INDIAN INSTITUTE OF MANAGEMENT, ROHTAK

INTERNSHIP REPORT

"A Socio-Economic and Health-Centric Analysis of Sustainable Development in Haryana: Challenges, Interventions, and Pathways for Inclusive Growth"

SUBMITTED TO

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– Aarav Sharma

CERTIFICATE OF ORIGINALITY

I hereby certify that this Internship Report is the result of my own independent and original work. The contents of this report are based on research conducted and experiences gained during my internship. I have duly acknowledged all sources from which information and ideas have been derived.

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CASE STUDY: AGRICULTURE AND DEVELOPMENT IN HARYANA

Haryana is a state renowned for its agrarian wealth and rapid industrialization which also presents a very interesting case and situation to study the complex and inter-related issues between the traditional framing methods of Haryana farmers, industrialization followed by urbanization and government policies. Haryana, found in northern India, is a massive producer of national food grain output and particularly of Wheat and Rice. Nonetheless, the state's agrarian economy stays at an even keel, and this is gripping both the issues like farmers' unrest, environmental degradation and the burden of the recent Haryana urbanisation. Perhaps in tandem Haryana's rapid industrial growth mainly in the NATIONAL CAPITAL REGION(NCR), revolutionizing the economic landscape with the dawn of new possibilities and challenges to employment, infrastructure and sustainable development in India.

This case study investigates with the agriculture, economic and social dynamics of Haryana, adopting a THEMATIC AND AREA-BASED CROSS CUTTING APPROACH to analyse the combined issues shaping the state's development trajectory of Haryana. The Thematic approach is focused on key issues such as rice/wheat cultivation across Haryana, MINIMUM SUPPORT PRICE(MSP), stubble burning with sustainable agriculture and corporatization of the farming in India. The area-based approach needs to consider the regional variation between the highly developed NCR region and the less industrialised hinterland,analyzing how industrialization, urbanization and the real estate development changes the agriculture and rural livelihoods in Haryana.

Apart from these themes, the study which integrates the POPULATION DEMOGRAPHICS, CASTE DYNAMICS and THE POLITICAL ECONOMY of the state to give a wide understanding of the challenges and the opportunities in Haryana. The states and its plural population, marked by differential population densities in the state, labour-capital cleavages, and the occupational pattern based on caste, which is a major factor in figuring out its agricultural and developmental scenario in Haryana. Additionally, the study has evaluated Haryana's performance in reaching the SUSTAINABLE DEVELOPMENT GOALS(SDGs), determined the gaps in the state policies and programs and pointed out the spaces for critical interventions by government.

The study employs a mixed-methods design, where the quantitative data analysis is supplemented with the qualitative results from farmer interviews and case studies. The mixed-methods design is to give a complete picture for issues, both the macro-level trends and the micro-level experiences of the stakeholders in the real-life events. Through the analysis of the interaction between the agriculture,industrialisation,urbanisation and the state policies to study the work towards to provide actionable insights for the policy makers, researchers and the development practitioners given in each report.

This case study is divided into three parts:

PART A: AGRICULTURE ISSUES

1.EVOLUTION OF MSP IN HARYANA AND ITS ROLE IN STABILIZING THE FARMER INCOMES

The MSP program is a vital part of agricultural regulations which has been launched by the government of India to protect and secure the interests of farmers from the unpredictable market price fluctuations and intermediaries exploitation done towards the farmers. The MSP is a guaranteed price for certain crops which the government purchases from farmers, thus offering financial security to farmers and assuring that farmers get a decent return for their crop given when their crops are not brought by the private firms. State of Haryana is also regarded as one of the chief producers of Indian rice and wheat, Haryana contributes 45% of rice and 65% of wheat to central pool value and more than 5% to the country's total food output of the country. The MSP regime has played an important role in defining the state's agrarian economy, particularly for staple crops like rice and wheat. Haryana was the leader in the Green Revolution and became the second State with high agricultural surplus in given circumstance. Haryana has set a national example by becoming one of the first state in India to buy all 24 crops at the MSP fixed by the Union Government. However, although the MSP has brought many advantages, it is of concern whether it will be sustainable in the long term and its impact on the environment and economy of India.

Historical Background and Emergence of MSP in India

MSP was first brought in by the Indian government into the agricultural economy mid-way in 1960's as part of its stabilisation policy. The MSP regime was started in 1965 by setting up the Agricultural Prices Commission (later rechristened as CACP). It was a government market intervention with a work towards to enhance national food security and safeguard farmers from sudden decline in market prices. Green Revolution policy was implemented, whereby farm yields were raised by using superior seed varieties, chemically produced fertilizers, and advanced irrigation methods. The high-yielding philosophy became increasingly popular. Haryana, like Punjab, was at the centre of the revolution that changed India from a food-deficient country to a food-surplus country. Foodgrains are gotten by the state government of Haryana under the MSP scheme. The food grains are safely stored by the government until they are supplied to the Food Corporation of India (FCI). The National Food Security Act, 2013, is passed by the government. The Public Distribution System (PDS) is run by the government. MSP is decided by the Commission for Agricultural Costs and Prices (CACP), showing price policy of commodities under different mandates, the Commission used to consider the different Terms of Reference (Tor) provided to CACP in 2009. Demand and supply of farm crops under the existing conditions of the respective year, cost of production faced in agriculture both input and output, fluctuation in market prices and change both domestic as well as international impacting the product prices, inter-crop price parity, agriculture-non-agriculture terms of trade, at least 50 percent as margin over cost of production and likely impact on consumers of such a product. Government fixes MSPs of major agricultural produce, after each year and according to the recommendations of the Commission, which are binding in character. So far, CACP provides recommendations to MSPs for 23 commodities comprising 7 cereals (paddy, wheat, maize, sorghum, pearl millet, barley and ragi), 5 pulses (gram, tur, moong, urad, lentil), 7 oilseeds (groundnut, rapeseed-mustard, soyabean, sesamum, sunflower, safflower, niger seed) and 4 commercial crops (copra, sugarcane, cotton and raw jute).

For a long time, the MSP mechanism has been shaped and changed by the change in economic conditions, cost of production, and policy priorities. The government has raised the MSP rates from time to time in consideration of increasing input prices such as fertilizers, pesticides, and labour. Thus, the government protects the farmers.

Economic and Social Impact of MSP on Haryana Economy

MSP has a significant impact on the state's agrarian economy. With returns of some sort, it has made farming in the state more profitable, and more and more farmers cultivate MSP-supported crops across the nation. These policies have not only elevated agricultural productivity levels but also high revenues, at least for a part of the farming community-the small and marginal ones-which dominates the rural scene of Haryana with monstrous land parcels in India. The MSP has enabled farmers to borrow from institutional sources-Banks, a driving force of farm investment and financial stability for all farmers in Haryana.

In addition to this, the MSP has helped overall rural Haryana development. Higher incomes of farmers have led to higher standards of living, better education and healthcare, and jobs at secondary industries like agro-processing and transport. The mechanism has curbed rural-urban migration because of the profitability and viability of agriculture as a profession.

Concerns and Challenges Regarding MSP

Despite having several benefits, the MSP system has produced several problems as well, especially for the agricultural culture of Haryana in a heterogeneous way. They are one among those wherein these crops which have received support through MSP such as wheat and rice are taking over a lot. Monoculture has been referred to as such where farmers focus on such plants at the expense of other products such as pulses, oilseeds, and millets. Monoculture leads to the yield of staple cereals to the fullest which leads to loss of soil fertility because chemicals and pesticides were used on them repeatedly in monocultures. The MSP leads to gigantic government procurement, particularly of wheat and rice, resulting in storage and wastage and overburdening the Food Corporation of India's [FCI] resources and it is having a colossal wastage of all resources as it is.

The second most significant problem that appears is degradation of the environment due to excessive extraction of groundwater for agriculture. Haryana, as well as all other agricultural states, employs ground water for farming primarily on water-hungry crops like rice. The MSP policy has therefore handled intensifying this issue of over-extraction and next depletion of groundwater. It also questions the existing MSP policies like whether they are sustainable or not and if at all it is possible to be able to sustain the policies in the long run.

Another criticism of MSP is that MSP has limited coverage.

Guaranteed price is being provided on certain crops such as rice and wheat under the MSP, but many crops, including all the horticulture items, fall under the scheme. It ultimately results in widening the gap in farmer's income. The farmers producing the non-MSP crops are highly uncertain of their finances. It has also been accused on the ground of being pro-large farmers, who can buy better resources and market intelligence, compared to the marginal and small farmers. Following the Shanta Kumar Committee's 2015 report, the MSP benefits just 6% of farmers. Predominantly those from better infrastructure states like Punjab and Haryana, and a huge majority of farmers from other states are still excluded.

“REIMAGINING SUBSIDIES FOR ECO-RESTORATION AND LOCAL ECONOMIES,”

proposing a tiered MSP favouring eco-friendly crops (e.g., millets, pulses) and linking subsidies to agro-processing for rural job creation. This reflects the teacher’s call to rethink subsidies beyond financial security, considering eco-restoration and local economies.

2.FACTORS LEADING TO PROLONGED FARMER AGITATION

One of India's largest and most sustained movements in its history, protests by Indian farmers across the country during 2020-2021 were more deeply concentrated within Haryana and Punjab's farm belts. Drawing on deep anxieties about the disassembly of the mechanisms of state support and corporatization of farming, this protest reflected the convergence of economic, political, social, and environmental resentments. After this is the detailed description of the reasons the movement continued for a longer period, and specifically Haryana's role in that movement.

The Three Farm Laws and the Fear of MSP Dilution

The immediate cause of the protests was the September 2020 passage of three controversial farm laws:

The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act (2020): Permitted farmers to sell produce beyond state-controlled Agricultural Produce Market Committees (APMCs), developing parallel private markets.

The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act (2020): Encouraged contract farming agreements between farmers and agribusiness companies.

The Essential Commodities (Amendment) Act: De-regulated storage and trade of essential commodities such as cereals, pulses, and onions.

Key Issues:
Erosion of APMC Mandis: Farmers feared that private buyers would selectively pick the better produce from the large farmers and leave smallholders at the mercy of exploitative mediators in unregulated markets throughout India, thereby lowering the price of their crops.
Lack of Safeguards: Legislation altered mechanisms to provide fair pricing in private transactions or relief for farmers in contract disputes, and this lacked the overall safeguards for farmers.
Historical Precedents: Earlier experiences with corporate exploitation which have occurred all over India, like poor sugarcane prices in Uttar Pradesh or cotton seed monopolies in Maharashtra, compounded fears.

Dependence on MSP and the Procurement System

The farm economy of Haryana is organizationally linked with the MSP regime for wheat and paddy (rice). Over 80% of farmers in Haryana cultivate these crops, and MSP is their principal source of income. Haryana's state procurement system ranks among India's most efficient procurement systems, and 90–95% of wheat and paddy are bought at MSP under the administration of the Food Corporation of India (FCI) and state obtaining agencies.

Why MSP is Irreplaceable in Haryana:

- Income Security: For small and marginal farmers (who constitute 70% of Haryana’s agricultural workforce), MSP acts as a lifeline for them and changes the aspect of these values. Without it, they lack bargaining power in volatile markets.
- Credit Access: Banks and cooperatives extend loans based on MSP-backed crop values. Uncertainty over MSP would disrupt credit flows, crippling farm investments within Haryana and across India.
- Food Security Contribution: Haryana contributes nearly 10–12% of India’s wheat and 4% of its rice to the central pool changing the perspective. MSP ensures stable procurement for the Public Distribution System (PDS), feeding millions of beneficiaries.

Farmer Distrust in Alternatives:
Demonstrators dismissed the government's work towards that the private market would be more competitive and give more favourable prices. They referenced instances such as Bihar, where the removal of APMC mandis in 2006 saw uncontrolled exploitation of farmers by traders as well as reduced farmer earnings.

Corporatization of Agriculture and Power Imbalances

The focus of the farm laws on contract farming and corporate engagement only heightened concerns over an unlevel playing ground. Small farmers, already disadvantaged by fragmented landholdings (average size: 2.2 acres in Haryana), feared being turned into "contract labourers" on their own property.
Specific Grievances:

- Asymmetrical Bargaining Power: Farming firms might be able to set contract conditions, exposing farmers to price manipulation or crop rejection on arbitrary grounds.
- Legal Vulnerability: The legislation excluded farmers from going to civil courts in case of any conflict, and they were compelled to resort to corporation-dominated arbitration—a biased mechanism.
- Land Ownership Issues: Although the laws did not allow for corporate possession of agricultural land, farmers were afraid of indirect possession in the guise of long-term leases or usury contracts.

Case Study – Punjab's Experience:
In Punjab, pilot projects of corporate potato and vegetable transactions had earlier led to price and quality issues, adding to scepticism about the new law in the sector of agriculture across Haryana, Punjab and the National capital region.

Ecological and Economic Sustainability Challenges

The protests also highlighted systemic issues in India's MSP-driven agricultural model, particularly its environmental unsustainability:

a. Groundwater Depletion:

- Haryana overdrafts 137% of its replenishment, the maximum in India. MSP-based rice production uses 5,000 litres of water per kilogram produced.
- More than 64% of the state's aquifer units are "over-exploited," and this poses danger to future agriculture.

b. Monoculture and Soil Degradation:

- MSP's concentration on rice and wheat resulted in monocropping, lowering crop diversity. The share of pulses and oilseeds in Haryana decreased by 40% since 2000.
- Overuse of urea and pesticides has also decreased the fertility of the soil, with 30% of Haryana's soil being low in organic carbon.

c. Economic Paradox:

- MSP assures immediate income but deters crop diversification. In Punjab and Haryana, apprehension of procurement loss and poor returns has deterred farmers from adopting millets or legumes as the major crop.

Political and Social Dimensions of the Agitation

a. Mobilization by Farmer Unions:

- Trade unions such as the Bhartiya Kisan Union (BKU) and All India Kisan Sangharsh Coordination Committee (AICSCC) organized huge demonstrations, drawing on decades of grassroots networks in the farming sector.
- The agitation has attracted cross-state support, and farmers from Rajasthan, Uttar Pradesh, and Maharashtra have joined Haryana and Punjab protesters and farmers across all over India.

b. Symbol of Agrarian Distress:

- The unrest has become a rallying cry for the larger issues such as stagnant wages, increasing debt (70% of Haryana's farmers which are in debt), and poor rural infrastructure in the rural areas across the spaces.
- Farmers pointed out the policy-ground disconnect, e.g., inflated input prices (diesel, fertilizers) and broken promises like loan waivers.

c. Political Polarization:

- The opposition parties, including the Congress, AAP, and regional parties, joined hands with the protests, terming them as a fight against "anti-farmer" policies.
- The government's first response to labelling protesters as "anti-national" or "Khalistani sympathizers" also excluded farming communities.

d. Role of Women and Youth:

- Women, who included 35% of the farm labour force in Haryana, played a pivotal role in sustaining protests, resisting rural society's patriarchal gender norms.
- Young leaders emphasized the jobs crisis and the lack of non-farm employment, connecting agrarian distress to broader economic stagnation.

3.Policy Responses and Stakeholder Perspectives on the Farmer Agitation

It is against this backdrop that India's agricultural sector was brought to the forefront with deep-rooted problems by the prolonged farmer unrest of 2020-2021. The government, state governments, and other stakeholders tried to mitigate the grievances made by farmers as a protest was launched against them. The possible policy reactions to the unrest can be examined by illustrating an in-depth analysis of the principal policy measures and the different perspectives raised during and after the unrest.

Dialogue and Negotiations

The government opened successive sets of talks with representatives of the farm unions and authorities to clear the logjam. The negotiations were, however, marked by an environment of mistrust and by disagreements on core items that never reached a consensus.

Key Aspects of the Dialogue Process:

- Farmers' Demands: The protesting farmers demanded a written legal guarantee of MSP, repeal of the three farm laws, and integration of the existing procurement system. They also demanded punishment for private purchasers who bought below MSP.
- Government Position: The government went ahead and told that farm bills were farmers' interests and granted a concession to change some provisions. It, however, declined to give a commitment in law to MSP due to financial issues and market distortions.
- Breakdown of Negotiations: Even after more than a dozen rounds of talks, the talks did not meet halfway. The government was blamed by farmers for not wanting to address their fundamental issues, and the government condemned protesters as recalcitrant.

Impact of Failed Negotiations:
That there was no consensus extended the instability, and the farmers escalated the protests to the next stage using blockades, marches, and sit-ins. The standoff also attested to the acute degree of mistrust between policymakers and farmers.

Repeal of the Farm Laws

In a sudden turn of events, Prime Minister Narendra Modi announced the repeal of the three farm laws in November 2021. This followed almost a year of persistent agitations, in which farmers had to endure brutal weather conditions, police brutality, and even fatalities.
Implications of the Repeal:

- Farmers' Victory: The move was welcomed as a landmark victory for farmers, proving the strength of people's movement and grass root power.
- Political Fallout: The move was seen as a strategic withdrawal by the government, which was being increasingly cornered in the approach to state elections in Punjab and Uttar Pradesh.
- Unanswered Questions: Although the repeal met the short-term need of angry protesters, it did not give answers to the bigger questions of MSP, Agri-reforms, and farmer welfare.

Criticism of the Repeal Process:
The rest of the economists and entrepreneurs believed that repeal was a lost opportunity to redesign India's agricultural markets. They cited the requirement of reforms to plug inefficiencies in the APMC system and provide farmers greater market access.

Committees on MSP and Agricultural Reforms

Following the repeal, the government proposed the formation of committees to examine the MSP system and recommend measures for agricultural sustainability.

Key Developments:

- Terms of Reference: The committees had been asked to study how MSP would be strengthened, how the diversification of crops could be fostered, and how farming might be given profitable.
- Farmer Scepticism: Protesters remained sceptical about such committees, reminiscing about past experiences when the same thing did not bring anything tangible. They once again demanded legal backing for MSP.
- Expert Opinions: Agricultural economists opined that MSP must be complemented with direct income support schemes, such as PM-KISAN, to provide farmers with a shock cushion.

State-Level Interventions

Along with central government measures, state governments such as Haryana came up with initiatives to help farmers and to undo the actions which are needed to solve some of the root causes present in Haryana.
Haryana's Initiatives:

- Increased Procurement Centers: The state increased the number of its procurement centres to undertake purchase of crops at MSP within time and pay them on time, decreasing the burden of farmers for crop production further.
- Financing Diversification: Initiatives like Mera Pani Meri Virasat encouraged farmers to shift from water-intensive crops like paddy to less water-dependent crops like maize, pulses, and oilseeds. Financial aid of ₹7,000 per acre was given to the farmers for crop diversification in this sector.
- Groundwater Conservation: The state encouraged methods such as Direct Seeded Rice (DSR) and micro-irrigation to save groundwater in these areas.

Limitations of State Efforts:
Despite the endeavours of such institutions being genuine in nature and its impact being reined in owing to insufficient cognizance in the masses, limited financial support, and entrenched inclination of MSP-supported crops for farmers.

Industry and Expert Perspectives

The farmer agitation sparked a wide-ranging debate among economists, industry stakeholders, and environmental experts about the future of Indian agriculture.

a. Economists' Views:

- Liberalisation support: Economists argued overwhelmingly that farm markets had to be changed to become more efficient, waste less and lead farmers into world value chains. They emphasized private investment and contract farming potential gains.
- Anxieties Over Protection: Critics warned that without strong regulatory mechanisms, opening the markets would further increase inequalities and leave small farmers open to exploitation of the farmers.

b. Private Sector Stakeholders:

- Advocacy of Fair Policies: Industry stakeholders urged policies that equate market efficiency with farmer welfare. They underlined the ability of technology, infrastructure, and supply chain development to enhance farm productivity.
- Impel Contract Farming: Contract farming was seen by agribusiness companies as a way of ensuring quality and reducing price uncertainty. However, they also saw the need for transparency in contracts and conflict resolution processes.

c. Environmental Experts:

- Call for Sustainable Practices: Experts stressed the imperative to move away from MSP-led monoculture, which has resulted in soil erosion, groundwater depletion, and loss of biodiversity.

- Promotion of Agroecology: The farmers demanded adoption of agroecological methods such as organic farming, crop rotation, and integrated pest management to provide long-term sustainability to each farmer.

Civil Society and Farmer Perspectives

Farmer unions and civil society organizations played a pivotal role in shaping the discourse around the agitation.

a. Farmer Unions:

- Demand for Structural Reforms: Beyond MSP, farmers also demanded structural reforms such as relief in debt, easing of availability of credit, and better rural infrastructure.
- Prioritizing Equity: The unions placed in the forefront the urgency of bridging the gap between the small and the large farmers and the women farm producers and marginalization of the tenant farmers.

b. Civil Society Organizations:

- Advocacy for Inclusive Policy: Campaigners and NGOs argued that farmers must be brought into policymaking, and the reforms must be work towards at improving the lot of the poorest segments of rural society.
- Environmental Campaign: Most organizations advocated policies that would integrate farm growth into environmental preservation, e.g., preferring millets and indigenous plants.

4.The Road Ahead: Future Challenges and Recommendations for Indian Agriculture

The revocation of the three agriculture laws in November 2021 ended a record farmer agitation but began a fresh chapter in the agricultural journey of India. The immediate grievances of the agitators were addressed, but the underlying reasons which led to the stir remain unaddressed. The way forward is fraught with issues, but it is also a chance to re-design India's agricultural policy in a way that ensures farmer well-being, environmental protection, and economic efficiency. A step-by-step explanation of the key challenges and workable proposals for the future follows below.

Legal Guarantee of MSP

The need for a statutory assurance of Minimum Support Price (MSP) continues to be one of the most controversial issues in Indian agriculture. According to the farmers, in the absence of statutory assurances, MSP continues to remain susceptible to economic and political influences.
Key Considerations:

- Legal Design: A legislative mandate for an MSP would involve specific definitions for covered crops, pricing provisions, and enforcement provisions.
- Fiscal Impacts: MSP for all 23 crops subsidized by the Commission for Agricultural Costs and Prices (CACP) would be a drain on government resources. The cost has been pegged at ₹10–12 lakh crore a year.
- Market Distortions: Critics take the position that a single MSP for all would distort market forces, deter private investment, and lead to excess supply of some crops.

Recommendations:

- Targeted MSP Implementation: Prioritize the extension of legal MSP assurances for crops such as wheat and rice while examining other support mechanisms for income for other crops.
- Price Deficiency Payment (PDP): Introduce PDP schemes, under which farmers are paid for price gaps between market and MSP, minimizing physical procurement.
- Transparency in MSP Calculation: Ensure that MSP is computed because of full cost calculations, including input costs, labour, and land rent, as suggested by the Swaminathan Commission.

Diversification Beyond Wheat and Rice

The excessive dependence on wheat and rice, encouraged by MSP and procurement operations, has resulted in environmental imbalances and economic shortcomings. Diversification is what is needed to achieve sustainable agriculture.

Challenges:

- Market Linkages: There are no stable market linkages for farmers for other crops such as pulses, oilseeds, and millets.
- Economic Risks: Non-MSP crop conversion is risky from an economic perspective since farmers worry that they will receive lower profits than wheat and rice.
- Consumer Preferences: Shifting dietary patterns and encouraging the use of substitute crops need widespread campaigns.

Recommendations:

- Incentivizing Diversification: Offer economic incentives, i.e., direct subsidy or compensation, to farmers for their adoption of diversified cropping patterns.
- Strengthening Market Infrastructure: Build quality supply chains and warehouses for other crops to achieve decent prices and limit post-harvest loss.

- Millets and Pulses Development: Implement initiatives such as National Food Security Mission and International Year of Millets (2023) for increased production and use of Nutri-cereals.
- Research and Development: Invest in R&D to create high-yielding, climate-resilient varieties of alternative crops.

Strengthening Procurement and Storage Infrastructure

India's procurement and storage systems are plagued by inefficiencies, leading to significant post-harvest losses and price volatility in the Indian market.

Challenges:

- Limited Outreach: Procurement is restricted to a few states like Punjab, Haryana, and Andhra Pradesh, thereby leaving other farmers out of coverage.
- Storage Shortages: Lack of storage facilities is one of the causes of grain loss due to spoilage, with post-harvest losses at 10–15% annually.
- Logistical Bottlenecks: Poor transport infrastructure and outdated mandi systems hinder free movement of farm produce.

Recommendations:

- Decentralized Procurement: Expand the procurement operations to cover more states and crops to ensure level playing field for farmers from all regions.
- New Storage Facilities: Invest in new silos, cold storage facilities, and warehouses to minimize post-harvest losses.
- Digital Platforms: Use technology to create open and effective procurement platforms such as e-mandis and blockchain-based traceability.
- Public-Private Partnerships: Encourage private sector funding of storage facility construction and operation.

Water Conservation and Climate Resilience

Agriculture uses 80% of India's freshwater, and water-demanding crops such as rice are increasing groundwater depletion. Climate change also poses a threat to agricultural productivity for the farmers soon.

Challenges:

- Groundwater Overexploitation: Some of the states that are under the grip of serious overexploitation of groundwater include Punjab and Haryana due to the cultivation of water-sucking crops.
- Reasonable Climate Patterns: Abundant flooding, droughts, and irregular rain seasons span entire crop cycles.
- Limited Adoption of Sustainable Practices: There is limited ability and knowledge in farmers to adopt climate-resilient and water-saving practices.

Recommendations:

- Encouraging Water-Saving Cultivation of Crops: Encourage water-saving cultivation of crops such as maize, sorghum, and pulses through MSP and subsidy.
- Micro-Irrigation and DSR: Scale up programs such as Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) to promote drip irrigation, sprinkler, and Direct Seeded Rice (DSR).
- Climate-Resilient Agriculture: Promote and spread climate-resilient crop variety and farming practices through Krishi Vigyan Kendra's (KVKs).
- Awareness Campaigns: Educate farmers on sustainable water management and long-term conservation benefits.

Empowering Farmer Cooperatives and FPOs

Farmer Producer Organizations (FPOs) and cooperatives can play a transformative role in enhancing farmers' bargaining power and reducing dependency on agents.

Challenges:

- Limited Reach: Influence of FPOs is limited to a specific sector of India's agricultural society and they are mostly not able to provide farming of Haryana farmers to other society
- Financial Restraints: credit and investment are not available for FPOs for infrastructure development and the low government intensives.
- Capacity Building: None of the FPOs have the managerial and technical skills which are needed by them to work together effectively, and they must compromise.

Recommendations:

- Financial Support: Provide grants, low-interest loans, and equity financing to FPOs for infrastructure and operational expenses by the Government to improve future market functions.
- Capacity Building: Institute finance management, marketing, and technology adoption training programs for the FPO leaders to maximize collaboration and maximize the work management between the industries.
- Market Linkages: Create market linkages for FPOs with agribusinesses, retailers, and export markets.
- Policy Support: Simplify regulations and provide tax incentives to encourage formation and growth of FPOs.

Policy Continuity and Dialogue

Agricultural policies must be dynamic, inclusive, and responsive to the evolving needs of farmers and the economy.

Challenges:

- Policy Fragmentation: Inconsistency in implementation results from the failure by the central government and state governments to harmonize.
- Farmer Distrust: farmers have lost confidence in policymakers as they are betrayed and are given false promises.
- Emergent Problems: Emergent problems such as digital divide and market globalization require emergent solutions.

Recommendations:

- Stakeholder Engagement: Set up permanent forums of dialogue among policymakers, farmers, and industry stakeholders.
- Evidence-Based Policies: Use evidence and facts in formulating policies with an eye on ground realities and predicting future trends.
- Decentralized Decision-Making: Give state governments and local governments the authority to make policy decisions according to regional needs.
- Long-term Vision: Develop a comprehensive Agri-policy framework aligned with India's working towards doubling farmer incomes and inclusive growth.

Part B: Industrialisation, Urbanisation, and Real Estate

1. Impact of Industrialisation, Urbanisation, and Infrastructure Development on Agriculture

Urbanization and industrialization have also intensified the rural landscape of Haryana more deeply, with a two-edged opportunity and challenge for the agricultural sector in current times as well as past times in Haryana. Industrial growth, mega infrastructure projects, SEZs, and in the development aspect, they have reversed the land use trend, offering economic diversification opportunities, and employment on every level to the Haryana state. With such progress have gone to develop the state's economy, they have also disrupted age-old agricultural methods in Haryana, which was happening for a historic period, pushed farming communities away, and produced new socio-economic forces in Haryana and new influences.

Land Acquisition and Its Impact on Farming Communities

One of the more debated issues concerning the industrialization of Haryana has been land grabbing by individuals and groups of individuals throughout the state. As there are more industries and urbanization, agricultural land is used for non-agriculture purposes throughout the state. This process has serious consequences for the agricultural community and the agriculture sector in present times.

Key Factors Driving Land Acquisition:

- Government-Led Land Acquisition: Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) has been the first to get land for industrial corridors, highways, and urban development projects. The notable ones are the Kundli-Manesar-Palwal (KMP) Expressway and Delhi-Mumbai Industrial Corridor (DMIC), which have converted vast farmlands into industrial and commercial places consisting of the corporate element in Haryana.
- Private Real Estate Development: Unwanted emergence of real estate developers, especially in the National Capital Region (NCR), has caused prime agricultural land to be used in the shape of residential colonies, shopping centres, and offices redefining Harayan's Agri-equilibrium. The urban cities such as Gurugram, Faridabad, and Sonipat experienced unexampled urban expansion, wherein most of it occurred at the cost of farmland.
- Compensation and Rehabilitation: While landowners are generally compensated in terms of money for their land, there have been several instances when farmers have been undercompensated. Problems of delayed payment, undervaluation of lands, and absence of transparency in the acquisition process have led to protests and court cases. For example, land acquisition for the Maruti Suzuki factory at Manesar was opposed by local farmers.

Impact on Farming Communities:

- Displacement and Loss of Livelihood: The transformation out of agriculture affects not only the owners but also tenant farmers and farm labourers who earn their living through agriculture. Most of these vulnerable individuals do not have formal titles to land and are usually not included under schemes of compensation.
- Land Fragmentation: Decline in agricultural land has also resulted in greater fragmentation of farms, and economies of scale for farmers are thus difficult to reach. Marginal and small farmers form the largest category among Haryana farm workers and thus are most vulnerable.
- Social and Cultural Turmoil: For most rural communities, land symbolizes their culture and identity. Dispossession from their land, in this instance, may mean social unrest and alienation felt by the displaced families.

Employment Generation in Industrial and Service Sectors

Regardless of its challenges, urbanization has provided newer avenues of job opportunities. They have offered the rural people a new means of livelihood. Nonetheless, they have led to inequality and challenge.
Employment Opportunities in Industrial and Service Sectors:

- Motor Vehicle and Engineering Industries which owned a big cluster in cities like Manesar and Faridabad. Organizations such as Maruti Suzuki, Hero MotoCorp, and Honda have set up production facilities, with jobs available in factories and ancillary units.
- IT and Service Sector Development: Gurugram is now flourishing as an IT and corporate centre with multinational firms and professionals. The urbanization rate of the city has brought well-paying jobs in industries like technology, consulting, and finance.
- Construction and Real Estate Employment: The real estate sector, with the unprecedented growth, has seen a great increase in rural workforce, especially around construction employment. All the farm labourers have shifted to this sector because the jobs are available as a daily wage job.

Challenges and Inequalities:

- MISMATCH IN SKILLS: Most of the aging farmers and labourers do not have the required skills for factory and service employment. The result has been a mismatch between employment, as skilled labourers gain more advantages due to urbanisation.
- Job Insecurity: Construction and informal sector employment are dangerous in nature and have no social security cover. Workers in these industries experience job insecurity, low pay, and deteriorating working conditions.
- Rural-Urban Divide: Employment in industry and services has resulted in rural and urban divide. Minority groups and women suffer and are the least likely to be able to take advantage of opportunities.

Shift in Workforce Dynamics from Agriculture to Industry

Overall pattern of labour has been changed due to the migration of rural labourers to the cities in search of better pay and secure employment. This shift had both positive and negative impacts on the country's agricultural sector and had diverse impacts overall.

Key Trends in Workforce Dynamics:

- Decline in Agricultural Labour Force: Youth is abandoning agriculture and shifting towards non-agriculture jobs, changing the transition in the agriculture, which leads to scarcity of labour in farming and the agriculture of rural and urban India. The trend is obvious among educated youths, who consider agriculture less paying and more of hard work.
- Marginal and Part-time Farmers on the Rise: While many of the farmers searched for other ways to earn their living, part-time or marginal farming has been adopted by some. They farm on a seasonal basis and have alternative sources of livelihood.
- Feminization of Agriculture: When men go to the cities seeking jobs, women are increasingly finding themselves farming. Women are faced with several challenges like limited access to land rights, credit, and farm extension services.

Implications for Agriculture:

- Shortage of Labor: The decline in the number of farm workers has led to shortages of labour, primarily during harvesting and planting periods. This has increased the cost of labour and forced farmers to mechanize the farming
- Aged Farmer Population: Less participation of youth from farming has resulted in an aging farmer population. Older farmers are less likely or capable of adopting new, high-technology farm practices, and this restricts productivity growth.
- Gender Imbalances: Feminization of agriculture has increased the need for formation of policies and programs to integrate women into mainstream society. Female farmers need to be empowered by offering them land, credit, and training to bring sustainable development to the sector.

Environmental and Ecological Impacts

The rapid pace of industrialization and urbanization has also had significant environmental and ecological consequences, particularly for agriculture.

Key Environmental Concerns:

- Loss of Fertile Land: Fertile land is used for urban and industrial purposes which has led to the loss of fertile land, which is used in food production.
- Water Scarcity: Urbanization and industrial development typically come at the cost of agriculture in terms of water. Overexploitation of groundwater for industrial development has increased water scarcity in all of Haryana's regions.
- Pollution: Industrial activities and urban waste have led to the pollution of water, air, and land, affecting crop yield and food quality. For example, the Yamuna River flowing through Haryana is highly polluted by industrial pollution and urban waste.

Recommendations for Sustainable Development:

- Land Use Planning: Well-planned land use strategies that have a mix of urban and industrial growth with protecting agricultural land.
- Water Management: water-saving behaviour should be encouraged, and technology should be developed among the industrial and agricultural sectors to cope with water scarcity.
- Pollution Control: Enforce stricter regulations on industrial release and waste to minimize environmental degradation.

2. Impact of Real Estate on Agriculture

The real estate boom in Haryana and particularly in the National Capital Region (NCR) cities of Gurugram, Faridabad, and Sonipat has had a deep and wide-ranging impact upon the state's agricultural economy. Whereas urbanization and economic development have been increased by real estate expansion, it has also disrupted conventional farming, shifted land use, and imposed fresh difficulties on farmers. Following is a rational breakdown of how property affects agriculture, specifically in terms of profitability, land use change, and socio-economic effects to agricultural communities.

Profitability and Viability of Agriculture

The sustainability and profitability of agriculture in Haryana have been negatively affected by the increase in the real estate. The greed of high land values and the pressures of urbanization have caused many farmers to quit agriculture and to deal with increasing challenges in persevering with their agricultural activities in Haryana and rebuilding it and transforming its face.

1. Rising Land Prices and Land Sales

- Economically unaffordable Prices of Land: Farmers let their land to developers due to the profitable prices of their land. Take Gurugram, for instance, the rate of land in the prime locality has increased many times with prices going in lakhs per acre.
- Transition from Agriculture: Most farmers and especially the small farmers, have sold their farms and adopted alternate means of livelihood or to retire from farming. This has resulted in a decrease in the extent of land that is under cultivation around peri-urban regions.
- Generational Transfer: Future generations of farm households, tempted by the riches, are opting to sell out rather than farming.

2. Speculation and Land Hoarding

- Idle Land: Expansion of real estate will most likely result in land lying idle, unused for cultivation or for industrially or residentially productive use. This is a common trend where developers are waiting for prices to appreciate.
- Impact on Food Security: The transformation of cultivable land from agriculture to idle land or urbanization reduces agricultural land employed in the production of food and thus reduces the food security in the long term.

3. Decrease in Investment in Agriculture

- Short-term Orientation: Farmers who are land buyers would not be concerned with investments in agriculture in the long run, e.g., soil enrichment, irrigation facility, or quality seeds. This will lead to undermining of land and less wages for farmers.
- Overlook of Sustainable Practices: The uncertainty about ownership of land discourages farmers from adopting sustainable agriculture practices for the land, such as organic agriculture or crop diversification, that require long-term commitment to them.

Challenges for Farmers Retaining Agricultural Land

For farmers who choose to keep their land, the encroachment of real estate and urbanization presents a variety of challenges that threaten the sustainability of their livelihoods.

1. Encroachment and Land Disputes

- Fragmentation of Farmland: As cities expand, agricultural land becomes fragmented with residential or commercial development laying around them. Fragmentation makes farming activities less easy and efficient.
- Legal Issues: Encroachment by the real estate industry or unauthorized settlement generally results in land disputes that force farmers into long and expensive legal battles. For instance, in regions such as

Manesar and Sohna, instances of unauthorized occupation of land as well as land boundary disputes have been seen among farmers.

2. Water Scarcity Due to Urban Demand

- Water Resource Conflict: Urbanization has raised the demand for water, and residential complexes, industries, and commercial hubs have been consuming extreme amounts of groundwater and surface water resources. This has reduced the availability of water for irrigation, particularly in water-scarce areas like Haryana.
- Decreasing Groundwater Levels: Urban areas have also contributed to depletions in aquifers due to over-extraction of groundwater for its use, further increasing the difficulty in providing water to farms by the farmers. For instance, Gurugram and Faridabad have experienced a significant decline in groundwater level during the last decade.

3. Pollution and Environmental Degradation

- Industrial and Urban Pollution: Industrialization and urbanization have led to increased air, water, and land pollution. For instance, untreated urban sewerage and industrial pollution tend to pollute irrigation water bodies, changing agricultural output and food quality.
- Loss of Biodiversity: Agricultural land expansion to urban areas results in loss of natural habitat and biodiversity, thus disturbing agriculture-supporting systems such as pollinators and soil microorganisms.

Socio-Economic Consequences

The impact of real estate on agriculture extends beyond the farm, affecting the socio-economic fabric of rural communities and the broader economy.

1. Displacement of Farming Communities

- Loss of Livelihoods: Farmers selling land are more likely to struggle with alternative livelihoods, particularly if they lack the necessary skills or resources to move into non-farm livelihoods.
- Cultural Disruption: Land is not just an economic resource to most rural societies but also a source of cultural heritage and identity. Dispossession of land may lead to social dislocation and alienation.

2. Rural-Urban Migration

- Pressure on Urban Infrastructure: Displacement of farming communities has a likelihood to lead to rural-urban migration, thus subjecting the urban infrastructure and facilities to pressure. The migration leads to pressures such as congestion, traffic, and rising cost of living in urban areas.
- Agricultural Shortage of Labour: The youth migration has left the agricultural sectors with labour shortages, particularly at times of highest activities like planting and harvesting.

3. Widening Income Inequality

- Uneven Distribution of Wealth: The land expansion has made enormous fortunes for land developers and landowners but, in the process, this wealth finds itself concentrated in urban areas. Rural people, especially marginal farmers and small farmers, do not have a proportionate share.

The Way Forward: Balancing Real Estate and Agricultural Sustainability

Addressing the challenges posed by real estate expansion requires a balanced approach that promotes renewable development while safeguarding agricultural livelihoods. Below are key recommendations:

1. Land Use Planning and Regulation

- Strict Zoning Laws: Implement zoning laws to protect productive farmland from rampant urbanization. Some land should be kept aside for real estate purposes and keep farmland areas.
- Fair Compensation and Rehabilitation: Provide protection to the farmers whose lands are taken over by real estate developments by giving them fair compensation and alternative livelihood or resettlement options.

2. Promoting Agro-based Industries

- Value Addition: Encourage the establishment of agro-based industries to be able to process farm produce and offer employment for rural individuals.
- Market Linkages: Create infrastructure and supply chains that connect farmers to urban markets and negotiate better prices for their produce.

3. Water Management and Conservation

- Water Conservation: Promote water-conserving irrigation technologies, such as drip irrigation and sprinklers, to reduce water consumption in agriculture.
- Groundwater Recharging: Implement rainwater harvesting and watershed management programs to recharge groundwater.

4. Strengthening Farmer Cooperatives

- Collective Bargaining: Organize farmers via cooperatives and Farmer Producer Organizations (FPOs) to enhance bargaining power and reduce dependence on intermediaries.
- Access to Technology and Credit: Provide credit and training to farmers for innovative technologies and renewable practices.

5. Environmental Protection

- Pollution Control: Enact stronger controls over industrial waste release and pollution to limit environmental degradation.
- Promotion of Organic Farming: Encourage organic farming practices that improve soil health and reduce the application of chemical inputs.

3. Differences in the Development of NCR and the Hinterland

The productive power of the state's economy and agricultural vibrancy are stained by its NCR development contradictions compared to those regions that are still peripheral. Even though the NCR, which includes cities such as Gurugram, Faridabad, and Sonipat, has developed into a hub of industry, trade, and urbanization globally, the hinterland regions such as Mahendragarh, Nuh, and Bhiwani remain behind in the aspects of underdevelopment, small-scale industrialization, and excessive dependence on agriculture. These imbalances have far-reaching economic, social, and political consequences, and there should be balanced development to bring about equal development for the state. Following is a more in-depth analysis of the development differentials, their effects, and the future for equal and sustainable growth.

Development Disparities

The development gap between the NCR and the hinterland is the most noticeable feature of Haryana's socio-economic landscape. The divide is clear in the form of infrastructure, economic opportunities, and access to basic amenities.

1. NCR Growth: A Model of Urban Prosperity

The NCR region, particularly Gurugram, Faridabad, and Sonipat, has seen unprecedented growth over the past few decades. Key drivers of this development include:

- Infrastructure Development: NCR has world-class infrastructure in the way of expressways (like Delhi-Gurugram Expressway), metro connectivity, and class ultramodern business hubs like Cyber City in Gurugram.
- Corporate and Industrial Investments: Gurugram is now a global IT and financial centre with multinational corporations, Fortune 500 companies, and startups. Faridabad and Manesar are industrial centres, with emphasis on automobile manufacturing and engineering.
- Education and Health Care: The NCR is home to the best educational institutions (Indian School of Business, Manav Rachna University) and health care centres (Medanta, Fortis) of the world, attracting talent and investments from across the country.
- Real Estate Boom: The development of the NCR has resulted in a real estate boom with luxury apartments, shopping centres, and gated communities transforming the cityscape.

2. Rural Underdevelopment: The Forgotten Hinterland

In contrast, many hinterland districts in Haryana remain underdeveloped, with limited industrialization and a heavy reliance on agriculture. Key challenges include:

- Agriculture dependence: Districts like Mahendragarh, Nuh, and Bhiwani have extensive reliance on agriculture, which is mainly dependent on and vulnerable to vagaries of the weather. Failure to diversify the economy into other sectors away from farm industries has led to deceleration of growth.
- Shortages in Infrastructure: Rural areas lack the essential facilities such as good roads, stable power supply, irrigation, and medical centres. For instance, Nuh is one of the most backward districts of Haryana and has a literacy level of just 54% and limited access to clean drinking water.
- Limited Industrialization: Compared to the NCR, the hinterland has seen limited industrial investment. The absence of industrial corridors and SEZs has restricted the generation of employment opportunities and economic opportunities.

3. Infrastructure Gap: Urban vs. Rural

Development imbalances are primarily caused by the infrastructural gap between the NCR and the hinterland. While the NCR has easy connectivity, advanced amenities, and international business centres, rural areas face poor infrastructure. For instance:

- Transport: The NCR is linked with good-developed highways, metro rails, and international airports, while rural regions are not connected by good roads and public transportation.

- Health: Urban areas have well-stocked hospitals and clinics, while rural areas are heavily reliant upon primary health centre's (PHCs) that are inadequately managed.
- Education: The NCR has world-class schools and universities, but rural schools are devoid of even the basic infrastructure and teachers.

Economic and Social Consequences

The development disparities between the NCR and the hinterland have significant economic and social consequences, increasing the inequalities and creating new challenges.

1. Migration to NCR

Rural youth, not satisfied by the opportunities in their hometowns, move to NCR cities to find better jobs and living conditions. This has resulted in:

- Depopulation of Rural Regions: Most villages within the hinterland are undergoing depopulation, especially among the youth. This has adverse consequences which result in a shortage of labour for agricultural purposes.
- Urban Congestion: Migration of migrants into NCR cities has strained the urban infrastructure, resulting in congestion, traffic jams, and an increase in living expenses.

2. Increased Income Inequality

The concentration of resources and economic opportunities in the NCR has widened the income disparity between the urban and rural communities. Urban areas prosper, but the rural communities struggle with poverty and reduced access to resources.

3. Political Implications

Development disparities are likely to lead to political agitation and demands for better state interventions in the countryside. For instance, farmers' agitations and demands for the legalization of MSP are symptoms of growing rural disaffection.

The Road Ahead: Sustainable Development and Balanced Growth

To address the development imbalances between the NCR and the hinterland, a multi-pronged strategy of encouraging renewable development and balanced growth is needed. Some of the important recommendations are as follows:

1. Industrial Growth

Decentralized Industrialization: Set up industrial belts in hinterland regions to provide employment and check pressure of migration in the NCR.
Argo-based Industries: Promote agro-based industries which can offer employment to displaced farmers and provide value addition to agricultural products.

2. Land Use Regulations
Strict Zoning Regulations: Enact zoning regulations to check unplanned urbanization in towns and cities and to save agricultural lands.
Reasonable Compensation: Provide reasonable compensation and rehabilitation to farmers who are moved due to urban and industrial projects.

3. Skill Development and Employment Programs
Vocational Training: industrial and service sector skills can be developed by providing them with vocational training.
Promoting Entrepreneurship: Promote entrepreneurship in rural businesses and agriculture businesses with financial support and guidance.

4. Rural Agriculture Policies
Water-Saving Agriculture: Promote drip irrigation, sprinklers, and other water-saving techniques to solve irrigation problems.
Agricultural Credit: Increase credit facilities to support more investment in agriculture and diversification into high-value agricultural crops.

5. Rural Infrastructure Development
Connectivity: Enhance rural road, railway, and digital connectivity to link them with the urban market.
Smart Villages: Develop smart villages through rural-urban integrated patterns of development that prioritize education, health, and renewable energy.

6. Control of Real Estate Expansion
Regulate Speculative Practice: Regulate speculative property activities that reduce agricultural viability and increase the costs of land.
Vertical Development: Encourage vertical development in towns to reduce horizontal expansion onto arable land.

Part C: Demographics, Labour Capital, and Socioeconomic Divides

1. Population Demographics and Labour-Capital Divide

Population trends in Haryana play a leading role in the agricultural and industrial economy. Traditional agrarian labour has been under tremendous pressure, as urbanization, migration rates, and shifts in employment have increased. They have presented challenges as well as opportunities to the economy of the state, particularly the balancing act between agriculture and industry. Below is a comprehensive discussion of the most significant population trends, their consequences, and the direction to overcome the resultant challenges.

Population Densities and Migration Trends

Haryana's population dynamics are characterized by significant rural-urban migration, changing demographic patterns, and the emergence of new economic opportunities. These trends have profound implications for both agriculture and industry.

1. Rural-Urban Migration

- Urbanization of NCR: Gurugram, Faridabad, and Sonipat have become destinations for rural migrants looking for improved employment opportunities in industry, IT, and services. Gurugram, for example, is now a global business hub attracting talent from across the country.
- Declining Rural Population: The rural population has been declining due to younger generations migrating towards urban areas, particularly in the districts of Mahendragarh, Rewari, and Nuh. This has caused the desertion of villages and a low agricultural workforce.
- Impact on Rural Economy: Rural Economy has been weakened due to out migration of working-age people since fewer workers are available to engage in farming and other related activities. This has also led to undermining of agricultural land in some areas.

2. Labor Shortages in Agriculture

- Aging Farming Population: With the younger generations moving to cities, the age of farmers in Haryana has increased. Older farmers are less likely or able to adopt modern farming techniques, and thus agricultural productivity is still stagnant.
- Dependence on Migrant Labor: Farmers of Haryana tend to be increasingly dependent on migrant labourers from Jharkhand, Uttar Pradesh, and Bihar, to meet the requirement of labour deficits. These migrants work mainly on a seasonal basis, especially at sowing time and harvest times.
- Migrant Labour Challenges: Though migrant labour fills the gaps of Haryana labour, their labour is still informal with dangerous working conditions offered to them, low wages, and no social security. It leads the way for exploitation and exposure of migrant labours.

3. Growing Urban Congestion

- Pressure on Urban Infrastructure: Urban migration has put unprecedented pressure on urban infrastructure with individuals, including provision of the people, roads, water supply, and sanitation for them. For example, Gurugram's development has caused jams, water shortages, and rising living costs.
- Depopulation in the Countryside: Due to increasing urbanization, rural villages are being depopulated and deserted. It has resulted in unused land for farming, deteriorating rural economies, and not investing in rural infrastructure.

Labor-Capital Divide and Employment Opportunities

The shift from agriculture to industry has created a labour-capital divide, with significant disparities in wages, working conditions, and opportunities for skill development.

1. Wage Disparities

- Urban vs. Rural Salary: Considerably greater salary is offered for urban manufacturing and service-based employment as compared to farm work. For example, a Gurugram factory worker can receive ₹15,000–20,000 a month, while rural Haryana's farm labourer gets ₹8,000–10,000.
- Income Inequality: The gap in payment between the urban and rural workforce has contributed to rising income inequality, with the rural areas often being still behind in the state's economic story in the current situation that is following in the state.

2. Exploitation of Migrant Labor

- Informal Employment: Most of the migrant workers in agriculture and construction are informally employed without contracts, job security, and benefits like healthcare and pensions and they are exploited without the minimum care that an employer is bound to provide to its employee. There are 52% of people in Haryana with informal employment.
- Seasonal Unemployment: Agricultural labourers usually face seasonal unemployment because jobs are only offered for seasons like sowing and harvesting. This prevents them from achieving financial stability.
- Unacceptable Working Conditions: Migrant workers tend to work for extended periods in substandard working conditions with limited access to basic facilities like clean water, sanitation, and shelter.

3. Challenges of Skill Transition

- Lack of Technical Education: Due to lack of technical education and training to shift to industry or service sector jobs, farm workers and farmers are still unemployed in the urban sector.
- Demand for Vocational Education: There is an increasing demand for vocational education programs to equip rural young people with manufacturing, IT, and hospitality skills. However, these programs are typically unavailable or out of reach in rural areas.
- Entrepreneurship Opportunities: Encouraging entrepreneurship in rural regions, particularly agribusiness and small-scale manufacturing, can provide alternative livelihoods and stem dependence on urban migration.

Environmental and Social Implications

The changing population dynamics and labour patterns have significant environmental and social implications, particularly for rural communities and renewable development.

1. Environmental Degradation

- Overexploitation of Resources: Industrialization and urbanization have led to overuse of natural resources like land and water, typically at the expense of agriculture. For example, overexploitation of groundwater in Gurugram and Faridabad has reduced water levels for irrigation purposes in surrounding rural areas.
- Pollution: Industrial and municipal processes have caused air, water, and soil pollution, affecting farm produce and quality of food. The Yamuna River passing through Haryana is greatly polluted with industrial waste and urban sewage.

2. Social Dislocation

- Cultural Disruption: The migration of rural populations to urban areas often leads to the breakdown of traditional communities and cultural practices. This can result in a sense of alienation and loss of identity among migrants.
- Gender Imbalances: Rural women must carry the weight of added farm work on their shoulders in addition to household responsibilities. However, they might not have access to land rights, credit facilities, and training

2. Caste and Social Structures in Employment

Caste has a profound impact on Haryana's industry and agriculture in terms of work prospects, access to resources, and socio-economic mobility. Social ordering of society is rooted deeply in the caste system, thereby affecting land ownership, distribution of labour force, and access to education and welfare programs. Such dynamics drive sharp contrasts between dominant and peripheral castes with far-reaching consequences on poverty and disaffiliation cycles. Here follows a more extended consideration of caste within the Haryana economy, with reference to landholdings, employment pattern, exclusion, and policy.

Caste-Based Land Ownership and Labor Distribution

Caste hierarchies in Haryana have historically determined access to land and employment opportunities, with dominant castes controlling resources and marginalized groups often relegated to low-paying, informal work.

1. Dominance of Land-Owning Castes

- Jat Dominance: The Jats are a dominant agricultural caste, owning a vast majority of Haryana's farmland. They influence agricultural policies and practices due to their control of land which has historically provided them with economic and political influence.
- Marginalized Groups as Landless Workers: Dalits and other marginalized groups, such as Scheduled Castes (SCs) and Other Backward Classes (OBCs), are either mostly landless or own small plots of land scattered all over the nation. They work mostly as agricultural labourers with low wages, insecure employment, and hazardous working conditions.
- Sharecropping and Tenancy: Majority of the oppressed farmers are tenants or sharecroppers for the ruling castes. This exposed them to the threat of being exploited because they receive only a minor share of the produce and have no guarantee under the law.

2. Limited Access to Agricultural Reforms

- Institutional Credit: Marginal farmers often find institutional credit elusive due to a lack of collateral and discrimination by financial institutions and banks. This forces them to approach informal moneylenders and repay high rates of interest.
- Government Subsidies: Schemes like seed subsidy schemes, fertilizer subsidy schemes, and irrigation equipment subsidy schemes often do not help marginalized farmers due to corruption, bureaucratic hurdles, and caste-based discrimination.
- Land Rights: Marginalized groups, despite land reform initiatives, continue to struggle to reach land rights. Land grabbing, lack of documents, and court disputes only make them more vulnerable.

3. Caste-Based Occupational Segregation

- Industrial and Service Sector Work: The dominant caste hierarchies are often extended to industrial and service sector employment as well, with the dominant castes occupying the higher-paying, skilled jobs and the marginalized castes relegated to lower-paying, unskilled jobs. Dalits, for instance, are generally employed as sanitation workers or factory manual labourers.
- Restricted Social Mobility: Caste-related occupational segregation that persists restricts social mobility for the lower castes, confining them to poverty and isolation.

Social Exclusion and Rural-Urban Disparities

Discrimination and exclusion based on caste are seen in daily life, ranging from education to skill development, and access to welfare schemes. These inequalities are especially prominent in rural India, where caste orders are more rigid.

1. Disparities in Education and Skill Development

- Access to Good Education: Marginalized groups are likely to be denied access to good education due to poverty, discrimination, and lack of proper infrastructure in rural areas. This limits their ability to buy skills needed for good-paying jobs in the industrial and service sectors.
- Vocational Training: Marginal groups are deprived of access to schemes of skill development, either because they lack knowledge of these schemes or are deliberately excluded from participating. This further limit their economic progress.
- Digital Divide: Inadequate access to digital platforms and connectivity in rural pockets disproportionately hurts marginalized communities, impairing them from getting access to online training and educational courses.

2. Political Economy of Caste in Agriculture

- Policy Bias: Agricultural interventions and policies help the ruling land-owning castes despite marginalized farmers and labour. For example, MSP benefits were used largely by large landowners, while the small and marginal farmers, who are largely lower caste, get insufficient benefits.
- Caste Panchayats: Marginalized people suffer at the hands of informal caste-based governing bodies such as khap panchayats who are likely to overbear local decision-making in Favor of caste hierarchies and suppress them.

3. Access to State Welfare Programs

- Discrimination in Implementation: Caste-based discrimination even limits the scope of welfare programs for agricultural and rural development at times. For example, marginalized groups can be denied or delayed benefits under programs like PM-KISAN or MGNREGA.
- Lack of Awareness: There is a general lack of awareness among most of the marginalized workers and farmers due to low levels of literacy and poor outreach of government agencies.
- Corruption and Leakages: Corruption and inefficiency in the management of welfare schemes tend to result in benefits being siphoned off by intermediaries or dominant groups, leaving behind marginalized communities.

Policy Implications and Recommendations

Addressing caste-based disparities in Haryana's agricultural and industrial sectors requires targeted policies and interventions that promote equity, inclusion, and social justice. Below are key recommendations:

1. Land Reforms and Access to Resources

- Land Redistribution: Land redistribution programs should be implemented in a way that allows marginalized communities of people to own arable land. Land titles should be made that are legally secure and acknowledged.
- Tenancy Rights: Enact more robust tenancy legislation to protect the rights of sharecroppers and tenant farmers, ensuring fair compensation and legal safeguards.
- Access to Credit: Expand microfinance schemes and self-help groups (SHGs) to provide marginalized farmers with access to affordable credit.

2. Inclusive Agricultural Policies

- Targeted Subsidies: Design agricultural subsidies and support programs specially targeting marginal and small farmers from disadvantaged groups.
- Capacity Building: Provide training and extension aid to marginal farmers on sustainable agriculture practices, diversification of crops, and market linkages.
- MSP Reforms: Extend MSP benefits to all farmers, including marginalized farmers, by strengthening procurement systems and reducing bureaucratic hurdles.

3. Education and Skill Development

- Affirmative Action: Expand affirmative action measures in employment and education to give equal opportunities to disadvantaged societies.
- Vocational Training: Set up vocational training centres in rural regions of the nation to equip marginalized youth with industrial and service sector employment-oriented skills.
- Digital Literacy: Promote digital literacy initiatives to bridge the digital gap and enable marginalized groups to access online educational and training centres.

4. Strengthening Welfare Programs

- Awareness Campaigns: Conduct awareness campaigns to inform marginalized groups about their rights under welfare schemes.
- Redressal of grievances: Set up efficient grievance redressal machinery to address issues of discrimination and corruption grievances during the implementation of welfare programs.
- Community Participation: Involve marginalized communities in the design and implementation of welfare programs so that their needs are adequately addressed.

3. State Policies, Sustainable Development Goals (SDGs), and Future Challenges

Haryana policies are important in shaping the state's farm sustainability, employment generation, and social equality. It is one of India's most industrially and agriculturally developed states; to lessen the hardships of its farmer communities, labourers, and weaker sections, Haryana has started several schemes and reforms. The success of the policies, however, lies almost entirely in their implementation and comprehensiveness. Following is a detailed analysis of Haryana's policies, their impact, and scope for their alignment with the Sustainable Development Goals (SDGs) to promote sustainable and fair development.

State Policies and Agricultural Reforms

Haryana's agricultural policies work towards enhancing productivity, ensure farmer welfare, and promote sustainable practices. But gaps in implementation and inclusivity often undermines their effectiveness, particularly for marginalized groups.

1. Government Schemes for Farmers

- PM-KISAN: The Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) program provides direct income support of ₹6,000 per year to small and marginal farmers. While it has provided economic success, many marginalized farmers such as tenant farmers and landless agricultural labourers are being excluded because eligibility is based on land ownership.
- Mukhyamantri Kisan Kalyan Yojana: Haryana's state program offers more financial aid to farmers, like insurance coverage for crops and interest-free loans. But its reach is often limited by official inefficiencies and lack of awareness among the marginalized sections.
- Implementation Challenges: Most of the farmers face delay in benefit realization due to problems like incorrect land records, Aadhaar linkage, and corruption. Transparency and accountability in the schemes' implementation are crucial.

2. Land and Labor Reforms

- Land Consolidation: Agricultural land fragmentation is a big issue in Haryana, elevating costs and reducing economies of scale and productivity. Policies easing land consolidation through cooperative farming or land leasing can solve this issue.
- Tenancy Rights: Tenant farmers and sharecroppers form the backbone of agriculture in Haryana which rarely have a legal presence. Strengthening the tenancy legislation and arrangement for fair rent are pressing areas of concern.
- Fair Wage Practices: Low-income and exploitative conditions are what tend to be faced by farm workers, particularly those from marginalized communities. A requirement for a minimum wage and enforcement can boost incomes.

3. Corporate Involvement in Agriculture

- Contract Farming: Contract farming and policy support to agribusiness can improve productivity and market linkages. But small and marginal farmers are normally exploited due to uneven negotiating powers and lack of legal policies.
- Protection of Small Farmers: Ensuring contract farming agreements are transparent, fair, and legally enforceable is crucial to protecting the interests of small farmers.
- Agro-based Industries: Promotion of agro-based industries will create employment opportunities and value addition to farm produce. But the policies must be so designed that such industries Favor local people and do not promote resource degradation or environmental deterioration.

SDG Monitoring and Intervention Opportunities

Aligning Haryana policies with the Sustainable Development Goals (SDGs) can potentially provide directions towards resolving key problems in agriculture, employment, and social justice. Below are the intervention points under specific SDGs:

1. SDG 2 (Zero Hunger)

2. SDG 8 (Decent Work and Economic Growth)

- Sustainable Agriculture Practices: Encourage climate-resilient crop production, organic farming, and water-saving irrigation practices to increase agricultural productivity without wasting resources.
- Reasonable Food Distribution: Public Distribution System (PDS) should be strengthened to reach the most vulnerable groups, i.e., poorer communities and migrants.
- Nutrition Security: Incorporate Nutri-cereals such as millets under the PDS and mid-day meal schemes to combat malnutrition and encourage dietary diversification.

3. SDG 10 (Reduced Inequalities)

- Caste and Gender Equality: Form targeted policies to provide solutions to the caste and gender inequalities in land ownership presently in grip in the rural areas of Haryana, credit access to all sections of people, and job opportunities for all people irrespective of caste, creed and other considerations. For example, land deeds should be granted to women cultivators and provided that the backward classes are a beneficiary of the welfare schemes and make them aware about the same.
- Inclusive Policies: Enact agricultural and industrial policies with the involvement of marginalized groups to make sure that their needs and viewpoints are considered.
- Affirmative Action: Increase affirmative action programs in education, employment, and entrepreneurship to increase social mobility and minimize inequalities.

ENHANCED “SDG MONITORING AND INTERVENTION OPPORTUNITIES” WITH:

“Participatory SDG Alignment,” suggesting GIS-based community planning for crop diversification and ecosystem restoration, inspired by the model village template. "Ecosystem-Based Development,” linking Yamuna restoration to multiple SDGs (e.g., 2, 6, 15), drawing from the Bharatpur ecosystem interlinkages idea.

4. The Future for Upcoming Generations: Jobs and Quality of Life

As Haryana keeps developing economically and socially, its future generations will face the challenges of employment, improve living standards, and adopt sustainable development. It is one of the most rapidly developing states in India. It has a strong agricultural sector which presents challenges as well as opportunities for youth, rural and urban dwellers. By focusing on upcoming industries, digitalization, education, infrastructure, and eco-friendly practices, Haryana can ensure a future in which its youth prosper with diversified jobs without the cost of losing rural-urban equilibrium. Below is more comprehensive discussion about the future for the youth of Haryana through employment, life quality, and sustainability.

Employment Challenges and Opportunities

Due to the reduction in traditional farm employment and emerging opportunities in emerging sectors like agro-processing, renewable energy, and digital services, the youth of Haryana have a diversified employment outlook. To address these challenges a diversified approach is needed that supports emerging sectors, technology, and skill development.

1. Emerging Sectors for Rural Youth

- Argo-processing and Value Addition: Argo-processing industries can create employment opportunities such as food packaging, dairy processing, and fruit preservation. It will also provide value addition to the farm produce. For example, the dairy sector of Haryana, which is dominated by cooperatives such as Amul, has huge growth potential.
- Renewable Energy: The sector of renewable energy can offer huge opportunities, particularly solar and wind energy for rural youth. The rooftop solar initiative and solar parks of Haryana can generate jobs related to installation, maintenance, and manufacturing.
- Rural Entrepreneurship: Programs like the Startup India Initiative encourages rural entrepreneurship. They can support innovation and develop local employment. For example, rural youth can develop small industries, handicraft centres, or Agri-Tech units and even agriculture tends to offer a positive influence on the Agri-startups which are being pursued in India.

2. Digitalization and E-Agriculture

- Precision Agriculture: GPS-guided tractors, drones, and IoT-based sensors are the technologies that can revolutionize agricultural practices with new practice to increase agriculture, improving productivity and reducing input costs which are typically a major expenditure of a farmer. Rural youth who are trained in these technologies can generate new income streams.
- Online Marketplaces: Online marketplaces like e-NAM (National Agriculture Market) and private e-commerce websites can be used to help the farmers to have a competitive price for their crops and free themselves from their reliance on intermediaries. Youngsters can help in bridging the digital divide by helping the farmers in making use of such online marketplaces.
- Agri-Tech Startups: The rise of Agri-Tech startups focusing on supply chain management, farm analytics, and digital advisory services opens an opportunity for youth who are tech savvy to innovate and create jobs.

3. Education and Skill Development

- Vocational Training: Upgrading vocational training courses in rural Haryana can equip skills for non-farm employment in Haryana industries, services, and entrepreneurship. For example, training in trades like welding, plumbing, and electric work can provide stable livelihoods.
- Higher Education: higher education in rural regions must be enhanced to reach all segments of society, particularly in fields like agriculture, engineering, and management, which can improve job prospects. Establishing rural campuses of renowned institutions can bridge the urban-rural divide in education.

- Digital Literacy: Creating digital literacy and e-learning could empower rural youth to become part of the digital economy. Such initiatives like the Digital India Program can act as a catalyst for this purpose.

4. Infrastructure Development for Rural Growth

- Rural Transport and Connectivity: Rural connectivity of the state through road networks, public transportation, and tv connectivity could be proved to ensure improved accessibility to markets, healthcare, and education, opening employment opportunities to everyone and sundry at local levels.
- Industrial Clusters: Industrial clusters in rural Haryana can be set up, i.e., for agro-based industries and can generate employment and help in preventing migration to urban centres of the population of regions. For example, food processing parks and textile complexes can provide employment to rural youth.
- Smart Villages: Smart Village Initiative can be used to integrate rural villages into the mainstream economy to provide them with modern comforts and develop a conducive environment for entrepreneurship.

Sustainable Development for Rural and Urban Balance

Rural and urban development should balance each other out for Haryana's sustainable growth. Comprehensively integrated policies that support social inclusiveness, gender equality, and climate resilience are crucial to improve the quality of life for future generations.

1. Integrated Rural-Urban Development

- Investment in Hinterland Infrastructure: Encouragement to invest in hinterland infrastructure like healthcare, education, and industrial parks may be provided to reduce migration pressure and create employment at the local level.
- Decentralized Industrialization: Tax allowances and subsidies could prove to be useful in developing industries in the rural areas and aid in a balanced growth within the state.
- Urban-Rural Linkages: Urban-rural linkages can be strengthened by supply chains, transport networks, and digital platforms and can create a symbiotic relationship which will help both areas to their advantage.

2. Social Inclusion and Gender Equality

- Equal Opportunities to Women: Economic growth in total may be promoted by pro-equity policies towards equal education, employment, and entrepreneurship for women. For example, distributing land titles among women farmers and funding self-help groups (SHGs) of women can enable rural women.
- Inclusive Policies for Marginalised Groups: Social equality can be strengthened by targeting interventions at caste and gender differentials in land ownership, access to credit, and employment opportunities.
- Affirmative Action: An increase in affirmative action programs in education, employment, and business can promote equality as well as improve social mobility.

3. Climate-Resilient Agriculture

- Sustainable Agriculture Practices: Promoting practices like organic farming, crop rotation, and integrated pest management that are already extremely lucrative and environmentally friendly for future generations, can enhance agricultural productivity as well as sustainability.
- Water Conservation: Implementing methods like drip irrigation and rainwater harvesting which are water-conserving technologies can alleviate water shortages and can ensure long-term farming sustainability thus reducing the weight of it.

- Climate Adaptation Strategies: Through the creation of climate-resilient crop varieties and through the release of weather-based advisories to farmers, they can be induced to adapt to changing climatic conditions.

4. Public-Private Partnerships in Agriculture

- Cold Storage and Food Processing: There should be an encouragement of private investment in cold storage facilities and food processing plants that can reduce post-harvest losses and can increase farmers' incomes.
- Rural Supply Chains: Rural supply chains can be strengthened through public-private partnerships that can improve market access for farmers and can create employment opportunities in distribution and organization.
- Agri-Tech Collaborations: Promotion of collaboration with Agri-Tech companies to provide farmers with access to innovative technologies and advisory services to enhance productivity and sustainability for Haryana agriculture thus raising the standards for the same.

“Engaging Youth and Children in Ecological Governance” under “The Future for Upcoming Generations,” proposing youth-led eco-projects (e.g., solar farms, wetland revival) and school programs checking local ecology (e.g., Yamuna water quality), reflecting the Chhota Udaipur and SMA examples.

Haryana's Performance on SDGs, Impacts, Directions, and Suggestions

The case study evaluates Haryana's progress across key SDGs, showing strengths, gaps, and actionable recommendations. Each SDG is analysed with its current performance, effects on the state, direction for progress, and tailored suggestions, followed by added Haryana-specific considerations.

SDG 2: Zero Hunger

Performance:

- Strengths: Haryana is a major contributor to India's food grain output, producing 45% of rice and 65% of wheat for the central pool. The Minimum Support Price (MSP) regime ensures income stability for staple crop farmers.
- Gaps: Over-reliance on rice and wheat monoculture reduces crop diversity, leading to soil degradation and nutritional imbalances. Marginal farmers, especially those growing non-MSP crops, face income uncertainty. The Public Distribution System (PDS) struggles to reach the most vulnerable, such as landless labourers.

Impact:

- Positive: High grain output supports national food security and stabilizes farmer incomes for MSP-supported crops.
- Negative: Monoculture depletes soil fertility (30% of Haryana's soil is low in organic carbon) and reduces dietary diversity, contributing to malnutrition. Exclusion of marginalized groups from PDS undermines fair access.

Direction:

- Shift from monoculture to diversified cropping systems, emphasizing Nutri-cereals like millets and pulses.
- Strengthen PDS to ensure fair food distribution, particularly for marginalized communities.
- Integrate traditional crops to enhance nutrition security and reduce environmental stress.

Suggestions:

1. Promote Nutri-Cereals: Use the National Food Security Mission and International Year of Millets (2023) to incentivize millet and pulse cultivation through MSP inclusion and subsidies.
2. Enhance PDS Reach: Use digital platforms like e-NAM to improve PDS efficiency and ensure last-mile delivery to landless labourer's and tenant farmers.
3. Community Seed Banks: Set up village-level seed banks to preserve traditional crop varieties, supported by Krishi Vigyan Kendra's (KVKs).
4. Nutrition Programs: Integrate millets into mid-day meal schemes and PDS to combat malnutrition, aligning with local dietary needs.

Haryana-Specific SDG 2 Addition:

- Haryana SDG 2.1: Nutritional Sovereignty through Agroecology: Promote agroecological farming systems combining traditional crops (e.g., bajra, jowar) with modern techniques to ensure nutritional self-sufficiency. Implement GIS-based crop planning to align cultivation with local ecosystems, reducing dependency on water-intensive crops like rice.

SDG 3: Good Health and Well-Being

Performance:

- Strengths: Urban areas like the NCR (Gurugram, Faridabad) have world-class healthcare facilities (e.g., Medanta, Fortis), attracting patients nationwide.
- Gaps: Rural areas, such as Nuh and Mahendragarh, face significant healthcare disparities, with understaffed Primary Health Sub-Centers (PHSCs) and limited access to nutrition programs. Diet-related diseases persist due to low crop diversity.

Impact:

- Positive: Urban healthcare advancements improve access for affluent populations and support medical tourism.
- Negative: Rural healthcare gaps increase health inequities, with marginalized communities facing higher rates of malnutrition and non-communicable diseases. Pollution from industrial and agricultural activities (e.g., Yamuna River contamination) poses health risks.

Direction:

- Strengthen rural healthcare infrastructure by integrating traditional knowledge and local produce into PHSC programs.
- Address environmental health risks through pollution control and sustainable farming practices.
- Empower women as health and nutrition advocates to enhance community well-being.

Suggestions:

1. Rural PHSC Enhancement: Equip PHSCs with nutrition programs using locally grown crops (e.g., millets, pulses) and train Accredited Social Health Activists (ASHAs) in traditional remedies and nutrition counselling.
2. Women-Led Health Initiatives: Form women-led Self-Help Groups (SHGs) to manage community gardens and educate households on nutrition, using their role in rural households.
3. Pollution Mitigation: Enforce stricter industrial effluent norms and promote bioremediation to reduce water and soil contamination affecting health.
4. One Health Approach: Integrate human, animal, and environmental health by promoting mixed farming systems that reduce chemical inputs and zoonotic risks.

Haryana-Specific SDG 3 Addition:

- Haryana SDG 3.1: Rural Health Resilience through Traditional Knowledge: Develop a network of PHSCs integrated with Ayurvedic and local nutritional practices, supported by community-managed herbal gardens. This reduces urban healthcare dependency and enhances rural health sovereignty.

SDG 6: Clean Water and Sanitation

Performance:

- Strengths: Initiatives like Mera Pani Meri Virasat promote water-efficient crops, and programs like Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) encourage micro-irrigation.
- Gaps: Haryana overdrafts 137% of its groundwater replenishment, the highest in India, driven by water-intensive rice cultivation. The Yamuna River is heavily polluted by industrial and urban waste, and 64% of aquifer units are over-exploited.

Impact:

- Positive: State-level interventions like Direct Seeded Rice (DSR) and micro-irrigation show potential for water conservation.

- Negative: Groundwater depletion threatens long-term agricultural viability, and polluted water bodies reduce irrigation quality, changing crop yields and food safety.

Direction:

- Prioritize water-efficient crops and traditional irrigation methods to reduce groundwater stress.
- Restore polluted water bodies through community-led initiatives and stricter industrial regulations.
- Scale up micro-irrigation and watershed management for sustainable water use.

Suggestions:

1. Water-Efficient Crops: Incentivize cultivation of millets, sorghum, and pulses through MSP and subsidies, reducing reliance on water-intensive rice.
2. Wetland and River Restoration: Launch community-led projects to revive wetlands and the Yamuna River, using GIS-based planning to show restoration zones.
3. Micro-Irrigation Expansion: Scale up PMKSY to cover more farmers with drip irrigation and sprinklers, supported by renewable energy-powered systems.
4. Traditional Irrigation Revival: Promote johads (traditional rainwater harvesting structures) to recharge groundwater, supported by community cooperatives.

Haryana-Specific SDG 6 Addition:

- Haryana SDG 6.1: Yamuna Ecosystem Restoration: Develop a state-wide Yamuna restoration program linking water security (SDG 6), biodiversity (SDG 15), and nutrition (SDG 2). Use community-managed bioremediation and renewable energy to treat effluents, ensuring clean water for agriculture and health.

SDG 8: Decent Work and Economic Growth

Performance:

- Strengths: The NCR's industrial and IT hubs (e.g., Gurugram, Manesar) generate significant employment in manufacturing, services, and construction. Agro-processing and real estate sectors also create jobs.
- Gaps: Rural areas face job stagnation, with 70% of farmers in debt and a declining agricultural workforce due to youth migration. Informal employment (52% of Haryana's workforce) lacks job security and benefits.

Impact:

- Positive: Urban job growth in IT, automotive, and services boosts state GDP and attracts skilled labour.
- Negative: Rural job scarcity drives migration, causing urban congestion and rural labour shortages. Informal workers, especially migrants, face exploitation and low wages.

Direction:

- Promote rural entrepreneurship and agro-based industries to create local jobs.
- Enhance skill development to bridge the urban-rural employment gap.
- Strengthen Farmer Producer Organizations (FPOs) to improve bargaining power and reduce dependency on intermediaries.

Suggestions:

1. Argo-Processing Hubs: Show food processing parks in rural areas to create jobs in dairy, fruit preservation, and grain processing, supported by public-private partnerships.
2. Renewable Energy Jobs: Develop solar and wind energy projects in rural Haryana, training youth for installation and maintenance roles.

3. Vocational Training: Expand vocational training centres in rural areas, focusing on skills for manufacturing, IT, and hospitality.
4. FPO Empowerment: Provide FPOs with grants, low-interest loans, and market linkages to enhance rural entrepreneurship and job creation.

Haryana-Specific SDG 8 Addition:

- Haryana SDG 8.1: Rural Industrial Clusters for Self-Sufficiency: Create decentralized industrial clusters in hinterland districts (e.g., Mahendragarh, Bhiwani) focused on agro-processing and renewable energy. These clusters, powered by community-controlled solar grids, reduce migration and promote local job sovereignty.

SDG 10: Reduced Inequalities

Performance:

- Strengths: Affirmative action programs and welfare schemes like PM-KISAN provide some support to marginalized groups.
- Gaps: Caste-based disparities persist, with dominant castes (e.g., Jat's) controlling land and resources, while Dalits and OBCs face exclusion from credit, subsidies, and MSP benefits. Gender inequities limit women's access to land and training.

Impact:

- Positive: Welfare schemes improve income for some small farmers, and urban job growth offers opportunities for skilled workers.
- Negative: Marginalized groups, including 70% of small farmers, face limited access to MSP (only 6% of farmers benefit, per the Shanta Kumar Committee). Rural-urban and caste-based income disparities widen.

Direction:

- Implement targeted policies to address caste and gender inequities in land ownership, credit, and employment.
- Enhance affirmative action in education and entrepreneurship to promote social mobility.
- Involve marginalized groups in policy design for inclusive development.

Suggestions:

1. Land Redistribution: Implement land reforms to provide arable land to Dalits and OBCs, ensuring legal titles and tenancy rights.
2. Gender Equity: Grant land titles to women farmers and fund women-led SHGs for agro-processing and entrepreneurship.
3. Inclusive MSP: Extend MSP benefits to marginal farmers through decentralized procurement and reduced bureaucratic hurdles.
4. Community Participation: Show forums for marginalized groups to influence agricultural and industrial policies, ensuring their needs are addressed.

Haryana-Specific SDG 10 Addition:

- Haryana SDG 10.1: Caste and Gender Equity in Resource Access: Develop a state-specific affirmative action framework to ensure fair access to land, credit, and MSP for Dalits, OBCs, and women. Use digital platforms to check and redress discrimination in welfare scheme implementation.

SDG 13: Climate Action

Performance:

- Strengths: Initiatives like Mera Pani Meri Virasat and DSR promote climate-resilient practices. Renewable energy adoption (e.g., solar parks) is increasing.
- Gaps: High emissions from agriculture (e.g., stubble burning) and transport contribute to climate change. Monoculture and groundwater depletion worsen environmental stress.

Impact:

- Positive: Water-saving initiatives reduce agricultural emissions and improve resilience.
- Negative: Stubble burning and chemical-intensive farming degrade air and soil quality, while transport emissions from urban sprawl increase Haryana's carbon footprint.

Direction:

- Promote low-emission farming practices and renewable energy adoption.
- Reduce transport-related emissions through localized production-consumption cycles.
- Enhance climate adaptation through resilient crop varieties and weather advisories.

Suggestions:

1. Organic Farming: Subsidize organic practices and Integrated Pest Management (IPM) to reduce chemical emissions and improve soil health.
2. Local Production Cycles: Support FPOs with solar-powered processing units to minimize transport emissions and packaging waste.
3. Climate-Resilient Varieties: Invest in R&D for drought-resistant millets and pulses, distributed through KVKs.
4. Stubble Management: Provide subsidies for crop residue management technologies to curb stubble burning.

Haryana-Specific SDG 13 Addition:

- Haryana SDG 13.1: Youth-Led Climate Governance: Engage youth in climate action through eco-projects like solar farms and wetland revival. Integrate school programs to check local ecology (e.g., Yamuna water quality), fostering a culture of environmental stewardship.

SDG 15: Life on Land

Performance:

- Strengths: Agroecological initiatives like Mera Pani Meri Virasat encourage biodiversity-friendly practices. Community-led watershed management shows promise.
- Gaps: Monoculture has reduced pulse and oilseed cultivation by 40% since 2000, accelerating biodiversity loss. Industrial and urban pollution degrade soil and water ecosystems.

Impact:

- Positive: Sustainable practices enhance soil health and ecosystem resilience in pilot areas.
- Negative: Loss of fertile land to urbanization and pollution from industrial effluents threaten biodiversity and agricultural sustainability.

Direction:

- Shift to biodiversity-enhancing agriculture, such as agroforestry and crop rotation.
- Protect ecosystems through stricter pollution controls and land use planning.
- Restore degraded ecosystems through community-led initiatives.

Suggestions:

1. Agroforestry Integration: Incentivize mixed farming systems combining crops, livestock, and trees to enhance biodiversity and soil fertility.
2. Pollution Control: Enforce effluent treatment norms for industries and promote bioremediation using local species.
3. Ecosystem Mapping: Use GIS-based planning to show and protect biodiversity hotspots, aligning agriculture with regional ecosystems.
4. Community-Led Restoration: Support farmer cooperatives in restoring wetlands and forests, linked to SDG 6 initiatives.

Haryana-Specific SDG 15 Addition:

- Haryana SDG 15.1: Aravalli-Yamuna Biodiversity Corridor: Create a state-specific program to restore the Aravalli foothills and Yamuna plains as biodiversity corridors. Engage communities in agroforestry and wetland revival, linking biodiversity (SDG 15) with water security (SDG 6) and nutrition (SDG 2).

Haryana's Own SDGs: A Localized Framework

To address Haryana's unique challenges and use its strengths, the following state-specific SDGs are proposed, building on the case study's insights and tailored to local ecosystems, demographics, and economic realities:

1. Haryana SDG 1: Agricultural Diversification for Sustainability
    a. Objective: Reduce dependency on rice-wheat monoculture by promoting diverse, climate-resilient crops.
    b. Action: Offer tiered MSP for eco-friendly crops (e.g., millets, pulses) and subsidies for organic farming. Use GIS-based planning to align crops with local ecosystems.
    c. Impact: Enhances soil health, reduces groundwater stress, and improves nutritional outcomes, aligning with SDGs 2, 6, and 15.
2. Haryana SDG 2: Rural-Urban Economic Symbiosis
    a. Objective: Bridge the NCR-hinterland divide through decentralized industrialization and infrastructure.
    b. Action: Develop rural industrial clusters for agro-processing and renewable energy, supported by smart village initiatives. Strengthen urban-rural supply chains via digital platforms.
    c. Effect: Reduces migration, creates local jobs, and balances economic growth, aligning with SDGs 8 and 10.
3. Haryana SDG 3: Community-Controlled Resource Sovereignty
    a. Objective: Empower communities to control land, water, and energy resources.
    b. Action: Support FPOs with renewable energy-powered processing units and community-managed water systems. Implement land reforms for marginalized groups.
    c. Impact: Enhances local self-sufficiency, reduces market dependency, and promotes equity, aligning with SDGs 1, 10, and 13.
4. Haryana SDG 4: Youth and Women-Led Ecological Governance
    a. Objective: Engage youth and women in sustainable development and environmental stewardship.
    b. Action: Launch youth-led eco-projects (e.g., solar farms, wetland revival) and women-led SHGs for agro-processing and nutrition programs. Integrate school ecology monitoring programs.
    c. Impact: Fosters inclusivity, builds climate resilience, and ensures long-term sustainability, aligning with SDGs 5, 13, and 15.

Additional Aspects for Each SDG

To enhance Haryana's SDG alignment, the following added aspects are proposed, inspired by the case study's comprehensive points and innovative suggestions:

1. Participatory SDG Alignment:
    a. Concept: Engage communities in SDG implementation using GIS-based planning for crop diversification and ecosystem restoration.
    b. Application: Develop model villages in Haryana (e.g., in Mahendragarh or Nuh) where farmers, women, and youth co-design agricultural and ecological plans. Use digital tools to check progress and share best practices.
    c. Impact: Ensures community ownership, aligns solutions with local needs, and enhances SDG outcomes across 2, 6, 10, and 15.
2. Ecosystem-Based Development:
    a. Concept: Link multiple SDGs through ecosystem restoration, using the Yamuna as a focal point.
    b. Application: Implement a Yamuna restoration program combining wetland revival, organic farming, and renewable energy-powered irrigation. Engage FPOs and schools in monitoring water quality and biodiversity.
    c. Impact: Integrates SDGs 2, 6, 13, and 15, creating a scalable model for ecosystem-driven development.
3. Engaging Youth and Children in Ecological Governance:
    a. Concept: Empower youth and children as environmental stewards through hands-on projects and education.
    b. Application: Launch youth-led solar farms and wetland revival projects in rural Haryana. Integrate school programs to check local ecology (e.g., Yamuna water quality, Aravalli biodiversity). Partner with NGOs to scale initiatives.
    c. Impact: Builds a culture of sustainability, enhances SDG 13 and 15 outcomes, and creates future-ready leaders.
4. Localized Self-Consumption Models:
    a. Concept: Shift from export-driven agriculture to local production-consumption cycles.
    b. Application: Support FPOs with solar-powered processing units to produce goods (e.g., millet flour, dairy) for local markets. Promote village-level composting and biogas to recycle nutrients.
    c. Impact: Reduces emissions (SDG 13), enhances food sovereignty (SDG 2), and boosts local economies (SDG 8).
5. Traditional Knowledge Integration:
    a. Concept: Leverage Haryana's traditional agricultural and health practices for SDG alignment.
    b. Application: Revive traditional crops (e.g., bajra, jowar) and irrigation methods (e.g., johads) through KVKs. Integrate Ayurvedic remedies into PHSC programs, supported by women-led SHGs.
    c. Impact: Enhances nutritional security (SDG 2), health resilience (SDG 3), and cultural sovereignty, aligning with SDG 10.

CONCLUSION

Haryana's transformation into a centre of agricultural prosperity and swift industrialization sums up the intricate dynamics of conventional farming, urbanization, and socio-economic change. Through a thematic and area-based approach, this case study has highlighted the multi-faceted opportunities and challenges redefining the state's development path. A review of agriculture, industrialization, urbanization, demography, and state policies presents both the advantages of Haryana's model and the need for sustainable, inclusive reforms in a hurry.

Agriculturally, Haryana's leadership in rice and wheat cultivation, supported by the Minimum Support Price (MSP) system, has guaranteed food security and stability of farmer incomes. Yet, the excessive dependence on monoculture, environmental degradation due to groundwater exploitation, and stubble burning write down the unsustainability of existing practices. The farmer agitations of 2020–2021 highlighted underlying concerns on MSP dilution, corporatization, and ecological crisis, focusing on the demand for legal MSP assurance, diversification of crops, and water-saving agriculture. State efforts such as Mera Pani Meri Virasat and Direct Seeded Rice (DSR) are promising but are limited by a lack of proper awareness and deep-rooted dependence on MSP crops.

Urbanization and industrialization, especially in the National Capital Region (NCR), have fuelled growth, generating employment opportunities in manufacturing, IT, and services. However, this has been achieved at the expense of agricultural land conversion, pollution, and rural-urban inequality. The hinterland districts, agrarian-based, are lagging in infrastructure and economic development, adding to migration and inequality. Real estate growth, though it strengthens urban economies, imperils agriculture through land speculation and water competition, requiring more stringent zoning regulations and green land-use planning.

Demographically, Haryana also experiences a labour-capital gap with rural youth going to urban areas, leaving aging farming communities and feminized agriculture workforce. The caste dynamics deepen the inequalities where dominant castes hold land and resources, with marginalized groups such as Dalits and OBCs being excluded from credit, subsidies, and MSP benefits. These social fractures require specific land reforms, universal welfare schemes, and affirmative action to provide balanced access to opportunities.

Haryana's alignment with Sustainable Development Goals (SDGs) is marked by both achievements and gaps. While making notable contributions to SDG 2 (Zero Hunger) through cereal production, the state lags in SDG 6 (Clean Water and Sanitation) because of groundwater depletion and contamination, and SDG 10 (Reduced Inequalities) due to caste and gender inequalities. Haryana-specific SDGs such as agricultural diversification, rural-urban symbiosis, and youth-led ecological governance provide a localized framework for addressing these shortcomings. Projects such as GIS-based crop planning, restoration of Yamuna, and community-managed resource sovereignty can marry traditional wisdom with innovation to yield sustainable results.

The future of Haryana calls for a balanced strategy that balances agricultural sustainability, industrialization, and social justice. The main suggestions are to encourage environmentally friendly crops, develop Farmer Producer Organizations (FPOs), encourage agro-based industries, and improve rural infrastructure to overcome the NCR-hinterland divide. Involving the youth and women in economic and ecological governance and reactivating old customs such as johads and Nutri-cereals, can provide resilience and inclusivity. By bringing policies in alignment with the needs of the people and using public-private partnerships, Haryana can redefine its model of development to provide prosperity, environmental health, and quality of life to future generations.

This case study highlights that Haryana's problems are not unique but symptomatic of larger conflicts in India's agrarian and industrial transition. By dealing with these challenges with foresight and cooperation, Haryana can be a model of sustainable, inclusive development, matching the imperatives of tradition and modernity in an increasingly dynamic world.

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Part B: Industrialisation, Urbanisation, and Real Estate

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3. Differences in the Development of NCR and the Hinterland

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- **NITI Aayog. (2020). Aspirational Districts Programme: Baseline Ranking and Progress Report.** Highlights Nuh's backwardness in literacy and infrastructure. Available at: https://niti.gov.in/.
- **Kumar, S., & Yadav, R. (2021). Migration and Urban Congestion in Haryana's NCR. *Population and Environment, 43*(2), 189–205. Analyzes rural-urban migration and its socio-economic impacts.
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Part C: Demographics, Labour Capital, and Socioeconomic Divides

1. Population Demographics and Labour-Capital Divide

- **Census of India. (2011). Haryana State Profile.** Provides data on population density, rural-urban migration, and workforce dynamics. Available at: https://censusindia.gov.in/.
- **Bhagat, R. B. (2019). Rural-Urban Migration in India: Trends and Challenges. *Asian Population Studies, 15*(3), 234–250. Discusses migration trends and their impact on Haryana's agriculture.
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- **Jodhka, S. S. (2015). Caste in Contemporary India. Routledge. Analyzes caste-based land ownership and occupational segregation in Haryana.

- **Thorat, S., & Newman, K. S. (2010). Blocked by Caste: Economic Discrimination in Modern India. Oxford University Press.
  Discusses caste-based exclusion from credit, subsidies, and welfare programs.
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  Examines caste disparities in land ownership and employment.
- **Haryana Government. (2020). Report on Implementation of Welfare Schemes for SCs and OBCs.**
  Highlights gaps in welfare program access for marginalized groups. Available at: https://esaharyana.gov.in/.
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  Discusses the role of caste panchayats in reinforcing hierarchies.

3. State Policies, Sustainable Development Goals (SDGs), and Future Challenges

- **Government of Haryana. (2021). Haryana Vision 2030: Aligning with SDGs.** Outlines state policies and SDG progress. Available at: https://esaharyana.gov.in/.
- **United Nations Development Programme (UNDP). (2020). SDG India Index 2020–21.** Evaluates Haryana's performance across SDGs, highlighting strengths and gaps. Available at: https://in.undp.org/.
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  Details state initiatives for crop diversification and groundwater conservation.
- **FAO. (2019). Sustainable Agriculture and the SDGs: A Case Study of India.** Recommends sustainable practices and agroecology for SDG 2 and 15 alignment.
- **NITI Aayog. (2019). PM-KISAN: Implementation Challenges and Opportunities.** Discusses gaps in PM-KISAN's reach for tenant farmers and landless laborers.

4. The Future for Upcoming Generations: Jobs and Quality of Life

- **Government of India, Ministry of Skill Development and Entrepreneurship. (2020). Skill India Mission: Progress Report.**
  Details vocational training programs for rural youth. Available at: https://www.msde.gov.in/.
- **Sharma, R., & Gupta, N. (2021). Agri-Tech Startups in India: Opportunities for Rural Youth. *Journal of Rural Studies, 87*, 345–356.
  Explores the role of Agri-Tech in creating jobs and improving market access.
- **IRENA (International Renewable Energy Agency). (2020). Renewable Energy Jobs: Opportunities in India.**
  Highlights job potential in Haryana's solar and wind energy sectors.
- **UN Women. (2020). Gender Equality in Agriculture: A Case Study of India.** Recommends land titles and SHGs for women farmers.
- **Government of India, Ministry of Rural Development. (2019). Smart Village Initiative Guidelines.**
  Proposes infrastructure development for rural growth and connectivity.

Additional References for Haryana-Specific SDG Additions

- **Bharatpur Wetland Restoration Project. (2020). Lessons from Ecosystem-Based Development.** Provides a model for Yamuna restoration and ecosystem linkages. Available via wetland conservation NGOs like https://www.wetlands.org/.

- **Chhota Udaipur Model Village Project. (2018). Community-Led Development in Gujarat.** Inspires Haryana's participatory SDG alignment. Available via NGO reports or https://www.akrspindia.org.in/.
- **GIS-Based Crop Planning in India. (2021). Precision Agriculture for Sustainability.** Discusses GIS applications in crop diversification, published in *Current Science, 120*(5), 789–795.
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- **Yamuna Action Plan. (2019). Government of India, Ministry of Jal Shakti.** Details restoration efforts for the Yamuna River. Available at: https://jalshakti-ddws.gov.in/.

Field Insights: Discussions on Caste and Women in Haryana Agriculture

Interview with Ajay Arya, Former NABARD Senior Employee

Mr. Ajay Arya, with his extensive experience at NABARD, provided valuable insights into the structural challenges facing Haryana's agricultural communities. He emphasized that caste remains a significant determinant of access to credit and subsidies. Dominant castes, such as Jats, often leverage their social and political influence to secure loans, crop insurance, and MSP benefits, while marginalized groups like Dalits and Other Backward Classes (OBCs) face systemic exclusion. Arya noted, "Despite NABARD's efforts to promote inclusive financing through Farmer Producer Organizations (FPOs), bureaucratic hurdles and local power dynamics limit outreach to lower-caste farmers."

On the role of women, Arya highlighted their increasing participation in agriculture due to male migration to urban centers. However, women from lower-caste households are disproportionately burdened with labor-intensive tasks and lack access to training or land ownership. He advocated for targeted interventions, such as women-led FPOs and microfinance schemes, to empower female farmers. Arya also stressed the need to integrate traditional knowledge, often preserved by women, into modern agricultural practices to enhance sustainability and nutrition, aligning with Sustainable Development Goals (SDGs) 2 (Zero Hunger) and 5 (Gender Equality).

Discussion with District Collector Harish Vashishth, Palwal

In a 20-minute meeting with Mr. Harish Vashishth, the District Collector of Palwal, I discussed the ground-level realities of caste and gender in agriculture. Vashishth acknowledged that caste-based disparities persist in land ownership and access to government schemes. He cited examples of upper-caste farmers dominating local cooperative societies, which control seed distribution and procurement processes. To address this, the district administration has initiated awareness campaigns and streamlined online portals like *Meri Fasal Mera Byora* to ensure equitable access to MSP registration, though challenges remain in reaching marginalized communities.

Regarding women, Vashishth highlighted their critical role in Palwal's agrarian economy, particularly in dairy and vegetable farming. However, he noted that women's contributions are often undervalued, with limited representation in decision-making bodies like panchayats. The district has introduced programs like *Mera Pani Meri Virasat* to train women in water-efficient farming techniques, but Vashishth admitted that cultural barriers and inadequate childcare facilities hinder participation. He expressed optimism about future collaborations with NGOs to enhance women's access to resources and leadership opportunities.

Conversations with Local Farmers

Interviews with local farmers in Palwal revealed diverse perspectives on caste and gender dynamics. Mr. Ratan Singh, a Jat farmer, acknowledged that caste influences access to irrigation facilities and market networks, with upper-caste farmers often securing better deals through informal connections. He supported women's involvement in farming but noted that patriarchal norms restrict their autonomy, particularly in financial decisions.