

**Soil, Climate, Irrigation and Market Accessibility in NCR Haryana: A  
Floriculture Perspective**

**Pooja**

Research Scholar Geography, Department of Social Science, Baba Mastnath University,  
Asthali Bohar – 124021, Rohtak

**Dr. Sunila Kumari**

Assistant Professor of Geography, Department of Social Science, Baba Mastnath University,  
Asthali Bohar – 124021, Rohtak

**Abstract:**

Floriculture has emerged as a high-value agricultural activity in Haryana, particularly in the National Capital Region (NCR), where proximity to Delhi provides farmers with unique opportunities for income diversification and market expansion. This paper analyzes the geographical and agro-economic determinants of floriculture in NCR Haryana with specific focus on soil types, climatic conditions, irrigation facilities and market accessibility. The study area covers 14 districts, including Faridabad, Gurugram, Sonapat, Rohtak, Jhajjar, Panipat, Rewari, Karnal, Mahendragarh, Jind, Palwal, Bhiwani, Charkhi Dadri and Mewat (Nuh), collectively forming a critical part of Haryana's agrarian and urbanizing landscape. Findings reveal that eastern districts such as Karnal, Panipat and Sonapat benefit from fertile alluvial soils, canal irrigation and better access to wholesale markets, making them favorable hubs for intensive floriculture. Conversely, southern and southwestern districts like Mahendragarh, Bhiwani and Mewat face challenges of sandy or rocky soils, erratic rainfall, water scarcity and weak mandi infrastructure, which constrain agricultural productivity and flower trade. Climatic extremes, ranging from scorching summers (up to 45°C) to cold winters (as low as 4°C), shape cropping cycles and necessitate resilient floricultural practices. Market access is highly uneven: while districts adjacent to Delhi such as Gurugram, Faridabad and Sonapat leverage express highways and export units, Mewat and Mahendragarh remain marginalized due to infrastructural backwardness. The study concludes that floriculture in NCR Haryana presents both opportunities and challenges: while fertile soils, irrigation networks and urban demand drive growth in some districts, constraints of soil infertility, climatic stress and poor market linkages hinder its expansion in others. Region-specific interventions such as soil improvement, water management, cold chain development and mandi modernization are essential for balanced and sustainable floriculture growth across the NCR.

**Keywords:** NCR Haryana; Shahbad City; Floriculture; Soil Types; Climate; Irrigation; Market Accessibility; Urban Expansion; Agro-Economic Profile; Sustainable Agriculture

**Introduction:**

Floriculture plays a transformative role in enhancing the socio-economic conditions of farmers by providing an alternative and lucrative avenue for income generation. Unlike conventional agriculture, which often faces challenges such as fluctuating market prices, climate

vulnerability and soil degradation, floriculture offers farmers a high-value crop with relatively consistent demand. Flowers are widely used in religious ceremonies, social events, decorations and the perfume industry, making them a commercially viable option. The economic benefits of floriculture are substantial, as flower cultivation generally yields higher returns per unit area compared to traditional crops like cereals or pulses. Additionally, since floriculture is labor-intensive, it creates numerous employment opportunities for rural populations, including women and marginalized groups, thereby reducing rural unemployment and migration to urban areas. Floriculture has emerged as a significant contributor to the socio-economic development of farmers in Haryana, a state traditionally known for its wheat and rice cultivation. Due to the increasing demand for flowers in religious ceremonies, weddings, festivals and industrial uses (such as perfumes and medicines), farmers in Haryana are increasingly adopting floriculture as a viable alternative to conventional crops.

#### **NCR Haryana:**

The total area covered by the National Capital Region (NCR) districts in Haryana is approximately 13,413 square kilometers, as per data from the NCR Planning Board. This expansive region comprises 14 districts: Faridabad, Gurugram, Sonipat, Rohtak, Jhajjar, Panipat, Rewari, Karnal, Mahendragarh, Jind, Palwal, Bhiwani, Charkhi Dadri and Nuh (formerly Mewat). These districts form a critical part of the NCR's economic and infrastructural landscape, contributing to its rapid urbanization. The total population of the National Capital Region (NCR) districts in Haryana, was approximately 18.3 million (1.83 crore). This includes the combined population of all 14 NCR districts: Faridabad, Gurugram, Sonipat, Rohtak, Jhajjar, Panipat, Rewari, Karnal, Mahendragarh, Jind, Palwal, Bhiwani, Charkhi Dadri and Nuh. The region's growth is fueled by proximity to Delhi, infrastructure development and employment opportunities. The historical roots of Haryana's National Capital Region (NCR) districts are deeply intertwined with India's ancient and medieval past. Post-independence, the 1985 creation of the NCR marked a turning point, integrating Haryana's districts into a planned urban-economic zone to decongest Delhi. Districts like Gurugram and Faridabad transformed from agrarian hubs into global IT and industrial corridors, fueled by post-1990s economic liberalization. Today, the NCR's history reflects a blend of ancient heritage, colonial legacies and modern urbanization, positioning it as a symbol of India's evolving developmental narrative.

**Table 1: Total NCR Area & Population in NCR Haryana**

Sr. No.	District	Area (sq km)	Population
1	Faridabad	741	1,809,733
2	Gurgaon	1,258	1,514,085
3	Sonipat	2,122	1,450,001

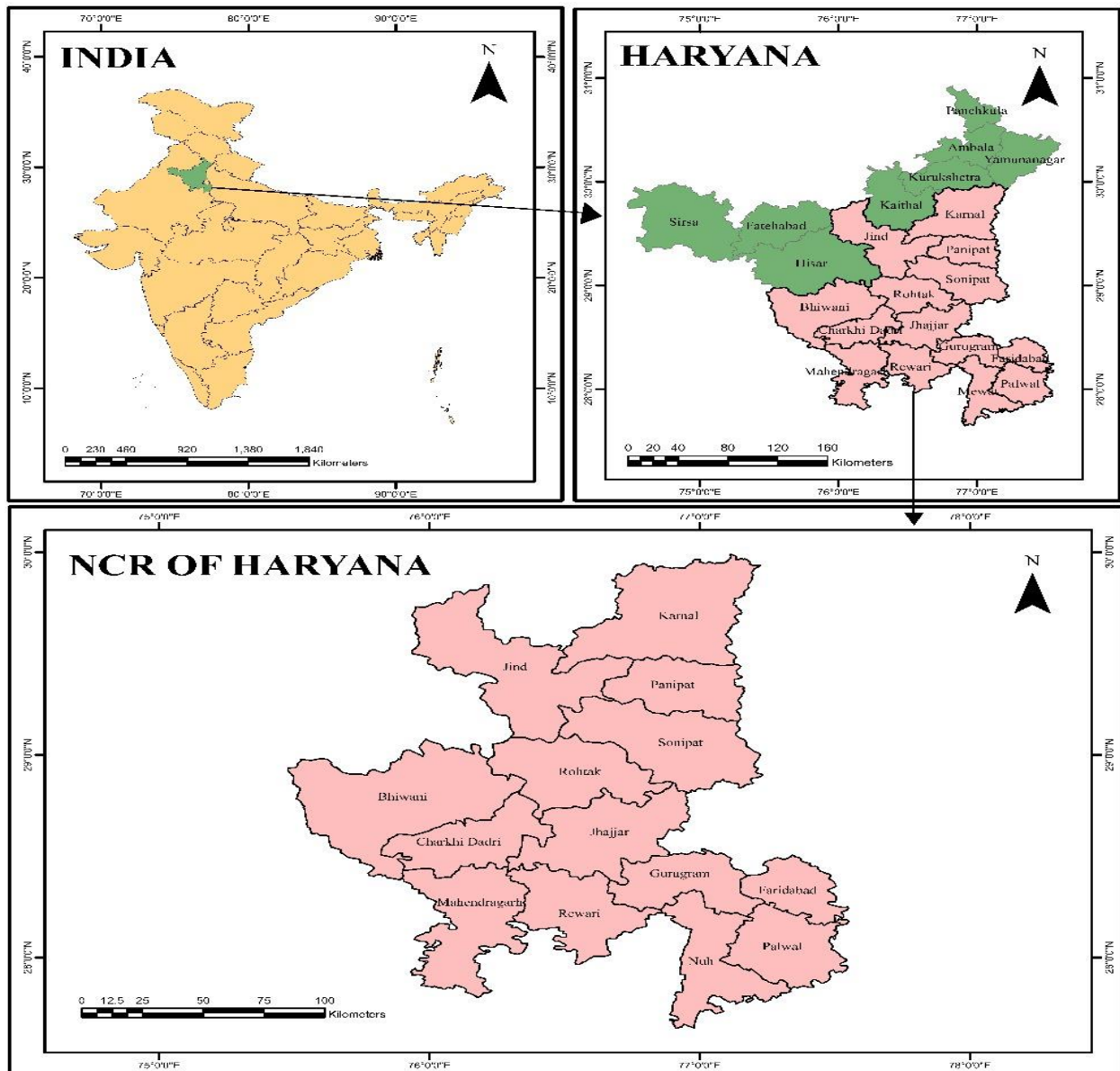
4	Rohtak	1,745	1,061,204
5	Jhajjar	1,834	958,405
6	Panipat	1,268	1,205,437
7	Rewari	1,594	900,332
8	Palwal	1,359	1,042,708
9	Mahendragarh	1,899	922,088
10 11	Bhiwani + Charkhi Dadri	4,778	1,634,445
12	Karnal	2,520	1,505,324
13	Jind	2,702	1,334,152
14	Mewat (Nuh)	1,507	1,089,263

Source: Censes of India, 2011

**Table 2.1** presents comprehensive data on the area and population of the districts in Haryana that fall under the National Capital Region (NCR). Among the listed districts, Bhiwani and Charkhi Dadri together cover the largest area (4,778 sq km) and also have a significant population of over 1.63 million. Faridabad, despite being one of the smallest in area (741 sq km), has the highest population of 1.8 million, indicating extremely high population density and an urban-dominated character. Gurgaon follows with a population of over 1.5 million within an area of 1,258 sq km, showcasing its rapid urbanization and industrial development in recent decades.

Districts like Sonipat, Rohtak and Karnal also exhibit a notable balance of area and population, each contributing significantly to the demographic, spatial and economic structure of NCR Haryana. On the other hand, districts such as Rewari and Mahendragarh, though relatively moderate in population, cover substantial land areas, reflecting a more rural or semi-urban character. Mewat (Nuh), with an area of 1,507 sq km and a population of over 1.08 million, represents a district with moderate population density but significant developmental challenges. Despite its proximity to urbanized districts like Gurgaon and Faridabad, Mewat continues to lag behind in terms of infrastructure, literacy and economic diversification. The district's predominantly rural composition and socio-economic backwardness make it a critical area for targeted regional planning and inclusive growth initiatives within the NCR framework.

**Map 1: Location of the Study Area**



Source: Prepared by Research Scholar using Arc-GIS

### Geographical Profile of NCR Haryana

Faridabad district, located in the southeastern part of Haryana, is one of the most urbanized, industrialized and economically significant regions in the state. As part of the National Capital Region (NCR), it enjoys a strategic geographic advantage owing to its direct proximity to Delhi, the national capital. The district extends from  $27^{\circ}55'50''$  to  $28^{\circ}29'20''$  North latitude and  $77^{\circ}06'50''$  to  $77^{\circ}33'20''$  East longitude, occupying a total geographical area of 741.45 square kilometers. It is bordered by Delhi to the north, Uttar Pradesh to the east across the Yamuna River, Gurgaon to the west and Palwal district to the south, thereby forming an integral corridor in the Delhi–Agra–Mumbai industrial and transport network. Topographically, Faridabad exhibits a diverse terrain, divided between the flat and fertile alluvial plains of the Yamuna

basin in the eastern region and the undulating, semi-arid terrain of the Aravalli hills in the west and south. The Yamuna River flows along its eastern edge, playing a significant role in groundwater recharge, irrigation and historically supporting agriculture in the region. However, with rapid urban expansion, much of the floodplain has come under stress, including encroachments, degradation of wetlands and pollution. In the west, the Aravalli hill outcrops represent the geologically ancient landscape of peninsular India and act as important natural buffers for microclimatic regulation and biodiversity conservation. The soil composition of the district is predominantly alluvial, especially in the Yamuna belt, known for being deep, fertile and suitable for a variety of crops like wheat, mustard, vegetables and sugarcane. In contrast, the hilly regions have gravelly and sandy loam soils, less suitable for cultivation but important from a hydrological and ecological standpoint. Despite the fertility of the plains, agricultural activity has declined significantly over recent decades due to urban sprawl, industrialization and the conversion of farmland into residential and commercial zones. Climatically, Faridabad falls under the semi-arid to sub-tropical climatic zone. Summers are extremely hot and dry, with temperatures often exceeding 45°C, while winters are cool, with minimum temperatures dropping below 6°C in December–January. The monsoon season, from late June to September, accounts for the majority of the average annual rainfall of about 600–800 mm. The district, like other parts of NCR, experiences environmental concerns such as air pollution, dust storms and water scarcity during non-monsoon months.

### **Discussing Climatic Conditions**

The NCR districts of Haryana experience an extreme continental climate, marked by intensely hot summers and cold winters due to their inland position and absence of maritime influence. **Summers**, generally stretching from April to June, are typically long, dry and harsh, especially in the southwestern districts such as Mahendragarh, Bhiwani, Charkhi Dadri and Rewari, which are more prone to arid conditions due to their proximity to Rajasthan and prevalence of sandy soils. Mewat (Nuh), situated in the southernmost part of the state and affected by the Aravalli hill ranges, also faces semi-arid climatic conditions. Its rocky terrain, sparse vegetation and frequent rainfall deficiency create agro-climatic challenges, including limited crop diversity and greater dependence on irrigation to sustain cultivation during dry spells. Winter months, from December to February, are characterized by cool to cold conditions, with significant drops in night temperatures across most districts.

Districts closer to the Yamuna river basin, such as Karnal, Panipat and Sonapat, tend to experience less severe winters due to higher humidity and moisture-retaining alluvial soils. In contrast, districts like Jhajjar, Rohtak and Jind frequently encounter wide temperature fluctuations between day and night, often accompanied by dense fog, which disrupts visibility and agricultural schedules. These seasonal climatic shifts play a decisive role in shaping cropping patterns, irrigation needs and agricultural productivity in the region. Farmers have adapted to these variations by cultivating summer crops **that are** tolerant to heat and water stress, such as millet, cotton and pulses and winter crops like wheat and mustard, which thrive in cooler temperatures. Additionally, the climate supports floriculture, particularly in peri-



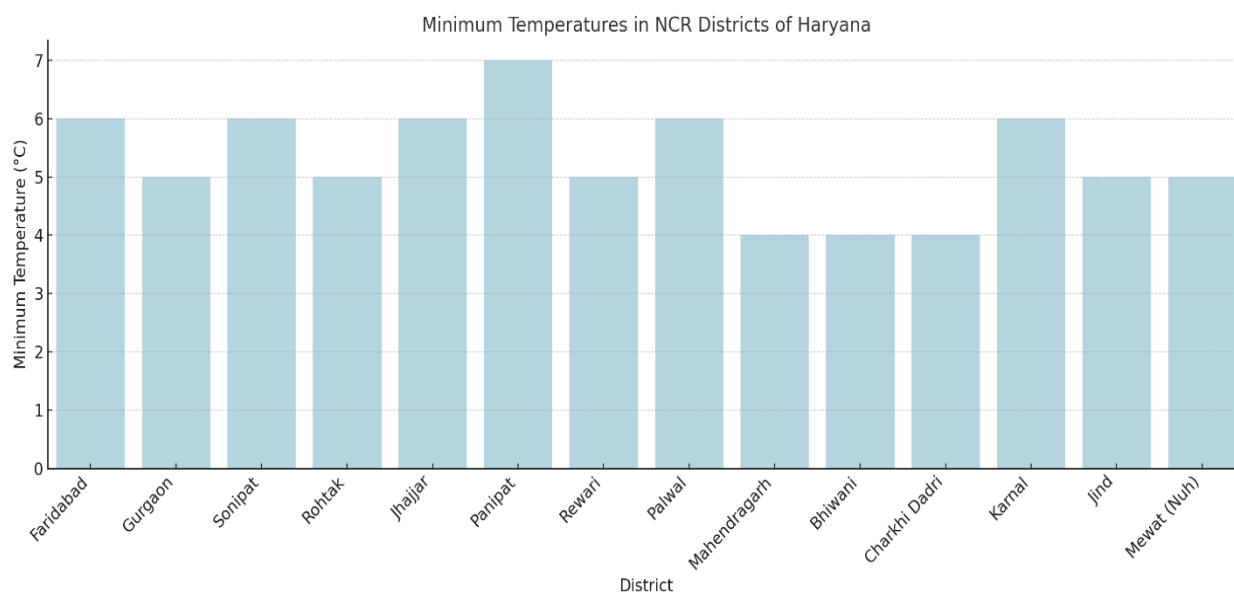
urban districts, where flowers such as marigold and gladiolus perform well under these temperature dynamics, contributing to diversification and income generation.

**Table 2:** *Temperature Profile of NCR Districts in Haryana, in 2024*

Sr. No.	District	Minimum Temperature (°C)	Maximum Temperature (°C)
1	Faridabad	6°C	44°C
2	Gurgaon	5°C	44°C
3	Sonipat	6°C	43°C
4	Rohtak	5°C	44°C
5	Jhajjar	6°C	43°C
6	Panipat	7°C	42°C
7	Rewari	5°C	44°C
8	Palwal	6°C	44°C
9	Mahendragarh	4°C	45°C
10	Bhiwani	4°C	45°C
11	Charkhi Dadri	4°C	45°C
12	Karnal	6°C	42°C
13	Jind	5°C	43°C
14	Mewat (Nuh)	5°C	42°C

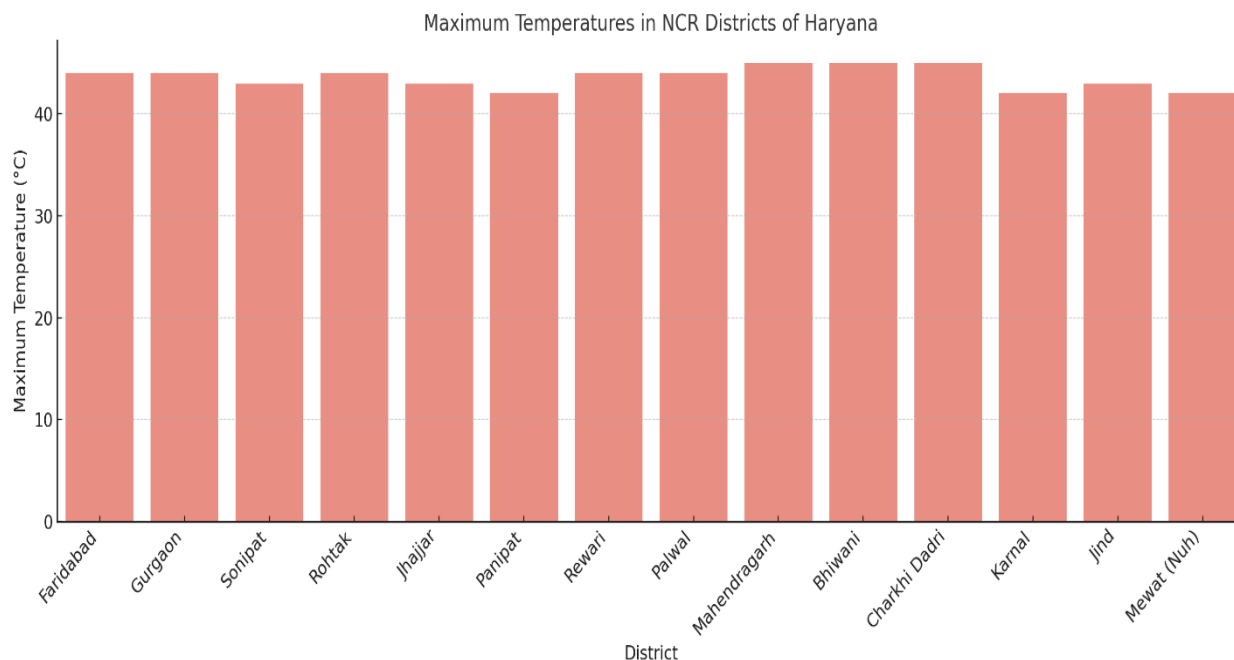
Source: Haryana Meteorological Department

**Figure 1:** *Temperature Profile of NCR Districts in Haryana, in 2024*



Source: Table 2

**Figure 2:** *Temperature Profile of NCR Districts in Haryana, in 2024*



Source: Table 2

The NCR districts of Haryana experience a continental climate characterized by sharp seasonal variations in temperature. Summers (April to June) are extremely hot, with temperatures commonly ranging between 42°C and 45°C, while winters (December to February) bring significantly lower temperatures, dropping as low as 4°C in the western and southern districts. Districts such as Mahendragarh and Bhiwani-Charkhi Dadri record the highest summer temperatures, reaching up to 45°C, due to their proximity to Rajasthan's arid zone and low vegetation cover. Similarly, Rewari, Gurgaon, Rohtak, Faridabad and Palwal also experience scorching summer temperatures peaking at 44°C, reflecting their semi-arid environmental conditions. Karnal, Panipat and Sonipat, situated closer to the Yamuna river basin, tend to have slightly lower summer extremes (42–43°C) and relatively milder winters, owing to higher atmospheric moisture and irrigation-based land use. Jhajjar and Jind, representing transitional zones, experience temperature ranges from 5°C in winters to 43–44°C in summers, showing typical characteristics of northern plains. Mewat (Nuh), located in the southern part of the state near the Aravalli hills, exhibits a temperature profile ranging from 5°C in winters to 42°C in peak summer. While not the hottest, the district's rocky terrain and sparse vegetation lead to considerable daytime heating and dryness. The climate here is categorized as semi-arid, which impacts crop choices, irrigation needs and agricultural cycles. Overall, these wide temperature fluctuations across the NCR districts have a direct influence on cropping patterns, water requirements and floriculture potential. Districts with extreme temperatures must adopt climate-resilient agricultural practices, while regions like Mewat, due to their ecological vulnerability, require focused interventions in micro-climate management and sustainable farming systems.

### Soil Types

The NCR districts of Haryana exhibit a diversity of soil types, largely influenced by their geographical location, climatic conditions and proximity to the Aravalli hills and the Yamuna-Ganga alluvial plains. The eastern districts such as Faridabad, Palwal, Sonipat, Panipat and Karnal predominantly feature alluvial soils rich in nutrients and ideal for intensive agriculture. These soils are generally loamy to clay loam in texture and exhibit high fertility, supporting crops like wheat, rice, sugarcane and vegetables. In contrast, the southern and southwestern districts such as Gurgaon, Rewari, Mahendragarh and parts of Bhiwani-Charkhi Dadri are influenced by arid and semi-arid conditions, resulting in sandy loam and loamy sand soils. These soils have lower water-holding capacity and are prone to wind erosion, but they are suitable for drought-resistant crops like bajra, mustard and pulses. Some areas near the Aravalli ranges also contain gravelly and red sandy soils with low organic matter, which further limits their productivity. Districts such as Rohtak, Jhajjar and Jind represent a transitional soil zone, with silt loam and clay loam soils that offer a good mix of fertility and moisture retention. These regions benefit from canal irrigation and are favorable for both food and cash crops. Mewat (Nuh), however, presents a challenging soil environment. The district features sandy loam, light alluvial and arid rocky soils, particularly in the regions adjoining the Aravalli hills. These soils are coarse in texture, low in nutrients and have poor water retention, making them less suitable for conventional agriculture. Combined with frequent drought conditions and lack of irrigation infrastructure, these soils constrain the district's agricultural potential. As a result, farmers in Mewat largely grow rainfed and low-input crops and there is an urgent need for soil improvement programs, organic matter enhancement and watershed-based land use planning. Overall, the soil profile across NCR Haryana supports a diverse agricultural base, but the variations in fertility, water-holding capacity and erosion susceptibility require district-specific soil management and conservation practices to ensure sustainable and productive land use, particularly in underdeveloped zones like Mewat.

**Table 3:** *Soil Types in NCR Districts of Haryana, in 2024*

Sr. No.	District	Dominant Soil Type(s)
1	Faridabad	Sandy loam, Loam
2	Gurgaon	Loamy sand, Arid brown soils
3	Sonipat	Sandy loam, Clay loam
4	Rohtak	Silt loam, Clay loam
5	Jhajjar	Sandy loam, Loam



6	Panipat	Loam, Silty loam
7	Rewari	Arid red and yellow soils, Loamy sand
8	Palwal	Sandy loam, Alluvial soil
9	Mahendragarh	Sandy, Loamy sand
10	Bhiwani	Sandy loam, Arid brown soils
11	Charkhi Dadri	Sandy loam, Arid brown soils
12	Karnal	Fertile alluvial soil, Clay loam
13	Jind	Sandy loam, Clay loam
14	Mewat (Nuh)	Sandy loam, Light alluvial, Arid rocky soils

Source: Reports of Haryana Agriculture department

The NCR districts of Haryana display a diverse range of soil types, significantly shaped by their geographical location, climatic conditions and terrain features. In the eastern districts like Faridabad, Palwal, Sonipat, Panipat and Karnal, alluvial and loam-based soils dominate. These soils ranging from sandy loam to silty and clay loam are highly fertile, well-draining and suitable for intensive cropping of wheat, rice, sugarcane and vegetables. Rohtak and Jind exhibit silt loam and clay loam soils, which are rich in organic matter and moisture-retentive, supporting a mixed cropping system. Similarly, Jhajjar presents sandy loam and loam soils that allow for both irrigated and rainfed agriculture. In contrast, southern and southwestern districts such as Gurgaon, Rewari, Mahendragarh and Bhiwani-Charkhi Dadri feature loamy sand, arid brown and red-yellow soils. These soils are relatively less fertile, have lower water-holding capacity and are often prone to wind erosion, making them suitable mainly for drought-resistant crops like bajra, mustard and gram. Mahendragarh, in particular, exhibits sandy and loamy sand soils that reflect its arid ecological setting and depend heavily on seasonal rainfall and supplementary irrigation. Mewat (Nuh) presents a challenging soil profile with sandy loam, light alluvial and arid rocky soils, especially in areas influenced by the Aravalli hill outcrops. These soils are typically low in fertility, coarse-textured and have poor water retention. As a result, agricultural productivity is limited and crop choices are often restricted to hardy, low-water crops. The fragile nature of these soils, combined with erratic rainfall and limited irrigation, necessitates soil conservation practices, organic enrichment and watershed-based

planning to enhance agricultural outcomes. In summary, while eastern and central NCR districts enjoy fertile alluvial soils conducive to intensive agriculture, the southern and western regions including Mewat face soil-related constraints that demand region-specific soil management and conservation strategies to ensure sustainable agricultural development.

### **Irrigation Facilities**

Irrigation in the NCR districts of Haryana plays a vital role in sustaining agriculture, especially due to the state's semi-arid to sub-humid climate. The region benefits from a mixed irrigation system that includes canal networks, tube wells and rainwater harvesting. Eastern districts such as Karnal, Panipat, Sonipat and Jind are among the best irrigated, primarily due to the extensive reach of the Western Yamuna Canal and Bhakra Canal systems. These canals provide a reliable water source, allowing farmers to cultivate water-intensive crops like paddy and sugarcane. In contrast, the southern and southwestern districts Rewari, Mahendragarh and parts of Bhiwani and Charkhi Dadri are largely dependent on groundwater through tube wells due to limited canal access. These areas face water scarcity challenges and often rely on rainfall and submersible pumps, leading to declining groundwater levels over time. Palwal, Faridabad and Gurgaon, while having moderate canal access, benefit from their proximity to urban markets and better infrastructure, which supports investment in irrigation equipment like drip and sprinkler systems. Mewat (Nuh), however, represents one of the most water-deficient regions in the NCR of Haryana. The district lacks access to major canal networks and is primarily dependent on tube wells, rain-fed agriculture and seasonal ponds or talabs. The erratic nature of rainfall and absence of structured irrigation facilities severely hamper agricultural productivity. Fragmented landholdings, limited awareness about water-saving technologies and infrastructural backwardness further intensify the irrigation crisis in the region. Overall, the irrigation infrastructure in NCR Haryana reflects both strengths and disparities. While northern and central districts enjoy better canal coverage and multiple irrigation options, the western and southern arid zones especially Mewat continue to struggle with water access. These areas require targeted interventions such as micro-irrigation systems, rainwater conservation structures, tank restoration and capacity building to ensure sustainable and equitable agricultural productivity across all districts.

**Table 4:** *Irrigation Facilities in NCR Districts of Haryana, in 2024*

Sr. No.	District	Major Irrigation Source(s)
1	Faridabad	Tube wells, Canal (limited)
2	Gurgaon	Tube wells, Rainfed (supplementary canal)
3	Sonipat	Western Yamuna Canal, Tube wells

4	Rohtak	Bhakra Canal, Tube wells
5	Jhajjar	Canal network, Tube wells
6	Panipat	Western Yamuna Canal, Tube wells
7	Rewari	Mostly Tube wells, Limited canal access
8	Palwal	Tube wells, Canal (Agra canal region)
9	Mahendragarh	Tube wells, Rain-dependent, Tank irrigation
10	Bhiwani	Tube wells, Canal (minor)
11	Charkhi Dadri	Tube wells, Canal (minor)
12	Karnal	Western Yamuna Canal, Intensive tube wells
13	Jind	Bhakra Canal, Tube wells
14	Mewat (Nuh)	Tube wells, Rain-dependent, Seasonal ponds (Talabs)

Source: Department of Haryana Jal Shakti (2024)

Irrigation in the NCR districts of Haryana plays a crucial role in sustaining agricultural productivity, especially given the region's semi-arid to sub-humid climatic conditions. Districts like Sonapat, Panipat and Karnal are among the best-irrigated areas, benefiting from the extensive coverage of the Western Yamuna Canal system combined with intensive use of tube wells, which support the cultivation of water-intensive crops such as paddy and sugarcane. Similarly, Rohtak and Jind are well-served by the Bhakra Canal network along with deep bore tube wells, ensuring reliable irrigation supply. Jhajjar also enjoys a strong canal and tube well network that supports diverse cropping patterns. In Faridabad, Palwal and Gurgaon, irrigation is predominantly dependent on tube wells, with limited canal access such as the Agra Canal in Palwal and supplementary rainfed canals in Gurgaon. These districts, due to their peri-urban nature, have seen growing adoption of micro-irrigation techniques in some areas. In contrast, Rewari and Mahendragarh, located in the arid southwestern belt, rely heavily on groundwater

extraction via tube wells and rain-dependent irrigation, with tank irrigation systems supplementing water needs in certain pockets. Bhiwani and Charkhi Dadri face similar challenges, depending on a combination of minor canal networks and groundwater sources, with rainfall patterns playing a significant role in seasonal irrigation planning. Mewat (Nuh), however, presents one of the most water-stressed irrigation profiles among the NCR districts. The region relies mainly on tube wells and rainwater harvesting, with seasonal ponds (locally known as talabs) playing a traditional but diminishing role in irrigation. The absence of a major canal network and erratic rainfall patterns make agriculture in Mewat highly vulnerable, particularly for small and marginal farmers. Limited access to irrigation infrastructure has restricted the crop choices and productivity in this district. Overall, while northern and central districts of NCR Haryana benefit from structured canal systems and better groundwater availability, southern and southwestern districts, including Mewat, require targeted intervention in sustainable water management, micro-irrigation promotion and rainwater conservation to bridge the regional irrigation gap and ensure long-term agricultural viability.

#### Market Access

The NCR districts of Haryana enjoy varying levels of market access, largely influenced by their proximity to Delhi, infrastructure connectivity and mandi (market yard) networks. Districts like Faridabad, Gurgaon, Sonipat and Panipat have excellent market accessibility due to their strategic location along major national highways (NH-44, NH-19, NH-48) and railway lines, allowing farmers to swiftly transport their produce to large urban markets such as Delhi, Noida and Ghaziabad. These regions also benefit from the presence of regulated mandis, cold storage facilities and even export-oriented units, especially in horticulture and floriculture. On the other hand, districts such as Rohtak, Jhajjar and Jind have moderate access to markets. While they are connected via state highways and have local mandi infrastructure, they rely heavily on nearby cities like Delhi, Sonipat, or Karnal for large-scale trade. These districts are witnessing gradual improvement in logistics due to government schemes promoting rural-urban linkages and agri-infrastructure development. However, Rewari, Mahendragarh and parts of Bhiwani and Charkhi Dadri face comparatively limited market access, primarily due to weaker road connectivity, greater distance from major urban centers and inadequate post-harvest facilities. Farmers here often struggle with selling perishable produce and obtaining competitive prices. Mewat (Nuh), in particular, represents one of the most underserved districts in terms of market access. The region suffers from poor road infrastructure, lack of organized mandis and minimal access to cold chains or aggregation centers. Most of the trade is conducted through small village haats or informal channels and farmers often depend on nearby urban centers like Palwal, Faridabad, or Sohna for marketing their produce. The limited institutional support and infrastructural backwardness severely constrain the agricultural economy of Mewat. Overall, while NCR Haryana benefits from its location within a high-demand urban zone, market access remains uneven, especially for districts like Mewat and Mahendragarh. There is a pressing need for targeted investments in transport infrastructure, mandi

modernization, e-NAM integration and farm-to-market logistics to ensure inclusive and equitable agricultural growth across all districts.

**Table 5:** *Market Access in NCR Districts of Haryana, in 2024*

Sr. No.	District	Market Access Description
1	Faridabad	Excellent access to Delhi-NCR markets; well-developed road networks
2	Gurgaon	High connectivity to metro cities; major hubs for agri-export & retail
3	Sonipat	Strong mandi network; proximity to Delhi facilitates fast produce movement
4	Rohtak	Central location with good road/rail access to urban and rural mandis
5	Jhajjar	Moderate access; relies on Rohtak, Bahadurgarh and Delhi markets
6	Panipat	Well-connected to NH-44; large wholesale grain & vegetable mandis
7	Rewari	Access to Delhi and Jaipur via NH-48; local mandis active
8	Palwal	Good access to Agra and Delhi; linked via NH-19 and Agra Canal area
9	Mahendragarh	Limited market infrastructure; dependent on Narnaul and Rewari for trade
10	Bhiwani	Moderate access via state highways; mandis in Dadri and Bhiwani cities
11	Charkhi Dadri	Moderate access via state highways; mandis in Dadri and Bhiwani cities
12	Karnal	Major agricultural trading center; Karnal mandi is among state's largest
13	Jind	Good mandi infrastructure; linked via rail and road to Delhi and Panipat
14	Mewat (Nuh)	Limited access; rural economy relies on small village haats and nearby urban mandis

Source: Agri. Dept. of Haryana

Market access across the NCR districts of Haryana exhibits considerable regional variation, influenced by proximity to major cities, road and rail connectivity and the presence of organized agricultural mandis. Faridabad, Gurgaon, Sonapat and Panipat enjoy excellent to high access to metropolitan markets such as Delhi, Noida and Ghaziabad. These districts are well-integrated into national highway networks like NH-44, NH-19 and NH-48 and have established mandi systems and cold storage facilities that support rapid movement and better pricing of agricultural produce. Rohtak, Jind and Karnal also show strong market linkages, with Karnal standing out as one of the state's largest agricultural trading centers. Jhajjar, Bhiwani-Charkhi Dadri and Palwal have moderate access, often dependent on adjacent districts like Rohtak or Faridabad for larger trade operations. These districts are witnessing improvement through state highway expansion and e-NAM platforms. In contrast, Mahendragarh and Rewari face limited to moderate access, constrained by weaker infrastructure and long distances from large trade centers, though NH-48 offers some connectivity in Rewari. Mewat (Nuh), however, represents one of the most disadvantaged districts in terms of market access. The region lacks a robust mandi infrastructure and is largely dependent on small village haats, informal trade routes and neighboring urban mandis in Palwal, Sohna, or Faridabad. Poor road conditions, inadequate storage and limited transport facilities further marginalize the agricultural economy. Farmers in Mewat often struggle to fetch competitive prices for their produce due to logistical bottlenecks and absence of formal market linkages. Thus, while some NCR districts of Haryana have leveraged their strategic location to develop vibrant agri-marketing systems, regions like Mewat need targeted interventions such as mandi modernization, road upgrades and aggregation platforms to bridge the rural-urban market divide and promote inclusive agricultural development.

### **Conclusion:**

The study demonstrates that floriculture in NCR Haryana is deeply shaped by geographical conditions, irrigation availability and market connectivity. Fertile alluvial soils in districts like Karnal, Panipat and Sonapat, combined with canal irrigation and efficient mandi networks, provide a strong foundation for intensive flower cultivation. Similarly, peri-urban districts such as Gurugram and Faridabad capitalize on their proximity to Delhi and export linkages, creating vibrant floriculture economies. However, the challenges of sandy and rocky soils, arid climatic conditions, water scarcity and weak infrastructure significantly constrain floricultural development in southern and southwestern districts, particularly Mahendragarh, Bhiwani and Mewat. This spatial imbalance reflects the need for region-specific strategies, including soil enrichment programs, promotion of micro-irrigation, capacity-building of farmers and investments in cold storage and transportation systems. The paper concludes that floriculture holds immense potential to diversify Haryana's agrarian economy, generate rural employment and meet rising urban and industrial demand for flowers. However, to realize this potential equitably across the NCR, a policy focus on sustainable soil and water management, improved market access and inclusive infrastructural development is essential. By addressing regional disparities and integrating floriculture into broader rural development and urban demand



frameworks, Haryana can transform floriculture into a sustainable and economically rewarding sector, reducing rural distress while strengthening its agro-economic profile.

**References:**

1. Sinha, R., & Tiwari, S. (2023). Environmental management in floriculture production. *Indian Journal of Environmental Planning*, 11(1), 22–31.
2. Sharma, N., & Verma, R. (2023). Impact of floriculture on environment and biodiversity in peri-urban belts. *Environmental Studies Journal*, 9(2), 44–52.
3. Rani, S., & Malik, A. (2023). Impact of urbanization on floriculture land in NCR towns. *Indian Journal of Urban Studies*, 5(2), 101–112.
4. Meena, R. K., & Devi, P. (2023). Role of floriculture in rural employment in Northern India. *International Journal of Rural Development*, 15(1), 24–30.
5. Yadav, R., & Sharma, S. (2022). Urban floriculture in Haryana: A district-wise analysis. *Journal of Horticulture and Floriculture Research*, 10(2), 101–110.
6. Singh, B. (2022). Regional planning and sustainable floriculture in urban corridors. *Planning Perspectives*, 38(1), 56–65.
7. Patel, D., & Jain, M. (2022). Economics of rose and marigold farming in Haryana's commercial zones. *International Journal of Agri-Economics*, 14(2), 88–97.
8. Ministry of Environment, Forest and Climate Change. (2022). *Urban agriculture and sustainable development in India*.
9. Kumar, S. (2022). Comparative economics of traditional vs. commercial floriculture in Sonipat. *Haryana Agricultural Journal*, 41(2), 111–117.
10. Bhatia, N. (2022). Value chain analysis of floriculture in NCR districts. *Horticultural Economics Review*, 16(3), 45–54.