AN ECONOMIC BOTANICAL STUDY OF CUT-FLOWER FARMING IN JHUNJHUNU DISTRICT OF RAJASTHAN (INDIA)

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ABSTRACT
Rajasthan state has specific climate features and the farmers of Jhunjhunu district of the state are adaptive to new technology and innovations in cultivating crops. The floriculture is a rising industry in this region. The district has been upcoming on map of Indian film shooting spots due to its heritage and geographical features. These developments are supportive and favorable for the cut flower farmers of the district. The demands from cosmetics producers and event organizers in Delhi and Jaipur are making the cut flower farming a high profit earning practice. Rose, marigold, jasmine, tulip etc. are main flower crops of the district. Farmers are cultivating cut flowers in both open and green house conditions. The yield and profit margin are 4 to 10 times more from green house production in comparison with the open farming.

Keywords: Floriculture, Farming conditions, Profit

INTRODUCTION
Jhunjhunu district of Rajasthan is situated on the desert line of Thar. The district climate zone is semi arid and major irrigation is ground water based. The geography of the district is featured specific under the Aravali hills Khetri range, flow line of seasonal river Katli forming small valley regions. The ground water level is decreasing rapidly in the district and the district has been categorized as dark zone area due to excess exploitation of the ground water reserve for agriculture and domestic use. Under these intense and alarming situations the traditional farming has become hard and low yield is another problem that is being faced by the farmers of this district. Large numbers of species of rare medicinal plants are available in the Aravali hills region. The farmers are taking keen interest in advanced irrigation techniques and progressive farming. The government agencies and NGOs are motivating farmers for this. Cultivation of ornamental plants and flowering plants is proving an alternative to the farmers of this area. The flowers are in great demand for sale or for use in perfume and cosmetics. The Jhunjhunu district is famous for heritage havelis and beautiful wall paintings and tourism industry is creating demands for natural cosmetic products. There are small towns like Mandawa, Dundlod, Nawalgarh and Khetri knocking as shooting places for Indian film industry. In addition to these traditional ceremony functions and festivals has been proving a boost to the cut flower farming. Floriculture [1-3] is the sunshine industry of Jhunjhunu district, as it offers excellent self-employment good remuneration for the small and marginal farmers. In India more than 60 % farmers are marginal farmers cultivating its own 1 hectare or less land.
England where flowers were grown in large estate is the floriculture leader of the world. Presently two third part of the political map of the world is involved in the cut flower farming. More than 125 countries are active in floriculture on large scale. China is the largest producer of the globe and India with the area of 2,33000ha is the second largest producer of floriculture and Roses after China. Floriculture in Rajasthan [4] and whole India is growing the sunshine with its wide genetic diversity. The flower cultivation in Jhunjhunu district is grown in both the conditions open cultivation and green house cultivation. Farmers are using technology and automated machines to have high yield and profit. In recent years there are much more changes in trends of floriculture growing in which Hi-tech floriculture is having high profit margin. The demand curve attains a peak during festival and marriage season generating employment for flower decorators and banquets interior artists. A good quantity is sold in mandis of national capital Delhi and state capital Jaipur. Exporters are searching opportunity in Jhunjhunu in association with the collection centers and agents.

OBJECTIVES

1. To present an economic botanical study of cut-flower cultivation in Jhunjhunu district of Rajasthan state.
2. To study and suggest the measures for marginal farmers to earn profit in water scarcity conditions.
3. To study and summaries the Hi-tech trends in cut flower cultivation.
4. To identify and explore direct trade link between farmers and industry to ensure maximum benefit to the farmers.

CLIMATE AND FARMING CONDITIONS IN RAJASTHAN

Rajasthan is the largest state of India covering 10.5% of its geographical area. A variety of climate conditions make this state unique. The geographical map showing different climate zones of the state is given in following figure.

In this state 5.5% population of the country is available as a human resource, mostly involved in agriculture and animal husbandry. There is rich livestock available in Rajasthan state covering 10% animal population of the country. The state has a larger part of its available land resource as desert land. The statistics and features of climate of the state are summarized in table 1.
Table 1 Rajasthan state climate zones and their features

<table>
<thead>
<tr>
<th>Climate zone</th>
<th>% share in total area of Rajasthan</th>
<th>Average temperature (°Celsius)</th>
<th>Average rainfall (Cms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arid</td>
<td>61</td>
<td>5.3</td>
<td>45</td>
</tr>
<tr>
<td>Semi Arid</td>
<td>16</td>
<td>8.3</td>
<td>42</td>
</tr>
<tr>
<td>Humid</td>
<td>15</td>
<td>7.8</td>
<td>40.5</td>
</tr>
<tr>
<td>Sub Humid</td>
<td>8</td>
<td>10.6</td>
<td>41</td>
</tr>
</tbody>
</table>

Only 1% of water resources of the country are available in this state. The water management is very challenging part of life and the 83% of available water is used for irrigation, animal husbandry and domestic uses. In this state where 2/3 population depends on agriculture, only 35% of cropped area is irrigated and 70% area is being irrigated through wells & tube-wells. This has caused excess exploitation of ground water and the water level has fallen deep. The land use pattern of Rajasthan out of total area of 342.7 lac hectares is tabulated in table 2 [5].

Table 2 Land use pattern in Rajasthan state

<table>
<thead>
<tr>
<th>Land use specification</th>
<th>Area (in lac hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cropped land</td>
<td>183</td>
</tr>
<tr>
<td>Cultivable waste land</td>
<td>42</td>
</tr>
<tr>
<td>Fallow land</td>
<td>30</td>
</tr>
<tr>
<td>Rain fed cultivated land</td>
<td>116.88</td>
</tr>
<tr>
<td>Irrigated cultivated land</td>
<td>66.61</td>
</tr>
</tbody>
</table>

FARMING CONDITIONS IN JHUNJHUNU DISTRICT

Rajasthan state is divided in 33 revenue districts. Jhunjhunu is situated in border area in northern direction. The farmers of this district are progressive and adopting new techniques for high yield and contributing in growth and development of the agriculture sector. The district has a higher literacy rate and highest numbers of military personals and ex-servicemen soldiers from agricultural family background. This section of the district population has a wider and global experience of different climate conditions during their in-service deployment. These people are nature lovers and have carried different varieties of plants and seeds from all over the India and world to this land of Jhunjhunu district. The regime to progress is visible in innovations from the farmers of this area. They are frequently using Information Technology based weather reports through SMS on their mobiles. The farmers are adopting organic farming and crop diversification. Drip drop irrigation methods are replacing sprinklers and solar panels are popular in this district.

CUT FLOWER CULTIVATION IN JHUNJHUNU DISTRICT

The crop that has been attracted larger attention of farmers of cut flowers in Jhunjhunu district are marigold, rose, jasmine, aster, tulip and gladiolus. In open cultivation marigold and rose are highest profitable crops. Aster, tulip and gladiolus are profitable crop giving attractive profit margin/sq.m. in greenhouse to the farmers of the district. From this course of study it reveals that the per square meter return from floriculture is highest in green house as compared to open house cultivation of flower but open house cultivation of flower gives much more profit than other ordinary crop. It is seen that the farmers are earning highest return per square meter from marigold in open cultivation of flowers out of selected flower but in greenhouse the net return per square meter is 4 times more in rose and 6 times in jasmine and aster. Tulip and gladiolus profit is 10 times more in green house than the open cultivation of crop. After the study the conclusion comes out that the open cultivation of floriculture is much more profitable than other ordinary crops like wheat, cotton, beans and bajra. In open cultivation of flowers marginal farmers are earning between 2 – 3 lacs rupees every year. But the greenhouse cultivation of...
flowers gives 4 to 10 times more profit than that of open cultivation. Farmers having even 1acre of land can earn much more in floriculture produce in open condition and even the farmer having only 0.25acre land can earn his livelihood by adapting hi-tech cultivation. Government agencies and Krishi Vigyan Kendra are spreading knowledge in farmers [6] and they are becoming more adaptive towards technology in every step of cut flower cultivation. So, floriculture is playing great role to success [7] of marginal farmers in Jhunjhunu district of Rajasthan. Marigold farming is very popular for crop separation in traditional vegetable farms in the Khetri and Udaipurwati areas of the district.

Figure 2 Cut flower farming in Nawalgarh of Jhunjhunu district

DISCUSSION

Floriculture is a fast growing industry in Jhunjhunu district of Rajasthan. Farmers of the district are very innovative and progressive farming is widely spread in this region. The entrepreneur approach in people of the villages here and dedicated efforts by the local leaders of this sector are proving profitable for the marginal farmers. During season between October to December the demand curve reaches to peak and cut flower prices remain in higher range with maximum returns to the farmers. Some farmers are trying with American saffron as experimental project. A farmer has earned 20 lacs rupees from its 3 hectare land in year 2016. Puskar in Ajmer district, Abu in Sirohi district and Behror in Alwar district of Rajastha are major cut flower producers. Jhunjhunu is a rising star on this map of cut flower market. Lack of labour training, packing technique, market linkage programs and market intelligence are the challenges to the industry.

CONCLUSION

The Jhunjhunu district climate zone is semi arid and irrigation is ground water based. The rapid decrease in ground water level is a major problem for the farmers of this region. Under these harsh and alarming situations the traditional farming has become hard. Low yield is another problem that is being faced by the farmers of this district. Jhunjhunu district has highest numbers of retired military personals in India and most of these are from farmer family background. High literacy rate in the district is another factor boosting the progressive farming and adoption of advanced irrigation techniques. Cultivation of ornamental plants and flowering plants is proving an alternative to the farmers of this area. Cut flowers are in great demand for use in perfume and cosmetics and this is the sunshine industry of Jhunjhunu district. During festival seasons it offers excellent self-employment and good remuneration for the small and marginal farmers. Aster, tulip, marigold and gladiolus are some profitable crop being cultivated in this area. This course of study reveals that the per square meter return from floriculture is highest in green house as compared to open house cultivation of flower but open house cultivation of flower is much more profitable than traditional crops. Presently A good quantity is sold in mandis of national capital Delhi and state capital Jaipur. Exporters are searching opportunity in Jhunjhunu in association with the collection centers and agents. It is concluded that selling the cut flower yield through cooperative societies managed by the farmers
themselves as is implemented in dairies in the country shall be a highly beneficial for the farmers and shall assure the expansion of cut flower cultivation in the arid zone areas of the state of Rajasthan.

REFERENCES