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Problems and Possibilities of Agriculture in Rural Development of Ayodhya (Faizabad) District: A Geographical Approach

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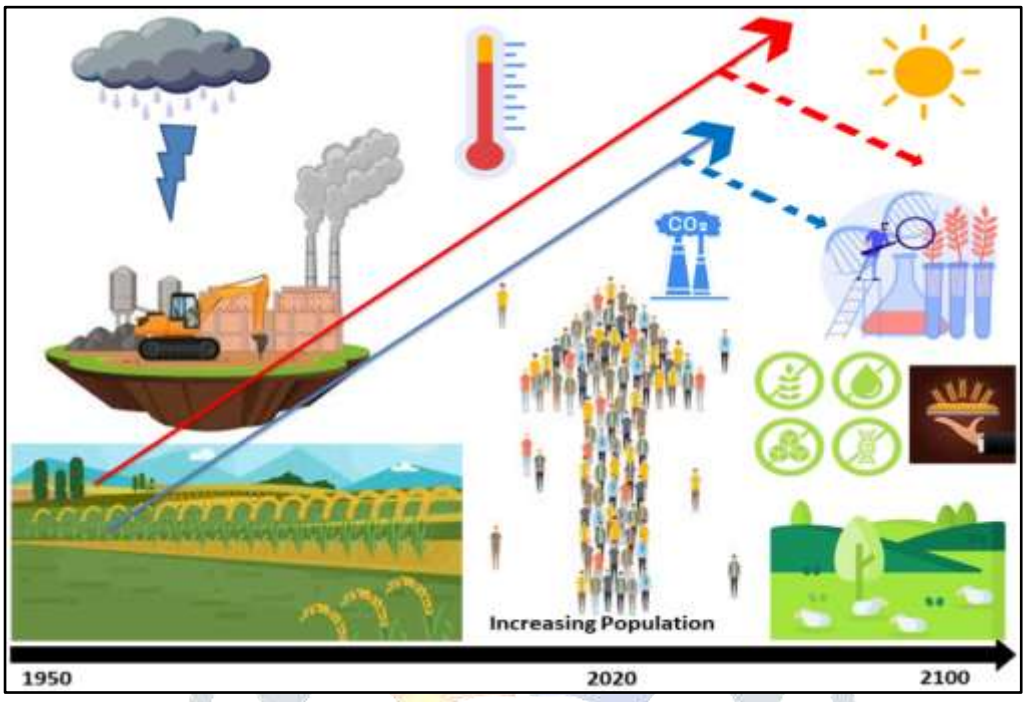
Abstract

Agriculture is the backbone of rural development in Ayodhya (Faizabad) district, Uttar Pradesh, where a majority of the population relies on farming for their livelihood. However, the agricultural sector faces several challenges that impede its full potential in contributing to rural development. The present paper explores the problems and possibilities of agriculture in the rural development of Ayodhya (Faizabad) district, utilizing a geographical approach. Through examining the regional features, climate, soil types, irrigation infrastructure and socio-economic conditions, the paper investigates the multifaceted issues that hinder agricultural productivity, such as water scarcity, inadequate infrastructure and limited access to modern technology. Additionally, the paper highlights the opportunities available for improving agricultural outcomes, focusing on sustainable practices, diversification, government policies and technological interventions. A combination of geographical analysis and policy recommendations provides a comprehensive understanding of how agriculture can be a driving force for rural development in Ayodhya (Faizabad) district.

Keywords: Agriculture, climatic condition, interventions, rural development, water scarcity.



Graphical abstract

1. Introduction

Agriculture remains the cornerstone of rural development in many parts of India (Lele and Goswami, 2017), particularly in regions such as Ayodhya (formerly Faizabad) district, located in the state of Uttar Pradesh. The economy of district and livelihood patterns are deeply intertwined with the agricultural sector, with a significant portion of the rural population engaged in farming and allied activities. Agriculture not only provides employment and sustenance to a vast majority of the population but also plays a crucial role in maintaining food security and supporting the overall economic framework of the region (Pawlak, K. and Kołodziejczak, 2020) (Figure 1).

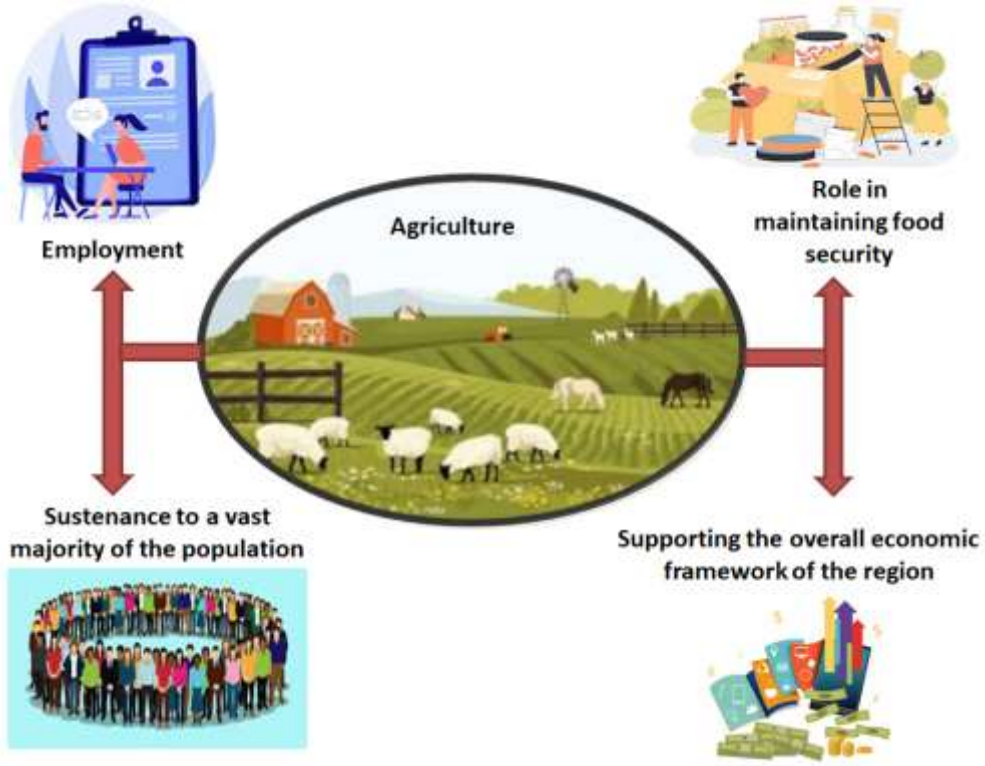


Fig. 1: Benefits of agriculture

Despite its centrality to rural livelihoods, agriculture in other districts as well as Ayodhya (Faizabad) district faces numerous challenges that hinder its growth and limit its potential as a driver of rural development (Srivastava, 2018). Among these challenges are declining soil fertility, inadequate irrigation facilities, small and fragmented land holdings, low mechanization levels and limited access to modern farming techniques (Figure 2). Additionally, factors such as rapid urbanization, climate variability, market inefficiencies and inadequate rural infrastructure further exacerbate the difficulties faced by the farming community (Balogun et al., 2022).

Fig. 2: Challenges and difficulties faced by the farming community

The transformation of rural areas due to urban expansion and infrastructural development presents both opportunities and challenges for the agricultural sector (Siddique and Mukherjee, 2017). While urbanization can create better market linkages and access to technology, it also leads to issues such as land encroachment, depletion of natural resources and shifts in labour dynamics. Similarly, changing climatic conditions, characterized by irregular monsoon patterns, extreme weather events and rising temperatures, pose a significant threat to agricultural productivity and sustainability (Gopalkrishnan et al., 2019). The present study investigates the problems and possibilities of agriculture in the context of rural development in Ayodhya (Faizabad) district through a geographical lens. The research aims to analyze the agricultural environment of the area by identifying key challenges and opportunities that influence the sectorial development. Through examining spatial factors, socio-economic conditions and policy interventions, this study seeks to provide valuable insights into how agriculture can be leveraged for sustainable rural development.

Furthermore, the study highlights the role of government initiatives, technological advancements and community-driven approaches in enhancing agricultural productivity and resilience. Understanding the interplay between environmental, economic and policy factors will contribute to formulating strategies that can help farmers overcome existing challenges while promoting sustainable agricultural practices. Ultimately, the findings of this study will contribute to a broader discourse on rural development and the need for targeted interventions to strengthen the agricultural sector in Ayodhya (Faizabad) district (Figure 3).

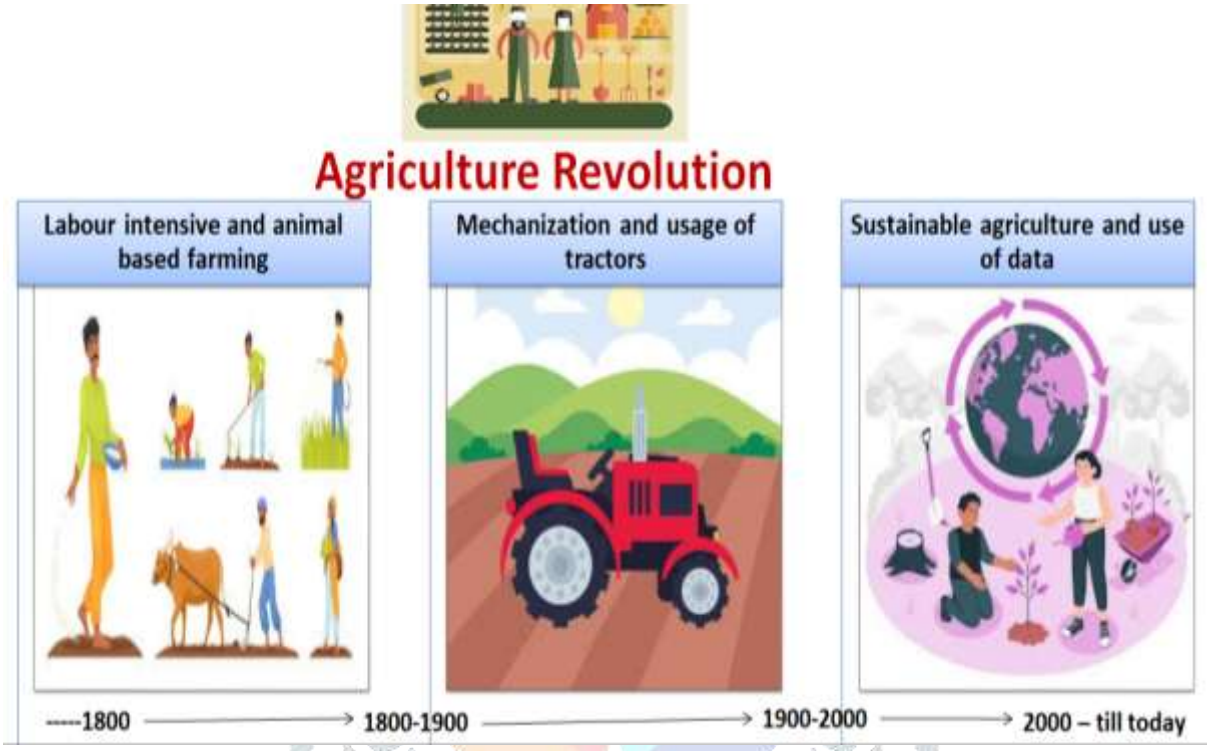


Fig. 3: Representation of agriculture revolution over the years

2. Geographical Overview of Ayodhya (Faizabad) District

Ayodhya district is located in the eastern part of Uttar Pradesh, covering an area of approximately 2,300 square kilometers. It is bordered by districts like Barabanki, Ambedkar Nagar, Sultanpur and the Gonda district. The district is situated in the fertile Gangetic plains, which are endowed with alluvial soils conducive to agriculture. The region experiences a sub-tropical climate with distinct seasons viz., hot summers, monsoon season and cool winters making it ideal for the cultivation of various crops.

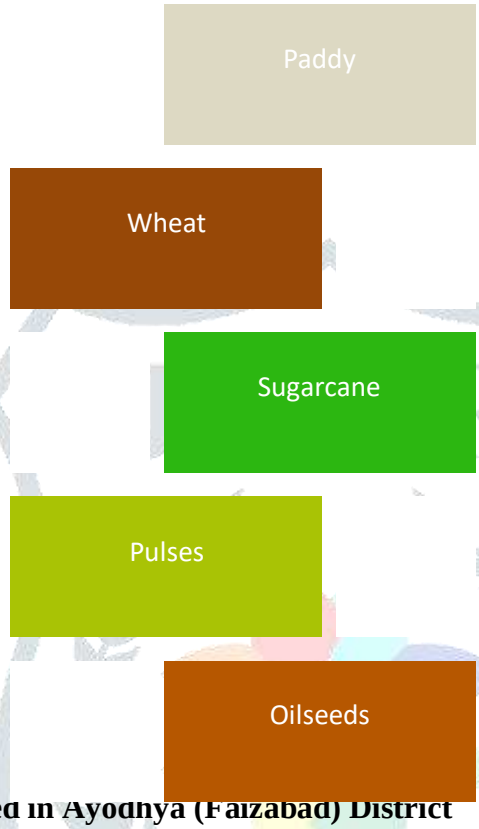


Fig. 4: Major crops cultivated in Ayodhya (Faizabad) District

The major crops cultivated in Ayodhya (Faizabad) include paddy, wheat, sugarcane, pulses and oilseeds (Figure 4). The region is also known for its horticultural produce, such as mangoes, guavas and citrus fruits. Despite the favourable climatic and soil conditions, the district faces several challenges that hinder the agricultural potential of its rural areas.

3. Problems of Agriculture in Ayodhya (Faizabad) District (Figure 5)

3.1 Water Scarcity and Irrigation Issues

Water availability is one of the most pressing challenges faced by farmers in Ayodhya (Faizabad). While the district is situated near the banks of the Ghaghara River, the irrigation infrastructure is inadequate to meet the needs of the agricultural sector. The reliance on traditional methods of irrigation, such as rainwater and tube wells, exacerbates the problem, particularly during dry seasons (Pal et al., 1994). The lack of modern irrigation techniques, such as drip or sprinkler irrigation, makes water management inefficient, leading to over-extraction of groundwater and poor crop yields (Paria et al., 2021).

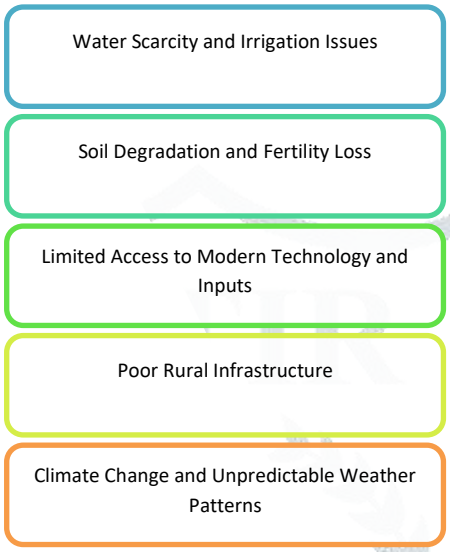


Fig. 5: Problems related to Agriculture in Ayodhya (Faizabad) District

3.2 Soil Degradation and Fertility Loss

The overuse of chemical fertilizers, combined with inadequate soil management practices, has led to a gradual decline in soil fertility in some parts of Uttar Pradesh (Lata, 2019) including Ayodhya (Faizabad). The continuous cultivation of monoculture crops such as wheat and rice without proper crop rotation has resulted in the depletion of essential nutrients from the soil. This, in turn, affects the productivity of crops and increases the dependency on chemical inputs.

3.3 Limited Access to Modern Technology and Inputs

While technology has revolutionized farming practices in many parts of India, Ayodhya (Faizabad) remains relatively underdeveloped in terms of technological access. The use of high-yielding variety (HYV) seeds, mechanized farming equipment, and advanced agricultural practices is limited due to a lack of awareness, financial constraints, and inadequate extension services (Gulati et al., 2021). This technological gap results in lower productivity and less efficient farming methods.

3.4 Poor Rural Infrastructure

The rural infrastructure in Ayodhya (Faizabad), including roads, markets, storage facilities, and transportation, is underdeveloped. Farmers often struggle to access markets for their produce due to poor road conditions and a lack of proper storage facilities (Singh et al., 2024). The absence of cold storage units for perishable crops leads to post-harvest losses, which further reduce the income of farmers. Moreover, the lack of reliable electricity hampers the use of modern irrigation and farming equipment (Lata, 2019).

3.5 Climate Change and Unpredictable Weather Patterns

Climate change has introduced greater unpredictability in the farming calendar in Ayodhya. Unseasonal rains, droughts, and erratic monsoon patterns are becoming more frequent, disrupting sowing and harvesting schedules (Gupta and Pathak, 2016). These climatic changes adversely affect crop yields and increase the vulnerability of farmers to natural disasters (Figure 6). Small-scale farmers, who lack financial resilience, are especially at risk (Singh et al., 2020).

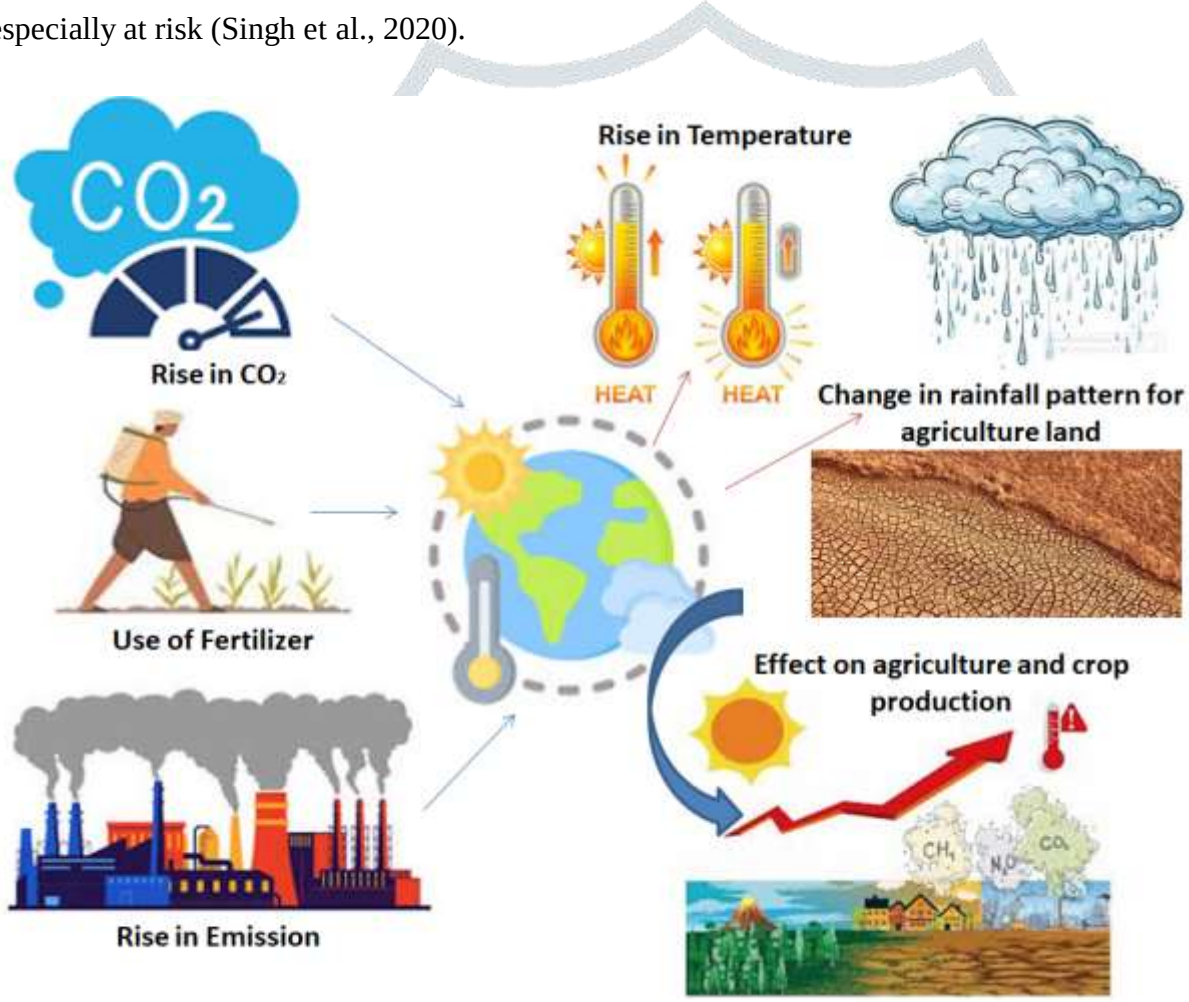


Fig. 6: Linkage of Climate change on agriculture and crop production

4. Possibilities and Opportunities for Agricultural Development (Figure 7)

4.1 Sustainable Agricultural Practices

There is immense potential to improve agricultural practices in Ayodhya by promoting sustainable farming techniques. Azam et al. (2024) conducted a field experiment during the Kharif seasons of 2022 and 2023 at the Agronomy Research Farm, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India. The study examined three crop establishment methods—Direct Seeded Rice, System of Rice Intensification (SRI), and Transplanted Rice—in the main plot, with seven nitrogen application treatments in the sub-plots. These included a control, 100% Recommended Dose of Nitrogen (RDN) through conventional urea, 100% RDN through Nano Urea, and various combinations of

conventional urea and Nano Urea at different ratios (80:20, 60:40, 40:60, and 20:80). The results indicated that the application of 60% RDN through conventional urea combined with 40% RDN through Nano Urea led to significantly higher NPK content, NPK uptake, protein content, and protein yield. This treatment was statistically at par with the 40% RDN conventional urea + 60% Nano Urea treatment but was significantly superior to the other treatments across both years of the study. Organic farming, agroforestry, and the use of bio-fertilizers can help restore soil health and reduce the dependency on chemical inputs (Yadav et al., 2021). Additionally, conservation tillage practices can improve water retention and soil structure, thus enhancing crop yields in the long term (Rathore et al., 2018).

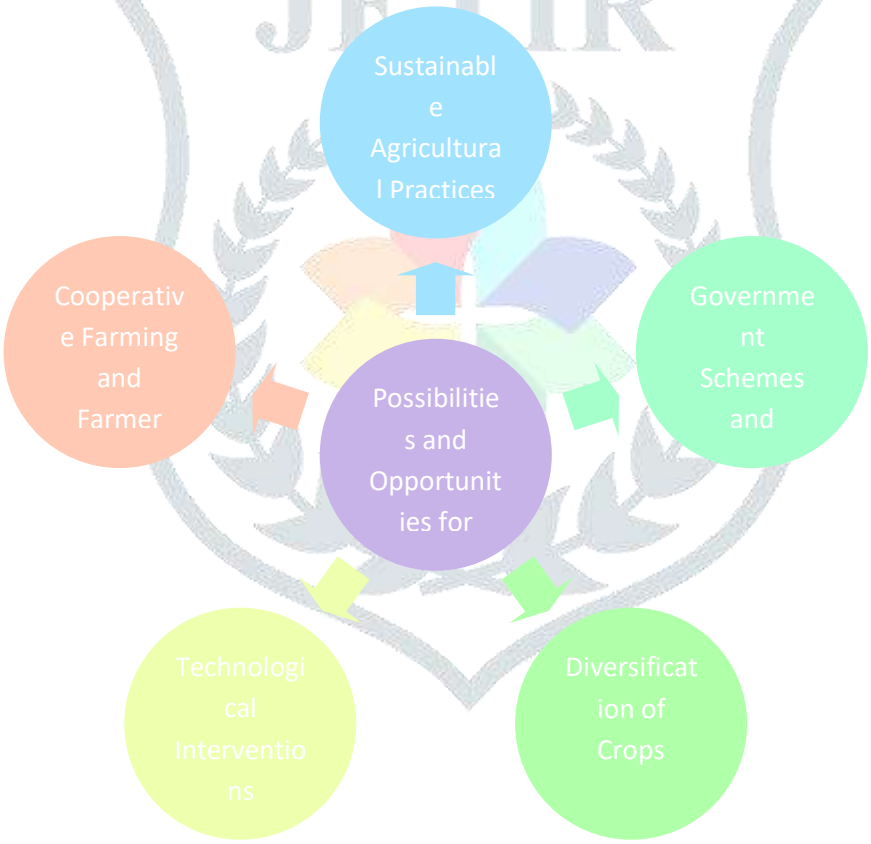


Fig. 7: Representation of possibilities and opportunities for agricultural development

4.2 Diversification of Crops

Diversifying crop production can reduce the risk of monoculture and provide farmers with an opportunity to earn higher incomes (Singh et al., 2014). In Uttar Pradesh, along with other district, Ayodhya (Faizabad) district is endowed with favourable conditions for the cultivation of high-value crops such as fruits, vegetables, and spices (Kumari, 2018). Integrating horticulture and floriculture into the farming system could lead to higher profits and increased rural employment opportunities (Singh et al., 2011).

4.3 Government Schemes and Support

The government of Uttar Pradesh has launched various schemes aimed at improving agricultural productivity and rural development. Programs such as the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Pradhan Mantri Fasal Bima Yojana (PMFBY), and the National Agriculture Market (eNAM) provide avenues for better irrigation, crop insurance, and market linkages (Tripathi and Panwar, 2024) (Figure 8). Additionally, the government's focus on infrastructure development, including the construction of rural roads and cold storage facilities, has the potential to improve market access and reduce post-harvest losses (Nuthalapati and Sharma, 2021; Kaur and Watson, 2024).

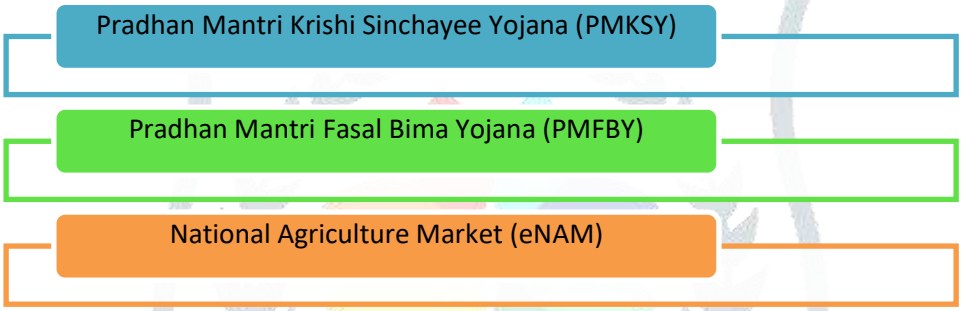


Fig. 8: Government schemes and support for agriculture in recent years

4.4 Technological Interventions

The adoption of modern agricultural technologies can revolutionize farming practices in Ayodhya. Precision farming, the use of drones for crop monitoring, and the promotion of mobile applications for weather forecasting and pest management can improve decision-making for farmers (Singh, 2022). Furthermore, promoting the use of drip irrigation systems and solar-powered irrigation pumps can address water scarcity issues.

4.5 Cooperative Farming and Farmer Producer Organizations (FPOs)

Bikkina et al. (2018) examined the role of Farmer Producer Organizations (FPOs) as collective institutions through a case study of Avirat. Their findings suggest that FPOs can generate significant benefits through effective collective action. However, a key challenge remains in securing adequate capital to fully realize these benefits. This study explores the policy implications of these findings. The formation of cooperatives and Farmer Producer Organizations (FPOs) can help farmers access better prices for their produce, reduce exploitation by middlemen, and create opportunities for collective marketing and storage (Kumar et al., 2015). These organizations can also facilitate the adoption of modern farming techniques through collective training and resource sharing.

5. Conclusion

Agriculture in Ayodhya (Faizabad) district plays a crucial role in the rural development process, but it faces numerous challenges that hinder its full potential. Water scarcity, soil degradation, poor infrastructure and the lack of modern technology are among the primary obstacles limiting agricultural productivity. However, there are significant opportunities for improvement through the promotion of sustainable practices, crop diversification, technological adoption, and government support. By addressing these challenges and leveraging the available possibilities, agriculture can become a powerful engine for rural development in Ayodhya district. Sustainable agricultural practices, infrastructure improvement, and policy interventions are key to enhancing the socio-economic conditions of the rural population and fostering long-term growth in the district.

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