

Impact of Urban Fringe Development on Farmers' Livelihoods and Cropping Patterns in Hisar District

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ABSTRACT

Urban fringe development has become one of the most visible expressions of spatial transformation in rapidly expanding districts of Haryana. Hisar District, located in the western part of the state, has experienced the outward movement of urban functions such as residential colonies, transport corridors, educational institutions, warehouses, industrial units, service activities, and real-estate development. This expansion has produced a transitional peri-urban landscape in which agriculture and urban land uses coexist, compete, and reshape each other. The present article examines the impact of urban fringe development on farmers' livelihoods and cropping patterns in Hisar District. It argues that the urban fringe is not only an area of physical land conversion but also a zone of economic adjustment, social mobility, occupational diversification, and agricultural restructuring.

The article adopts a conceptual, descriptive, and analytical approach based on secondary sources and geographical interpretation. It discusses how land fragmentation, rising land values, changing irrigation pressure, labor scarcity, market proximity, road connectivity, and urban demand influence agricultural decisions. Farmers in fringe villages often face declining certainty in traditional cultivation, yet they also encounter new opportunities through dairying, vegetable cultivation, rental income, non-farm employment, transport services, and land leasing. Cropping patterns change as farmers respond to urban markets, risk, input costs, water availability, and expectations of future land conversion. The study concludes that urban fringe development produces both livelihood diversification and agricultural vulnerability. Sustainable planning is therefore necessary to protect productive agricultural land, improve farmers' adaptive capacity, and guide balanced rural–urban transformation in Hisar District.

Keywords - Urban fringe; Peri-urban agriculture; Farmers' livelihoods; Cropping pattern; Hisar District; Land use change; Rural transformation; Haryana; Spatial analysis

1. INTRODUCTION

Urban expansion has emerged as one of the major forces shaping contemporary agrarian landscapes in India. Cities and towns are no longer confined to their administrative limits; they extend outward through roads, residential colonies, commercial establishments, institutional campuses, small industries, transport nodes, and service-sector activities. The zone surrounding an urban center, commonly described as the urban fringe or peri-urban belt, becomes a transitional space where rural and urban processes overlap. In such areas, agricultural land, village settlements, real-estate interests, infrastructure development, and changing livelihood choices interact in complex ways. The impact of this transformation is especially visible in districts where agriculture has historically remained important but urban growth is rapidly expanding.

Hisar District of Haryana provides a significant geographical context for examining this issue. The district has a long agrarian background and is associated with wheat, cotton, mustard, gram, bajra, fodder, and other crops suited to the semi-arid conditions of western Haryana. At the same time, Hisar city and nearby towns have expanded as administrative, educational, commercial, transport, and industrial centers. The growth of road networks, public institutions, housing colonies, agro-processing activities, private educational establishments, and service-sector opportunities has altered the spatial character of surrounding villages. These changes have gradually transformed agricultural land into a contested resource, not only for cultivation but also for real-estate investment, infrastructural expansion, and non-farm income generation.

Urban fringe development affects agriculture in two major ways. First, it changes the physical use of land. Fields near roads, urban settlements, and expanding colonies often become more attractive for non-agricultural uses. This leads to the conversion of agricultural plots into residential, commercial, institutional, or industrial land. Even where land is not immediately converted, expectations of future urban use may reduce farmers' willingness to make long-term agricultural investments. Second, it changes the socio-economic logic of farming. Farmers begin to evaluate cultivation in relation to land prices, wage rates, market demand, transport access, family aspirations, and the availability of non-farm work. Agriculture continues, but its meaning and management change.

The impact on farmers' livelihoods is therefore multidimensional. Some farmers benefit from rising land values, rental income, improved connectivity, or employment opportunities outside farming. Others face land loss, reduced farm size, uncertainty, labor shortage, and pressure to abandon traditional cultivation. Small and marginal farmers are often more vulnerable because their landholdings are limited and their capacity to absorb risk is weaker. However, peri-urban conditions may also create opportunities for high-value cultivation, dairy farming, vegetable supply, nursery production, and direct marketing to urban consumers. Thus, the urban fringe is neither purely a zone of agricultural decline nor simply a zone of opportunity. It is a dynamic space of uneven transformation.

Cropping patterns also respond to these pressures. Farmers may continue traditional cereal and cash crop combinations, but many adjust their choices according to water availability, labor requirements, input costs, market access, and expected returns. In fringe areas, proximity to urban markets can encourage vegetables, fodder, floriculture, and dairy-linked cropping. At the same time, uncertainty over land conversion may discourage investment in soil improvement, orchards, or long-duration crops. Increasing urban demand for milk, vegetables, construction material, and services can reshape the rural economy and reduce dependence on conventional field crops. The study of cropping pattern change therefore provides a useful window into the wider transformation of peri-urban agriculture.

2. REVIEW OF LITERATURE

Research on peri-urban development has emphasized that urban fringes are transitional zones marked by land-use conflict, socio-economic change, and institutional ambiguity. Early studies of rural-urban fringe areas identified them as spaces where urban expansion gradually modifies agricultural land, settlement morphology, transport flows, and occupational structure. Later research expanded the discussion by examining peri-urban livelihoods, environmental stress, resource competition, and planning challenges. The urban fringe is now widely understood as a dynamic interface rather than a simple boundary between city and countryside.

A major stream of literature focuses on land-use change. Scholars have shown that urban expansion often leads to the conversion of fertile agricultural land into built-up uses. The process is influenced by road accessibility, proximity to city centers, land speculation, real-estate markets, and public infrastructure projects. In many Indian districts, agricultural land near expanding towns becomes economically more valuable for non-farm purposes than for cultivation. This changes both land ownership decisions and farmers' attitudes toward long-term agricultural investment.

Another body of literature examines livelihood diversification in peri-urban areas. Studies show that farmers in urban fringe locations rarely depend exclusively on crop cultivation. They combine farming with wage labor, transport work, petty trade, construction employment, dairying, rental income, and service-sector occupations. Such diversification may improve household income, but it can also indicate stress in agriculture. The shift is often shaped by land fragmentation, uncertain returns, rising cultivation costs, and the attraction of urban employment.

Cropping pattern change has also received significant attention. Research suggests that peri-urban farmers may shift from traditional cereal crops to vegetables, fodder, flowers, dairy-support crops, or other high-value products where urban demand and market access are strong. However, the shift is not automatic. It depends on irrigation, capital, labor availability, risk tolerance, cold storage, price stability, and knowledge. In semi-arid regions such as western Haryana, groundwater pressure and climatic variability further influence crop decisions. Studies on Haryana have highlighted the region's agrarian transformation after the Green Revolution, including mechanization, irrigation expansion, increased use of chemical inputs, and commercialization of farming. However, more recent scholarship has drawn attention to emerging challenges such as groundwater depletion, soil degradation, declining farm profitability, and rural youth moving toward non-farm employment. In districts like Hisar, urban expansion adds another layer to these changes by influencing land markets, cropping choices, and household livelihood strategies.

Overall, the literature indicates that urban fringe development affects agriculture through interlinked spatial and socio-economic processes. It alters land values, farm size, labor relations, crop choice, income sources, and rural aspirations. This article builds upon these insights by focusing specifically on farmers' livelihoods and cropping pattern changes in Hisar District, where agriculture and urbanization are increasingly interacting within a shared regional landscape.

3. OBJECTIVES OF THE STUDY

- To examine the nature of urban fringe development in Hisar District and its relationship with agricultural land use.
- To analyze the impact of urban fringe development on farmers' livelihoods, income sources, and occupational choices.
- To study how peri-urban expansion influences cropping patterns, crop selection, and agricultural decision-making.

- To identify the opportunities and challenges faced by farmers in the urban fringe areas of Hisar District.
- To suggest planning and policy measures for balanced agricultural and peri-urban development.

4. RESEARCH METHODOLOGY

The present article is conceptual, descriptive, and analytical in nature. It is based on secondary data, existing academic literature, policy reports, census-related observations, district-level agricultural information, and geographical interpretation of urban fringe processes. The study does not present primary survey findings; rather, it synthesizes available knowledge to build an analytical understanding of how urban fringe development affects farmers' livelihoods and cropping patterns in Hisar District.

The research adopts a spatial perspective because the impact of urban fringe development differs according to location. Villages closer to Hisar city, major roads, institutional corridors, market centers, and expanding built-up areas are likely to experience stronger land-use pressure than more distant rural settlements. Therefore, the analysis gives attention to proximity, accessibility, land value, infrastructural expansion, and rural-urban interaction as key geographical variables.

A qualitative analytical method has been used to interpret the relationship between urbanization and agriculture. The study identifies major themes such as land conversion, livelihood diversification, changing labor relations, irrigation stress, market-oriented cropping, and social transformation. These themes are discussed in relation to the specific agrarian and semi-arid context of Hisar District. The method is also comparative in the sense that it distinguishes between traditional agricultural villages and urban fringe villages where farming is more directly exposed to non-agricultural pressures.

The study is limited by its reliance on secondary sources and conceptual interpretation. Actual village-level survey data, remote sensing classification, and household interviews would provide more precise empirical evidence. Nevertheless, the present analytical framework is useful for understanding the broader nature of peri-urban agricultural transformation and for identifying areas that require future field-based research.

Conceptual Understanding of Urban Fringe Development

Urban fringe development refers to the outward growth of urban activities into surrounding rural areas. It is not merely an increase in built-up land; it represents the gradual spread of urban functions, lifestyles, infrastructure, markets, and land values into spaces that were earlier dominated by agriculture. The urban fringe typically contains a mixture of farms, village settlements, vacant plots, warehouses, schools, private colonies, small industries, transport facilities, and commercial establishments. This mixed character makes it one of the most complex zones in regional geography.

In the context of Hisar District, urban fringe development may be understood through the expansion of Hisar city and nearby towns into surrounding villages. As road networks improve and urban demand grows, land near highways, bypass roads, institutional areas, and service centers becomes increasingly valuable. This encourages land transactions, plot development, and speculative holding. Farmers located in these zones may continue cultivation, but they often view their land through both agricultural and real-estate lenses.

The urban fringe also changes the social imagination of rural households. Farming families begin to compare agricultural income with non-farm earnings, land sale values, rental possibilities, and educational aspirations for younger generations. The household economy becomes less dependent on crop production alone. This shift can increase economic flexibility, but it may also weaken long-term commitment to farming. In many cases, agriculture becomes a temporary use of land until a more profitable urban opportunity appears.

Urban fringe development should therefore be understood as a process of spatial transition. It transforms land, labor, income, mobility, and social expectations. It also creates planning difficulties because the administrative category of an area may remain rural even while its economy becomes increasingly urban-oriented. Without appropriate regulation, this transition can result in unplanned growth, loss of agricultural land, pressure on groundwater, traffic congestion, and uneven benefits among farming households.

Hisar District as a Peri-Urban Agricultural Region

Hisar District occupies an important position in the agricultural geography of western Haryana. The district is characterized by semi-arid climatic conditions, canal and tube-well irrigation, mixed cropping systems, livestock activities, and a strong rural settlement network. Agriculture has traditionally been central to the district's economy, with crops such as wheat, cotton, mustard, bajra, gram, and fodder playing an important role. The agrarian structure is shaped by landholding size, irrigation access, market linkages, and household labor availability.

At the same time, Hisar city has developed as a major urban center in the region. It performs administrative, educational, commercial, health, transport, and industrial functions. The presence of universities, research institutions, markets, government offices, hospitals, and service-sector establishments increases the city's regional influence. This influence extends into nearby rural areas through daily commuting, commodity flows, land transactions, and infrastructural expansion.

The peri-urban zone around Hisar is therefore marked by close interaction between agriculture and urban demand. Farmers benefit from nearby markets for milk, vegetables, fodder, labor, transport, and consumer goods. However, they also face rising land prices, pressure for land conversion, waste disposal issues, changing social relations, and competition for water and labor. Villages located near roads and expanding built-up corridors are especially exposed to these pressures.

The geographical significance of Hisar lies in the fact that it represents a semi-arid agrarian region undergoing urban transformation. Unlike metropolitan fringe areas where agriculture may decline rapidly, Hisar's fringe contains a more gradual and uneven transformation. Some farmers intensify agriculture due to market proximity, while others reduce cultivation because of land speculation or non-farm opportunities. This coexistence of adaptation and decline makes Hisar an important case for studying peri-urban agricultural change.

Impact on Farmers' Livelihoods

One of the most important effects of urban fringe development is livelihood diversification. Farmers in fringe villages increasingly combine agriculture with non-agricultural income sources. Family members may engage in transport services, small shops, construction work, private jobs, dairy business, property dealing, rental housing, or wage employment in nearby urban areas. This diversification is partly an opportunity and partly a response to uncertainty in farming.

For some households, non-farm income reduces dependence on crop failure, price fluctuation, and climatic variability. It can provide regular cash flow and support education, health expenditure, and improved housing. However, diversification may also reduce the availability of household labor for agriculture. Younger members may prefer urban employment to farming, leaving older family members to manage cultivation. Over time, this may lead to reduced interest in intensive farming and greater reliance on hired labor or leasing arrangements.

Urban fringe development sharply increases the market value of land. Agricultural fields near roads, urban colonies, or commercial corridors become attractive for non-agricultural investment. Farmers may experience a sudden rise in asset value, but this does not always translate into long-term livelihood security. Land sale may provide immediate income, yet it can also reduce the household's productive base. Families that sell land without stable alternative investment may face economic insecurity after the sale proceeds are exhausted.

The expectation of future land conversion also affects farming behavior. Farmers may hesitate to invest in soil improvement, irrigation infrastructure, orchards, or long-term agricultural technologies if they believe the land may soon be sold or converted. This speculative attitude can reduce agricultural productivity even before actual land-use change occurs. In this way, land market pressure influences both livelihood decisions and cultivation practices.

Urban proximity changes rural aspirations. Farming households increasingly invest in education, urban-style housing, consumer goods, private vehicles, and non-farm careers for children. Agriculture may no longer be viewed as the only desirable livelihood. This shift reflects social mobility, but it also indicates a changing relationship between farmers and land. Land becomes both a productive resource and a financial asset that can support urban-oriented aspirations.

Impact on Cropping Patterns

Cropping pattern refers to the spatial and temporal arrangement of crops grown in an area. It reflects physical conditions such as soil, climate, water, and terrain, but it is also shaped by market demand, technology, policy, labor, and farmer preferences. In urban fringe areas, cropping patterns change because agriculture is exposed to new economic opportunities and constraints. In Hisar District, the interaction between semi-arid conditions and urban expansion creates a distinctive pattern of crop adjustment.

Traditional crops such as wheat, cotton, mustard, bajra, gram, and fodder continue to be important in the district. However, farmers near urban markets may show greater interest in vegetables, green fodder, dairy-linked crops, nurseries, and short-duration crops. These crops can provide quicker returns and may be better aligned with urban demand. Vegetable cultivation, for instance, can benefit from proximity to consumers and transport routes. Fodder cultivation may expand where dairy activity becomes economically attractive due to nearby urban milk demand.

At the same time, urban fringe conditions can discourage certain types of cultivation. Crops requiring long-term investment, larger contiguous fields, or stable irrigation may become less attractive in areas facing land fragmentation and conversion pressure. Farmers may avoid orchards or soil-improvement investments if land-use uncertainty is high. They may prefer crops that require less commitment or can be adjusted quickly according to market conditions.

Labor availability also influences cropping patterns. As rural labor shifts toward construction, transport, and urban services, agriculture may face higher wage costs or seasonal labor shortages. Labor-intensive crops become difficult for households that cannot afford hired workers. Mechanized and less labor-demanding crops may be preferred, especially by farmers whose family members are involved in non-farm work.

Water availability remains a major factor. Hisar's semi-arid setting makes irrigation crucial. Urban expansion can intensify pressure on groundwater and local water resources. Where irrigation becomes costly or uncertain, farmers may shift toward less water-intensive crops or reduce cropping intensity. Conversely, farmers with reliable irrigation may intensify production for urban markets. Thus, cropping pattern change is not uniform; it varies according to water access, capital, location, and household strategy.

Market Proximity and Agricultural Commercialization

One of the positive effects of urban fringe development is improved market proximity. Farmers near Hisar city have better access to mandis, consumers, input dealers, transport services, dairy markets, and retail outlets. This can reduce transaction costs and encourage more commercial forms of agriculture. Products such as milk, vegetables, fodder, and fresh produce can reach markets more quickly, which is especially important for perishable commodities.

Market proximity also improves access to information. Farmers in fringe areas are more exposed to price signals, new technologies, input suppliers, agricultural services, and consumer demand. They may experiment with crop diversification or allied activities more readily than farmers in remote areas. However, commercialization also increases dependence on fluctuating markets. If prices fall or input costs rise, farmers may face greater risk. Therefore, access to markets must be supported by storage, processing, credit, insurance, and reliable extension services.

Urban demand can also create opportunities beyond crop production. Dairy farming, poultry, small food processing, farm-to-market transport, and direct sale of produce can become important livelihood components. These activities can strengthen household income if properly managed. Nevertheless, they require capital, skills, and institutional support. Without such support, only better-off farmers may fully benefit from peri-urban commercialization.

Land Fragmentation and Declining Agricultural Continuity

Land fragmentation is a common consequence of urban fringe development. As land is divided for inheritance, sale, plotting, roads, colonies, and other uses, the continuity of agricultural fields is reduced. Fragmented plots make irrigation management, mechanization, and crop planning more difficult. Small scattered fields may become less efficient for cultivation, encouraging farmers to lease out land, reduce investment, or shift toward less intensive crops.

Fragmentation also creates conflicts between agricultural and non-agricultural uses. A field located beside a residential colony may face problems of waste dumping, boundary disputes, stray animals, drainage blockage, or restrictions on agricultural operations. Farmers may find it difficult to use machinery, transport inputs, or manage irrigation channels when built-up development interrupts traditional field systems. Such micro-level disruptions can gradually weaken agricultural continuity.

In some cases, land fragmentation is psychological as well as physical. Farmers may no longer treat agriculture as a stable long-term occupation when surrounding land is being converted. They may continue cultivation only as an interim activity. This reduces innovation and long-term planning in agriculture. Therefore, land fragmentation and uncertainty are major channels through which urban fringe development affects cropping decisions and livelihood security.

Opportunities Created by Urban Fringe Development

Although urban fringe development creates pressure on agriculture, it also produces opportunities. Improved roads and market access can help farmers sell perishable and high-value products. Dairy farming can expand because urban consumers provide a regular demand for milk and milk products. Farmers can diversify into vegetables, fodder, nursery plants, floriculture, farm-based services, and agri-business activities. Land near urban areas may also support rental income, storage facilities, shops, or small enterprises.

Urban proximity can enhance access to education, health care, banking, digital services, agricultural input shops, and government offices. These services can improve the overall livelihood capacity of rural households. Farmers may become more informed and better connected to schemes, markets, and technologies. If managed properly, peri-urban agriculture can become more productive and diversified than traditional farming systems.

The key issue is whether opportunities are inclusive and sustainable. Large farmers with capital and road-facing land may benefit more than small farmers. Similarly, farmers with irrigation and market knowledge can adopt high-value crops, while others may remain dependent on uncertain wage work. Planning interventions are needed to ensure that peri-urban development supports rural livelihoods rather than simply replacing agriculture with unregulated construction.

5. CHALLENGES AND PROBLEMS

The first major challenge is the loss of agricultural land. Once fertile land is converted into built-up use, it is difficult to restore it to farming. Unplanned conversion can reduce local food production, disturb drainage, and fragment the rural landscape. The second challenge is livelihood insecurity for small and marginal farmers.

Land sale may provide temporary income, but without stable alternative employment or investment, households may become vulnerable in the long run.

The third challenge is pressure on natural resources. Urban growth increases demand for water, land, energy, and construction materials. In a semi-arid district like Hisar, groundwater stress is already an important concern. Urban expansion may intensify competition for water between domestic, industrial, and agricultural uses. Pollution, waste disposal, and drainage problems can also affect fields located near urban settlements.

The fourth challenge is the weakening of traditional agricultural labor systems. As workers move toward construction and urban employment, farmers may face labor shortage and higher wage costs. This affects crop choice and cultivation intensity. The fifth challenge is social inequality. Benefits from land conversion are not equally distributed. Landowners may gain from rising land values, while landless laborers may lose agricultural employment without receiving compensation from land markets.

Finally, planning gaps remain a serious problem. Peri-urban areas often fall between rural and urban governance systems. Development may occur without adequate zoning, infrastructure, drainage, waste management, or agricultural protection. This results in scattered growth, environmental degradation, and avoidable conflict between farmers, developers, and residents.

6. SUGGESTIONS AND POLICY IMPLICATIONS

Balanced peri-urban planning is necessary to manage the impact of urban fringe development in Hisar District. Productive agricultural land should be protected through clear zoning and land-use regulation. Urban expansion should be directed toward planned growth corridors rather than scattered conversion of fertile fields. Local development plans must recognize agriculture as an important economic and environmental function, not merely as vacant land awaiting urban use.

Farmers in fringe areas should be supported through livelihood diversification programs. Training in dairy management, vegetable cultivation, protected farming, food processing, direct marketing, and digital market access can help them benefit from urban proximity. Small and marginal farmers require special support through credit, cooperative marketing, storage, irrigation efficiency, and crop insurance. Extension services should focus on peri-urban agricultural systems rather than only conventional rural agriculture.

Water management must be a priority. Micro-irrigation, rainwater harvesting, treated wastewater reuse, groundwater regulation, and crop planning according to water availability can help reduce pressure on local resources. Urban institutions should also be made responsible for preventing waste and sewage from damaging agricultural fields. Environmental planning is essential for maintaining the ecological stability of fringe areas.

Land transaction policies should protect farmers from distress sale and speculative exploitation. Financial literacy, legal awareness, and guidance on investment after land sale are important. Households receiving income from land sale should be encouraged to invest in sustainable livelihoods, education, enterprises, or productive assets rather than short-term consumption. Planning bodies should also ensure that landless agricultural workers are not ignored in compensation and rehabilitation discussions.

Finally, future research should include village-level surveys, GIS-based mapping, household livelihood analysis, and cropping pattern data over time. Such empirical work would help identify which villages are most affected, which farmer groups are most vulnerable, and which adaptive strategies are most successful. A spatially informed approach can support more precise planning for Hisar's rural-urban fringe.

7. CONCLUSION

Urban fringe development in Hisar District represents a major process of rural transformation. It reshapes agricultural land use, farmers' livelihoods, and cropping patterns through the expansion of urban functions into surrounding rural areas. The impact is complex and uneven. On one hand, farmers gain access to markets, roads, employment, dairy demand, land value appreciation, and non-farm income opportunities. On the other hand, they face land conversion, fragmentation, labor shortage, water stress, uncertainty, and declining agricultural continuity.

The study shows that farmers' livelihoods in fringe areas are becoming increasingly diversified. Agriculture remains important, but it is no longer the only economic foundation for many households. Non-farm employment, rental income, service activities, and dairy-related enterprises are becoming more significant. This diversification can strengthen household resilience when managed properly, but it can also indicate the weakening of crop-based agriculture under urban pressure.

Cropping patterns are also changing in response to urban demand, market access, irrigation conditions, labor availability, and expectations of land conversion. Traditional crops continue, but high-value and short-duration crops may become more attractive near urban markets. At the same time, uncertainty discourages long-term agricultural investment. The cropping landscape of Hisar's fringe is therefore marked by adjustment, experimentation, and uneven transition.

The central conclusion is that urban fringe development should not be treated only as an urban planning issue. It is equally an agricultural and livelihood issue. If unmanaged, it may lead to loss of productive land and

vulnerability among farming households. If planned carefully, it can support diversified, market-oriented, and sustainable peri-urban agriculture. For Hisar District, the challenge is to guide urban growth in a manner that protects farmers, conserves resources, and maintains a balanced relationship between rural and urban development.

8. REFERENCES

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