) | NA | NA | (4.27) | (-2.53) | (4.87) | (9.46) |
| 1990-91 to 2000-01* | -0.28 | 8.09 | 5.46 | -2.33 | 3.61 | 0.41 | -2.60 | 3.57 | 9.51 | -1.31 | 4.63 | 0.74 |
| | (-1.30) | (3.16) | (9,13) | (-2,95) | (1.91) | (0.31 ) | -0.39) | (0.68) | (6.03) | (-0.87) | (3.20) | (0.83) |
| 2000-01 to | 4.08 | 10.47 | 4.58 | 11.26 | 0,99 | 1.28 | 9.77 | 5.48 | 6,22 | -0.96 | 2.59 | 6.01 |
| 2010-11* | (9.43) | (5.69) | (6,52) | (6.98) | (0.40) | (0,88) | (4.93) | (2.02) | (6.23) | (0.59) | (1.61) | (3.91) |

Notes. (I) Prod. implies production; Horti, implies horticultural crops
(2)* The growth rate for the decennial period (part B) are based on semi log time trend and the figures in the parentheses are respective' t' values. The figures in the parentheses in Part A are the percentages of total.
Sources: Same as Table 1.

As far as different categories of horticultural crops are concerned, the area under fruits and flowers has exhibited negative trends during 1990s which has steadily increased thereafter. However, the yield of fruits and plantation crops has exhibited negative trends during 1980s but showed a healthy growth during next two decades. Since fruits and plantation crops are long duration crops, the yield growth has been poor during initial years. Even though area under medicinal plants has steadily increased from 199.3 thousand ha in 1980-81 to 285.2 thousand ha in 2010-11, the growth in production and yield of these crops have not been very encouraging throughout the three decades. It may be seen in Figure 3 that the share of area under medicinal plants was 21.0 per cent during 2010-11 whereas the share of its production was only 6.1 per cent of total horticultural production in the corresponding year.

**Figure 3 : Change in Composition of Horticultural Crops in Rajasthan (1980-81 and 2000-01)**



The area and production of vegetables have increased steadily throughout the study period (from 38.0 thousand ha and 105.2 thousand tonnes in 1980-81 to 140.3 thousand ha and 885.0 thousand tonnes in 2010-11, respectively). However, the yield growth of these crops have been somehow constrained during 1990s with negative annual growth (-0.2.3%). It is pertinent to look into the causes of relatively lower growth in productivity of vegetables and medicinal crops in the state.

The state is well known for its lion's share in both area and production of spices at all India level. The annual growth in area and yield of spices was 3.6 per cent and 14.9 per cent respectively during the 1980s. The growth momentum in area and production of spices has continued during the next two decades (1990s and 2000s) with lower annual growth rates. During 2000s, the annual growth rates in area and yield of spices has sharply declined to 1.0 per cent and 1.3 per cent respectively. The share of both area and production of spices has declined during 2010-11 over 1980-81.

As far as flowers are concerned, the growth in area and production has satisfactorily increased during the 2000s, though not during 1980s and 1990s. The area under flowers has increased from 2.2 thousand ha in 2000-01 to 5.4 thousand ha in 2010-11. Moreover, the productivity of flowers has increased by 5.5 per cent annually. Thus, the further area expansion of flowers in the state looks promising.

It was observed that 10 major horticultural crops growing districts were Jhalawar, Barmer, Baran, Jodhpur, Jalore, Nagaur, Kota, Pali, Jaipur and Chittorgarh, which together accounted for about 81.0 per cent of total horticultural area and 76.2 per cent of total horticultural production in the state. Thus, the production of horticultural crops has been concentrated in about 30 per cent districts in the state. There is huge scope for further expansion of horticultural crops in these districts as well as other untouched districts of the state.

A careful analysis of all major districts producing horticultural crops reveals that most of the districts have failed to consistently perform with respect to three major growth parameters (area coverage, production level and yield level). Only a very few districts those have performed well in terms of area coverage of different categories of horticultural crops (e.g., fruits, vegetables, spices, flowers and medicinal), have also performed well in terms of higher productivity and production. Barring few districts like Jodhpur, Ajmer and Nagaur (category: flowers) and Nagaur (category: medicinal and aromatic), none of the top five districts with larger share in area under various sub groups of horticultural crops could also find a place among the top five districts having maximum productivity. It is necessary that these districts with major share in area under various horticultural crops should concentrate in raising the levels of production and productivity as well.

The spices being the major horticultural crops of the state is mainly grown in the districts such as Jhalawar, Baran, Kota, Barmer, Jalore, Jodhpur and Chittorgarh. These seven districts together covered about 80.7 per cent of total area under spices of the State in 2008-09. However, the yield level was better in Bharatpur (5.0 t/ha), Karauli (2.7t/ha). S. Madhopur (2.6t/ha) and Chittorgarh (2.2t/ha).

**5. Decomposition of Output Growth of Horticultural Crops**

With the help of decomposition analysis, the relative contribution of area and yield effects towards the total change in production of various horticultural crops was assessed. The results are presented in Table 3. Among the three effects i.e., area effect, yield effect and interaction effect, the area effect was found to contribute more to the change in the production of fruits and medicinal & aromatic crops during Period I (1980-81 to 1990-91), whereas the yield effect contributed more to the change in the production of spices & condiments, vegetables and total horticultural crops during the corresponding period.

TABLE 3. DECOMPOSITION OF GROWTH IN PRODUCTION OF HORTICULTURAL CROPS IN RAJASTHAN

(Per cent)

| Crop | Effects | Period I (1980-81 to 1990-91 | Period 11 (1990-91 to 2000-01 | Period III (2000-01 to 2010-11 | Overall (1980-81 to 2010-11) |
|---|---|---|---|---|---|
| Fruits | Area | 40.52 | -1.66 | 25.73 | 8.71 |
| | Yield | 31.60 | 103.87 | 49.71 | 33.16 |
| | Interaction | 27.88 | -2.20 | 24.56 | 58.13 |
| Vegetables | Area | 29.94 | 246.90 | 41.49 | 37.63 |
| | Yield | 45.07 | -95.96 | 36.75 | 16.46 |
| | Interaction | 24.99 | -50.95 | 21.77 | 45.91 |

TABLE 3. DECOMPOSITION OF GROWTH IN PRODUCTION OF HORTICULTURAL CROPS IN RAJASTHAN–*CONTD.*

(Per cent)

| Crop | Effects | Period I (1980-81 to 1990-91 | Period II (1990-91 to 2000-01 | Period III (2000-01 to 2010-11 | Overall (1980-81 to 2010-11) |
|---|---|---|---|---|---|
| Spices and | Area | 4.65 | 222.61 | 72.38 | 18.30 |
| Condiments | Yield | 79.25 | -76.06 | 16.95 | 25.85 |
| | Interaction | 16.10 | -46.55 | 10.67 | 55.85 |
| Medicinal & | Area | 2415.69 | 4.28 | 88.79 | 19.38 |
| Aromatic | Yield | -727.91 | 42.82 | 6.63 | 6.70 |
| | Interaction | -1587.78 | 52.90 | 4.58 | 73.92 |
| Flowers | Area | NA | -364.05 | 53.46 | NA |
| | Yield | NA | 240.89 | 18.26 | NA |
| | Interaction | NA | 223.15 | 28.27 | NA |
| All Horticultural | Area | 12.39 | 127.29 | 48.91 | 20.24 |
| crops | Yield | 62.28 | -16.36 | 31.23 | 20.77 |
| | Interaction | 25.33 | -10.93 | 19.86 | 58.98 |

*Sources :* Computed from GoR (2000); GoR (2003); GoR (2012a).

The yield effects also played a dominant role for the growth in production of fruits and flowers during Period II (1990-91 to 2000-01), also for fruits during Period III (2000-01 to 2010-11). If we examine the contribution of various effected during overall period (1980-81 to 2010-11), the interaction effect was found to play a dominant role for the change in horticultural production in the state.

## 6. Drivers and Constraints for Agricultural Diversification Towards Horticulture

As discussed earlier, the share of horticultural crops in GCA has increased substantially during the last three decades. Among various policies/programmes, the National Horticulture Mission (NHM) has emerged as the path breaking intervention that helped in agricultural diversification towards horticulture since its implementation in 2005-06 (Swain et al, 2011). It may be seen in Table 2 that the total area under horticulture before launch of NHM was 148.9 thousand ha (2004-05) that has increased by 59.3 per cent to 1139.1 thousand ha in 2010-11. Particularly, the growth in area and production of fruits, medicinal crops and flowers has been quite impressive during post NHM period. The launch of other programmes/ bodies like National Medicinal Plants Board (NMPB) in 2000-01 for promoting cultivation of medicinal plants, National Bamboo Board (NBM) in 2006-07 for promoting cultivation of bamboo and Rashtriya Krishi Vikas Yojana (RKVY) in 2007-08 for further development of horticulture sector, among others, contributed a lot in expansion of area under horticulture (GoR, 2012b).

Out of 60 Agri-Export Zones (AEZ) in India, two AEZs (coriander and cumin) are located in Rajasthan for export promotion and value addition. The state government has also initiated a number of export promotion schemes for spices and vegetables. Additionally, seven Krishi Upaj Mandi Samitis (KUMS) have been promoted exclusively for export marketing of major spices (GoR, 2014). Thus attempt has been made to create facilities and conducive policies for export promotion and value addition.

Besides conducive policy environment and diverse agro-climatic conditions, some major drivers of agricultural diversification towards horticultural crops in the state are (i) increased availability of water for irrigation and of micro-irrigation technologies, leading to an increase in cropping intensity, (ii) increased fertilizer use (iii) strengthening of institutions, (iv) higher profitability. The gross irrigated area has increased from 20.1 per cent in 1990-91 to 32.0 per cent 2010-11. Micro-irrigation has played an important role in improving irrigation coverage in the state. About 26 per cent of sprinkler irrigated area of India in 2004-05 was in Rajasthan (Narayanmoorthy, 2014). However, only about 12.4 per cent of the potential area has been covered under drip and sprinkler irrigation systems in the state (Palanisami et al. 2011). The increase in irrigation coverage over the

years has resulted in an increase in cropping intensity from 118.3 per cent in 1990-91 to 141.7 per cent in 2010-11 (GoR, 2012a). Fertilizer consumption per ha of GCA increased substantially, from about 18 kg/ha in 1980-81 to 62.4 kg/ha in 2011-12 (GoI, 2013). Furthermore, a large number of institutions, both governmental and non-governmental, have been increasingly participating in motivating farmers to diversify their cropping pattern and generating market consciousness in them to earn more; in creating marketing and storage facilities; and in developing processing units for agricultural and horticultural commodities. The emergence of self-help institutions like fruit growers' associations/cooperatives is yet another factor that has played an important role in promoting the cultivation of horticultural crops. Higher profitability of horticultural crops over traditional crops has been another driving force for the farmers to cultivate more of these crops (Swain et al, 2011) .

In spite of noticeable extent of cropping pattern diversification favouring horticultural crops, there are some challenges that inhibit the growth of these crops in the state. First, the large degree of spatial and temporal variations in the area and yield of different horticultural crops points to existence of higher production risks due to periodic occurrence of drought and water stress. For instance, the cases of high mortality of plantation crops were found in some parts of the state due to insufficient irrigation (Swain et al., 2011). The rainfall is highly inadequate (average annual rainfall is 575 mm) and variable both in time (3 out of 5 years are drought year) and quantum (23.55 cm to 99.9 cm) in the state (Swain et al 2012). On the other hand, irrigation coverage in the state has been inadequate for horticulture development in the state. About 68 per cent area is still rain fed. Due to scarcity of rainfall in arid and semi areas that constitute about two-third of total geographical area of the state, there is limited availability of ground water.

Second, keeping in view the prevalence of high production risks due to water stress, drought and pest attack, there is a need of expanding crop insurance coverage for major horticultural crops that will improve the confidence level of farmers. However, the proportion of area under horticultural crops covered under crop insurance has been very less. Only coriander, cumin, methi and isabgol have currently been covered under National Agricultural Insurance Scheme (NAIS). Though the scheme was started at national level in 1999-2000, it was implemented in the state during 2003-04. A large number of horticultural crops are not yet covered under gamut of crop insurance schemes.

Third, since the majority of farmers are small and marginal with fewer resources and their lands are largely under rainfed conditions, their capacity to manage the risks is limited. It is thus necessary to make promotional programmes such as NHM, NFSM and RKVY more targeted towards small and marginal farmers so as to strengthen their capacity and to encourage them to cultivate more cash crops like horticultural crops. It is a fact in various parts of the country that the small and marginal farmers have played greater role in promotion of these cash crops in various states (Birthal et al, 2007).

Fourth, the cultivation of horticultural crops has started showing increasing symptoms of unsustainability due to falling soil fertility, erratic weather conditions and the emergence of numerous insects, pests and diseases (Swain et al. 2011). The adoption of same cropping sequence year after year has caused the loss of micronutrients leading to deterioration in the overall soil health. The problem has been compounded due to the availability of spurious inputs particularly during 1990s and 2000s. There is as yet no proper regulatory mechanism to control the supply of these spurious inputs.

Fifth, a survey on selected horticulture growers (Swain et al. 2011) reveals that the post harvest management and marketing facilities are increasingly proving to be inadequate to cope with the mounting pressure. The markets yards do not have adequate space to accommodate the produce brought for sale and also lack modern facilities like internet. There have been huge post harvest losses during peak harvest period. As far as rural infrastructures are concerned, a large part of remote rural areas, with a potential to grow high value crops, still remain inaccessible. The survey further reveals that, about 77 per cent of them did not get sufficient electricity in required quantity and rural roads are not well developed in remote areas (Swain et aI., 2011). Thus, there is a need of further expansion of network of warehouses, cold storage facilities, processing units and rural infrastructures such as rural roads and electricity in the remote areas of the state.

Sixth, the concept of Agri-Export Zone was centered around a cluster approach for developing and sourcing the raw materials, their processing/packaging, leading to final exports. It was observed that horticultural clusters in the state were changed later on with some inclusion and exclusion of districts which may affect the development of processing units and other necessary infrastructures. Thus it is suggested not to make changes in composition of clusters that has long-term implications.

**7. Conclusions and Policy Prescriptions**

The analysis on the nature and pattern of growth of horticultural crops suggests that there is a clear shift in area from cereals and fodder to oilseeds, guar and horticultural crops in Rajasthan during last three decades. However, there has been wide temporal and spatial variation in growth of area and production of horticultural crops. Though the state offers excellent horticulture development potential, several biophysical as well as development constraints inhibits the growth of the sector.

Few of such challenges have been discussed in the preceding section, which need to be addressed properly. Major emphasis should be, among others, on further expansion of irrigation facilities through rain water harvesting and increasing the irrigation efficiency through more adoption of micro-irrigation systems such as sprinkler and drip. Ensuring timely availability of quality inputs, promotion of organic farming, mechanization to bring efficiency and competence, post harvest infrastructure to match the mammoth expansion, transfer of technology to make the extension systems more accountable and promoting more genetic modified organisms (GMOs) for improvement in-horticultural crops need to be emphasized by the policy makers.

For further capacity building of the farmers, as noted by Swain et al. (2011), adequate training on organic farming practices and awareness about timely pruning, use and maintenance of drip/sprinkler irrigation systems and plant protection measures need to be provided to the farmers. Furthermore, spreading of awareness in remote areas regarding existing schemes and provisions for farmers and updated information on improved agricultural practices will be helpful in more adoption of horticultural crops in the state.

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# Trends of Area, Production and Productivity of Soyabean Crop in Madhya Pradesh

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**Abstract**

Madhya Pradesh is one of the forerunner states in soyabean production. Contribution of Madhya Pradesh was more than fifty percent in the total area and production of soyabean. The study measured the growth performance, instability and decomposition approach in area, production and productivity of soyabean crop in Madhya Pradesh based on secondary data during 1996-97 to 2012-13. The tools used for analysis were compound growth trend, instability indices and decomposition analysis. The area, production and productivity of soyabean registered positive and significant growth trend during the study period. The Instability Index suggested that there was highest inter-annual fluctuation in soyabean production followed by variation in productivity and area during study period. Further the study conducted a decomposition analysis to determine the contribution of different components to the growth rate. The decomposition analysis suggested that area was one of the important factors in overall growth of soyabean production followed by interaction effect. The productivity contribution to total soyabean production in state was very low.

**Key words :** Soyabean, Compound Growth Rate, Instability, Decomposition Analysis.

## Introduction

Soyabean has emerged as golden bean of 21st century and it is largely used as oilseed. It is the single largest oilseed grown in the different agro-climatic conditions. Soyabean is looked upon not merely as a means to supply food for humans and animals, but it also improves the soil fertility by fixing atmospheric nitrogen (Jaiswal and Hugar 2011). Soyabean, with over 40 per cent protein and 20 per cent oil, has now been recognized all over the world as a potential supplementary source of edible oil and nutritious food. The protein of soyabean is called a complete protein, because it supplies sufficient amounts of the kinds of amino acids required by the body for building and repair of tissues. Its food value in heart disease and diabetes is well known. In India soyabean cultivation has increased manifold as compared to any other oilseed crop and stands next only to groundnut, though commercial production of soybean began in 1971-72. The five major soyabean producing countries in the world are USA, Brazil, Argentina, China and India. World's soyabean production in 2011 was 25l.5 million metric tonnes out of this USA has a lion share of 83.2 million metric tonnes (33 per cent) followed by Brazil, Argentina, China and India (72.0, 48.0, 13.5 and 1l.0 million metric tonnes, respectively). India contributes about four per cent of total world soyabean-production and it stands at fifth position in terms of production (soy stats 2012). Out of total area and production in India, share of Madhya Pradesh was 56.03 and 51.43 per cent respectively (GOl, 2013). The studies undertaken by research workers at various times is mostly related to cereal crop like paddy and wheat and very limited work has been done on soyabean which is the major oil seed crop, especially of Madhya Pradesh. Thus considering the importance and need, the present study had been taken up to analyze the trends in the production of soyabean in Madhya Pradesh. (Solmon and Paul 2013). The specific objectives of the study were as follow: [1] To examine the growth rate in area, production and productivity of soyabean crop; [2] To measure the instability in production of soyabean crop; and [3]To estimate the relative contribution of area and productivity in production of soyabean crop.

## Materials and Method:

Present study was based on secondary data and confined to the period of 1996-97 to 2012-13. Data related to area, production and productivity of soyabean crop of Madhya Pradesh was collected from Directorate of Economics and Statistics Government of India.

## Analytical Procedures:

In order to examine the growth performance, instability and degree of relationship in area, production and productivity of soybean crop in Madhya Pradesh, various statistical measures such as mean, correlation coefficient and coefficient of variation were worked out.

## Growth Trend

Growth rates are worked out to examine the tendency of variable to increase, decrease or remain stagnant over a period of time. It also indicates the magnitude of the rate of change in the variable under consideration per unit of time. For the present study, compound growth trend was used to estimate the growth in area, production and

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productivity of soyabean crop. The algebraic form of the function as suggested by Kalita (2011) is given below:

$$Y = a*b^t$$

The log form of the above exponential equation can be expressed as,

$$\text{Log}(Y) = \text{Log}(a) + t\,\text{Log}(b)$$

Now, CGR (%) can be expressed as

$$\text{CGR}(\%) = [\text{Antilog}(b)-1]*100$$

Where, Y is the variable for which growth rate is calculated, it may be area, production or productivity as per case; a is the constant; b is the regression coefficient of 'Y' on't' and t is time variable (rank was given to year concerned, ranking of the year was done in their ascending order as per case.

***Measurement of Instability***

An index of instability was computed for examining the nature and degree of instability in area, production and productivity of soybean in Madhya Pradesh. Simple CV does not explain properly the trend component inherent in the time series data so the Instability Index suggested by Cuddy-Della Valle (1978) was used as a better measure of variability.

$$II = CV \times \sqrt{(1 - R^2)}$$

Where,

II = Instability index

$\overline{R}^2$ = Adjusted coefficient of multiple determination

CV = Co-efficient of variation

***Decomposition Analysis***

To estimate the effect of area, productivity and their interaction on the overall growth performance of soyabean production, decomposition approach was used (Kalita, 2011). The algebraic form of equation is given below:

$$P = A_0(Y_n - Y_0) + Y_0(A_n - A_0) + \Delta A\,\Delta Y$$

$$1 = [(Y_0\,\Delta A)/P] + [(A_0\,\Delta Y)/p] + [\Delta A\,\Delta Y)/P]$$

Where,

P = Change in production

$A_0$ = Area in base year

$A_n$ = Area in current year

$Y_a$ = Yield in base year

$Y_n$ = Yield in current year

$\Delta A$ = Change in area $(A_n - A_0)$

$\Delta Y$ = Change in yield $(Y_n - Y_0)$.

**Results and Discussion :**

The percentage change over the year during the study period for the production of soyabean in Madhya Pradesh had a positive value except five years i.e. 1998-99,2000-01,2002-03,2004-05, and 2011-12. This negative growth was mainly due to negative productivity growth. The highest positive growth was observed in 2003-04 i.e. 74.01 per cent which was highly attributed by productivity growth (73.11 per cent) and contribution of area growth was neglible for the same i.e. 0.52 per cent. (Table 1)

The degree of relationship between area and production of soyabean crop is measured by correlation test. It was observed that correlation coefficient (r) of area and production of soyabean over the period i.e. 1996-97 to 2012-13 is 0.91 (Table 2), which is highly significant at one per cent level implying that the production of soyabean crop is highly influenced by increment area.

The growth performance of soyabean production in Madhya Pradesh is presented in Table 3. The compound growth trend analysis for soybean area, production and productivity was found to be positive and significant during the study period i.e. 1996-97 to 2012- L3. Soyabean area, production and productivity in the state was growing with a compound growth rate of 1.9,3.8 and 1.8 per cent per annum respectively. Growth performance of soyabean production during study period was 3.8 per cent per annum, which is mainly attributed by area and productivity growth.

For the estimation of inter annual fluctuation in area, production and productivity of soyabean in Madhya Pradesh, the Instability index was used. It is well known that fluctuation in area and production are interrelated, if other factor remain constant than the increment in area gives the highest production but variation in productivity may be due to many reasons such as weather conditions, technological changes etc. Some exogenous factor like price also brings the variation in production of crop. The coefficient of variation and Instability Index in area, production and productivity of soyabean for Madhya Pradesh is presented in Table 4. It was analyzed that inter-annual fluctuation was highest in case of soyabean production i.e. 19.66 followed by variation in productivity (14.71) and area (6.78) during 1996-97 to 2012-13. It was concluded that the variability in production is the compound result of fluctuation in productivity and area.

To determine how contribution of area, productivity and their interaction are responsible for the overall growth of soyabean production in Madhya Pradesh during the study period, decomposition analysis was carried out. It was revealed that the area under soyabean production in Madhya Pradesh plays a major role in growth of soyabean production due to area effect (55.96 per cent) (Table 5).

The productivity effect was influencing soyabean production in the state by 33.72 per cent, whereas interaction effect was very low to enhance soyabean production in the state. The analysis suggested that area was one of the important factors in overall development of soyabean production followed by productivity effect.

**Conclusion:**

The above discussion throws light on the fact that the growth performance of area, production and productivity of soyabean crop in the state was positive and statistically significant. Inter annual fluctuation in soyabean production was 19.66 which was mainly augmented by unstable productivity level. The area under soyabean production in Madhya Pradesh was one of the important factors which influenced the overall growth of soyabean production in the state during the study period. Therefore it is necessary to increase the sustainable soy bean production in state and to take up productivity enhancing measures in soyabean crop like varietal improvement, appropriate technologies.

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TABLE 1 : AREA, PRODUCTION AND PRODUCTIVITY OF SOYABEAN IN MADHYA PRADESH OVER THE PERIOD FROM 1996-97 TO 2012-13

| Year | Area | % change | Production | % change | Productivity | % change |
|---|---|---|---|---|---|---|
| 1996-97 | 4165.80 | | 3946.20 | | 947.29 | |
| 1997-98 | 4469.70 | 7.30 | 4843.30 | 22.73 | 1083.59 | 14.39 |
| 1998-99 | 4588.70 | 2.66 | 4637.00 | -4.26 | 1010.53 | -6.74 |
| 1999-2000 | 4439.40 | -3.25 | 4741.60 | 2.26 | 1068.07 | 5.69 |
| 2000-01 | 4475.50 | 0.81 | 3435.20 | -27.55 | 767.56 | -28.14 |
| 2001-02 | 4449.70 | -0.58 | 3735.00 | 8.73 | 839.38 | 9.36 |
| 2002-03 | 4190.60 | -5.82 | 2673.70 | -28.41 | 638.02 | -23.99 |
| 2003-04 | 4212.40 | 0.52 | 4652.60 | 74.01 | 1104.50 | 73.11 |
| 2004-05 | 4485.30 | 6.48 | 3747.10 | -19.46 | 835.42 | -24.36 |
| 2005-06 | 4255.30 | -5.13 | 4500.70 | 20.11 | 1057.67 | 26.60 |
| 2006-07 | 4756.60 | 11.78 | 4784.90 | 6.31 | 1005.95 | -4.89 |
| 2007-08 | 5024.40 | 5.63 | 5480.50 | 14.54 | 1090.78 | 8.43 |
| 2008-09 | 5124.00 | 1.98 | 5849.80 | 6.74 | 1141.65 | 4.66 |
| 2009-10 | 5349.50 | 4.40 | 6406.30 | 9.51 | 1197.55 | 4.90 |
| 2010-11 | 5559.90 | 3.93 | 6669.80 | 4.11 | 1199.63 | 0.17 |
| 2011-12 | 5669.10 | 1.96 | 6280.60 | -5.84 | 1107.87 | -7.65 |
| 2012-13 | 6031.70 | 6.40 | 7800.1 0 | 24.19 | 1293.00 | 16.71 |

TABLE 2 : Relationship Between Area and Production of Soyabean

| criteria | Value of correlation | P (T <t) two- tail |
|---|---|---|
| Area Vs Production | 0.91 | 0.01 |

TABLE 3 : Compound Growth Rate in Area, Production and Productivity of Soyabean Crop in Madhya Pradesh

| Particulars | Area | Production | Productivity |
|---|---|---|---|
| CGR (%) | 1.9* | 3.8* | 1.8** |
| $R^2$ (%) | 70.4 | 49.1 | 26.0 |
| t value | 5.96 | 3.80 | 2.29 |

* : Significant at 1 per cent level of significance
** : significant at 5 per cent level of significance
CGR: Compound Growth Rate

TABLE 4 : Instability in Area, Production and Productivity of Soyabean

| Statistical tools | Area | Production | Productivity |
|---|---|---|---|
| AM | 4779.27 | 4952.02 | 1022.85 |
| SD | 577.0671 | 1321.467 | 170.0228 |
| CV (%) | 12.07438 | 26.6854 | 16.62247 |
| Instability Index | 6.787474 | 19.66408 | 14.76502 |

TABLE 5 : Share of Area effect, Productivity Effect and Interaction Effect on Production Growth of Soyabean Crop

| | Area effect (%) | Productivity effect (%) | Interaction effect (%) |
|---|---|---|---|
| Soyabean production | 55.99 | 33.72 | 10.29 |

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## C. Agro-Economic Research

### Problems and Prospects of Oilseed Production in Madhya Pradesh*

A wide range of oilseed crops are grown in different states of the country. Among the oilseeds, groundnut which was the most important crop in TE 1998-99 has lost its prime position to soyabean in TE 2008-09 and is grown in Madhya Pradesh, Maharashtra and Rajasthan, accounting for about 95 per cent of total production in the country. The second most important oilseed crop is groundnut, which is grown mainly in Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, Karnataka and Maharashtra. The third major oilseed crop, mustard/rapeseed is grown in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, Gujarat and West Bengal. These three crops accounted for about 87 per cent of the total oilseeds production in the country. The other edible oilseeds are sunflower, sesame and safflower. Karnataka, Andhra Pradesh and Maharashtra are major sunflower producing states while West Bengal, Gujarat and Rajasthan are major sesame producing states.

Madhya Pradesh is a leading state of India in terms of area and production of oilseeds and recognized as Soya State in the country. It becomes possible only due to the serious efforts made by the scientists and the government resulting into tremendous increase in oilseed production. Amongst different major oilseeds cultivated in Madhya Pradesh the total area covered in soyabean was found maximum (79.10%) followed by rapeseed & mustard (10.7%), sesame (3.8%), groundnut (3.1%), linseed (1.7%) and Niger (1.6%). Similarly production of soyabean also recorded maximum (79.07%) followed by rapeseed & mustard (10.66%), sesame (3.77%), groundnut (3.08%), linseed (1.68%) and Niger (1.58%). Madhya Pradesh still has tremendous potential to increase yield of oilseeds particularly soyabean and mustard in the state though, the potential yield of these crops is far from the actual yield which farmer harvest. It can be achieved provided government should take serious efforts to remove constraints faced by the farmers during the cultivation of oilseeds crops. Keeping above facts in mind the present study has been undertaken with following specific objectives:

#### l.l Specific Objectives

1. To examine trends and pattern of growth of soyabean and mustard over time and across districts and identify the sources of growth in edible oilseeds output in the state.
2. To analyse the cost and profitability of Soyabean and Mustard and their competing crops in the area under study.
3. To analyse yield gap and identify major constraints in the soyabean and mustard cultivation and suggest policy options to increase oilseeds production and productivity in the country.

#### 1.2 Data base and Methodology

The study was based on both primary and secondary data pertaining to major edible oilseeds of Madhya Pradesh i.e. Soyabean and Mustard. The secondary data related to area, production and productivity of these oilseeds were taken into consideration for detail study. In order to comprehend the behavior of the oilseeds crops in the context of different policy regimes, a disaggregated analysis of time series data covering time periods between 1951-52 to 2009-10 and classified them in to 1951-52 to 1960-61, 1961-62 to 1970-71, 1971-72 to 1980 - 81, 1981 - 82 to 1990 - 91, 1991 - 92 to 2000 - 0l and 200l - 02 to 2009-10. Apart from the detailed crop-wise analysis of growth patterns and sources of growth of edible oilseeds also considers for this, the growth of oilseeds was observed during 1980s, 1990s, 2000s and overall 1981-82 to 2009-10. The district wise time series data on area, production and yield of soyabean & mustard have been collected for the above periods related to soyabean and mustard to analyse the growth and variability of oilseeds in area, production and yield of selected crops with their competing crops i.e. maize and wheat. In order to identify profitability, yield gap and major constraints in edible oilseeds production in the state, primary data from the household growing oilseed in major producing districts were collected and analysed. A multistage, purposive sampling method was used to select the districts, blocks, villages and farm households. At first stage, all the districts were classified into two categories i.e. high area under the districts and low area under the districts considering area more than the mean (State Average) and area less than the mean (State Average) respectively for a particular crop. These two catagories have been classified into three categories, viz. high area high yield (HAHY), high area low yield (HALY) and low area high yield (LAHY) categories-one district from each category has been selected for the study. Hence, Chhindwara (HAHY), Khandwa (HALY) and Narsinghpur (LAHY) have been

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selected for soyabean, while Morena (HAHY), Chhatarpur (HALY) and Mandla (LAHY) were selected for mustard in Madhya Pradesh. In second stage one block in each selected district has been selected on the basis of maximum area of respective crops in the district. In third stage three villages were selected in each selected block for the study. In the last stage a list of all the farmers of the selected villages was prepared in ascending order and classified them into marginal (less than 1 ha), small (l-2 ha), medium (2-4ha) and large (above 4 ha) size of holdings. 20 farmers in each category were being selected for soyabean and 10 farmers in each category were selected for mustard. Thus, study covers 240 soyabean growers and 120 mustard growers of selected districts of Madhya Pradesh. Regression co-efficient, linear and compound growth, mean, percentage analytical techniques were employed to analyze collected data along with identification and prioritization major constraints facing oilseed production in the state. A pre tested interview schedule was used for collection of required data from the respondents of the study.

### 1.3 Major Findings

The following results have been drawn from the analysis of time series data:

The area under total oilseed increased from 1.59 million ha (1973-74) to 6.68 million ha (2009-10) in Madhya Pradesh. The contribution of total oilseeds and total pulses in total cropped area was found to be increased from 10.00 per cent (1973-74) to 34.01 per cent (2009-10), and 20.58 per cent (l973-74) to 23.63 per cent (2009-10) respectively. While, the contribution of total cereals to total cropped area was found to be decreased from 54.61 per cent (1973-74) to 38.85 per cent (2009-10). The area under total food grains to total cropped area was also found to be decreased from 75.25 per cent (l973-74) to 62.47 per cent (2009-10).

As regards to the contribution of area of soyabean and mustard to total cropped area were found to be increased from 1.98 per cent (1983-84) to 26.63 per cent (2009-10) and 1.07 per cent (l973-74) to 3.72 per cent (2009-10) respectively, while the share of area of rice, groundnut, other oilseeds and cotton to total cropped area found to be decreased from 9.03 to 8.35 per cent, 2.71 to 1.07 per cent, 6.25 to 2.60 per cent and 4.10 to 3.16 per cent during the period 1973 - 74 to 2009 - 10. Hence, it is clear that the area of oilseeds particularly soyabean increased tremendously which might be due to shift of the area of cotton, groundnut, other cereals, other oilseeds etc. to soyabean in Madhya Pradesh.

The area, production and productivity of total oilseeds showed increasing trends over different periods. The area under oilseed increased from 1682.20 thousand ha to 6033.44, while the production of total oilseeds increased from 463.4 to 5694.66 thousand t and productivity from 285 kg/ha to 934 kg/ha respectively during the period 1951-52 to 2009 - 10.

The per cent area under oilseeds found to be increased by 2% in Guna and 3% Mandsaur districts, 1% in Shivpuri , Khandwa, Rajgarh, Sagar and Vidisha districts. It remained constant in Sehore, Ratlam, Ujjain, Hoshangabad, Dewas, Shajapur, Dhar, Bhind, Mandsaur, Raisen and Seoni districts, while decreased in Morena (-2%), Indore (-1%), Chhindwara (-1%), and other districts (-2%).The oilseeds production increased by 2% in Guna, Hosangabad, Vidisha and Sehore districts and 1% in Bhind, Chhindwara, Khandwa, Rajgarh, Sagar and Shajapur districts. It remained constant in Dewas, Dhar, Mandsour, Raisen, Seoni and Shivpuri districts, while decreased in Indore (-1%), Morena (-2%), Ratlam (-1%), Ujjain (-2%) and other districts (-6%) during the period between 1993-94 to 2009-10.

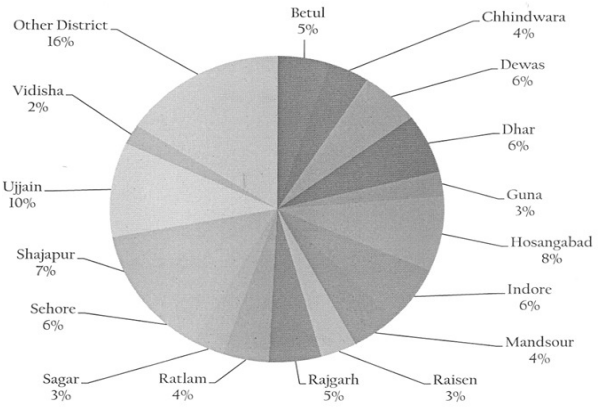


Fig. l.l : Share of area of soyabean in major districts of Madhya Pradesh (TE 1993-94)

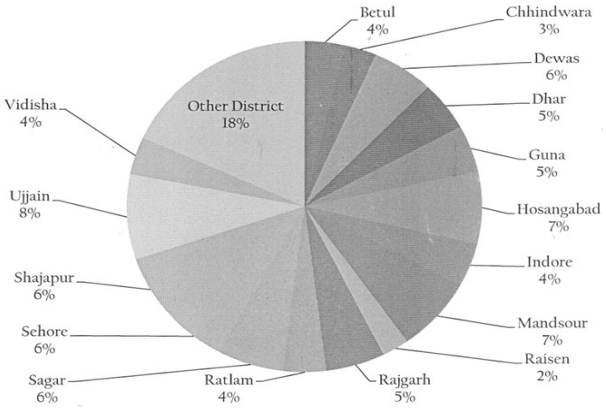


Fig. 1.2 : Share of area of soybean in major districts of Madhya Pradesh (TE2009-10)

Madhya Pradesh being "Soya-State" accounts for 54.96 per cent of area and 57.62 per cent of production of soyabean in the country with an average productivity of 1052 kg/ha. Maharashtra stands second in terms of soyabean production in the country sharing 31.28 per cent of acreage and 28.57 per cent production, Rajasthan the

third important state in terms of soyabean production (7.02%) in the country. These three states together accounts for more than 92 per cent of area and production of the soyabean in the country Soybean is concentrated mainly in Betul, Chhindwara, Dewas, Dhar, Guna, Hoshangabad, Indore, Mandsaur, Raisen, Rajgarh, Ratlarn, Sagar, Sehore, Shajapur, Ujjain and Vidisha districts of Madhya Pradesh. All these districts contributed 81.82 per cent of total soyabean area of Madhya Pradesh. The area of soyabean was found to be increased in Guna (2%), Mandsaur (3%), Sagar (3%) and Vidisha (2%) districts, while decreased in Dhar (-1%), Indore (-2%), Ujjain (-2%), Raisen (-1%), Hoshangabad (-1%), Betul (-1%), Shajapur (-1%) and Chhindwara (-1%). The area of soyabean found stagnate in Sehore, Rajgarh, Dewas, Ratlam and other districts of Madhya Pradesh during the period 1993-94 to 2009 - 10.

The production of soyabean was found to be increased in Guna (2%), Khandwa (2%), Mandsaur (1%), Sagar (2%), Hoshangabad (1%), Sehore (1%), Rajgarh (2%) and Vidisha (2%) districts, while decreased in Dhar (-1%), Indore (-1%), Ujjain (-1%), Shajapur (-2%), Ratlam (-1%) and Chhindwara (-4%) districts.

The area and production of soyabean in Madhya Pradesh increased by 42.18 per cent and 67.20 per cent respectively in the year 2009-10 over the year 1993-94.

The growth of area of soyabean was found to be positive and significant in all the periods and in all the major soyabean growing districts of Madhya Pradesh except in Raisen and Betul (1990s) and Indore and Sehore (2000s), where it was found to be positive and stagnate. In Chhindwara the growth of area of Soyabean was found to be negative and stagnate in 1990s. The growth of production of soyabean was found positive and significant in all the districts and in all periods except in Dhar (1990s), Hoshangabad (1990s &: 2000s), Raisen (1990s), Ujjain (1990s) and Sehore (2000s), where it was found positive but non- significant. In Madhya Pradesh only in Betul the growth of production of soyabean was found to be negative but non-significant in 1990s.

In Madhya Pradesh the districts Sehore, Dewas, Indore, Dhar, Ujjain, Betul and Chhindwara comes under high productivity districts, while Raisen, Vidisha, Guna, Hosangabad, Rajgarh, Shajapur, Ratlam, Mandsour and Sagar were under low productivity districts. In all these districts none of the districts recorded significant decline in yield of soyabean in Madhya Pradesh. The districts like Sehore, Dewas, Indore, Dhar, Ujjain, Raisen, Vidisha, Guna, Hoshangabad, Rajgarh, Shajapur and Ratlam showed significant increased in yield of soyabean in Madhya Pradesh, while districts like Betul, Mandsaur and Sagar showed positive and stagnate, and Chhindwara showed negative and stagnate yield of soyabean in 2010s in Madhya Pradesh.

The variability in area of these crops was found more in 1980s as compared to 1990s and 2000 in all the major soyabean growing districts of Madhya Pradesh During 1980s amongst all major soybean growing districts the variability was found maximum in Mandsour (100.90%) followed by Ratlam (85.71%), Guna (82.99%), Vidisha (70.66%), Sagar (67.19%), Ujjain (59.40%) and Shajapur (54.16%). During 1990s the variability in area of soybean was found between 6.38 (Indore) to 35.07 per cent (Betul), while in 2000 it ranged between 2.04 (Indore) to 35.83 per cent (Sehore). In overall period it ranged between 36.08 (Indore) to 76.41 per cent (Mandsour).

The variability of production of soyabean was also found more in case of soyabean as compared to its competitive crop i.e. maize in all the periods and in all the major soyabean producing districts of M.P. The variability in production of soyabean was found to be more in 1980s (77.02%) as compared to 1990s (37.56%) and 2000s (32.41%). In overall period (1980s-2000s) it was found to be 67.90 per cent and ranged between 55.20 per cent (Indore) to 89.92 per cent (Guna). During 1980s it ranged between 17.47 per cent (Hoshangabad) to 59.12 per cent (Chhindwara), while in the period of 1990s and 2000s it ranged between 13.63 per cent (Indore) to 50.77 per cent (Rajgarh) and 17.30 per cent (Indore) to 100.21 per cent (Ratlam) respectively.

The variability in the productivity in soyabean and maize in different major soybean producing districts in Madhya Pradesh was also observed in different periods of the study and found that the variability in productivity of soyabean was found to be more during 1980s (27.28%) as compared to 1990s (26.06%) and 2000s (23.64%). In overall period it was found to be 30.54 per cent and ranged between 18.71 per cent (Sagar) to 49.24 per cent (Chhindwara), As regard to different districts is concerned the maximum variability in yield of soyabean was found in Chhindwara i.e. 48.36 per cent in 1980s, 55.81 per cent 1990s and 34.24 per cent in 2000s.

The variability in yield of maize was found to be more than the variability in yield of soyabean in the period 1980s, 2000s and overall period (1980s to 2000s) and found less than the variability in the yield of soyabean in 1990s. Amongst different major soyabean producing districts the variability in the yield of maize was ranged between 17.47 (Hoshangabad) to 59.12 per cent (Chhindwara). In 1990s it was found between 15.73(Dewas) to 50.77 per cent (Rajgarh), while in 2000s it ranged between 17.30 (Indore) to 100.21 per cent ((Ratlam). In overall period (1980s to 2000s) it was found between 26.07 (Sagar) to 70.70 per cent (Chhindwara).

Madhya Pradesh is also one of the major mustard producing state in India and occupies 5th rank in the production of mustard. The area of mustard was 605.1 thousand hectares with the production and productivity of 701.2 thousand tonnes and 1159 kg/ha. The area of mustard found to be concentrated in Bhind, Gwalior,

Mandla, Mandsaur, Morena and Shivpuri districts. These five districts contributed nearly 85 per cent to 90 per cent of area and production of mustard in Madhya Pradesh (2009-10).

The area under mustard also increased in all the districts except Balaghat (-0.97%), Gwalior (-30.65%), Hoshangabad (-42.80%), Jhabua (-100.00%), Mandsaur (-23.22%), Morena (-37.93%), Sagar (-34.48%), Shahdol (-75.49%), Sidhi (-21.16%) and Vidisha (- 47.37%) in the year 2009-10 over the year 1993-94.

The share of area of mustard was found to be increased in Shivpuri (1%), Bhind (9%), Mandla (1%), and Other districts (3%), while decreased in Morena (-9%), Gwalior (-5%) in the year TE 2009-10 as compared to TE 1993-94. The share of production of mustard was found to be increased in Bhind (10%), Mandla (1%), and Other districts (9%), while decreased in Morena (-13%), Gwalior (-7%) in the year 2009-10 as compared to 1993-94. It was found stagnate in Shivpuri and Mandsaur districts of Madhya Pradesh.

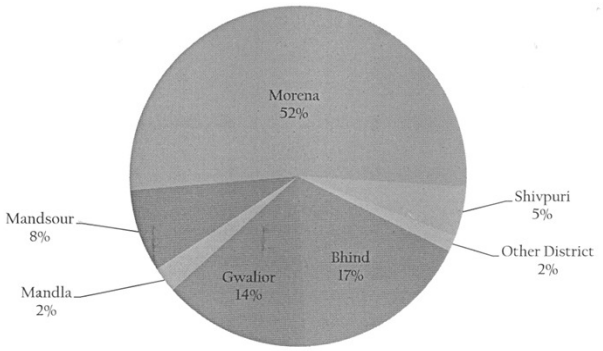


Fig. 1.3 : Share of production of mustard in major districts of Madhya Pradesh (TE 1993-94)

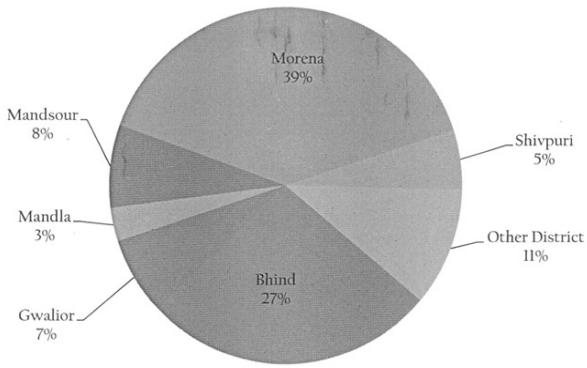


Fig. 1.4 : Share of production of mustard in major districts of Madhya Pradesh (TE 2009-10)

The growth in area of mustard was found to be positive and significant in the periods 1980s and in 1981-82 to 2009-10 in all the major mustard growing districts of Madhya Pradesh. In 1990s the growth of area of mustard was found to be positive and significant only in Mandla district, while found positive and stagnate, negative and significant, and negative and stagnate in Bhind and Shivpuri districts, Morena district and Gwalior and Mandsour districts respectively. In 2000s the growth of mustard was found positive and significant in Bhind and Shivpuri and positive and stagnate in rest of the major mustard growing districts of M.P. viz. Gwalior, Mandla, Mandsour and Morena. The growth of production of mustard was found to be positive and significant in the periods 1980s and in overall period (1981-82 to 2009-10) in all the major mustard growing districts of Madhya Pradesh. In 1990s the growth of area of mustard was found to be positive and stagnate in Bhind, Mandla, Morena and Shivpuri districts, while found negative and significant in Gwalior and Mandsaur districts. In 2000s the growth of production of mustard was found positive and significant in Bhind, Gwalior, Morena and Shivpuri, while found positive but non-significant in Mandla and Mandsaur. Morena comes under in High productivity district, while all other major mustard growing districts viz. Bhind, Mandsaur, Shivpuri, Mandla and Gwalior were under low productivity districts. Amongst all these districts the significant increase in yield of mustard was found in Morena, Bhind, Mandsaur and Shivpuri-while found stagnate with positive sign in Mandla and with negative sign in Gwalior.

The variability in area of mustard was found more in 1980s as compared to 1990s and 2000 in all the major Mustard growing districts of Madhya Pradesh The average variability in area of mustard was found to be more in 1980s (57.99%) as compared to 1990s (21.32%) and 2000s (27.45%). In overall period (1980s to 2000s) the variability in area of mustard in different major mustard growing district was found to be 46.77 per cent and ranged between 17.24 (Mandla) to 75.90 per cent (Mandsaur). In 1980s the variability in area of mustard was ranged between 12.89 (Mandla) to 132.90 per cent (Mandsaur), while in 1990s and 2000s it was between 10.48 (Morena) to 39.19 per cent (Mandsaur) and 8.14 (Mandla) to 48.65 per cent (Mandsaur) respectively.

The variability in area of mustard was found to be more than the variability in area of wheat in all the major mustard growing districts of Madhya Pradesh. The variability of area of mustard as well as area of wheat in Mandsaur district was found to be more in all the periods of the study amongst different major mustard growing districts of Madhya Pradesh.

The average variability in production of mustard was found to be more in 1980s (78.13%) as compared to 1990s (31.68%) and 2000s (37.35%). In overall period (1980s to 2000s) the variability in production of mustard in different major mustard growing district was found to

be 60.48 per cent and ranged between 34.75 (Morena) to 84.05 per cent (Mandsaur). In 1980s the variability in production of mustard was ranged between 43.36 (Morena) to 145.81 percent (Mandsaur), while in 1990s and 2000s it was between 19.31(Shivpuri) to 45.28 per cent (Mandla) and 12.68 (Mandla) to 53.34 per cent (Mandsaur) respectively. As regards to the variability in production of wheat in different major mustard growing districts in Madhya Pradesh here also the variability in production of wheat was found to be more in 1980s (24.92%) as compared to 2000s (22.82%) and 1990s (22.90%). In overall period it was found to be 28.28 per cent and ranged between 22.37 (Morena) to 40.43 per cent (Mandsaur). It is also clear from the data that the variability in production of mustard was found to be more than the variability in production of wheat in all the periods of the study and also in all the major mustard growing districts of Madhya Pradesh. The variability of production of mustard as well as the variability in production of wheat in Mandsaur district was found to be more in all the periods of the study and amongst different major mustard growing districts of Madhya Pradesh except during 1990s.

The variability in productivity of mustard was found to be more than the variability in productivity of wheat in all the periods of the study and also in all the major mustard growing districts of Madhya Pradesh except in 2000s in which the variability in productivity of mustard was less than the variability in productivity of wheat.

The cropping pattern of any area governed by various factors such as price of input and output, agro-climatic conditions, market forces and technological development along with irrigated potential in the area, which determine their makeup. Oilseeds are mainly grown in rain fed areas in the states. These crops are best suited to soils of Madhya Pradesh. The oilseed production preferred by the farmers as it is more profitable over the other crops and due to availability of low input cost technologies. The most of the marginal and small farmers who are having rain fed areas and marginal lands prefer oilseeds instead of cereal and pulses crops in their cropping pattern. The de oiled cake, a by product of oilseeds generate extra income which leads to enhance the profitability of the farmers in particular and contribute significant role in the state economy in general it is also having tremendous export potential (Soyabean). The technological advancement i.e. evolution of new high yielding varieties/hybrid, production and marketing technology are also influence farmer to grow oilseed instead of other crops.

The findings drawn from the primary data collected from the respondents are as under:

The average oilseed grower of study area had 6-7 members in his family, which constitute 3-4 male and 3 female. The maximum number of respondents was found to be related to Other Backward Class followed by General and Schedule Caste /Schedule Tribe groups. In 95 per cent cases males were found to be head of the family and the average educational level of the respondent was found up to 8th to 9th standard. Average HH was found to operate 5.56 (mustard grower) and 4.98 ha (soyabean grower) of land out of which 3.71 ha and 3.49 ha land was found under irrigation by ground water followed by surface water. Leasing out of owned cultivated land was not found in practice, although 8 to 13 percent of respondents found to cultivate crops on leased in land on fixed money basis which was ranged between Rs. 8800 to 16700/ha/year.

The majority of soyabean growers cultivated soyabean followed by cotton, maize, rice in kharif and wheat followed by gram, coarse cereals in rabi crop season, while the majority of mustard growers cultivated coarse cereals followed by pulses, soyabean, rice in kharif and mustard followed by wheat, pulses in rabi crop season. In both the cases the cropping intensity of their farm was found to be around between 160 to 180 per cent reveals that almost 60 to 80 per cent of areas of their farm under double cropping. As regards to yield potential of different crops are concerned it was noticed from the study that wheat gave highest yield potential in the area under study followed by rice, maize, gram, soyabean and mustard.

The cultivation of soyabean was found to be more profitable over its competitive crop (maize) as an average soyabean grower got return of Rs.2.21 as compared to maizee (Rs.2.61) over an investment of Rs. l.00. The majority of cultivators preferred to cultivate soyabean over the maize because of low yield risk in cultivation of soyabean as compared to maize.

The cultivation of mustard was also found some what more profitable as compared to wheat (competitive crop) as an average mustard grower received more income (Rs.2.56) as compared to wheat (Rs.l.88) from investment of Rs. 1.00. The cultivation of wheat is preferred by the mustard growers because of low yield risk, low price risk and low net income risk in cultivation of wheat over the main crop (mustard).

All the oilseeds growers were found to use HYVs seeds of soyabean as well as mustard although 70 -75 per cent respondents were using their owned seeds. About 50 -60 per cent respondents were found to applying recommended dose of fertilizers. All were attentive with Minimum Support Price (which was locally called as "society rate") and majority of them sold their produce above the society rate. The majority (85 to 90 %) of respondents reported that they were not faced any problem in the marketing of their oilseed produce.

As regards to yield gap between experimental, potential and actual farm yield of soyabean and mustard

are concerned, there is found a yield gap of 4.54 q between actual yield (11.46 q/ha) and potential yield (16 q/ha), In case of mustard also yield gap I was found to be only 1.2 per cent between experimental yield (25 q/ha) and potential yield (24.7 q/ha) of mustard and 70.40 per cent between actual yield (7.3 q/ha) and potential yield (24.7q/ha) of mustard.

As far as marketing of oilseeds are concerned the majority of oilseeds growers whether related to soyabean or mustard found to sell their produce to local village traders followed by regulated market (wholesaler). The 8 per cent of large farmers were found to sell their soyabean grains to ITC soya choupal. None of the respondents sold their produce directly to processing plant, commission agent ete. The results of the study also revealed that as the size of farm increase the percentage share sell to regulated market increase, while percentage share sold to local village trader decreases and only large farmers were found to be sold their soybean grains to ITC soya choupal.

As regards to the input and extension services, the majority of respondents reported that the major source of HYVs seeds was fellow farmer followed by State Department of Agriculture. The majority of them also reported that the State Department of Agriculture followed by input dealer was the major sources of extension services.

As far as the constraints in cultivation of oilseeds are concerned the majority of oilseeds growers reported that incidence of insect pest and diseases, weeds infestations, and non availabilities of desired HYVs of seeds were the some particular and important technical constraints in the cultivation of oilseeds in the area under study.

High price of inputs particularly insecticides, weedicide, fertilizers etc., low/ Fluctuating prices, more yield and income risk over cereals, shortage of human labours on peak operational periods (field preparation, intercultural operations harvesting, threshing etc.) were found to be serious and important economic constraints exist in the area under study.

The majority of respondents also reported irregular supply of power lelectricity as serious and important constraints under institutional constraints and lack and inadequate storage facilities, high transportation cost, serious and important constraints related to post harvest, marketing and value additions constraints in oilseeds.

### 1.4 Policy Suggestions

It is clear from the above conclusions that the production of soyabean has increased not only by area expansion and increase in yield but other factors also contribute such as;

(i) Creating awareness among the masses about the economic nutritional and health benefits of soyabean and its products by using print electronic media.

(ii) Training in manufacture and marketing of soy based food products and machinery for individual groups and entrepreneurs.

(iii) By providing technical support to the potential entrepreneurs through project report, consultancy and service support.

(iv.) Strong political will and positive government policies to encourage production and utilization of soyabean through fiscal incentives like soft loan and tax rebate / concessions.

(v) The Research and Industry linkage to refine the product and modify the technology, with time, for better efficiency and output. For all these to happen there must be a commitment and missionary zeal by those involved in soyabean production and value chain. It is in the interest of mankind. By doing all these efforts People are becoming conscious and there by demand of specialty foods is likely to increase.

(vi) As Soyabean has tremendous potential to be transformed into a number of foods suiting to the requirements of diabetics' lactose intolerant and cancer & CVD patients. Moreover, the daily use of soyabean in the diet would provide a better nutrition at low cost. Awareness on this aspect, among masses, is need of the hour.

(vii) The utilization pattern of soyabean in near future may be as (i) Direct food of soyabean in the form of flour and dairy analogs. (ii) Partial defecting of soyabean using mechanical expression aided with extrusion pretreatment to produce physically refined oil and protein rich edible flour. (iii) Solvent extraction of soyabean using superior technology to produce oil and edible grade soy meal (iv) Value added food products from soy meal for domestic markets (v) Industrial application of soyabean and it's by products in pharmaceutical plastics pants printing, etc.

(viii) The strategy should be the complete utilization of soyabean and its products in the domestic market specially, the soy meal in food feed and pharmaceutically industry. Some of the option are production of protein rich edible defected soy flour to be used in wheat and chickpea flours for higher contents and better nutritional quality; high and cost effects poultry, aqua and cattle feed soy protein constraints isolate and hydro sates to be used in food formulation for infants, children, adult and agreed person. In this way the problem of mal nutrition in poorer will be solved, but due to free competition in the market the soyabean growers will also get the remunerative price for their product and cultivation of soyabean will tremendously increased in the country.

## *D. Commodity Reviews*

### (i) Foodgrains

During the month of May, 2014 the Wholesale Price Index (Base 2004-05=100) of pulses increased by 0.86%, cereals declined by 0.22% and there are no change in foodgrains respectively over the previous month.

ALL INDIA INDEX NUMBER OF WHOLESALE PRICES

(Base : 2004-2005=100)

| Commodity | Weight (%) | WPI for the Month of September, 2014 | WPI for the Month of August, 2014 | WPI A year ago | Percentage change during | |
|---|---|---|---|---|---|---|
| | | | | | A month | A year |
| (1 ) | (2) | (3) | (4) | (5) | (6) | (7) |
| Rice | 1.793 | 137.8 | 234.1 | 210.9 | 1.58 | 12.75 |
| Wheat | 1.116 | 208.1 | 212.9 | 200.8 | -2.25 | 3.64 |
| Jowar | 0.096 | 282.6 | 284.5 | 251.6 | -0.67 | 12.32 |
| Bajra | 0.115 | 258.7 | 258.7 | 267.0 | 0.00 | -3.11 |
| Maize | 0.217 | 234.3 | 245.7 | 246.8 | -4.64 | -5.06 |
| Barley | 0.017 | 217.1 | 214.6 | 206.2 | 1.16 | 5.29 |
| Ragi | 0.019 | 329.1 | 334.8 | 349.6 | -1.70 | -5.86 |
| Cereals | 3.373 | 230.1 | 230.6 | 213.7 | -0.22 | 7.67 |
| Pulses | 0.717 | 233.4 | 231.4 | 231.6 | 0.86 | 0.78 |
| Foodgrains | 4.09 | 230.7 | 230.7 | 216.8 | 0.00 | 6.41 |

*Source* : Office of the Economic Adviser, M/o Commerce and Industry.

**Wholesale Prices**

The following Table indicates the State wise trend of Wholesale Prices of Cereals during the month of May, 2014.

| Commodity | Main Trend | Rising | Falling | Mixed | Steady |
|---|---|---|---|---|---|
| Rice | Steady | A.P.<br>Assam | Haryana<br>U.P. | Jharkhand<br>Karnataka | Gujarat<br>Kerala<br>Tamilnadu |
| Wheat | Rising | Haryana<br>Karnataka<br>M.P. | Gujarat<br>Jharkhand | Rajasthan<br>U.P. | |
| Jowar | Rising | A.P.<br>Gujarat<br>Karnataka<br>Maharashtra | | | Rajasthan |
| Bajra | Falling | A.P.<br>Tamilnadu | Gujarat<br>Karnataka<br>Maharashtra | Haryana<br>Rajasthan | |
| Maize | Rising | A.P.<br>Haryana<br>U.P. | Gujarat<br>Karnataka | Rajasthan | Jharkhand |

**Procurement of Rice**

0.868 million tonnes of Rice (including paddy converted into rice) was procured during May, 2014, as against 1.64 million tonnes of Rice (including paddy converted into rice) procured during May, 2014. The total procurement of Rice in the current marketing season i.e 2013-2014, upto 30.05.2014 stood at 28.47 million tonnes, as against 32.32 million tonnes of rice procured, during the corresponding period of last year. The details are given in the following table.

PROCUREMENT OF RICE

(In thousand tonnes)

| State | Marketing Season 2013-14 (up to 30-05-2014) | | Corresponding Period of last Year 2012-13 | | Marketing Year (October-September) 2012-13 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2011-12 | |
| | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Andhra Pradesh | 6022 | 21.15 | 5869 | 18.16 | 6464 | 19.00 | 7548 | 21.53 |
| Chhatisgarh | 4285 | 15.05 | 4803 | 14.86 | 4804 | 14.12 | 4115 | 11.74 |
| Haryana | 2406 | 8.49 | 2603 | 8.05 | 2609 | 7.67 | 2007 | 5.72 |
| Maharashtra | 141 | 0.50 | 180 | 0.56 | 192 | 0.56 | 190 | 0.54 |
| Punjab | 8106 | 28.47 | 8558 | 26.47 | 8558 | 25.16 | 7731 | 22.05 |
| Tamil Nadu | 618 | 2.17 | 475 | 1.47 | 481 | 1.41 | 1596 | 4.55 |
| Uttar Pradesh | 1118 | 3.93 | 2252 | 6.97 | 2286 | 6.72 | 3357 | 9.58 |
| Uttarakhand | 413 | 1.40 | 466 | 1.44 | 497 | 1.46 | 378 | 1.08 |
| Others | 5368 | 18.85 | 7121 | 22.03 | 8129 | 23.89 | 8138 | 23.21 |
| **Total** | **28477** | 100.00 | **32327** | 100.00 | **34020** | 100.00 | **35060** | 100.00 |

*Source*: Department of Food and Public Distribution.

**Procurement of Wheat**

The total procurement of wheat in the current marketing season i.e 2014-2015 upto May, 2014 is 27.37 million tonnes as against a total of 24.97 million tonnes of wheat procured during last year. The details are given in the following table.

PROCUREMENT OF WHEAT

(In thousand tonnes)

| State | Marketing Season 2014-15 (upto 30-05-2014) | | Corresponding Period of last Year (2013-14) | | Marketing Year (April-March) 2013-14 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2012-13 | |
| | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total | Procure-ment | Percentage to Total |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Haryana | 6494 | 23.73 | 5873 | 23.52 | 5873 | 23.41 | 8665 | 22.71 |
| Madhya Pradesh | 7094 | 25.92 | 6325 | 25.33 | 6355 | 25.33 | 8493 | 22.26 |
| Punjab | 11591 | 42.36 | 10867 | 43.51 | 10897 | 43.43 | 12834 | 33.64 |
| Rajasthan | 1822 | 6.66 | 1221 | 4.89 | 1268 | 5.06 | 1964 | 5.15 |
| Uttar Pradesh | 359 | 1.31 | 673 | 2.69 | 683 | 2.72 | 5063 | 13.27 |
| Others | 6 | 0.02 | 14 | 0.06 | 16 | 0.06 | 1129 | 2.96 |
| **Total** | **27366** | 100.00 | **24973** | 100.00 | **25092** | 100.00 | **38148** | 100.00 |

*Source*: Department of Food and Public Distribution.

## (ii) Commercial Crops

**Oilseeds and Edible Oils :** The Wholesale Price Index (WPI) of nine major oilseeds as a group stood at 217.3 in May, 2014 showing an increase of 3.1 percent and 4.8 percent over the previous month and over the previous year. The Wholesale Price Index (WPI) of all individual oilseeds showed a mixed trend. The WPI of Soyabean (10.1 percent), Copra (7.1 percent), Cotton Seed (4.2 percent), Groundnut seed (1.4 percent) and Rape & Mustard Seed (0.2 percent) increased over the previous month. However, the WPI of Safflower seed (19.7 percent), Gingelly seed (8.0 percent) and Sunflower Seed (0.7 percent) decreased over the previous month. However, the WPI of Niger Seed remained unchanged.

The Wholesale Price Index (WPI) of Edible Oils as a group stood 145.8 in May, 2014 showing a fall of 0.2 percent and 0.9 percent over the previous month and over the previous year. The WPI of Copra oil (2.3 percent), Cottonseed oil (0.5 percent) and Mustard Oil (0.3 percent) increased over the previous month. However, the WPI of Soyabean Oil (1.3 percent), Gingelly Oil (1.3 percent), Sunflower Oil (1.1 percent) and Groundnut Oil (0.2 percent) decreased over the previous month.

**Fruits & Vegetable :** The Wholesale Price Index (WPI) of Fruits & Vegetable as a group stood at 234.3 in May, 2014 showing an increase of 3.9 percent and 9.2 percent over the previous month and over the previous year.

**Potato :** The Wholesale Price Index (WPI) of Potato stood at 270.9 in May, 2014 showing an increase of 17.9 percent and 31.4 percent over the previous month and over the previous year.

**Onion :** The Wholesale Price Index (WPI) of Onion stood 260.9 in May, 2014 showing an increase of 9.5 percent over the previous month. However, it declined by 2.8 percent over the previous year.

**Candiments & Spices :** The Wholesale Price Index (WPI) of Condiments & Spices (Group) stood at 275.0 in May, 2014 showing an increase of 3.4 percent and 18.5 percent over the previous month and over the previous year. The WPI of Black Pepper and Chillies (Dry) increased by 8.4 percent and 0.6 percent over the previous month. However, the WPI of Turmeric declined by 0.1 percent over the previous month.

**Raw Cotton :** The Wholesale Price Index (WPI) of Raw Cotton stood at 230.4 in May, 2014 showing an increase of 0.7 percent and 8.0 percent over the previous month and over the previous year.

**Raw Jute :** The Wholesale Price Index (WPI) of Raw Jute stood at 289.9 in May, 2014 showing an increase of 4.7 percent and 8.2 percent over the previous month and over the previous year.

WHOLESALE PRICE INDEX OF COMMERCIAL CROPS FOR THE MONTH OF MAY, 2014

(Base Year : 2004-05=100)

| Commodity | Latest | Month | Year | Percentage Variation over | |
|---|---|---|---|---|---|
| | May, 2014 | April, 2014 | May, 2013 | Month | Year |
| ***OIL SEEDS*** | 217.3 | 210.8 | 207.3 | 3.1 | 4.8 |
| Groundnut Seed | 202.6 | 199.8 | 260.2 | 1.4 | –22.1 |
| Rape & Mustard Seed | 186.7 | 186.4 | 185.6 | 0.2 | 0.6 |
| Cotton Seed | 176.9 | 169.8 | 168.1 | 4.2 | 5.2 |
| Copra (Coconut) | 185.8 | 173.5 | 90.7 | 7.1 | 104.9 |
| Gingelly Seed (Sesamum) | 438.9 | 477.1 | 349.4 | –8.1 | 25.6 |
| Niger Seed | 177.1 | 177.1 | 177.1 | 0.0 | 0.0 |
| Safflower (Kardi Seed) | 150.4 | 187.4 | 156.8 | –19.7 | –4.1 |
| Sunflower | 185.0 | 186.3 | 190.1 | –0.7 | –2.7 |
| Soyabean | 268.2 | 243.7 | 247.4 | 10.1 | 8.4 |
| ***EDIBLE OILS*** | 145.8 | 146.1 | 147.1 | –0.2 | –0.9 |
| Groundnut Oil | 162.0 | 162.3 | 200.5 | –0.2 | –19.2 |
| Cotton Seed Oil | 181.4 | 180.5 | 166.5 | 0.5 | 8.9 |
| Mustard & Rapeseed Oil | 154.7 | 154.2 | 152.8 | 0.3 | 1.2 |
| Soyabean Oil | 155.8 | 157.8 | 159.5 | –1.3 | –2.3 |
| Copra Oil | 125.0 | 122.2 | 115.6 | 2.3 | 8.1 |
| Sunflower Oil | 126.5 | 127.9 | 132.7 | –1.1 | –4.7 |
| Gingelly Oil | 190.9 | 193.5 | 186.8 | –1.3 | 2.2 |
| ***FRUITS AND VEGETABLES*** | 234.3 | 225.4 | 214.5 | 3.9 | 9.2 |
| Potato | 270.9 | 229.7 | 206.1 | 17.9 | 31.4 |
| Onion | 260.9 | 238.2 | 268.5 | 9.5 | –2.8 |
| ***CONDIMENTS AND SPICES*** | 275.0 | 266.0 | 232.0 | 3.4 | 18.5 |
| Black Pepper | 717.8 | 662.4 | 494.8 | 8.4 | 45.1 |
| Chillies (Dry) | 268.0 | 266.4 | 247.5 | 0.6 | 8.3 |
| Turmeric | 214.2 | 214.4 | 225.3 | –0.1 | –4.9 |
| Raw Cotton | 230.4 | 228.8 | 213.3 | 0.7 | 8.0 |
| Raw Jute | 289.9 | 276.9 | 268.0 | 4.7 | 8.2 |

# *PART - II—Statistical Tables*

## *A. Wages*

### 1. Daily Agricultural Wages in Some States (Category-wise)

(In Rupees)

| State/Distt. | Centre | Month and Year | Daily Normal Working Hours | Field Labour | | Other Agri. Labour | | Herdsman | | Skilled Labour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Man | Woman | Man | Woman | Man | Woman | Carpenter | Blacksmith | Cobbler |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| *Andhra Pradesh* | | | | | | | | | | | | |
| Krishna | Ghantasala | Dec., 2013 | 8 | 300 | 200 | 250 | NA | 140 | NA | NA | NA | NA |
| Guntur | Tadikonda | Dec., 2013 | 8 | 300 | 245 | 300 | NA | 250 | NA | NA | NA | NA |
| Rangareddy | Arutala | Dec., 2013 | 8 | 220 | 170 | 250 | NA | NA | NA | 275 | 250 | NA |
| *Karnataka* | | | | | | | | | | | | |
| Bangalore | Harisandra | Sep., 2013 | 8 | 250 | 200 | 200 | 175 | 200 | 180 | 300 | 250 | NA |
| Tumkur | Gedlahali | Nov., & Dec., 2013 | 8 | 175 | 165 | 180 | 170 | 180 | 170 | 200 | 180 | NA |
| *Maharashtra* | | | | | | | | | | | | |
| Nagpur | Mauda | Feb., 2012 | 8 | 100 | 100 | NA | NA | NA | NA | NA | NA | NA |
| Ahmednagar | Akole | Feb., 2012 | 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Jharkhand* | | | | | | | | | | | | |
| Ranchi | Gaintalsood | April, 2012 | 8 | 100 | 100 | NA | 90 | 90 | NA | 58 | 58 | NA |

### 1.1 Daily Agricultural Wages in Some States (Operation-wise)

(In Rupees)

| State/Distt. | Centre | Month and Year | Type of Labour | Normal Daily Working hours | Ploughing | Sowing | Weeding | Harvesting | Other Agri. Labour | Herdsman | Skilled Labour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Carpenter | Blacksmith | Cobbler |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| *Assam* | | | | | | | | | | | | | |
| Barpeta | Loharapara | March, 2012 | M | 8 | 180 | 180 | 180 | 180 | 180 | | 180 | 180 | 180 |
| | | | W | 8 | NA | NA | 160 | 160 | 160 | NA | NA | NA | NA |
| *Bihar* | | | | | | | | | | | | | |
| Muzaffarpur | Bhalui Rasul | April to June, 2012 | M | 8 | 130 | 120 | 80 | 130 | 150 | 120 | 200 | 180 | 250 |
| | | | W | 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Shekhpura | Kutaut | May & June, 2012 | M | 8 | NA | NA | 185 | NA | 185 | NA | 245 | NA | NA |
| | | | W | 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Chhattisgarh* | | | | | | | | | | | | | |
| Dhamtari | Sihaba | March, 2014 | M | 8 | NA | NA | 150 | 80 | 80 | 80 | 250 | 100 | 100 |
| | | | W | 8 | NA | NA | 80 | 80 | 80 | 80 | 150 | NA | NA |
| *Gujarat* | | | | | | | | | | | | | |
| Rajkot | Rajkot | Jan., 2013 | M | 8 | 209 | 225 | 150 | 170 | 147 | 150 | 360 | 360 | 240 |
| | | | W | 8 | NA | 169 | 150 | 179 | 145 | 142 | NA | NA | NA |
| Dahod | Dahod | Jan., 2013 | M | 8 | 100 | 100 | 100 | 100 | 100 | NA | 200 | 144 | 150 |
| | | | W | 8 | NA | 100 | 100 | 100 | 100 | NA | NA | NA | NA |
| *Haryana* | | | | | | | | | | | | | |
| Panipat | Ugarakheri | March, 2014 | M | 8 | 300 | 300 | 300 | 300 | 300 | NA | NA | NA | NA |
| | | | W | 8 | NA | 250 | 200 | 250 | 250 | NA | NA | NA | NA |

## 1.1 Daily Agricultural Wages in Some States (Operation-wise)—*Contd.*

(In Rupees)

| State/Distt. | Centre | Month and Year | Type of Labour | Normal Daily Working Hours | Ploughing | Sowing | Weeding | Harvesting | Other Agri. Labour | Herdsman | Skilled Labour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Carpenter | Blacksmith | Cobbler |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| *Himachal Pradesh* | | | | | | | | | | | | | |
| Mandi | Mandi | Dec. 2013 | M | 8 | NA | 162 | 162 | 162 | 162 | NA | 260 | 240 | 240 |
| | | | W | 8 | NA | 162 | 162 | 162 | 162 | NA | NA | NA | NA |
| *Kerala* | | | | | | | | | | | | | |
| Kozhikode | Koduvally | Jan., 2014 | M | 4 to 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | W | 4 to 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Palakkad | Elappally | Jan., 2014 | M | 4 to 8 | 400 | 350 | NA | 450 | 433 | NA | 550 | NA | NA |
| | | | W | 4 to 8 | NA | NA | 300 | 450 | 250 | NA | NA | NA | NA |
| *Madhya Pradesh* | | | | | | | | | | | | | |
| Hoshangabad | Sangarkhera | Jan., 2014 | M | 8 | 150 | 130 | 150 | 150 | 125 | 100 | NA | NA | NA |
| | | | W | 8 | NA | 130 | 150 | 150 | 125 | 100 | NA | NA | NA |
| Satna | Kotar | Jan., 2014 | M | 8 | 250 | NA | 150 | 150 | 250 | 150 | 350 | 350 | 350 |
| | | | W | 8 | NA | NA | 150 | 150 | 250 | 150 | NA | NA | NA |
| Shyopur Kala | Vijaypur | Jan., 2014 | M | 8 | NA | 200 | 200 | NA | NA | NA | 250 | 250 | NA |
| | | | W | 8 | NA | 200 | 200 | NA | NA | NA | NA | NA | NA |
| *Odisha* | | | | | | | | | | | | | |
| Bhadrak | Chandbali | Jan., 2014 | M | 8 | 180 | 130 | 130 | 250 | 216.66 | 150 | 350 | 200 | 200 |
| | | | W | 8 | NA | 120 | 120 | 200 | 180 | 140 | NA | NA | NA |
| Ganjam | Aska | Jan., 2014 | M | 8 | 250 | 200 | 200 | 200 | 225 | 200 | 350 | 350 | 200 |
| | | | W | 8 | NA | 150 | 150 | 100 | 1400 | 100 | NA | NA | NA |
| *Punjab* | | | | | | | | | | | | | |
| Ludhiana | Pakhowal | June, 2008 | M | 8 | NA | NA | 90 | 95 | NA | 99.44 | NA | NA | NA |
| | | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Rajasthan* | | | | | | | | | | | | | |
| Barmer | Vishala | Feb., 14 | M | 8 | 310 | 310 | NA | NA | NA | 100 | 400 | 300 | 300 |
| | | | W | 8 | 310 | 310 | NA | NA | NA | NA | NA | 300 | NA |
| Jalore | Panwa | Feb., 14 | M | 8 | NA | NA | 200 | NA | NA | 200 | 350 | 300 | NA |
| | | | W | 8 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Tamil Nadu** | | | | | | | | | | | | | |
| Thanjavur | Pulvarnatham | Dec., 2013 | M | 8 | 331 | 278.5 | NA | 300 | 299.7 | NA | NA | NA | NA |
| | | | W | 8 | NA | 112.5 | 110.45 | 125 | 130 | NA | NA | NA | NA |
| Tirunelveli | Malayakulam | Dec., 2013 | M | 8 | NA | NA | NA | NA | 378.41 | NA | NA | NA | NA |
| | | | W | 8 | NA | NA | 140 | 120 | 300 | NA | NA | NA | NA |
| *Tripura* | | | | | | | | | | | | | |
| State average | | March, 2012 | M | 8 | 238 | 201 | 203 | 209 | 207 | 199 | 253 | 235 | 240 |
| | | | W | 8 | NA | 154 | 152 | 154 | 154 | 149 | NA | NA | NA |
| *Uttar Pradesh** | | | | | | | | | | | | | |
| Meerut | Ganeshpur | March, 2014 | M | 8 | 231 | 228 | 228 | 228 | 232 | NA | 348 | NA | NA |
| | | | W | 8 | NA | 187 | 187 | 187 | 192 | NA | NA | NA | NA |
| Aurraiya | Aurraiya | March, 2014 | M | 8 | NA | 147.71 | 147.71 | 152 | 147.71 | NA | 292.86 | NA | NA |
| | | | W | 8 | NA | 147.71 | 147.71 | 147.71 | 147.71 | NA | NA | NA | NA |
| Chandauli | Chandauli | March, 2014 | M | 8 | NA | NA | 142 | NA | 142 | NA | 300 | NA | NA |
| | | | W | 8 | NA | NA | 142 | NA | 142 | NA | NA | NA | NA |

M-Man, W-Woman.

N. A. —Not Available, N. R. —Not Reported

*States reported district average daily wages

## *B. PRICES*

### 2. Wholesale Prices of Certain Agricultural Commodities and Animal Husbandry Products at Selected Centres in India

(Month-end Prices in Rupees)

| Commodity | Variety | Unit | State | Centre | May-14 | Apr.-14 | May-13 |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Wheat | PBW 343 | Quintal | Punjab | Amritsar | 1405 | - | 1375 |
| Wheat | Dara | Quintal | Uttar Pradesh | Chandausi | 1450 | 1420 | 1390 |
| Wheat | Lokvan | Quintal | Madhya Pradesh | Bhopal | 1520 | 1519 | 1650 |
| Jowar | — | Quintal | Maharashtra | Mumbai | 2600 | 2600 | 2600 |
| Gram | No III | Quintal | Madhya Pradesh | Sehore | 2537 | 2560 | - |
| Maize | Yellow | Quintal | Uttar Pradesh | Kanpur | - | 1315 | - |
| Gram Split | — | Quintal | Bihar | Patna | 4500 | 4480 | 5140 |
| Gram Split | — | Quintal | Maharashtra | Mumbai | 4550 | 4500 | 6200 |
| Arhar Split | — | Quintal | Bihar | Patna | 6765 | 6800 | 6100 |
| Arhar Split | — | Quintal | Maharashtra | Mumbai | 7400 | 7400 | 6800 |
| Arhar Split | — | Quintal | NCT of Delhi | Delhi | 6345 | 6340 | 6400 |
| Arhar Split | Sort II | Quintal | Tamil Nadu | Chennai | 6500 | 6400 | 6300 |
| Gur | — | Quintal | Maharashtra | Mumbai | 3600 | 3400 | 3500 |
| Gur | Sort II | Quintal | Tamil Nadu | Coimbatore | - | - | 3400 |
| Gur | Balti | Quintal | Uttar Pradesh | Hapur | 2600 | 2475 | 2800 |
| Mustard Seed | Black (S) | Quintal | Uttar Pradesh | Kanpur | 3200 | 3215 | 3160 |
| Mustard seed | Black | Quintal | West Bengal | Raniganj | 3500 | 3450 | 3900 |
| Mustard Seed | — | Quintal | West Bengal | Kolkata | 3500 | 3500 | 3700 |
| Linseed | Bada Dana | Quintal | Uttar Pradesh | Kanpur | 4160 | 4115 | 3875 |
| Linseed | Small | Quintal | Uttar Pradesh | Varanasi | 3785 | - | 3320 |
| Cotton Seed | Mixed | Quintal | Tamil Nadu | Virudhunagar | 1700 | 1500 | 1600 |
| Cotton Seed | MCU 5 | Quintal | Tamil Nadu | Coimbatore | - | - | 1550 |
| Castor Seed | — | Quintal | Andhra Pradesh | Hyderabad | 3550 | 3550 | 3050 |
| Sesamum Seed | White | Quintal | Uttar Pradesh | Varanasi | 6310 | 6250 | 6250 |
| Copra | FAQ | Quintal | Kerala | Alleppey | 10500 | 10550 | 4350 |
| Groundnut | Pods | Quintal | Tamil Nadu | Coimbatore | - | - | 4000 |
| Groundnut | — | Quintal | Maharashtra | Mumbai | 5800 | 6000 | 7600 |
| Mustard Oil | — | 15 Kg. | Uttar Pradesh | Kanpur | 1215 | 1230 | 1239 |
| Mustard Oil | Ordinary | 15 Kg. | West Bengal | Kolkata | 1185 | 1200 | 1140 |
| Groundnut Oil | — | 15 Kg. | Maharashtra | Mumbai | 1125 | 1095 | 1650 |
| Groundnut Oil | Ordinary | 15 Kg. | Tamil Nadu | Chennai | 1275 | 1275 | 1650 |
| Linseed Oil | — | 15 Kg. | Uttar Pradesh | Kanpur | 1515 | 1455 | - |
| Castor Oil | — | 15 Kg. | Andhra Pradesh | Hyderabad | 1208 | 1223 | 1065 |
| Sesamum Oil | — | 15 Kg. | NCT of Delhi | Delhi | 2245 | 2245 | 1700 |
| Sesamum Oil | Ordinary | 15 Kg. | Tamil Nadu | Chennai | 2250 | 2730 | 2550 |
| Coconut Oil | — | 15 Kg. | Kerala | Cochin | 2295 | 2310 | 923 |
| Mustard Cake | — | Quintal | Uttar Pradesh | Kanpur | 1800 | 1825 | 1675 |
| Groundnut Cake | — | Quintal | Andhra Pradesh | Hyderabad | 3071 | 3143 | 3143 |
| Cotton/Kapas | NH44 | Quintal | Andhra Pradesh | Nandyal | 4500 | 4600 | 4300 |
| Cotton/Kapas | LRA | Quintal | Tamil Nadu | Virudhunagar | 3806 | 4016 | 3700 |
| Jute Raw | TD 5 | Quintal | West Bengal | Kolkata | 3120 | 2985 | 2785 |
| Jute Raw | W5 | Quintal | West Bengal | Kolkata | 3050 | 2955 | 2785 |

2. WHOLESALE PRICES OF CERTAIN AGRICULTURAL COMMODITIES AND ANIMAL HUSBANDRY PRODUCTS AT SELECTED CENTRES IN INDIA —*Contd.*

(Month-end Prices in Rupees)

| Commodity | Variety | Unit | State | Centre | May-14 | Apr.-14 | May-13 |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Oranges | — | 100 No. | NCT of Delhi | Delhi | - | 542 | - |
| Oranges | Big | 100 No. | Tamil Nadu | Chennai | 650 | 650 | 610 |
| Oranges | Nagpuri | 100 No. | West Bengal | Kolkata | - | - | - |
| Banana | — | 100 No. | NCT of Delhi | Delhi | 375 | 375 | 183 |
| Banana | Medium | 100 No. | Tamil Nadu | Kodaikkanal | 459 | 455 | 388 |
| Cashewnuts | Raw | Quintal | Maharashtra | Mumbai | 56000 | 58000 | 48000 |
| Almonds | — | Quintal | Maharashtra | Mumbai | 61000 | 63000 | 46000 |
| Walnuts | — | Quintal | Maharashtra | Mumbai | 64000 | 65000 | 62500 |
| Kishmish | — | Quintal | Maharashtra | Mumbai | 14500 | 14000 | 13500 |
| Peas Green | — | Quintal | Maharashtra | Mumbai | 4700 | 4600 | 3650 |
| Tomatoes | Ripe | Quintal | Uttar Pradesh | Kanpur | 550 | 1400 | 1150 |
| Ladyfinger | — | Quintal | Tamil Nadu | Chennai | 1500 | 1800 | 2200 |
| Cauliflower | — | 100 No. | Tamil Nadu | Chennai | 1900 | 1500 | 1850 |
| Potatoes | Red | Quintal | Bihar | Patna | 1460 | 1400 | 720 |
| Potatoes | Desi | Quintal | West Bengal | Kolkata | 1340 | 1280 | 840 |
| Potatoes | Sort I | Quintal | Tamil Nadu | Mettuppalayam | 3389 | - | - |
| Onions | Pole | Quintal | Maharashtra | Nashik | 900 | 850 | 950 |
| Turmeric | Nadan | Quintal | Kerala | Cochin | 10000 | 10000 | 10500 |
| Turmeric | Salam | Quintal | Tamil Nadu | Chennai | 9800 | 9800 | 9700 |
| Chillies | — | Quintal | Bihar | Patna | 8540 | 8500 | 7920 |
| Black Pepper | Nadan | Quintal | Kerala | Kozhikode | 66000 | 66500 | 31000 |
| Ginger | Dry | Quintal | Kerala | Cochin | 35000 | 35000 | 15500 |
| Cardamom | Major | Quintal | NCT of Delhi | Delhi | 125000 | 126000 | 100000 |
| Cardamom | Small | Quintal | West Bengal | Kolkata | 115000 | 98000 | 110000 |
| Milk | Cow | 100 Liters | NCT of Delhi | Delhi | - | - | 3800 |
| Milk | Buffalo | 100 Liters | West Bengal | Kolkata | 3600 | 3600 | 3200 |
| Ghee Deshi | Deshi No 1 | Quintal | NCT of Delhi | Delhi | 30015 | 28681 | 28681 |
| Ghee Deshi | — | Quintal | Maharashtra | Mumbai | 35000 | 34500 | 25500 |
| Ghee Deshi | Desi | Quintal | Uttar Pradesh | Kanpur | 32000 | 31250 | - |
| Fish | Rohu | Quintal | NCT of Delhi | Delhi | 9500 | 10000 | 8500 |
| Fish | Pomphrets | Quintal | Tamil Nadu | Chennai | 36500 | 32500 | 30000 |
| Eggs | Madras | 1000 No. | West Bengal | Kolkata | 3500 | 3500 | 3500 |
| Tea | — | Quintal | Bihar | Patna | 20250 | 20100 | 19900 |
| Tea | Atti Kunna | Quintal | Tamil Nadu | Coimbatore | - | - | 9000 |
| Coffee | Plant-A | Quintal | Tamil Nadu | Coimbatore | - | - | 26000 |
| Coffee | Rubusta | Quintal | Tamil Nadu | Coimbatore | - | - | 14000 |
| Tobacco | Kampila | Quintal | Uttar Pradesh | Farukhabad | 4850 | 4400 | 2650 |
| Tobacco | Raisa | Quintal | Uttar Pradesh | Farukhabad | 3800 | 3600 | 2550 |
| Tobacco | Bidi Tobacco | Quintal | West Bengal | Kolkata | 3900 | 3900 | 3450 |
| Rubber | — | Quintal | Kerala | Kottayam | 14000 | 13100 | 15700 |
| Arecanut | Pheton | Quintal | Tamil Nadu | Chennai | 29700 | 29700 | 28000 |

## 3. Month-end Wholesale Prices of Some Important Agricultural Commodities in International Markets During Year, 2014

| Commodity | Variety | Country | Centre | Unit | Jan. | Feb. | Mar. | Apri | May |
|---|---|---|---|---|---|---|---|---|---|
| Cardamom | Guatmala Bold Green | U.K. | — | Dollar/M.T. | 9000.00 | 9000.00 | 9000.00 | 9000.00 | 9000.00 |
| | | | | Rs./Qtl. | 56079.00 | 55818.00 | 54216.00 | 55008.00 | 53010.00 |
| Cashew Kernels | Spot U.K. 320s | U.K. | — | Dollar/1bs | 3.46 | 3.44 | 3.46 | 3.40 | 3.48 |
| | | | | Rs./Qtl. | 47516.61 | 47022.08 | 45938.06 | 45800.88 | 45175.83 |
| | Spot U.K. 320s | U.K. | — | Dollar/1bs | 7648.65 | 7614.88 | 7623.07 | 7497.06 | 7673.14 |
| | | | | Rs./Qtl. | 47658.74 | 47227.49 | 45921.37 | 45822.03 | 45194.79 |
| Castor Oil | Any Origin ex tank Rotterdam | Nether-lands | — | Dollar/M.T. | 1600.00 | - | 1700.00 | 1675.00 | 1650.00 |
| | | | | Rs./Qtl. | 9969.60 | - | 10240.80 | 10237.60 | 9718.50 |
| Celery Seed | ASTA cif | India | — | Dollar/M.T. | 1500.00 | 1500.00 | 1500.00 | 1500.00 | 1500.00 |
| | | | | Rs./Qtl. | 9346.50 | 9303.00 | 9036.00 | 9168.00 | 8835.00 |
| Chillies | Birds eye 2005 crop | Africa | — | Dollar/M.T. | 4100.00 | 4100.00 | 4100.00 | 4100.00 | 4100.00 |
| | | | | Rs./Qtl. | 25547.10 | 25428.20 | 24698.40 | 25059.20 | 24149.00 |
| Cinnamon Bark | | Mada-gascar | — | Dollar/M.T. | 1100.00 | 1100.00 | 1100.00 | 1100.00 | 1100.00 |
| | | | | Rs./Qtl. | 6854.10 | 6822.20 | 6626.40 | 7798.91 | 7515.64 |
| Cloves | Singapore | Mada-gascar | — | Dollar/M.T. | 13250.00 | 13250.00 | 12600.00 | 12600.00 | 12600.00 |
| | | | | Rs./Qtl. | 82560.75 | 82176.50 | 75902.40 | 77011.20 | 74214.00 |
| Coconut Oil | Crude Phillipine/ Indonesia | Nether-lands | — | Dollar/M.T. | 1280.00 | 1420.0 | 01355.00 | 1375.00 | 1385.00 |
| | | | | Rs./Qtl. | 7975.68 | 8806.84 | 8162.52 | 8404.00 | 8157.65 |
| Copra | Phillipines cif Rotterdam | Philli pine | — | Dollar/M.T. | 806.50 | 895.50 | 851.00 | 867.00 | 873.00 |
| | | | | Rs./Qtl. | 5025.30 | 5553.89 | 5126.42 | 5299.10 | 5141.97 |
| Corriander | | India | — | Dollar/M.T. | 1500.00 | 1500.00 | 1500.00 | 1500.00 | 1500.00 |
| | | | | Rs./Qtl. | 9346.50 | 9303.00 | 9036.00 | 9168.00 | 8835.00 |
| Cummin Seed | | India | — | Dollar./M.T. | 2250.00 | 2250.00 | 2250.00 | 2250.00 | 2250.00 |
| | | | | Rs./Qtl. | 14019.75 | 13954.50 | 13554.00 | 13752.00 | 13252.50 |
| Fennel seed | | India | — | Dollar/M.T. | 2600.00 | 2600.00 | 2600.00 | 2600.00 | 2600.00 |
| | | | | Rs./Qtl. | 16200.60 | 16125.20 | 15662.40 | 15891.20 | 15314.00 |
| Ginger | Split | Nigeria | — | Dollar/M.T. | 1800.00 | 1800.00 | 1800.00 | 1800.00 | 1800.00 |
| | | | | Rs./Qtl. | 11215.80 | 11163.60 | 13855.20 | 14057.60 | 13547.00 |
| Groundnut kernels | US 2005, 40/50 | European Ports | — | Dollar/M.T | 1250.00 | 1250.00 | 1220.00 | 1200.00 | 1180.00 |
| | | | | Rs./Qtl. | 7788.75 | 7752.50 | 7349.28 | 7334.40 | 6950.20 |
| Groundnut Oil | Crude Any Origin cif Rotterdam | U.K. | — | Dollar/M.T | 1500.00 | 1500.00 | 1500.00 | 1180.00 | 1180.00 |
| | | | | Rs./Qtl. | 9346.50 | 9303.00 | 9036.00 | 7212.16 | 6950.20 |
| Lentils | Turkish Red Split Crop 1+1 water | U.K. | — | Pound/M.T | 606.12 | 599.09 | 602.12 | 594.90 | 597.93 |
| | | | | Rs./Qtl. | 6230.91 | 6201.78 | 6023.61 | 6112.00 | 5890.21 |
| Maize | | U.S.A | Chic-ago | C/56 lbs. | 427.50 | 455.50 | 484.50 | 503.50 | 472.50 |
| | | | | Rs./Qtl | 1046.85 | 1110.23 | 1147.02 | 1209.42 | 1093.73 |
| Oats | | Canada | Winni-peg | Dollar/M.T. | 465.48 | 569.22 | 445.04 | 446.35 | 368.48 |
| | | | | Rs./Qtl. | 2900.41 | 3530.30 | 2680.92 | 2728.09 | 2170.35 |
| Palm Kernal Oil | Crude Malaysia/ Indonesia | Nether-lands | — — | Dollar/M.T. | 1170.00 | 1375.00 | 1350.00 | 1300.00 | 1245.00 |
| | | | | Rs./Qtl. | 7290.27 | 8527.75 | 8132.40 | 7945.60 | 7333.05 |

3. Month-end Wholesale Prices of Some Important Agricultural Commodities in International Markets During Year, 2014—*Contd.*

| Commodity | Variety | Country | Centre | Unit | Jan. | Feb. | Mar. | Apri | May |
|---|---|---|---|---|---|---|---|---|---|
| Palm Oil | Crude Malaysian/ Sumatra | Nether-lands | —<br>— | Dollar/M.T.<br>Rs./Qtl. | 855.00<br>5327.51 | 950.00<br>5891.90 | 923.00<br>5560.15 | 903.00<br>5519.14 | 875.00<br>5153.75 |
| Rapeseed | Canola | Canada | Winni-peg | Can Dollar/M.T | 423.80<br>2366.92 | 415.50<br>2316.83 | 458.20<br>2502.23 | 445.80<br>2472.41 | 466.50<br>2535.43 |
| | UK delivered ropseed delivered | U.K. | — | Pound/M.T.<br>Rs/Qtl. | 278.00<br>2857.84 | 304.00<br>3147.01 | 325.00<br>3251.30 | 330.00<br>3390.42 | 273.00<br>2689.32 |
| Rapeseed Oil | Refined bleached and deodorised | U.K. | — | Pound/M.T.<br>Rs/Qtl. | 668.00<br>6867.04 | 681.00<br>7049.71 | 706.00<br>7062.82 | 711.00<br>7304.91 | 675.00<br>6649.43 |
| Soyabean Meal | U.K. produced 49% oil & protein | U.K. | — | Pound/M.T.<br>Rs./Qtl. | 366.00<br>3762.48 | 410.00<br>4244.32 | 412.00<br>4121.65 | 384.00<br>3945.22 | 371.00<br>3654.72 |
| Soyabean Oil | | U.S.A. | — | C/lbs Rs./Qtl. | 37.10<br>5094.99 | 41.20<br>5631.71 | 40.73<br>5407.68 | 42.50<br>5725.11 | 39.64<br>5144.59 |
| | Refined bleached and deodorised | U.K. | — | Pound/M.T.<br>Rs/Qtl. | 652.00<br>6702.56 | 695.00<br>7194.64 | 683.00<br>6832.73 | 686.00<br>7047.96 | 645.00<br>6353.90 |
| Soyabeans | US No. 2 yellow | Nether-lands | Chi-cago | Dollar/M.T.<br>Rs./Qtl | 563.90<br>3513.66 | 492.20<br>3052.62 | 504.70<br>3040.31 | 517.30<br>3161.74 | 523.00<br>3080.47 |
| | | U.S.A. | — | C/60 lbs<br>Rs./Qtl | 1269.25<br>2902.49 | 1407.25<br>3203.09 | 1440.00<br>3183.56 | 1468.50<br>3294.00 | 1497.75<br>3237.58 |
| Sunflower Seed Oil | Refined bleached and deodorised | U.K. | — | Pound/M.T.<br>Rs./Qtl | 7100.00<br>7298.80 | 732.00<br>7577.66 | 696.00<br>6962.78 | 720.00<br>7397.28 | 693.00<br>6826.74 |
| Tallow | High grade delivered | U.K. | Lon-don | Pound/M.T.<br>Rs./Qtl | 465.00<br>4780.20 | 445.00<br>4606.64 | 445.00<br>4451.78 | 445.00<br>4571.93 | 420.00<br>4137.42 |
| Turmeric | Madras finger spot/cif | India | — | Dollar/M.T.<br>Rs./Qtl | 850.0<br>5296.35 | 850.00<br>5271.70 | 850.00<br>5120.40 | 850.00<br>5195.20 | 850.00<br>5006.50 |
| Walnuts | Indian light halves | U.K. | — | Pound/M.T.<br>Rs./Qtl | 8130.00<br>83576.40 | 8130.00<br>84161.76 | 8130.00<br>81332.52 | 8130.00<br>83527.62 | 8130.00<br>80088.63 |
| Wheat | | U.S.A. | Chic-ago | C/60 lbs<br>Rs../Qtl | 551.50<br>1261.16 | 600.00<br>1365.68 | 696.75<br>1540.38 | 676.50<br>1517.46 | 638.75<br>1380.74 |

*Source* : Public Ledger

**Exchange Rate**

| | Jan. | Feb. | Mar. | Apri | May |
|---|---|---|---|---|---|
| US Dollar | 62.31 | 62.02 | 60.24 | 61.12 | 589.90 |
| CAN Dollar | 55.85 | 55.76 | 54.61 | 55.46 | 54.35 |
| UK Pound | 102.80 | 103.52 | 100.04 | 102.74 | 98.51 |

## *C. CROP PRODUCTION*

4. SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING OF JULY, 2014

| State | Sowing | Harvesting |
|---|---|---|
| (1) | (2) | (3) |
| Andhra Pradesh | Winter Rice. Jowar (K), Bajra, Maize ('K), Ragi (K), Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses. Ginger, Chillies (Dry), Groundnut, Castorseed, Sesamum, Cotton, Mesta, Sweet Potato, Turmeric, Sannhernp. Nigerseed, Onion, apioca. | Autumn Rice |
| Assam | Winter Rice, Castorseed. | Autumn Rice,Jute |
| Bihar | Autumn Rice, Winter Rice, Jowar (K), Bajra, Maize, Ragi. Small Millets (K). Tur (K), Groundnut, Castorseed. Sesamum, Cotton, Jute. Mesta. | Jute |
| Gujarat | Winter Rice, Jowar (K), Bajra, Maize. Ragi. Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses, Chillies (Dry), Tobacco. Groundnut. Castorseed, Sesamum. Cotton, Sannhemp. | — |
| Himachal Pradesh | Summer Rice, Jowar (K), Bajra, Ragi, Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses, Chillies (Dry), Sesamum, Sannhemp, Summer Potato (Plains). | Winter Potato (Hills) |
| Jammu & Kashmir | Autumn Rice, Jowar (K), Bajra, Small Millets (K), Urad (K), Mung (K), Winter Potato, Ginger, Tobacco, Sesamum, Jute, Onion. | Tobacco, Sesamum, Onion |
| Karnataka | Autumn Rice, Winter Rice, Jowar(K). Bajra, Maize, Ragi, Small Millets (K), Tur (K), Urad (K). Mung (K). Other Kharif Pulses, Winter Potato (Plains), Summer Potato (Plains), Black Pepper, Chillies (Dry), Tobacco, Groundnut, Castorseed Sesamum, Cotton Mesta, Sweet Potato, Turmeric, Sannhemp, Nigerseed, Kardiseed, Onion, Tapioca. | Summere Rice, Maize, Sweet Potato, Sannhemp |
| Kerala | Ragi, Sweet Potato, Tapioca. Autumn Rice, Jowar (K), Bajra, Maize, Ragi, Small Millets (K), Tur (K), Mung (K), Other Kharif Pulses, Summer Potato, Ginger, Chillies (Dry), Tobacco. Groundnut, Castorseed, Sesarnurn, Cotton, Jute, Mesta, Sweet Potato, Turmeric, Sannhemp, Nigerseed. | Sesamum, tapioca — |
| Maharashtra | Winter Rice, Jowar ( K), Bajra, Maize, Ragi Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses, Summer Potato (Plains), Chillies (Dry), Tobacco, Groundnut, Castorseed, Sesamum, Cotton, Jute, Mesta, Sannhemp, Nigerseed. | — |
| Manipur | Winter Rice, Tur (K), Sesamum (K), Sweet Potato, Maize. | — |
| Orissa | Winter Rice, Jowar (K), Bajra, Maize, Ragi, Small Millets (K), Summer Potato (Plains), Chillies (Dry), Groundnut, Castorseed, Cotton, Mesta. | Chillies (Dry) |
| Punjab and Haryana | Autumn Rice, Summer Rice, Jowar (K), Bajra, Maize, Ragi, Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses, Groundnut, Castorseed, Sweet Potato, Turmeric, Sannhemp. | Small Millets (K), Potato |
| Rajasthan | Autumn Rice. Jowar (K), Bajra, Maize, Small· Millets (K). Tur (K), Urad (K), Mung (K), Other | — |

4. SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING OF JULY, 2014—*Contd.*

| State | Sowing | Harvesting |
|---|---|---|
| (1) | (2) | (3) |
| | Kharif Pulses. Chillies (Dry), Groundnut. Castorseed. Sesamum. Cotton, Sannhemp. | |
| Tamil Nadu | Autumn Rice. Jowar (K). Bajra, Ragi, Small Millets (K), Tur (K), Urad (K). Sumer Potato (Hills), Sugarcane, Chillies (Dry). Groundnut. Castorseed, Sesamum, Cotton, Sannhemp, Onion, Tapioca. | Jowar (R), Summer Potato (Hills), Sugarcane, Chillies (Dry), Sesamum, Cotton, Sannhemp. |
| Tripura | Winter Rice. Urad (K). Mung (K), Sesamum. | Onion, Autumn Rice |
| Uttar Pradesh | Autumn Rice. Winter Rice. Joar (K). Bajra. Maize. Small Millets (K). Tur (K). Urad (K). Mung (K). Other Kharif Pulses. Ginger. Groundnut. Castorseed, Sesamum. Jute. Mesta, Sweet Potato. Turmeric. Sannhernp, Nigerseed. Tapioca. | Small Millets (R), Chillies (Dry). |
| Wesst Bengal | Autumn Rice. Winter Rice. Tur (K). Ginger. Chillies (Dry). | Autumn Rice, Maize, Chillies (Dry), Sesaman, Jute |
| Delhi | Summer Rice. Jowar (K). Bajra, Maize. Tur (K). Urad (K). Mung (K). Other Kharif Pulses. Summer Potato (Plains). Chillies (Dry). Cotton. Sweet Potato. | Winter Potato (Plains), Onion. |
| Andaman & Nicobar Islands, | Autumn Rice. Winter Rice. | |

(K)—Kharif. (R)—Rabi.


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