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STATE-WISE GROWTH AND IMPORTANT OF OILSEEDS IN INDIA

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ABSTRACT: -

Trends in Area, Production and Productivity of Oilseeds, Trends in the average area (million ha), production (million tonnes), and yield (kg/ha) of oilseeds in India, Trends in oilseeds acreage, production and productivity during 1981-82 to 2011-12. Production of oilseeds

also witnessed almost a similar trend. The share of kharif oilseeds was about 67 percent and for rabi oilseeds, it was 33 per cent. Regional Variations in Oilseeds Production, The share of kharif oilseeds in total oilseeds acreage increased from less than 60 percent in TE1993-94 to 68.7 percent in TE2011-12 while production share in this period increased from 56 per cent to about 67 percent. Share of selected oilseeds in total area and production of nine oilseeds in India: TE2011-12, The changing shares of major oilseeds in total acreage and production of oilseeds in the country are presented. The share of soybean was 12.7 per cent in production and 11.0 per cent in area under oilseeds during the TE1991-92. Changing shares (%) of kharif and rabi oilseeds area in major oilseeds producing states in India: TE1991-92, TE2001-02 and TE2011-12, Kharif and rabi oilseeds acreage in major oilseeds producing states in India: TE 1993-94 and TE 2011-12, Instability in Oilseeds Production, Instability in yield, acreage and production of major oilseeds in selected states of India, 1991-92 to 2011-12, Instability in production of major oilseeds and competing crops in selected states of India, 1991-92 to 2011-12.

KEYWORDS: *Production and Productivity of Oilseeds , Indian Agriculture.*

IMPORTANCE OF OILSEEDS IN INDIAN AGRICULTURE

Indian agriculture has made considerable progress, particularly in respect of food crops such as wheat and rice in irrigated areas; however, performance has not been so good in case of other crops particularly oilseeds, pulses, and coarse cereals. Therefore, after achieving self-sufficiency in foodgrains the government is focusing attention on these agricultural commodities. The oilseed sector has been an important area of concern and interventions for Indian policy makers in the post-reforms period when India became one of the largest importers of edible oils in the world, importing about half of domestic requirement in the 1990s.

On the oilseeds map of the world, India occupies a prominent position, both in regard to acreage and production. India is the 4th largest edible oil economy in the world and contributes about 10 per cent of the world oilseeds production, 6-7% of the global production of vegetable oil, and nearly 7 percent of protein meal. This sector also has an important place in the Indian agricultural sector covering an area of about 26.5 million hectares, with total production of over 29 million tonnes in the triennium ending 2011-12 (GOI, 2013). This

constitutes about 14.8 per cent of the gross cropped area in the country. The oilseeds accounted for about 9.8 per cent (at 2004-05 prices) of the total value of output from agriculture in TE 2011-12 (CSO, 2013).

A wide range of oilseed crops is produced in different agro-climatic regions of the country. Three main oilseeds namely, groundnut, soybean, and rapeseed-mustard accounted for over 88 per cent of total oilseeds output during the TE2011-12. Soybean is the most important crop with an estimated production of 11.6 million tonnes in TE2011-12 grown mainly in Madhya Pradesh, Maharashtra, and Rajasthan accounting for more than 95 per cent of total production. The second most important oilseed crop is rapeseed-mustard (7.1 million tonnes) mainly grown in Rajasthan, Madhya Pradesh, Haryana, Uttar Pradesh, West Bengal and Gujarat with an estimated share of about 93 per cent in total production in the country. Groundnut, which was the largest oilseed crop in the 1990s, lost its share and is now 3rd important oilseed with an average production of 6.9 million tonnes in TE2011-12 and grown in Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, Karnataka and Maharashtra with a combined share of about 91 per cent in total groundnut production in the country.

Other important edible oilseeds are sesamum, sunflower and safflower. Apart from West Bengal (21.3%) and Rajasthan (21.2%), Madhya Pradesh (16.8%) and Gujarat (14.1%) are other major sesamum producing states in the country. Karnataka (37.3%), Andhra Pradesh (27.2%) and Maharashtra (14.6%) account for about 80 percent of total sunflower production in the country, but production of sunflower has remained more or less constant with high variability during the last one and half decade. Safflower production has witnessed a steady decline and Maharashtra (54.7%), Karnataka (27.9%), and Gujarat (12.7%) are major producers with a share of over 95 percent in total production.

OBJECTIVES

The specific objectives of the study are:

1) To examine trends and pattern of growth of different edible oilseeds.
2) To study the over time and across states and identify the sources of growth in edible oilseeds output in India.

The agricultural policy in India has evolved from a focus on achieving self-sufficiency in crop production in general and foodgrains in particular and food security concerns to enhancing the competitiveness of the Indian agriculture and diversification of agriculture. Policy support for agricultural markets, inputs and services, technology, product price support, institutions and infrastructure has led to an increase in area, production, and yield of foodgrains and other agricultural commodities. India became self-sufficient, and in fact witnessed surplus in foodgrains in the late-1980s. However, this 'policy support' neglected some of the crops and regions, and India became a net importer of some agricultural commodities, such as edible oils and pulses. However, the liberalization of the economy led to some shift in acreage under foodgrains to non-foodgrains, particularly high-value crops/enterprises such as fruits, vegetables, fibers, etc. and policy support was provided to encourage farmers to diversify their cropping pattern towards high-value crops.

Cropping pattern changes are the result of farmers' decision about allocation of land to various crops, which is dependent on net returns and risks associated with the individual crop and competing crops. However, there are other factors which influence area allocation decisions such as availability of seeds and other production inputs, irrigation, access to input and output markets, access to credit and other services, product price support policy, input subsidies and agro-climatic factors such as soil type, temperature, rainfall distribution, etc. Significant changes in cropping pattern have taken place during the last four decades. After the introduction of high yielding varieties of rice and wheat in the mid-1960s (Green Revolution), area under wheat and rice expanded significantly while area under coarse cereals and pulses declined. The area, production and productivity of oilseeds also remained stagnant during the decades of sixties and seventies.

Concerned with stagnating production of oilseeds in the country, government of India launched the "Technology Mission on Oilseeds" in the mid-80s, which led to a significant increase in area and production of oilseeds. However, during the 1990s there have been some shifts in area allocation among different crops/crop groups due to the opening-up of the agricultural sector and changing food habits. In this chapter, we examine the cropping pattern changes over the last four decades and identify important factors influencing those changes in the country.

Oilseeds

Since the focus of the study is on oilseeds, we analyzed changes in area under oilseeds in major states during last two decades and results are presented in Table 1. Area under oilseeds increased by about 730 thousand ha during the period from TE1993-94 to TE2009-10 and the major gainers were Madhya Pradesh (more than 2 million ha), Maharashtra (1.3 million ha), Rajasthan (750 thousand ha) and West Bengal (154 thousand ha). On the other hand, states like Karnataka (810 thousand ha), Andhra Pradesh (798 thousand ha), Tamil Nadu (770 thousand ha), Uttar Pradesh (447 thousand ha) and Odisha (426 thousand ha) lost area under oilseeds during this period. Soybean is the only oilseed crop, which has registered an increase in area under cultivation during the last two decades. The area under soybean has increased by about 5.6 million ha between TE1993-94 and 2009-10 and Maharashtra (2.5 million ha) and Madhya Pradesh (2.2 million ha) accounted for about 85 per cent of this increase. However, the other two major edible oilseeds, namely, groundnut and rapeseed-mustard lost their acreage during the last two decades. Groundnut area declined by about 241 thousand ha between TE1993-94 and 2009-10 and almost all major groundnut producing states like Andhra Pradesh (781 thousand ha), Gujarat (97 thousand ha), Tamil Nadu (669 thousand ha), Karnataka (425 thousand ha), and Maharashtra (337 witnessed a decline in area under groundnut and in almost all states cotton replaced groundnut area during the last decade. Rapeseed-mustard lost about 2.4 million ha area since early-1990s, and most of this can be attributed to a decline in area in Uttar Pradesh, Gujarat, Haryana, Odisha, Assam and Punjab. However, in Rajasthan, a major producer of rapeseed-mustard, area under rapeseed-mustard increased by about 170 thousand ha, followed by Madhya Pradesh (102 thousand ha). The area under sesamum, the next important edible oilseed, declined by 474 thousand ha and almost all states except Uttar Pradesh, West Bengal and Madhya Pradesh lost area under sesamum.

Other Crops

The area under cotton increased by about 2.2 million ha in the country during the last two decades and most of the major producers such as Andhra Pradesh, Gujarat, Maharashtra, and Madhya Pradesh witnessed an increase in cotton acreage. However, Karnataka, Tamil Nadu and Rajasthan lost area under cotton. Sugarcane also experienced a moderate increase in acreage by about 936 thousand ha and almost all states except northern states recorded an increase in sugarcane acreage.

The results of changes in the cropping pattern at all-India level show that there has been a shift of area from coarse cereals to rice, wheat, and oilseeds during the last two decades. Total area under coarse cereals saw a significant decline in absolute terms (8.9 million ha).

Table 1: Net changes in absolute and relative terms for major foodgrains crops in India: TE 1993-94 and TE 2009-10

(Absolute change (A) in '000 ha; Relative change (R) in percentage)

	Rice		Wheat		Maize		Other Coarse Cereals		Total Cereals		Total Pulses		Total Foodgrains	
States	A	R	A	R	A	R	A	R	A	R	A	R	A	R
A.P.	241.7	6.5	1.2	12.2	492.6	156.7	-1012.7	-68.3	-277.2	-5.0	341.0	21.3	63.8	0.9
Assam	-90.7	-3.6	-21.6	-28.22	-0.1	-0.5	15.0	156.6	-115.6	-4.4	2.3	2.0	-113.3	-4.1
Chhattisgarh[2]	-86.6	-2.3	-0.5	-0.5	7.3	7.6	8.0	2.8	-174.7	-4.1	-6.4	-0.7	-181.1	-3.5
Bihar[3]	93.5	2.0	257.2	12.8	139.9	19.9	-118.1	-57.9	372.5	4.8	-62.1	-6.1	310.3	3.6
Gujarat	137.9	23.3	578.5	115.1	112.7	31.3	-720.9	-42.0	108.1	3.4	-101.2	-11.2	7.0	0.2
Haryana	464.7	66.5	551.3	28.7	-17.2	-58.1	21.8	3.0	1008.1	29.9	-282.1	-63.7	726.0	19.0
Karnataka	152.6	11.6	56.1	25.5	836.8	275.3	-1128.9	-30.6	-83.4	-1.5	671.2	40.8	587.5	8.2
Jharkhand	21.8	1.5	27.2	39.9	51.9	33.8	-22.1	-31.9	83.2	4.9	207.5	126.8	290.6	15.5
Kerala	-296.6	-56.1	-	-	-	-	-5.9	-62.9	-302.5	-56.2	-13.7	-59.6	-316.2	-56.3
M.P.	110.6	2.1	244.0	6.4	57.4	6.4	-1382.4	-51.1	-1073.4	-8.5	655.2	13.9	-418.2	-2.4
Maharashtra	-33.1	-2.1	431.8	62.9	532.5	305.1	-2640.2	-32.9	-1709.0	-16.4	240.8	7.4	-1468.2	-10.7
Odisha	-91.7	-2.0	-8.8	-64.0	-27.8	-27.2	-67.3	-28.6	-269.8	-5.5	-478.0	-36.2	-747.6	-12.1
Punjab	609.7	28.9	229.0	7.0	-39.0	-20.9	-33.1	-59.7	766.5	13.6	-77.7	-76.3	688.8	12.0
Rajasthan	-13.1	-9.3	412.6	20.5	125.8	13.4	427.4	7.6	962.2	11.0	481.3	15.0	1443.6	12.1
Tamil Nadu	-347.4	-15.8	-	-	213.2	558.2	-569.9	-56.4	-704.3	-21.7	-181.3	-24.4	-885.6	-22.2
U.P.	517.0	9.5	972.3	11.0	-264.8	-24.6	-457.6	-23.6	736.9	4.3	-520.4	-18.0	216.6	1.1
Uttarakhand	0.0	0.0	0.6	0.2	-8.5	-22.1	12.1	4.9	-24.5	-2.5	24.2	61.2	-0.3	0.0
West Bengal	-1.5	0.0	49.5	17.9	37.3	72.8	-9.0	-32.5	76.5	1.3	-87.5	-32.3	-11.0	-0.2
India	1468.5	3.5	3750.1	15.4	2245.3	37.8	-8929.5	-32.3	-465.1	-0.5	618.7	2.8	153.6	0.1

Source: Authors' calculations using Land Use Statistics, various years (GoI, 2013)

The share of oilseeds in GCA increased from about 10 per cent in TE1973-74 to about 14.1 per cent in TE1993-94 but declined to 13.4 per cent in TE 2001-02, but improved marginally (14.8%) during the last decade. India lost more than 1.5 million ha net sown area during the last two decades. Crop intensification has contributed to the increase in gross cropped area.

Table 2: Net changes in absolute and relative terms for major commercial crops in India: TE1993-94 and TE2009-10

(Absolute change (A) in '000 ha; Relative change (R) in %age)

	Groundnut		Rapeseed-Mustard		Sesame		Soybean		Total oilseeds		Cotton		Sugarcane	
States	A	R	A	R	A	R	A	R	A	R	A	R	A	R
A.P.	-781.1	-32.5	0.8	16.8	-80.8	-46.1	126.2	5046.7	-798.2	-24.6	586.9	78.6	17.4	9.5
Assam	-	-	-55.5	-19.1	-2.0	-13.6	-	-	-50.6	-16.0	-0.7	-33.9	-10.6	-28.0
Bihar	-	-	-	-	-5.7	-55.7	-	-	98.9	297.3	-	-	2.1	52.9
Chhattisgarh	15.4	326.1	56.3	53.7	-11.3	-61.0	-	-	44.9	19.8	-	-	-14.4	-10.8
Gujarat	-97.4	-5.0	-111.9	-28.4	-10.5	-4.0	60.0	310.3	-37.6	-1.3	1275.8	112.2	70.1	55.9
Haryana	-0.3	-13.8	-85.7	-14.4	-0.6	-17.0	-	-	-125.9	-19.1	-51.0	-9.5	-34.1	-25.2
Jharkhand	-11.3	-85.2	-	-	-8.3	-93.6	-	-	-19.7	-88.6	-9.7	-89.3	-4.2	-63.6
Karnataka	-424.8	-33.1	-0.7	-13.6	-59.2	-44.8	107.6	298.0	-809.9	-27.3	-172.6	-29.0	25.5	9.0
Kerala	-6.4	-18.5	3.6	7.0	-3.5	-14.4	70.0	450.6	78.8	28.2	-	-	7.2	170.6
Madhya Pradesh	-48.1	-17.7	101.8	15.7	12.6	5.7	2212.2	72.8	2028.8	42.0	116.4	23.0	34.2	73.7
Maharashtra	-336.8	-49.2	-1.0	-12.9	-226.1	-76.9	2535.2	666.9	1335.5	52.2	717.7	28.0	471.9	117.9
Orissa	-108.2	-57.1	-85.0	-85.7	-131.5	-75.0	-	-	-426.4	-58.3	49.1	1009.6	-11.1	-46.3
Punjab	-8.2	-74.8	-46.7	-62.2	-11.7	-59.7	-	-	-130.3	-68.4	-95.0	-14.8	-15.7	-15.8
Rajasthan	48.4	18.7	169.6	7.1	-78.1	-14.0	541.1	207.5	749.5	21.4	-117.7	-24.0	-17.7	-69.9
Tamil Nadu	-669.2	-58.3	-0.7	-69.0	-72.9	-52.1	-	-	-769.7	-57.0	-147.5	-58.2	84.4	36.0
Uttarakhand	-0.6	-37.5	1.4	11.1	-0.3	-11.8	-3.5	-24.1	-2.9	-9.4	-	-	-20.4	-15.8
Uttar Pradesh	-31.8	-24.9	-414.6	-34.1	131.1	84.1	-10.6	-36.3	-446.8	-25.8	-8.1	-65.2	338.7	18.3
West Bengal	48.1	244.0	14.6	3.7	87.5	79.7	-	-	154.8	28.5	4.0	4000.0	1.9	13.1
India	-2407.3	-28.7	-693.2	-10.9	-474.2	-20.4	5594.4	147.9	730.1	2.8	2142.8	28.5	935.5	25.9

Source: Authors calculations using Land Use Statistics, various years (Got, 2013). For newly created states, the figures are between 2003-04 and 2009-10

Trends in Area, Production and Productivity of Oilseeds

Oilseeds occupy a prominent position in the Indian economy. India was a net exporter of edible oils and oilseeds till the mid-1960s. However, concerns for achieving self-sufficiency in foodgrains in general and cereals in particular were so dominant that all efforts were directed in that direction. In the process, while self-sufficiency in foodgrains, particularly cereals was achieved, edible oil, the major source of cooking medium remained neglected, and the country became dependent on imports. The introduction of green revolution in the mid-sixties that resulted in a spectacular growth in rice and wheat production during the late-1960s and 1970s forced the oilseed cultivation to marginal rainfed areas. However, after implementation of Technology Mission on Oilseeds (TMO) in 1986 and protection to domestic sector, there were dramatic changes in the oilseeds scenario in the country and India became self-sufficient in edible oils by early-1990s. After opening up of edible oils sector in 1994 as part of economic reforms, production of edible oilseeds suffered a lot and remained almost stagnant during the 1990s. In order to examine the trends in area, production and yield of oilseeds, time series secondary data for the last six decades was analyzed and the results are presented in Table 3.

Average area under oilseeds, which was estimated at 12.4 million ha during the 1950s, increased to about 25.8 million ha during the last decade. Annual production, which was about 6.1 million tonnes during the 1950s registered a rapid rise and reached a level of 25.6 million tonnes during the 2000s. The average productivity per ha also increased from 488 kg/ha to 989 kg/ha during the same period.

The area, production and productivity of oilseeds grew at an annual compound growth rate of 1.51 per cent, 3.06 per cent and 1.77 per cent, respectively during the period 1951-52 to 2010-11. Instability in area, production and productivity of oilseeds computed using coefficients of variation, showed that the highest variability has been observed in case of production (55.6%), and followed by productivity (30.6%) and the lowest in area (27%) of oilseeds during the period 1951-2011. However, performance of oilseeds during different decades shows quite interesting trends. As is evident from Table 3, oilseeds production recorded the highest

growth rate (5.8%) during the 1980s, followed by 2000s (4.89%) and the lowest (0.57%) during the 1990s. Almost a similar trend was observed in the case of variability in production. Yield variability has been a major factor for production variability during all decades, which is an indication of high yield risks associated with oilseeds.

Table 3: Trends in the average area (million ha), production (million tonnes), and yield (kg/ha) of oilseeds in India

	1951-52 to 1960-61[4]	*1961-62 to 1970-71*	*1971-72 to 1980-81*	*1981-82 to 1990-91*	*1991-92 to 2000-01*	*2001-02 to 2011-12*
Area	12.4	15.2	17.0	20.1	25.5	25.8
Production	6.1	7.6	9.2	13.6	21.3	25.6
Yield	488	497	538	671	836	989

Source: GoI (2013)

Table 4: Trends in compound annual growth rates (%) and variability in area, production and yield of oilseeds in India

Period	*CAGR (%)*			*Coefficient of variations [%]*		
	Area	*Production*	*Yield*	*Area*	*Production*	*Yield*
1950s	2.41	4.24	1.78	8.0	13.8	8.3
1960s	0.47	1.55	1.08	4.0	13.4	10.5
1970s	0.51	1.22	0.70	3.3	10.4	8.5
1980s	3.02	5.80	2.70	10.6	22.8	12.9
1990s	-0.87	0.57	1.45	4.7	9.8	7.8
2000s	1.80	4.89	3.07	8.4	19.0	14.2
All Period	1.51	3.06	1.53	27.0	55.6	30.6

Source: Authors' calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013)

Trends in oilseeds acreage, production and productivity during 1981-82 to 2011-12. The total area under oilseeds increased from about 18.9 million ha in 1981-92 to 26.9 million ha in 1993-94 and then witnessed a declining/stagnant trend up to 2003-04 but increased thereafter and reached the peak (27.6 million ha) in 2008-09. Production of oilseeds also witnessed almost a similar trend. Crop yield increased from about 625 kg per ha in early-80s to about 1100 kg per ha in the recent years.

It is important to identify the major sources of growth in production of oilseeds. The relative contribution of area expansion and yield improvement towards the total change in oilseeds production has been examined using decomposition analysis. The analysis helped in identifying the major sources of growth (area effect, yield effect and interaction effect) in the output and the results are presented. It is evident from that acreage expansion was more important source of growth (55.7%) in oilseeds output than yield improvement (31.4%) between TE1983-84 and TE1993-94. However, increase in yield was the largest contributor (60.3%), followed by area expansion (31.1%) to increase in oilseeds production during the TE2001-02 and TE2011-12. These trends clearly show that the yield had a higher contribution than acreage expansion to the total change in output growth during the last decade.

The relative position of various oilseeds in total area and production of oilseeds is given in Table 4. As is evident, soybean enjoys a dominant position both in terms of area and production. Its share in output of oilseeds is over 40 per cent and in respect of total oil production, 29.4 per cent during the TE2011-12. Rapeseed-mustard is the second important crop, its share being 24.5 per cent of oilseeds output and about 22.8 per cent of the acreage. It is interesting to note that rapeseed-mustard oil contributes a significant share to domestic supply, ranking number one, and its share in oil production being 35 per cent. Groundnut, which was the predominant crop during the 1980s and early-1990s, lost its share and accounted for 23.7 per cent of total production and 20.6 per cent in acreage during TE2011-12. The share of kharif oilseeds was about 67 percent and for rabi oilseeds, it was 33 per cent. The share of kharif oilseeds has increased during the last two decades.

REGIONAL VARIATIONS IN OILSEEDS PRODUCTION

The share of kharif oilseeds in total oilseeds acreage increased from less than 60 percent in TE1993-94 to 68.7 percent in TE2011-12 while production share in this period increased from 56 per cent to about 67 percent. On the other hand, share of rabi oilseeds declined both in total area and production of oilseeds in the country during the last two decades. The growth rate of production of rabi oilseeds was negative (-2.35%) during the nineties but improved significantly (3.05%) during the last decade. Almost a similar trend was observed in the case of acreage. The average productivity of oilseeds during TE2011-12 was higher in the rabi season (1158 kg/ha) compared with kharif season (1067 kg/ha).

Table 5: Share of selected oilseeds in total area and production of nine oilseeds in India: TE2011-12

Oilseeds	Area (lakh ha)	Production (lakh tonnes)		
		Oilseeds	Oil	Oil Meal
Soybean	98.1 (36.6)	116.4 (40.1)	21.0 (27.2)	85.0 (47.3)
Rapeseed & mustard	61.3 (22.8)	71.3 (24.5)	23.5 (30.5)	47.8 (26.6)
Groundnut Total	55.4 (20.6)	68.9 (23.7)	19.3 (25.0)	28.9 (16.1)
Kharif	46.4	52.1	-	-
Rabi	9.0	16.8	-	-
Castor seed	10.3 (3.8)	15.5 (5.3)	6.2 (8.0)	9.3 (5.2)
Sesame	19.8 (7.4)	7.6 (2.6)	3.0 (3.9)	4.6 (2.5)
Sunflower Total	10.4 (3.9)	6.7 (2.3)	2.6 (3.4)	1.4 (0.8)
Kharif	3.8	1.8	-	-
Rabi	6.6	4.9	-	-
Safflower	6.1 (2.3)	1.6 (0.6)	0.6 (0.8)	1.0 (0.5)
Linseed	3.4 (1.3)	1.5 (0.5)	0.5 (0.6)	1.0 (0.6)
Nigerseed	3.7 (1.4)	1.0 (0.3)	0.3 (0.4)	0.7 (0.4)
Total Oilseeds	265.0 (100.0)	290.6 (100.0)	77.0 (100.0)	179.7 (100)
Kharif	182.1 (68.7)	194.5 (66.9)		
Rabi	82.9 (31.3)	96.1 (33.1)		

Source: Go I (2013)

Figures in parentheses show share in Total Area and production. Oil and oil meal production using conversion factors from has been calculated Statistics at a Glance 2013, pp. 288-289.

Table 6: Trends in area, production and yield and compound annual growth rates (%) of kharif and rabi oilseeds in India

Period	*Kharif*			***Rabi***		
	Area	***Production***	***Yield***	***Area***	***Production***	***Yield***
	Area (million ha), production (million tonnes) and yield (kg/ha)					
TE1993-94	15.5 (59.8)	11.2 (56.0)	844	10.5 (40.2)	8.8 (44.0)	783
TE2001-02	15.4 (66.2)	12.5 (62.9)	941	7.9 (33.8)	7.4 (37.1)	879
TE2011-12	18.2 (68.7)	19.4 (66.9)	1037	8.3 (31.3)	9.6 (33.1)	1158
	Compound annual growth rate (%)					
1990s	0.23	2.63	2.39	-2.80	-2.35	0.46
2000s	2.45	5.90	3.37	0.42	3.05*	2.62*"
All Period	0.98	2.85	1.85	-1.12	0.66	1.80*"

Figures in parentheses show percent share of area/production of oilseeds during kharif and rabi season.
Source: Authors' calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013)

The changing shares of major oilseeds in total acreage and production of oilseeds in the country are presented. Groundnut was the most important oilseeds crop in the country with 41.9 per cent share in production and 35.2 per cent share in area, followed by rapeseed-mustard with an estimated share of 28.1 per cent and 23.8 per cent in total production and acreage, respectively, during the TE1991-92. The share of soybean was 12.7 per cent in production and 11.0 per cent in area under oilseeds during the TE1991-92. However, during

the last two decades, soybean has become increasingly important oilseed with a steady increase in production and has replaced groundnut. In TE2011-12, soybean accounted for over 40 percent of total production under oilseeds and 37.0 per cent of the total area in the country. The share of groundnut in total oilseeds production fell from about 42 per cent in early-1990s to 23.7 per cent in TE2011-12. Cotton, mainly Bt cotton, replaced groundnut crop in Gujarat and Andhra Pradesh, the two major groundnut producing States in the country. Rapeseed-mustard has been able to retain its position both in acreage and production. The share of rapeseed-mustard was 24.5 percent in total production and 23.2 per cent in acreage during the TE2011-12. The shares of other edible oils like sesamum, sunflower, and safflower have declined during the last two decades.

The top-four oilseed producing states, namely, Madhya Pradesh, Rajasthan, Gujarat and Maharashtra accounted for nearly 76 percent of the total production in the TE2011-12. Madhya Pradesh alone accounted for 27.5 per cent of the total oilseed production in India, with other three states contributing 48.3 per cent (Rajasthan, 19.2%, Gujarat, 14.9%, Maharashtra 14.2%). Andhra Pradesh, Karnataka, Tamil Nadu, Haryana, Uttar Pradesh, Haryana, West Bengal, and Odisha are other important oilseed producers in the country. Madhya Pradesh, Rajasthan, Gujarat and Maharashtra have increased their share in oilseeds production during the last two decades while all other States have lost their share. Madhya Pradesh recorded the highest increase (11.7%) in its share, followed by Rajasthan (6.4%) and Maharashtra (5.3%) between TE1991-92 and TE2011-12.

In case of acreage shares, the situation is slightly different. Andhra Pradesh, which is the 5th largest producer of oilseeds in the country, accounted for 12.9 per cent acreage (second largest acreage) during TE1991-92 and 8 per cent (5th position) during the TE2011-12. Madhya Pradesh gained share in area between TE1991-92 and TE2011-12 (from 16.4% to 27.6%). Other states like Rajasthan, Karnataka, Uttar Pradesh, Tamil Nadu, Odisha and Haryana lost their share in oilseeds acreage. Area expansion in Madhya Pradesh and Maharashtra has been primarily driven by soybean cultivation due to increase in exports of soymeal.

The changing shares of kharif and rabi oilseeds area in important oilseeds producing states in the country are given in Table 7. The share of kharif oilseeds in total acreage has increased in major states like Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan during the last two decades and have higher share than national average (66.9%). On the other hand, though the share of rabi oilseeds in total acreage has declined at all India level, some states have recorded increase in share of rabi crops. Rabi oilseeds are important in states like Assam, Haryana, Punjab, Uttar Pradesh, West Bengal, and Bihar, and account for more than 80 per cent of oilseeds acreage.

Table 7: Changing shares (%) of kharif and rabi oilseeds area in major oilseeds producing states in India: TE1991-92, TE2001-02 and TE2011-12

State	Kharif			Rabi		
	TE1991-92	*TE2001-02*	*TE2011-12*	*TE1991-92*	*TE2001-02*	*TE2011-12*
Andhra Pradesh	68.2	69.3	54.7	31.8	30.7	45.3
Assam	4.7	8.9	7.7	95.3	91.1	92.3
Bihar	15.4	15.4	11.9	84.6	84.6	88.1
Gujarat	71.7	85.2	85.9	28.3	14.8	14.1
Haryana	0.6	0.3	0.5	99.4	99.7	99.5
Karnataka	61.9	66.2	67.3	38.1	33.8	32.7
Madhya Pradesh	79.7	88.1	88.2	20.3	11.9	11.8
Maharashtra	54.1	81.8	93.4	45.9	18.2	6.6
Orissa	57.5	60.0	48.2	42.5	40.0	51.8
Punjab	11.2	12.0	7.6	88.8	88.0	92.4
Rajasthan	22.4	32.9	38.5	77.6	67.1	61.5
Tamil Nadu	69.5	61.5	55.4	30.5	38.5	44.6
Uttar Pradesh	13.0	12.3	18.5	87.0	87.7	81.5
West Bengal	20.3	18.7	23.9	79.7	81.3	76.1
Others	35.8	34.1	27.3	64.2	65.9	72.7
All India	53.1	62.9	66.9	46.9	37.1	33.1

Source: Authors' calculations using State wise Area, Production and Yield Statistics, various issues (GoI, 2013)

The trends in area under kharif and rabi oilseeds are presented in Table 8. It is interesting to note that most of the states witnessed a decline in area under rabi oilseeds except Bihar, Rajasthan and West Bengal between TE1993-94 and TE2011-12. In contrast, majority of major oilseeds producing states recorded an increase in kharif crop acreage during the same period. Madhya Pradesh recorded the highest increase (3767.5 thousand ha in TE1993-94 to 6328.6 thousand ha in TE2011-12), followed by Maharashtra and Rajasthan, which recorded significant increases in crop acreage. Total area under kharif oilseeds increased while rabi acreage declined during the period.

Table: 8: Kharif and rabi oilseeds acreage in major oilseeds producing states in India: TE 1993-94 and TE 2011-12

State	*Kharif*		*Rabi*	
	TE 1993-94	*TE 2011-12*	*TE 1993-94*	*TE 2011-12*
Andhra Pradesh	2606.1 (16.8)	1627.3 (8.9)	634.8 (6.1)	484.7 (5.8)
Assam	16.5 (0.1)	21.4 (0.1)	299.5 (2.9)	248.8 (3.0)
Bihar	51.5 (0.3)	41.9 (0.2)	175.0 (0.3)	276.3 (3.3)
Gujarat	2434.0 (15.7)	2561.3 (14.1)	502.9 (4.8)	377.7 (4.6)
Haryana	5.9 (0.0)	6.3 (0.0)	654.7 (6.3)	529.0 (6.4)
Karnataka	1945.2 (12.5)	1147.3 (6.3)	1016.3 (9.7)	533.0 (6.4)
Madhya Pradesh	3767.5 (24.2)	6328.6 (34.8)	1065.7 (10.2)	988.6 (11.9)
Maharashtra	1552.4 (10.0)	3334.3 (18.3)	1008.4 (9.6)	387.7 (4.7)
Odisha	508.6 (3.3)	181.3 (1.0)	222.4 (2.1)	96.5 (1.2)
Punjab	30.7 (0.2)	8.2 (0.0)	159.8 (1.5)	46.8 (0.6)
Rajasthan	1089.7 (7.0)	1914.6 (10.5)	2420.0 (23.1)	2833.5 (34.2)
Tamil Nadu	1029.7 (6.6)	330.0 (1.8)	320.0 (3.1)	134.5 (1.6)
Uttar Pradesh	313.0 (2.0)	453.0 (2.5)	1419.0 (13.6)	681.7 (8.2)
West Bengal	116.9 (0.8)	189.9 (1.0)	426.1 (4.1)	486.9 (5.9)
Others	664.5 (4.5)	61.7 (0.3)	697.5 (6.7)	184.4 (2.2)
All India	15541.5	18207.1	10464.7	8290.0

Source: Authors calculations using State wise Area, Production and Yield Statistics, various issues (GoI, 2013)

Figures are in '000 Hectares and figures in parentheses show the state's per cent share in all-India area under oilseeds

Major oilseed crops, the area under irrigation was high in case of rapeseed-mustard (72.1%), whereas it was quite low in the case of groundnut (22.6%), soybean (0.8%) and sesamum (10.2%) during the TE2010-11. The percentage area under irrigation for other oilseed crops was also very low. The irrigated area as a percentage of the total area under oilseeds varied from less than five percent in Maharashtra to more than 80 percent in Punjab (86.4%) and West Bengal (82.3%). Madhya Pradesh, the largest producer of oilseeds in the country has less than 6 percent area under irrigation (Table 9). There has not been any significant increase in irrigated area in most of the states. At all India level, the percentage of area under irrigation for oilseeds increased from 24.2 per cent to 26.2 percent during the last decade. Though oilseed crops in general require relatively less irrigation, scope for yield improvements even with protective irrigation is very high. Yield increases to the tune of 45 per cent, 42 per cent and 60 per cent have been recorded in groundnut, rapeseed-mustard and sunflower, respectively due to proper irrigation (Jha, et. al. 2012).

Table 9: Irrigated Area (%) under total oilseeds and major oilseed(s) in selected states in India

State	*TE2003-04*	*TE 2010-11*	*Major oilseed crop(s)*	*TE2010-11*
Andhra Pradesh	16.6	22.0	Groundnut	19.4
Assam	2.4	0.2	-	-
Bihar	29.8	43.2	Rapeseed-mustard	45.6
Chhattisgarh	4.4	4.6		
Gujarat	22.4	27.7	Groundnut Rapeseed-mustard	12.4 95.3
Haryana	79.9	78.5	Rapeseed-mustard	78.6
Jharkhand	3.9	8.0		
Karnataka	21.8	27.5	Groundnut Sunflower	25.6 23.1
Madhya Pradesh	4.2	5.8	Rapeseed-mustard Soybean	48.5 0.3
Maharashtra	7.3	3.8	Soybean	0.4
Orissa	11.6	17.2	Groundnut Sesamum	32.7 7.2
Punjab	86.0	86.4	Rapeseed-mustard	91.9
Rajasthan	56.5	51.5	Rapeseed-mustard Soybean	83.0 1.5
Tamil Nadu	47.1	58.0	Groundnut	36.4
Uttar Pradesh	54.1	48.1	Sesamum Rapeseed-mustard	0.5 81.1
Uttarakhand	22.1	27.7		
West Bengal	70.4	82.3	Sesamum Rapeseed-mustard	73.4 88.1
All India	24.2	26.1	Groundnut Sesamum Rapeseed-mustard Soybean Sunflower	22.5 10.2 72.1 0.8 30.0

Source: Authors' calculations using State wise Area, Production and Yield Statistics, various issues (GoI, 2013)

Oilseeds are generally grown on marginal lands with scanty irrigation facilities or in dry land areas. Irrigation has been a major source of yield growth in oilseed crops. Given the uneven growth and differences between oilseed crops in the area under irrigation and the potential for yield increase under irrigation, it will be prudent to bring more oilseed area under assured irrigation.

INSTABILITY IN OILSEEDS PRODUCTION

Nearly three-fourth of the total area under oilseeds is still unirrigated and largely rainfed, leading to unstable oilseeds production. Instability in productivity, production and area under oilseeds and major competing crops during the period 1991-92 to 2011-12 were analyzed for major oilseeds in selected states of India and the results are presented in Table 10. The yield instability in terms of coefficient of variation (CV) increased in all major edible oilseeds except for rapeseed-mustard at all India level. It showed a mixed response in major oilseeds producing states during the last two decades. In the case of groundnut, it declined in Gujarat but increased in Andhra Pradesh and Tamil Nadu during Period II. The instability of soybean yield increased in the case of both major producers and decreased for rapeseed-mustard in Rajasthan and Uttar Pradesh. In the case of sunflower, the instability increased in Andhra Pradesh but marginally declined in Karnataka during the last decade compared with the preceding decade of 1990s. While for sesamum, yield instability increased in Rajasthan and Madhya Pradesh but declined in West Bengal and Gujarat.

Oilseed crops are not high yielding crops in comparison with cereals and other competing crops. Moreover, compared with traditional cereals, these crops are generally more risky because oilseeds are mostly grown under rainfed conditions, and market price support is also not very effective. A comparison of instability in yield of major oilseeds and competing crops in selected states is given in Table 10.

Table 10: Instability in yield, acreage and production of major oilseeds in selected states of India, 1991-92 to 2011-12

Crop	*Major Producers*	*Yield*		*Area*		*Production*	
		1990s	2000s	1990s	2000s	1990s	2000s
Groundnut	Gujarat	21.6	29.7	4.4	5.5	25.0	39.2
	A.P.	52.6	35.7	10.8	13.2	53.1	36.7
	Tamil Nadu	25.9	18.3	15.8	18.8	27.0	13.2
	All India	12.0	19.9	8.3	7.3	13.5	21.4
Soybean	M.P.	11.7	16.4	17.4	11.4	24.3	24.9
	Maharashtra	19.2	21.4	41.7	29.3	52.1	35.4
	All India	11.9	14.6	21.7	16.9	28.6	27.1
Rapeseed & Mustard	Rajasthan	11.8	11.2	18.7	26.8	18.3	30.5
	Uttar Pradesh	16.0	8.1	8.1	12.6	15.1	12.2
	M.P.	13.0	13.4	10.9	19.1	18.9	27.8
	All India	10.9	8.8	10.4	14.3	12.6	18.9
Sunflower	Karnataka	15.6	14.3	19.4	28.1	18.0	29.9
	A.P.	11.6	17.6	32.0	36.2	27.8	40.2
	All India	8.0	13.8	22.6	30.4	22.3	30.5
Sesamum	West Bengal	11.4	8.7	12.2	19.9	9.9	22.7
	Rajasthan	38.4	39.4	38.3	30.9	57.8	44.9
	Gujarat	38.5	27.3	11.5	18.7	41.1	39.1
	M.P.	13.2	18.7	24.5	24.2	27.6	42.6
	All India	9.8	12.8	16.2	8.9	14.2	17.1

Source: Authors calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013)

It is evident from the Table that the instability of groundnut yield in the two major oilseed producing states, namely, Gujarat and Andhra Pradesh is higher when compared with competing crops. Almost a similar trend was observed for rapeseed-mustard and sesamum in all major producing states. Soybean has relatively lower instability of crop yields, and that could be one of the reasons why the area under soybean cultivation has increased significantly in the country. Almost similar trends were observed in the case of oilseeds acreage and production in different states.

Table 11: Instability in yield of major oilseeds and competing crops in selected states of India, 1991-92 to 2011-12

Main Crop	Major Producers	CV of Main Crop (%)	Competing Crops	CV of Competing Crop (%)
Groundnut	Gujarat	51.8	Cotton	45.3
	Andhra Pradesh	39.8	Maize	24.0
			Jowar	20.9
			Cotton	25.6
	Tamil Nadu	33.7		
	All India	22.0	Cotton	38.4
Soybean	Madhya Pradesh	15.0	Maize	20.3
	Maharashtra	20.6	Groundnut	14.8
			Cotton	42.2
	All India	14.2		
Rapeseed &	Rajasthan	18.1	Wheat	12.1

Mustard				
	Uttar Pradesh	14.2	Wheat	8.6
	Madhya Pradesh	15.1	Wheat	11.9
	All India	13.9	Wheat	7.6
Sunflower	Karnataka	16.2	Jowar	29.3
	Andhra Pradesh	17.8	Cotton	25.6
			Maize	24.0
			Jowar	20.9
	All India	12.2	Jowar	11.7
Sesamum	West Bengal	10.4	Rice	4.4
	Rajasthan	51.6	Maize	28.1
	Gujarat	32.9	Maize	27.4
	Madhya Pradesh	27.5	Maize	20.3
	All India	16.2	Maize	16.7

Source: Authors calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013)

Table 12: Instability in area under major oilseeds and competing crops in selected states of India, 1991-92 to 2011-12

Main Crop	*Major Producers*	*CV of Main Crop (%)*	*Competing Crops*	*CV of Competing Crop (%)*
Groundnut	Gujarat	6.3	Cotton	28.9
	Andhra Pradesh	18.7	Maize Jowar Cotton	36.0 18.4 29.1
	Tamil Nadu	41.1		
	All India	14.1	Cotton	26.5
Soybean	Madhya Pradesh	18.4	Maize	5.2
	Maharashtra	61.4	Groundnut Cotton	27.8 12.9
	All India	29.6		
Rapeseed & Mustard	Rajasthan	23.9	Wheat	12.7
	Uttar Pradesh	20.7	Wheat	4.2
	Madhya Pradesh	16.6	Wheat	10.5
	All India	20.7	Wheat	19.7
Sunflower	Karnataka	25.9	Jowar	40.4
	Andhra Pradesh	34.3	Cotton Maize Jowar	29.1 36.0 18.4
	All India	27.3	Jowar	18.8
Sesamum	West Bengal	26.1	Rice	15.2
	Rajasthan	34.6	Maize	6.6
	Gujarat	17.1	Maize	12.9
	Madhya Pradesh	35.0	Maize	5.2
	All India	13.8	Maize	13.5

Source: Authors' calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013c)

Table 13: Instability in production of major oilseeds and competing crops in selected states of India, 1991-92 to 2011-12

Main Crop	*Major Producers*	*CV of Main Crop (%)*	*Competing Crops*	*CV of Competing Crop (%)*
Groundnut	Gujarat	52.1	Cotton	71.3
	Andhra Pradesh	48.9	Maize Jowar Cotton	56.0 18.3 52.5
	Tamil Nadu	40.0		
	All India	21.2	Cotton	59.1
Soybean	Madhya Pradesh	29.5	Maize	21.2
	Maharashtra	65.5	Groundnut Cotton	24.6 53.8
	All India	39.2		
Rapeseed & Mustard	Rajasthan	33.5	Wheat	19.7
	Uttar Pradesh	17.4	Wheat	12.5
	Madhya Pradesh	28.0	Wheat	21.5
	All India	19.3	Wheat	13.1
Sunflower	Karnataka	30.0	Jowar	24.8
	Andhra Pradesh	37.5	Cotton Maize Jowar	52.5 56.0 18.3
	All India	26.9	Jowar	20.3
Sesamum	West Bengal	30.0	Rice	16.5
	Rajasthan	59.5	Maize	34.0
	Gujarat	41.4	Maize	32.0
	Madhya Pradesh	63.4	Maize	21.2
	All India	17.7	Maize	30.1

Source: Authors' calculations using state wise Area, Production and Yield Statistics, various issues (GoI, 2013c)

Trade Patterns and Policies in Edible Oilseed Complex

India is the largest producer of oilseeds in the world but domestic production of edible oils has not kept pace with the rising demand for edible oils in the country, leading to a substantial increase in the imports of edible oils over time.

India was nearly self-sufficient in edible oils and a net exporter of oilseeds complex till the mid-sixties. However, with stagnating production and yield as well as rise in demand for edible oils due to increasing in population, oilseed production fell far short of its demand in the 1970s. Oilseeds sector was adversely affected by the green revolution as this breakthrough in technology was accompanied by a significant shift in the area under oilseeds, pulses and coarse cereals to high yielding varieties of wheat and rice. The share of imports in total edible oils consumption, which was about 3 per cent in the first half of 1970s, increased to 28.5 per cent in the second half and to over 30 per cent during 1981-1987. By the mid-80s, India became one of the major importers of edible oil, constituting about one-third of the total supply. This was a cause of concern for the policy planners and a decision was taken to improve oilseeds production, reduce the import of edible oils and achieve self-sufficiency in edible oils by launching Technology Mission on Oilseeds (TMO) through integrated approach involving different developmental, scientific, input, banking and marketing agencies in May 1986. The programme helped in increasing production of oilseeds from 11.3 million tonnes in 1986-87 to 21.5 million tonnes during 1993-94 and import dependence declined from about one-third during 1986-87 to about 7.5 per during 1988-93. From a high quantum of about 1.8 million tonnes in 1987-88, imports came down to about two lakh tonnes in 1992-93.

However, as part of the Uruguay Round of Agreement on Agriculture commitments and domestic market reforms as well as to contain rise in edible oil prices, India opened up edible oilseeds/oils sector by removing quantitative restrictions on edible oil imports. The first significant shift in policy was announced in April 1994, when imports of palmolein were shifted from the negative list to Open General License (OGL) which

was followed by enlarging the basket of oils under OGL imports in 1995, when all edible oils except coconut oil, palm kernel oil, RBD Palm Oil and RBD Palm Stearin were brought under OGL import. Following the liberalization of edible oils sector, edible oil market experienced an explosion of imports. Imports of edible oils have grown significantly over the years, from less than one million tonnes in mid-1990s to about 5.3 million tonnes in 2003-04 and further to about 10.4 million tonnes in 2012-13.

Palm oil accounted for the largest share (75-80%) of India's total vegetable oil imports followed by soybean (11.1 per cent) and sunflower (10.1 per cent) in TE2012. The share of sunflower oil has increased significantly from 1.3 per cent in TE2005-06 to over 10 per cent in recent years while that of soybean oil has declined from about one-third to about 11 per cent during the same period. About 80 per cent of the palm oil is imported as crude palm oil and the remaining as refined oil because of high import duty on crude oil compared to refined. India imports palm oil mainly from Indonesia and Malaysia and the share was about 71 per cent and 28 per cent, respectively during the TE2013. During the last decade, Indonesia has lost its share while Malaysia has increased its share. Soybean oil is primarily imported from Argentina, Brazil and the USA, with an estimated share of about 73 per cent, 16 per cent and 9 per cent, respectively during the last five years. Ukraine is the single largest supplier of sunflower oil with over 90 per cent share. Argentina is the second largest exporter of soybean oil to India but its share is only 5 per cent.

With the exception of palm oil, substantial inter-year variability in imports of other edible oils has been observed. The soybean import have shown a negative growth rate (-0.4%) during 2003-04 to 2013-14. However, a sharp increasing trend was observed in the quantum of sunflower oil imports during the last decade. Palm oil imports have shown a consistent upward trend and increased from about 3 million tonnes in early-2000s to about 8.3 million tonnes in 2012-13 (Table 14). It is evident from the Table that for palm oil, which is a major import item for India, imports have grown at a consistent rate. The growth rates for sunflower oil and other oils are very high, but this may be due to the low base year values as the volume of imports of sunflower, coconut oil and rape oil in the early-2000s were very small. High values of coefficients of variation indicate a high degree of inter-year fluctuations in imports of all edible oils.

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