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# Drivers of Unfettered Urban Sprawl in Pakistan

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## ABSTRACT

Urban sprawl is a global concern, however, developing countries are failing to effectively overcome this problem. For instance, in Pakistan, urban development policies are tenuous and urban areas remained without certified boundaries. This failure is mainly causing an unfettered sprawl in major cities of the country. An alarming fact is that most of the urban sprawl is consistently taking place on fertile agricultural land in the peripheries of cities. The researcher has verified the problem through literature and by supervised classification of the satellite imageries to specifically verify growth of Peshawar city. This research contributed to unveil the fundamental causes of the unrestricted urban sprawl and its aftereffects in the context of Pakistan. Finally certain reforms and techniques are suggested to curb leapfrogged and low-density haphazard growth of cities.

### KEYWORDS

Housing Societies, Loss of Agriculture Land, Migration and Intensification, Urban Sprawl

## 1. INTRODUCTION

Worldwide urban areas have been characterized by sprawl, however, developed countries succeed to overcome this problem through better management practices and policy options (OCED, 2018; Jiang, 2016; Habibia & Asadi, 2011). It is believed that cities are inclusive units; they have to accommodate people choosing these places to live in. Therefore, it is inevitable for cities to grow with the passage of time as per its population increase. However, cities never grow in a planned manner (i.e., vertically or at appropriate direction) but rather sprawl on prime agricultural land in Pakistan. Sprawl is dissimilar to urban growth as sprawl is a form of urban expansion that is unplanned and unsustainable (Sinha, 2017) brings miseries and environmental degradation (Gordon & Richardson, 2000). Yin and Sun, 2007 described that urban sprawl has been the cause of many environmental problems in cities of United States before 1960, until they adopt Growth Management Program for cities. Galster et al, (2001) labelled poor planning and weak governance procedures for sprawl of cities across the US. However, Fulton et al, (2001) declared that population increase and sub-urbanization intensified land consumption relatively in cities of various countries. Most often government policies, institutional strength and adherence to development plan, work to discourage sprawl. Lopez and Hynes, (2003) described that migration and natural increase influence population growth and it concurrently caused change in land consumption earlier in US cities.

The streaming of immigrants and amalgamation of contiguous towns/villages into cities is a continuous phenomenon of contemporary urbanization in developing countries (Kugelman, 2013;

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2014). This process has caused a consistent increase in urban sprawl and loss of agriculture land. Angel et al., 2011 estimated that in the year 2000 global urban land cover was approximately 0.6 million $km^2$, while it is projected that it will cross 1.25 million $km^2$ by 2030. Considering the continuous rise in unmanaged urbanization and proliferation of cities, it is expected that by the year 2050 urban land cover will cross the figure of 2 million $km^2$ (Angel et al., 2011).

Various United Nations (UN) reports indicated that in 21-century the countries whose majority were rural would become predominantly urbanized (Kugelman, 2014). Pakistan is projected to cross this limit in 2025 to be called more urban and according to current projections, this will have risen to 70 percent by 2050 (World Bank, 2006). This phenomenon would further intensify sub- urbanization, agglomeration and the formation of hyper cities. No doubt urbanization brings prosperity and development, if it is properly planned. In this context managed urbanization is an essential prerequisite for development, as no country in the World has developed without encouraging planned urbanization (Nadeem Ul Haque, 2014). There is a direct correlation between urbanization and the GDP of a country (Sardar, 2012; Nadeem Ul Haque, 2014). Hussain and Tahir, 2014, verified that if a country succeeds to better manage its urban areas, then it will always enjoy lower cost of service delivery per capita, to keep providing better living conditions and better opportunities for personal happiness and economic accomplishments. However, uncontrolled urbanization is inversely proportional to the standard of living as witnessed in the cities of developing countries. It has been the cause of failure for various efforts of the government agencies to improve its urbanities.

It is of grave concern that urban growth is almost unplanned in Pakistan. There exists no policy for urban management and have no certified boundaries for cities. Urban centers have grown consistently without any land use plan and control. Consequently, urban sprawl most often progressed on the fertile agricultural land contiguous to cities. This is an unsustainable development pattern. The goal of this research is to highlight the causes of unfettered urban sprawl and to encourage urban planning to ensure urban land management in the future. It is an admitted fact that poor governance, the nonexistence of land management policy and ineffective urban planning intensify the migration of masses towards cities. Therefore, population increase, and boundary expansion is become a permanent feature of cities in Pakistan. The significance of this research is to highlight that, metropolitan cities are on the way to sprawl further and further and have no sign to stop at a certain point in Pakistan. Finally, this research recommends various policy options along with effective urban planning techniques to prevent further sprawl of cities in Pakistan.

## 2. RESEARCH DESIGN

This research is initiated to identify the real causes behind the unfettered urban sprawl in Pakistan. In order to understand the phenomenon of urban sprawl (in the context of South Asian countries) verification from various UN reports and individual research was carried out to grasp the problem. Thereafter, metropolitan cities of the country's four provinces were selected to study its population growth rate and spatial expansion from the literature. Official census reports were mainly used to investigate population growth rate. While the migration record is established through literature and Social Welfare Department as well as UNHCR official record for the various events (The war of 1971; The Afghan refugees and the internal unrest due to militancy) occur in the history of Pakistan. Urban expansion of the selected cities (Karachi, Lahore and Quetta) was verified from literature. While the case of Peshawar city was practically verified through GIS analysis of the archive images of 2010 and 2020. The CA Markov model was used to predict the future land use and land cover change detection for 2030. This analysis helps to quantify the loss of agricultural land into urban sprawl in Peshawar city. To ascertain its causes certain important factors were verified such as rampant construction of housing schemes, internal and external migration towards the city and its boundary extension towards its periphery.

## 3. NEXUSES OF URBAN SPRAWL IN SOUTH ASIA

Contemporary world statistics highlighted that urban sprawl is largely an underdeveloped country's phenomenon. According to UN estimates, around 44 million people are urbanized every year in Asia (Roberts and Kanaley, 2006). This exhibit that, a further 120,548 people are increasing each day in cities within Asia. Roberts and Kanaley, (2006) predicted that due to massive shift of people more than 12 $km^2$ of productive prime agricultural land and foreshores are generally lost daily due to sub urbanization. Similarly, Sardar, 2012, seconded that during 1980-2010 about 0.11(ha) land/capita loss occurred in Bangladesh, 0.15(ha) land/capita loss occurred in Nepal and 0.23(ha) land/capita loss occurred in India, while in Pakistan about 0.24(ha) i.e 5 kanal[1] land/capita were on continuous loss due to urban sprawl. This is important for the policy makers that why Pakistan, which is much lesser in population than India, its rate of land loss is much greater comparatively to the neighboring countries.

Ellis and Robbert, (2016) calculated that land requirements for urban expansion in South Asia till 2050 would cross the permissible limits. They considered both the best and worst cases scenarios to indicate urban land requirements (see World Bank Leveraging Urbanization report 2016 for South Asia). The calculated figures are mentioned in table-1.

The estimates mentioned in Table 1, reflects that urban sprawl in South Asian cities looks set to continue horribly through the twenty-first century too, presenting challenges for managers. According to Ellis and Roberts 2016, there is an about 1764.5 $km^2$ or 6736.23 $km^2$ per year of land (in worst case) requirements are expected for urban expansion in Pakistan. This is worrisome that the calculated figure for 2050 is about 36% of the total land of the country. This loss of land will certainly spoil prime agricultural land contiguous to the cities. Where in many cases basic principle of urban planning and land management standards has been almost non-existent. Samie et al. (2017) articulated that urban area and desertification increased many times at the cost of agricultural land during (1950-2015) period due to demographic changes and economic development across Pakistan. Urban sprawl in a leapfrogged pattern consumes more land in the vicinities of cities. The prospects of sustainable development are at great risk in Pakistan and would dreadfully intensify the phenomenon of climatic change in the future.

## 4. URBAN SPRAWL IN PAKISTAN

Urban sprawl progressed due to uncontrolled urbanization and has caused loss of prime agricultural land in the vicinity of cities in Pakistan (Khan et al 2014; Samiullah, et al. 2019). Their research

**Table 1. Urban land requirement scenarios (2010-50) for South Asia**

| Country | Total area in $Km^2$ 2020 | Urban Area in $km^2$ 2010 | Projected Urban Area in $km^2$ (Best case - 2050) | Projected Urban Area in $km^2$ (Worst case - 2050) |
|---|---|---|---|---|
| **Afghanistan** | 652864 | 1969 | 8928 | 23560 |
| **Bangladesh** | 147630 | 4865 | 11889 | 31844 |
| **Bhutan** | 38144 | 148 | 322 | 866 |
| **India** | 3287236 | 236924 | 547553 | 1468580 |
| **Nepal** | 147516 | 742 | 2536 | 6736 |
| **Pakistan** | 881913 | 47956 | 118537 | 317405 |
| **Sri-Lanka** | 65612 | 4695 | 10512 | 28216 |
| **Total** | 5220915 | 297299 | 700277 | 1877207 |

Source: Ellis and Roberts, 2016

identified that annually about 7700 ha. of agricultural land has continuously been lost during the first decade of the 21st century. While the national census 2017 results show that about 1.6 million annual increases occur in the population of our urban areas. Most of the city's expansion occurs in low density horizontal form and consume more land. Therefore, it is alarming for the loss of our agricultural land contiguous to cities. Another important indicator is the increase in the number of cities and its growth pattern. In Pakistan a settlement having 0.1 million population having a municipality and where more than 70% population are engaged in non-agriculture activities, is considered an official definition for a city. The number of such settlements was only 53 in 1997 census, while it reached to 105 in 2017 census. There occurs an abrupt increase of 52 new cities, unfortunately, none of these cities were pre-planned but evolved form through the amalgamation of contiguous rural settlements. Almost unplanned in physical form and with deficient infrastructure. The calculated data reflects that growth rate of 59 cities remains above 60% between the two censuses. Whereas twenty cities are growing very fast i.e its population increase is above 100% between the censuses (table-2). Two cities have crossed ten million population size, while another eight cities have population exceeding 1 million each, and by 2030 another 4 cities will be added to the list. This high pressure of growth in urban areas has created enormous challenges for the manager of these cities.

Urban sprawl in major cities is becoming a challenge for cities administration in Pakistan. Due to which urban services have been significantly affected by the uncontrolled influx of large numbers of people (Arif and Hameed, 2009). Amenities and services such as clean water supply and sanitation remain deficient (particularly in major cities) to meet the demand of continuous growth. Other infrastructure such as road networks has become overcrowded and have caused frequent traffic jams and increased levels of air pollution (Qadeer, 2014), whereas slums and squatter settlements spread throughout the cities (Ahmad, 2020). Such an organic form of urbanization inflicts drastic implication

**Table 2. Population growth rate between the census (1998 and 2017) in cities of Pakistan**

| # | Name of cities | Change occurs in growth of cities population (%) | Number Count |
|---|---|---|---|
| 1 | Mirpur; Kabal | 0 | 2 |
| 2 | Khaplu, Dambudas | 1 – 20 | 2 |
| 3 | Nowshera; Mirpur Khas; Jacobabad; Jhelum; Kamalia; Ahmadpur East; Khushab and Charsadda. | 21 – 40 | 8 |
| 4 | Karachi; Faisalabad; Rawalpindi; Multan; Hyderabad; Sargodah; Sialkot; Gujra; Sukkar; Bahawalnagar; Tando Adam; Jaranwala; Chishtian; Vehari; Jhang; Gugranwala Cant; Mardan; Kasur; Nawabshah; Wazirabad; Swabi; Gujrat; Mianwali; Bhakkar; Burewala; Arifwala; Tando Muhammad Khan; Kandhkot; Sheikhpura; Shikarpur; Khanpur; Muridke, Mirpur | 41 – 60 | 33 |
| 5 | Gujranwala; Quetta; Rahim Yar khan; Okara; Khair pur; Chiniot; Khanewal; Muzaffargarh; Taxila; Muzaffarabad; Chakwal; Layyah; Lodhran; Badin; Dadu; Hasilpur; Haroonabad; Kamoki; Sadiqabad; Kamber Ali Khan; Balwal; Deska; Pakpattan; Kotaddu; Gilgit and Muzaffar Abad. | 61 – 80 | 26 |
| 6 | Islamabad; Bahawalpur; Larkana, Sahiwal; Wah Cant; Mingora; Hafizabad; Kohat; Abbottabad; Mandi Bahauddin; Tando Allayar; Narowal; Shahdadkot. | 81 -100 | 13 |
| 7 | Lahore; Peshawar; Dera Ghazi Khan; Dera Ismail Khan; Hub; Samundri; Attock; Kot Abdul Malik; Ferozwala; Mansehra; Khuzdar; Chaman; Ghotki; Sambrial; Jatoi; Daharki; Mirpur Mathelo. | above 100 | 17 |
| 8 | Turbat and Umerkot. | above 200 | 2 |
| 9 | Kotri | above 300 | 1 |

Source: GOP Population census reports 2017

on cities' role towards countries progress and prosperity. Resultantly, cities are a prelude towards places of miseries, exploitation, disease and unpleasant places in Pakistan (Qadeer, 2014). This research illustrates the detailed assessment of urban sprawl carried out in the selected metropolitan cities of Pakistan. Detail analysis of the provincial metropolitan cities is presented as follows.

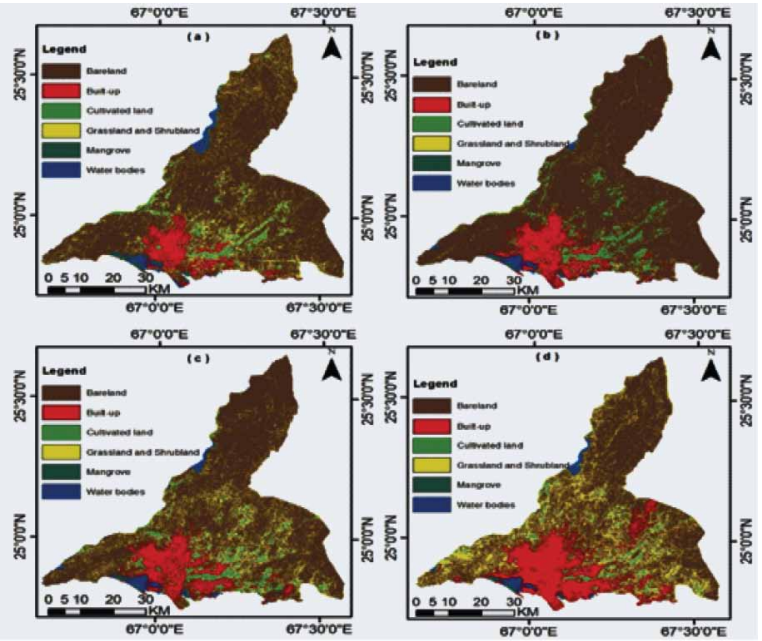
### 4.1 Karachi City

Karachi is the capital of Sindh province and is a metropolitan city of Pakistan. It was a small town of 14000 people in 1843 that had been developed as a port in the colonial period (Sivaramakrishnan, 1986). By the 1941 census its population reached only 436000 persons. After independence, Karachi become capital of the newly emerged state and was also the principal destination of refugees from India. Therefore by 1951, Karachi's population had reached about 1.065 million, which represented an increase of 144 percent over the 1941 census (Table 2). While the metropolitan Karachi land cover limit was 349 Sq. Km in 1974 and reached to 3780 Sq. $Km^2$ in 2020 reflects about 74.6 $Km^2$ per year spatial increase occur (Yasmeen, et al. 2017). Figure 1 illustrates the spatial variation in Karachi city.

### 4.2 Lahore City

Lahore is the capital of Punjab province and is the second largest city in Pakistan. Its population escalates from 5.143 million in the 1998 census to 11.13 million in the 2017 population census (GoP, 1998&2017). The government through an executive order expanded the city boundary to 230670 hectares. It incorporates the whole of Lahore district and includes Ferozewala Tehsil of Sheikhupura district and two adjacent union council of the Kasur district too. The city engulfed about 114630 hectare of prime agricultural land during 1972-2000. The cultivable area of the city is at a continuous loss, as it was about 166862 hectares in 1972, reduced to 52232 hectares in 2000, it comes about 4094 hectares or 40.94 $Km^2$ per year decrease in agriculture land of the city (Zaman, 2012). In his research article Aziz, (2020) expressed that low valued urban expansion occur at the rate of 303%

**Figure 1. Urban sprawl of Karachi city between the year (a) 1990, (b) 2000, (c) 2010, and (d) 2020**



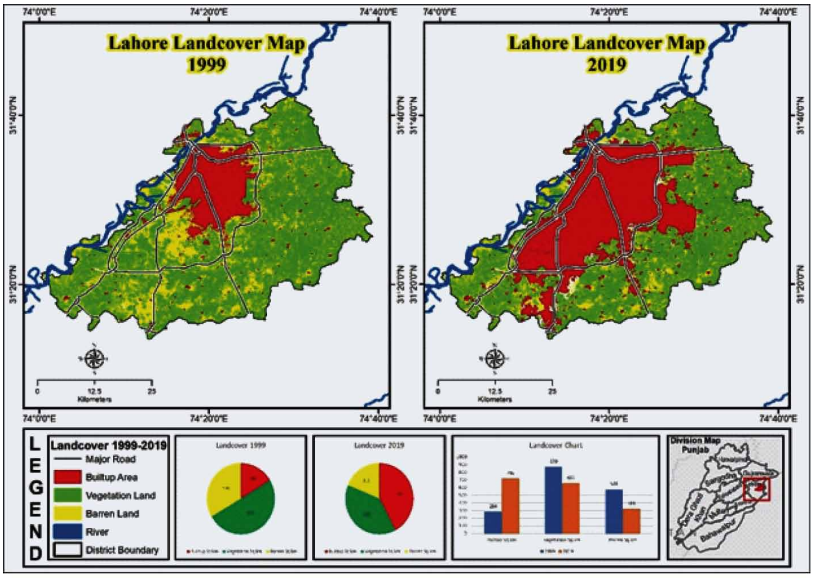

Source: Baqa, etal. 2021

during 2000-2015 and is projected to 307% for 2015-2050 causing dreadful loss to the rest of the high valued ecosystem such as water, forest, gross and cropland in district Lahore see Figure 2.

### 4.3 Quetta City

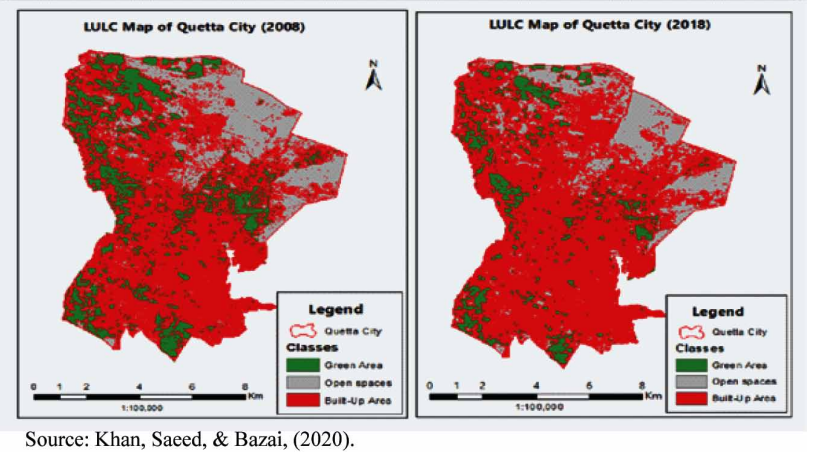
Quetta city is the capital of Baluchistan province. Urban sprawl in the city is taking place very rapidly. Khan, Saeed, & Bazai, (2020) research assessment shows that 1.4 $Km^2$ increase occur in the Quetta city built-up area during the last 20 years (1998 – 2018) period (see Figure 3). This increase mostly damaged the urban agricultural land and open spaces within the city enclaves. Their research mentioned that agricultural area of the city is decreased from 22.15 $km^2$ in 1998 to 10.45 $Km^2$ in 2018, while open spaces were decreased from 31.09 $Km^2$ in 1998 to 15.69 $Km^2$ in 2018. Therefore,

**Figure 2. Urban sprawl of Lahore city between the year 1999-2019**




Source: Tanveer, etal, 2020.

**Figure 3. Urban sprawl of Quetta city between the year 2008-18**




Source: Khan, Saeed, & Bazai, (2020).

an overall 27.1 $Km^2$ decrease occurred in 20 years within both the agri-land and open spaces within the city enclaves. Whereas the predicted result shows that the built-up area would have increased by 6.5 $km^2$ in the next ten years, i.e., 2028 (Khan, Saeed, & Bazai, 2020).

### 4.4 Peshawar City

Peshawar city is the capital of Khyber Pakhtunkhwa province. Its spatial growth has also been extremely rapid (Ali, Rahman, Ali, 2022). Ahmad, 2012 analyzed the built-up area of the Peshawar municipality and recorded that it was only 20 $km^2$ in 1947 and reached 111 $km^2$ through five consecutive boundary extensions till 1981. The first two of these (1954 and 1964) were rather limited in extent and added a total area of only 2.5 $km^2$ within the municipal limit. The third and fourth were the two major extensions (1972 and 1978). Together they resulted in the expansion of the municipal area to 103 $km^2$. Another change in the boundary of the MC took place in 1981 to increase the city area to 111 $km^2$. The influx of Afghan refugees and internally displaced persons cause further extension to the city boundary, and it reached 245 $km^2$ (Ahmad, 2012). Samiullah, et al. 2019 calculated that about 11,193 (ha) prime agricultural land had been lost during 1991-2012 in the metropolitan city of Peshawar.

To validate the previous growth pattern detailed supervised classification within the Peshawar district was carried out through application of the CA Markov model using SPOT image to understand the present scenario and to predict the future urban sprawl. This research reflected a consistent increase in built-up area since 2010. The figures for various classifications are shown in Table 3.

Analyzing the land use land cover change detection carried out for Peshawar shows that a continuous decrease occurs in other uses, while built up area increase drastically between 2010-2020 showing 202 sq.km increase. While application of CA Markov model reflect that it could further increase to 560 sq.km till 2030 (Table 3). Spatially it is presented in Figure 4.

The spatial temporal analysis reflects that urban sprawl is consistently taking place in Peshawar. It has crossed the city boundary many times. The red color boundary line was of the Master Plan (1965-85), while the blue color line is the Structure Plan (1986-2000) proposed boundary line for the city (Figure 5). Both of these boundary lines were crossed by the urban sprawl. While there were enough vacant places available within the urban enclaves of that time. The comparison of these boundary lines with the present built up area shown in fig.4 presents a horrific picture of the city growth. The most worrisome factor for urban planner is that urban sprawl has eaten-up prime agricultural land of the city.

As a matter of fact, this trend is simultaneously continuing in small cities too, Yar, 2016 lamented that agricultural land within Mardan city reduced from 1339(ha) in 1990 to 1109(ha) in 2010, while built up area of the city increase from 953(ha) to 1994(ha). It shows that built up area account for 52% increase during one decade. This decrease does not occur only in farmland but kitchen gardens used for fresh air circulation got abandoned too.

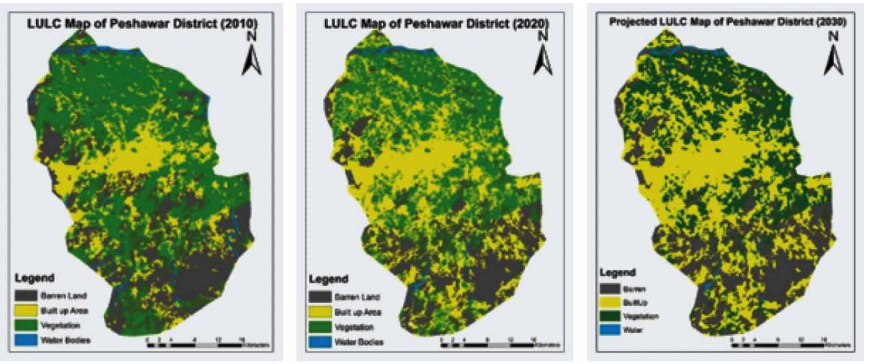
**Table 3. Land cover land use change classification for Peshawar District KP**

| Classification | Area in $Km^2$ | | | Net change detected between 2010 to 2020 |
|---|---|---|---|---|
| | 2010 | 2020 | 2030 Est.* | |
| Vegetation | 552 | 437 | 356 | -115 **Sq. Km** |
| Barren Land | 385 | 310 | 330 | -75 **Sq. KM** |
| Built up | 292 | 494 | 560 | +202 **Sq. KM** |
| Water bodies | 28 | 16 | 11 | -12 **Sq. KM** |
| Total | **1257** | **1257** | **1257** | |

Source: SPOT images analysis 2022

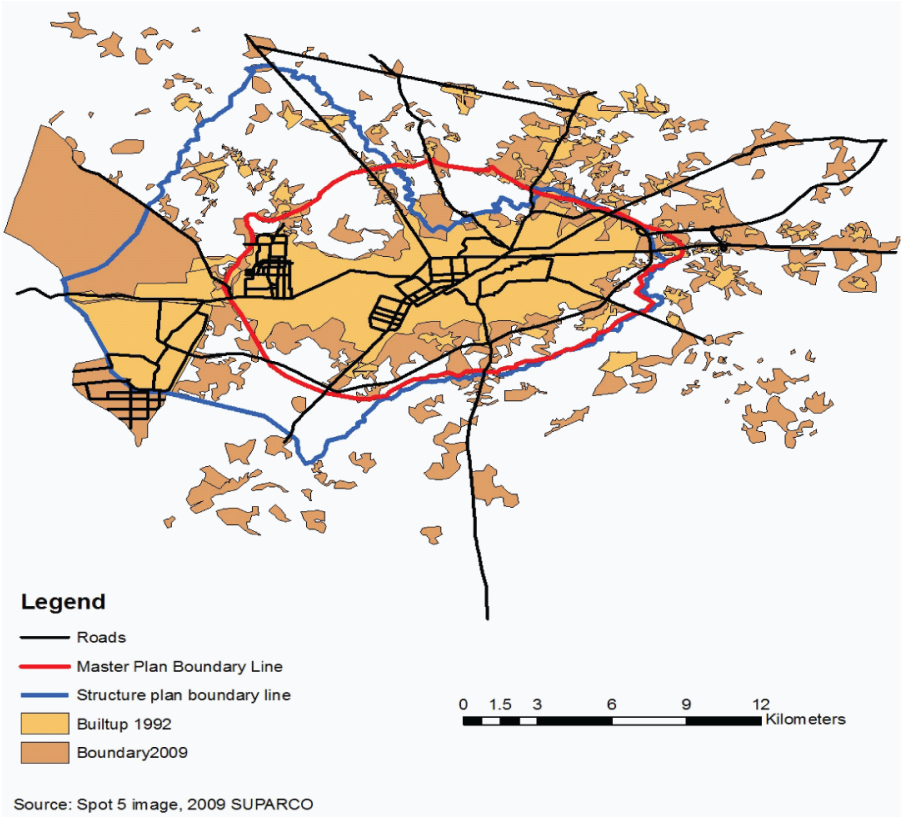
* Est= Estimated through CA Markov Model

**Figure 4. Urban sprawl of Peshawar city between the year 2010-2020 and Further Projection till 2030 by Using CA Markov Model**




Source: Shahzad and Arshad, BS URP Thesis 2022

**Figure 5. Urban sprawl surpasses the urban boundaries specified for master plan 1965 and structure plan 2000**




Source: Spot 5 image, 2009 SUPARCO

## 5. CAUSES OF URBAN SPRAWL IN PAKISTAN

In Pakistan the causes for sprawl are not centric to people's preferences or subsidies as identified by Ewing, (1996) for American cities. In particular, failure in the implementation of urban development plans caused cities to sprawl further and further in Pakistan. The laxity of government to control the use of land in the peripheries of cities accelerated the conversion of green fields into brown fields.

The forces behind this invasion and succession are evident that herds of refugees in the wake of many unfortunate events enters cities in Pakistan. These were mostly poor people and were allowed to occupy every available space improperly in the vicinity of cities. This happens due to absence of government policies for refugee settlements and weak enforcement of planning initiatives. It not only creates slums but engulfed the prime agricultural land in the vicinity of cities (Ali, Rahman, Ali, 2022; Ahmad,2020).

This uncontrolled and unplanned urbanization has greatly reduced agriculture land but has degraded the physical environment that cannot be reproduced again. This research identified the specific reasons that actually caused sprawl in major cities of Pakistan. These are explained as below.

## 5.1 Housing Societies

The haphazard growth of cities has caused widespread slums in Pakistan. This has tremendously deteriorated the living environment of cities. Resultantly, the property dealers have manipulated the situation and have started the mushroom growth of small and large housing schemes in the periphery of cities. The Federal Investigation Agency (FIA) identified in 2019, that about 9792 private sector housing societies are working in the country. Ironically, among these societies' majority (6072) are illegal and 3720 are legal. Illegal society are those that have not followed any of the development authority rules necessary for the development of housing schemes and are therefore declared illegal. These societies are run by influential property dealers, who succeed to develop housing schemes irrespective of the formal approval of the development authorities of the cities. Very little of these schemes has been constructed and colonized properly, while the rest of the schemes traded for speculative purposes (Anjum and Hameed, 2006). Real estate and property dealing is on continuous hype due to speculation. Figures in table-4 mention that number of illegal societies are greater than the legal one. It reflects that primate city of the country "Karachi" has 81 legal and 119 illegal housing societies. Similarly, the second largest city "Lahore" has about 243 legal and 217 illegals housing schemes in the city. The third largest city Faisalabad has 165 legal and 295 illegal housing schemes, while the fourth largest city Rawalpindi has 48 legal and 203 illegal housing schemes (table-4). The sixth largest "Peshawar" has only 6 legal and 181 illegal housing societies. Embarrassingly, the capital city "Islamabad" too has 109 illegal housing societies to grow on its protected zone (table-4). The figures in table-4 reflecting that 1461 housing schemes exists on acres of fertile agricultural land that haven't followed a formal procedure as per land use rules and infrastructure standard required for a planned town in cities of Pakistan.

**Table 4. Proliferation of housing schemes in major cities of Pakistan**

| # | Name of City | Legal Housing Schemes | Illegal Housing Schemes | Total |
|---|---|---|---|---|
| 1 | Karachi | 81 | 119 | 200 |
| 2 | Lahore | 243 | 217 | 460 |
| 3 | Faisalabad | 165 | 295 | 460 |
| 4 | Rawalpindi | 48 | 203 | 251 |
| 5 | Multan | 213 | 214 | 427 |
| 6 | Peshawar | 6 | 181 | 187 |
| 7 | Gujranwala | 20 | 123 | 143 |
| 9 | Quetta | 16 | Not known | 16 |
| 10 | Islamabad | Not known | 109 | 109 |
| Total | | 792 | 1461 | 2253 |

Source: Development authorities web sites access on 10/1/2021

The other most important ill feature of these schemes is improper site selection regardless of the national housing policy recommendations. Most often, these schemes select cheaper sites far beyond the city limits and develop attractive gated communities (i.e Bahria, DHA/Askary and other private sector schemes). The developer through media advertisement reflects lavish lifestyle and facilities within these towns. Resultantly, it attracts expatriates and other well-up people from within the country to invest for future needs of their generation to come. Beside it, property prices are increasing manyfold day by day. These schemes are safe havens for investors to safeguard their money. These avenues flourishing rent houses too. Hence, it accelerates migration from within cities and other parts of the country too (Qadeer, 2014).

Nonetheless, the development of satellite towns was a good idea of twentieth century in Europe (see British New Towns Act of 1946) to accommodate the overspills of the parent cities, however there was a strict Green Belt (GB) concept around the cities. Nobody was allowed to build permanent structures within the GB boundary. Conversely, there exists no boundary limits to cities nor there exists any plan for these areas in Pakistan. Land brokers and real estate dealers get advantage of the newly developed infrastructure (roads, electricity and gas) for these towns start illegal land sub-division without having proper streets and sewerage system (Ahmad, 2020). Thus, suburban land in between these towns filled very fast with informal construction of houses for the middle class who cannot afford to acquire a house in these high standards housing schemes. Consequently, all major cities have engulfed thousands of acres of prime agricultural land, particularly Lahore, Faisalabad, Gujranwala, Gujarat, Rawalpindi and Multan etc. in Punjab province (Aziz, 2020; Samie, et al. 2017). While Peshawar, Mardan, Mingora, Abbottabad, Nowshera etc. in Khyber Pakhtunkhwa province. A million hectare of agricultural land (see fig. 1,2,3 & 4) is being lost due to urban sprawl (Baqa et al. 2021; Tanveer et al. 2020; Samiullah, et al. 2019 and Khan et al. 2020). Formation of city districts through LGO 2001 had further escalates urban agglomeration in Pakistan. For example, Lahore city had crossed its district boundary in 2001 has captured some portion of other districts (Qasoor and Sheikhupura) too. Similarly, Karachi has already engulfed 5 districts into its boundary many years before. There exists no legal end point to the city's boundary, nor does there exist some sort of mechanism to stop further expansion beyond the city's limits. This has not only petered out the element of a uniform urban design but has diminished the prospects of sustainable development too. Hence, lack of a stringent policy for urban management and enforcement are causing urban expansion in horizontal direction in Pakistan. Therefore, it is important to investigate the structure and face of urbanization in the context of urban sprawl in order to support national urban policy formulation, effective governance to develop and implements antidotes for urban sprawl.

## 5.2 Forced Migrants

The other most important aspects of unfettered urban sprawl is the scale of force migrants such as refugees and internally displaced persons in Pakistan. Almost everywhere cities are becoming the primary destination for migrants who may be escaping violence, human right violations, poverty or natural disasters (Kugelman, 2013). However, the majority of cities administration fail to adequately arrange housing and infrastructure for their growing populations (Roberts and Kanaley, 2006). Therefore, formation of slums and squatter settlements are very common and has widespread ramification on cities in Pakistan. Forced migrants has a great share in to dislodge once tranquil and harmonious environment of cities in Pakistan. First due to independence in 1947, millions of people left India and stream into cities in Pakistan (Kugelman, 2013). At the time of partition in 1947, Pakistan urban population was only 5 million and its share was 17.6% in the total population of the country. Additionally, the war of 1965 and 1971 with India propelled million refugees towards cities in West Pakistan. This caused about 48% of our urbanization at that time. Kugleman, 2014 noted that due to India and Pakistan war in 1965 and 1971 the influx of about 5-8 million migrants (from India and East Pakistan: Bangladesh) were settled in major cities of the parted west portion i.e., Pakistan. This unprecedented shift of people escalated the urban share of West Pakistan to 25.4% in 1972.

While cities in KP are severely affected by the influx of Afghan refugees since 1980. Generally, majority of Afghan refugees prefer KP for their accommodation (Fig. 6) and have considerably chosen major cities to live (UNHCR, 2007). This has been the biggest factor contributing to phenomenal rise in burdening urban resources particularly prime agricultural land. It is of great concern that Afghan refugees are not included in the official census count of urban population, however functionally they are very much a part of the urban areas. There exists no camp for them as refugees are living with the local population within cities. The UNHCR releases the figures as mentioned in fig. 6 (registered with them) whereas the actual figures are not available for the Afghan refugees. The majority of the refugees escaped to register themselves due to fear of eviction. This has become a major cause for increasing rent housing demand and vacant sites abandonment within the urban enclaves in cities of Pakistan.

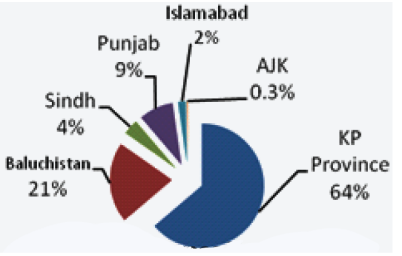
### 5.3 Internally Displace Persons

Apart from the haphazard growth of cities the direct societal impact of the Afghan war appeared in the form of militancy and insurgency in the whole country particularly in Khyber Pakhtunkhwa. This unrest and militancy in north and south of the province caused internal displacement of masses in large quantity. As militancy and unrest were dealt with through military operation in affected areas. For the first time in 2008, a major military operation (Rah-e-Rast) in district Swat caused about two million people displacement from the valley. Similarly, FATA region military operations (Sherdil; Rah-e-Haq; Rahi-e-Rast and Rah-eNijat) in between 2007-2010 forced about 3-4 million people to flee into cities in KP (Mosel and Jackson, 2013). This process pushed all the resident population of hot spots into exile. UNOCHA, 2012 calculated that by 2009, there were more than 3m IDPs in KP.

According to the Social welfare Department (SWD) statistics instability of security situation and militancy in some districts of KP caused about 514,806 IDPs families to fled from hotspots towards safer areas of the province (Table-5). SWM confirms that the majority of these IDPs settled in towns and cities of Peshawar valley. According to UNHCR and SWD estimates more than 6 million people were displaced from their localities. The majority of these IDP (particularly poor) do not intend to go back to their native places (SWD, 2015). As militancy and insurgency is not going to culminate entirely. One can hardly expect the complete peace and return of these displaced persons. In an interview the Provincial Relief Commissioner confirmed that amongst these displaced families only 20 per cent are living in the official camps while the rest are either living with their relatives or in rented houses. The provincial Social Welfare Department confirmed that so far 514,806 families were displaced from various parts of the province. The majority of them were accommodated in Mardan, Peshawar and Charsaddah districts (Table 5).

According to the social welfare department, Peshawar city accommodated more IDPS than rest of the cities in the province. The department confirms that 10-15% of IDPs (mainly the poor class) do not want to go back, as they have better access to employment in their displaced location. The official of social welfare further illustrated that almost 5-10% of IDPs coming back to cities (where they spent few months of displacement) after going back due to normalization of the security

**Figure 6. Afghan refugees province of residence in Pakistan**




Source: GoP and UNHCR report, 2007

**Table 5. Sanctuary for internally displaced persons due to militancy in Khyber Pakhtunkhwa**

| Asylum Localities | Displaced Families | Total Displaced Population |
|---|---|---|
| Mardan | 149294 | 18,66,175 |
| **Peshawar** | **123553** | **15,44,413** |
| Charsaddah | 108109 | 13,51,363 |
| Swabi | 72073 | 9,00913 |
| Nowshera | 46444 | 5,79,163 |
| Others | 15444 | 1,93,050 |
| **Total** | **514806** | **64,35,077** |

Source: Calculated from SWD record book, 2015

situation in their places of displacement. However, the authorities could not succeed in reopening the disserted schools and colleges (somewhere but that too on the gun point). Sporadic events were still continuing and it did not allow normality within these regions. The parents of school going children cannot afford any more to waste their children's time and they decided to shift their schooling to safer places and to develop alternate source of income as well. These forces compelled IDPs to select proper places for their asylum and to develop their second home in cities. Therefore, people having good financial background shifted to better places for their children's education like Abbottabad, Islamabad, Rawalpindi, while the middle-income families selected Peshawar city or another small town with in Khyber Pakhtunkhwa for their asylum. They settled in cities either by paying rent or permanently purchasing houses for themselves. This phenomenon mounted housing and infrastructure demands and resultantly cities sprawled into the immediate vicinity.

### 5.4 Rural to Urban Migration

Beside the forced migrants and IDPs, industrialization in major cities the 1960s attracted migrants from the rural areas and small cities within the country. In terms of urban planning migration cannot be considered as a mere shift of people from one place to another, it is most fundamental to understand the reasons behind change of places, content and space relationship of an area (Arif & Hameed, 2009). Due to many full factors in urban areas, rural-to-urban shift of people has occurred and the process of concentration of people and activities into larger (one million and above) cities is set to continue well in the 21st century too (Zaman, 2012). In this respect, Samiullah (2019) research calculated that built-up area of Peshawar city increased from 7,182 ha in 1991 to 16,986 ha (13.5%) in 2009. Therefore, during 18 years (1991-2009) the increase in urban population has caused urban sprawl at a rate of about 545 ha per year (Samiullah, 2012). While, Yar, et al, (2016) research calculated that the city further engulfed about 3462 ha of prime agricultural land in a merely 5-years period (2009-2014). Their research identified that urban sprawl in Peshawar city increased at a rate of 692.4 ha. per year. Therefore, it is predicted that the city would require about 27,700 ha. more land to meet the ever-increasing demand by the year 2030. It reflects that there exists no end of the city and it sprawled further and further having no direction and destination.

## 6. SOLUTION FOR CONTROL

It has been widely believed that unlimited urban growth and agglomeration towards cities is not a desirable pattern of urbanization. The sustainability of cities rests on the availability of agricultural land to serve its population. It is of grave concern that on average about 60,000 hectares of agricultural land and open spaces are lost every year in Pakistan due to urban expansion. It reflects that there has

been no policy for urban development to avert urban expansion and to conserve agricultural land. The aspect of sustainability and equity has never been the priority for development in Pakistan. The actual cost of urban sprawl is difficult to measure. However, its impacts can be felt in the loss of green fields, breathing polluted air, heat islands development, urban flooding, larger distances, and non-existence of sewerage system.

Urban growth that has taken place so far in Pakistan has been largely haphazard, and devoid of proper urban planning techniques. A very harmful consequence of urban expansion has emerged in the form of the conversion of large tracts of agricultural land for residential, industrial, and commercial buildings. The list of its negative socio-economic impacts is long. It is likely to get longer and more threatening, if remedial measures are not taken. This research finds that most of the developed countries succeed to manage the cities growth through the following measures.

### 6.1 Legal and Institutional Perplexities

Looking at the challenges posed, first of all the existing institutional arrangements and capacities seem to be drastically inadequate as well as disintegrated. Every department is legally working in isolation without coordinating their activities with other line agencies. Unless all these entities and departments are working in an integrated manner and with a vigorous urban management policy, the objective of making cities efficient will remain an elusive dream, beyond their reach.

In this regard the legislative support for physical planning and development control is severely required to be reviewed and enforced. It is important to discern that urban development is not just the provision of infrastructure (which has been the focus of government's ADP) but more importantly involves policy reforms and institutional strengthening. This would make our institutions more efficient and productive in order to ensure sustainable development pattern within cities.

### 6.2 Urban Planning/Smart Growth

In Pakistan, it has been believed that incremental approach for development would solve the problem and would convert the cities into engines of economic growth. However, the reality is contrary to it. The problem still exists and continue to intensify environmental problems. It has obviously increased miseries of life in cities of Pakistan. The concept of physical planning or smart growth needs to be imbedded in the policy option as that of the developed world. Specifically, provision of infrastructure and other public sector investment could be used as a guide to cities growth towards spatially more appropriate areas. The adoption of cities development plan and regional land-use plans for ADP allocation are required to resolve haphazard development and to conserve agricultural land.

### 6.3 Vertical Growth

Urban sprawl is the outcome of low-density leapfrogged housing. In order to discourage it, densification and compact development is to be introduced. This has been practiced in many developed countries of the world. High rise residential apartments could sufficiently resolve housing problems in cities of Pakistan. Being a populated country, Pakistan needs to protect its natural assets and prime agricultural land. Vertical growth is indispensable, however, it must be properly planned through better zoning and building control rules. Indiscriminate change of land use and haphazard development pattern is to be strictly banned. However, land subdivision regulations, standard plot size and land pooling techniques are required to support vertical growth in cities.

### 6.4 Equity in Housing

The provision of affordable housing is always de-emphasized in the preparation of cities master plans. Its locations most often take place in environmentally depressed areas, where basic infrastructure always remains deficient. Resultantly, these houses produced slums in cities of Pakistan. Therefore, physical planners must incorporate equity focus in cities master plans. So far, equity has not been

emphasized to the extent in order to solve housing problems of poor people, cities can never get rid of slums. The government must incorporate equitable policies and incentives to ensure planned growth and can provide opportunities to everyone within it.

### 6.5 Urban Growth Boundary

Fixing urban growth boundaries for cities is necessary for urban management and to control urban sprawl. It establishes cities sizes and focus on construction in inner districts or encourage compact development or densification. It reduces infrastructure costs and conserves the natural flora and fauna as well as conserve the natural vegetation cover to feed the city population. The daily needs of fresh vegetables, dairy milk and poultry depend on the agricultural land surrounding the cities. Therefore, it is of prime importance to fix cities limits through urban growth boundaries and to ensure vertical growth instead of horizontal growth in cities. This could be made possible through the use of technology such as GIS and remote sensing to monitor and enforce implementation of land use rules and development control regulations effectively.

## 7. CONCLUSION

It is a fact that land management and disposal are very weak in Pakistan. Prime agriculture land is on continuous loss due to settlement expansion and proliferation. The process of urbanization is almost mishandled to conserve the natural assets. Urbanization has on the whole gone on haphazardly and proper urban planning has not been conspicuous. The practice of land use planning nor any such policy exists within the country. Contiguous rural settlements and housing schemes (built in complete deviation of land use standards) are continuously taking place on prime agricultural land. In particular the illicit schemes have greatly supported property business, inter and intra migration. Whereas the influx of Afghan refugees and forced migrants from various parts of the country added to the urban growth rate in Pakistan. Resultantly, unfettered urban sprawl continued and has grappled the cities into an unattractive spree of settlements. So far, this phenomenon has never been properly researched nor has been tackled through urban planning techniques. This research has remarkably identified the actual causes pertained to cities expansion in Pakistan. Beside it, various techniques are suggested for administrators and practicians to curb urban sprawl and to formulate an effective strategy for sustainable urbanization in the future.

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## ENDNOTES

[1] One Kanal=5445 sq. feet.

[2] Karachi population is increasing at 4.78 percent a year, while city growth is taking place at a rate of 7.5 percent per year. It clearly demonstrates that city growth is beyond its demand, which is prelude to property business and was ultimately caused for pulling people from different parts of the city.