A study on the production potential of soya in Madhya Pradesh

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Abstract

Madhya Pradesh is the highest producer of Soyabean due to various favorable factors. Soybean is the most important kharif crop of Madhya Pradesh. In fact it is the agricultural crop touching the lives of nearly 100 percent of the farming families in Madhya Pradesh. The purpose of this research is to determine the production potential of Soya in Madhya Pradesh on the basis of past records. The present study has used secondary data which was collected from reliable sources for forecasting the production potential of soya in the upcoming years. The results of this study will be helpful for determining the contribution of the state in the international trade for soya export & thus contribution in the Indian economy. This study will enable to produce efficient and useful results for the entrepreneurs, government and who so ever it may concern. The study revealed that on an average a growth rate of 21.35% is expected in soya production in Madhya Pradesh. The present study will encourage stake-holders to initiate the exports of concerning sector along with the sustainable growth and that will not only lead to promotion of exports of Madhya Pradesh, but also this will give the pace to growth of emerging Indian economy.

Keywords: export potential, sustainable growth, Indian economy.

Introduction

The soybean or soya bean is a species of legume native to East Asia, widely grown for its edible bean which has numerous uses. It is an important protein source for millions of people for over five thousand years. It can be grown on a variety of soils and a wide range of climates. The plant is classed as an oilseed rather than a pulse by the Food and Agricultural Organization.

In 2008 the soybean production of the world (in million metric tons) United States 80.5, Brazil 59.9, Argentina 46.2, China 15.5, India 9.0, Paraguay 6.8, Canada 3.3, Bolivia 1.6, European Union 0.6 and Worlds Total production 230.9. The main producers of soybean are the United States (35%), Brazil (27%), Argentina (19%), China (6%) and India* (4%). In India Madhya Pradesh, Maharashtra, Rajasthan and Andhra Pradesh are the major producers of soybeans. Madhya Pradesh tops the list. Nearly 88% of soya bean is produced in the state. During 1997-98 total soya bean production in the state was 49.19 metric tons which was about 84.2% of the total produce.

History of soya

The origin of soybean can be traced to China and was introduced to India centuries ago through the Himalayan routes, and also brought in via Burma (now Myanmar) by traders from Indonesia. As a result, soybean has been traditionally grown on a small scale in Himachal Pradesh, the Kumaon Hills of Uttar Pradesh (now Uttarakhand), Eastern Bengal, the Khasi Hills, Manipur, the Naga Hills, and parts of central India covering Madhya Pradesh. Today Madhya Pradesh is the highest producer of soybean. Basically India is a land of agriculture, so agriculture and its trading have an enormous importance as far as the Indian economy is concerned. In fact soybean is the most important kharif crop of Madhya Pradesh. Soyabean is the agricultural crop touching the lives of nearly 100 percent of the farming families in Madhya Pradesh and the set of people dependent on the farming activities namely labor. Soybean also known as the miracle crop is highly rich in proteins and oil content, and other attributes such as it has beneficial effects on soil fertility, several attempts were made in the past to popularize soybean cultivation in India. Mahatma Gandhi himself had taken initiative in 1935.

Government of India has taken many initiatives for enhancing the production of soyabean in India. The first systematic attempts to develop improved varieties of soybean suitable for Indian environments were made in the early 1900s at the Pusa Agricultural Research Farm in Bihar State, and the work was eventually extended to West Bengal, Orissa, Uttar Pradesh, Delhi, Punjab, Madhya Pradesh, Maharashtra, Tamil Nadu, and Rajasthan (Woodhouse and Taylor, 1913; 1914; Lal, 1968).

Literature review

Williams et al. (1974) estimated that if all the fallow and marginal lands were brought under soybean, Madhya Pradesh alone would have over two million hectares under soybean. This eventually came to be true, thanks to the concerted efforts of the Madhya Pradesh Government and the M P State Cooperative Oilseed Growers Federation in promoting soybean cultivation and marketing in the State.

As a step towards increasing the yield of soybean, initiatives were taken to develop improved, high yielding soybean varieties with good seed viability. Seed viability during storage was observed to be related to seed size: varieties with a 100-seed mass of more than 15 gram lost viability quickly, whereas varieties with a 100-seed mass of 10 gram or less showed little loss of viability even after a year.
However, these small-seeded varieties had low yield and low oil content. On the other hand, varieties with a 100-seed mass of 12–15 gram maintained good viability for 7–8 months, had good yield potential, and contained high levels of oil and protein. Therefore, seed mass became one of the selection criteria in the breeding program for improved seed viability. These findings paved the way for a systematic soybean breeding program, and a number of new improved varieties were developed (Singh, 1975; Singh and Saxena, 1975).

Along with the variety improvement program, considerable research was also done by agronomists, microbiologists, plant pathologists, entomologists, food scientists, and economists under the auspices of the national coordinated project (Saxena et al., 1971). This led to the development of a complete package of practices for soybean production for different agro climatic zones and cropping systems, and to the initial spread of soybean cultivation in parts of Uttar Pradesh and Madhya Pradesh.

Objectives of the Study
• To study the rate of growth of soybean production in Madhya Pradesh.
• To envisage the role of Madhya Pradesh in soya production.
• To develop a model for future prediction upon production of soya in Madhya Pradesh.

Research Methodology

The study:
The paper attempts to study the potential growth of soya in Madhya Pradesh.

Tools for Data Collection:
The study is based on secondary data. The Data were collected from various sources like Internet, Books, journals and SOPA (The Soybean Processors Association of India).

Tools for Data Analysis:
The Data was tabulated in Excel sheet and the collected data was analyzed with the help of Trend Analysis Method.

Findings

Soyabean production data of Madhya Pradesh and India for the past 10 years from 2002-03 to 2011-12 was analyzed with the help of Trend Analysis Method. Findings of the study reveal that there is positive growth rate of soybean production in Madhya Pradesh as well as India as a whole. A growth rate of 21.35% in Madhya Pradesh and 19.12% growth rate in India as a whole was revealed by the study. The data collected was tested by applying trend analysis method.

Conclusion

On the basis of this study it can be concluded that there is a positive growth trend in soybean yield in Madhya Pradesh as well as India as a whole. This positive trend can be attributed to the initiations and efforts taken by the government in the form of research and development in soybean production. In Madhya Pradesh a significant growth was observed in the past years on account of intensified research and development undertaken by the scientists at the National Research Centre for Soybean, Indore. Apart from the private sector investment, the financial support from the government can go a long way in facilitating high soybean production in Madhya Pradesh. Presently the greatest challenge for Indian scientists and development programs is to increase the average yield of soybean.

Reference


- SOPA (The Soybean Processors Association of India), Accessed on 1stFeb’12. (Production data of Soya)


- http://en.wikipedia.org/wiki/Soybean on 7th Feb’12, 04:27 pm (Production rank of India around the World of Soybean)
Annexure

Table 1: Past Production & future growth potential of Soya in India

<table>
<thead>
<tr>
<th>Years</th>
<th>ALL INDIA ( '000 Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>4300</td>
</tr>
<tr>
<td>2003-04</td>
<td>6932</td>
</tr>
<tr>
<td>2004-05</td>
<td>6122</td>
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<tr>
<td>2005-06</td>
<td>7388</td>
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<td>2006-07</td>
<td>7150</td>
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<td>9308</td>
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<td>9725</td>
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<td>2012-13</td>
<td>12173</td>
</tr>
<tr>
<td>2013-14</td>
<td>12884</td>
</tr>
<tr>
<td>2014-15</td>
<td>13595</td>
</tr>
<tr>
<td>2015-16</td>
<td>14306</td>
</tr>
<tr>
<td>2016-17</td>
<td>15017</td>
</tr>
</tbody>
</table>

\[
\sum S = a \sum T + b \sum T^2 \\
82624 = 10a + 55b \\
513082 = 55a + 385b \\
\]

\[
\begin{align*}
\sum ST &= a \sum T + b \sum T^2 \\
4544320 &= 550a + 211756b \\
5130820 &= 3850a + 211756b \\
586500 &= 825b \\
\end{align*}
\]

\[
b = \frac{586500}{825} = 710.9 \\
b = 711 \\
\]

\[
\begin{align*}
\sum ST &= a \sum T + b \sum T^2 \\
31810240 &= 211756b + 385a \\
28219510 &= 211756b + 3025a \\
3590730 &= 825a \\
\end{align*}
\]

\[
a = \frac{3590730}{825} = 4352.4 \\
a = 4352 \\
\]

The model used for trend analysis is:-

\[
S = a + b^t \\
S = \text{yield forecast India} \\
a = \text{Growth production value of soya per year} \\
b = \text{calculated value production of soya per year} \\
t = \text{forecast year} \\
S = 4352 + 711t
Table 2: Past Production & future growth potential of Soya in MP

<table>
<thead>
<tr>
<th>Years</th>
<th>Production in MP ('000 Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
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</tr>
<tr>
<td>2003-04</td>
<td>4169</td>
</tr>
<tr>
<td>2004-05</td>
<td>3660</td>
</tr>
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<td>4450</td>
</tr>
<tr>
<td>2006-07</td>
<td>3943</td>
</tr>
<tr>
<td>2007-08</td>
<td>5100</td>
</tr>
<tr>
<td>2008-09</td>
<td>5195</td>
</tr>
<tr>
<td>2009-10</td>
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<td>2015-16</td>
<td>7600</td>
</tr>
<tr>
<td>2016-17</td>
<td>7940</td>
</tr>
</tbody>
</table>

The model used for trend analysis is:

\[ S = a + b \cdot t \]

- \( S \) = yield forecast Madhya Pradesh
- \( a \) = growth production value of soya per year
- \( b \) = calculated value production of soya per year
- \( t \) = forecast year

\[ S = 2847 + 339.5 \cdot t \]

The calculation steps are as follows:

\[
\begin{align*}
47144 &= 10a + 55b \\
287303 &= 55a + 385b
\end{align*}
\]

\[
\begin{align*}
(\ldots \cdot 55) &= 2592920 = 550a + 3025b \\
(\ldots \cdot 10) &= 2873030 = 550a + 3050b
\end{align*}
\]

\[
\begin{align*}
280110 &= + 825b
\end{align*}
\]

\[
\begin{align*}
b &= 280110/825 \\
b &= 339.527273
\end{align*}
\]

\[
\begin{align*}
18150440 &= 3850a + 21175b \\
15801665 &= 3025a + 21176b
\end{align*}
\]

\[
\begin{align*}
2348775 &= 825a + \ldots
\end{align*}
\]

\[
\begin{align*}
a &= 2348775/825 \\
a &= 2847
\end{align*}
\]