SCENARIO OF MAJOR OILSEED CROP IN AGRO CLIMATIC ZONES OF MADHYA PRADESH, INDIA

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Abstract

Oilseed crops are the second utmost important supporting factor of agricultural economy, succeeding only to cereals. Oilseed crops add a considerable share to the agricultural GDP. Nine oilseeds are the main supply source of vegetable oils in the country. Annually oilseeds are ploughed over 26.67 million hectares of area yielding 30.06 million tonnes annually (quinquennium ending 2016-17). Oilseeds are cultivated mostly under rainfed environment (70%) (NMOOP, 2018). Soybean, groundnut, rapeseed-mustard, sunflower, sesame, safflower and niger are primary source of edible oil and castor and linseed are non-eatable oils. India is yielding about 7-8 million tons of vegetable oils from prime sources and 3 million tons of vegetable oil is being harnessed from secondary sources like cottonseed, rice bran, coconut, Tree Borne Oilseeds and Oil Palm. India ranks first in the production of groundnut, second in rapeseed-mustard, and fifth in soybean (NMOOP, 2018). Main aim of this study was to know the present situation of oilseed crop in different Agro climatic zones. The study based on time-series data of area, production and yield of major oilseed crops of Madhya Pradesh (Soybean, Rapeseed & Mustard, Sesame and Groundnut) and for the calculation of absolute and relative change in different Agro climatic regions. Result shows that amongst the different Agro climatic regions of Madhya Pradesh, soybean area was recorded high in Malwa Plateau, Gird region registered maximum area under rapeseed and mustard, Bundelkhand registered maximum area under both sesame and groundnut crop.

Key words: Soybean, Rapeseed & Mustard, Sesame, Groundnut, Absolute change, Relative change etc.

Introduction

“Yellow Revolution” during early 1990’s was the reason for achieving self-sufficiency in oilseed. The requirement for edible and non-edible oils together is increasing due to different contributing factors like increasing income, population and urbanization. Nine oilseeds (soyabean, Rapeseed & Mustard, sesame, groundnut, safflower, sunflower, linseed, niger and castor) are the primary source of vegetable oils. Rice bran, cottonseed, coconut, Oil Palm and Tree Borne Oilseeds (TBOs) are secondary sources of vegetable oil. Amongst diverse oilseeds in the country, soybean, rapeseed-mustard and groundnut report for about 80 per cent of area and 87 per cent of production of oilseed (2010-11). Despite the leading position of country in the global oilseed, the actual yield of oilseeds is very low. At national level demand for fats and vegetable oil has been increasing speedily at the rate of 6% per annum, but inland output has been growing just by about 2% per annum. Insufficient and unfair crop nutrition, the slow pace in covering the yield gap and absence of adoption of the suitable agronomic practices and available technologies are some of the key issues associated to the production of oilseed crops. As a result, there is largely decline in the per capita availability of edible oils. Oilseed cultivation in India is mainly dependent on rainfall and this leads to a higher magnitude of variability in production of oilseeds. India is profoundly dependent on imports to meet its edible oil needs, despite being the fifth largest oilseed crop producing country in the world. India is largest importer of vegetable oils in the world (15% share) followed by China & USA. From the imported edible oils, share of palm oil is about 60% followed by soybean oil with a share of 25% and sunflower oil (12%). During the last decades import growth in respect of edible oils is about 174%. The import number of edible oils during 2015-16 reveals that India imported a total of 15.88 million tonnes of oilseed and vegetable oil.
products worth Rs. 69331.96 crore (NMOOP, 2018). Thus, there is a kind of virtual unproductivity in most oilseed crops. It is unfortunate that the level of production that is attainable with the accessible technology is not being realized due lack of adoption of technologies by the oilseed cultivators. Agriculture growth in Madhya Pradesh (MP) during the decade long period of 2005-06 to 2014-15 was around 9.7 percent per annum. Which is the highest growth rate recorded in agriculture by any major state of India over a ten year period. Madhya Pradesh stretch over 30.8 million hectares of land and consists of around 6.0 percent of India’s population. The state is predominantly an agricultural state, with almost 70 percent of its workforce involved in agriculture, much more than all India average of 55 percent (Agriculture Madhya Pradesh, 2018). The study was formulated with the objectives of analyze and relate the performance of Agro climatic regions with the performance of Madhya Pradesh.

Materials and methods

Agro climatic zones as units of research, because in Madhya Pradesh, a marked deviation exists in soil and climate which divided the state in eleven distinct Agroclimatic zones, which lead to great variation in farming patterns and growth rates in area, production and yield in different parts of the state. In order to make the changes easily understandable, different districts were grouped under the following zones instead of accounting them separately.

The study has used time-series data of area, production and yield of major oilseed crops like Soybean, Rapeseed & Mustard, Sesame and Groundnut. Data obtained from published sources from various issues of Agricultural Statistics published by Directorate of Land Record and Directorate of Farmer Welfare and Agriculture Development, Madhya Pradesh. This study covers the period 1991-92 to 2007-08.

Analytical Tools

Absolute change

This methods is used for analyzing comparison into change over time/state/crop is by estimation of absolute change. For measuring the absolute change in area, production and yield, the mean value of each of these elements for the first (base) and the last (current) triennium ending 1991-92 to 2007-08 are used. Absolute change in area, production and productivity are conducted by the formula :-

\[ \text{Absolute change} = \text{Y}_n - \text{Y}_o \]  

Where,

\[ \text{Y}_n = \text{Mean value (area, production and yield) for the last triennium ending.} \]

\[ \text{Y}_o = \text{Mean value (area, production and yield) for the first (base) triennium ending.} \]

The absolute change have been performed for eleven agroclimatic zones and four oilseed crop.

Relative change

In addition to absolute change, relative change has also been included in the present study. Absolute change fails to shows a comparative change among the variables. Relative changes have been worked out by the index number, which is a good measure of relative performance.

Relative change = \[ \frac{\text{Y}_n - \text{Y}_o}{\text{Y}_o} \times 100 \]  

This measure has been driven for the variables for which absolute change has been worked out.

Absolute and Relative changes in Different Agroclimatic zones of the Madhya Pradesh

A crop wise discussion on absolute and relative changes in area, production and productivity in different Agro climatic regions of state have been carried out in the following sections.

Results and Discussion

Soybean

The absolute and relative changes of soybean area among different Agro climatic zones of Madhya Pradesh have discovered an increasing trend over the last 18 years excluding in the Northern hill Regions of Chhattisgarh, Chhattisgarh Plains and Central Narmada Valley as presented in Table 1. It may be observed from the table that there has been 1809.367 thousand ha areas bring under cultivation in the state. So there was an increase of 59.854 percent in the current period above the base period in the M.P. Amongst the different Agro climatic regions of Madhya Pradesh, soybean area was recorded high in Malwa Plateau, supported by Vindhya Plateau, Nimar Plains, Gird Region, Satpura Plateau, Central Narmada Valley and Kymore Plateau & Satpura hills. Malwa Plateau placed first in terms of absolute increase in the area (824.067 thousand ha), followed by Vindhya Plateau, Nimar Plains and Gird Region, whereas Kymore Plateau & Satpura hills showed the lowest increase (2.350 thousand ha) between two periods. Nimar Plains had the maximum increase (629.636%) in the current period over the base period, supported by Gird region (230.287%), Jhabua hills (93.040%), Vindhya Plateau (67.852%), Malwa Plateau (54.169%), Bundelkhand (20.968%) and Satpura Plateau (20.952%).

Agro climatic regions registered an increasing trend
in production except Bundelkhand, Northern hill Regions of Chhattisgarh and Chhattisgarh Plains. There was a net decline in the production of soybean in Bundelkhand (23.833 thousand tonnes), Northern hill Regions of Chhattisgarh (4.267 thousand tonnes) and Chhattisgarh region (0.200 thousand tonnes) during the two periods. In terms of absolute change, Malwa Plateau reaped the highest production (1065.967 thousand tonnes), followed by Vindhya Plateau (414.200 thousand tonnes), Nimar Plains (388.300 thousand tonnes), Gird Region (256.117 thousand tonnes) and Satpura Plateau (127.267 thousand tonnes) during the two periods. On percentage basis Nimar Plains positions first (1105.218%), supported by Gird Region (339.003%), Vindhya Plateau (88.586%), Jhabua hills (85.101%), Malwa Plateau (75.114%) and Satpura Plateau (53.331%). The total production under soybean reported for Madhya Pradesh in the base period was 2749.933 thousand tonnes which was increased by 81.471 percent to 4990.331 thousand tonnes in current period.

In whole Madhya Pradesh productivity of soybean has risen up from 898.667 kg/ha to 1034.000 kg/ha between the two periods. This rise is of 135.333 kg/ha or nearly 15.059 percent. All Agro climatic regions registered increased productivity except Bundelkhand and Northern hill Regions of Chhattisgarh. Nimar Plains recorded the highest increase in yield of soybean (421.567 kg/ha), supported by Gird Region (304.333 kg/ha), Chhattisgarh Plains (250.000 kg/ha), Central Narmada Valley (142.028 kg/ha), Malwa Plateau (133.882 kg/ha) and Vindhya Plateau (118.467 kg/ha). Nimar Plains (70.217%) recorded first in relative increase, followed by Gird Region (43.655%) and Satpura Plateau (27.274%).

**Rapeseed & Mustard**

The data in Table 2 presented the absolute and relative changes in area, production and productivity of rapeseed & mustard in all Agro climatic regions of Madhya Pradesh. It is evident from the table that in the base period, Gird Region occupied the largest area (376.367 thousand ha), followed by Malwa Plateau (55.233 thousand ha), Northern hill Regions of Chhattisgarh (37.733 thousand ha), Kymore Plateau & Satpura hill (16.867 thousand ha), Bundelkhand (27.500 thousand ha).

Reviewing the current period, it is interesting to note that Gird Region has maintained its supremacy, followed by Malwa Plateau, Northern hill Regions of Chhattisgarh, Bundelkhand, Kymore Plateau & Satpura hill.
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For whole Madhya Pradesh, the changes in area under rapeseed & mustard was 175.333 thousand ha which is more by 31.051 percent. Among the Agro climatic regions Gird Region registered the highest net increase (137.500 thousand ha), followed by Malwa Plateau (48.010 thousand ha), Northern hill Regions of Chhattisgarh (15.167 thousand ha), Satpura hills (14.353 thousand ha), Kymore Plateau & Satpura hills (14.263 thousand ha), Chhattisgarh Plains (0.567 thousand ha). The agroclimatic region Vindhya Plateau (0.833 thousand ha) and Jhabua hills (0.567 thousand ha) registered a decrease in their acreage. In relative term, the picture was quite different. Satpura Plateau had the maximum relative increase (1683.333%) in the current period over the base period, supported by Nimar Plains (99.978%), Malwa Plateau (86.938%), Northern hill Regions of Chhattisgarh (40.194%), Kymore Plateau & Satpura hills (37.945%), Gird Region (36.534%) and Bundelkhand (27.152%).

All the Agro climatic region of state except Chhattisgarh Plains and Vindhya Plateau registered increased production of rapeseed & mustard. The production of rapeseed & mustard increased from 498.333 thousand tones to 718.667 thousand tones between two periods in the state. There was a net increase of 220.333 thousand tones. Gird Region (209.633 thousand tonnes) registered maximum absolute change, followed by Malwa Plateau, Northern hill Regions of Chhattisgarh, Kymore Plateau & Satpura hills, Satpura Plateau, Bundelkhand, Central Narmada Valley and Nimar Plains. In relative terms the picture was very much different. Satpura Plateau had the lead in the current period over the base period in relative position, followed by Malwa Plateau (137.155%), Kymore Plateau & Satpura hills (92.308%), Northern hill Regions of Chhattisgarh (81.263%) and Gird region (61.064%).

Average yield of rapeseed & mustard in the whole Madhya Pradesh has risen up 76.333kg/ha, which is nearly 8.554 percent. Among all Agro climatic regions productivity increased excluding Chhattisgarh Plains and Bundelkhand. Maximum productivity of rapeseed & mustard (314.530 kg/ha) recorded in Central Narmada Valley, supported by Satpura Plateau (243.071 kg/ha), Malwa Plateau (199.955 kg/ha), Gird Region (169.095 kg/ha), Northern hill Regions of Chhattisgarh (143.694 kg/ha), Kymore Plateau & Satpura hills (143.635 kg/ha). Nimar Plains (333.333%) topped in relative position, followed by Satpura Plateau (41.198%), Kymore Plateau & Satpura hills (26.937%).

Table 2: Absolute and Relative change in area, production and productivity of Rapeseed & Mustard in different Agro climatic regions of Madhya Pradesh.

<table>
<thead>
<tr>
<th>Agroclimatic Regions</th>
<th>Area '000 ha</th>
<th>Absolute change</th>
<th>Relative change(%)</th>
<th>Production '000 tonnes</th>
<th>Absolute change</th>
<th>Relative change(%)</th>
<th>Yield Kg/ha</th>
<th>Absolute change</th>
<th>Relative change(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chhattisgarh Plains</td>
<td>3.467</td>
<td>0.067</td>
<td>1.923</td>
<td>2.800</td>
<td>-0.133</td>
<td>-4.762</td>
<td>809.494</td>
<td>-54.732</td>
<td>-6.761</td>
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<tr>
<td>Northern hill Regions Chhattisgarh</td>
<td>37.733</td>
<td>15.167</td>
<td>40.194</td>
<td>16.367</td>
<td>13.300</td>
<td>81.263</td>
<td>417.038</td>
<td>143.694</td>
<td>34.456</td>
</tr>
<tr>
<td>Central Narmada Valley</td>
<td>0.310</td>
<td>0.023</td>
<td>0.752</td>
<td>0.273</td>
<td>0.127</td>
<td>46.341</td>
<td>918.803</td>
<td>314.530</td>
<td>34.233</td>
</tr>
<tr>
<td>Gird Region</td>
<td>376.367</td>
<td>137.500</td>
<td>36.534</td>
<td>343.300</td>
<td>209.633</td>
<td>61.064</td>
<td>902.060</td>
<td>169.095</td>
<td>18.745</td>
</tr>
<tr>
<td>Bundelkhand</td>
<td>27.500</td>
<td>7.467</td>
<td>27.152</td>
<td>12.267</td>
<td>2200</td>
<td>17.935</td>
<td>447.301</td>
<td>44.551</td>
<td>-9.960</td>
</tr>
<tr>
<td>Satpura Plateau</td>
<td>0.200</td>
<td>3.367</td>
<td>1683.333</td>
<td>0.109</td>
<td>2858</td>
<td>2621.713</td>
<td>590.000</td>
<td>243.071</td>
<td>41.198</td>
</tr>
<tr>
<td>Malwa Plateau</td>
<td>55.223</td>
<td>48.010</td>
<td>86.938</td>
<td>42.799</td>
<td>58.701</td>
<td>137.155</td>
<td>776.097</td>
<td>25.764</td>
<td>4.198</td>
</tr>
<tr>
<td>Nimar Plains</td>
<td>0.033</td>
<td>0.033</td>
<td>99.978</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Jhabua Hills</td>
<td>0.567</td>
<td>-0.567</td>
<td>-10.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>564.667</td>
<td>175.333</td>
<td>31.051</td>
<td>498.333</td>
<td>220333</td>
<td>44.214</td>
<td>892.333</td>
<td>76.333</td>
<td>8.554</td>
</tr>
</tbody>
</table>

Base period : Mean value for the first triennium ending
Current period : Mean value for the last triennium ending
Scenario of major Oilseed crop in Agro Climatic Zones of Madhya Pradesh, India

(40.198%), Northern hill Regions of Chhattisgarh (34.456%), Central Narmada Valley (34.233%), Malwa Plateau (25.764%), Gird Region (18.745%) and Vindhya Plateau (9.241%).

Sesame

Table 3 shows the absolute and relative changes in area, production and productivity of sesame in dissimilar Agro climatic regions of Madhya Pradesh between the two periods. Sesame area increased by 53.000 thousand ha which is 27.320 percent at M.P. level. The tendency of decrease in the area was seen in Central Narmada valley (14.100 thousand ha), Vindhya Plateau (10.767 thousand ha), Nimar Plains (10.033 thousand ha), Northern hill Regions of Chhattisgarh (3.967 thousand ha), Satpura Plateau (3.233 thousand ha) and Malwa Plateau (2.800 thousand ha) between two periods. In terms of net increase in area, the highest increase was found in Bundelkhand (63.233 thousand ha), followed by Gird Region (38.733 thousand ha), however the increase was lowest in Jhabua hills (0.033 thousand ha). Bundelkhand (134.826 %), topped in relatively position, followed by Gird Region (126.718%) and Chhattisgarh Plains (43.478%).

Sesame production in the Madhya Pradesh raised by 45.667 thousand tones which is 97.163 percent . In absolute position, the maximum increase in the production was recorded in Bundelkhand (27.467 thousand tonnes) and Gird region (20.700 thousand tonnes). The lowest increase was seen in Kymore Plateau & Satpura hills, followed by Central Narmada Valley, Chhattisgarh Plain and Northern hill Regions of Chhattisgarh. The maximum shrinkage in the production was detected in Vindhya Plateau (2.267 thousand tones), followed by Satpura Plateau and Malwa Plateau. In terms of relative position, Bundelkhand had the maximum rise (220.912%), followed by Gird Region, Chhattisgarh Plain, Jhabua hills and Kymore Plateau & Satpura hills.

It is significant to note that all the Agro climatic regions have recorded an increase sesame productivity. Sesame yield was highest in Chhattisgarh Plain (818.182 kg/ha), followed by Central Narmada Valley (538.462 kg/ha), Gird Region (454.697 kg/ha), Jhabua hills (444.444 kg/ha) and Malwa Plateau (432.621 kg/ha).

In these Agro climatic regions, the yield were more than the yield of M.P. (375.333 kg/ha). In the remaining Agro climatic regions sesame yield were below the yield of M.P. The highest net increase in the yield was found in Chhattisgarh (425.325 kg/ha), followed by Jhabua hills (277.778 kg/ha), Kymore Plateau & Satpura hills.

<table>
<thead>
<tr>
<th>AgroclimaticRegions</th>
<th>Area - Base period</th>
<th>Current period</th>
<th>Relative change (%</th>
<th>Production - Base period</th>
<th>Current period</th>
<th>Relative change (%)</th>
<th>Yield - Base period</th>
<th>Current period</th>
<th>Relative change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chhattisgarh Plains</td>
<td>0.767</td>
<td>1.100</td>
<td>43.478</td>
<td>0.300</td>
<td>0.900</td>
<td>200.000</td>
<td>0.333</td>
<td>0.900</td>
<td>200.000</td>
</tr>
<tr>
<td>Gird Region</td>
<td>30.567</td>
<td>69.300</td>
<td>38.733</td>
<td>0.900</td>
<td>2.700</td>
<td>126.718</td>
<td>0.433</td>
<td>1.100</td>
<td>166.667</td>
</tr>
<tr>
<td>Bundelkhand</td>
<td>46.900</td>
<td>100.333</td>
<td>134.826</td>
<td>1.100</td>
<td>20.700</td>
<td>212.671</td>
<td>0.600</td>
<td>2.200</td>
<td>212.671</td>
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<tr>
<td>Central Narmada Valley</td>
<td>41.533</td>
<td>90.400</td>
<td>126.718</td>
<td>3.600</td>
<td>12.700</td>
<td>454.697</td>
<td>5.533</td>
<td>24.600</td>
<td>454.697</td>
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<tr>
<td>Satpura Plateau</td>
<td>4.633</td>
<td>1.450</td>
<td>126.718</td>
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<td>10.000</td>
<td>212.671</td>
<td>5.533</td>
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<tr>
<td>Malwa Plateau</td>
<td>7.333</td>
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<td>126.718</td>
<td>4.000</td>
<td>10.000</td>
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<td>Nimar Plains</td>
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<td>0.233</td>
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<td>0.100</td>
<td>166.667</td>
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<td>0.100</td>
<td>166.667</td>
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<tr>
<td>Jhabua Hills</td>
<td>0.200</td>
<td>0.233</td>
<td>126.718</td>
<td>0.100</td>
<td>0.100</td>
<td>166.667</td>
<td>0.033</td>
<td>0.100</td>
<td>166.667</td>
</tr>
</tbody>
</table>

Table 3: Absolute and Relative change in area, production and productivity of sesame in different agroclimatic region of Madhya Pradesh.
Groundnut

It is observed that there was a tendency towards drop in groundnut area from 234.333 thousand ha to 204.333 thousand ha in whole Madhya Pradesh (Table 4). So, there was a net decrease of 30.000 thousand ha and percentage decrease came to 12.802. Table 4, illustrate that Nimar Plains ranked first (70.933 thousand ha) in acreage followed by Gird region (49.500 thousand ha), Malwa Plateau (43.100 thousand ha), Satpura Plateau (30.767 thousand ha), Jhabua hills (18.433 thousand ha) and Bundelkhand (11.833 thousand ha). All Agro climatic regions recorded an increase in the area of groundnut except Nimar Plains, Malwa Plateau and Vindhya Plateau in the current period. The highest absolute increase in the area was found in Bundelkhand (18.100 thousand ha), followed by Gird Region (16.833 thousand ha) and the lowest increase in Satpura Plateau, Chhattisgarh Plain and Central Narmada Valley. In relative expression, the highest increase in area was found in Central Narmada Valley (249.998%), followed by Bundelkhand (152.958%), Kymore Plateau & Satpura hills (106.667%), Northern hill Regions of Chhattisgarh (63.636%) and Gird Region (34.007%) and lowest increase was in Satpura Plateau (1.733%). Central Narmada Valley showed highest percentage increase but it occupied the smallest area under groundnut in the current and base period. There was an absolute decrease of 12.000 thousand tones in the production of groundnut in Madhya Pradesh between two periods. The lowest increase was recorded in Northern hill Regions of Chhattisgarh in absolute term and in Central narmada valley in relative term. Nimar Plains and Vindhya Plateau recorded decline in production of groundnut.

Vindhya Plateau show lowest rise in both absolute (4.884 kg/ha) and relative (0.505%) terms. The Agro climatic regions Bundelkhand, Nimar Plains and Northern region Chhattisgarh showed decreased yield. Whole state’s yield of groundnut was 994.000 kg/ha, which was 6.882 percent more than the base period yield.

**Conclusion**

Assessment of the data comes with these ends:

1. It was noted from the analysis that among the four major oilseed crops (soybean, rapeseed & mustard, (170.991 kg/ha), Malwa Plateau (156.298 kg/ha) and Nimar Plains (138.129 kg/ha). Relatively the maximum increase in the yield was witnessed in Jhabua hills (166.667%), followed by Kymore Plateau & Satpura hills, Chhattisgarh Plains, Malwa Plateau, Saypura Plateau and Gird Region.

**Groundnut**

It is observed that there was a tendency towards drop in groundnut area from 234.333 thousand ha to 204.333 thousand ha in whole Madhya Pradesh (Table 4). So, there was a net decrease of 30.000 thousand ha and percentage decrease came to 12.802. Table 4, illustrate that Nimar Plains ranked first (70.933 thousand ha) in acreage followed by Gird region (49.500 thousand ha), Malwa Plateau (43.100 thousand ha), Satpura Plateau (30.767 thousand ha), Jhabua hills (18.433 thousand ha) and Bundelkhand (11.833 thousand ha). All Agro climatic regions recorded an increase in the area of groundnut except Nimar Plains, Malwa Plateau and Vindhya Plateau in the current period. The highest absolute increase in the area was found in Bundelkhand (18.100 thousand ha), followed by Gird Region (16.833 thousand ha) and the lowest increase in Satpura Plateau, Chhattisgarh Plain and Central Narmada Valley. In relative expression, the highest increase in area was found in Central Narmada Valley (249.998%), followed by Bundelkhand (152.958%), Kymore Plateau & Satpura hills (106.667%), Northern hill Regions of Chhattisgarh (63.636%) and Gird Region (34.007%) and lowest increase was in Satpura Plateau (1.733%). Central Narmada Valley showed highest percentage increase but it occupied the smallest area under groundnut in the current and base period. There was an absolute decrease of 12.000 thousand tones in the production of groundnut in Madhya Pradesh between two periods. The lowest increase was recorded in Northern hill Regions of Chhattisgarh in absolute term and in Central narmada valley in relative term. Nimar Plains and Vindhya Plateau recorded decline in production of groundnut.

Vindhya Plateau show lowest rise in both absolute (4.884 kg/ha) and relative (0.505%) terms. The Agro climatic regions Bundelkhand, Nimar Plains and Northern region Chhattisgarh showed decreased yield. Whole state’s yield of groundnut was 994.000 kg/ha, which was 6.882 percent more than the base period yield.

**Conclusion**

Assessment of the data comes with these ends:

1. It was noted from the analysis that among the four major oilseed crops (soybean, rapeseed & mustard,
sesame and groundnut), largest area brought under soybean supported by rapeseed & mustard in the whole state.

2. Malwa Plateau ranks first in terms of absolute increase in the area and production of soybean, whereas Kymore Plateau & Satpura hill showed the lowest increase in area. In relative terms change in area, production and productivity of soybean was found highest in Nimar Plain. Nimar Plain registered the highest increase in productivity of soybean.

3. In terms of absolute change Gird Region registered the highest area and production of rapeseed & mustard. Whereas Vindhya Plateau and Jhabua hill registered a decrease in their acreage. For productivity Central Narmada Valley showed the highest absolute change. The relative change in area and production was found highest in Satpura Plateau, whereas in production relative change was highest in Nimar Plain.

4. Bundelkhand registered highest net and relative increase in area and production of sesame crop, whereas in productivity Chhattisgarh Plain showed the highest absolute change.

Gird region recorded highest increase in the area and production of groundnut. In relative terms Chhattisgarh Plain showed the highest change in area. Central Narmada Valley showed the highest absolute and relative productivity and production change respectively.

References