

# Analysing Spatial Pattern of Horticulture Development in Haryana: A Geographic Perspective

Meenakshi<sup>1</sup>, Dr. Rajesh Malik<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Geography, Baba Mastnath University, Asthal Bohar Rohtak

<sup>2</sup>Professor, Department of Geography, Baba Mastnath University, Asthal Bohar Rohtak

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## ABSTRACT

This study has explored the horticultural trends in Haryana during the 2010-11 period, focusing on the spatial distribution and production patterns of various horticultural crops, including fruits, vegetables, spices, and flowers. Horticulture has played a crucial role in enhancing the agricultural sector in Haryana, contributing significantly to the state's economy. Utilizing secondary data from the Horticulture Department of Panchkula, the research has analysed the area under cultivation and the production levels across different districts, revealing notable regional variations. The findings have indicated that Haryana has made substantial advancements in horticultural practices due to favourable climatic conditions and government initiatives like the National Horticulture Mission. Key districts such as Sirsa and Gurgaon have emerged as leaders in fruit and vegetable production, respectively, while Yamuna Nagar has been highlighted for its significant contributions to spice cultivation. Additionally, flower cultivation has shown a vibrant sector, with districts like Sonapat and Gurgaon playing crucial roles in both area and production, reflecting the potential for growth in floriculture. It has been noted that horticulture has been widely practiced across districts in Haryana, even though disparities exist. The findings have shown that Haryana has the potential to improve its horticultural output and solidify its position in the horticulture sector in the country.

**Keywords:** Horticulture, Haryana, Spatial Distribution, Fruits, Vegetables, Sustainable Agriculture, National Horticulture Mission

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## INTRODUCTION

Horticulture has played a crucial part in the Indian agriculture ecosystem. It has significantly contributed to the economy and food security. The sector has encompassed the cultivation of a diverse range of crops, including fruits, vegetables, flowers, spices, and medicinal plants. In recent years, horticulture has surpassed food grain production, accounting for approximately 33% of the gross value added in agriculture (Gulati & Juneja, 2022).

This remarkable growth has been attributed to the favorable climatic conditions in India, which have allowed for the cultivation of a variety of crops throughout the year.

The importance of horticulture has extended beyond mere economic figures; it has been vital for ensuring nutritional security among the population (Kumar et al., 2015). Horticultural crops have been rich in essential vitamins and minerals, making them an integral component of a balanced diet. Additionally, horticulture has provided significant employment opportunities, particularly for women and smallholder farmers, facilitating income diversification and enhancing livelihoods. The sector has also supported the food processing industry by supplying raw materials, thereby contributing to value addition and export earnings.

Haryana has been one of the major agricultural states in India, where horticulture has developed significantly over the past few decades. The favorable climate and irrigation facilities in the state have enabled farmers to adopt horticultural practices effectively (Singh and Kumar, 2014). The state government has implemented various initiatives, such as the National Horticulture Mission, to promote the growth of this sector. These efforts have led to increased productivity and expanded market access for farmers (Kumar et al., 2013). Horticulture in Haryana has been a vital component of the

state's agricultural framework, showcasing both strengths and challenges when compared to other states in India. The state has made significant advancements in horticultural production, with the area under horticultural crops reaching approximately 415.93 thousand hectares during 2010-2011, accounting for 6.4% of its total cropped area (Malik et al., 2013).

This growth has been particularly notable given the state's proximity to the National Capital Region of Delhi, which has provided farmers with the required access to markets for their produce. Haryana has been recognized for its high production of vegetables, which constitute about 82.6% of the total horticultural area, while fruits and flowers have also contributed to its diverse agricultural output (Kumar and Kumar, 2018). The horticultural sector has not only contributed to local economies but also played a crucial role in addressing issues like rural poverty and unemployment. By encouraging crop diversification and sustainable farming practices, horticulture has helped improve soil health and reduce environmental degradation. The state's focus on enhancing horticultural production has aligned with national goals aimed at boosting agricultural growth and achieving food security across India.

Despite these advancements, Haryana has faced challenges that affect its overall horticultural productivity. The per unit productivity of many horticultural crops in Haryana has been reported to be lower compared to leading states like Maharashtra and Uttar Pradesh. For instance, while Haryana ranks 11th in vegetable production with about 61.57 lakh MT, Uttar Pradesh leads with a staggering 256.89 lakh MT. In fruit production, Haryana ranks 22nd, producing around 737.82 thousand MT, significantly trailing Uttar Pradesh, which produces over 100 lakh MT of fruits. This disparity has highlighted the need for improved agricultural practices and technology adoption in Haryana to enhance productivity (Kaur et al., 2023).

In comparison to other states, Haryana has benefited from favorable climatic conditions and an extensive irrigation network, covering around 85.8% of its net sown area, which supports horticultural activities (Chahal and Kumar, 2024). However, states like Maharashtra have established themselves as leaders in both production and innovation within the horticulture sector, leveraging advanced techniques and better market linkages. Furthermore, while Haryana has made significant investments in horticulture through initiatives like the National Horticulture Mission, there remains considerable potential for growth. In this context, this study has analyzed the spatial distribution and production patterns of horticultural crops across various districts in Haryana during 2010-11.

### Objectives

The objectives of this study are as follows:

- To analyse the spatial patterns of horticultural crop cultivation across different districts of Haryana.
- To analyse the production levels of various horticultural crops including fruits, vegetables, spices, and flowers across different districts of Haryana.

### DATA SOURCES & METHODOLOGY

The study has been primarily based on secondary data collected from the Horticulture Department of Panchkula, Haryana. The data has included various aspects of horticultural practices, such as the cultivation of fruits, vegetables, spices, and flowers at the district level during 2010-11. The information has been systematically organized using Microsoft Excel and tabulated to facilitate effective analysis and visualization. The study has involved tabulating the collected data, enabling a clear representation of the spatial distribution and production levels of different horticultural crops across Haryana during the 2010-2011 study period.

### RESULT & DISCUSSION

#### Spatial Pattern of Area & Production under Fruits Crops: 2010-11: -

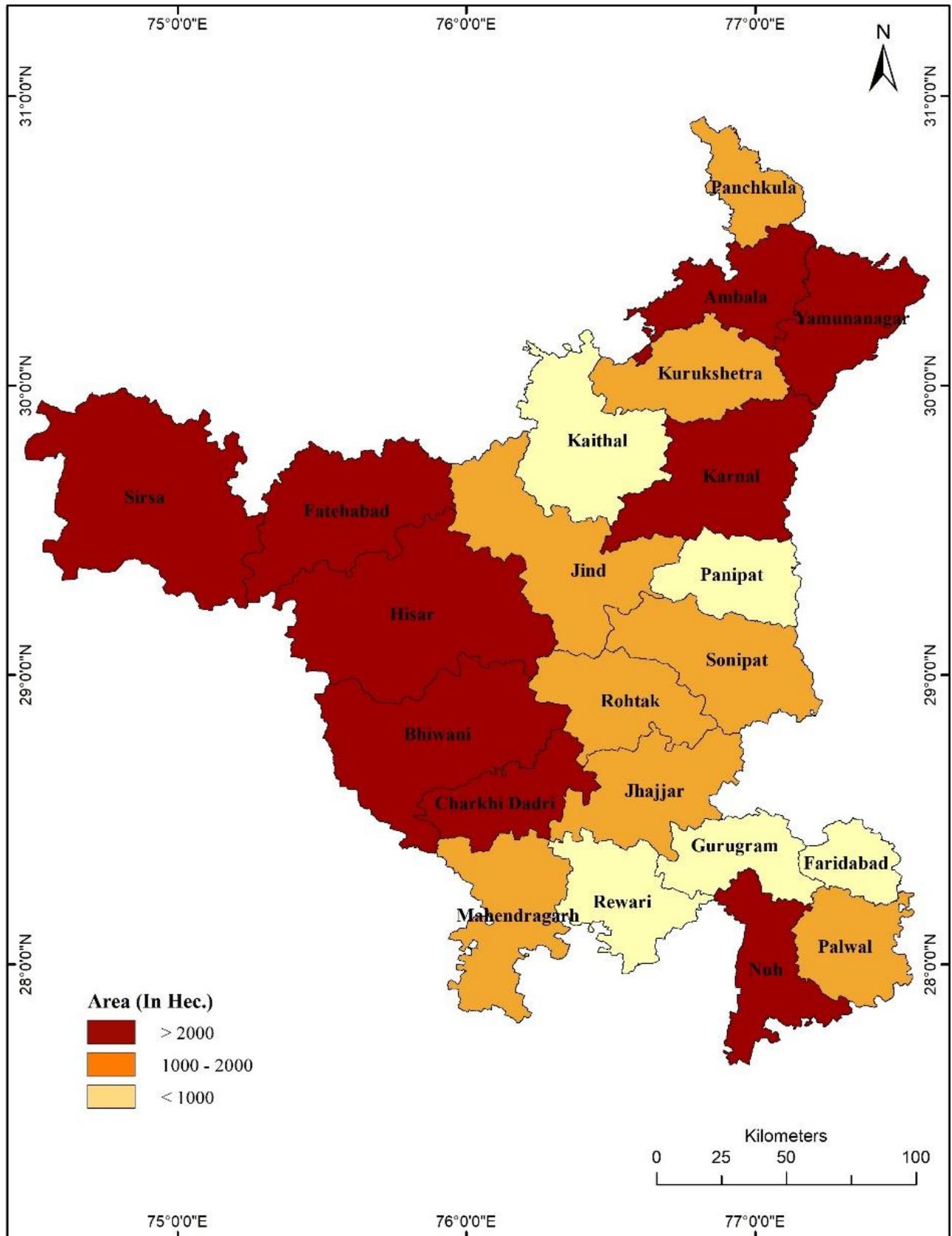
The spatial distribution of fruit cultivation in Haryana during the 2010-11 period has revealed significant variations across districts, as detailed in Table 1. Sirsa has emerged as the leading district, with the largest area dedicated to fruit cultivation, totaling 9,395 hectares. This has been followed by Yamuna Nagar with 6,887 hectares and Hissar with 3,035 hectares (Table 1).

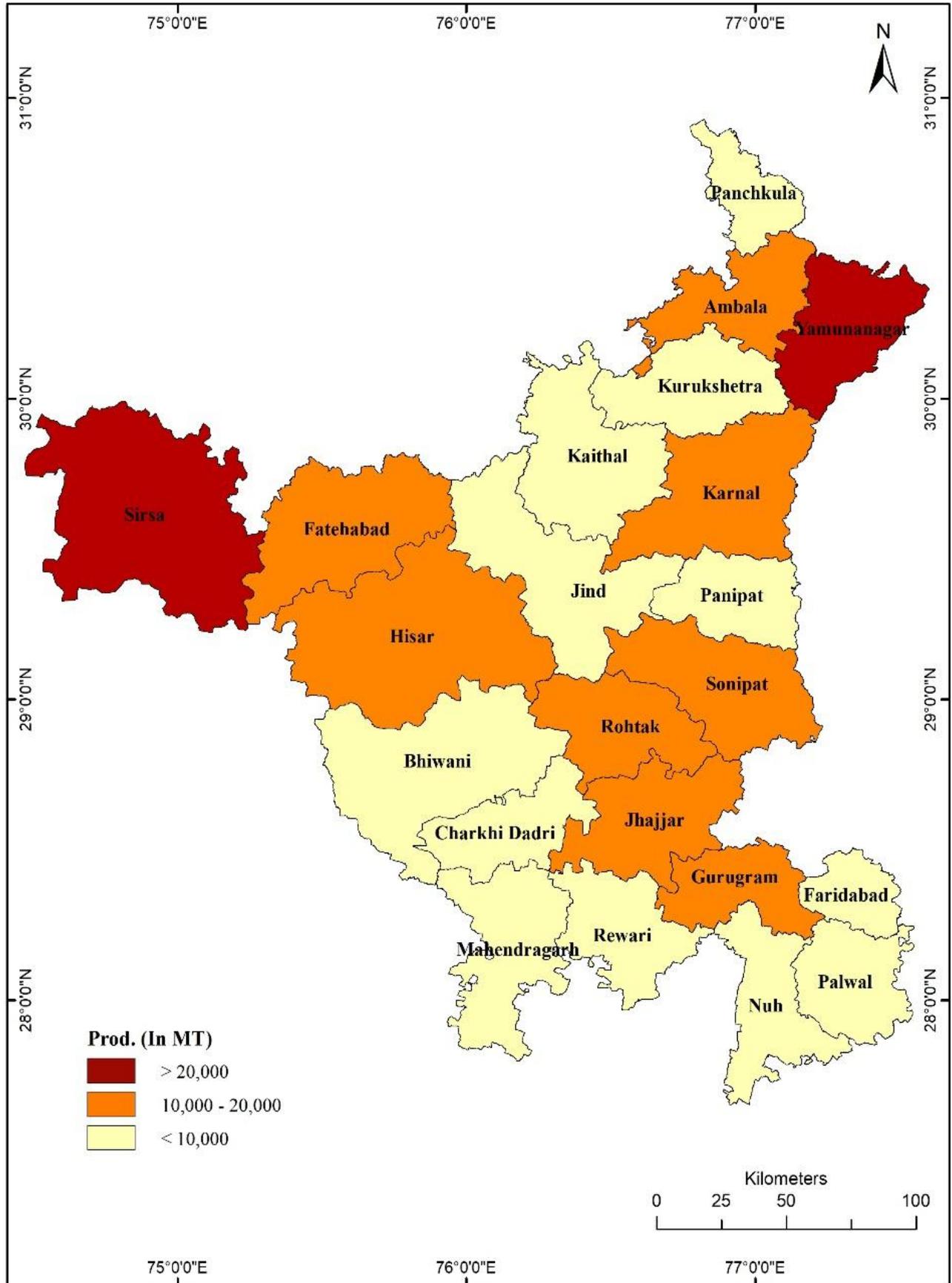
**Table 1: Pattern of Horticulture Crops in Haryana, 2010-11 Area (In Hec.) Prod. (In MT)**

Sr. No.	Districts	Fruits		Vegetables		Spices		Flower	
		Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.
1.	Panchkula	1,256	9,078	8,946	1,08,449	1,072	8,040	82	517
2.	Ambala	2,042	11,932	24,999	3,34,674	626	3,051	12	135
3.	Yamuna Nagar	6,887	65,590	28,927	4,06,955	3,512	21,711	81	618
4.	Kurukshetra	1,158	8,596	21,263	3,32,559	372	2,460	97	520
5.	Kaithal	422	4,040	6,500	91,989	380	1,530	32	270
6.	Karnal	2,138	16,982	33,850	4,44,771	1,779	10,245	373	4,148
7.	Panipat	840	5,625	19,280	2,35,869	579	2,051	205	457
8.	Sonipat	1,510	15,546	33,132	4,41,044	1,830	4,590	1,329	14,597
9.	Rohtak	1,091	11,715	16,711	1,80,558	749	2,139	274	2,242
10.	Jhajjar	1,600	11,063	9,843	1,24,363	188	481	195	1,810
11.	Faridabad	730	7,157	11,765	1,44,155	500	1,180	595	1,840
12.	Mahendragarh	1,956	4,373	7,290	93,326	725	1,780	116	1,240
13.	Rewari	669	4,203	4,877	65,125	215	622	180	2,642
14.	Gurgaon	966	14,160	39,600	4,34,460	435	2,535	2,141	24,098
15.	Bhiwani	2,666	8,515	14,602	1,22,534	515	1,795	10	115
16.	Hissar	3,035	16,351	5,525	1,19,096	611	1,608	48	395
17.	Fatehabad	3,023	19,139	11,415	1,68,456	650	2,800	24	380
18.	Sirsa	9,395	1,01,903	8,819	1,03,041	290	1,492	10	144
19.	Jind	1,172	8,280	11,890	1,78,154	685	2,560	178	1,966
20.	Mewat	2,502	7,716	14,068	2,08,615	60	319	144	1,640
21.	Palwal	1,192	4,614	9,198	90,707	187	471	174	1,546
<b>Haryana</b>		<b>46,250</b>	<b>3,56,620</b>	<b>3,42,500</b>	<b>44,28,900</b>	<b>15,960</b>	<b>73,460</b>	<b>6,300</b>	<b>61,320</b>

Source: Department of Horticulture, Haryana, 2011

Map 1: Spatial Pattern of Area & Production under Fruits Crops in Haryana, 2010-11



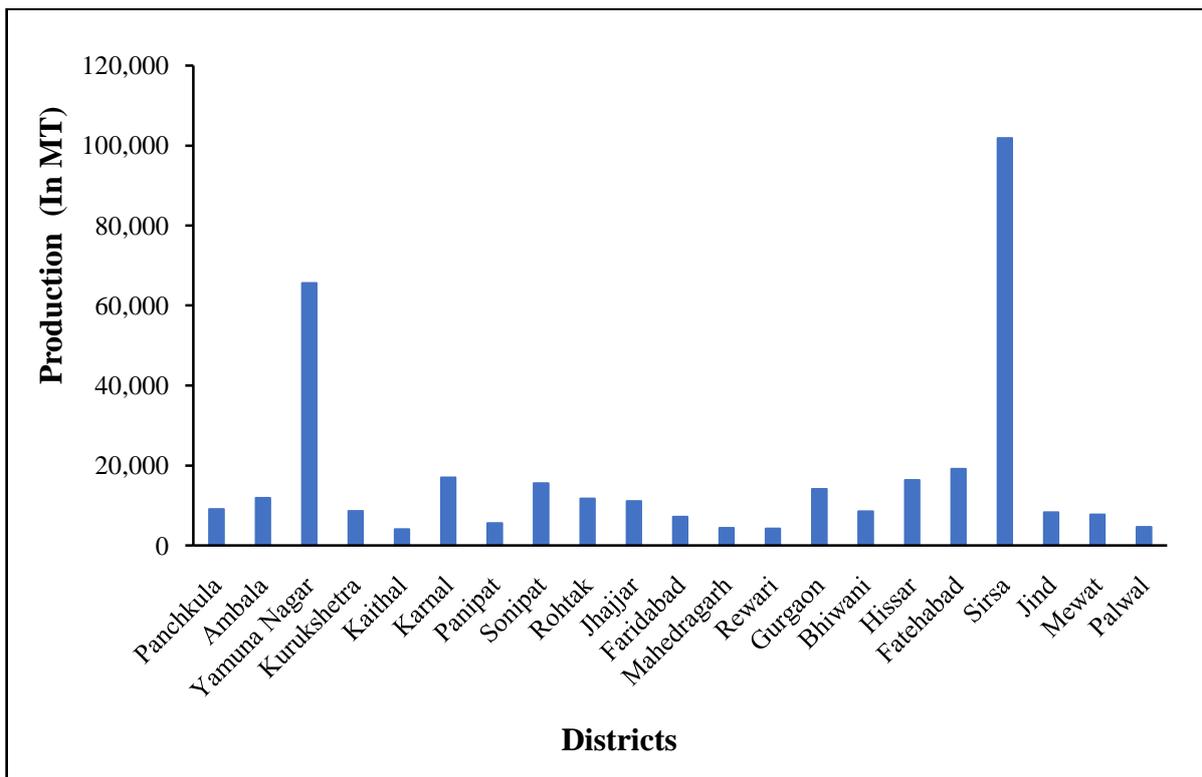


Source: Based on table 1

In contrast, districts such as Kaithal, Panipat, and Faridabad have shown relatively limited areas for fruit cultivation, measuring only 422, 840, and 730 hectares respectively (Fig. 1).

Collectively, the total area under fruit cultivation in Haryana has reached approximately 46,250 hectares, underscoring the state's vital role in regional fruit production. In terms of production, Sirsa has not only led in area but also stood out with an impressive production output of 101,903 tonnes, marking it as a crucial contributor to the fruit sector in Haryana.

Yamuna Nagar has followed closely, producing 65,590 tonnes, reinforcing its significance within the industry. Karnal has also played a noteworthy role, contributing 16,982 tonnes to the state's overall fruit yield. Conversely, districts such as Mahendragarh, Rewari, and Palwal have recorded lower production levels, with outputs of 4,373, 4,203, and 4,614 tonnes, respectively (Map 1).



Source: Based on table 1

**Figure 1: Distribution of Fruits Production in Haryana, 2010-11**

**Spatial Pattern of Area & Production under Vegetables Crops: 2010-11: -**

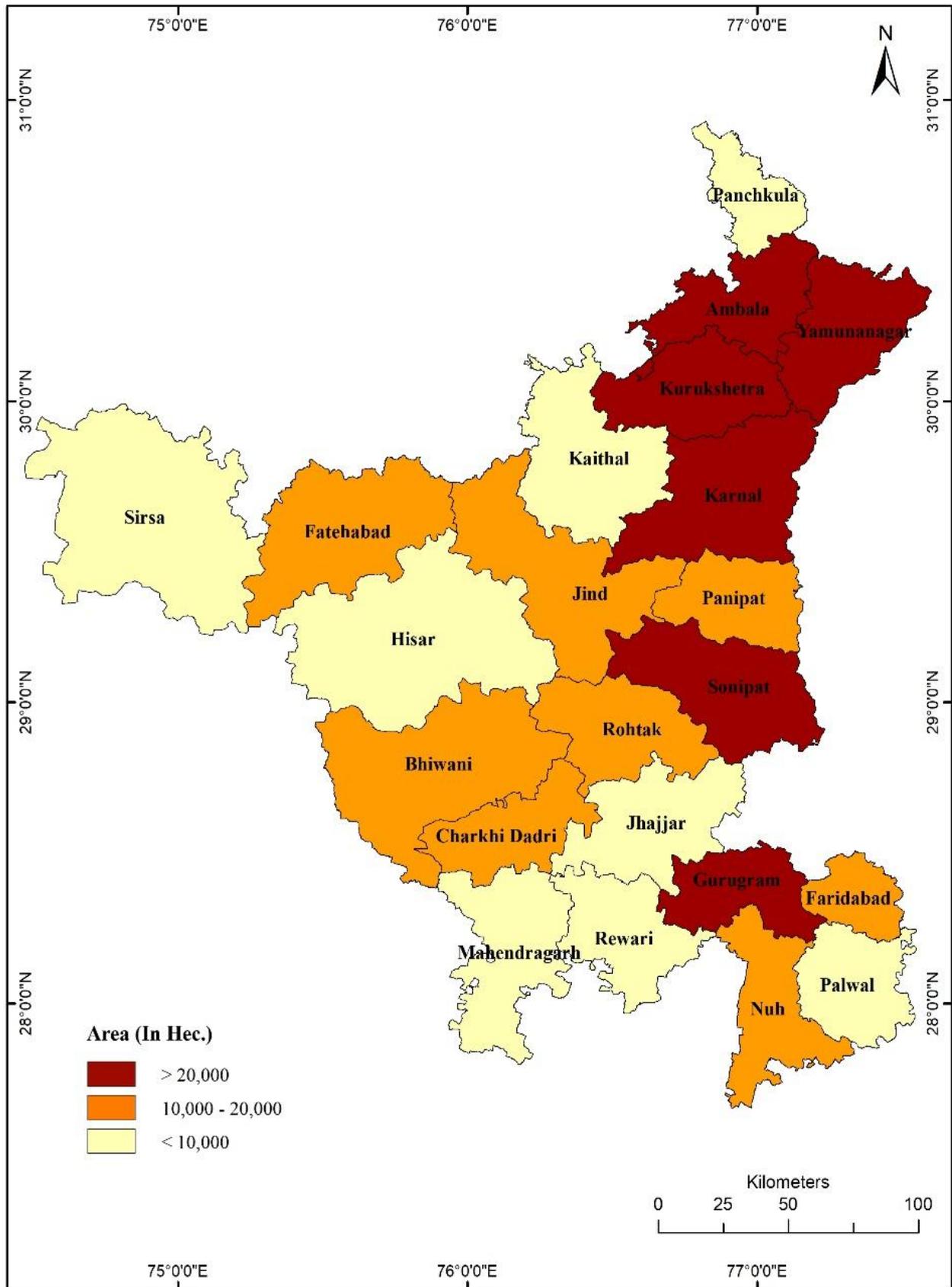
The spatial distribution of vegetable cultivation in Haryana during the 2010-11 period, as outlined in Table 1, has shown that Gurgaon has emerged as a prominent district for vegetable farming, dedicating a substantial area of 39,600 hectares to this activity. Following closely behind are Yamuna Nagar and Karnal, with areas of 28,927 and 33,850 hectares, respectively.

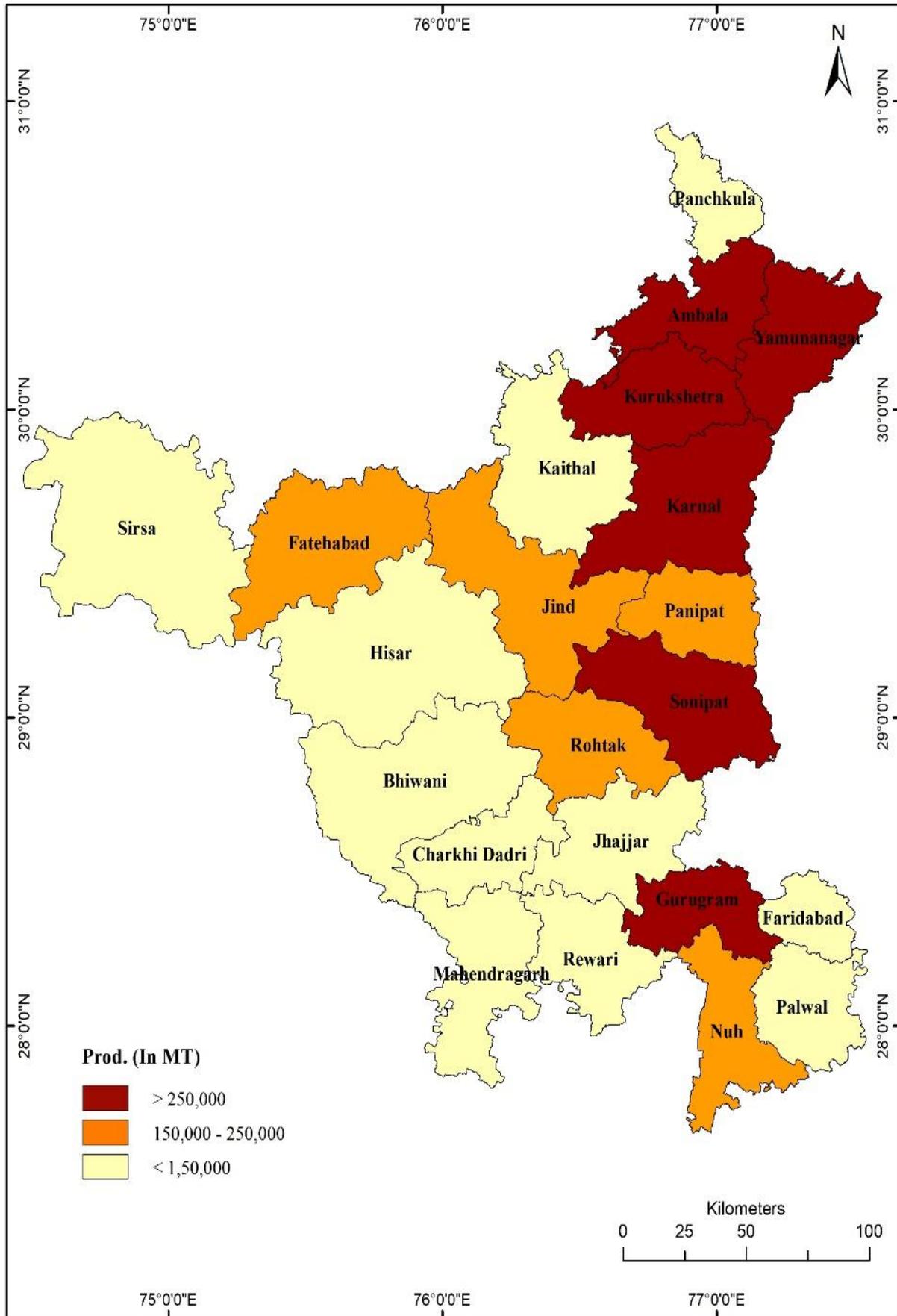
In contrast, districts like Rewari and Mahendragarh have shown smaller areas under cultivation, with 4,877 and 7,290 hectares, respectively.

Notably, Ambala has also contributed significantly, with 24,999 hectares dedicated to vegetable production, underscoring its role in the state's agricultural landscape (Fig. 2).

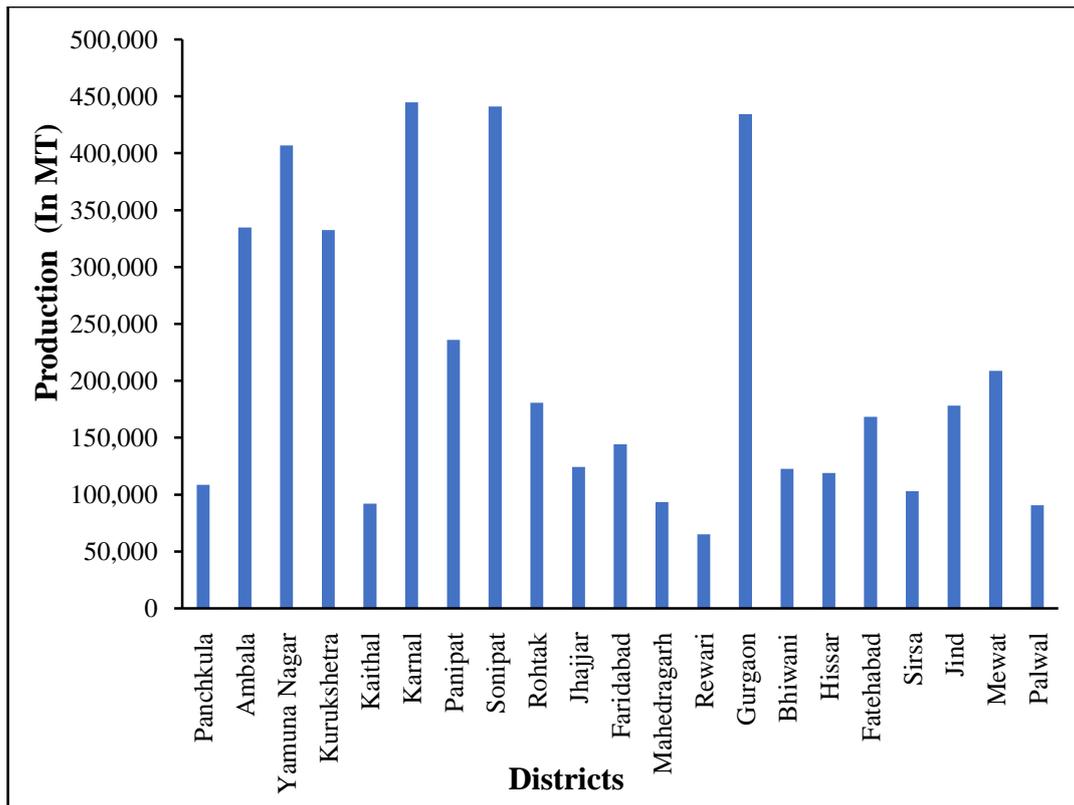
In terms of production, the data has revealed that Yamuna Nagar, Karnal, and Sonipat have been key contributors to Haryana's overall vegetable output (Map 2).

Map 2: Spatial Pattern of Area & Production under Vegetables Crops in Haryana, 2010-11





Source: Based on table 1



Source: Based on table 1

**Figure 2: Distribution of Vegetables Crops Production in Haryana, 2010-11**

Yamuna Nagar has led with an impressive production of 406,955 tonnes, closely followed by Karnal at 444,771 tonnes and Sonapat at 441,044 tonnes. These districts have demonstrated robust agricultural activity and have been essential in meeting the region's vegetable demands.

Conversely, districts like Rewari and Mahendragarh have exhibited lower production levels, with outputs of 65,125 and 93,326 tonnes, respectively. Despite these disparities, the collective efforts of all districts have resulted in a total vegetable production of approximately 4,428,900 tonnes for Haryana during 2010-11 (Fig. 2).

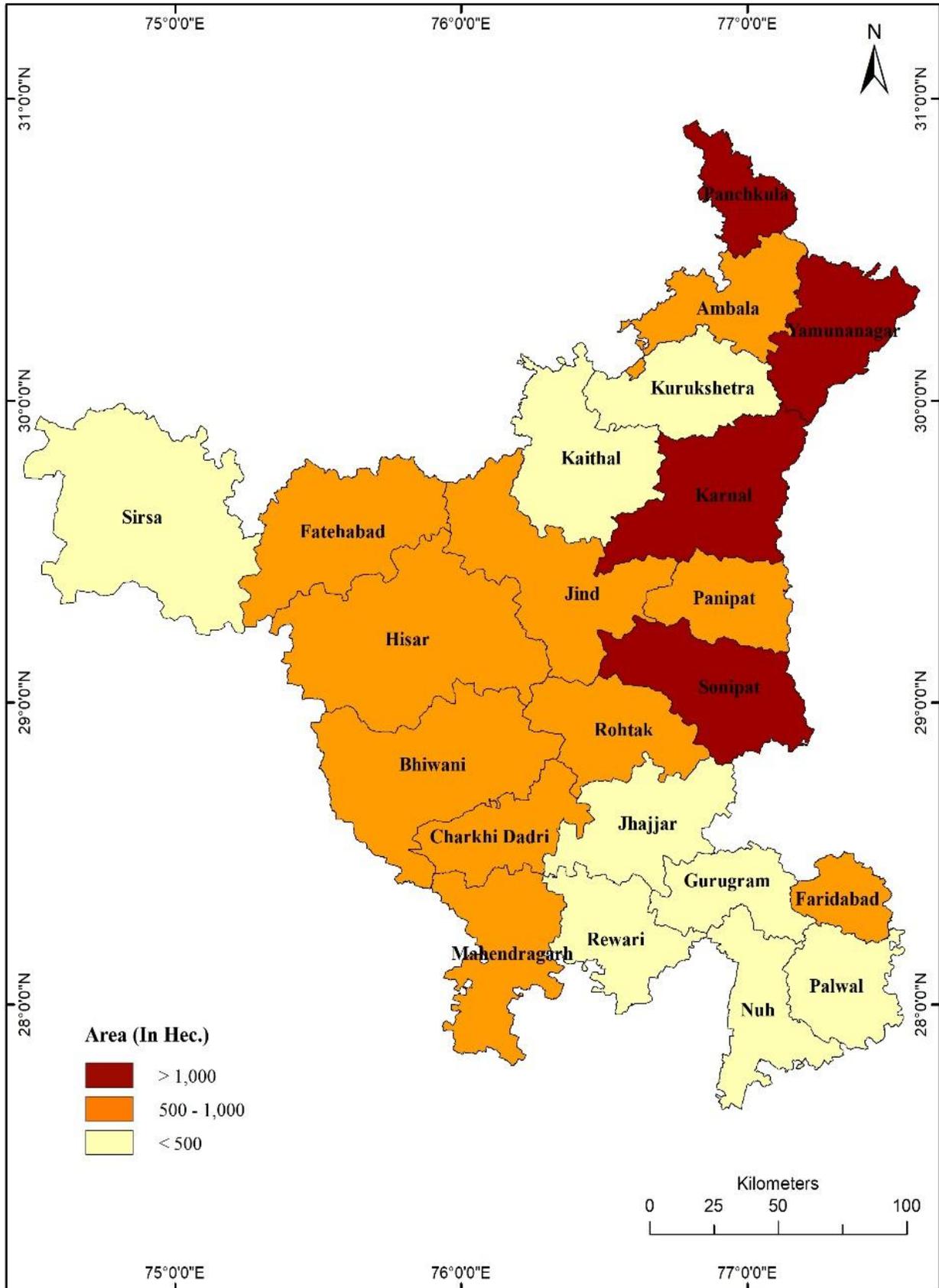
**Spatial Pattern of Area & Production under Spices Crops: 2010-11: -**

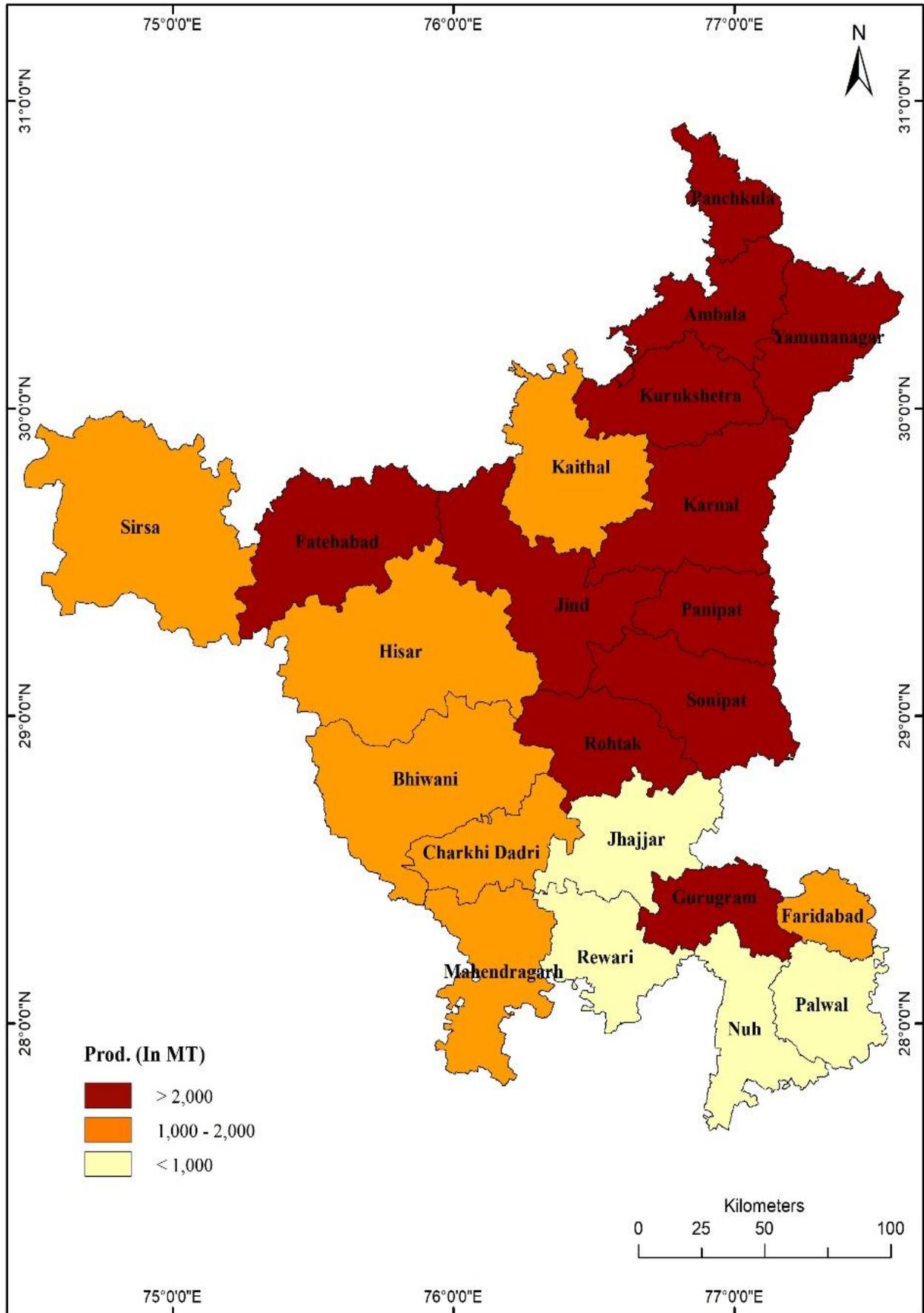
The spatial distribution of spice cultivation in Haryana for the 2010-11 period has shown that Yamuna Nagar has been the leading producer in spice cultivation, dedicating an expansive area of 3,512 hectares to this activity. Sonipat has also played a notable role, utilizing 1,830 hectares for spice farming (Table 1).

Additionally, districts like Karnal, Rohtak, and Faridabad have contributed to spice cultivation, with areas ranging from 749 to 1,779 hectares. In contrast, Mewat and Palwal have shown minimal engagement in spice cultivation, with only 60 and 187 hectares, respectively.

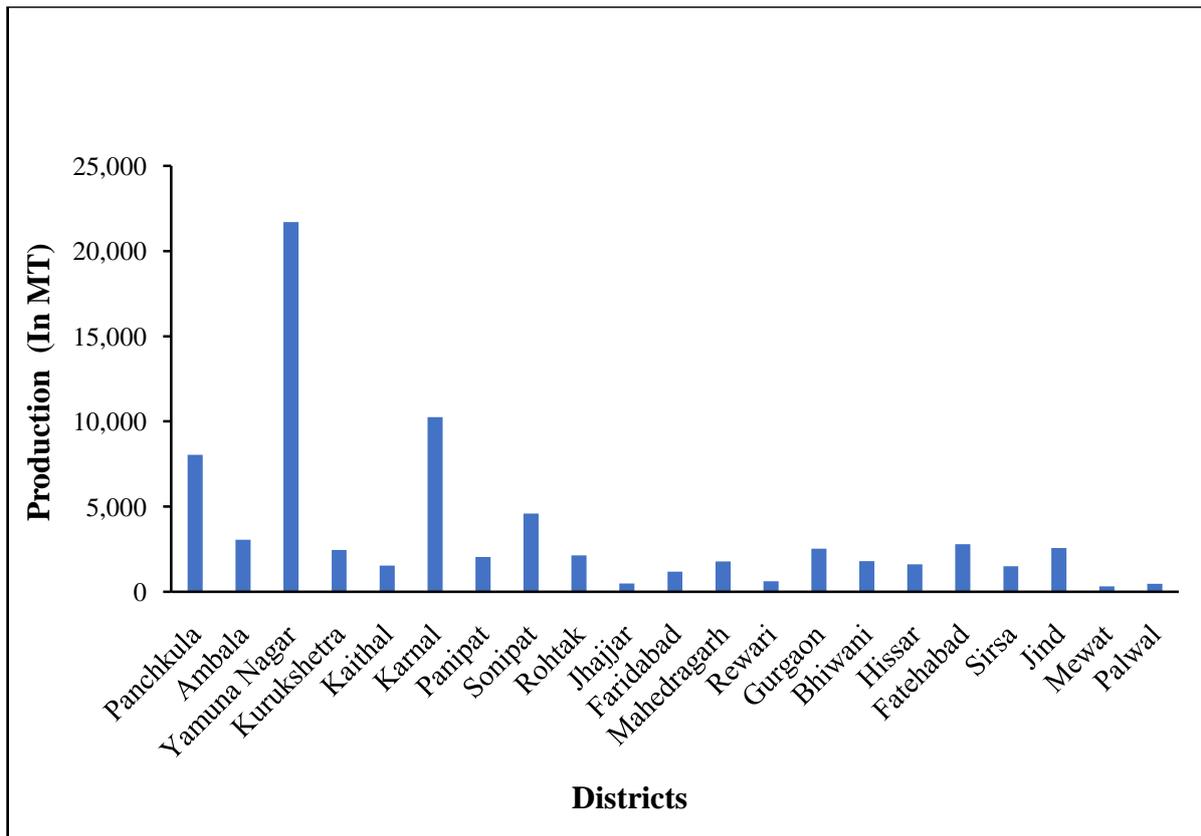
Production data has further illustrated the prominence of Yamuna Nagar, which has stood out with an impressive output of 21,711 tonnes, marking it as a major contributor to Haryana's spice industry (Fig. 3). Karnal has followed with a substantial production of 10,245 tonnes, affirming its importance in the spice sector (Map 3).

Map 3: Spatial Pattern of Area & Production under Spices Crops in Haryana, 2010-11





Source: Based on table 1



Source: Based on table 1

**Figure 3: Distribution of Spices Crops Production in Haryana, 2010-11**

Other districts, including Sonipat, Gurgaon, and Jind, have also contributed meaningfully, with outputs ranging from 2,535 to 4,590 tonnes.

However, districts like Rewari and Mewat have demonstrated lower production levels, yielding 622 and 319 tonnes, respectively. Overall, Haryana has produced a total of 80,817 tonnes of spices during 2010-11 (Fig. 3).

**Spatial Pattern of Area & Production under Flowers Crops: 2010-11: -**

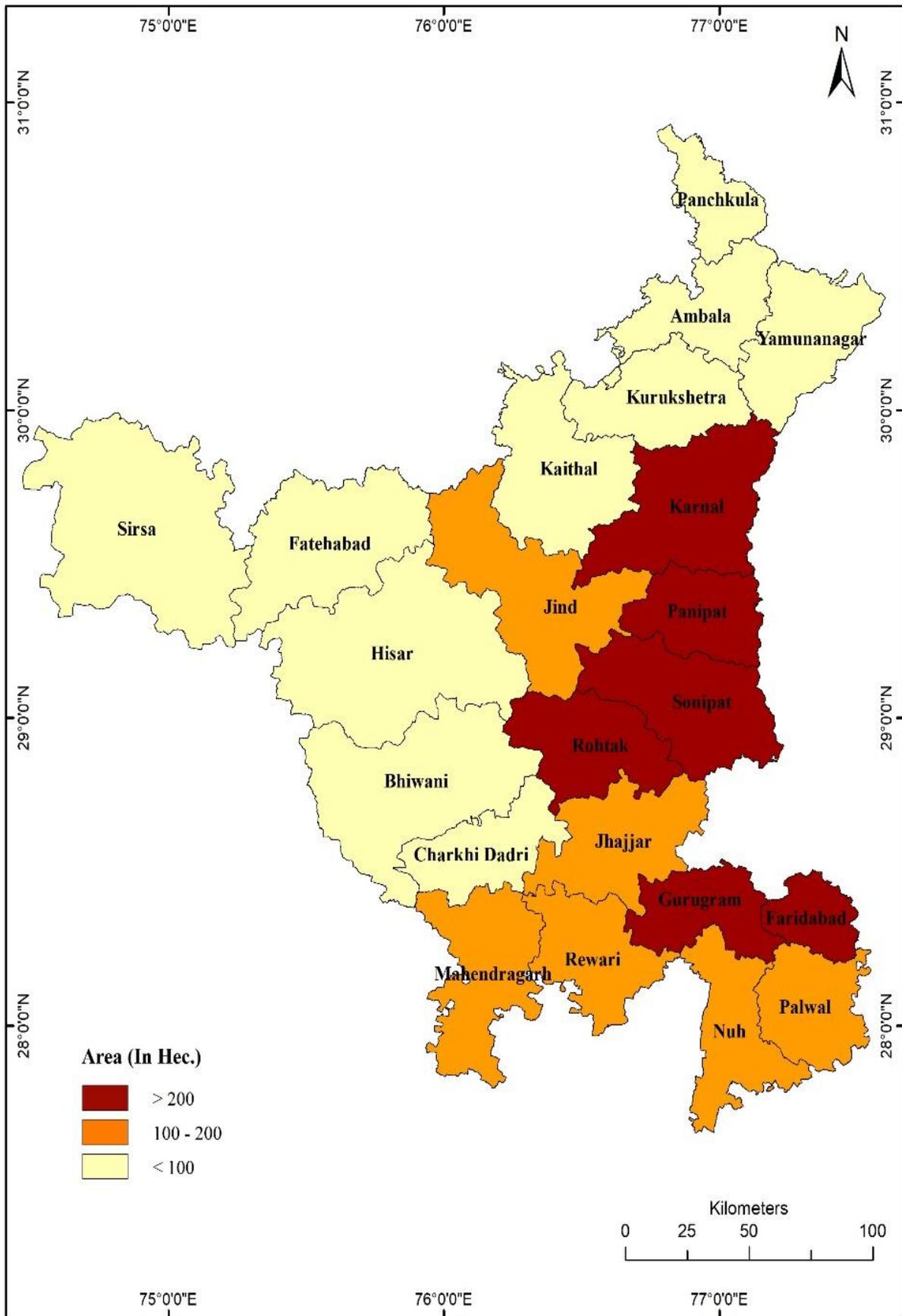
The spatial distribution of flower cultivation in Haryana during the 2010-11 period, as illustrated in Table 1, has revealed a diverse and vibrant floriculture sector across various districts. Sonipat has stood out as a significant contributor, with an extensive area of 1,329 hectares dedicated to flower cultivation, demonstrating the district's agricultural strength in this industry.

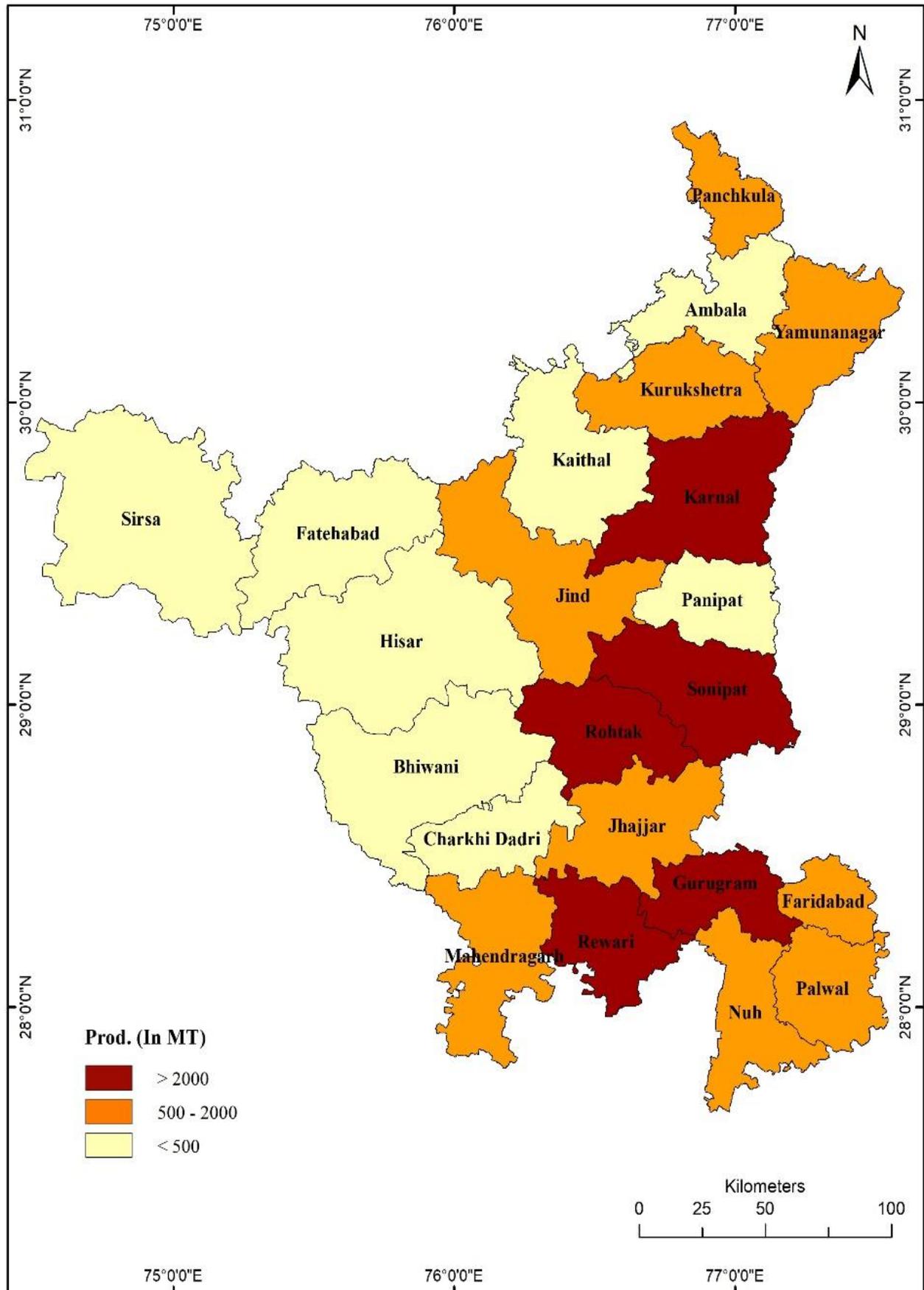
Notably, Gurgaon has surpassed others with a high area covering 2,141 hectares. Karnal, another key agricultural hub, has utilized 373 hectares for flower cultivation. Faridabad has also played a crucial role, with 595 hectares dedicated to flower cultivation (Fig. 4). In addition to these leading districts, Rohtak has shown moderate involvement in flower cultivation, with 274 hectares under production.

Conversely, districts such as Ambala, Kaithal, and Mahendragarh have shown smaller areas of engagement, ranging from 12 to 116 hectares. Despite their limited contributions, these districts have still contributed to the overall floricultural landscape of Haryana.

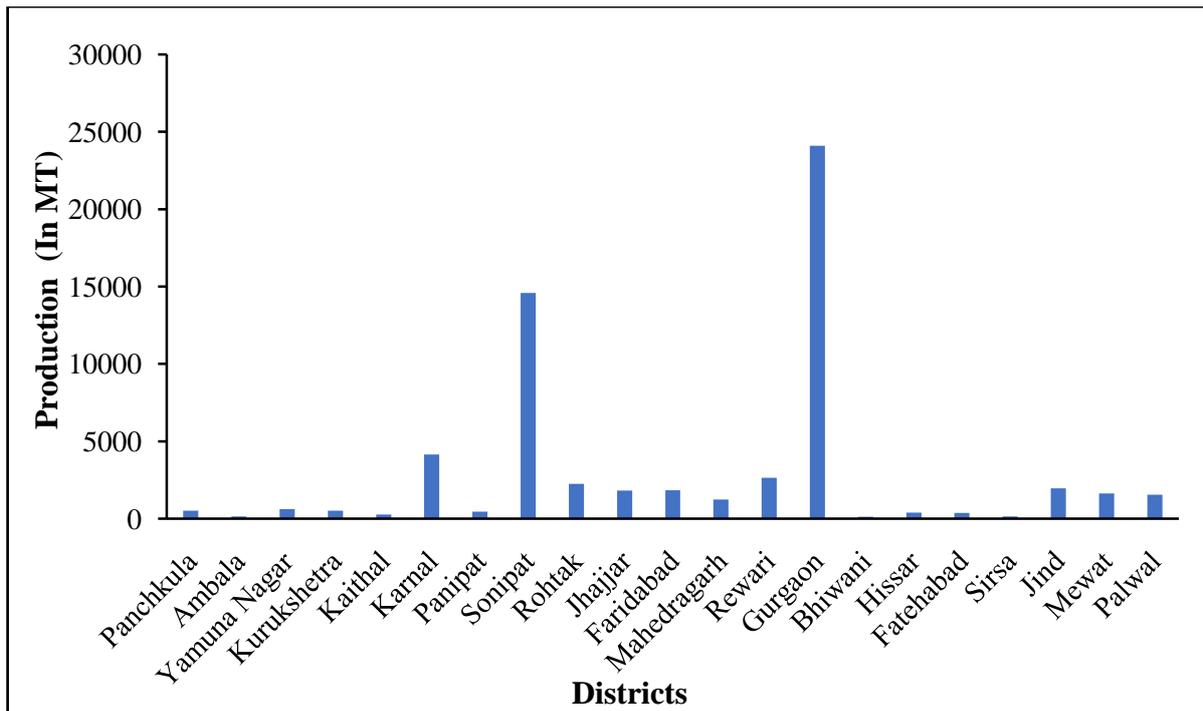
The total area under flower cultivation across the state has amounted to 6,300 hectares, showcasing the diversity of agricultural activities and the potential for growth in the floriculture sector (Map 4).

Map 4: Spatial Pattern of Area & Production under Flowers Crops in Haryana, 2010-11





Source: Based on table 1



Source: Based on table 1

**Figure 4 : Distribution of Flowers Crops Production in Haryana, 2010-11**

In terms of production, Sonipat has emerged as the top producer, yielding a substantial output of 14,597 tonnes. Gurgaon has also excelled, demonstrating remarkable production of 24,098 tonnes, which underscores its favorable conditions for floriculture. Karnal has contributed 4,148 tonnes, reflecting its diversified agricultural practices. Other districts like Rohtak and Jhajjar have also shown significant outputs, with 2,242 and 1,810 tonnes, respectively. Conversely, districts such as Bhiwani, Sirsa, and Fatehabad have produced less, with outputs ranging from 115 to 380 tonnes (Map 4). Despite these smaller contributions, these districts have still played a role in Haryana's overall floricultural landscape, highlighting the state's diverse capabilities and the potential for further expansion in flower production (Fig. 4).

### CONCLUSION

The analysis of horticultural trends in Haryana during the 2010-11 period has highlighted the significant role that horticulture plays in the state's agriculture. With a diverse range of crops, including fruits, vegetables, spices, and flowers, Haryana has demonstrated notable advancements in horticultural practices, driven by favorable climatic conditions and supportive government initiatives like the National Horticulture Mission. The data has revealed that the total area under horticultural crops reached approximately 415.93 thousand hectares, which constitutes 6.4% of the total cropped area. However, the findings have also highlighted disparities in productivity compared to leading states such as Maharashtra and Uttar Pradesh.

For instance, while Haryana ranks 11th in vegetable production, its overall output of 61.57 lakh MT is significantly lower than that of Uttar Pradesh. Similar trends are evident in fruit production, where Haryana ranks 22nd. Moreover, while districts like Sirsa and Gurgaon emerge as leaders in fruit and vegetable cultivation, respectively, there remains considerable potential for growth in less prominent districts. The analysis of horticultural crops in Haryana during the 2010-11 period has revealed distinct spatial patterns in the cultivation of fruits, vegetables, spices, and flowers. In fruit cultivation, Sirsa has emerged as the leading district, significantly contributing to both the area and production, while Yamuna Nagar follows closely behind.

Conversely, some districts exhibit lower production levels, highlighting regional disparities. In vegetable farming, Gurgaon has stood out as the dominant district, with notable contributions from Yamuna Nagar and Karnal, reflecting robust agricultural activity. The spice sector has been prominently represented by Yamuna Nagar, which has played a crucial role in both cultivation and production, while other districts like Sonipat and Karnal have also made meaningful contributions. Flower cultivation has shown Sonipat as a significant player, with Gurgaon leading in area dedicated to flowers, underscoring favorable agricultural conditions. In conclusion, horticulture in Haryana plays a vital role in the state's agricultural framework, showcasing a diverse range of crops, including fruits, vegetables, spices, and flowers. While districts like Sirsa and Gurgaon lead in production and cultivation areas, regional disparities highlight the need

for improved practices and technology adoption. By addressing existing challenges and leveraging its strengths, Haryana has the potential to enhance its horticultural productivity and sustainability, positioning itself as a key horticulture region in India.

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