



EVALUATE THE IMPACT OF URBANIZATION ON AGRICULTURAL TRANSFORMATION

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Abstract: Urbanization has emerged as a critical global concern, characterized by the rapid expansion of urban areas. However, the unregulated development on the outskirts of cities poses significant challenges. To address this issue, it is crucial to establish an effective land management system in these peripheral regions. This research underscores the importance of implementing such a system to ensure well-planned and managed growth during the urbanization process. The research focuses on assessing and analyzing land use patterns in the target area, with the objective of identifying suitable zones for future development as part of comprehensive development plans. It recommends the implementation of appropriate zoning regulations, development control measures, and the establishment of necessary city-level infrastructure. These measures aim to guide and regulate the growth of urban areas in a systematic and sustainable manner. However, it is important to highlight that the success of the land management system relies heavily on proper local-level planning, robust implementation strategies, well-defined development policies, and the provision of essential infrastructure and social amenities ahead of anticipated development. Failure to undertake these preparatory measures can result in unplanned and chaotic land conversion, leading to sporadic pockets of development that are challenging for local authorities to monitor and regulate. This issue is particularly prominent in fringe areas, where the management system often falls short. Therefore, to mitigate the adverse effects of unregulated urbanization, it is essential to strengthen the land management system in peripheral regions. This entails comprehensive planning, proactive implementation strategies, and the provision of necessary infrastructure and services in anticipation of future development. By adopting a proactive and integrated approach, we can ensure that urbanization in these areas occurs in a controlled and organized manner, fostering sustainable growth and maximizing the benefits for both residents and the environment.

Keywords - Urbanization, Agriculture, Development, Urban and Land

INTRODUCTION

Urbanization refers to the process of migration from rural to urban areas, resulting in a rise in the number of individuals residing in urban areas and a decrease in those living in rural regions. Various factors like economic development, technological advancement, and social transformation lead to urbanization. As the population of urban areas increases, land use patterns also undergo changes for different purposes such as commercial, residential, industrial, and transportation. The impact of urbanization is significant on society, economy, environment, and culture. Urbanization has positive outcomes such as improved access to education, healthcare, and employment opportunities that enhance the standard of living. However, urbanization also has negative impacts such as increased air pollution, traffic congestion, and depletion of natural resources. To ensure the benefits of urbanization outweigh the drawbacks, governments and societies must manage it effectively through proper urban planning, infrastructure development, essential services provision, and policies that support sustainable development.

It can include densely populated centers, as well as their adjacent peri urban or suburban fringes (United States Environmental Protection Agency). The well-defined term “Urban” is adopted in India in the 1961 Census. As per the Census of 1961, Urban area includes:

- There should be a population density of not less than one thousand person per square mile.
- Population size should be 5000 or more of each area.
- Most of the Population (3/4th of the Population) should be engaged in Non-Agricultural Occupation.

As per the Census of India 2001, Urban Area defined as,

- a. All places having Municipalities, Municipal Corporations, Cantonment Board or notified town area committee etc.
- b. Other Places having:
 - i. A minimum population of 5000.
 - ii. At least 75% of working population (Male) engaged in Non-Agricultural occupation.
 - iii. Places having population density of at least 400 persons per square kilometres.

The term urbanization has different meanings depending on the scientific discipline or specialist involved (Firman, 1992). For economists, urbanization is a process that accompanies the structural transformation of the regional economy, involving growth in non-agricultural activities (Reismann, 1964; McGee, 1971; Choe, 1981; Bhadra and Brandao, 1993). Sjoberg (1960) also emphasized the importance of non-agricultural occupations in defining urbanization, as it involves an increase in population density and heterogeneity of such occupations. Breese (1966) defines urbanization as a process of becoming urban, involving a shift from agriculture to other pursuits common in cities and corresponding changes in behavior patterns. Friedman (1966) provides two definitions of urbanization applicable to LDCs. The first refers to the concentration of previously dispersed populations primarily engaged in farming into a small number of settlements whose main economic activities are in the service, trades, and manufacturing sectors. The second meaning involves urban modes of production, living, and thinking originating in these centres and spreading to outlying towns and rural populations.

Deriving Terminologies

Urbanization is the process of population concentration and physical expansion of urban areas, typically characterized by the growth of cities and towns. It involves the migration of individuals from rural or less populated areas to urban centres in search of improved economic opportunities, better living conditions, and access to social and cultural amenities. This influx of population presents a major challenge for local governments, which must expand the municipal area to accommodate the growing population and provide adequate infrastructure services and facilities.

As cities expand, agricultural land undergoes transformation due to the conversion of land for residential, commercial, and industrial purposes. This transformation in agricultural practices, land use, and production systems is known as agricultural transformation. It entails adapting to the changing needs and demands of urban areas. Land use is the utilization of the Earth's surface, encompassing developed and vacant land. It is influenced by human behaviour and the specific requirements of different land uses. The efficient allocation of limited land between different major types of land use is crucial. The expansion of cities and the conversion of agricultural land into built-up areas can have significant implications for agriculture and the environment. It leads to changes in land cover, which refers to the physical and biological characteristics of the Earth's surface, including vegetation, water bodies, bare ground, and built-up areas. Land cover plays a vital role in ecosystem services such as carbon sequestration, water filtration, and providing habitat for wildlife.

IMPORTANCE

Land use and land cover change refers to the modifications and transformations that occur in the utilization and physical characteristics of the Earth's surface over time. It involves the conversion, alteration, or modification of land for various human activities and natural processes. Land use refers to the purpose or function for which land is utilized by humans. It encompasses different activities such as residential areas, agricultural fields, industrial zones, commercial spaces, forests, parks, and transportation infrastructure. Land use is influenced by social, economic, and environmental factors, as well as government policies and planning. Land cover, on the other hand, refers to the physical and biological features that cover the Earth's surface. It includes natural elements such as forests, grasslands, wetlands, deserts, and bodies of water, as well as human-made features like buildings, roads, and urban areas. Land cover provides information about the type and distribution of different surface features. Land use and land cover change can occur due to various factors, including population growth, urbanization, agricultural expansion, industrial development, deforestation, and natural processes like erosion and climate change. These changes can have significant environmental, social, and economic impacts. Monitoring and understanding land use and land cover change is important for sustainable land management, ecosystem conservation, resource planning, and environmental decision-making. Remote sensing

technologies, geographic information systems (GIS), and other tools are commonly used to study and analyse these changes over time, providing valuable information for land-use planning, biodiversity conservation, disaster management, and land resource management.

The conversion of land for different purposes is influenced by various factors that drive land use change. These factors include the underutilization of potential cropland, inadequate land management practices, faulty land use practices, population growth, land conversion activities, intensive fuel wood extraction, and cattle grazing. To address these challenges and promote sustainable land use, it is essential to implement effective strategies. One such strategy is the implementation of crop rotation practices, which can help improve the productivity of land and prevent poor yields. Additionally, it is crucial to avoid widening drainage streams to minimize soil erosion and downstream siltation. The decrease in forest areas and agricultural lands can be attributed to the rapid pace of industrialization and urbanization. These processes often lead to the loss of agricultural land and the conversion of forests for urban development. Such changes in land use and land cover have significant implications for the environment and local communities. It is important to recognize the need for balanced and sustainable land use practices that take into account the conservation of natural resources, biodiversity, and ecosystem services. This requires a comprehensive approach that integrates land use planning, conservation efforts, and the promotion of sustainable development (Jaykumar et. al, 2003). Urbanization has both positive and negative impacts on cultivated land. The effect of urbanization on changes in cultivated land is relatively small, and it varies depending on the mode of urbanization and the region in question. The expansion of built-up areas in different urbanization modes can have different effects on changes in cultivated land use. In some cases, policies aimed at protecting cultivated land by promoting population movement to small towns may unintentionally contribute to the occupation of cultivated land. This implies that the intended protective measures may paradoxically accelerate the conversion of agricultural land for urban development. It is important to consider these complexities and potential unintended consequences when formulating policies and strategies related to urbanization and the preservation of cultivated land (Xiangzheng Deng, 2014).

Urbanization contributes to the fragmentation of agricultural land, resulting in increased landlessness among households and a decline in the number of households with agricultural land. The regional patterns of urbanization are primarily influenced by the deteriorating structural conditions in agricultural land tenure and the worsening socioeconomic conditions in rural areas, particularly when compared to more urbanized subregions (Joyo Winoto and Gerhardus Schultink, 1996). Urbanization resulted into transformation of agriculture from traditional to modern farming practices. The government policies should be designed to support small-scale farmers and promote sustainable agriculture to ensure food security and environmental sustainability (Yoon, H. et. al, 2017).

The urbanization has led to the fragmentation of agricultural land, decreased agricultural productivity, and increased food insecurity in rural areas. However, it has also led to the growth of urban agriculture, which can contribute to food security and income generation (Kumar, S., & Swaminathan, M. S., 2017). Urbanization has led to the conversion of agricultural land into urban areas, resulting in a decrease in agricultural productivity and an increase in food insecurity (Singh, J. P., 2015). The urbanization has also led to the fragmentation of agricultural land, decreased agricultural productivity, and increased land-use change. However, it has also led to increased diversification of agricultural activities and a shift towards high-value crops (Ghosh, S., & Ghosh, S. K., 2019). The urbanization has resulted in the transformation of agriculture from traditional to modern farming practices, but this has also led to environmental degradation and social inequality (Ramachandran, S., 2016). The urbanization has positively influenced agricultural productivity by increasing access to technology and markets (Huang, J., 2016). The urbanization leads to the shrinking of farm land. He also talks about the widening gap between the demand of food products and the total agricultural production. The consumption pattern of people also affected by the urban areas (Vijay Kumar, 2019). The Urbanization exacerbates the growing disparity between demand and supply in various aspects of urban development. It is essential to address this issue by integrating comprehensive and balanced approaches to urbanization and development. The focus should not only be on the physical expansion of urban areas but also on the simultaneous improvement of infrastructure, services, and amenities. To bridge the gap between demand and supply, it is crucial to adopt integrated planning and development strategies. This involves considering various factors such as population growth, housing needs, transportation requirements, employment opportunities, and social amenities. By taking a holistic approach, policymakers can ensure that urbanization is accompanied by the necessary infrastructure and services to meet the increasing demands of the population. Furthermore, it is essential to prioritize sustainable urban development practices that promote resource efficiency, environmental conservation, and social inclusivity. This includes the development of green spaces, efficient waste management systems, renewable energy initiatives, and affordable housing options. By integrating these elements into urban planning, the negative impacts of urbanization can be mitigated, and a more balanced and sustainable development pattern can be achieved (Vijay S. Jariwala, 2017).

The impact of urbanization and industrialization on agriculture has been extensively studied, and findings consistently highlight the negative consequences of these processes. Industrialization, in particular, has been identified as a significant contributor to the pollution of air and water resources. The release of harmful gases and suspended particles from industrial activities deteriorates air quality, posing a threat to crop health and productivity. Additionally, the deposition of pollutants can reduce the pH of the soil, making it less suitable for agricultural cultivation. The contamination of water sources due to industrial effluents further exacerbates the challenges faced by farmers in obtaining clean and adequate water for irrigation purposes. To address these issues, it is crucial to develop and implement specialized measures and techniques that can mitigate the adverse effects of industrialization on agriculture. This may include the implementation of stricter environmental regulations and pollution control measures in industrial sectors, as well as the promotion of sustainable farming practices that prioritize soil and water conservation. Furthermore, the adoption of innovative technologies and practices, such as precision agriculture and hydroponics, can help reduce the reliance on conventional agricultural methods that are more vulnerable to pollution and environmental degradation. These approaches can improve resource efficiency, minimize chemical inputs, and optimize crop production in urbanized and industrialized areas (Deepak Kochar, 2020).

Conclusion

Urbanization presents a range of challenges that must be addressed. These challenges include ensuring food security in the face of diminishing agricultural land, combating soil degradation caused by urban activities, tackling environmental issues resulting from pollution of air and water, and addressing social inequalities that can arise from uneven distribution of resources and opportunities in urban areas. The increasing gap between the demand for food and its supply is a direct consequence of urbanization. With agricultural land decreasing, the overall production of crops struggles to keep up with the rising food demands of a growing population. This imbalance highlights the need for sustainable agricultural practices and innovative solutions to bridge the gap between demand and supply. While urbanization is essential for societal and economic development, it is crucial to strike a balance between urban growth and the protection of agricultural land. Effective urban planning and policies should be in place to safeguard agricultural areas and ensure the provision of necessary services and facilities for both urban and rural communities. By addressing these challenges, we can promote sustainable urbanization that supports agricultural development and preserves the environment for future generations.

References

1. Jaykumar, S., Kuppannan, P., & Kannan, R. (2003). Land use change detection in a part of Kodaikanal taluk, Tamil Nadu using remote sensing and GIS. *Journal of Indian Society of Remote Sensing*, 31(3), 189-196.
2. Xiangzheng Deng. (2014). Urbanization and Changes in Cultivated Land: Empirical Study on Chinese Villages. *Sustainability*, 6(12), 9264-9282.
3. Vijay Kumar Hemappa Manegar (2019): Urbanization and its impact on agriculture, *International Journal of Research and Analytical Reviews*.
4. Sood, A., & Sood, S. (2019). Impact of urbanization on agricultural land use in India. *Journal of Environmental Biology*, 40(3), 407-412.
5. Jariwala, V. S. (2015) Urbanization and its trends in India – A case of Gujarat, *Artha-Vikas Journal of Economic Development*, Vol 51, Issue 2, pp. 72-85
6. Aruna Dash, S. D. (2017) "Urbanization, Migration and Economic Growth of India: Trends Challenges and Opportunities. *The Indian Economic Journal*, 4-10
7. Deepak Kochar, Sushil, & Rahul. (2020). Effect of Industrialization and Urbanization on Agriculture. *International Journal of Environmental & Agriculture Research*, 6(12), 18–25. <https://doi.org/10.5281/zenodo.4405056>