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URBANIZATION IMPACTS ON URBAN AGRICULTURE LAND CONVERSIONS AND CROP PRODUCTION IN METROPOLITAN LAHORE PAKISTAN

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ABSTRACT

The research aims to investigate the urbanization and urban agriculture land conversions in the Metropolitan city Lahore Punjab Pakistan. It describes spatiotemporal dimensions and pace of urban agriculture lands conversions by different urban development sectors. The research uses both primary and secondary datasets. The spatial primary data was created through digitization of housing societies and in-depth interviews of Lahore Development Authority (LDA) officials. The secondary data was collected from international journal articles, District Censes Report (DCR) Lahore, Agriculture Censes of Pakistan (ACP). Primary data and secondary data were visualized through digital maps and statistical charts. The results portray urban development sectors like LDA, CBD functions, commercialization and private housing societies' contribution in the agriculture land conversions since partition to the current era. The results revealed urban agriculture (UA) land conversions from 1947 to 2010 and contribution of different urban sectors in the conversion of urban agricultural lands. The decrease in crop production of two decades from 1986 to 2008 is also reported in response of agriculture land decrease. The development of housing societies in different towns of Lahore is also a crucial factor because low land rates converted agriculture lands to the housing societies. The major urban growth rate 4.1% of Lahore was in 1972. After 1972, private industries took the worth and shifted to local, regional, national trade. About 114,630 hector agricultural area is decreased by housing societies and other urban development sectors causing decrease in urban crop production. The study will be helpful for the planners and policy makers to cope with issue making metropolitan cities self-sufficient in food, livable and sustainable.

KEYWORDS: Urbanization, Urban Agriculture (UA), Urban Land Use & Land Conversion. Urban Development Sectors

INTRODUCTION

The major part of world population is concentrated in the mega cities of developing world. There is a great demand to avail every opportunity to get nutritionally adequate and safe food (Van Leeuwen, et al, 2010). Therefore, in developing countries urban/periurban agriculture (UPA) is generally practiced for food production. The main survival and livelihood strategy of (UPA) farmers household is cultivation. (Freeman, 1993; Atukunda and Maxwell, 1996; Rigg, 1998; Bryld, 2002). The additional benefits are self-employment and diversified income savings contributing to social instability (Van Leeuwen, et al, 2010). The communities are considering UA as a protection in unstable global market conditions and economic forces are promoting UA for better utilization of urban resources. (Van Leeuwen, et al,

2010). Approximately, 800 million civic population is engaged in UA world-wide (UNDP, 1996), that is 30% of the global urban population (UN, 2013), and 200 million of them were producing food for sale. The first number, and the widespread nature of UA, have been cited by various authors and agencies, including Food and Agriculture Organization (FAO) (FAO 1999, Kocetal.1999, Lee-Smith 2010, Mougeot 2005, 2011, Redwood 2009 and Smit et al. 2001). Majority of world's population is urban and there will be dramatic increase in the coming decade. The potential of UPA with reference to food security, natural resource conservation and green space facilities benefits yet not fully recorded and documented by the researchers and ignored by the policy makers (Pearson, 2010). Especially peri-urban zones more crucial as they are the mixture of urban rural landscapes. The diversity in population habitat, the morphological conditions, land uses, built up area densities and dynamic social structure are the key features of the peri-urban zones (Adell, 1999; Allen, 2001; Tacoli, 2001). These features will likely to become a part of urban system. This process of transformation decreases the cultivated areas because of urban areas are intruding to UPA areas (Zeng et al., 2005). Uncontrolled expansion and changing land use are raising many issues (Brook and Davila, 2000; Parveen et al., 2019). The controlling factors of urban expansion are geo-socioeconomic, such as population growth, economic development and policy (Xiao et al., 2006). Physical expansion of city distorts frontiers between urban, peri-urban and rural activity and merge, which provide opportunities for beneficial linkages (Rondinelli, 1985; Kaur, 1995; Riaz *et al.,* 2017). A giant proportion of the population lives in or around the mega cities including the peri-urban zone, where life depends mostly on natural resources for living (Allen, 2001). The encroachments towards peri-urban fringe are resulting in rapid commercial development along main roads connecting cities and the countryside (Sullivan and Lovell, 2006). The sustainability of urban and rural areas is compromised by the heavy flows of commodities, communities, capital, natural resources, and pollution to the peri-urban interface (Brook and Davila, 2000; Allen, 2001). UPA has potential to provide series of advantages in context of social, economic and environmental aspects (Pearson, et al, 2010, van Leeuwen, et al, 2010). It will provide a solution to ecologically unhealthy development of large urban agglomerations. There is a sociocultural integration in urban areas than rural ones therefore UPA can play an important role in the community development to provide unique benefits (Seymoar, et al, 2010; Karanja, et al, 2010; Summer, et al, 2010).

PROBLEM

According to different research findings, various urban sectors covert 3016 hector of agriculture lands annually for urban uses of Metropolitan Lahore. If this pace of conversion continues then total agricultural lands at the

fringes of Lahore will be converted to build up area up to 2030. This will create adverse effects on urban food security, environment and ecology of the city. The uncontrolled momentum of urban land use change may raise many other issues especially in peri-urban areas which act as transitional zone between urban and rural areas. The diverse conditions of peri urban areas of Lahore with respect to land uses, built area densities and social structure will likely be transformed to the urban system. This may speed up urban expansion and decrease of agricultural lands in the urban fringes. Like other megacities of developing countries, a significant proportion of the population lives in and around metropolitan areas and their livelihoods depend to some extent on natural resources such as land for food, water, fuel and space for living. The problem must be solved to prevent cultivated land conversions in Metropolitan Lahore for the survival of urban/peri-urban agriculture for the provision of series of advantages in context of social, economic and environmental aspects.

STUDY AREA

The study area is a Metropolitan Lahore. Lahore is the second largest city of Pakistan and the provincial capital of Punjab and called “Heart of Pakistan’’. Lahore city is the 8th largest city in the Islamic world and 42nd most populated urban area of the world. It is considered as the cultural and academic center of the country. Geographical location is between the 31.15`-31 45` N and 75 01-74 39` E. The River Ravi is the main river of Lahore. Total area of Lahore is 1,772 sq. km. Lahore is 213 meters (m) above the mean sea level. It is the historical center of South Asia. The recent estimate of population is over 10 million and density of population is about 7000 persons km. The population of Lahore will increase more than 22 million by 2025 (Siddiqi, 2004). Lahore is a metropolitan city and has provided all types of opportunities, which attracts the attention of surrounding population and all over Pakistan. There is a vast contrast in the rural and urban population. In current censes (2017) approximately 82 % of population is civic and 18 % is rural. Lahore is divided in to eight administrative units called towns as shown in Fig.1

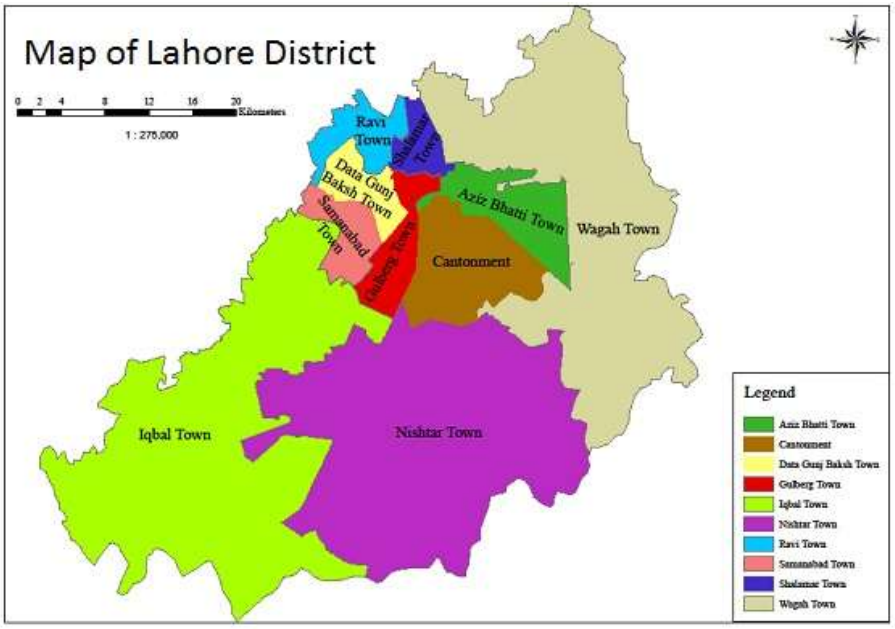

Fig.1: Town Map of Metropolitan Lahore District
Source: LDA, Modified by Author

METHODOLOGY

Both primary and secondary data is used in this research study. Secondary data was used to find out the temporal agricultural land use conversions, urban land use conversion sectors and its effects on UPA crop production. The data was collected from Punjab research articles which was further verified by Agriculture Censes of Pakistan (ACP) and Lahore Development Authority (LDA) The data was modified according to the subject requirements and graphical presentation of secondary data was displayed through SPSS software. The primary source of information to assess spatiotemporal process of urban agriculture land use conversion in different time span were In-depth interviews, conducted from (LDA) officials. The spatial primary data was created to show the housing societies in different towns of Metropolitan Lahore using Geographical Information System (GIS). In this case housing societies as a secondary source of information was collected from (LDA), Cantonment Board Lahore (CBL), and Bureau of Statistics Punjab (BOS).

RESULTS AND DISCUSSION

The section comprised of the results and discussion about urban agriculture land conversions of Metropolitan Lahore since partition of Pakistan. It describes the contribution of different urban sectors involved and their temporal pace in agriculture land conversions. On other hands it also displays the agricultural land conversions effects on local urban crop

production. The section discussed policies of Govt. of Pakistan having deep impacts on pace of urbanization in Lahore and urban agriculture land conversions. The section also discussed the role of housing schemes engulfing the cultivable lands of Metropolitan city Lahore.

Agriculture Land Conversions of Metropolitan Lahore since 1972-1910

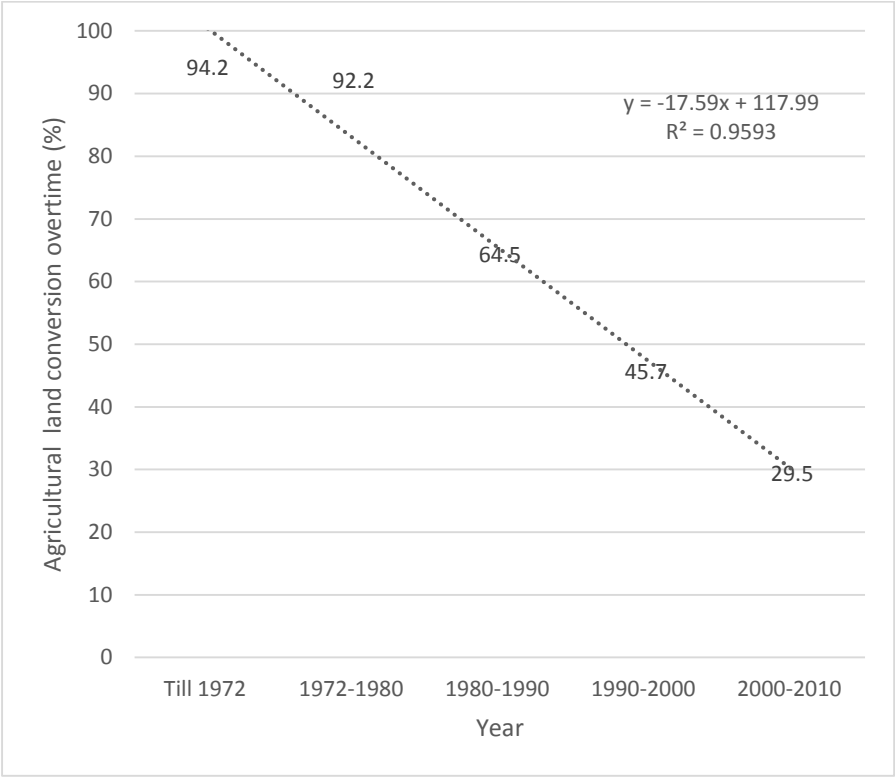

Fig. 2 Agriculture Land Conversion of Metropolitan Lahore
Source: Uz-Zaman, 2012. Modified by Author

Since partition near about one million refugees were pushed towards Pakistan. Majority was from eastern Punjab and most of them preferred to live in the urban areas of Lahore. Pakistan resolution was passed in Minto Park Lahore, therefor the major destination of Indian Punjab refugees was Lahore. Lahore is a basin of River Ravi and holds fertile land suitable for agriculture. Most of the refugees settled in Lahore were farmers. They select farming as a profession and easy source of earning in Lahore. The invasion of refugees accelerated the process of urbanization at the cost the fertile agriculture land conversions. Other factor was industrialization of late sixties caused the rush of urban population and agricultural land conversions. The boom of urbanization started with the new industrial

policy of prime Minister of Pakistan Mr. Zulafkar Ali Bhutto. The new reforms came in to being in industrial policy. Government preferred the privatization policy of industries. This policy effected the fertile agricultural lands of northern Lahore which comprised of the tributaries of River Ravi. Mostly the vegetable cultivators were here and accomplish the 50% demand of potatoes for the indigenous population. This area was connected with CBD and entrance of Lahore. Market access was very easy. On the other hand, the area was flood prone and land value was very low. Therefore, mostly agriculture land was converted due to low rates. The major urban growth rate 4.1% of Lahore was in 1972. It was the major push in the history of Lahore. The main reason was the speedy industrialization in that era. The industrialization speeds up the migration process from the vicinity and from outside Lahore. After 1972, private industries took the worth and shifted to local, regional, national trade. The process got the peak by crossing the international borders. It brought wealth and the wealth power targeted the southern Lahore with the development of new settlements and infrastructure. The urbanization expanded Lahore beyond CBD and walled city in the southern side. The second large growth rate was from 1981 to 90 and 1990 to 2000 because of the major push in the real estate industry. The businessmen and investors focused their attention in the southern Lahore due to privatization liberty by government and low land values. Government and private sector started the investment in the real estate. There was a start of main housing societies in the Lahore. Due to increase in inflation rates the property prices were boosted up. There was a start of great investments in the housing societies and cooperative housing societies in the Lahore. This trend also accelerated the rate of migration especially from the outside of the Lahore. Mostly rural population outside the Lahore and vicinity turned to migrate and reside in the Lahore. That was the largest intersensal increase in the population growth rate in the history of Lahore. The process is still in the progress and going to increase with near about with constant rate with somewhat fluctuation because of the start of conurbation process of Lahore which is intruding in the adjacent districts. In short, migration from the different areas towards the city in the search of job and education opportunities has mainly contributed to the increase in population. Lahore has been experiencing the massive population explosion, which is creating the huge pressure on the urban land and infrastructure of the city. The recent estimate of population is over 10 million and density of population is about 7000 persons per sq km. It is estimated that the population of Lahore will cross the 22 million up to 2025 with limited land resources.

The Urban Sectors Contribution in Agriculture land Conversions of Metropolitan Lahore

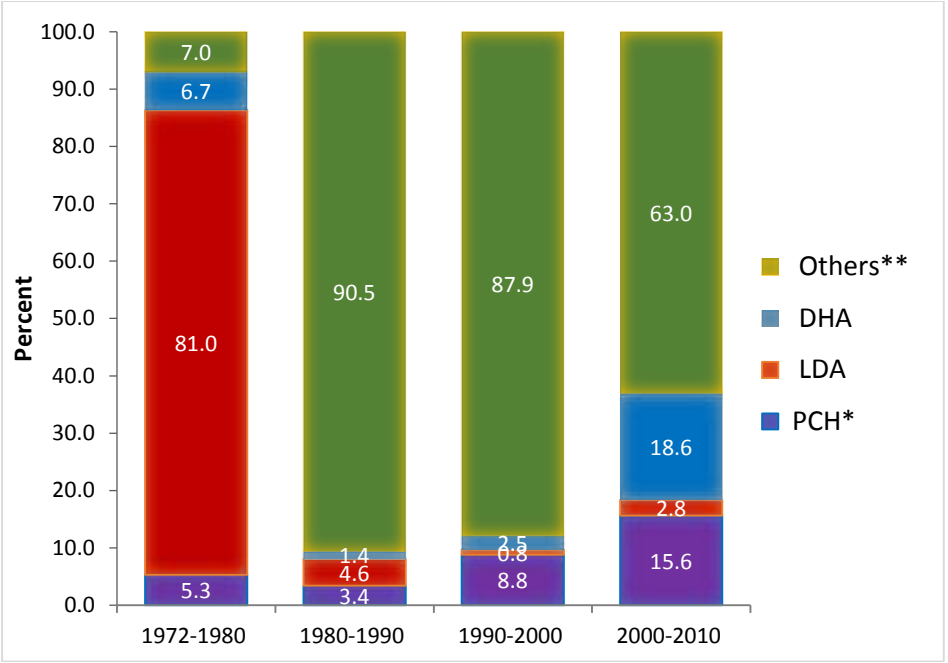

Fig.3 Percentage Share Over Time of Different Urban Sectors in Agriculture Land Conversion of Metropolitan Lahore
Source: Uz-Zman, 2012. Modified by Author

PCH* Private cooperative housing societies others** Infrastructure, roads, CBD functions and commercialization, DHA, Defense Housing Authority, LDA, Lahore Development Authority

Since the refuges entrance in Lahore from Indian held Punjab, the local departments were not well established. Urbanization process was not properly planned. Beside immigrants from India, local rural population was also settled in urban areas and vicinities for agriculture, building constructions and infrastructure development. Later on, these people settled in Lahore. To channelize the process of urbanization in Lahore, Lahore Development Authority (LDA) was established in 1976. LDA urbanized most of the open lands to accommodate large number of people settlement in Lahore. So, most of the land were turned into settlements and housing societies. Therefor the major contribution from urban sectors in agriculture land conversions from 1972 to 1980 was LDA, which contributed up to 81%. From 1980 to 2010 the major share of agriculture land conversions contribution was from overall process of urbanization that was speed up due to real estate industry. In Fig.3 from 1980 to 2010 the

agriculture land conversions were with "others". Others means road and network infrastructure, CBD functions and commercialization. The major urban center was walled city and side areas were the vicinities. Walled city was the first point of urbanization. GANJ BAKHSH Town areas were in the urban center from where the urbanization process started. Then urbanization directed towards south and east towards Ravi Town, Samnabad Town and Aziz Bhatti Town (Cantonment). Ravi Town hold very cheap agricultural lands. With the start of industrialization and development projects the population of adjacent district Sheikhupura rushed towards Ravi Town to enjoy the civic facilities of Lahore. High class settlement started in Gulberg with the development of new housing societies that cause the development of two new towns. Iqbal towns and Nishtar Towns and the further developments are still under progress. The process of urbanization with the real estate business also moved towards eastern rural towns along the Indian border namely the Shalimar Town and Wahga Town. The development projects are engulfing the agriculture lands in these rural towns.

Decrease in Production of Different Crops Grown in Lahore Because of Decreased Cultivated Area from 1986-87 to 2007-08

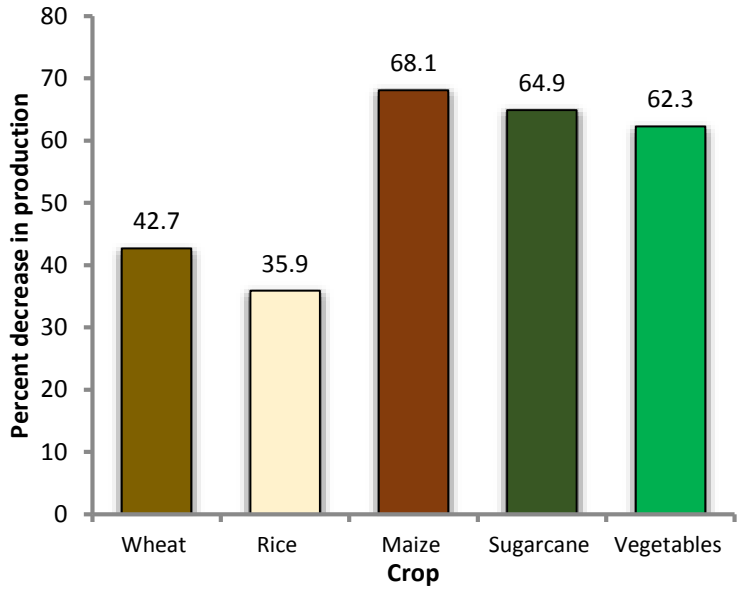

Fig.4. Decrease in Production of Different Crops Grown in Lahore Because of Decreased Cultivated Area from 1986-87 to 2007-08
Source: Uz-Zaman 2012 Modified by Author

The fig. clearly depicts the urbanization impacts urban/periurban agriculture crop production from 1986 to 2008. The urban/peri-urban agriculture land use conversions have very adverse effects on the urban agriculture crop production. The indigenous population of Lahore is suffering from the effects of significant decrease in the locally grown perishable fruits, vegetables and other cash crops. It is estimated that annually 3,016 ha of agricultural lands on the fringes of Lahore are being converted to urban use. If this urban land use policy is not changed by the officials, then remaining cultivated area of 52,332 ha will be exhausted by 2030 (Uz-Zaman and Baloch 2011). The housing schemes in urban areas are not only effecting the cultivable area but also adversely reducing the crop production (Dowall, 1995). About 114,630 hector cultivated area is decreased by housing schemes that is main cause of decrease in urban crops production. Housing schemes owners usually convert cultivable lands to the waste lands because these lands remain unused for several years and even decades as happening in Lahore. According to Saleem (2007) an induction of smuggled production into urban market had destroyed several industries and owners have invested their remaining in the real estates as an alternative business. Feudal and big land owners followed industrialists and launched housing schemes, on their lands. It is duty of policy makers to bring back industrialists into productive activities to discourage the development of housing schemes. Due to population invasion in to the mega city like Lahore the rate of urban/peri-urban agricultural land conversion into housing schemes is very high than the population invasion and accommodation demands. This tendency will encourage more urban lands conversions in to housing schemes. The limited UA areas require higher agricultural productivity without environmental deterioration (De Bon, 1999). Therefore, urban stake holders of Lahore should give more attention to urban/ peri-urban agricultural practices; it will be helpful in reducing urban food insecurity, employment and environmental sustainability.

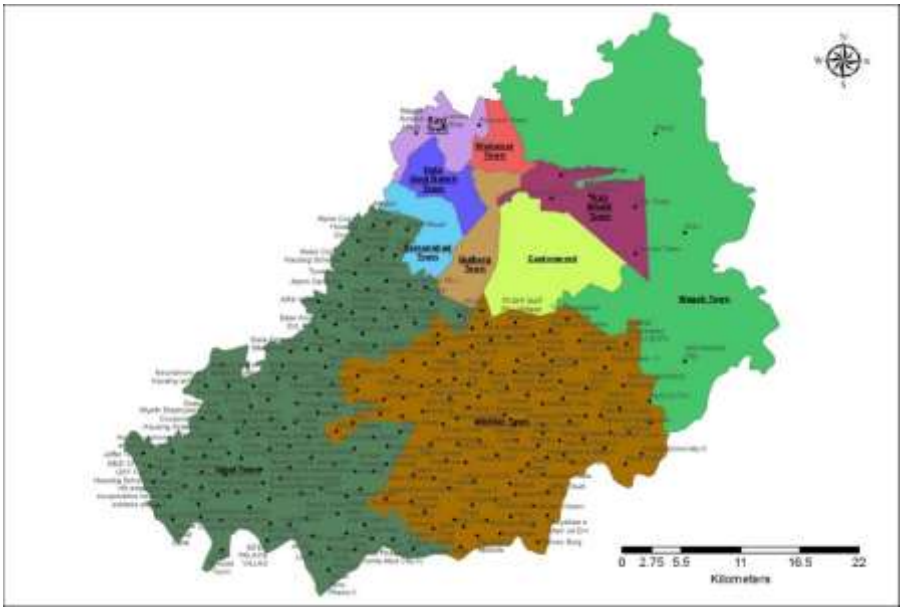

Fig.5 Development of Housing Societies and Urbanization From 1970 to2018 in Lahore
Source: LDA, CBL modified by Author 2018

CONCLUSION

From 1947 to 1972 the agriculture land conversion of Lahore was very high. Because of partition migration from Indian held Easter Punjab agrarian population and development policies of president Ayyub Khan from 1956 to 1965.It continued till 1980 with privatization policy of Prime Minister ZA Bhutto. Then boom of housing schemes started in 1980 and it is to be continued till now with the development of new infrastructure to accommodate population, coming from rural areas, adjacent districts and from other regions of Pakistan. Now the lands for agricultural activities are very limited which will be expected to eliminate by urbanization up to 2030. As the results showed that there is very significant decrease in the local urban food production. In near future urban/peri-urban population of Lahore will certainly suffer from food insecurity, environmental and ecological deterioration and living space for accommodation. For alignment of complex and dynamic urban systems, stakeholders and policy makers concerned should develop the instruments to hinder agricultural land conversions and elimination of local urban food production. There should be policy debate amongst the stake holders to enhance the understanding of opportunities for the development of urban/peri-urban agriculture available in the limited land and natural resources of Metropolitan Lahore.

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