

URBAN GROWTH AND SOCIO-ECONOMIC DEVELOPMENT IN GUJRANWALA, PAKISTAN: A GEOGRAPHICAL ANALYSIS

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ABSTRACT: Cities all over the world, particularly in developing countries like Pakistan, are experiencing rapid urban growth and changing socio-economic profile. Present study was conducted to investigate the trends of urban growth and socio-economic development in Gujranwala, the prominent industrial city, 5th largest city of the Punjab and 7th amongst the big populous cities of Pakistan. By making comparison of its structure with overall socio-economic structure of the Punjab Province, selected indicators were considered viz. population size, housing facilities and urban growth patterns. Data was obtained from various sources and efforts were made in order to realize the behavior of urban growth and socio-economic development. Results revealed that city had better place regarding its educational, health, housing and human development scenarios. But noticeably, a small proportion of population could have access to safe drinking water, sanitation etc. The urban growth patterns suggested the increasing urban population due to migration and natural increase of population, though overall growth rate was declining. Resultantly, city was spatially expanding in north, west and east directions since 1947 to present.

Key words: Urban growth, Socio-economic development, Gujranwala, Population, Spatial Analysis.

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INTRODUCTION

Rapid urban growth and expansion are changing the face of the urban centers and lead to the rising level of urbanization worldwide particularly in most of the developing countries. The rate and scale of urban growth in developing countries is quite unprecedented and more complex (Cohen, 2004). The changing Land Use and Land Cover (LULC) vogue have direct influence on settlements and deeply focused due to its wide-ranging socio-economic and environmental implications (Wu *et al.*, 2006). In Pakistan, similar trend of rapid urban growth and development of big cities is one of the most important geographic phenomena (Arif and Ibrahim, 1998; Arif and Hamid, 2009). Morphological shift from disperse to congestion is an obvious output of rapid urbanization in many cities and towns (Qian *et al.*, 2013). Previous studies using geospatial technologies indicate sprawling nature of many big cities and medium sized towns i.e. Karachi, Lahore, Faisalabad, Peshawar, Rawalpindi, Islamabad, Hyderabad, Multan and Bahawalpur etc. (Adeel, 2010; Qureshi, 2010 and Almas *et al.*, 2007) passing through this haphazard rage in all directions and causing various environmental and planning challenges for policy makers including environmental pollution, spatial congestion, lack of municipal amenities, increasing commuting distances etc. (Khan *et al.*, 2014; Shirazi and Kazmi *et al.*, 2010). That

is why Pakistan has the highest proportion of urban population (39.2 %) among the South Asian countries (GOP, 2014). The rapid increase of urban growth and land use changes as a result of socio-economic development and related activities which are mounting rapidly, have a rigorous impact on local, regional and global level change (Feng *et al.*, 2012; Wu *et al.*, 2010 and Bounoua *et al.*, 2009). Urban population growth, anthropogenic activities and socio-economic influences are the driving factors of rapid urban growth (Nong and Du, 2011; Jantz *et al.*, 2004). Therefore the search of various elements of demographic structure can be proved significant in socio-economic interpretation of the city (Anwar and Bhalli, 2012). The key indicators or elements to judge the condition of any specific geographic area are associated with the social and economic development. Both of them are internally structured displaying a strong bond between them. The social development results in the economic growth and economic developments in response, raises social status of the society (The Urban Unit, 2011).

Urbanization along with urban growth is a phenomena of major concern for the policy makers, the urban planners and geographers since the patterns of urbanization locate implications on socio-economic development. Development and growth of a city is proportional to urban land use changes as the growth effects visualizes in the size, shape, function and urban

environmental condition (Long *et al.*, 2007). Urban growth model of future predictions are essential for the urban planning and can be helpful to comprehend the mechanism of land use changes and to help us making worthy policies to support the rapid urban growth (Nong and Du, 2011). By the development of satellite remote sensing technology, accessibility and obtainability of spatial data and simulation of urban growth has been developed. Such as Cellular Automata (CA), logistic regression and agent-based procedures conducted by urban planners, geographers and environmentalists demonstrate a good potential to simulate multifaceted urban growth and land use land cover changes (Dietzel and Clarke, 2006). This increase was marked by the

alteration of urban land use to accommodate the growing anthropogenic activities (Nong and Du, 2011). Hence, the main objective of present study was to identify the trends of urban growth in Gujranwala and its relationship with socio-economic development of the city.

MATERIAL AND METHODS

Study area: Gujranwala, one of the rapidly growing cities of Pakistan, located between $32^{\circ} 11'$ east latitude and $74^{\circ} 9'$ north longitude and surrounded by Deska on east; Nowshera Virkan in west; Kamoki in north; and Wazirabad in south (Fig. 1) was selected study area.

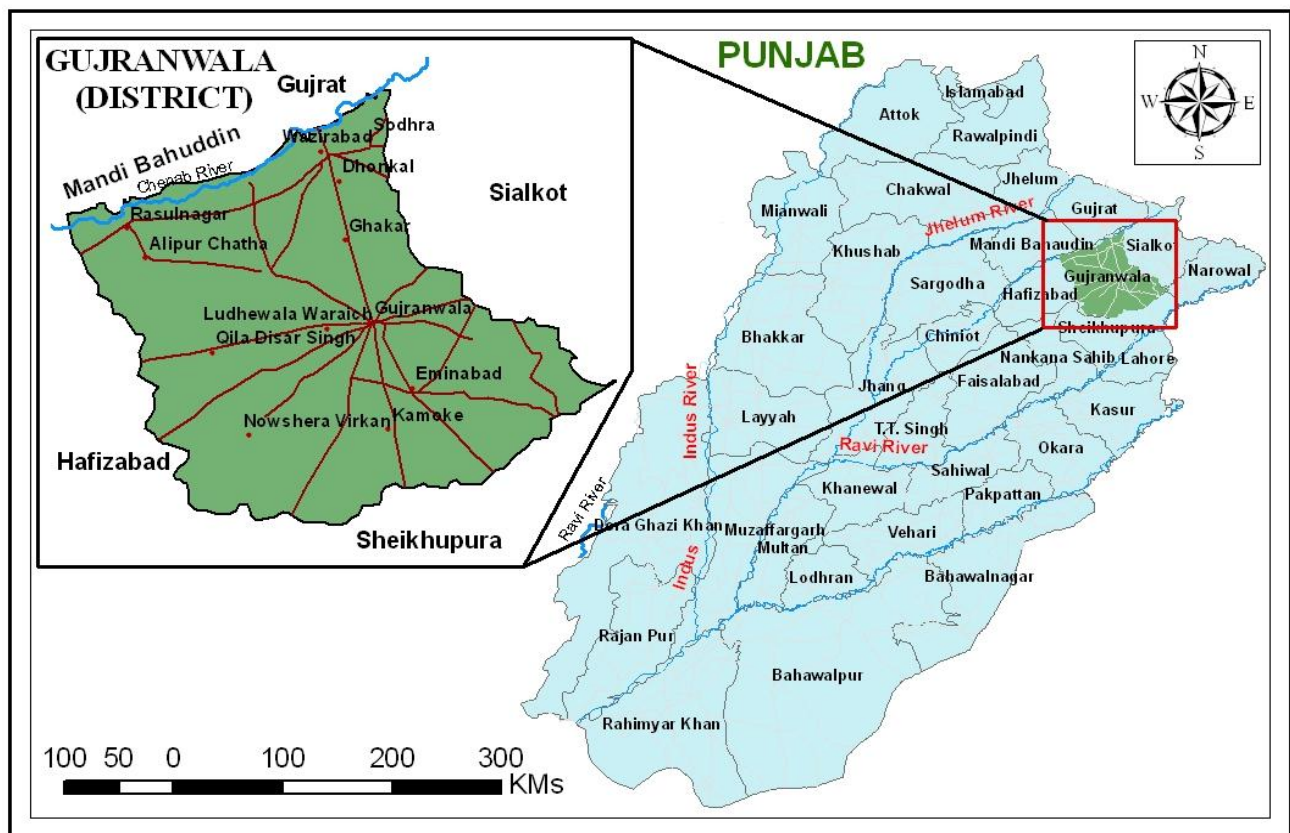


Fig. 1: Map of the Study Area Gujranwala

Data and its Sources: The present study was mainly based on the secondary sources of the data and utilized quantitative research method to achieve the desired objectives. Basically a descriptive approach was adopted for this study. The secondary data were collected through multiple sources in view of the array of different parameters to assess land use patterns, population dynamics, socio-economic development and urban growth in Gujranwala, Pakistan. The different sources of secondary data included Population Census of Pakistan, Punjab Development Statistic, and Bureau of statistics,

Pakistan Economic Survey, The Urban Unit, Gujranwala Development Authority (GDA) and other published reports and historical Maps. Population Census data had been utilized to assess and understand the Spatio-temporal pattern of population growth where annual growth rate was calculated.

Methodology: The study analyzed the trends of urban growth by using; historical published maps and other necessary information available in the existing literature (Arif and Hamid, 2009). Spatio-temporal urban growth

mapping modernized past landscapes by integrating historic maps, satellite data, and census statistics to make a progressive geo-referenced image of urban change detection within Gujranwala city. Therefore, the database was developed to demonstrate the spatial patterns of urban growth and its interactions among the socio-economic and physiographic variables contributing to urban expansion (Khan, 2000). Chronological overviews of urban and socio-economic development provided understanding into the future predictions. The analysis was carried out with the help of MS Excel software, logical calculations and projections. Geographic Information System (GIS) based urban growth maps were procured from secondary data sources in ArcGIS software and were used for graphical output.

RESULTS AND DISCUSSION

Amongst the most populated cities in the geographical vicinities of the Punjab, Gujranwala is one of the most crowded cities in terms of population which was 4,708,000 in 2014 regardless that it was only 120,807 in 1951 (GOP, 2014 and The Urban Unit, 2011). As found by the statistical analysis, union council outside

the Ex-MCL (Metropolitan Corporation Limits) boundary already boosted population comparable to that of inside and should had been added to the urban area of Gujranwala. The extension in the urban area and population influx had a detrimental effect on existing and continuously depleting resources. The new generation was striving hard to get their demands fulfilled regarding health, education, employment and recreation through the doors of the policy makers and besides having numerous advantages can also result in population explosion owing to the failure of the proper family planning programs. During the periods from 1951 to 1961, growth rate of Gujranwala was as higher as 5.01% and increased further to 7.59% in 1972-81. Population of Gujranwala increased nine times during the past 47 years with an average growth rate of 3.79%. Gujranwala city, comprising of seven towns, ranked fifth amongst the big cities of Pakistan with a population of 1,132,509 in 1998 and 141, 5711 in 2007 estimates. During the inter censal years (1981-1998), the population growth rate of the city had been 3.79% and total Ex-MCL area of 914 sq. km. The identification some urban area outside the Ex-MCL boundary, called as new urban area (Fig. 2), about 2381, sq. km.

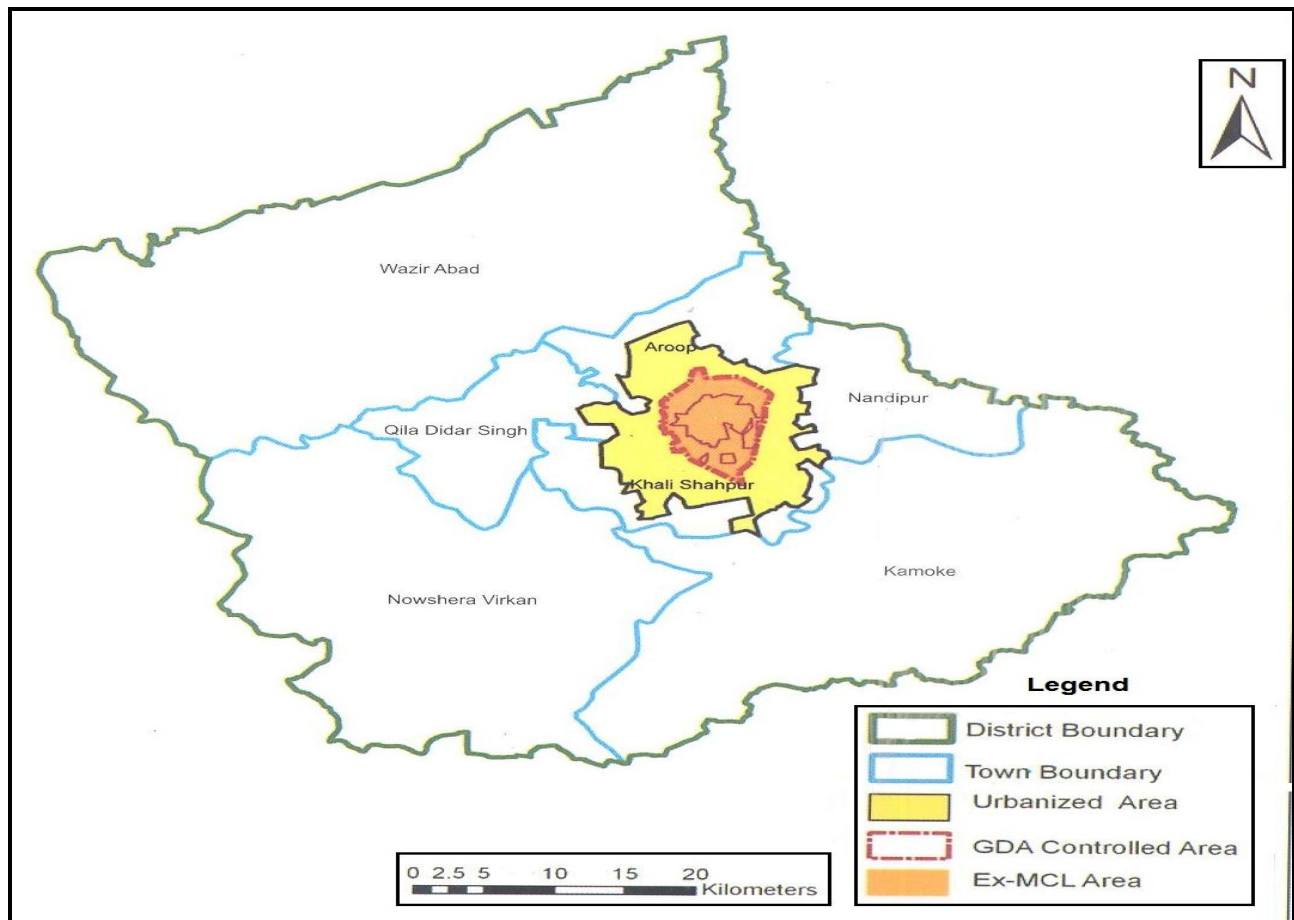


Fig. 2. New Urbanized and Ex- MCL Area of Gujranwala

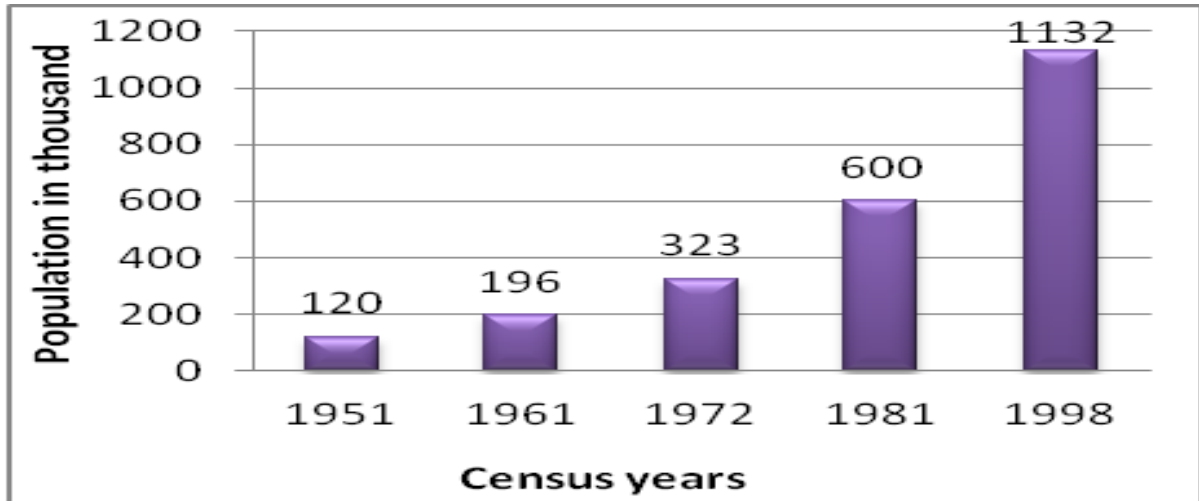


Fig. 3: Urban Population Growth of Gujranwala

Source: GOP, 2000

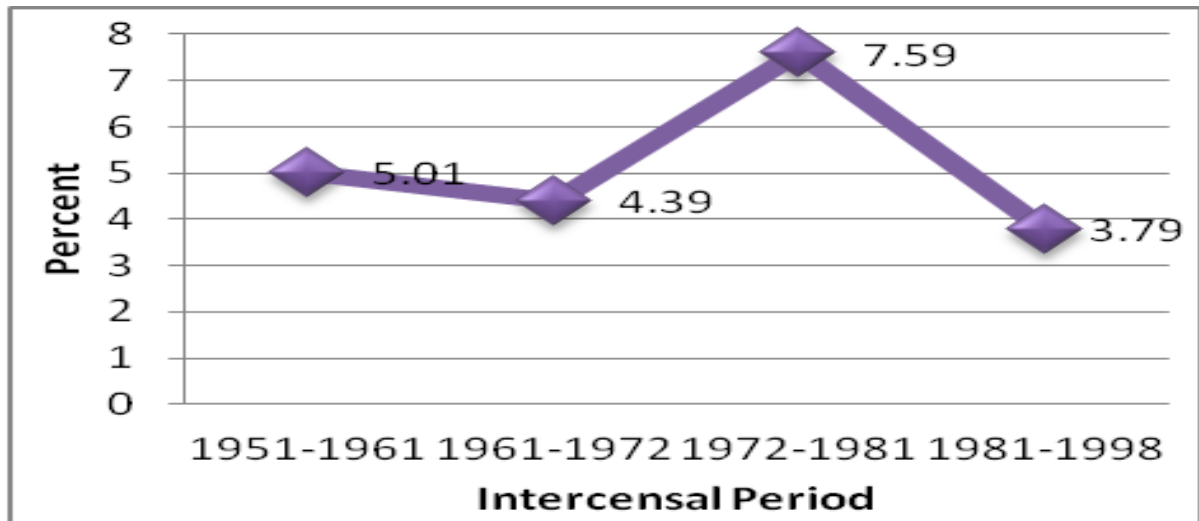


Fig.4: Gujranwala Annual Growth rate 1951-98

Source: GoP, 2000

Table 1. Gujranwala Population, Area and Density in 2014.

Components	Punjab	Gujranwala Distt.	Gujranwala City
Population (000, persons)	99786	4708	1711
Area in Sq/Km	205345	3622	914
Density (Person/km ²)	486	1300	1872

Source: GoP, 2014

Table 2. Urban and Rural Population (000, persons).

Years	Punjab			Gujranwala		
	Rural	Urban	Total	Rural	Urban	Total
1981	34239	13053	47292	1181	927	2108
1998	50602	23019	73621	1680	1721	3401
2014	67953	31833	99786	2329	2379	4708

Source: GoP, 1984; GoP, 2000; GoP, 2014

The total area of Punjab is 205,345 sq. km with an estimated population of 99,786 thousands increasing

yearly by 2.64% in 2014. On the other hand, the population of Gujranwala increased by 3.7% per annum;

within the district area of 3622 sq. km with an estimated population of 4,708 thousand in 2014. Owing to the rapid growth rate, the population density was higher as compared to overall Punjab, which has created problems in the provision of urban facilities within the area as well. The population of Gujranwala increased by 61% during the year 1981 and 1998 with the annual growth rate of 2.6% in 1998 and later (Table 2). During that period, the projected population of Gujranwala has sought a greater

increase in rural areas population as compared to that of urban areas. However, the estimated population of urban areas was greater than the estimated population of rural areas. This projection had been contrasted with the population data of district, Ex MCL and urban area of Gujranwala. Although, there had been substantial increment in total population, the growth trend was somewhat declining.

Table 3. Gujranwala Population Projection.

Components	1998	2006	2008	2010	2015	2020
Population						
District	3401	4242	4483	4737	5439	6244
Ex-MCL	1132	1524	1642	1769	2131	2566
Urban	2073	2546	2680	2821	3207	3646
Average Annual Growth Rate						
District	2.8	2.8	2.8	2.8	2.8	2.8
Ex-MCL	3.7	3.7	3.7	3.7	3.7	3.7
Urban	2.6	2.6	2.6	2.6	2.6	2.6
Density						
District	939	1171	1238	1308	1502	1724
Ex-MCL	1239	1668	1797	1935	2331	2808
Urban	1907	2342	2466	2595	2951	3355

Source: The Urban Unit, 2011; GOP, 2015

The population projections were estimated for 2020; by using the growth rate calculated from 1998 census by adopting simple exponent method. The annual growth rate of Gujranwala city in 1998 census for 2020 was estimated to be 3.64 million, indicating an increase of 1.12 million since 2006. The projected gender ratio would be more balanced in 2020 as compared to 2006, due to its declining trend. For the last 2 decades, the trends of migration from rural areas to urban areas had been increasing. It was evident from the data that 74.5% people migrated to Gujranwala belonging to the province of Punjab; 7.4% belonging to the Sindh, Khyber Pakhtunkhwa and Baluchistan, and 15.9% from other countries, during the year 1998 (GOP, 2000). The spatial growth from 1947 to 2009 and future growth direction of Gujranwala, are presented (Figure 5 and 6).

The Figure 7 indicated the growth corridors of Gujranwala. The thrust of the growth was to the North and South directions, while during 1947-1965 it was in the Northwest and South-east directions. In the period from 1965-1985, the growth directions were almost reversed and dominated by the North-eastern and South-western directions. During the period of 1985-2009, the city had grown almost equally towards the West, North and East. The most likely directions for development were southwards, generally along the GT Road and Northwards, most likely along Sialkot Road, especially if

the Cantonment acts as deterrence to growth towards the North (UNICON, 2009).

Keeping in view the above City footprints and analysis, it was concluded that almost 100% increase in the area was required for the urban development of Gujranwala City for the next twenty years.

Gujranwala being one of the major industrial cities of Punjab having industrial units of small industries, i.e. electronics, home appliances and machinery etc. At the same time industries like textile, flourmills, foundries and hosiery had also been working in the city. These industries provided a great numbers of job opportunities to the natives as well as the surrounding areas. The manufacturing industries were the most developed industry, and textile and hosiery industries also considered as developed and more than 34.4% labor force of Gujranwala work in manufacturing industries (GOP, 2008).

Gujranwala had better human developments among three districts include Lahore and Faisalabad if ranked one of the top ten cities of Pakistan. According to United Nations Development Program, Gujranwala had been emerging in the medium level of human development index, in the categories of high (more than .80), medium (.50 to 7.9) and low (below .50) levels of development. By insight view of district's HDI, pattern of government's ongoing policies and directions for future

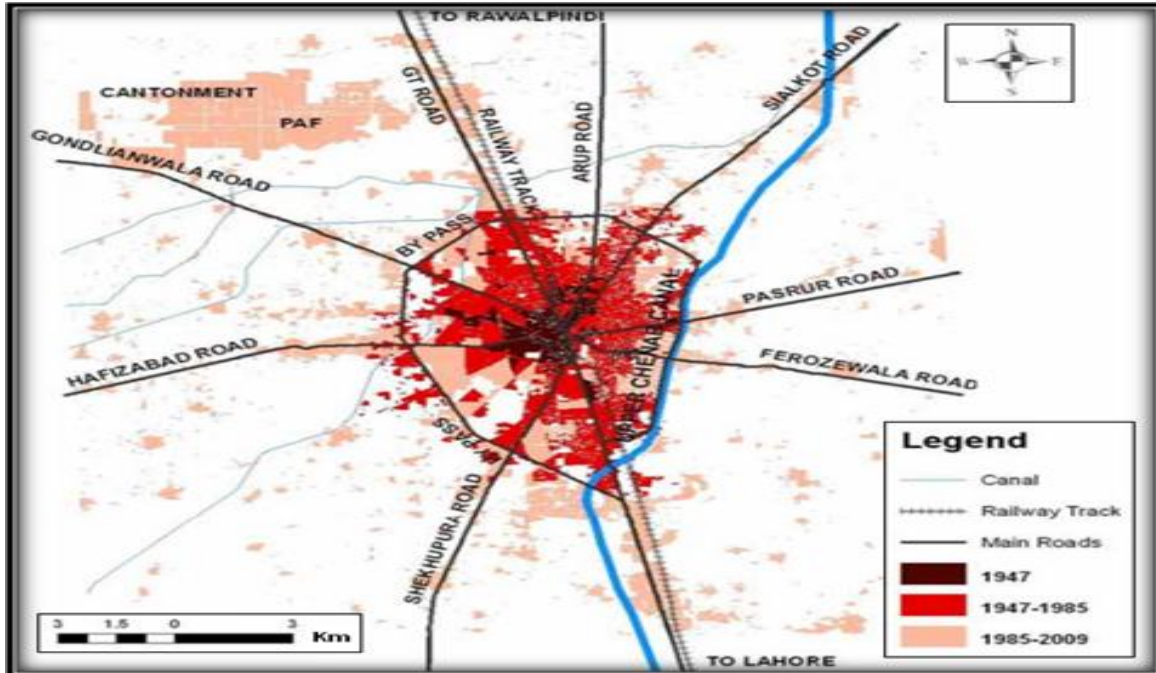


Fig. 5: Spatial Growth of Gujranwala

Source: UNICON, 2009

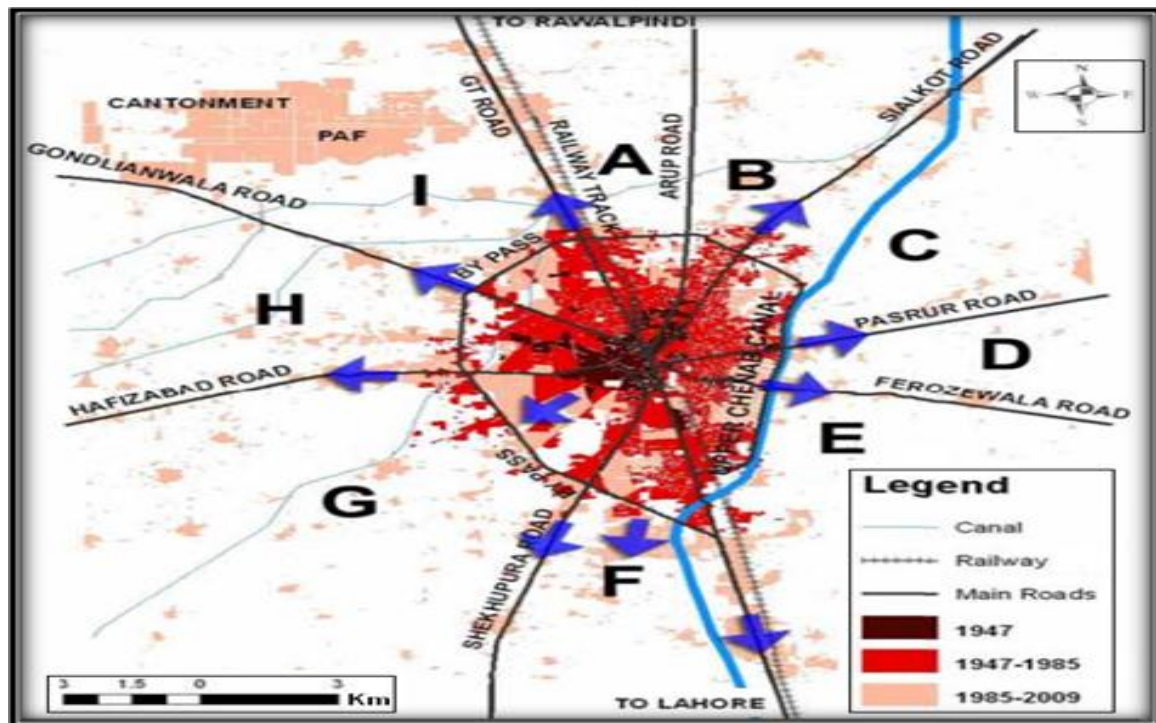


Fig. 6: Future Growth Trends of Gujranwala

Source: UNICON, 2009.

planning and policy making process are obvious (Khan and Haroon, 2007). Housing is one of the utensils of life as living standard of resident is reflected by housing. Resident's social facilities can be indicated by housing facility, therefore, data on housing facilities was an imperative parameter for planning and development of

the society. The trend of developed housing schemes had been introduced in Gujranwala since last year. Satellite Town, Model Town, WAPADA Town and Defense housing societies emerged as new developed areas in Gujranwala. According to the census report of 1981 and 1998, the housing entities had increased from 306 to 449

in Gujranwala with a growth rate of 2.28%. Similarly, according to the census of 1998, 81.21% people owned their own houses, 12.21% rented, and 6.58% on free spaces (GOP, 2000). In this regard, no prominent changes

were observed from 1998 to 2007. About 86.29% people owned a house while 10.39% rented during the period from 1998 to 2007 in Gujranwala city.

Table 4. Requirement of Urban Development.

1998 Area	2006 Area km ²	%age increase during 198-2006	Annual %age Increase during 1998-2006
63.8	88.69	39.36	4.92

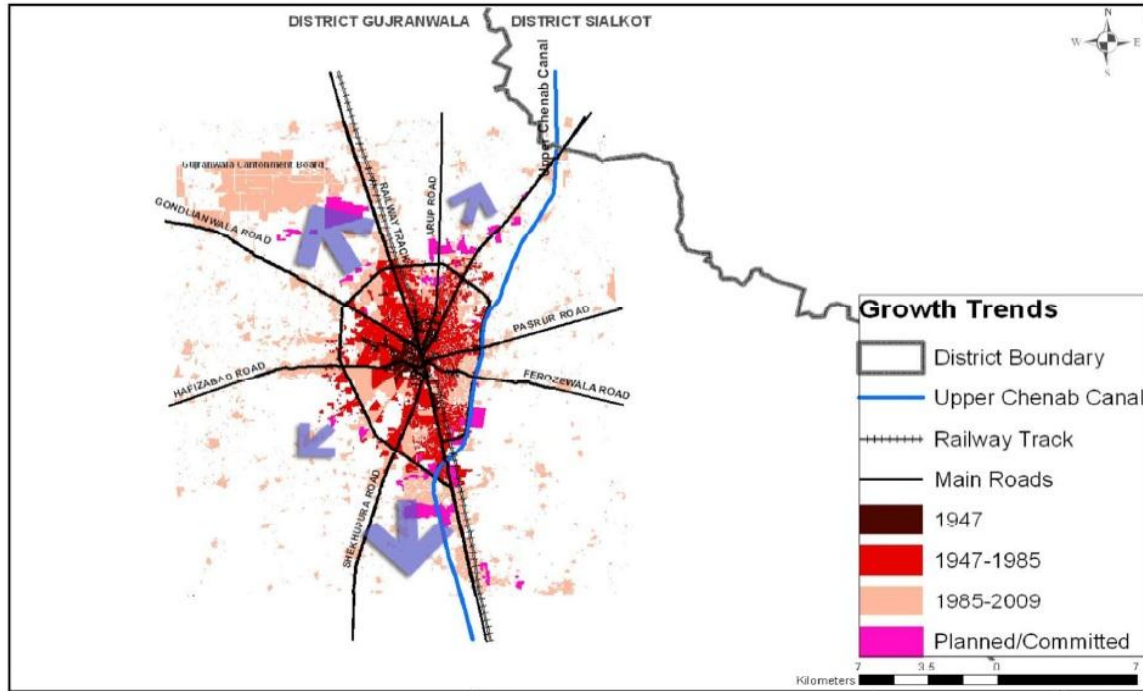


Fig. 7: Growth Corridors of Gujranwala

Source: UNICON, 2009

Table 5. Industries of Gujranwala.

Industry	No of Units
Power looms	921
Utensils	504
Foundry Products	341
Fans/washing machines	321
Sanitary fitting	172
Motor Pumps etc	151
Hosiery	107
Textile Processing	52
Woven Textile	48
Agriculture Implements	44

Source: GOP, 2008

Educational facility was considered to be one of the most important social facilities and an important development of any society. There were three private and one Public Sector Universities to provide post graduate education to the residents of Gujranwala as well as the

surrounding areas. The education growth rate in Gujranwala was 3.5 % per annum. On the other hand, the educational growth rate in overall Punjab was 4.8%, which is remarkable. At the same time out of 36 districts of Punjab, Gujranwala ranked 7th in having most developed educational Structure.

Conclusion: Urban expansion and population growth influx had eminent effect on continuous depletion of resources and land use changes. Natural population increase has been accompanied by increased migration trend towards this area. In the context of the basic infrastructure, Gujranwala has been boosted enough by educational institutes. It achieved 3.5% annual growth rate in education and ranked as 7th biggest education city of the province of Punjab. The resource allocation towards services provision was not efficient as only 15% population had an access to adequate water supply facilities and 28% to sewerage facility. Within the city,

the health facilities were satisfactory and human development was strong.

REFERENCES

- Adeel, M. (2010). Role of land use policy behind unauthorized expansion in Islamabad. In: 46th ISOCARP Congress 2010, Nairobi, Kenya, 1-7.
- Almas, A.S., C.A. Rahim, M.J. Butt, and T.I. Shah (2007). Metropolitan growth monitoring and landuse classification using geospatial techniques. In: SPRS Workshop on Service and Application of Spatial Data Infrastructure, XXXVI (4/W6), Oct.14-16, Hangzhou, China.
- Anwar, M.M., and M.N. Bhalli, (2012). Urban population growth monitoring and land use classification by using GIS and Remote Sensing techniques: A case study of Faisalabad city. *Asian J. Soc. Sci. & Human*, 1(1): 5-13.
- Arif, G.M., and S. Ibrahim (1998). The Process of urbanization in Pakistan, 1951–81. *The Pakistan Development Review*, 37(4): 507-522.
- Arif, G., and S. Hamid (2009). Urbanization, city growth and quality of life in Pakistan. *European JSS*, 10(2): 196-215.
- Bounoua, L., A. Safia, J. Masek, C. Peters-Lidard, and M.L. Imhoff (2009). Impact of urban growth on surface climate: A case study in Oran, Algeria. *JAMC*, 48(2): 217-231.
- Cohen, B. (2004). Urban growth in developing countries: A review of current trends and a caution regarding existing forecasts. *World Development*, 32(1): 23-51.
- Dietzel, C., and K. Clarke. (2006). The effect of disaggregating land use categories in cellular automata during model calibration and forecasting. *Computers, Environ. & Urban Systems*, 30(1): 78-101.
- Feng, H.H. Liu, and Y. Lu, (2012). Scenario prediction and analysis of urban growth using SLEUTH model. *Pedosphere*, 22(2): 206-216.
- GOP. (2000). District Census Report of Lahore 1998, Population Census Organization, Islamabad, Govt. of Pakistan.
- GOP. (2008). Punjab Development Statistics 2008. Bureau of Statistics, Lahore Government of Punjab, Pakistan.
- GOP. (2008). Socio-Economic and Demographic Profile 1998-2008. The urban unit, Urban Sector Policy Management Unit, P & D department, Punjab. Govt. of the Punjab, Pakistan.
- GoP. (2014). Punjab Development Statistic 2014, Bureau of Statistic, Lahore. Govt. of Punjab, Pakistan.
- Jantz, C.A., S.J. Goetz, and M.K. Shelley (2004). Using the SLEUTH urban growth model to simulate the impacts of future policy scenarios on urban land use in the Baltimore-Washington metropolitan area. *EPB*, 31(2): 251-272.
- Kazmi, S.J. H., Y. Anis, and S. Shaikh (2010). Impact of emerging geo-informatics technologies in city and regional planning of Pakistan. *JHSS*, 1(1): 93-104.
- Khan, N. (2000). Temporal mapping and spatial analysis of land transformation due to urbanization and its impact on surface water system: A case from Dhaka metropolitan area, Bangladesh. *Int. Arch. Photogramm. Remote Sensing*, 33: 598-605.
- Khan, J.A. and J. Haroon (2007). Trends in Region Human Development Indices, Social Policy and Development Centre, Research Report No. 73 Karachi (2007).
- Khan, A.A., S. Arshad and M. Mohsin (2014). Population growth and its impact on urban expansion: A case study of Bahawalpur, Pakistan. *Uni. J. Geosci.*, 2(8): 229-241.
- Long, H., G.K. Heilig, X. Li, and M. Zhang (2007). Socio-economic development and land-use change: Analysis of rural housing land transition in the Transect of the Yangtse River, China. *Land use Policy*, 24(1): 141-153.
- Nong, Y., and Q. Du (2011). Urban growth pattern modeling using logistic regression. *Geo-Spatial Info. Sci.*, 14(1): 62-67 (2011).
- Qian, M., L. Pu, J. Zhang, and M. Zhang (2013). Urban spatial expansion characteristics in China's rapid urbanization region-A case study of SXC region. *Intl. J. Geosci.*, 4:1365-1375.
- Qureshi, S. (2010). The fast growing megacity Karachi as a frontier of environmental challenges: Urbanization and contemporary urbanism issues. *JGRP*, 3(11): 306-321.
- Shirazi, S.A., and S.J.H. Kazmi (2010). Analysis of population growth and urban development in Lahore-Pakistan using geospatial techniques: Suggesting some future options. *SAS*, 29(1): 269-280.
- The Urban Unit. (2011). Assessment of land development and management practices in five large cities of Punjab.
- UNICON. (2009). Developing a comprehensive "City Boundary" for the city of Gujranwala. The Urban Unit Lahore.
- Wu, X., Y. Hu, H. He, F. Xi, and R. Bu (2010). Study on forecast scenarios for simulation of future urban growth in Shenyang City based on SLEUTH model. *Geo-Spatial Info. Sci.*, 13(1): 32-39.
- Wu, Q., H. Li, R. Wang, J. Paulussen, Y. He, M. Wang, B. Wang, and Z. Wang (2006). Monitoring and predicting land use change in Beijing using remote sensing and GIS. *LUP*, 78(4): 322-333.