

**Modern Farming Methods and its Impact on Agriculture Productivity in Mahendergarh District of Haryana**

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**Abstract:**

Agricultural productivity has been transformed all around the world by modern farming techniques, which have had a major effect on output, efficiency, and sustainability. This research examines the use and effects of contemporary farming methods in Mahendergarh District, Haryana. It looks at things like mechanisation, high-yield crop types, precision farming, and sustainable irrigation practices. The research looks at how much modern farming has been adopted, the advantages it brings, and the difficulties it presents. It does this by using a mixed-method approach that includes surveys and field observations. The results show that mechanised equipment, better seed types, and soil management methods have led to a substantial rise in agricultural output and resource efficiency. However, there are still significant issues, including expensive initial investment prices, a lack of technical understanding, and a shortage of water. The research emphasises the need of government involvement, financial assistance, and farmer training programs in order to improve the sustainable use of modern agricultural techniques in the area.

**Keywords:**

Modern farming, agricultural productivity, mechanization, precision farming, high-yield varieties, irrigation techniques

**Introduction:**

Agriculture is a crucial part of India's economy and society, providing a substantial number of jobs and contributing to food security. Modern farming techniques have been a powerful factor in agricultural growth due to the growing desire for increased productivity and efficiency. "The use of sophisticated methods like mechanisation, precision farming, high-yield crop varieties, and efficient irrigation systems has resulted in major advances in agricultural productivity, resource utilisation, and overall farm profitability. Farmers have been able to transcend the limits of conventional farming and lessen the impact of climate change and soil degradation because to these technical improvements. In the Mahendergarh District of Haryana, where agriculture is the main source of employment, the adoption of modern agricultural techniques has been essential for improving production and sustainability. The area is marked by a lack of water and semi-arid conditions, which create distinct difficulties that need the implementation of creative agricultural methods. The development of tractors, combine harvesters, drip irrigation, and genetically enhanced seeds has made it easier to manage crops, decreased the need for physical labour, and made better use of resources. Despite these benefits, many farmers encounter obstacles to adoption, such as the high prices of early investment, insufficient technical expertise, and restricted access to government subsidies and support programs. Farmers in Mahendergarh must deal with economic, environmental, and technical limitations, which makes the effects of modern farming both hopeful and complicated. The purpose of this research is to investigate how widely modern farming practices have been adopted in the area, evaluate how they have affected agricultural production, and determine the most significant difficulties and prospects for sustainable application. Policymakers and

agricultural stakeholders may create focused interventions to assist farmers, increase efficiency, and guarantee long-term agricultural development in Mahendergarh District by studying the advantages and disadvantages of contemporary farming methods.

The southern region of Haryana is where the Mahendergarh district is located. It is the region of plains and patches of low hills. There are a lot of sand dunes here, and they are between 3 and 5 meters tall. The geographical characteristics of the semi-arid environment are characterised by the presence of inland streams, sandy plains, sifting sand dunes, and eroded rocky slopes of the Aravali mountains. The seasonal streams move northward because the slope of the land goes from south to north. The Dohan and Krishnavati are two significant rivers that flow during the monsoon season". It is divided into three sections based on its physical geography. Satnali Bagar covers the northwestern section. The northern part of the area is made up of rolling plains. Krishnavati and Dohan area make up the southern part of the district. The Krishnavati area includes the Narnaul, Ateli, and Nangal Choudhry blocks of the district. This area is also home to certain Aravali offshoots, which assist in the formation of undulating terrain.

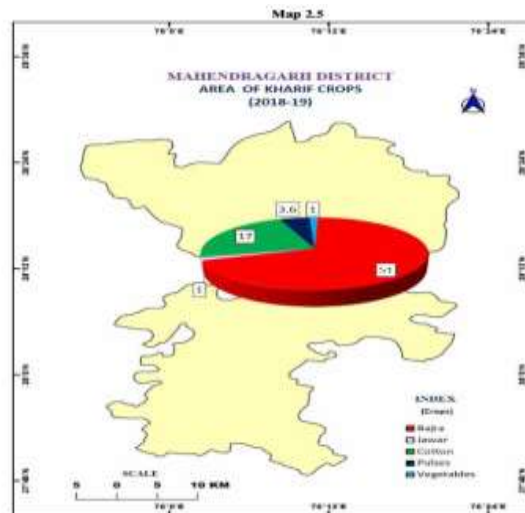
#### Soil and Cropping pattern:

The soil is sandy and sandy loam, which means it has a lower proportion of hummus. The winds erode all parts of the research area. "The soil contains lime, kankar, and rocks. The stony surface may also be found in areas. The crops that are farmed in this area are split into three categories: Kharif, Rabi, and Zaid. Crops that are harvested between the Kharif and Rabi seasons are known as Zaid. For example, Toria is referred to as Zaid Kharif, whereas vegetables, melon, and green fodder are referred to as Zaid Rabi. Bajra and cotton are the main kharif crops. Wheat, sarsaon, and gramme are the main rabi crops. The district needs to have enough irrigation infrastructure. The sprinkler and drip irrigation methods have been used by many farms in recent times. As a result, the crop pattern shifted from monoculture to multi-culture. The government had a crucial role in providing subsidies for various programs. Farmers in the villages that are located close metropolitan areas cultivate crops including tomatoes, carrots, cauliflower, and ladyfingers, among others. The farmers have begun the large-scale cultivation of cotton and mustard for economic purposes. Farmers in the southern portion of the district, namely in the Nangal Choudhary block, have begun to cultivate crops that demand less water due to the decrease in the water table during the previous ten years.

#### Agriculture:

The majority of inhabitants in the area work in agriculture. According to the 2001 census, 65.8% of individuals were involved in agricultural activities. However, at the time of the 2011 census, that number had dropped to 45.6%. This occurred as a result of the rise in tertiary activities, which climbed from 32% in 2001 to 42.4% in the 2011 census. The governments consistently urge the population to boost agricultural output by using the most recent methods and contemporary resources.

Sr.No.	Crops	Area Sown (in000 Hect.)	Production (In 000Tonnes)
<b>A</b>	<b>Rabi Crops</b>		
1	Wheat	51	207
2	Gram	3.6	02
3	Sarsaon	82	129
4	Barley	02	05
<b>B</b>	<b>Kharif Crops</b>		
1	Bajra	51	207
2	Jawar	01	1.5
3	Cotton	17	35
4	Pulses	3.6	02
5	Vegetables	01	02



Source: Statistical Abstract Haryana

### Importance of Modern Farming in Mahendergarh

Agriculture is still the foundation of Mahendergarh district's economy, and a large part of the people depends on farming to make a living. The district's semi-arid environment and limited water supplies make it difficult to use conventional farming operations. In recent years, it has become more important to employ contemporary farming technologies in order to solve these difficulties and improve agricultural output". Precision agriculture, efficient irrigation systems, and the adoption of high-yielding crop varieties are some of the techniques that have proved essential in improving resource utilisation and raising agricultural yields. For example, the Pradhan Mantri Kisan Urja Suraksha Utthan Mahabhiyan (PM-KUSUM) program has allowed farmers to water their fields more successfully by providing them with solar-powered irrigation pumps, which has resulted in increased agricultural output. The incorporation of these contemporary methods not only increases production but also helps to make agriculture in Mahendergarh more sustainable, which in turn guarantees food security and economic stability for the agricultural community in the area.

### Impact on Agricultural Productivity

The use of modern farming techniques has greatly enhanced agricultural output in Mahendergarh, resulting in higher crop yields, better resource management, and more financial security for farmers. Farmers have been able to cultivate more area while using less labour-intensive activities because to the introduction of high-yielding seed types, sophisticated irrigation systems, and mechanised equipment, which have all improved efficiency. Sustainable agricultural expansion has also been aided by precision farming, soil health management, and the use of organic fertilisers. As a consequence, farmers have seen a decrease in losses after harvesting and an increase in profits. However, even though modern farming has greatly increased productivity, the amount of its advantages differs depending on the financial resources, technical expertise, and access to infrastructure that farmers have.

### Challenges in Adoption of Modern Farming Methods

Even though modern farming has many benefits, there are a number of obstacles that prevent it from being widely adopted in Mahendergarh. The high cost of innovative agricultural equipment and technology is one of the main obstacles that makes it hard for small and marginal farmers to invest in modernisation. Furthermore, a lack of awareness and technical understanding about precision farming, automation, and soil management prevents many farmers from using these approaches efficiently. The district's water shortage, which is a significant issue, makes it even more difficult to implement improvements that are dependent on irrigation. In addition, farmers are typically discouraged from switching to contemporary techniques because of unstable access to the market, price changes, and insufficient financial help from banks and cooperatives. In order to tackle these difficulties, it is

necessary to employ a multi-stakeholder strategy that includes government action, investment from the commercial sector, and educational initiatives for farmers.

### **Role of Government and Policy Interventions**

The government is essential in encouraging the use of modern agricultural techniques by implementing a variety of legislation, providing financial assistance, and offering training programs. Programs like the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) have been implemented to enhance irrigation systems and guarantee that water is used effectively in regions that are susceptible to drought, such as Mahendergarh. Furthermore, the National Agriculture Market (e-NAM) connects farmers directly with buyers, which removes the need for intermediaries and allows for higher price realisation. Financial programs supported by the government, such as low-interest loans and subsidies for farming equipment, are designed to lessen the financial strain on farmers. Farmers are also given the information they need to put contemporary methods into action via extension services and training programs that are provided by agricultural institutions and Krishi Vigyan Kendras (KVKs). Although these efforts have been helpful, further revisions to policies, more investments in rural infrastructure, and better awareness campaigns are needed to guarantee that all farmers, particularly smallholders, may take full use of the benefits of modern agricultural technology.

### **Future Prospects and Recommendations**

In Mahendergarh District, the future of agriculture depends on the deliberate implementation of new agricultural techniques and policies that guarantee sustained development. In order to increase production and improve the lives of farmers, contemporary solutions must be implemented in response to the growing problems brought about by climate change, soil degradation, and economic volatility. The agriculture industry in the region has a lot of potential in the following main areas:

#### **1. Integration of Smart Agriculture Technologies**

The development of artificial intelligence (AI), the Internet of Things (IoT), and data analytics is changing agriculture all over the globe. Smart sensors, automated irrigation systems, and AI-driven weather predictions may help farmers make better choices, which can save costs and improve efficiency. Farmers may use precision farming, which is made possible by drones and satellite photography, to keep track of the health of their crops, the state of their soil, and any insect infestations as they happen. Mahendergarh's farmers will be able to increase their yields and reduce the amount of resources they waste by using these technologies.

#### **2. Development of Farmer Cooperatives**

Farmers that are small or marginal sometimes have a hard time because of high input prices, restricted access to capital, and market instability. By encouraging the creation of farmer cooperatives and producer organisations, farmers may work together to share resources, negotiate better prices, and obtain government assistance more efficiently, which can help to alleviate these issues. By working together in cooperative farming, smallholder farmers may share mechanised equipment, lessen their reliance on intermediaries, and improve their visibility in the market.

#### **3. Diversification of Crops**

Traditional reliance on staple crops makes farmers vulnerable to market fluctuations and environmental stress. Shifting towards horticulture, floriculture, and medicinal plant cultivation can provide diversified income streams and reduce dependency on a single crop type. High-value crops such as organic vegetables, aromatic plants, and spices have growing market demand and can offer better profitability. Government incentives and training programs should be expanded to support farmers willing to transition to diversified farming.

#### **4. Climate-Resilient Farming Strategies**

Because Mahendergarh is vulnerable to water shortages and unpredictable weather, it is essential to use drought-resistant crop types, water-efficient irrigation systems like as drip irrigation, and regenerative

agricultural techniques. Soil fertility may be maintained and desertification can be prevented by promoting agroforestry, mulching, and soil conservation techniques. Promoting the use of rainwater collection and micro-irrigation devices will improve water security for sustainable farming even further.

### **5. Strengthening Market Linkages**

Farmers are particularly worried about being able to access fair prices and marketplaces that are lucrative. Profitability may be greatly improved by strengthening connections with local and foreign markets via the use of digital platforms, contract farming, and direct-to-consumer methods. Farmers will be able to decrease post-harvest losses and get higher prices by increasing participation in the National Agriculture Market (e-NAM), growing agro-processing enterprises, and establishing cold storage facilities in rural areas. Collaborations between the government and the corporate sector may be very important in making sure that farmers have clear pricing systems and improved access to agricultural exports.

### **Conclusion**

In order for these initiatives to be successfully implemented, a multi-stakeholder approach will be necessary. This means that support from the government, commercial investment, research institutes, and active engagement from farmers would all be required. Farmers need to be educated about and encouraged to use modern farming methods, therefore training and awareness initiatives must be developed. Farmers will be better equipped to adopt modern farming practices and achieve long-term sustainability if they get more financial and infrastructural assistance. Mahendgarh's agricultural sector may thrive with more productivity and enhanced economic stability for farmers by incorporating smart technology, encouraging cooperative farming, diversifying crop output, improving climate resilience, and boosting market access.

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