

**THE IMPACT OF URBAN EXPANSION AND SUSTAINABLE FARMING
PRACTICES IN AGRICULTURAL SECTOR OF PAKISTAN**

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ABSTRACT

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In Pakistan population growth rate has increased drastically, in the recent years. It is the matter of serious concern for a country like Pakistan because the economy of the state lies in the agricultural sector and urban expansion is threatening our sustainable farming. With the expansion of urbanization, fertile land is shrinking which leads to economic devolution. People use to migrate from rural to urban areas in large number in recent years, due to the availability of better opportunities including better health and education services, good transportation and communication and a better livelihood in urban regions, this resulted in the shortage of fertile land in country. This paper is written through systemic literature review of recently published 20 articles. Secondary data is collected by examining data from Google scholar, and JStore. This data was collected, reviewed and analyzed to find out the causes, results, impacts and the consequences of urbanization. This article highlights the significance of proper urban planning, sustainable farming practices and prosperity of agriculture sector in the country. The review of the studies revealed that one major reason is the development of housing societies which focused more fertile land being consumed to ensure better life standards. Reduced agriculture land has affected the economy by increasing the dependence on imports of food products to fulfill the local demand affected the economy of country. Through proper urban planning and better housing policies we can spare more land for agricultural use. It will make us less dependent on imports and lead to a sustainable economy.

Key words: Urbanization, sustainable farming, agriculture, land capacity, Pakistan

INTRODUCTION

Global urbanism and the growth of cities provide great challenges. The population expects these areas to fulfill many of their economic and social needs. Our valuable fertile agricultural land is now used for homes, buildings, businesses, and the other uses to fulfill these demands of people. Fertile agricultural land is now being used in order to improve social and economic welfare. Land is the only source of food. Cities in developing countries are having problems and difficulties coping with the fastest rate of the growing population expansion in the world. They are taken as the factors behind economic and social advancement, representing variety and the vigor of human endeavors. (1996, Lash).

They also offer entertainment, employment opportunities, potential efficiency, and other advantages. The agricultural sector constitutes a significant part of the nation's sustainable economy (Boserup, 1965). While increased urbanization poses a threat to food security, a strengthened agricultural sector ensures its stability. Pakistan is recognized as the most urbanized nation in South Asia, with approximately 36.77% of people residing in cities today, a number expected to reach 50% by 2025 (Pakistan Economic Survey: 2021–2022).

Like other emerging nations in the region, Pakistan has witnessed a rapid surge in urbanization, resulting in a considerable increase in the urban population. Major cities infrastructure as well as urban land are under stress (Siddiqi, 2004). For example, of the 6.32 million people living in the Lahore area, 1.03 million were migrants, or roughly 16.4% of the overall population. In addition to other socioeconomic problems, the establishment of squatter colonies to house these migrants has resulted in difficulties with water, sanitation, education, and the conversion of agricultural land for urban use.

There is increasing concern about how neighboring productive agriculture is being impacted by metropolitan centers (Government of Pakistan, 2011). With 84% of its citizens residing in the metropolitan area, Lahore is the second most urbanized city in Pakistan, accounting for 36% of the country's total population that lives in urban areas. Pakistan's ability to increase food production in tandem with population growth is being strained by Lahore's continued growth and expansion, which is causing the loss of valuable agricultural fields.

There are obstacles to sustainable management since the Pakistani government is not doing enough to preserve farmlands from housing expansions surrounding big towns (Elahi, 2010). They are currently putting efforts to investigate policy tools in need-based allocation and affordable housing. Lahore is becoming more urbanized, but at a slower rate than in previous census cycles. Even yet, the current faster-than-average growth rate of 4% per year is anticipated to continue for a number of decades; by 2025, Lahore alone is forecast to be 90% urban, and 54% of Pakistan would be urban altogether (Elahi, 2010).

The growing commitment to urbanization has now resulted in the housing backlog which has reached 30% of the dwelling unit against the demand, and Lahore's economic welfare over past 40 years (Haque, 2007; Elahi, 2010). There is always a large number of unoccupied plots present in the colonies with quick services, and this leads to the call of policy recommendations (Bajwa, 2007).

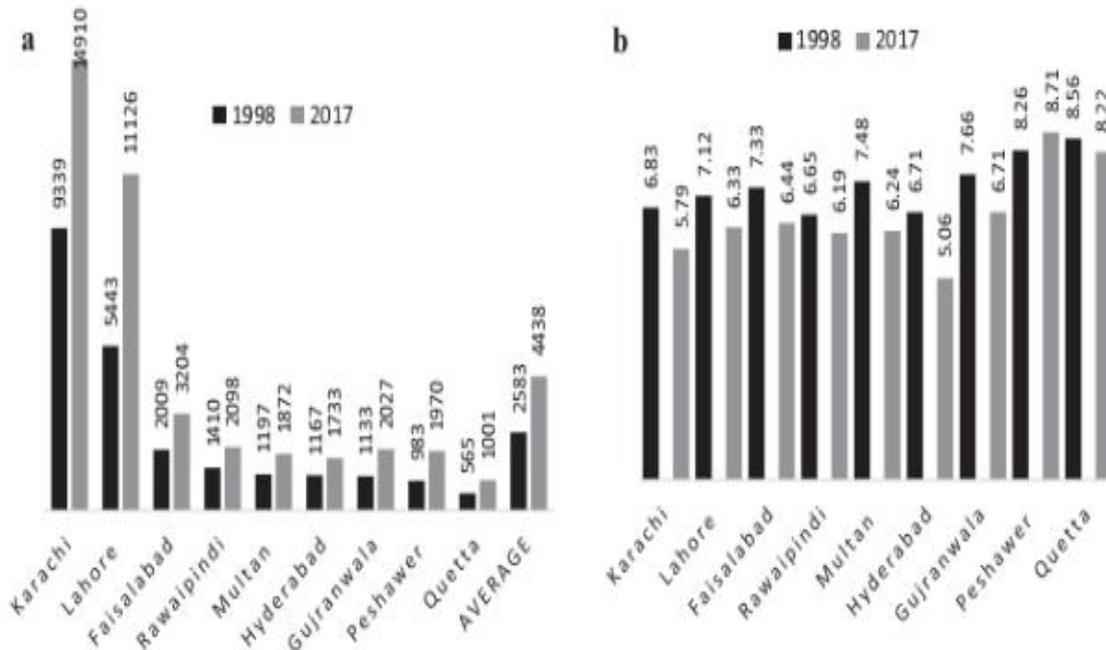
Urbanization provides enhanced life opportunities, employment, healthcare, transportation, education, and modern technology. The flow of employment from rural to urban areas is ensured through improved transit. However, these benefits come at the cost of arable and fertile land, which is our primary source of food. The conversion of land for urban expansion has resulted in a scarcity of arable land, challenging the expansion of more land into the metropolitan areas in order to accommodate the increasing population. This conversion of land process has become inevitable. Big cities in any country are the centers of economy. Cities are now experiencing a crucial rise in the population due to migration and natural growth. Mostly third world and the poor countries are suffering from this issue.

To settle this expanding population new homes, hospitals, infrastructure, buildings, factories and roads are constructed. For the sake of providing all these things we are using our fertile and productive land. Once the agricultural land is transferred to the urban area, it becomes hard to return it again to agricultural use. On the other side, Resource depletion and pollution are resulted by the growing populations. One more factor leading to the downfall of agriculture is the destruction of the natural nutrients because of the rising pollution. Urbanization is a reason for ozone depletion, climate change and deforestation.

Exactly after the independence, Pakistan has acted as hub for the migration. The people coming from Afghanistan and than from India led significantly to the rapid growth of population in country. Pakistan was already facing the shortage of food making it imperative to protect the existing land. Effective management of land is significant for sustainability. The expanding urbanization in Pakistan has affected our agriculture sector, by diminishing the arable land rapidly. This trend has raised very serious concerns for food security in the near future, we need to pay attention to the alarming transformation of fertile and the productive land of country (Yousaf et al., 2018). Agricultural Extension department and the Urban welfare Authorities are facing problems in persuading the real estate developers of detrimental effects of the urbanization on food security as well as agricultural welfare of country because of the fast growth of the urban regions.

Protecting a large area of agricultural land is very crucial due to the country's reliance on agriculture and the products of agriculture which plays an important role in the regulation of the economy. Preserving this significant asset is much crucial for ensuring the substantial growth of the agricultural sector, which is turning into backbone of Pakistan's economy very rapidly.

The main goal of the study is to give direction to future research on urbanization through highlighting the main and important problems that are coming up because of a country's rapid urban conversion. These problems include the major methodologies', themes, and the neglected regions and areas. The research articles published from about 2002 and 2023 are being reviewed in order to give a comprehensive result of the contemporary state of the urbanization in Pakistan.



The figure below shows the rapidly growing rate of urbanization in Lahore, Karachi, Rawalpindi, Peshawar, Quetta, Faisalabad, Multan and Hyderabad. We can see the spread of urbanization. This matter needs attention to be paid. Agriculture is most basic brick of our state, Pakistan being agrarian nation. Sustainable Farming and agriculture are most important for our economy. Economy of Pakistan is constraining due to the urbanization. Thus, it has caused an alarming situation. The main purpose of this research was to bring the attention of the government towards this issue. Fig 1 Household size and the population in the main cities of Pakistan in 1998 and 2017; source (GOP, 2016).

Agriculture basically plays a very significant role for strengthening GDP of the countries as Pakistan, providing approximately 19.8% (2016, GOP). A huge portion of the population, allowing 42.3% to rely on agriculture and its products for earning their livelihoods. When agriculture consists of 70% of the workforce, which may be directly or indirectly, the labor force of the country is extensively related to this sector. Furthermore, a huge portion of the nation's exports are derived from agriculture.

As the GOP (2016) indicates that there is significant shift in the population of nation with the growth in urban centers and a devolution in the rural ones. This rise in urban population raises concerns about the potential conflicts between food and land-use considering that the cities are basically developed on agricultural land (2017 Magsi et al).

The basic objective of my study is to highlight the consequences of altering land use, mentioning the crucial need for proper planning. As we know that Pakistan is currently facing the food shortage issues the major imperative is to keep our land from loss anymore. A sustainable agricultural sector can increase a nation's economic autonomy, food security and sustainability. Furthermore deforestation, often related with the land clearance for urbanization, basically contributes to the biodiversity loss and changes the local climatic conditions. Mentioning all of these problems diligently is important for promoting sustainable agriculture. This study also aims to enquire the growth of city areas and the housing patterns in our Pakistani cities, and to emphasize on the value of the agricultural products.

REVIEW OF LITERATURE

Fertile and valuable arable land is now disappearing very quickly as more people prefer to move and settle in cities due to the availability of better resources there. We have learned how expansion of cities affects the farming and agricultural land by reading different articles. After keenly reviewing the literature, we found two very contrary ideas. Some people were of view that cities are very good for the farming and agriculture as they let us use the updated and modern methods to produce more and

more food with very less land (Zhong et al., 2020; Iheke & Ihuoma, 2016). On other side few experts, i.e., Fatura et al., (2022) believes that loss of better farmland is a destructive thing which is caused by cities.

In our country, cities keep on growing as more and more people tend to move from the countryside, development of industry, and the job opportunities of the big cities. Urban areas like Karachi, Islamabad and Lahore are getting even bigger with a greater number of buildings and individuals. This quick growth has caused the issues i.e., not having enough houses, crowded transport, and unavailability of the enough basic services. Additionally, the way people live, and the changing communities work are due to city life. In order to understand this ongoing conversion in a better way, we should look into the latest available research about the way cities are now developing and how the people are surviving in them.

The agricultural industry of our state is pushed towards a miserable condition. we are not to overcome the situation on this stage as the population is expanding very quickly and we are expected to nourish them all. The available food is not enough for the entire population to be nourished. Most of the population resides in these cities of the country. Karachi is the fastest growing city in the world. Moreover Lahore, Rawalpindi, Hyderabad and Rawalpindi are also highly populated. Large Cities are areas where services and industries are based, and individuals work in the jobs unlike the rural areas where fishing, forestry and farming are the main income sources. So, the overall success of a country is dependent on agriculture, so policy makers and government need to pay attention to this issue.

METHODOLOGY

My research is based on the qualitative approach. I have used Systematic literature review (SLR) as the technique for research. It basically involves the systemic identification, evaluation and summarization of topics of the gather’s samples of literature review. Tool: The process used for enquiring the literature is known as the systematic literature review (SLR). This is the process of conducting research in order to obtain unbiased data, I employed the qualitative approach for conducting my research. For in-depth understanding of the study, I used secondary data from the papers which I gathered from the recently published papers.

Systemic literature review (SLR) is used for reviewing literature. A qualitative research approach is used for research to find out unbiased data. By realizing the scope of study secondary data has been taken from recently published paper. A comprehensive analysis of literature is done using Google scholar and jstore. Articles selection for review was based on relevance of research topic, quality of literature and latest study. This paper is written through systemic literature review of recently published 20 articles from 2008 to 2020. This data was collected, reviewed and analyzed to find out the causes, results, impacts and the consequences of urbanization.

Following are the articles which are being reviewed for writing this article

Articles	Year of publication	Author
The impact of urbanization on agriculture sector: A case study of Peshawar, Pakistan.	2015	Malik , R., and Ali M
Land use conflicts and urban sprawl: Conversion of agriculture lands into urbanization in Hyderabad, Pakistan.	2019	Peerzado, M. B., Magsi, H., & Sheikh, M. J.
Impact of rapid urbanization on the floral diversity and agriculture land of district Dir, Pakistan	2018	Shuaib, M., Ali, K., Ahmed, S., Hussain, F., Ilyas, M., Hassan,
Implications of urbanization on agricultural land:	2022	Chandio, N. H., & Shirazi, S. A.
Urbanization in Pakistan. In Keynote address delivered at	2014	Hussain, I.

South Asia Cities conference and Pakistan urban forum		
How Urbanization Effect Agriculture Output in Perspective of Pakistan. International Journal of Social Science & Entrepreneurship,	2022	Arif, M., & Gill, A. R.
Determining the role of agriculture towards urbanization: testing the hypothesis. International Journal of Agricultural Extension	2022	Riaz, N., Akram, W., & Javed, I.
An analysis of urban sprawl in Pakistan: consequences, challenges, and the way forward.	2021	Ahmed, S., Huifang, W., Akhtar, S., Imran, S., Hassan, G., & Wang, C

FINDINGS AND DISCUSSION

With the literature analysis I came to know that there is decline in the agriculture land due to urbanization. A huge amount of the land which was once used for the agriculture is now taken the housing. Being the agricultural state, it is a very significant loss. Our state's agriculture is the major source for the jobs, economy and exports. So, all of us are at risk due to the reduction of agricultural land. Government officials and policy makers must take this issue seriously considering the consequences. Urban planning must be done correctly.

Thus, all of these products are at risk because of the decline in land for agriculture. Officers of the Government and the policy makers need to look into the issue very seriously by considering the consequences. The planning of urban area needs to be done in correct way. Towers must be constructed in order to accommodate the enormous population. It will create some space that we may use for farming and other useful activities. Extensive research indicates that rapid urbanization is a global trend driven by population increase, industry, and rural-to-urban migration.

Increasing Urbanization Trends: Extensive research indicates that rapid urbanization is a global trend driven by population increase, industry, and rural-to-urban migration. People continue to migrate towards cities because of the superior chances they find there such as in terms of employment, healthcare, education, and transportation and because they may live better lives there. Because small places cannot accommodate such a large population, issues arise. The study's primary conclusions showed that, while the previous 40 years, 11,4630 acres of cultivable land have been altered, with 18% of that transformed area being occupied by colonies.

Land Use Transformation: Studies show that patterns of land use are changing significantly, with agricultural areas quickly transforming into urban areas. A few decades ago, people used to work in the fields and agriculture was the primary source of income. Although it was a source of food, several export goods, and jobs for a large number of people, lush agricultural land is currently being converted into urban areas. We are running out of agricultural land as we try to accommodate a growing population. The principal discoveries of this investigation are: From 1988 to 2008, 256 acres of cultivable land—or 12.8 acres annually—were converted into residential colonies. According to the results of the laboratory study of the 14 soil samples, the residential colonies' soil has a loamy to somewhat loamy texture, making it ideal for growing a wide variety of crops. (Jamal and Mohsin, 2014)

Impact on Agricultural production: Research continuously demonstrates how urbanization lowers agricultural production, pointing to issues such as increased competition for water supplies, soil deterioration, and land fragmentation. For country like Pakistan where agriculture plays an important role in supporting the economy of country, large number of agricultural products were exported out of country. But due to decreasing agricultural land we are running short of these products.

Population Pressure on Land: Research highlights how population pressure exacerbates the scarcity of agricultural land, highlighting the necessity of sustainable land management techniques to

satisfy rising food demands. Population explosion has started exerting great pressure on land. It has become very hard to settle such a large population in small areas of cities and provide them with all the facilities. Infected conversion of land has made it hard to provide them all with food.

Technological Solutions: Several studies demonstrate how technological interventions, such as vertical agriculture and precision farming, can help lessen the negative effects of urbanization on the amount of agricultural land that is accessible for farming. In this era where the world is growing in the field of technology, we should use it for increasing the production of food. Hydroponic culture should be adopted to produce more food without soil. We cannot control population immediately, but we can improve food production by using advanced technology.

Policy Challenges: Research indicates that current land use policies frequently fall short of meeting the demands of urbanization, which encourages unchecked growth and the encroachment of agricultural regions. Policy makers need to pay attention to this matter. Strict policies should be adopted to control population in these areas. Moreover, fertile agricultural land should be protected through implementing policies and laws.

Community Perspectives: Research done in communities shows a range of perspectives about the effects of growing urbanization. people in rural areas are concerned about disappearance of traditional and cultural ways of the life and the cultural landscapes. In urban hubs people are from different areas, everyone having very different living practices. Culture in agriculture societies varies from one which is followed in the cities. People living in urban areas are losing their traditional values because of the changing lifestyle and the diffusion process.

Water Scarcity Issues: Studies have repeatedly emphasized the connection between urbanization and water scarcity in heightened areas for agriculture calling for comprehensive strategies for managing the water resources. Water scarcity also poses a huge challenge for agriculture. It Lowers the water levels for the irrigation of crops and is lowering production of the food and is a barrier in our food security.

Successful Case Studies: It is possible to work together to make agriculture better. We can come together, implement the policies, and make efforts together for better results. A large number of case studies showed that how the communities have worked together, implemented the policies, and employed the strategic planning in order to manage the urbanization along with the scarcity of arable land. Now it is high time for realizing our duty.

Environmental Consequences: Research again and again shows how urbanization basically affects the environment in agriculture. These effects may include the decline in biodiversity, an increase of the pollutants, and a disruption in the ecosystem services which are important for successful farming. Migration towards the urban area also poses great pressure on some areas. Individuals start depleting the environment as they are increasing pollution, deforestation, the cutting down of trees and it ultimately leads towards change in the climate of specific areas.

Climate Change Impacts: Research showed a strong link between the changes in our agricultural land use, the urbanization, and effects of the climate change, mainly showing the need of using the climate-resilient Agricultural methods in both the urban and the rural areas. Climate change, which is caused because of human activities brings disturbance in agricultural production moreover we also need to take the steps in order to deal with all these challenges.

Sustainable Land Use Practices: Research tells how crucial it is to advance the sustainable practices of the land use, to compensate the damage of fertile arable land.

So, all the above-mentioned findings plays a very critical role for figuring out the link between urbanization and agricultural land, also gives a clear path to the policy makers in order maintain and promote the sustainable land use practices.

CONCLUSION AND RECOMMENDATIONS

Improving agricultural production will not only boost the country's s economic development, but it also ensures food security. But as we know that the population increases, urbanization and the environmental devolution accelerate, which has a lasting impact on the productivity of agricultural products. The most basic objective of my study is to figure out the impact of urbanization on a country's agricultural output. For fulfillment of this purpose, the study discovered that the production of country's agriculture is clearly and asymmetrically suffered from the rate of the population expansion in urban areas.

It has become clear that escalation of urbanization has very adverse effects on agricultural productivity, i.e. indicated by coefficient of the variable, showcasing a decline of 8.2391 units in agriculture production due to increasing urbanization. Likewise, the positive improvement in urbanization seems to be beneficial for the country's agricultural output. The coefficient value clearly signifies a 1.9750 unit rise in the agricultural output for every unit decline in the urban growth rate. On the other side, the study concludes that the Gross Fixed Capital Formation (GFCF) and the participation of labor force rate basically exerts a very positive and healthy impact on country's agricultural output. Along with all these things, foreign debt and direct foreign investment influence agricultural outputs very adversely. Environmental destruction is determined to be playing its role in slight negative impact, which is negligible, on a country's agricultural output.

The results of my research are very significant for the policy considerations, which emphasizes the need to compensate the crucial effects of the urbanization on agricultural production and safeguard the Pakistan's agricultural land. Policymakers are directed to make strategies that protect fertile lands from the conversion of urbanization. For the sake of enhancement of farm infrastructure, policymakers should also make it sure that the external debt is utilized effectively in agricultural sector. In a similar way, the leaders of Pakistan ought to provide farmers with loans and subsidies to raise the Pakistan's agricultural output. To use better seed varieties along with the application of current technologies, more research should be conducted. The current investigation is very limited. For many people the economy is based on the agricultural industry. Crops, livestock, forestry and fishing all come under the agriculture industry. So, we need to keep our focus on them too.

The unjust influence of urbanization is seen in my study. Although the impacts of growing urbanization on the agriculture is very evident, more research on the topic may find out the link between Pakistan's agricultural sub sectors and the urbanization. Moreover, as time series data is unavailable, the sustainable impacts of the urbanization on the groundwater level is overlooked. More research may also examine how a country's urbanization affects groundwater level.

A main factor affecting the agricultural areas includes urbanization. It is clear that the agricultural output plays an important role in food security along with enhancing economic growth. Urbanization, environmental degradation, pollution, and climate change are all due to the rapid population increase. Policymakers need to therefore enact laws to protect precious fertile and arable land. Well-defined and strict legal frameworks and rules are necessary in order to facilitate appropriate urbanization by preserving the agricultural land.

The following are the few recommendations which drew from review of literature.

1. Integrated Planning:

Promoting all-encompassing urban planning strikes the balance between protection of agricultural land and necessity for the urban development. To make sure the sustainable use of land, we need to promote the cooperative environment between cities and the rural planning.

2. Technology Adoption:

Promote use of the cutting-edge technology of agriculture i, e. The vertical farming techniques and the precision farming, in order increase the productivity in limited areas. Stressing the smart techniques for farming can be helpful in lessening the adverse effects of urbanization on available agricultural landscapes.

3. Policy Reforms:

Making recommendations for the policy changes who tackle with the issues of land destruction and the fragmentation brought by urbanization. Giving recommendations for making laws that protect the valuable agricultural areas and the incentives for the long-lasting management techniques for land.

4. Community Engagement:

It explains how important it is to involve the neighborhood groups in the processes of taking decisions about changing land use. Encourage instructions and consciousness.

Encourage awareness-raising and educational initiatives which will enable societies to get benefits and also adjust to urbanization.

5. Water Resource Management:

Promote the efficient management of water in the urban and the agricultural contexts in order to address the issues of the water shortage. laws that give sustainable water use priority to assist both agriculture as well as urban development.

6. Global Collaboration:

To present the global issues of urbanization along with the scarcity of agricultural land, promote international collaboration as well as knowledge-sharing. Promote the sharing of effective techniques and the solutions that are applied in the various locales.

7. Climate-Resilient Agriculture:

Promote use of climate-resilient methods of agriculture to compensate the impacts of shifting climate patterns on both rural as well as urban environments. Stress the importance of sustainable farming under the domain of global warming.

8. Sustainable landscaping

Encourage the incorporation of green space into the metropolitan areas for enhancing the environmental quality and moreover to offer them leisure possibilities. Encourage laws that results in the development of a sustainable landscaping as well as urban green areas.

9. Monitoring and Evaluation:

In order to determine the efficacy of land use policies, highlight necessity of the ongoing evaluation and monitoring. Prepare a complete proposal for creation of metrics to assess how urbanization affects the sustainability of environment and the productivity of agriculture.

10. Public-Private Partnerships:

Promote joint efforts in the public as well as the private domains for the execution of the long-lasting resolutions. Examine the prospects of public and private collaborations which bolster objectives of agricultural protection and urban growth.

By promoting sustainability and then guaranteeing the comprehensive approach all these things attempt to address the problems raised by urbanization along with the scarcity of agricultural land.

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