

IMPACT OF URBAN SPRAWL ON THE SERVICE AREAS OF LAYYAH CITY, PUNJAB, PAKISTAN (1950-2015)

Basit Nadeem¹, Nazia Aslam², Rahim Bux³, Saifullah Khan^{4*}, Farhat Ismail⁵

¹⁻⁵Department of Geography, Faculty of Social Sciences, BZU, Multan, Punjab, Pakistan

Email: saifullahkhan33@gmail.com/ Cell No. 00923005248325

Abstract- *Earlier than the 1950s, the Layyah urban territory was a diminutive civic center cover up the vicinity of about 5 km² having less than 10 thousand residents. During the 1950-81's, the urban sprawl in the city was 9 km² (total 14 km²) and covered the cropping area in the neighborhood towards south, north, and east. From 1982-2015's, the rural-urban fringe further grew by about 8 km² and occupied a vast agricultural land. Recently, it covered about 22 km² area having 1.27 million population [1] with a mostly density. Gopal Wala, Chahan Wala, Basti Mirani, Arain Wala, Chandia Wala, Basti Aliani, Basti Sarai, Basti Chandrar and Khangah were the major neighborhoods during 1951-80's but at present, these are merged into the urban center and represent a structure of multiple nuclei/urban realms models.*

KEYWORDS: Internal Structure, Urban Sprawl, Sub-Urban Areas, Affects, Adaptation

1.0 INTRODUCTION

The work illustrates the impact of urban growth on the neighborhoods of a Layyah metropolis. The urban centers and environs are currently twirled into populous areas due to resettlement and natural growth, though right now it is necessitated to come diagonally at the foundations and the consequences of urbanization in Pakistan as well as at an international level. There are numerous reasons for urban growth to upset our current physical circumstances and the lives of creatures. The main causes, among them, comprised land cost, lack of urban planning, low taxes, and many more. Due to every kind of pollution and expensive life, the residents desire to stop settling in the core (CBD) of the cities and to move into the nearby lands (suburbs). Historically, urbanization in Punjab Province dated back to the Neolithic Mehrgarh (7000 BC) Balochistan, Mohen Jo Daro, and Harappan civic centers (2500-1900 BC).

The study area is located between 71°-50' to 70°-44' East Longitudes and 30°-45' to 31°-24' North Latitudes. The Layyah district comprises sandy land (Thal desert) between the Chenab River and the Indus River (Sind Sager Doab) and has a total area of 6,291 km² with 2 million residents [1]. It is covered by Bhakkar district (North), Muzaffargarh district (South), Jhang district (East) and Dera Ghazi Khan district (West) has a well-established drainage system covered by Indus and Chenab rivers. There are a number of contributors who have studied urbanization at an international level as well as Pakistan. The utmost comprises [2 to 12].

2.0 METHODS AND MATERIALS

The research explains the effects of urban sprawl on the service areas and changes in the rural-urban fringe of the Layyah municipality in Punjab province, Pakistan. The work is based on the examination of the effects of urban sprawl on the suburbs with reference to its causes, consequences, and how to overcome the issue. The government plan was selected as an independent element with migration, population growth, land use, industrialization, transportation, services, economy, education, infrastructure, health, etc, as dependent elements to explore the problem. The primary data was collected from various stakeholders using questionnaires, personal visits, and official interviews. The secondary information regarding the residents, population growth, migration, employment, etc accumulated from population census origination, statistical division, Islamabad. The land use, climate, transportation and

rural settlements (suburbs) were gathered from their relevant private and government institutions. The tools considered for the research work consist of a questionnaire (open-ended), official visits, interviews, focus group meetings, cartographic mapping, and statistical tools (sum, averages, graphs, percentages, and charts). The field survey was conducted using random sampling techniques, whereas a complete sample was considered in the evaluation of urban growth on a micro basis using RS/GIS technology. The secondary data of satellite images and earth relief maps were matched with each other for the urban sprawl. Both the land-use comprised of present and past were compared to each other to represent and calculate the growth in agriculture, residential, and forests vicinity, etc, and to explain and discuss it scientifically.

3.0 RESULTS AND DISCUSSIONS

The study area consists of a single charge circle, eleven circles, blocks, and wards per land record information system, Government of Pakistan. There are many neighborhoods, which are situated around the city that supply goods and services to the main urban center and play core roles in the economic and social development of the Layyah municipality. The well-developed transportation system and street-level planning connected the urban center with other parts of the country, though the water supply, sewers, and living standards are not well established and represent nature of an urban slum.

3.1 Urban Sprawl

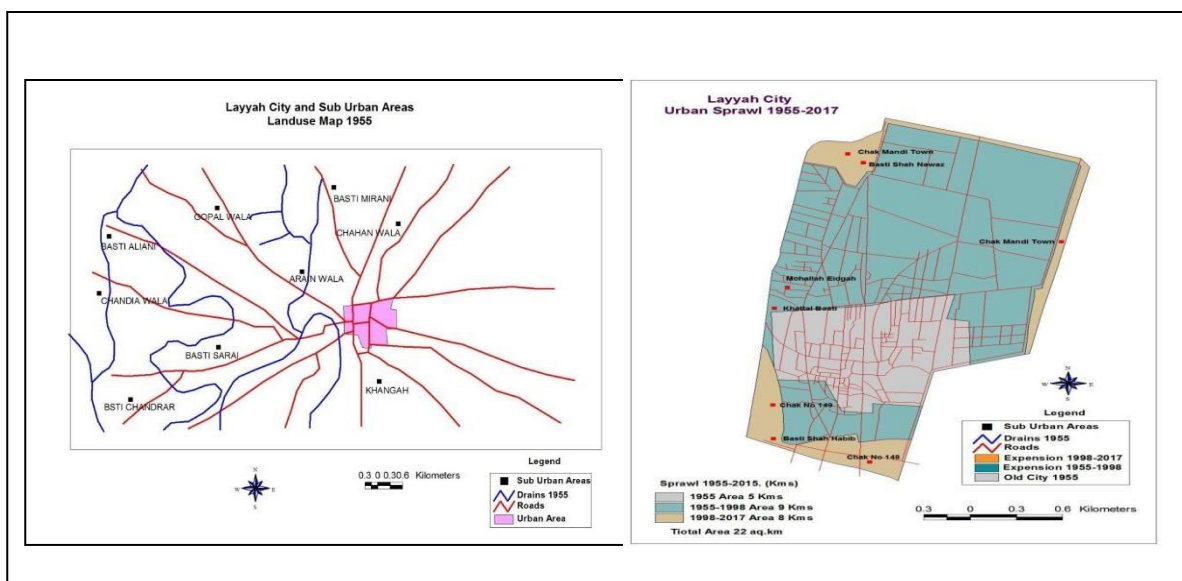


Fig. 1. Layyah urban area, 1961 and 2015

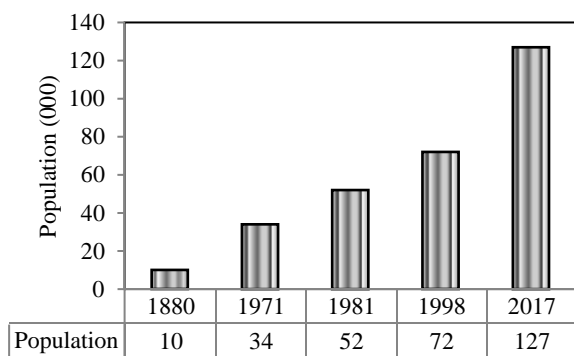


Fig.2. Population Growth (1971-2017) [1]

Figure-1 indicates the Landuse pattern of Layyah municipality with its neighborhoods for the time period of 1950-1961. During the 1950s, the Layyah metropolis was a town having less economic and social development and a lack of urban planning. The coverage estate of the town was about 5 km² with a sum of inhabitants, fewer than 10,000 people, and an elevation of 490 meters (AMSL). A colossal green belt having thorn forests, shrubs, and sandy land was located in the surroundings of the town. Moreover, the majority of transportation was non-metal except for main roads for heavy national-level traffic. The internal structure of the town was in a radial form instead of concentric zones without any industrial or working men zones specific zones. The neighborhoods between 1951 and 1960 consisted of Gopal Wala, Basti Mirani, Arain Wala, Chahan Wala, Chandia Wala, Basti Aliani, Khangah, Basti Chandrar, and Basti Sarai, which were the main source of goods and services for the town. These suburban settlements were hooked up to Layyah town by well-established transportation and communication system with the passage of time and make an internal structure of multiple nuclei, where it is hard to identify the central business district of the city. Many drains were going by at the western sectors of the city in the bare lands that sap the sewer water to the closer drainage. Most of these sewers are presently seems as working men’s homes due to expansion in the city towards suburban territories. The Indus River in the west and Chenab

River in the east covered the underground as well as surface water needs of the locals, agriculture lands, and industrial sectors. The urban center controls the administration of two municipal corporations (Chowk Azam and Layyah City) having separate nuclei or loops. The western part of the urban center is swathed by past residences, while the Chowk Azam metropolis is located in the east with newly constructed working men’s homelands as well as industrial zones. These municipalities are generally known as the Layyah urban center. The comparative study of various topographic maps as well as satellite imageries indicates that the urban area increased up to nine km² (Total of 14 km²) towards the green belt in the north, south, and east directions and occupied most of the sub-urban areas due to an increase in the industrial estates, migration (1947), built-up areas, living standards and economy (Fig.1).

From 1998 to 2015 the urban center expanded further towards neighborhoods up to 8 km² in the north and south. Presently, the Layyah urban center occupied almost 22 km² of acreage with occupants of more than 100 thousand, and due to its economic functions; it is counted as a major urban center of the southern Punjab province, Pakistan. The hasty sprawl of Layyah city has not only originated traffic congestion, but also increased human pressure, pollution, market demands, education, and infrastructure and decreased life facilities in the entire urban center. The conversion of the neighborhoods into the urban built-up area affected city planning and created pressure on the available resources, raw materials, goods, services, communication systems, health, and industrial sector, and weakened the economic hub.

3.2 Factors of Urban Sprawl

- Commonly, population growth is the main element of urban sprawl in Layyah city. It is the result of high fertility, early marriages, and low mortality. Whereas, the relocation of people has been caused by the increasing number of industries, unemployment, education centers, and life needs (push factor), etc. During independence (1947), the inhabitants of the city were 10.000 which moved up to 1.3 thousand (2017) having 22 thousand in-migrants (Fig. 2) [1].

- Due to an increase in the number of education centers, the literacy ratio grows up from 18.9 (1981) to 36.7 percent in 2017 [1].
- The increasing trend in basic health facilities pulls people from neighborhoods in the urban center [1].
- The transportation system of the city comprises roads, streets, and railways and provided bases for urban-to-rural, rural-to-urban, and urban-to-urban migration and expedites the urban sprawl of the city.
- The ratio of cement homes in the transition zone is higher as compared to non-cemented residences (4676).
- Most of the residences have potable water supply/dug wells, latrines, and power resources for their life needs.
- The percentage of 18.1 active and 81.9% non-active population led to a high ratio of unemployment in the city.
- The industrial sectors consist of sugar mills, flour mills, cottage industries, and household industries and push the residents from the rural sector to urban areas.

3.3 People Perception

Most of the female population is doing primary activities (household and agriculture), whereas the male is engaged in secondary as well as tertiary services. The people have spoken out that owing to the increase in residences and migration (rural-urban), the city is growing up to its surroundings due to which the agricultural land converted into working men's homes. The residents were encouraged to settle in the neighborhoods due to pollution, traffic congestion, overcrowding, land value, and taxes in the urban area. They have stated that the rapid urban-rural and rural-urban resettlement is due to the establishment of industrial sectors, employment, and economic stability. The land-use change has been upshot due to the daydreams of well-furnished houses, low cost of land in neighborhoods, housing congestions, family size, traditional lifestyles, and land utilization. The inhabitants of the area mostly choose to live in low-population-density areas as well as vehicle-dependent suburban areas. Urban growth has not only changed the settlement pattern in the urban and suburban sectors but also consumed the natural vegetation, harms fragile ecosystems, and reduced the diversity of animal species.

4.0 CONCLUSION

The Layyah civic center was a town with having total acreage of five km² with residents of below 10,000 (1950's) in contrast to 22 km² having a population of greater than 1.3 million (2017). City planning represents urban realms and multiple nuclei models (sectors) as compared to concentric zones as well as the rank-size rule models. The neighborhoods amalgamated in the urban center (1951-2017) are Basti Mirani, Chahan Wala, Gopal Wala, Arain Wala, Chandia Wala, Khangah, Basti Sarai, Basti Chandrar and Basti Aliani. The elements that affected urbanization is the population growth, health facilities, education, communication, standards, housing schemes, economy, employment, income

level, banking, industrial development, and security. The people have called upon the step up in urban planning, policies, education, security, land value, sewer and water supply, taxation, economy, housing schemes, transportation, solid waste management, facilities, power resources, housing, and migration.

REFERENCES

- [1] GoP., *District Census Report of Layyah District*. Population Census Organization, Government of Pakistan, Islamabad, 331 pages (1998; 2017).
- [2] Shaukat, S., Zab, A., Rahim, T., Urbanization in North West Frontier Province. *Sarhad J. Agric.* **23**(1): 233-242 (2007).
- [3] Jamal, T., Mazhar, F., Temporal Residential Growth of Faisalabad City. *Journal of Scientific Research*, **xxxix**(1): 59-63 (2009).
- [4] Adeel, M., Methodology for Identifying Urban Growth Potential Using Landuse and Population Data: A Case Study of Islamabad Zone IV. International Society for Environmental Information Sciences 2010, Annual Conference (ISEIS), *ELSVIER, Science Direct, Procedia Environmental Sciences*, **(2)**: 32–41 (2010).
- [5] Geshkoy, M. V., Desalyo, J.S., The Landuse Control on the Spatial Size of U.S Urban Size Areas. *Journal of Regional Science*, **52**(4): 648-675 (2012).
- [6] Iram, A., Rasool, L., Shahzad, F., Saeed, Y., Impact of Urban Sprawl on Public Health, An Analysis of Lahore. *World Applied Sciences Journal*, **20**(1): 80-86 (2012).
- [7] Malik, A. A., Policy Option for Financing Urban Transportation in Resources Construction Environment, The case of Lahore, Pakistan. *The Pakistan development review*. **52**: 139-155 (2013).
- [8] Shirazi, S. A., Kazmi, S. J. H., Analysis of Population Growth and Urban Development in Lahore, Pakistan using Geospatial Techniques; Suggesting some Future Options. *Journal of South Asian studies*, **29**(1): 269-280 (2014).
- [9] Saeed, B., Sajjad, H. S., Hussain, S., Shirazi, S. A., Shkirullah, K., Batool, R., Impact of Urban Evolution on Land- Use Change of Sargodha City, Pakistan. *J. Sc. & Tech. Univ. Peshawar*, **39**(2): 29-36 (2015).
- [10] Hasan, A., Urban Sprawl, Infrastructure Deficiency and Economic Inequalities in Karachi. *Sci. Int. Lahore*, **28**(2): 1689-1696 (2016).
- [11] Jadoon, M., Ferwa, U., Jabeen, N., Urbanization in Pakistan: A Governance Perspective. *Journal of the Research Society of Pakistan*, **54**(1): 127-136 (2017).
- [12] Yaseen, A., Rana, W. A., Shu, H., Monitoring the population change and urban growth of four major Pakistan cities through spatial analysis of open source data. *Annals of GIS, Journal of the International Association of Chinese Professionals in Geographic Information Sciences, Tylor and Francis*, **29**(1): 1-13 (2023).