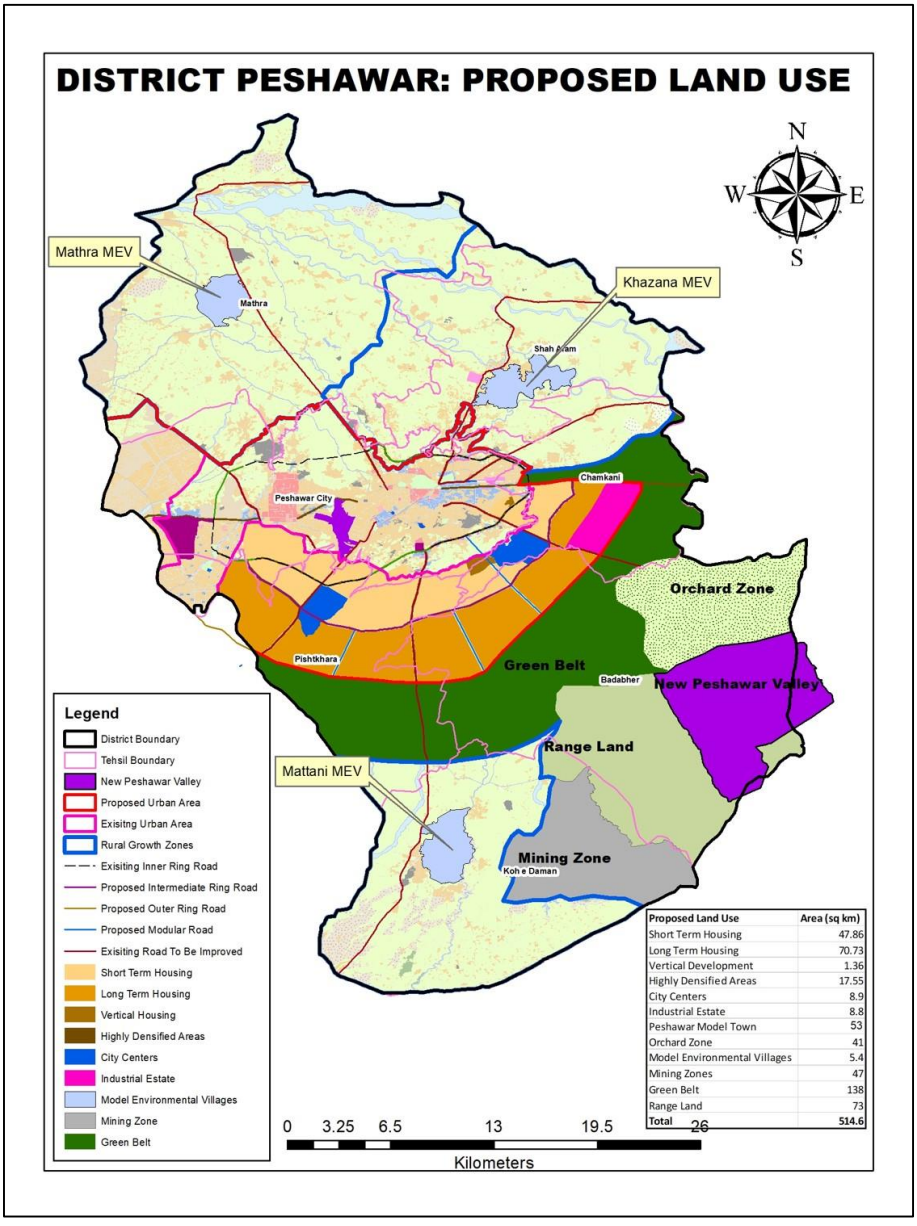
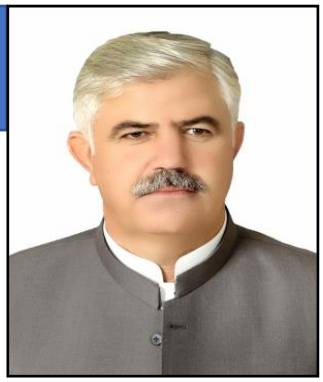
Urban Policy and Planning Unit – Provincial Land Use Plan (PLUP)
Planning and Development Department
Government of Khyber Pakhtunkhwa

Final Land Use Plan of District Peshawar



MESSAGE FROM CHIEF MINISTER KHYBER PAKHTUNKHWA



The process of allocating land among competing and frequently conflicting land uses is referred to as land use planning. This process aims to promote the rational and orderly use of land in an environmentally friendly manner to enable the sustained growth of human settlements.

Cities and towns would be in disarray without an appropriate land-use plan, and the traffic movement would not be effective. Industrial facilities would contaminate streams, residential areas, and the air. Urban sprawl would hinder the cities from functioning as they ought to, thus the economy would stagnate, causing future generations to be unable to benefit from the land due to resource wastage and environmental harm. There is a rising consciousness of human impact on the environment in today's society, reminding us that every change we make has an environmental impact. We are becoming more cognizant of how we live, work, and interact to maintain a sustainably able environment.

Land use planning is not a stand-alone idea. Visualizing land-use planning as a vital element in the process of promoting national development is important. Given the existing economic, financial, and technical resources and expertise, this approach aims to take these into account as well as identify and satisfy the population's fundamental social and human needs.

There are requirements that must be addressed for everyone such as housing, employment, education, leisure activities, transportation, and access to essential amenities like clean water, power, and healthcare. The goal of social planning and policy is to meet the population's fundamental social requirements. Economic planning and strategies aim to guarantee that the nation has a strong economic foundation, which generates income to fund government operations and pay for the delivery of services to the general public while also guaranteeing that there are jobs available for the labor force of the nation.

Within a conceptual and physical framework, land-use planning aims to meet the needs of housing for the population, but it cannot be constructed in a swamp, an area that is hazardous to the health and safety of the residents or other citizens, or an area which is ill suited for housing development due to its terrain, vulnerability to natural disasters or other hazards, or its incapability to physically endorse the building.

The master plans of cities and towns in Khyber Pakhtunkhwa were made independently from their respective rural areas in a disjointed and fragmented endeavor. Recognizing the circumstances, the present administration chose to implement development using an integrated and comprehensive district-level planning method across the province. The six districts of Peshawar, Nowshera, Charsadda, Mardan, Swabi, and Abbottabad have land use plans prepared, and work is ongoing on the province's remaining districts.

The Provincial Land Use and Building Control Act 2021, passed by the provincial government to standardize the approval and implementation systems for land use plans, which had previously been inadequate. For the purpose of reviewing and authorizing future infrastructure projects, the Provincial Land Use and Building Control Act established the Provincial Land Use and Building Control Council. Additionally, district-level land use plans provide explicit methods for their implementation. Land use plans of the districts of Peshawar, Nowshera, Charsadda, Mardan, Swabi, and Abbottabad were granted approval by the Provincial Land Use and Building Control Council.

I appreciate and acknowledge all stakeholders who provided their input during the preparation of these district land use plans. I would also like to extend my gratitude to the concerned team of the provincial land use plan, UPPU, P&D Department for their dedicated efforts to complete these six land use plans.

Mahmood Khan
CHIEF MINISTER

MESSAGE FROM ADDITIONAL CHIEF SECRETARY KHYBER PAKHTUNKHWA

In order to relieve pressure on mega cities, the Provincial Land Use Plan is intended to serve as a policy document for the integrated, coordinated, and systematic planning and even deployment of development programs and employment opportunities to rural and suburban communities close to their residences. As potential touchstones to benefit rural areas and small towns, it aims to build a hierarchy of settlements and developments made up of satellite, intermediate, secondary, and industrial towns. The plan will aim to maximize provincial revenue, raise overall activity, balance the distribution of infrastructure and services, and enhance per capita income while simultaneously maximizing the utilization of human and physical resources. Furthermore, it will serve as a guideline to the nation-building departments and agencies, including local government entities and TMAs, for carrying out integrated and coherent development projects through systematic and structured techniques.

Khyber Pakhtunkhwa has led the way in creating comprehensive land-use strategies. Based on the findings of studies and consultations with key stakeholders, this document serves as a roadmap for the sector plans that will be carried out with careful integration among sectors. District land use planning involves a variety of stakeholders at various stages of the planning process, including the Planning and Development Department, Local Government, Elections and Rural Development Department, and other key stakeholders. District land use planning is optimistic, based on the anticipated variations in the decades ahead, producing later ledgers in the plan at appropriate stages, and engaging stakeholders to identify their timely needs.

The proposed District Land Use Plan will serve as a major planning document for the allocation of land for future development initiatives. This will help fulfill human needs in a more effective manner and also ensure protection of the natural environment.

I wish to record my appreciation for the initiative of preparing the district land use plans of District Peshawar, Charsadda, Mardan, Nowshera, Swabi and Abbottabad and am optimistic for its implementation.

Shahab Ali Shah
ACS. P&DD

Acknowledgments

Provincial Land Use Plan is extremely thankful to the planning & Development Department, Government of KP for assigning this important and prestigious study. The Land Use Plan of District Peshawar is a component plan of Provincial Land Use Strategy for Khyber Pakhtunkhwa. The plan at work is an in-depth study encapsulating all sectors of physical, socio-cultural, environment and economy in spatial context. The plan also takes into account issues and constraints related to land use planning in the district and accordingly suggests a more harmonized, balanced and sustainable use of land and other natural resources.

The project team of the Provincial Land Use Plan is greatly indebted to the Additional Chief Secretary P & D Department, Secretary P & D Department and Executive Director of the Urban Policy & Planning Unit for spearheading the project. Without their continuous support, it wasn't possible at all to continue and successfully complete this District Land Use Plan. They have been the Project's sole custodian during project upheavals, and the project team is highly indebted to his patronage of the project.

It is worth, mentioning here that Khyber-Pakhtunkhwa is the first province in Pakistan taking this initiative of preparing District Land Use Plans of the 36 districts of Khyber Pakhtunkhwa including merged districts. We also deeply acknowledge the continuous support, cooperation, and omnipresence of sectoral experts of the Urban Policy and Planning Unit and the technical section of the Provincial Land Use Plan of their valuable inputs during the conceptualization, data collection, analysis, planning and review stages, which are truly praiseworthy.

Special thanks are due to the officials of the district line departments and all other stakeholders for their active involvement, cooperation and coordination during the preparation of this District Land Use Plan. we are also extremely thankful to those who help and facilitated various surveys by providing the required information.

Finally, but certainly not least, the dedicated efforts that the Project Manager, Mr. Naseer Ahmad, has put forth are commendable. He works around the clock to get the plans to the point where they were approved, leaving no stone unturned in the process.

Hope that these dedicated efforts of the whole team will bring prosperity and peace to the District Peshawar. Despite of our best efforts, if any error or omissions are detected or if there are suggestions for further improvements of this Plan, the same would be forwarded to the District Land Use Planning and Management Committee at District level for their inclusions in the updated versions of the Plan.

Project Manager
Provincial Land Use Plan

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF MAPS

ABBREVIATIONS AND ACRONYMS

Term	Description
ADB	Asian Development Bank
ADP	Annual Development Program
BHU	Basic Health Unit
Cantt	Cantonment
CIDA	Canadian International Development Agency
DB	Decibels (Unit of Sound)
EPA	Environmental Protection Agency
GIS	Geographical Information System
GT Road	Grand Trunk Road
HHs	Households
Kms	Kilometers
KPK	Khyber Pakhtunkhwa
DLUP	District Land Use Plan
PLU&BCA	Provincial Land Use & Building Control Authority
M1	Motorway Islamabad-Peshawar Section
MC	Municipal Corporation/Committee
NRM	National Reference Manual
MCC	Manual Classified Count
O-D Survey	Origin-Destination Survey
OFWM	On-Going Water Management
PCU	Passenger Car Unit
PEPA	Pakistan Environmental Protection Agency
PHA	Provincial Housing Authority
ppm	Particles per Million
R^2	Coefficient of Determination used in Regression Analysis
ROW	Right of Way
SME	Small and Medium Enterprises
SMEIDA	Small and Medium Industrial Development Authority
UC	Union Council
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND AND RATIONALE

In the past, Master Plans of Cities/Towns in Khyber Pakhtunkhwa were prepared in isolation from their hinterland, which was a piecemeal and isolated effort, and thus did not achieve the desired results. The Provincial Government, taking cognizance of the situation, decided to carry out development of all areas of the province by adopting an integrated and holistic Land Use Planning approach.

Land use Plan is envisaged as a policy document for an integrated, coordinated, systematic planning and uniform spread of development activities. It also aims at generating employment for the rural and sub-urban population reducing rural-urban migration. It would help in establishing hierarchy of settlements and development of satellite, intermediate, secondary and industrial towns as focal points for future to cater for the rural areas and small towns.

The Land Use Plan will help induce a sustainable development, optimize exploitation of land and physical resources, enhancing provincial income, increase overall activity and balanced distribution of infrastructure and services. The Land Use Plan will be a tool to provide guidance to Provincial Government, Urban Policy Unit, District Governments and TMAs for undertaking integrated and coherent development programs.

1.2 VISION

"To make District Peshawar prosperous and green through a comprehensive and integrated land use planning for systematic planning of development initiatives, controlling sprawl through planned development, creating more employment opportunities, managing natural resources, and balancing regional development."

1.3 OBJECTIVES

i. To provide broad framework for District Spatial Plans and to resolve inter-district planning issues.

ii. To establish a planned hierarchy of settlements and an integrated and systematic growth of trunk infrastructure and services in the province.

iii. To provide guidelines for the emerging developments corridors.

iv. To suggest parameters for reducing migration to big urban centers.

v. To determine a need for new towns at feasible locations.

vi. To provide guidelines for proper development of rural areas.

vii. To provide a broad guideline to the nation building departments/ agencies for undertaking integrated and coherent development programs at the provincial level.

1.4 PLANNING PARADIGM

In the traditional planning paradigm, usually separate spatial plans are prepared for urban and rural areas, while the district land use plan of Peshawar is a shift from the traditional planning paradigm where spatial plans for urban and rural areas were prepared simultaneously. The Land Use Plan principally emphasizes on two major planning techniques which are; projections according to existing scenarios encompasses the sectors of housing, infrastructure, transportation, commercial, industry and recreational activities, and the analysis & proposals for such sectors to improve the living standards of populace of Peshawar. The land use plan provides both long term broad policy guidelines and short-term specific project proposals for cohesive development of the area. The implementation of the plan will reduce regional disparities and will ensure the balanced development of both urban and rural areas in the district.

1.5 SECTORIAL COVERAGE

The sectors covered in the land use plan of Peshawar are listed as under:

Urbanization and hierarchy of human settlement, Demography, Agriculture and livestock, Trade, Commerce and Industries, Mines, Minerals and Energy, Communication (Road, Rail and airways, postal services and Telegraphs), Health and Education, Tourism, Sports and Entertainment including historical and religious places, libraries, museums, zoos and open spaces, security, graveyards, Housing, Water (surface and ground water resources) and district economy. For preparation of the District Land Use Plan of Peshawar (2021-40) all these sectors were thoroughly analyzed and mapped using modern techniques of GIS and Remote Sensing.

1.6 THE PROJECT AREA

District Peshawar is located in the central western part of KP and is bound by district Nowshera towards East, district Charsadda towards North, Mohmand tribal district in the Northwest, and Khyber tribal district towards West & South. The Afghan border is approximately 40 Km to the West. Peshawar stands right at the entrance of the world-famous Khyber Pass, and lies between 33° 44′ and 34° 15′ North latitudes and 71° 22′ and 71° 42′ East longitudes. The total area of the district is 1,216.17 square kilometers and comprises of four Towns which is further subdivided into 92 Union Councils & 346 village/neighborhoods councils.

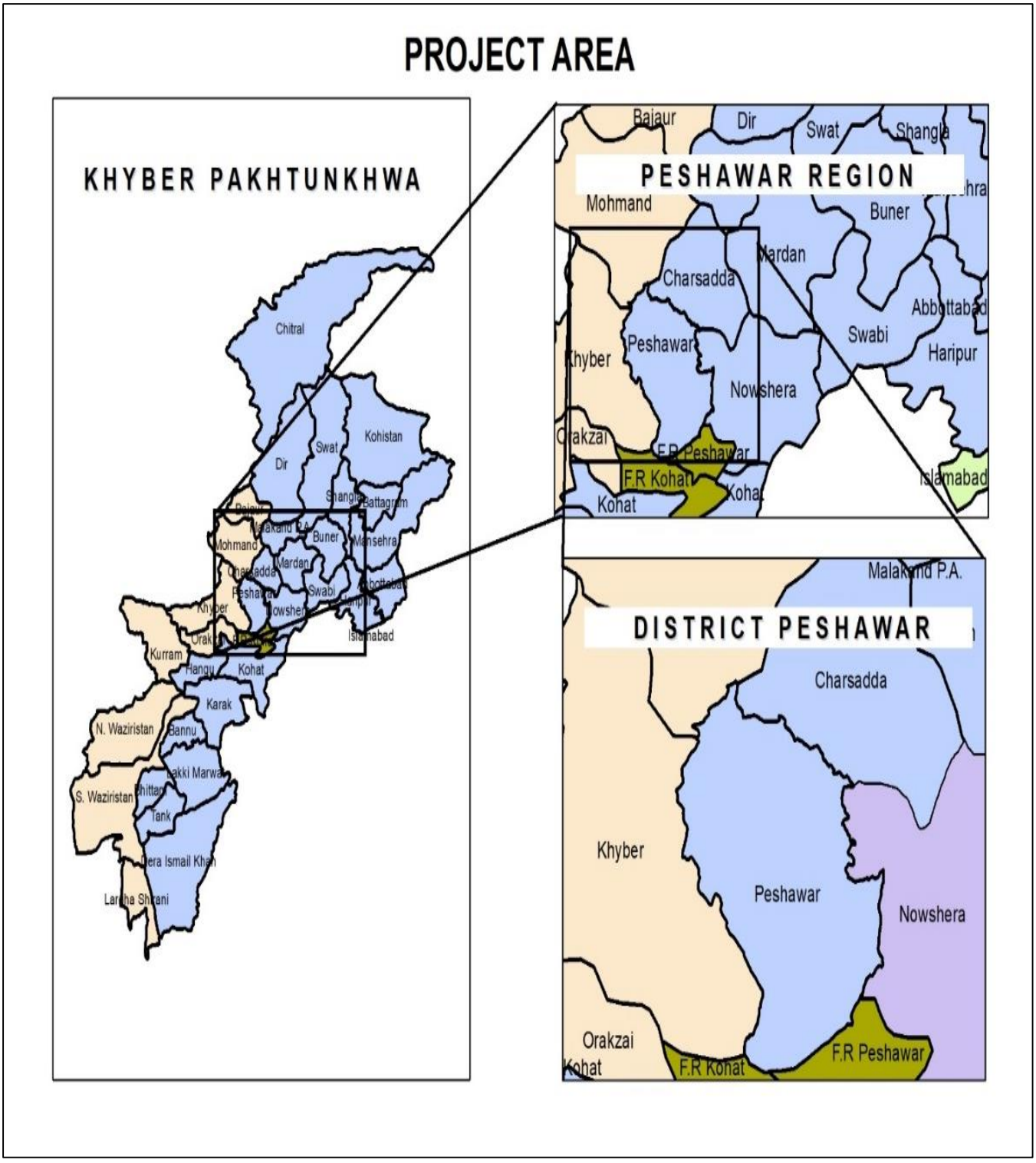
The availability of rich fertile soil and sufficient water for irrigation makes Peshawar district a prime place for agricultural development. The Kabul River and its tributaries providing water for irrigation. The River Kabul enters into Peshawar district at Warsak and flows towards East roughly along the Northern boundary of the district. The Bara River enters district Peshawar from South-West and flows in the North-Eastern direction through the district and enters Nowshera district before joining Kabul River in district Nowshera.

The Peshawar District Land Use Plan 2021-40 is envisaged as a policy document for an integrated, coordinated, systematic planning and uniform spread of development activities. It also aims at generating employment for the rural and sub-urban population reducing rural-urban migration. It would help in establishing hierarchy of settlements and development of

satellite, intermediate, secondary and industrial towns as focal points for future to cater for the rural areas and small towns. The land use will ensue planned expansion of the city and the emphasis will be on densification/intensification measures to

Reduce sprawl and conserve prime agriculture land to secure our food basket from competing uses.

Map 1. 1: Map of Project Area



1.7 CLIMATE

The climate of Peshawar is sub-tropical, semi-arid and sub-mountain with winter and monsoon rainy season, because of which Peshawar experiences considerable precipitation during winter and summer.

Generally, four seasons prevail in the area, which may climatologically be divided as[1]:

- Winter: December-March
- Pre-monsoon: April-June
- Monsoon: July-September
- Post-monsoon: October-November

During winter season, the western disturbances pass though the region and cause rainfall. If there is a strong trough, the air mass may get moisture supply from the Arabian Sea. Sometimes the path of western disturbance slightly moves to lower latitudes (middle part of the country) resulting in increasing number of rainy days. During the month of March which is the ending of winter season, tracks of Western disturbance lie more towards Southern Pakistan.

Pre-Monsoon is a transition period from the winter circulation to the monsoon circulation in the region. During this season, westerly waves shift Northwards and relatively the frequency of Western disturbance become less. It remains active over the Northern parts of the region with the decreasing frequency of occurrence as compared to the peak winter months. Sometimes, due to intense solar heating, musicale convective systems dominate over the plains and mountainous areas. As a result, heavy downpour associated with hailstorm and thunderstorms occur. South West monsoon rains start from the month of July and last till September. These rains are quite heavy and can cause significant flooding, even severe flooding if they interact with the waves of Western disturbance in the upper parts of the country. Post-monsoon season is transition period from the monsoon seasons to the winter season in the region. In this season the rainfall activity is very less and the temperatures become lower.

Precipitation is relatively high in winter and monsoon seasons. The area receives more rain during winter season than in summer ranging from 20 to 77mm.Maximum average monthly temperature is in the month of May-June ranges from 37-40°C. Low temperature occurs during October to March with minimum mean value of 3.4°C in January. Wind is influenced by a wide range of factors, from large scale pressure patterns, to the time of day and the nature of surrounding terrain. The mean surface wind speed varies during the year from 0 to 3 knots and the direction is usually variable. The average humidity is not high over the region. The mean relative humidity ranges from 44 to 65 percent during the year.

[1] The categorization is based on comments sent to PMU by Meteorological Department, Peshawar.

Table 1. 1: Climatological Normal for Peshawar, Pakistan (2020)[2]

Climatological Normal for Peshawar - (2020)												
Parameters/Months	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Monthly Mean Max Temp. (°C)	16.1	22.6	22.3	28.8	35.9	38.1	39.6	37.8	35.2	32.4	23.3	19.0
Monthly Mean Min Temp. (°C)	3.4	7.0	11.9	16.0	20.7	24.1	24.8	25.5	21.5	15.3	8.1	5.3
Monthly Total Rainfall (Mm)	47.2	35.3	149.1	60.9	7.8	10.2	25.0	39.2	56.2	0.8	63.7	9.4
Mean Monthly R/H %	58	47	64	51	44	49	45	57	53	47	65	61
Mean Monthly Wind Speed (Knots)	1.4	1.7	1.7	0.9	1.2	2.4	3.0	2.7	1.1	0.8	0.6	1.0
Mean Monthly Wind Direction	S85 W	N51 W	N34 W	N23 W	S45 W	N30 E	N45 E	N39 E	N53 E	N38 E	S80 W	S71 W

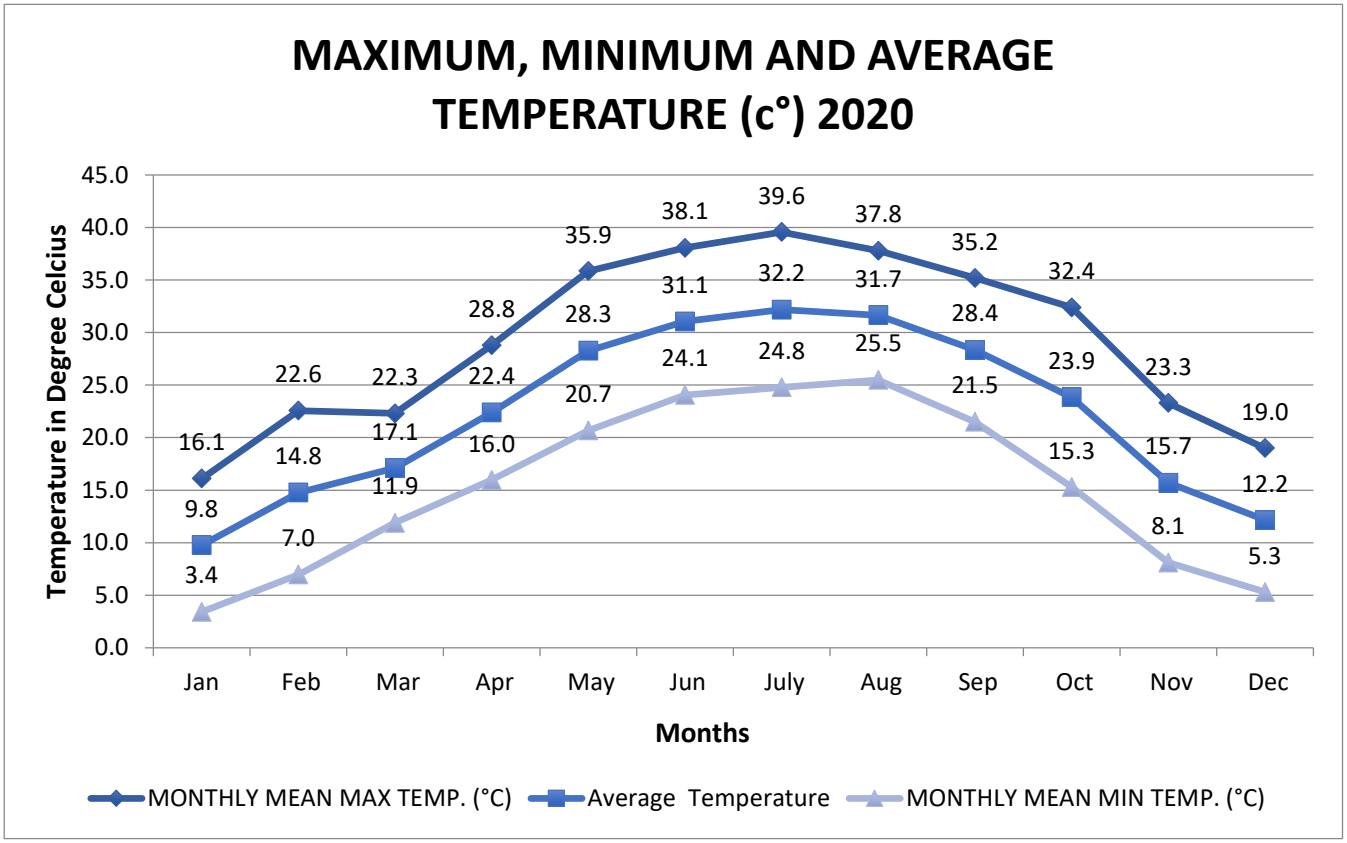


Figure 1. 1: Maximum, Minimum and Average Temperature(c°), 2020

[2] Pakistan Meteorological Department, Peshawar

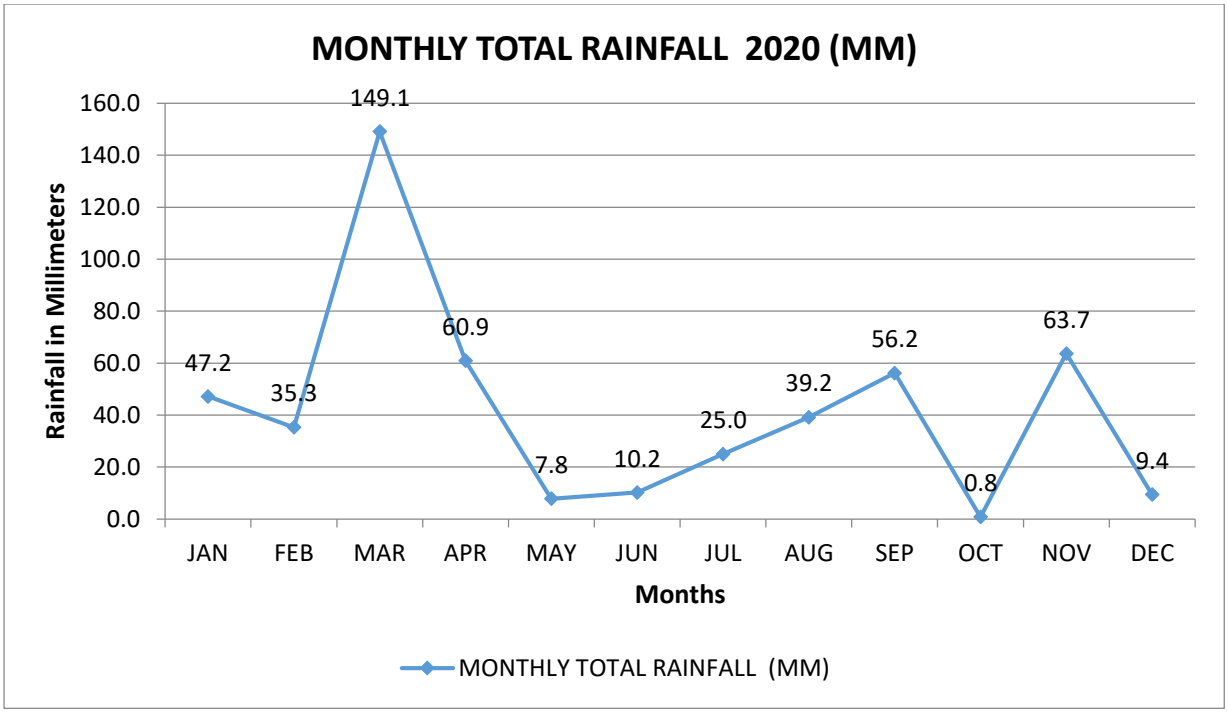


Figure 1. 2: Monthly Rainfall (mm), 2020

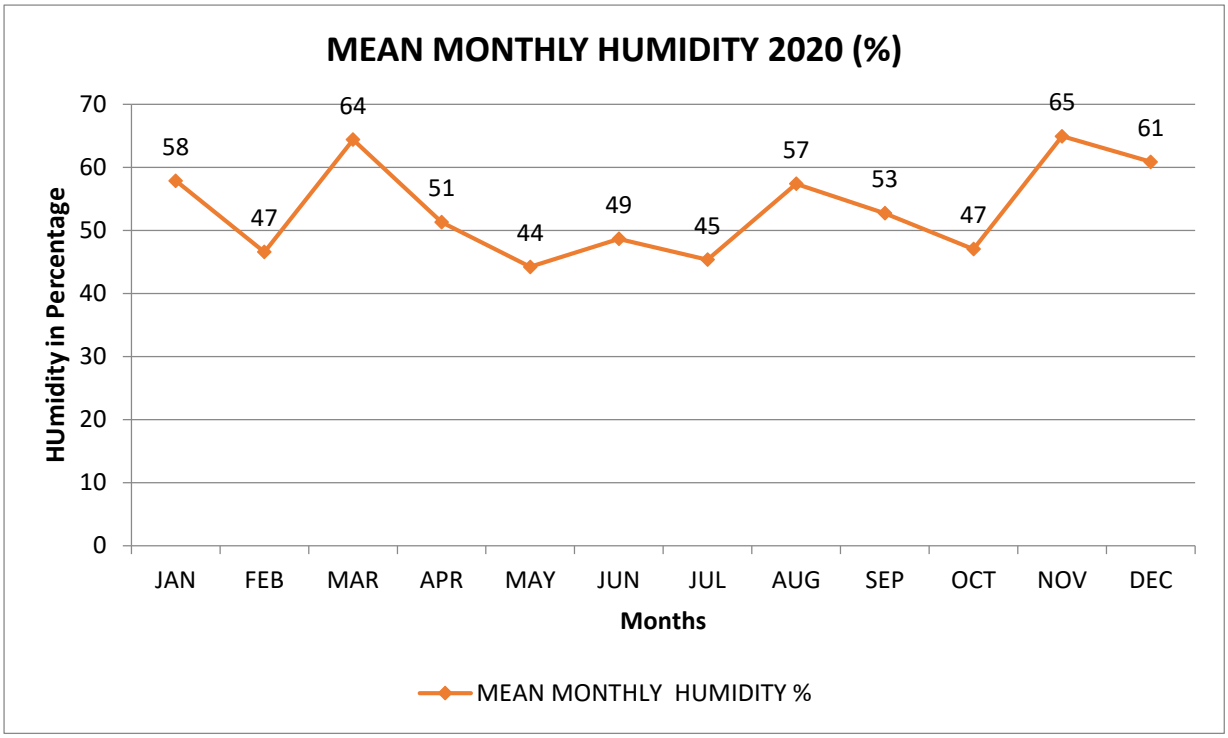


Figure 1. 3: Monthly Average Humidity (%), 2020

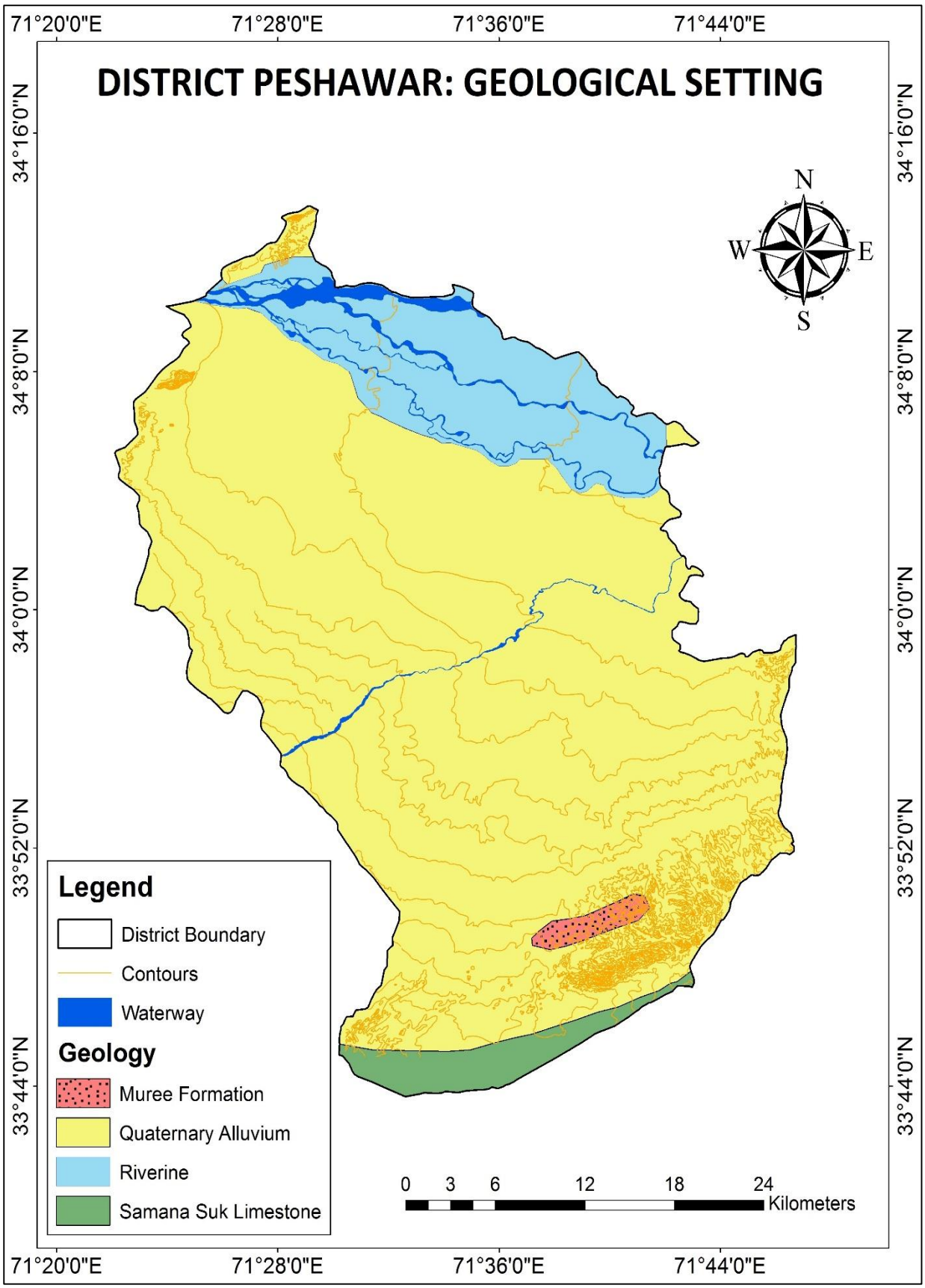
1.8 GEOLOGY

District Peshawar is underlain by recent river, stream and flood plain deposits, which belong to the Pleistocene age group. Such deposits constitute about 80% of the District area. These are classed into four types i.e. Riverine, Murree formation, Quaternary Alluvium and Samana Suk formation. Apart from these, about 20% of the area of the Peshawar district is covered by other rock types. These rocks are typically revealed in the outcrops to the West, South-West and South of the district. These include Tertiary Rocks, Jurassic Rocks, Paleozoic Rocks and Precambrian Rocks.

In the plain of Peshawar District, Quaternary deposit as old as 0.8 million years are present while in the north and north-west part of Peshawar District has riverine deposits of Kabul River. In the south, Samana Suk formation is present along the Main Boundary Trust. There are outcrops of the Murree Formation to the south of Peshawar District.[3]

About 80% of District Peshawar adjacent to District Khyber is covered by Landi Kotal slate and Manki formation in Khyber area slate with subordinate argillaceous limestone intruded by dolorite dykes. Manki formation consists of dark gray, black thin bedded argillite sericite bearing slate, phyllite and subordinate lenses of limestone, gravel sand and silt which has a bearing capacity in the range of 7-8 ton per sq ft for gravel and 0.2-0.3 ton per sq ft for clay soil with low water table. Therefore, as far as geology is concerned, the district area is suitable for urbanization, provided other factors permit.

[3] National Center of Excellence in Geology, University of Peshawar.



Map 1. 2: Geological Map of District Peshawar[4]

[4] Geological Map of North-West Frontier Province Pakistan-2006, Geological Survey of Pakistan

1.8.1 Seismic Conditions

Peshawar is the capital city of the Khyber Pakhtunkhwa province of Pakistan. The seismic hazard in Peshawar is aggravated by increasing vulnerability due to population growth and expansion in infrastructure due to its political and regional importance. It is located in the western Himalayan region characterized by high seismicity rates due to its vicinity to the active plate boundary between the Indian and Eurasian plates which are converging at rates of 37-42 mm/year. The Main Boundary Thrust (MBT) system along which the devastating Kashmir earthquake occurred in 2005 is located in the northern parts of the country together with some other active regional fault systems, which include Main Mantle Thrust (MMT) and Main Karakorum Thrust (MKT). These faults, if reactivated can act as a potential source of seismic hazard for the region including Peshawar. According to MOHW-PEC-NEPAK (2007), Peshawar is mainly placed in Zone 2B. The Zone 2B has Peak Ground Acceleration (PGA) in the range of 0.16g to 0.24g for a return period of 475 years.[5]

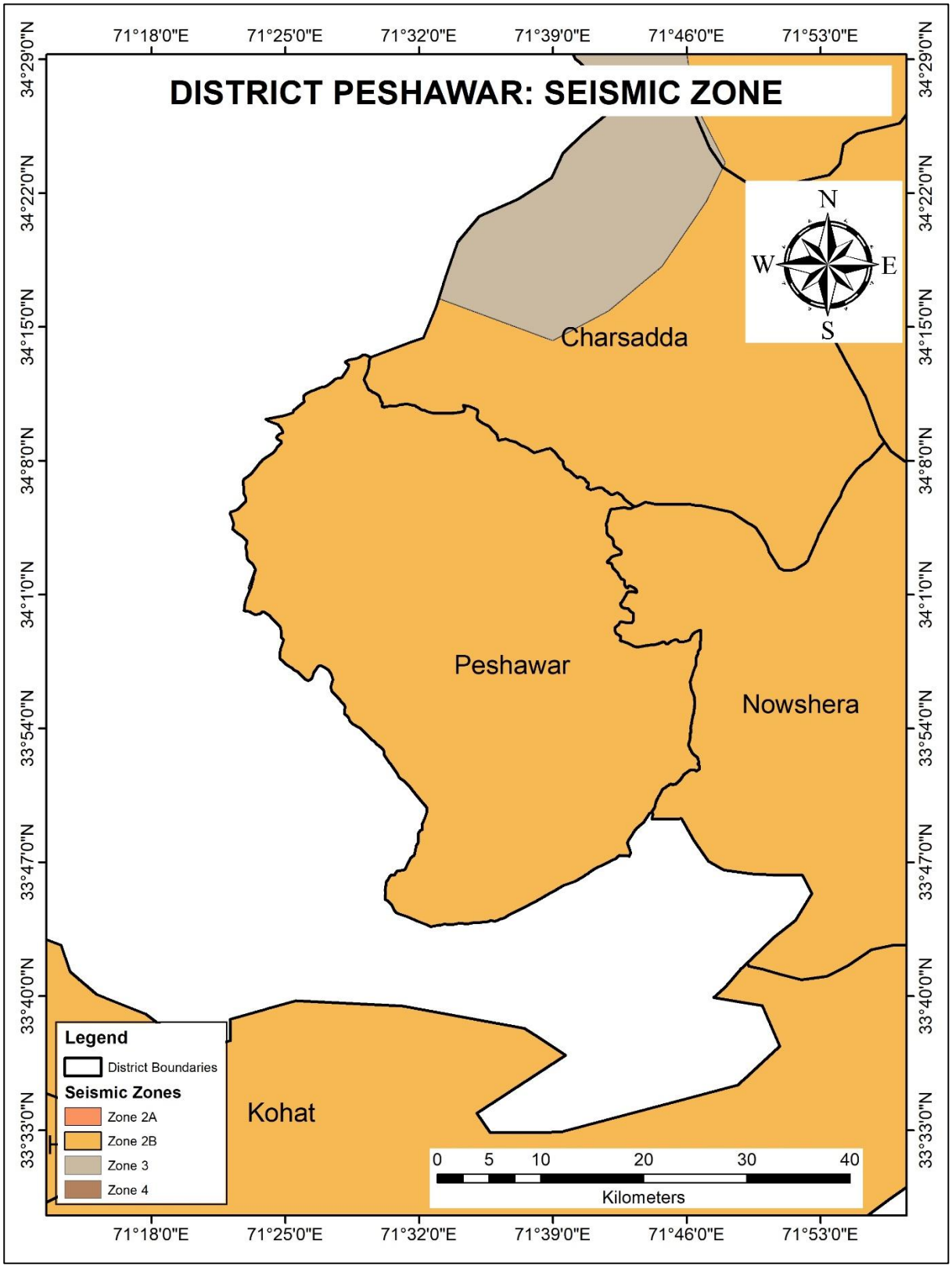
Regarding seismicity in the District, Peshawar lies in Zone 2B of minor damage zone corresponding to PGA (Peak Ground Acceleration) value of 0.0667g to 0.1g. Small magnitude earthquake, less than 4.5 have occurred near the city of Peshawar, but no earthquake of magnitude greater than 5.0 has occurred in close vicinity of Peshawar and none has occurred within the Peshawar Valley.

Expected epicenters cannot be predicted at any particular place. However, earth quake can occur at active fault/thrust lines because energy is continuously stored during the movements of earth along the fault/thrust lines. The only active faulting in the southern Peshawar basin is Uch-Khattak fault, above the Panjal-Khairabad Thrust (PKT) which is in area across the Attock-Cherat range. Therefore, this active fault could be the future (with no time frame) epicenters of earth quake in this region.[6]

Based on the seismic conditions of the area, Peshawar can be considered potentially safe area for construction of high-rise buildings and strategic infrastructure development.

[5] Waseem, M., Khan, M. A., Javed, M. W., & Ali, S. M. (2013). Deterministic seismic hazard analysis for Peshawar, Pakistan. Journal of Himalayan Earth Sciences, 67-72.

[6] Final District Studies Report Peshawar (Revised) January, 2013.



Map 1. 3: Seismic Zones Map of District Peshawar[7]

[7] Generated form: Ahmed Hussain and Roberts S. Yeast., Active faulting in the southern Peshawar basin, Pakistan Geological Bulletin Univ. Peshawar Vol. 35, pp. 113-124, 2002.

1.9 ENVIRONMENT

Peshawar has enormous environmental problems like another metropolitan cites of Pakistan. To observe the environmental condition in detail 28 samples are collected to test noise and air pollution while 74 samples are collected for drinking water supply. All the collected samples are compared with the national environmental quality standards (NEQ's).

1.9.1 Air Pollution

For air quality five parameters are tested in which three parameters; carbon monoxide, nitrogen dioxide & sulfur dioxide is within NEQ's limit while nitrogen oxide is greater than NEQ's limit at Kohat road & Ring road junction due to high traffic and congestion. The fifth parameters particulate matter ($PM_{2.5}$) exceed the NEQ, s standards at all location which increase the age specific mortality risk and can also exacerbate lungs and heart diseases.

1.9.2 Water Pollution

For drinking water 25 parameters are tested at different location in which majority are within the NEQ's limit except Nitrate (NO_3) which exceeds the NEQ's limit at Babbo Garai and Peshawar high court.

1.9.3 Noise Pollution

The noise level in Peshawar is higher than the NEQ's at all the sampling locations. The minimum noise is at Government College Chowk, because at this Chowk the traffic volume is less as compared to other sampling points. The national environmental quality standard declared for Noise pollution is 65 (db(A)) while the average noise pollution in Peshawar is 74.5 (db(A)).

Higher levels of noise can increase blood pressure and cause other cardiac issues even if the person has particularly disturbed. Noise pollution can also cause gastric problems. Noise leads to emotional and behavioral stress. A person may feel disturbed in the presence of loud noise such as produced by beating of drums. It also increases occurring of diseases such as headache, blood pressure, heart failure, etc. Exposure to excessive loud noise, over long periods, can also lead to partial deafness. Noise disturbs feeding and breeding patterns of some animals and has been identified as a contributing factor of the extinction of some species.

Transportation is a big source of noise pollution in urban area. Increasing traffic has given rise to traffic jams in overcrowded areas where the repeated hooting of horns by impatient drivers pierces the ears of road user. Noise from airplanes constitutes an increasing serious problem in cities where airport is situated in the vicinity of population centers.

1.9.4 Industrial Pollutants Areas

Peshawar has different type of industries such as marble factories, brick kilns, board industries, matches factories, mills, etc. These industries are located around the city at different points; Warsak road, Hayatabad, and the southern side. The effluent of these industries contributes to different types of pollution such as air, noise, water and soil.

Most of the marble factories are located on Warsak road. The white powder of marble factories discharges directly to the canals; through these canals the waste circulates in the

city and finally disposed into River Kabul. Waste water of marbles and chips factories contain harmful chemical which directly affects aquatic life, pollute the surrounding environment for residence, and poison the agricultural land which is irrigated through these canals.

The environment at the southern and south-eastern side of Peshawar is drastically polluted due to Brick kilns industries, the chimneys of brick kiln's discharge a huge amount of smog to the environment which contain hazardous chemical and causes air pollution. Hazardous chemical in the smog is due to coal combustion in the factories. Some industries in the industrial estate Peshawar like board industries and matches factories also do not fulfill the National Environmental quality standard and cause the air and water pollution of the surrounding. The Most industrial pollutant areas are: Warsak road, Southern side (Mattani, Addezai, Surizai Payans etc.), Hayatabad Phase 5.

Khyber Pakhtunkhwa Environmental Protection Act, 2014

Following the Eighteenth Amendment the Khyber Pakhtunkhwa EPA noted that proper procedures are required for implementing the environmental policy and pollution control protocols. Accordingly, Khyber Pakhtunkhwa Environmental Protection Act was enacted in 2014. The salient features of the Act are:

- The Act provides for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development in Khyber Pakhtunkhwa
- Ensure enforcement of the Khyber Pakhtunkhwa Environmental Quality Standards;
- Establish standards for the quality of the ambient air, water and land, by Notification;
- Establish systems and procedures for surveys, surveillance, monitoring, measurement, examination, investigation, research, inspection and audit to prevent and control pollution, and to estimate the costs of cleaning up pollution and rehabilitating the environment in various sectors;
- Carry out and conduct environmental monitoring and implementation of environmental approvals provided in this Act;
- Issue licenses for the consignment, handling, transport, treatment, disposal, storage, handling or otherwise dealing with hazardous substances;
- Certify laboratories as approved laboratories for conducting tests and analysis and one or more research institutes as environmental research institutes for conducting research and investigation for the purposes of this Act;
- Identify the needs for and initiate legislation in various sectors of the environment;
- Provide guidance and technical assistance to the relevant Federal and Provincial Government Agencies in the management of natural and environmental incidents and disasters;
- Render advice and assistance in environmental matters including such information and data available with it as may be required for carrying out the purposes of this Act:
- Promote public education and awareness of environmental issues through mass media and other means including seminars and workshops;

Enter into contracts, execute instruments, incur liabilities and do all acts or things necessary for proper management and conduct of its business

1.9.5 Recommendations

It is recommended that at provincial level the municipal services, such as sanitation, solid waste management and the provision of safe drinking water, The Present quality standard

should covered under PEPA 1997; shall be brought under the Directorate General of EPA, and qualified inspectors shall be pointed at the municipalities and even public health departments to regulate the environmental protocols.

Though most of these matters were covered in detail under the provincial LGOs of 2001; however, since 2001 is no longer enforced, thus these matters need to be resolved. For this specific purpose its time that the province must enact new or amendment local government legislation.

Rather than publication on provision services, it is advisable that those regulations are provided under provincial environmental law for the management of such service at the local level, and that specific provision in this regard are dealt with in local government laws.

It may be further argued that the environmental issues are best dealt with at local level, thus each WSSP and the rural local government shall be empowered and qualified environmental inspectors shall be included in the WSSP staff to create awareness among the public and report any polluting activities, as well as issue licenses to the local industries. The charge for pollution may be collected at local level by the WSSP.

It may be added here that a number of important issues need to be considered before any provincial legislative action can begin. Following measures will be required by the provincial and federal governments for environmental protection legislation:

- Rules and regulation under PEPA must be adopted and re-issued along with the provincial environmental law.
- Drafts rules under preparation need to be finalized.
- Coordination among provinces: guidelines issued by respective provincial EPA for specific sectors should be assessed, amended if necessary, and adopted as uniform standard policy.
- Requirement for the implementation of multilateral environmental agreements must be included in the provincial environmental laws and a mechanism for reporting must be developed.
- Funding by donors shall be transferred directly to the provincial governments.

1.10 FLOODS

Distribution of rainfall in district Peshawar generally occurs during two different seasons: winters rainfall continues during December to march while summers rainfall occuring during June to September. Normally monsoon arrives in first or second week of June but major floods occur in late summer i.e., July to September. During recent years, it has been commonly observed that the distribution of rainfall is very disturbed due to climatic changes and the District receives heavy rainfall in the form of erratic and cloud burst normally occurs especially during the monsoon season.

Table 1. 2: Impacts of 2010 Flood in District Peshawar[8]

No. of effected Villages	97
Total Households in affected area	50,067
Houses totally destroyed	5,312
Houses damaged	15,202
Number of effected households	20,514
Number of effect's people	164,112
Loss of Livestock Population	23427
a. Dead	5,406
b. Affected	18,021

NDMP categorized Peshawar as one of the top few cities in terms of flood risk. The PDMA KP has also listed Peshawar as highly vulnerable to floods in the last three consecutive monsoons Floods Contingency Plan[9]. The flood plains/zones fall between Kabul River and Budni Nala from Warsak in the Northwest towards Southeast in the upper Northern half of the district.

In 2010 floods, around 54,393 acres of area of District Peshawar has been affected is presented in Table 1.2. Out of this, 35,495 acres were severely affected. It's while 18,898 acres faced low level flood. It has affected around 14 Union councils. The name of the settlements affected in these UCs is given below in Table 1.3.

[8] UN Habitat, Initial Assessment of Flood affected areas in Khyber Pakhtunkhwa, July –August 2010, Page 4
[9] www.pdma.gov.pk/publications

Table 1. 3: Flood affected Areas

Sr. No	Flood Type	Name of Union Council	Name of Settlements
1	High	Jogani	Michni R H, Michni Fort, Jamalbad, AshaiKor, Bela Mohamandan, ZareefKor, Kodai, Bodi Koruna, Shanai Ghundai, Shine Ghundai, BadayKor, Jahangirpura, WazirKilli, Bandai, Tapu Sardar, Matin Akor, Masam Khan Koruna, Shah Baig Qilla, Octroi Post, Shaghali Payan, Shaghali Bala, Piari Bala, Piari Payan, Jugni, Turkai, Maqam Qila, Sar Khana, Dang Lakht Bala
2		Khatki	Banda Bala, Kariana, Niyami, Banda Farid khan, Khawaji, Giddar, Shiggi Bala, Bela Baramad Khel, Shaka Qila, Shiggi Payan, Melugan, Chandan Garhi, Khatki, Mamun, Jahangir Qila
3		Gulbela	Garhi Karim Dad, Isa Khel Hamid, Bhattian, Saeedabad, Afghan Refugees Camp, Bunyadi Kalay, Gulli Garhi, Badin Bala, Badin Payan, Dab, Karer (Dawoodzai), Kuchain, Garhi Sharif Khan, Gulbela, Nazir Bagh, Mashai, Murammazai
4		Mian Gujjar	Daman Afghani, Kharaka, Islam Gujjar, Mian Gujjar, Jala Bela, Kandar
5	High/Low	Panam Dheri	Afghan Refugees Camp, Zara Mena, Garhi Sherdad, Mian Khel, Tapu Koru, Dery Kaly, Ziarat Shah, Rosvi baba, Sher Killi, Sado Garhi, Yaka Khel, Kochian, Gara Tajak, Sherdil Killi, Sher Ali Kor
6		Chaghar Matti	Khat Killi, Kudai, Chaghar Matti, Garhi Miangan, Dang, Garanga Payan, Garangi Bala, Pir Kalay, Barbar, Opayan, Opayan Bala, Ali Muhammad Garhi, Harian Garh
7		Kaneza	Hasanabad, Shainday, Rahamabad, Banda Nisatta, Ali Zai, Amir Khan Garhi, Khapa Kalay, Kulma (Sherabad), Bonda Hanreza, Charpareeza
8		Budni	Sabai, Dalazak, Budhni, GuloZai, Bela, Muhammad Zai

9		Takhtabad	Takhtabad Awal, Jatti Bala, Shah Alam, Jatti Payan, Daggi Mahina, Babuzai, Meori, Garhi Ibrahim Khan, Tonnery, Afghan Refugees Colony, Takhtabad Payan, Gulababad (Dowzai)
10		Nahqai	Nahkai (Dawoodzai), Tapu, Shakarpura, Tauda, Wahid Garhi, Daman-e-Pushtu, Daman-e-Hindki
11	Low	Garhi Khazana	Garhi Shah Muhammad, Gawai, Hariana Bala, Hariana Payan, Garhi KhazanaKulah, Khazana Kalle, Nasopa Bala, Nasapa, Bakhshi Bridge
12		Dag	Bala
13		Pajagi	Garhi Mir Sahib, Ram Kishan
14		Mathra	Ghalji Kandar Khel, Haji Zai, Mali, Yar Ghalji

1.10.1 Short-Term Plans

- Early warning system through WAPDA and Irrigation Department regarding flooding/over topping of Warsak Dam.
- Early dissemination of weather forecasts and flood warnings through PDMA, Local Administration and community-based mechanisms.
- Removal of encroachments along rivers, streams and drains
- Repair and maintenance of Drainage System, rehabilitation of damaged flood protection works and its tributaries.

1.10.2 Long-Term Plans

- To receive real time information about water levels, a network of community level organizations and community volunteers be organized in the catchment areas.
- Arrangements for quick dissemination of flood warning by Revenue Department and Irrigation Department.
- Establishment of observation posts by Irrigation Department in the likely flood areas.
- Civil Defense Staff and volunteers should be made fully functional.
- Evacuation centers should be earmarked with the assistance of education department.
- Improvements in flood mitigation measures over River Kabul and construction of dams over the main tributaries of river Kabul.

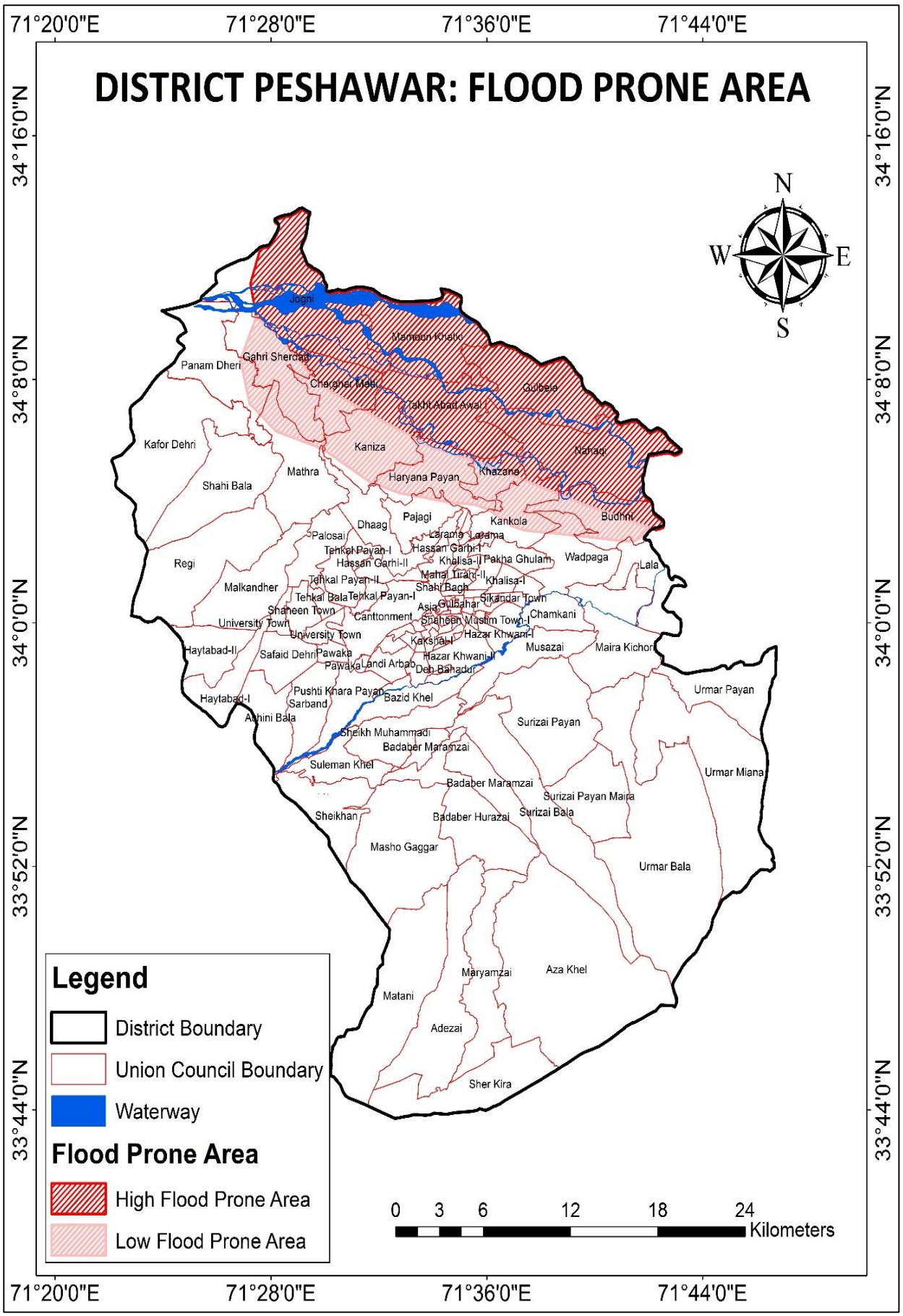
1.10.3 Flood Management

The floods may be managed through the following actions by different Departments/agencies[10]:

Table 1. 4: Department-wise Responsibilities

Departments	Flood Management Measures Required:
Irrigation Department	• Establishment of Flood Emergency Cell • Encroachments to be removed with the assistance of DCO, TMA, and C&W Department.
Communication and Works Department.	• Establishment of Flood Emergency Cell • When required, available machinery should be pre-positioned in vulnerable areas.
Transport Department	• When needed, Transport Department should coordinate for evacuation of affected population in an orderly manner. • The Regional Transport Authorities should coordinate with respective DCOs for needful arrangements.
Health Department	• When required, the Department should establish a Health Emergency Preparedness and Response Cell. • The Department should carry out detailed planning with district officials; and district level health plans should be in place well before the monsoon season.
Food Department	• The Department should keep a stock of wheat for population that may be affected by floods.
Information Department	• FM radio stations should be established for advance warnings and to sensitize the public as soon as flood warnings are received. These stations should guide the public about nearby safer places, food stuff, health care facilities, health tips and other precautionary measures. • The Department should also arrange press briefings/press conferences.

[10] Source: Adapted from: Monsoon Contingency Plan – 2011, Provincial Disaster Management Authority, KPK, June, 2011.



Map 1. 4 Flood Prone Area Map of District Peshawar

1.11 WATER LOGGING AND SALINITY

Peshawar District has geological formations with extensive clayey deposits with shingle beds, silt and clayey stratifications. The water table and soil salinity levels of the valley have been continuously increasing since the development of canal irrigation system; resulting in the rise of water table within a meter or so in some parts of the irrigated areas of the Peshawar District with the development of soil salinity. According to a study by WASID the water table was rising by 1.5-2.5 m per year adjacent to the Warsak canal system. Nearly 10 percent (91 square km) of the area was affected by salinity of which 4.1 percent was severely saline.

Degree of water logging vary with water table depths in different periods, and are categorized as high, moderate and low as given below:

- High: 3 meters and more
- Moderate: 1.5 to 3 meters
- Low: Less than 1 meter

For salinity, soil is tested for electric conductivity in the laboratory along with other analysis to find the salt as sodic or calcite in parts per million, ppm. Saline water which leads to salinity has 400 to 700 ppm. Agriculture department and farmers have a simple way of checking salinity visually. If salt is seen as white layer known as 'Kullur', one to two centimeters of earth from top is removed, and the soil is allowed to stay in sun for three; and then salt is rechecked. The scientific method however is to check the Electric Conductivity (EC) of soil, which varies and for this a device is used to determine the value of EC, based on which salinity is classified as below:

All land naturally contains some salt. Class 0 sites do not exhibit any signs of salinity and are referred to as non-saline. Some non-saline areas exhibit mild to severe water logging. Mildly waterlogged areas can exhibit good summer growth of pastures due to the high level of soil moisture. Severe water logging can cause bare soil, yellowing of crops and pasture and tree death due to excess soil moisture and poor soil aeration. Even though the soil and water may be non-saline the area can become saline and should be monitored for any early signs of salinity.

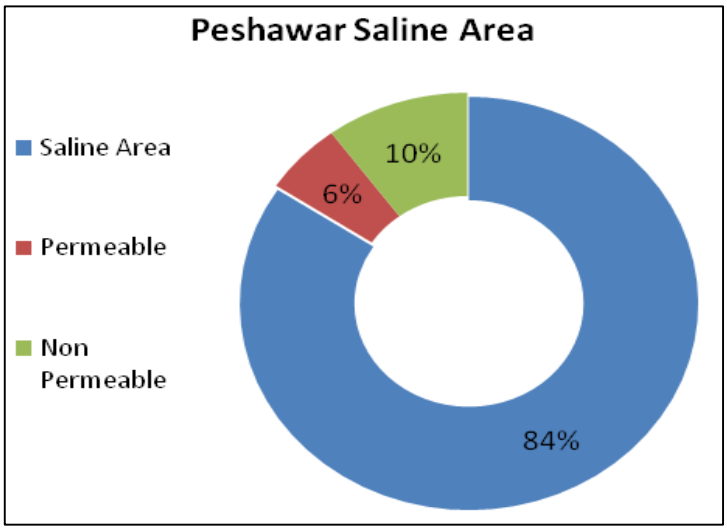


Figure 1. 4: District Peshawar Salinity Percentage

The problem of water logging and salinity needs to be addressed at both provincial and district level as the water resources jointly irrigate many districts, from Swat Malakand to DI Khan. The amount of sediments and salts carried by the rivers from upstream can be managed by adopting holistic approach by the provincial Irrigation and Drainage Authority.

1.11.1 Future Plans

The Irrigation department has prepared future Action Plans on short term medium term - and long-term basis. These plans include one lines statement of reducing water logging and salinity, and details in terms of statics of areas, users or area are not given.

Since there are a number of programs and initiatives adopted by the federal and provincial governments, which include OFWM program, RSPs program, Drainage project, lining of canals, distributaries and water courses and adoption of new and improved means of irrigation that include drip irrigation and rain water harvesting.

The government has also introduced the facility of providing extension services through agronomists and agricultural scientists to replace the crops in the water-logged areas by hardy crops. This has already been adopted by local farmers where fruit trees were replaced by sugar cane and tobacco production.

Similarly, delicate crops in the water logged and saline areas can be replaced by forestation, i.e., increasing growth of trees in the affected zones.

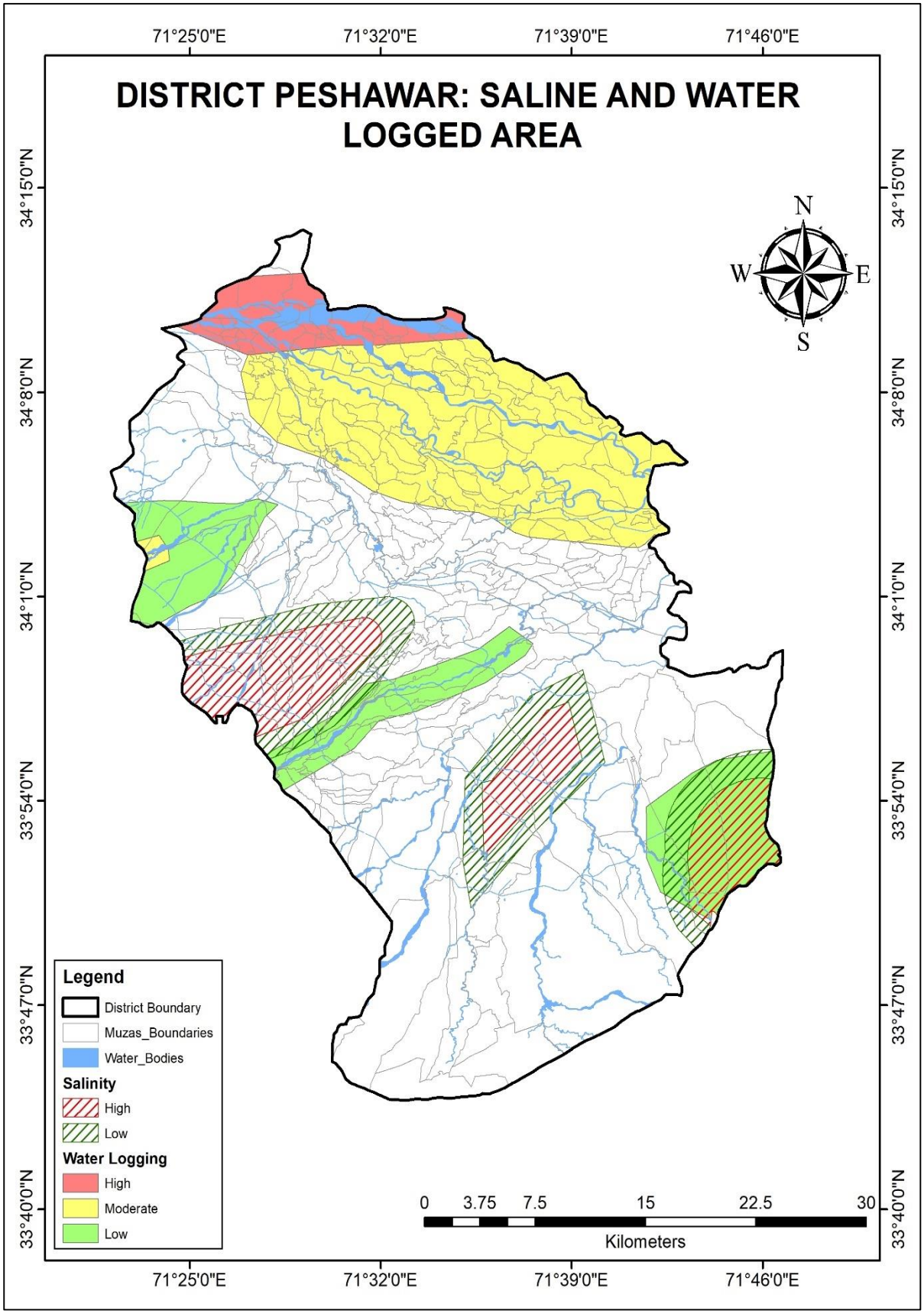
Government surveys estimated deforestation rate over the 1990-2005 period at 2.1 per cent annually. According to a World Bank report, forest types included in this definition of forests are Coniferous Forest, Riverine and Mangrove Forest.

Around major cities like Peshawar the concept of Urban Forests that include shady trees which grow on waste and waterlogged land shall be grown. The benefits of urban forest are three prone, a) conserve and sustain the environment; b) help mitigate the impact of climate change; c) timber can be used for economic gains.

In short it is proposed to adopt following strategy to combat water logging and salinity:

- Introduce and adapt participatory initiative of drainage and managing water courses
- Forestation of water logged and saline areas by appropriate trees
- Initiating the concept of urban forests around urban areas
- Changing the cropping pattern i.e., replacing delicate fruit and vegetable crops by more hardened crops like sugar cane, tobacco, etc.
- Managing the use of fertilizer upstream as well within the districts so that the wastewater does not increase the salt content in the water bodies.
- Training and creating awareness amongst farmers to adopt Integrated Water Resource Management initiative.
- Provide easy access to farm inputs like seeds, fertilizer, farm implements, farm to market roads and agricultural credit.

It may be argued here that the proposals to reduce or manage water logging and salinity shall be approached as an integrated solution to managing land, which can be adopted holistically by coordinating with other districts at the provincial level, at the same time personal participation through the water user's association, community groups or other platforms.



Map 1. 5: Saline and Water-Logged Area Map of District Peshawar[11]

[11] Peshawar SCARP program (1980-1997)

1.12 WATER RESOURCES

1.12.1 Surface Water

The surface water of Peshawar consists of irrigation canals, rivers, pounds, dam, and streams/khwars.

Canals[12]

Peshawar Irrigation canal system was constructed in 1963-65 including the pumping system for lift canal. The canal system has 890 structures including 375 outlets. It has the following major canals:

- Warsak left Feeder Channel
- Warsak lift canal with minor
- Warsak Gravity canal
- Kabul River canal

Warsak gravity canal receives its supplies directly from the reservoir. It starts at the exit of 17081 feet tunnel through Mullagori Hills on the right side of the Kabul River having a discharge capacity of 550 cusecs upstream of Warsak Dam. The Warsak Gravity Canal is having a discharge capacity of 255 cusecs with a total length of 226,000 feet and was designed to irrigate an area of 58641 acres. Its designed irrigation intensity was 100%. To irrigate the area, 155 outlets have been taken off directly from the Warsak Gravity Canal while 59 outlets have been provided through 9 minors.

Rivers

Peshawar consists of Bara, Shalam and Naguman rivers while the Kabul River only touches Jogni and Khatki UCs located on the North-West of the district. The Bara River enters Peshawar district from District Khyber. It flows in the center of the city and finally meets river Kabul in Nowshera district. Shalam and Naguman rivers are the branches of River Kabul which enter into the District with Kabul river and flow toward the East.

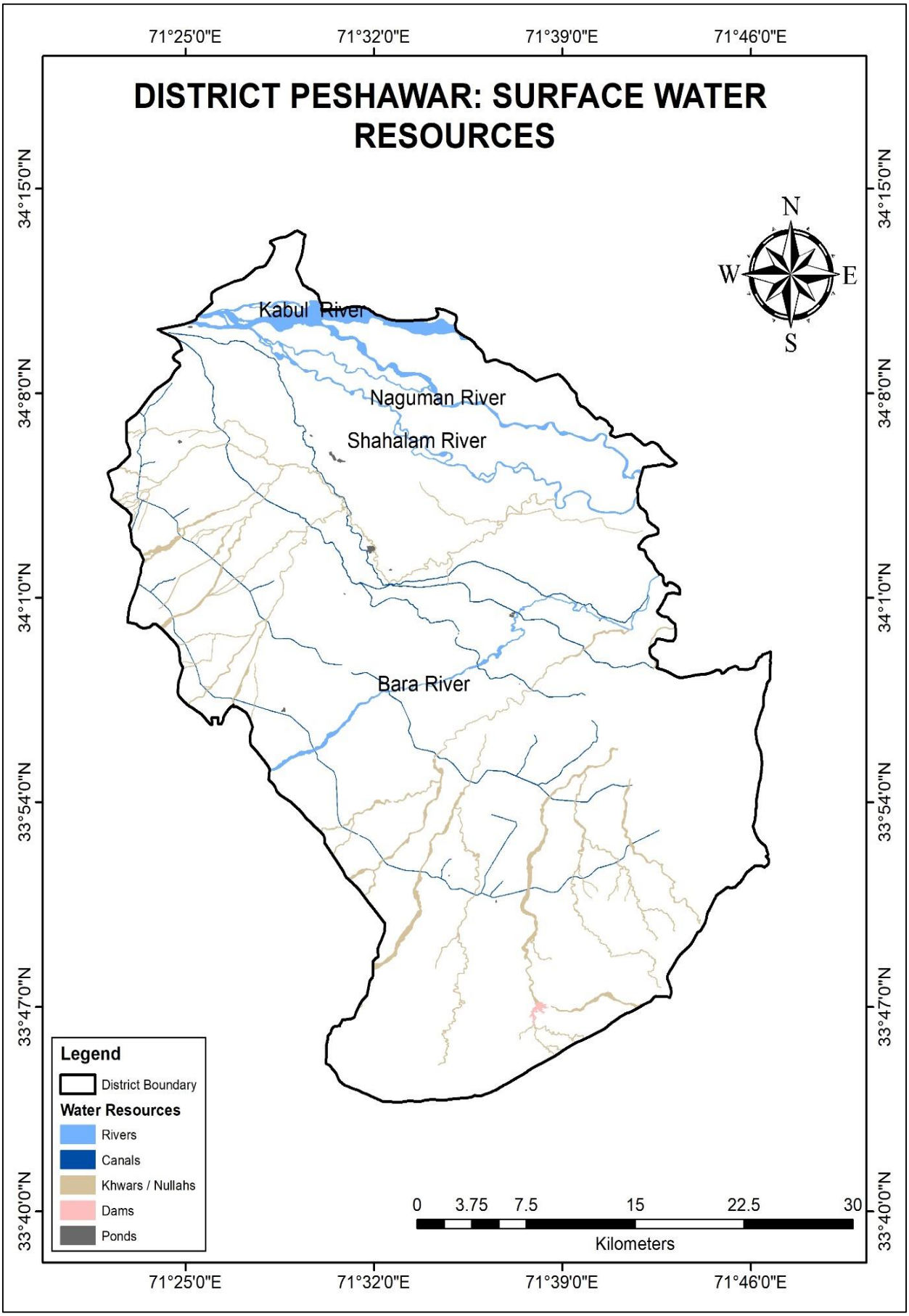
Khwar and Naullahs

Khwar and naullahs enter in the district jurisdiction from southern, western and south-western parts and flow toward Northern and Eastern parts. All these khwar discharge water into Bara River and Budni Nallah which finally dispose into Kabul River.

Dams

There is only one dam in the District on the Southern side name as Azakhel Dam. This dam is only used for irrigation purpose.

[12] Irrigation Department, Khyber Pakhtunkhwa

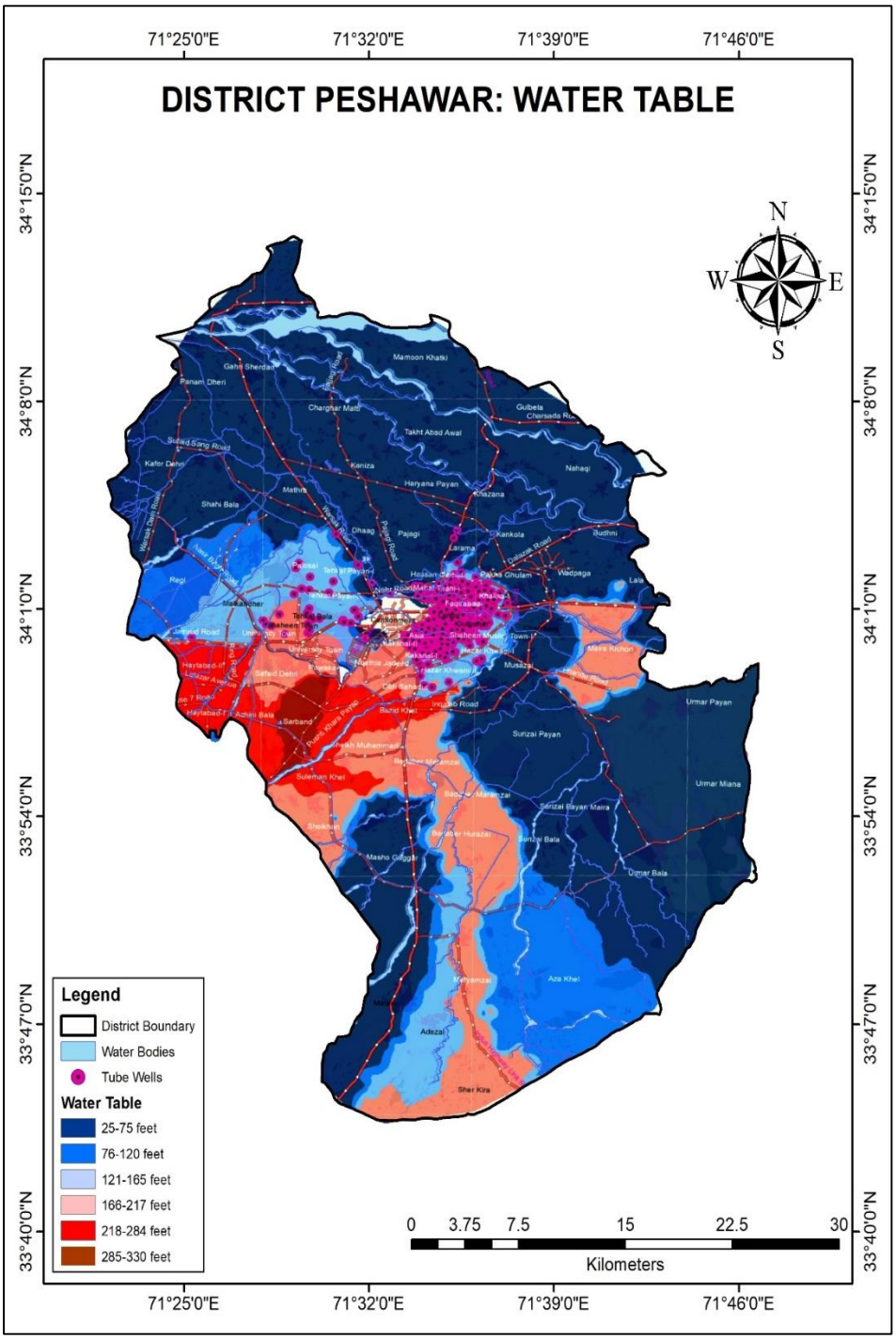


Map 1. 6: Surface Water Map of District Peshawar

1.12.2 Ground Water

The dominant aquifer system in Peshawar Valley is built up by a very heterogeneous alluvial fill of alternating layers of clay, silt, sand and gravel. In the central part of the plain the depth of this layer is more than 250 m. Only in the vicinity of mountains surrounding the basin, hard rock aquifers are present.

The depth of the groundwater table is less than 5 m, except in the vicinity of the mountains and in a smaller region in the southeast of the plain, where it is below 20 m. Because of high water table and the high evaporation rate in the former case, the hazard of salinization exists. There is a general groundwater flow towards the center of the basin from where the discharge is in southeastern direction towards the Indus Valley. The water depth in District Peshawar is shown in Map 1-7.



Map 1. 7: Water Table Map of District Peshawar

CHAPTER. 2: EXISTING LAND USE DISTRIBUTION

2.1 GENERAL

Land is an essential natural resource, both for the survival and prosperity of humanity. Over millennia, people have become progressively more expert in exploiting land resources for their own needs. The limited resources are defined while human demands from them are endless, therefore pushing these resources to the extreme. Increased pressure on land resources show up as declining crop production, exploitation of land quality and quantity, and competition for land. In the different uses of land, agriculture is the most important one. The sprawl in industrialization and urbanization affects agriculture land leading to scarcity, especially around urban centers. This change in-turn definitely affects the ecosystem and socio-economic conditions. The existing land use/ land cover pattern, changes in land use pattern and the relationship between population growth and food security is a matter of major concern. The agriculture sector is facing the most serious threats from an ongoing process of over exploitation and conversion into other uses, resulting the mortification and depletion of the agriculture land. Further, the urban expansion has become the major form of land mortification, removing large areas of the best agriculture land from production, for example, roads promote economic development, but they also nourish deforestation. The environmental impact of land transport has received a great impact on the society. Land transportation systems are cause of reduces area. Industrial revolution also brought rapid changes in road transportation. Town and cities emerged to accommodate commercial and industrial establishments. Increase in population was automatically accommodated near or around the cultivable lands.

In the last three decades, there has been a significant increase in urban population, in part due to internal migration of people in search of better employment opportunities, education, and services. Although Peshawar is spreading horizontally in all directions, there are few areas such as G.T road towards Nowshera and the link road on the motorway where there has been a drastic drift.

There is thus a dire need that an unbiased and sound land use plan must prepared at district level that can guide the implementing agency in rationalization of all land uses and objective planning and formulation based on the potential and requirements of the land resource. District Land Use plan need and promote a judicious use of the land for maximum land resource conservation.

The judicious use of land and its resources is a scientific basis to rationalize land uses so as to ensure optimum utilization of natural resources. The optimum utilization of land is, in fact, the main objective of the Land Use Plan. More specifically, objectives of the Plan are:

- Scientific utilization of land resources based on district land resource inventory and quantitative land evaluation through field research.
- Proposing necessary changes in the current land use system to promote conservation of the land and its resources.
- Identifying tracts of degraded farmland and suggesting economically viable and practical measures for their rehabilitation.

There is no known example of Land Use distribution at district level, with which Peshawar can be compared. In fact, even at urban level, there is a wide variation in the proportions of Land Uses. However, comparing Land Use distribution of urban area of Peshawar with other urban areas brings out the diversity of functions. This has been given in the Table 2-1 below.

Table 2. 1: Land Use Distribution at Town/City Level (500,000+ Population)[13]

S. No.	Land Uses	Percentage
1	Residential	24-32
2	Industrial	2-15
3	Commercial	1-2
4	Institutional	3-8
5	Arterial Circulation/Terminals	13-20
6	Recreational Open Spaces	2-5
7	Graveyards	0.5-3.5
8	Vacant	9-45

[13] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning & Infrastructure Standards, Page 305, Table 10.2.

2.2 LAND USE DISTRIBUTION IN OVERALL DISTRICT

The city of Peshawar is not only the provincial capital but also the mega city of the province. District Peshawa has still predominantly rural characteristics, where agriculture and allied sectors occupy around two third (66%) of the land mass, followed by the Residential land (13.82%), fruit orchards 4.22, grass/shrubs 4.57%, roads 2.68% and others 8.71%.

The area and their percentages are given in Table 2-2. The distribution is graphically illustrated in Figure 2-1

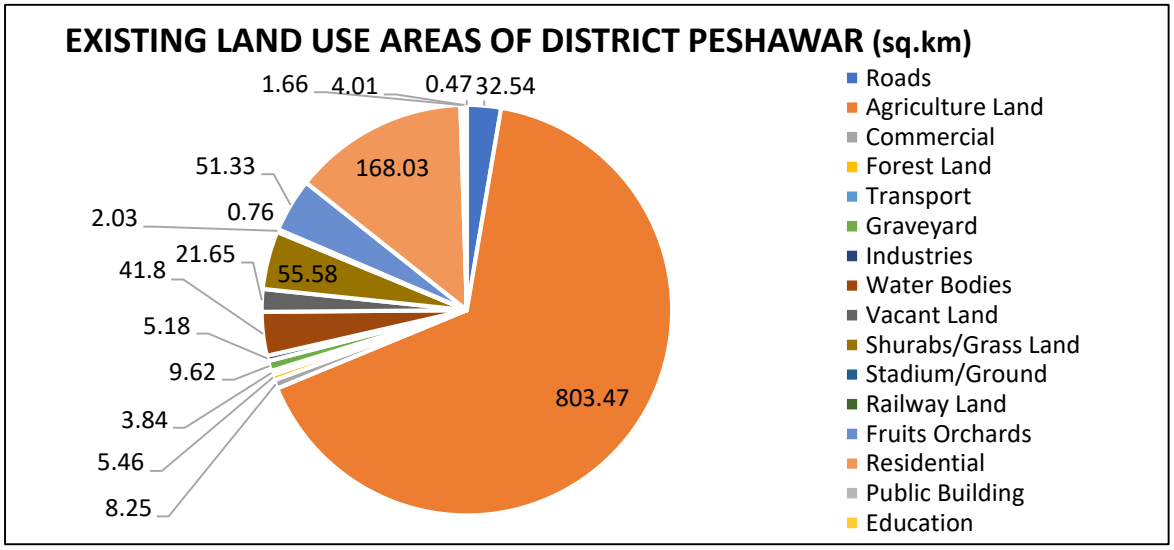
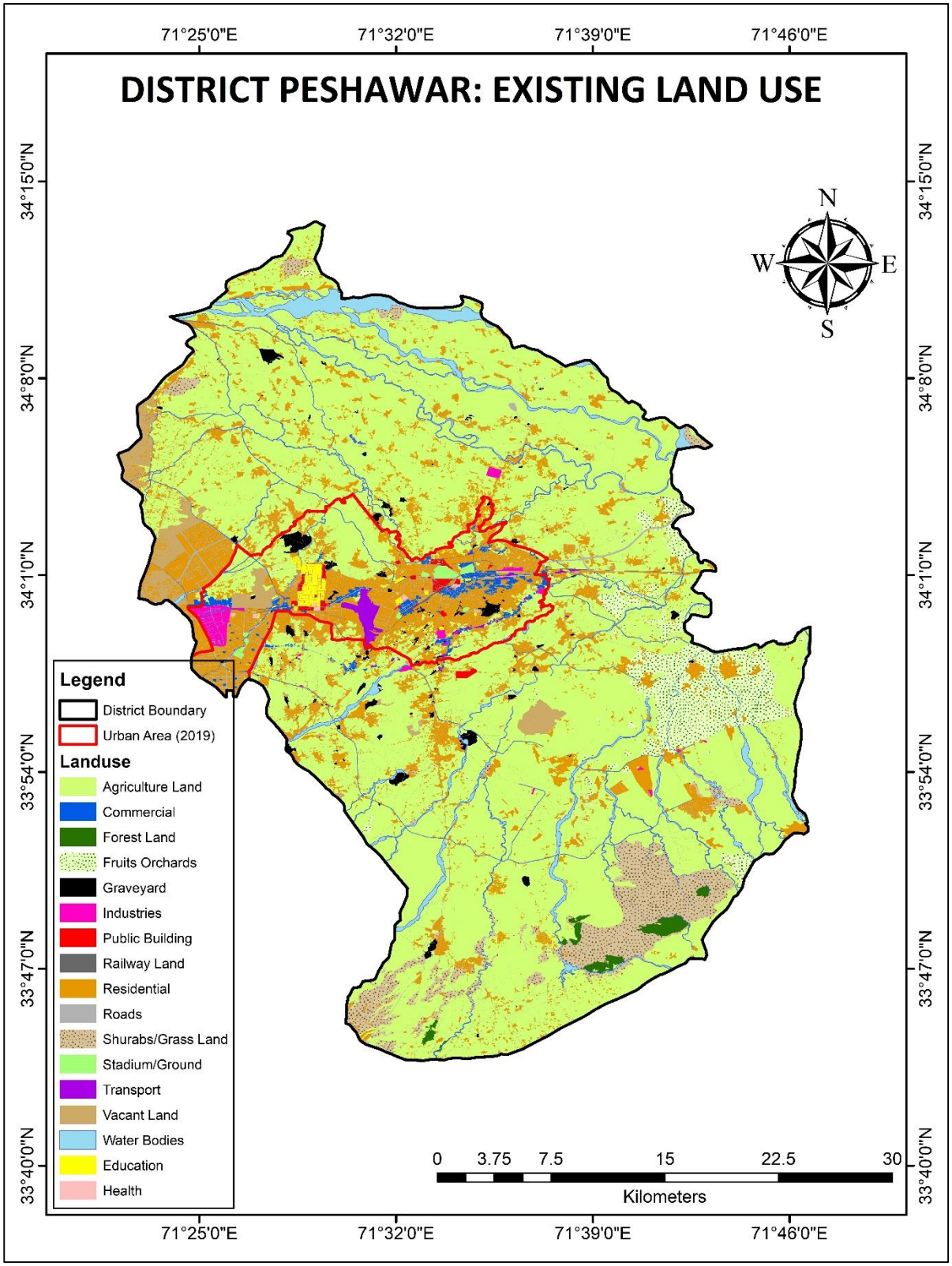


Figure 2. 1 Existing Land Use Area of District Peshawar

Table 2. 2 Existing Land Use Area of District Peshawar

Sr. No.	Land Use	Area (Sq. Km)	Percentage
1	Roads	32.54	2.68
2	Agriculture Land	803.47	66.09
3	Commercial	8.25	0.68
4	Forest Land	5.46	0.45
5	Transport	3.84	0.32
6	Graveyard	9.62	0.79
7	Industries	5.18	0.43
8	Water Bodies	41.8	3.44
9	Vacant Land	21.65	1.78
10	Shrubs/Grass Land	55.58	4.57
11	Stadium/Play Ground	2.03	0.17
12	Railway Land	0.76	0.06
13	Fruits Orchards	51.33	4.22
14	Residential	168.03	13.82
15	Public Building	1.66	0.14
16	Education	4.01	0.33
17	Health	0.47	0.04
	Total	**1216**	**100**



Map 2. 1: Existing Land Use Map of District Peshawar

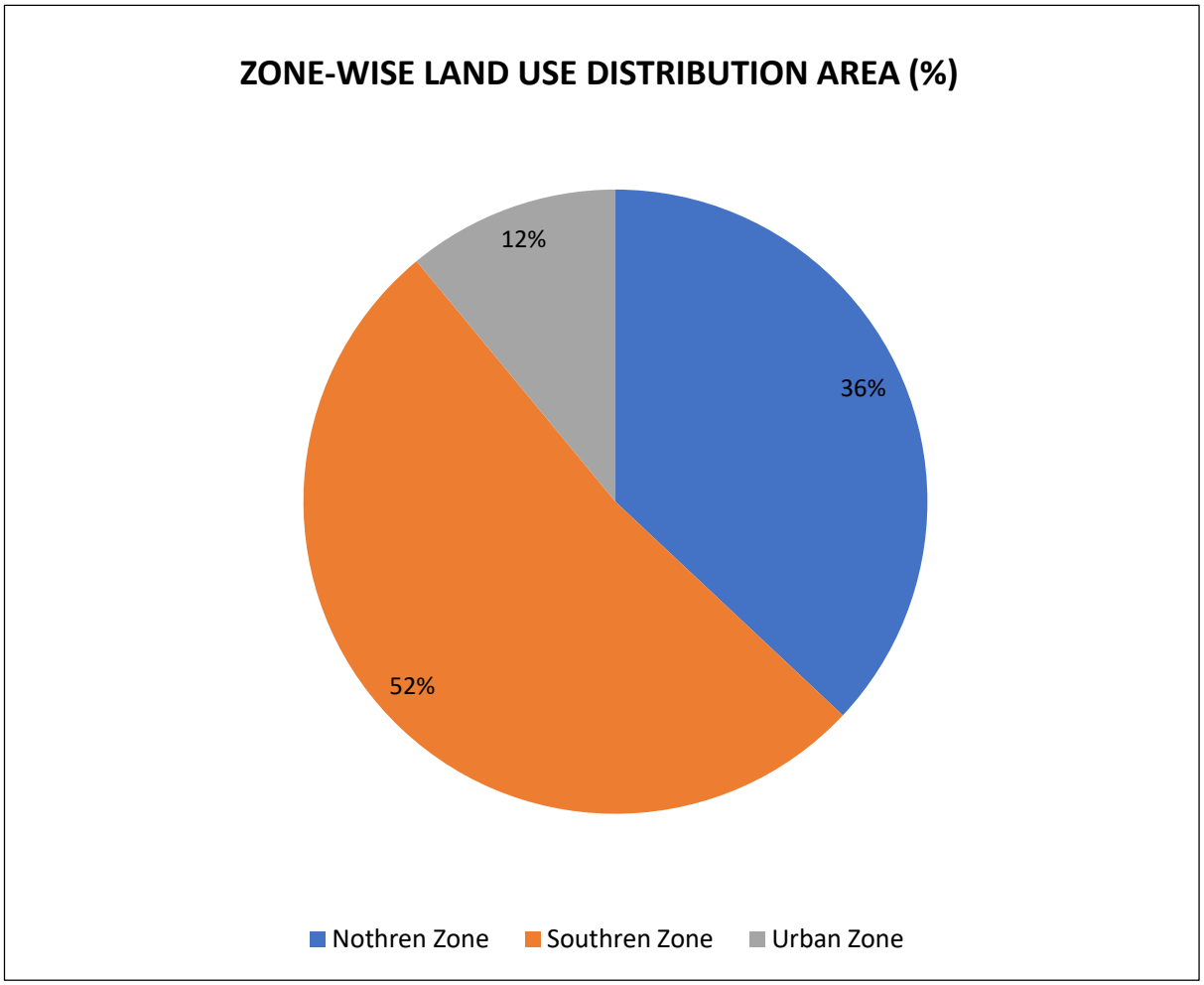
2.3 ZONE-WISE LAND USE DISTRIBUTION

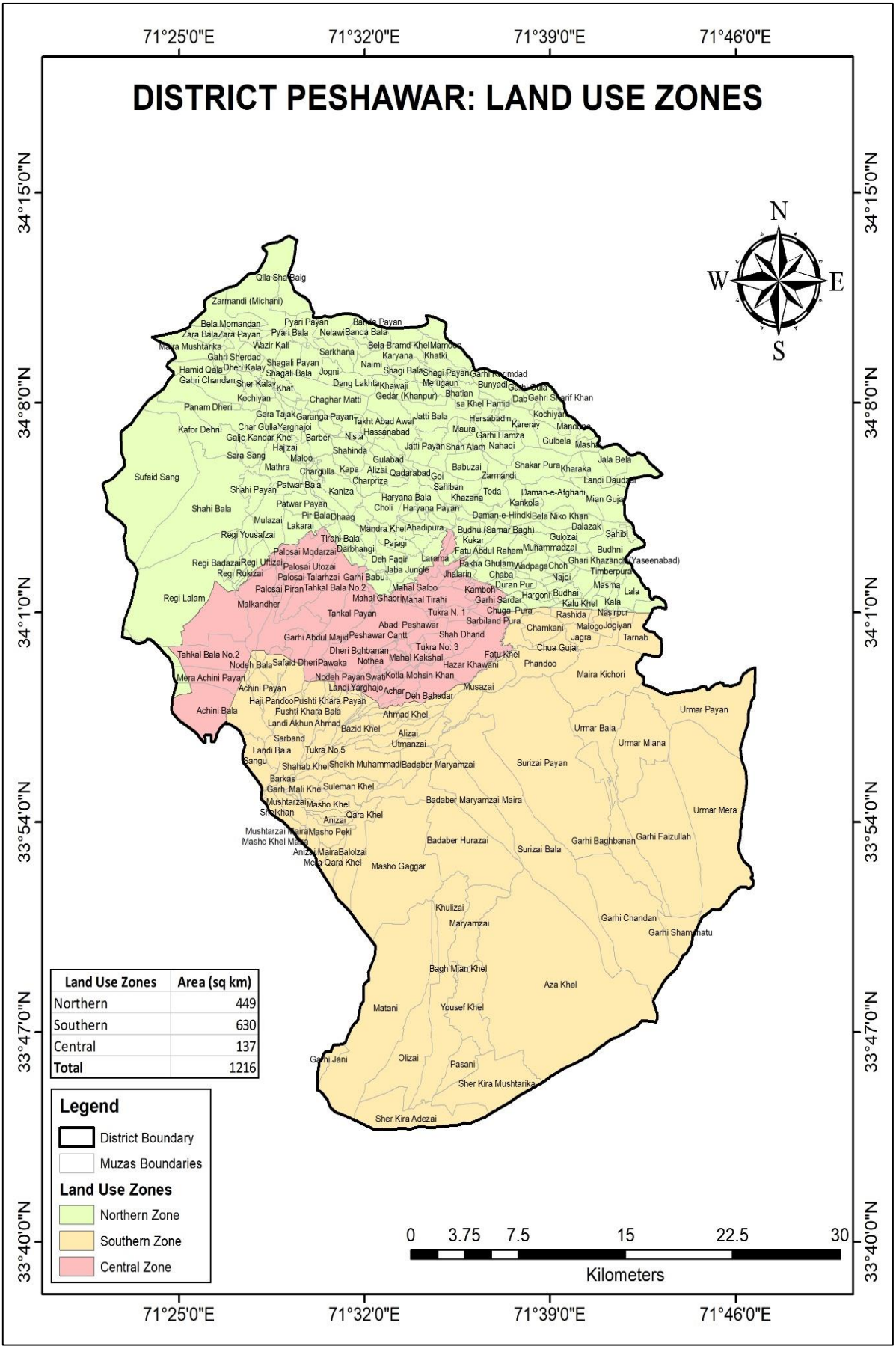
Total area of District Peshawar is 1216 square km, which for broad Land Use distribution, can be divided into the following three categories:

- Northern Zone
- Central Zone
- Southern Zone

Of the above, Northern zone is 443 square kilometers, or about 36% of the total District area, Central Zone is 143 square km or 12% of the total District area, while Southern zone is around 630 sq. km or 52% of the total area.

Figure 2. 2 Zone Wise Land use Distribution Area in Percentage





Map 2. 2: Land Use Zones Map of District Peshawar

2.3.1 Land Use Distribution in Northern Zone

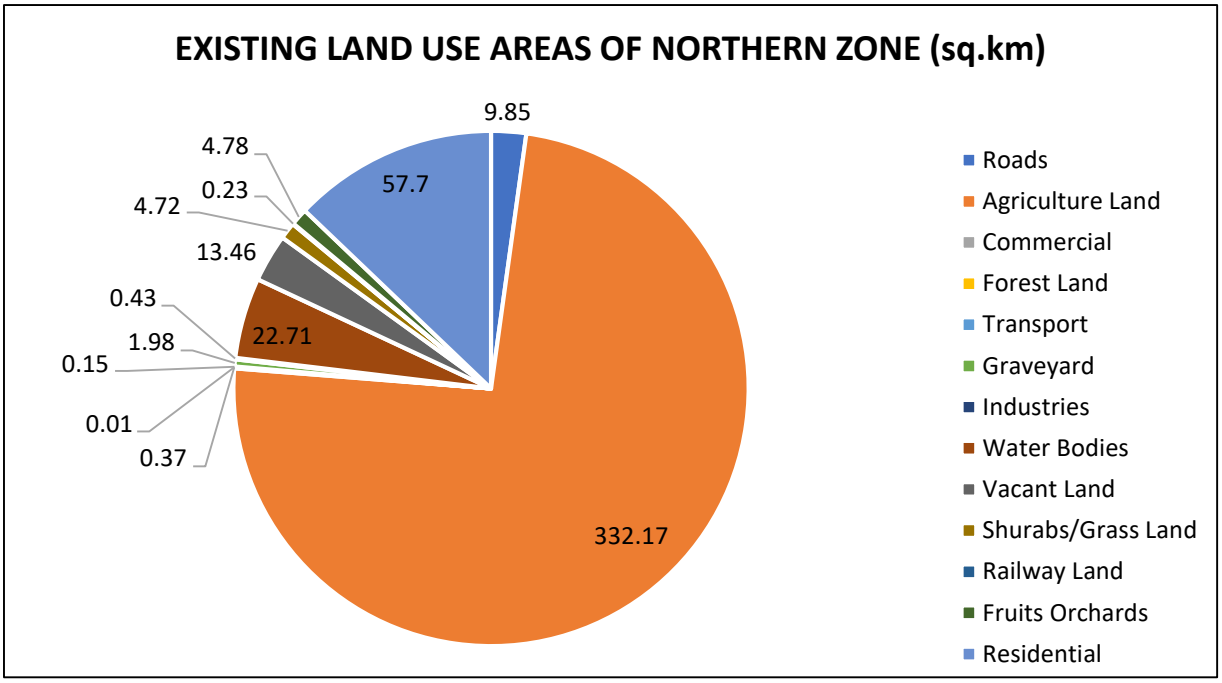
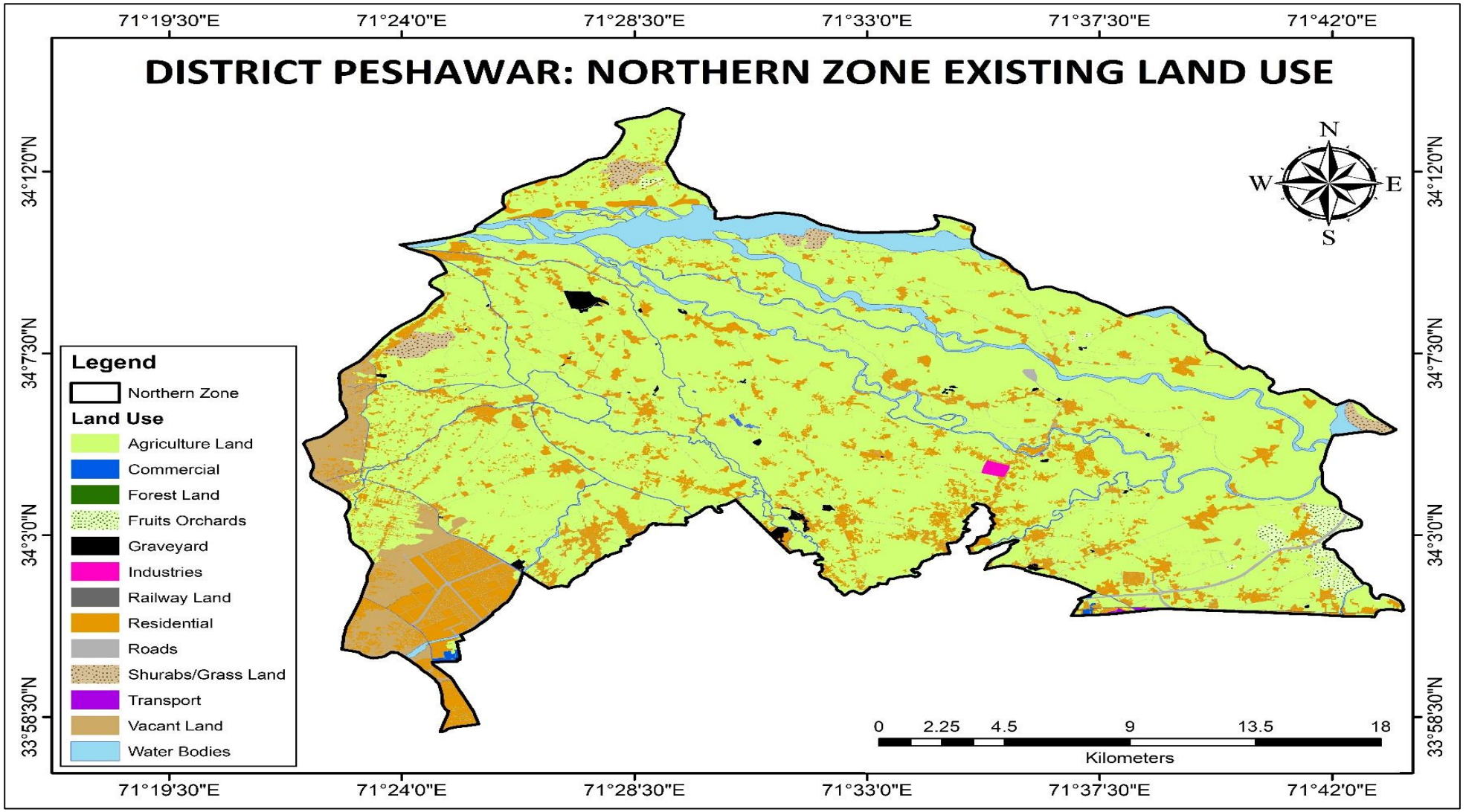


Figure 2. 3 Existing Land Use Areas of Northern Zone

Table 2. 3: Existing Land Use Areas of Northern Zone

Sr. No.	Land Use	Area (Sq. Km)	Percentage
1	Roads	9.85	2.2
2	Agriculture Land	329.17	74.05
3	Commercial	0.37	0.08
4	Forest Land	0.01	0
5	Transport	0.15	0.03
6	Graveyard	1.98	0.44
7	Industries	0.43	0.1
8	Water Bodies	22.71	5.06
9	Vacant Land	13.46	3
10	Shrubs/Grass Land	4.72	1.05
11	Railway Land	0.23	0.05
12	Fruits Orchards	4.78	1.07
13	Residential	55.7	12.86



Map 2. 3 Existing Land Use Map of Northern Zone

2.3.2 Land Use Distribution in Southern Zone

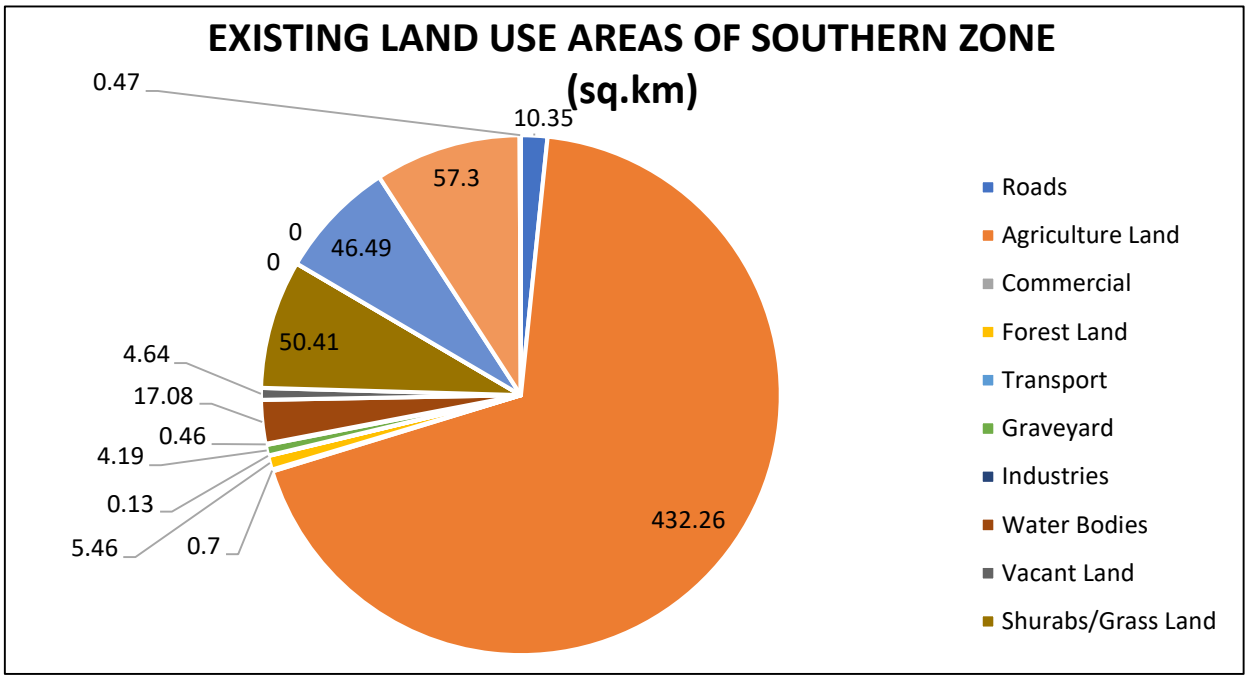
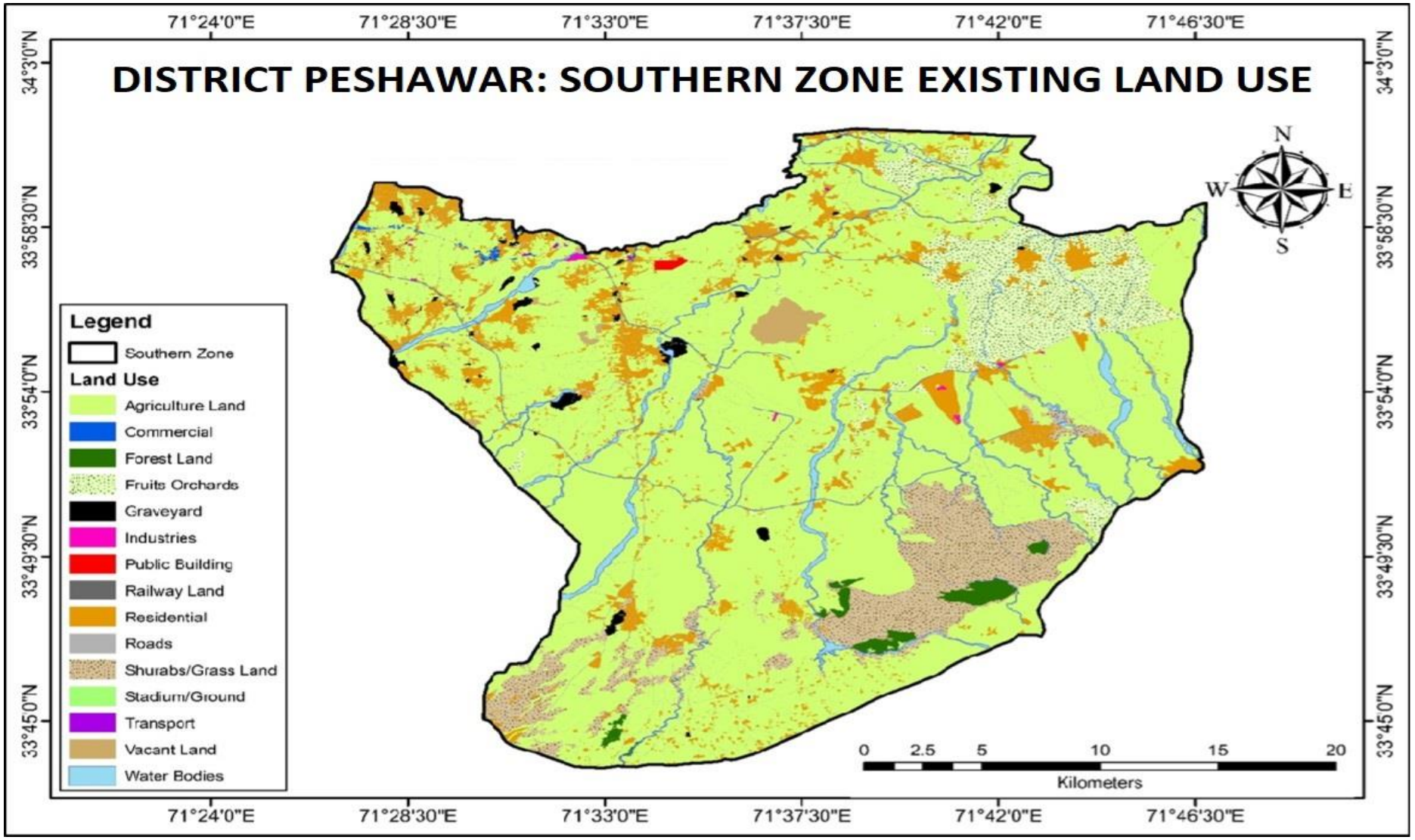


Figure 2. 4 Existing Land Use Area of Northern Zone

Table 2. 4: Existing Land Use Areas of Northern Zone

Sr. No.	Land Use	Area (Sq. Km)	Percentage
1	Roads	10.35	1.64
2	Agriculture Land	432.26	68.62
3	Commercial	0.7	0.11
4	Forest Land	5.46	0.87
5	Transport	0.13	0.02
6	Graveyard	4.19	0.67
7	Industries	0.46	0.07
8	Water Bodies	17.08	2.71
9	Vacant Land	4.64	0.74
10	Shrubs/Grass Land	50.41	8
11	Fruits Orchards	46.49	7.38
12	Residential	57.3	9.1
13	Public Building	0.47	0.07
	Total	**629.94**	**100**



Map 2. 4 Existing Land Use Map of Southern Zone

2.3.3 Land Use Distribution in Urban Area

The following methodology has been used to assess the current urban area of District Peshawar.

- For marking urban boundary of Peshawar city circle wise map is collected from census department which is georeferenced in GIS. With the help of that maps urban boundary is digitized.
- The urban land use was determined by visual interpretation of satellite image, and determining the current urban sprawl.
- Based on the scale selected for the study it was not possible to exactly identify the detail of individual. Land use with the urban limits, visually differentiated land uses were separated, while the rest of the area was determining as urban residentiary.

Total urban area thus delineated works out to be 147 square km, of which urban residentiary area is 53.03 square kilometers or about 38.66 % of the total urban area. As already stated, urban residentiary area is pre-dominantly residential but also includes local level health & education facilities, mosques, local roads, shops, etc.

Urban land use 39.0 square kilometer or 28.45% of the total area is under agriculture which is located mostly on the northern side of the urban area and need to be conserved.

Land Uses classification in urban area are given in Table 2.5 and demonstrated graphically in Figure 2.5

Table 2. 5: Existing Land Use Areas of Urban Area

Sr. No.	Land Use	Area (Sq. Km)	Percentage
1	Roads	12.35	9
2	Agriculture Land	42.03	28.45
3	Commercial	7.18	5.23
4	Transport	3.56	2.6
5	Graveyard	3.44	2.51
6	Industries	4.29	3.13
7	Water Bodies	2	1.46
8	Vacant Land	3.55	2.59
9	Shrubs/Grass Land	0.45	0.33
10	Stadium/Ground	2.03	1.48
11	Railway Land	0.52	0.38
12	Fruits Orchards	0.06	0.04
13	Residential	56.03	38.66
14	Public Building	1.2	0.87
15	Education	4.01	2.92
16	Health	0.47	0.34
	Total	**143**	**100**

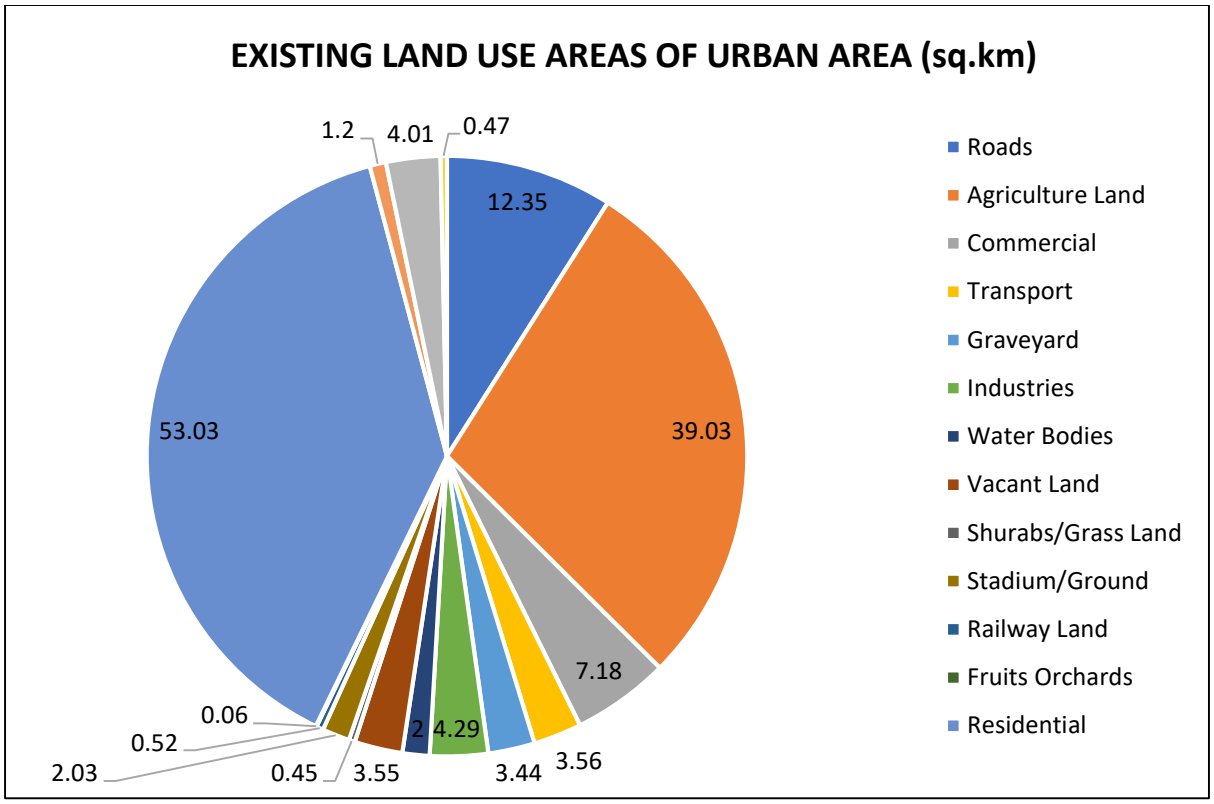
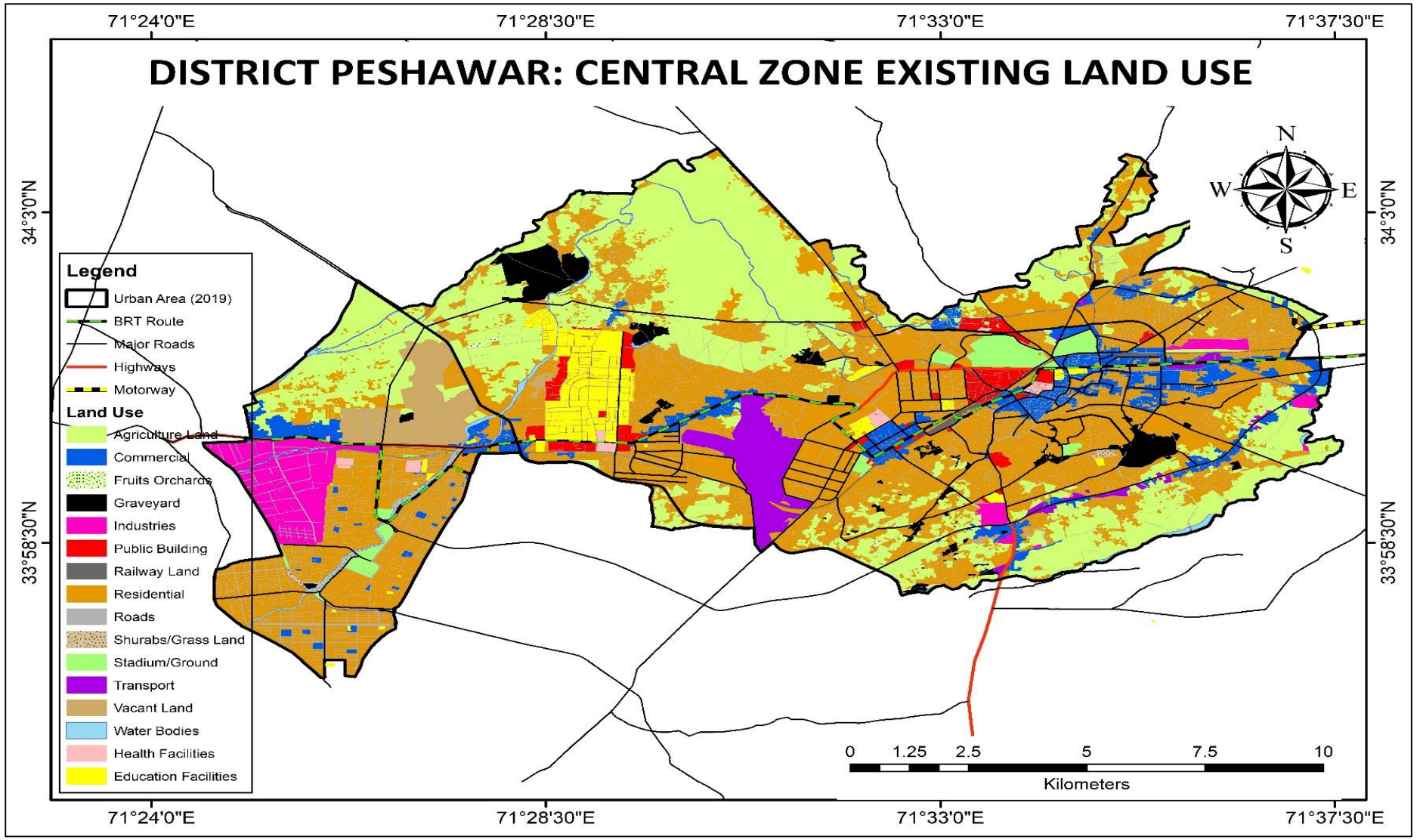
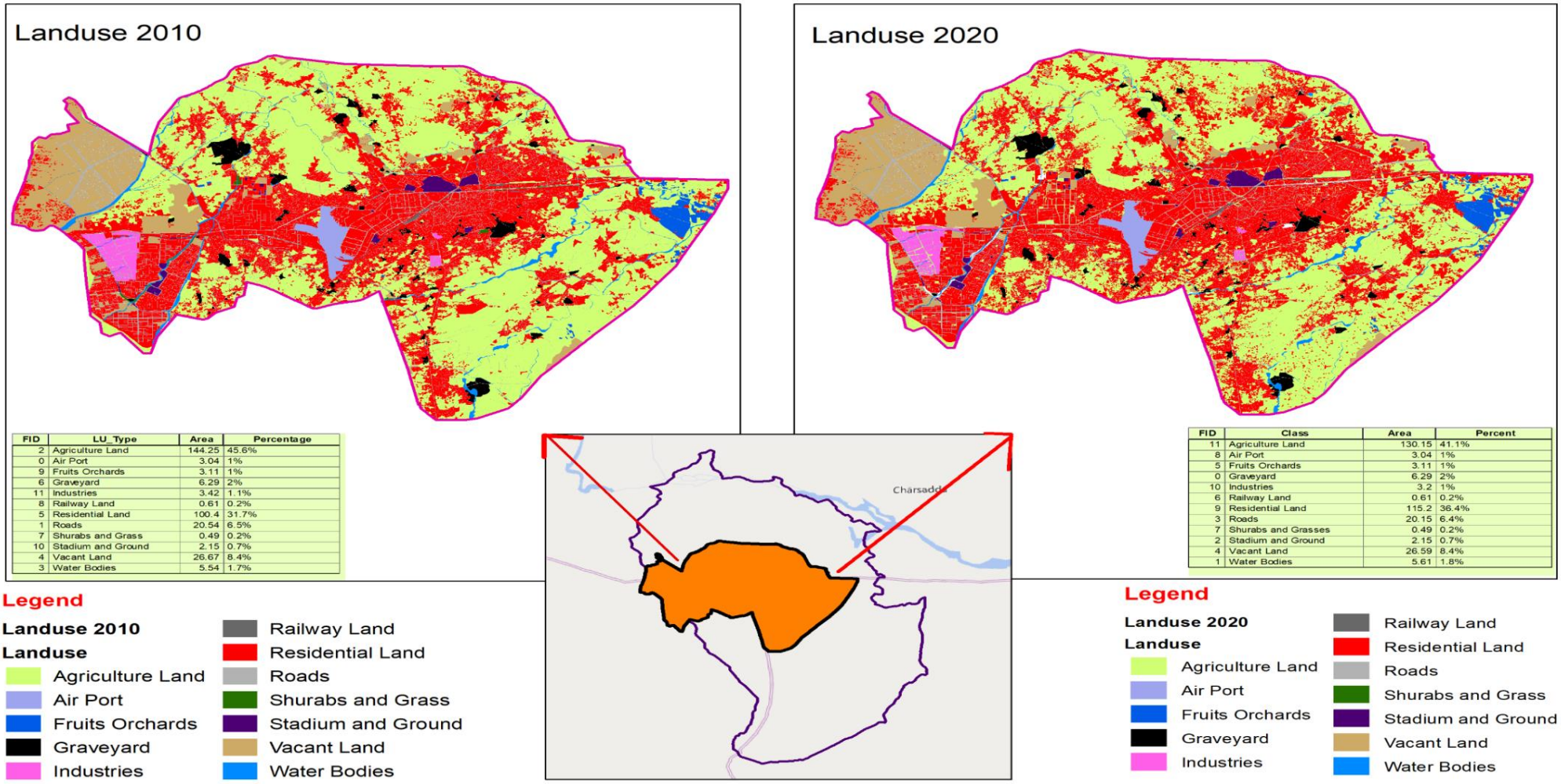


Figure 2. 5 Existing Land Use Areas of Urban Area



Map 2. 5 Existing Land Use Map of Central Zone

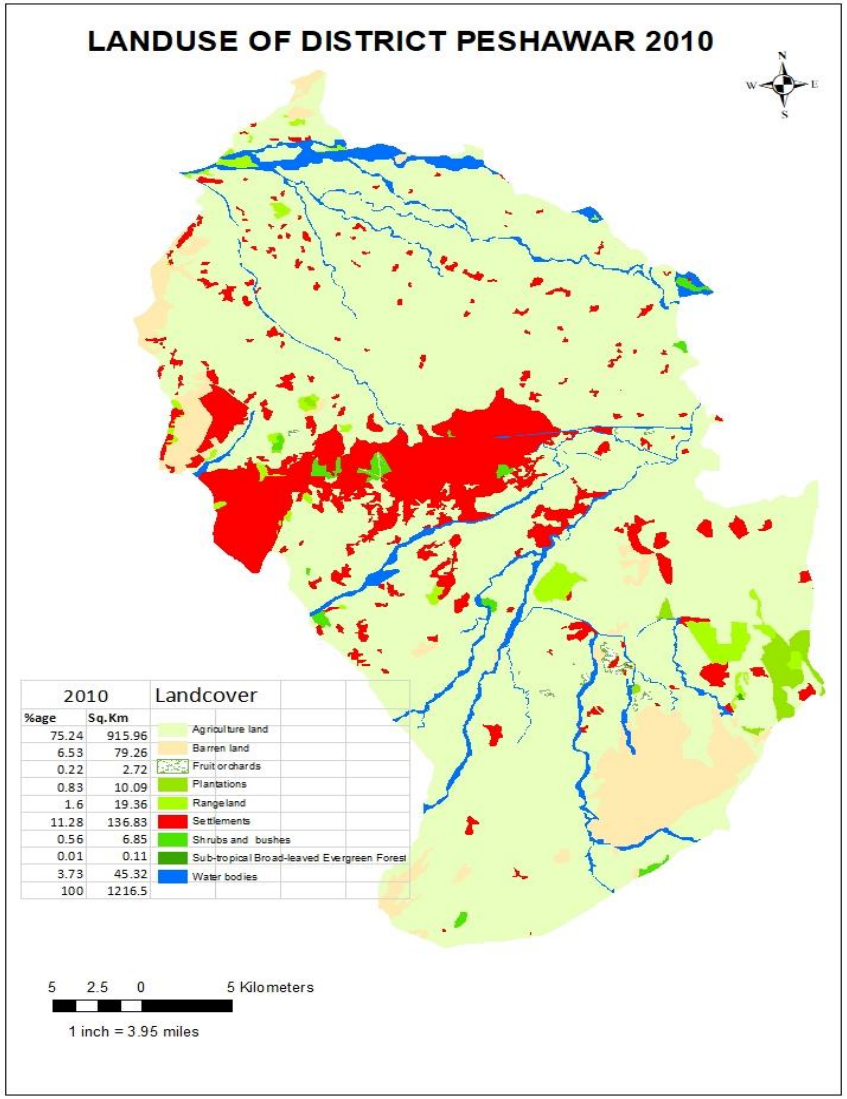


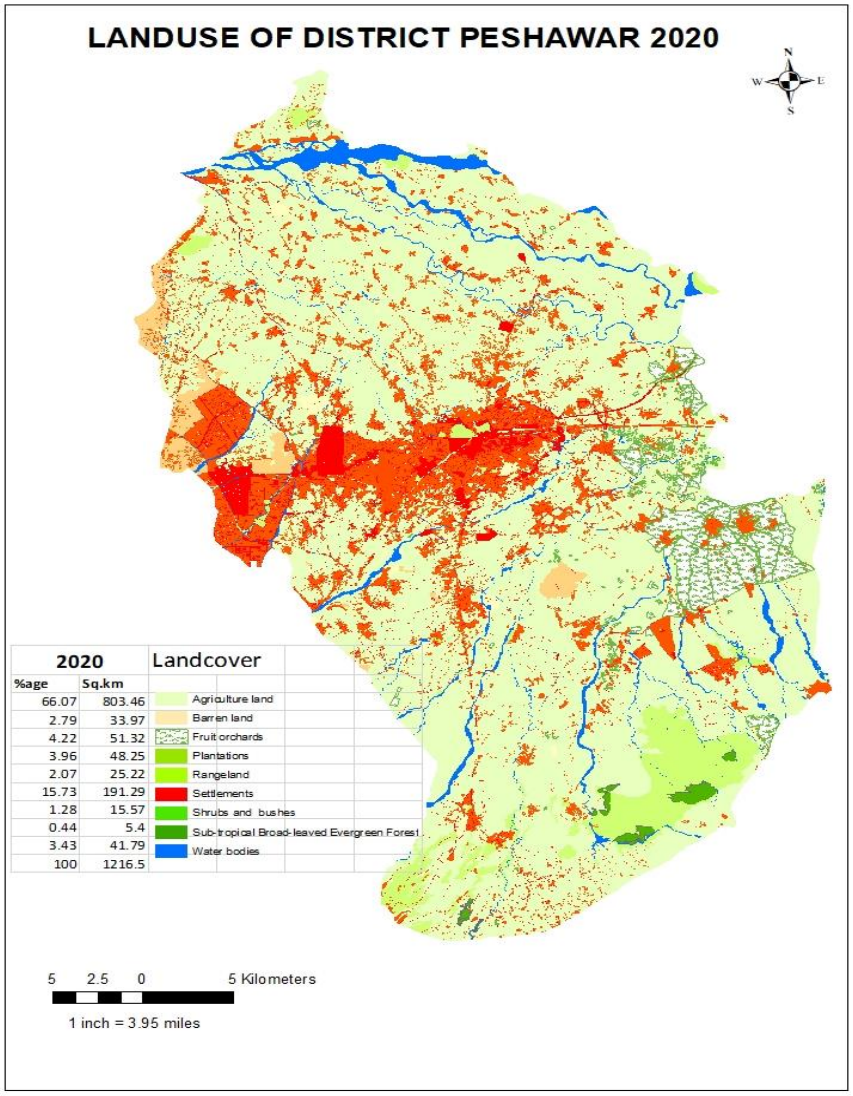
FID	LU_Type	Area	Percentage
2	Agriculture Land	144.25	45.6%
0	Air Port	3.04	1%
9	Fruits Orchards	3.11	1%
6	Graveyard	6.29	2%
11	Industries	3.42	1.1%
8	Railway Land	0.61	0.2%
5	Residential Land	100.4	31.7%
1	Roads	20.54	6.5%
7	Shurabs and Grass	0.49	0.2%
10	Stadium and Ground	2.15	0.7%
4	Vacant Land	26.67	8.4%
3	Water Bodies	5.54	1.7%

FID	Class	Area	Percent
11	Agriculture Land	130.15	41.1%
8	Air Port	3.04	1%
5	Fruits Orchards	3.11	1%
0	Graveyard	6.29	2%
10	Industries	3.2	1%
6	Railway Land	0.61	0.2%
9	Residential Land	115.2	36.4%
3	Roads	20.15	6.4%
7	Shurabs and Grasses	0.49	0.2%
2	Stadium and Ground	2.15	0.7%
4	Vacant Land	26.59	8.4%
1	Water Bodies	5.61	1.8%

Map 2. 6 Change detection of Peshawar urban area

Change Detection can be defined as the process of identifying differences in the state of an object or phenomenon by observing it at different times. The land use of Urban Area of Peshawar before a decade is shown at the left side of the Map having a huge percentage of agriculture (45.6%) however, the same can be seen at the left side of map with decreased percentage of a total of 41.1%. the detail of other land uses are shown in the Map 2-6.





2.3.4 Land use statistics of 2010 and 2020

Change detection helps us in understanding the growth pattern of an area by analyzing the geographic image of the area. The below figure shows the change occurred during 2010 and 2020 in district Peshawar. Due to rapid urbanization the agriculture land is becoming scarce as evident from the below figure the agriculture land in Peshawar decreased from 75.24% to 66.07%. Land is an important asset therefore its utilization must be planned to extract maximum benefits. The brown areas of the Peshawar district have been increasing rapidly due to speedy urbanization. Fig 2-6, shows that the settlements have increased from 11.28% to 15.73%. The details of other land uses are given in the Fig 2-6

2010		2020		Landcover
%age	Sq.Km	%age	Sq.km	
75.24	915.96	66.07	803.46	Agriculture land
6.53	79.26	2.79	33.97	Barren land
0.22	2.72	4.22	51.32	Fruit orchards
0.83	10.09	3.96	48.25	Plantations
1.6	19.36	2.07	25.22	Rangeland
11.28	136.83	15.73	191.29	Settlements
0.56	6.85	1.28	15.57	Shrubs and bushes
0.01	0.11	0.44	5.4	Sub-tropical Broad-leaved Evergreen Forest
3.73	45.32	3.43	41.79	Water bodies
100	1216.5	100	1216.5	

Figure 2. 6 Land use statistics of District Peshawar in 2010 and 2020

CHAPTER 3: POPULATION

3.1 POPULATION DISTRIBUTION AND GROWTH TREND

In case of District Peshawar, the growth rate has been increasing from the year 1951 to 1981 but declined during 1981-1998. It was 3.89% during 1972-1981 and fell to 3.56% in the period 1981- 1998. While the current growth rate is increasing, it was 3.99% from 1998-2017. The district growth rates have been significantly higher than the provincial growth rates in the corresponding time periods.

Table 3. 1: Population Distribution and Growth Trend[14]

Year	Urban		Rural		District	
	Population	Urban %	Population	Rural %	Growth Rate	Population
1951	151435	38.76	239252	61.24	---------	390687
1961	218691	41.33	310467	58.67	3.08%	529158
1972	272697	33.79	534315	66.21	3.70%	807012
1981	566248	50.86	547055	49.14	3.89%	1113303
1998	982816	48.49	1044035	51.51	3.56%	2026851
2017	1970042	46.15	2299037	53.85	3.99%	4269079

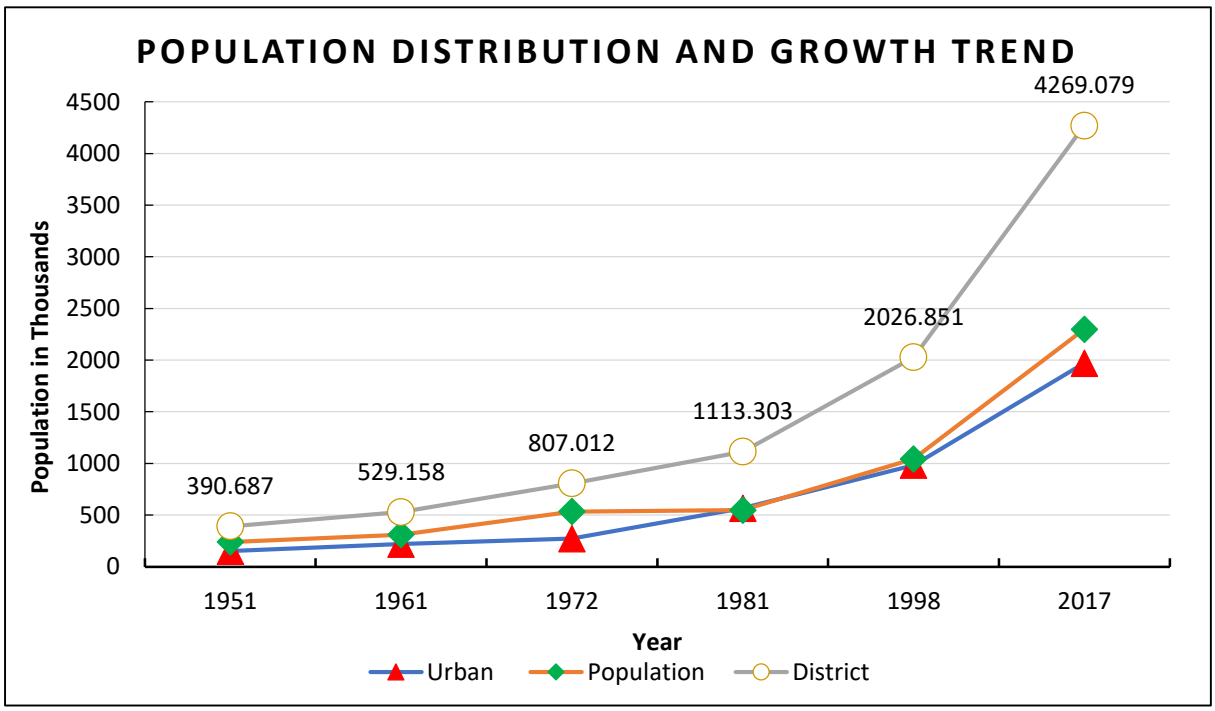


Figure 3. 1 Population Distribution and Growth Trend

[14] 1951,1961,1972,1981,1998 and 2017-District Census Report of Peshawar

3.2 MIGRATION

There are two main types of population migration:

- Conventional Migration
- Transient Migration

3.2.1 Conventional Migration

Conventional migration is the normal migration which takes place, and not due to specific reasons such as floods, earthquakes or due to security concerns.

Estimates of the magnitude of migration during 1981-2017 of District Peshawar have been made by the following method:

Table 3. 2: District Population – Migration Vs Natural Increase

2017 Census Population	4269079	(i)
2017 (using District G.R@ 2.40% during 1998-2017)	3180687	(ii)
1998 Census Population	2026851	(iii)
Total Additional Population (1998-2017)	**2242228**	(i)-(iii)=(iv)
Net Migration	**1088392**	(i)-(ii)=(v)
Net Natural Increase	**1153836**	(iv)-(v)

National growth rate during 1998-17 was applied on 1998 population to estimate expected population in the District Peshawar in 2017, assuming uniform natural increase. When these figures are compared with actual population as recorded in 2017 census, the difference is the contribution of net migration. Migration is never unidirectional, but there is no way (short of migration census) to assess inward and outward movements separately. But the net migration figure is a fairly robust assumption.

The national growth rate during the period 1998-2017 was 2.40%. Using this growth rate, the population of District Peshawar in 2017 is calculated to be 31,80,687. The actual 2017 census population of the District was 42,69,079 implying a net in-migration of 10,88,392. The additional population during 1998-2017 was 22,42,228, of which, as already stated, migration component was 10,88,392 (49%) and the remaining 11,53,836 (51%) was caused by natural increase.

3.2.2 Transient Migration

Transient migration in context of District Peshawar refers to analysis of mobility due to a number of factors which are shaped due to natural disasters and disturbances resulting from armed conflicts.

UNHCR conducted census of Afghan refugees in May 2011, and reported that there are 31,284 Afghan families residing outside regular camps in District Peshawar, and their total population is 144,204. The family size thus works out to be 4.6%. Most of them are living in Peshawar I & III.

Due to security issues in FATA/PATA a large number of people displaced into Peshawar. There are no camp-based IDPs in District Peshawar. However, IDPs living outside camps are about 90,000, constituting 17, 961 families.

The summary of transient population in District Peshawar is given in Table 3.3.

Comparing the above with District Peshawar's assessed population for 2011, it is estimated that transient population is around 10% of the District's existing population.

Table 3. 3: Transient Migration Population

Transient Population	Number of Persons	Number of Families
Afghan Refugees[15]	144,204	31,284
Internally Displaced Persons[16]	90,000	17,961
Effects of Flood/Earthquake	----	----
Total	**234,204**	**49,245**

3.3 POPULATION FORECASTS

An estimate number of future populations has been derived for the next 20 years using different forecasting models. These include:

- Regression Analysis
- Extrapolation
- Cohort-Survival Method

The estimates under the three forecasting models have been averaged to avoid uncertainty with growth rate and achieve more accuracy. The estimates under the three forecasting models and the recommended population for different years are presented in Table 3.4. These forecasts are radically illustrated below in Figure 3.2:

Table 3. 4: Population Forecasts for Plan Period (2021-2040)

Period	Projected Population		
	Urban	Rural	District
2017	1969823	2297375	4267198
2021	2303528	2686570	4990098
2025	2693766	3141699	5835465
2030	3275803	3820519	7096322
2035	3983599	4646012	8629611
2040	4844328	5649867	10494195

[15] Afghan Refuges Census 2011 (UNHCR)

[16] Source: Chief Coordinating Officer, Provincial Disaster Management Authority, Peshawar.

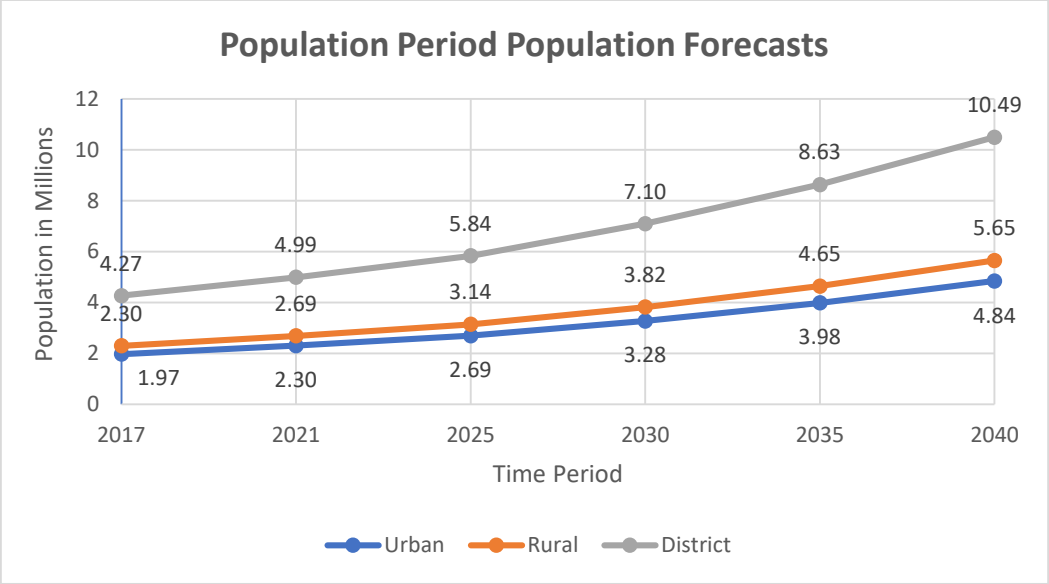


Figure 3. 2 Population Forecasts for Plan Period

3.4 DENSITY PATTERN

Even more alarming than the population growth trends in District Peshawar are its spiraling population density figures, which highlight the demographic dilemma that confronts the district. As of Census-2017, the population density in Peshawar was at 3394.65 persons/sq km, compared to 300 persons/sq km in the province. The current population density of District Peshawar is 3969 persons/sq km, it is estimated to increase to 8348 persons/sq km at the end of the plan period. It can be interpreted from the Table 3-5, that the increase in density of Province would be 87.4% and district Peshawar would be 102% at the end of the plan period.

Table 3. 5: Population Density (Sq. Km) of District Peshawar and Khyber Pakhtunkhwa[17]

Year	POPULATION DENSITY (PERSON/SQ KM)	
	Province	District
1981	148.43	885.68
1998	238	1612.45
2017	409.59	3394.75
2021	409.94	3969.85
2025	500.2	4642.37
2030	576.96	5645.44
2035	665.49	6865.24
2040	767.61	8348.60

[17] Up to 2017 density is calculated from census population while onward 2017 the density is calculated from population forecasts for plan period (2021-2040).

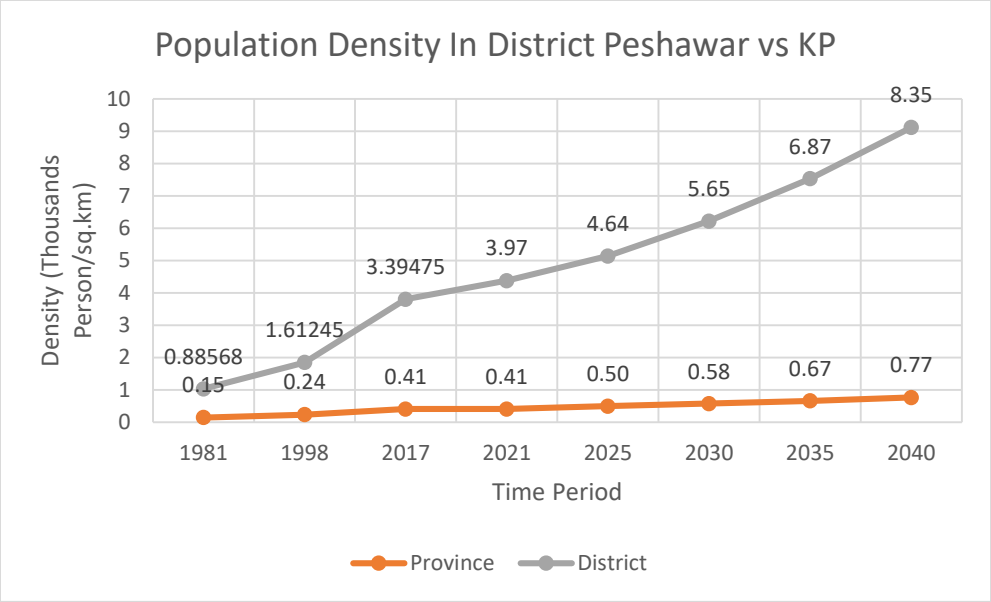


Figure 3. 3 Population Density (Sq. Km) of District Peshawar and Khyber Pakhtunkhwa

3.5 AGE-SEX DISTRIBUTION

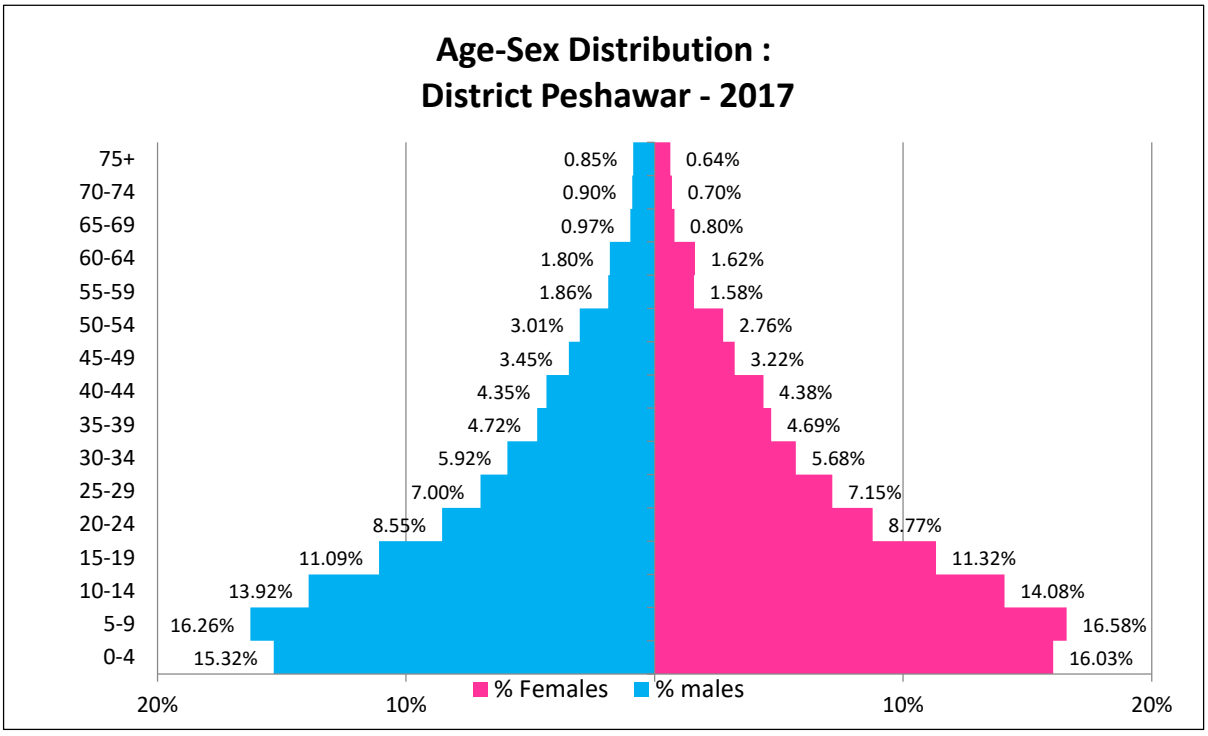


Figure 3. 4 Age-Sex Distribution of District Peshawar

CHAPTER 4: PROPOSED LAND USE PLAN

4.1 OVERVIEW

There was always need for provincial land use policy for land use planning and optimum utilization of land resources. The Land Use plans for the five Districts are building blocks towards that end.

At present there is no framework or a policy relating to land use in the province and therefore, in the matters of location and acquisition ad-hocism prevails. Government department takes certain decisions, which is negated by another department, behind most of which the confrontationist situation is the question of land. There being no Land Use policy within which framework different departments can decide their projects, contradictory views are taken by different departments, at the root of which is the question of land use.

Locating non-agricultural activity on land best suited for agriculture would not be permitted within the framework of the District Land Use Policy. To decide about location, therefore, land use policy is of vital importance. Under policy, appropriate land resources would always be available where necessary for development, and the logic of appropriate land use would apply.

Land is required for various kinds of activities including roads, railway tracks, airports, city expansion, industrial location, mining, afforestation, etc. The District Land Use Policy, and ultimately a Provincial Land Use Strategy would zealously guard the land for the Land Use which has been designated under the Plan, and their conversion to other use would be rationalized. Land also required for grazing, but un-controlled grazing will convert the pasture into a barren. Unfortunately, many of grazing areas have been eliminated.

The Land use plan have taken a holistic view of land as a resource and each parcel of land has been assigned to a designated use with compromising the competing uses. For example, prime agriculture land will not be used for urban development or industrialization.

Provincial Land Use Plan is envisaged as a policy document for an integrated, coordinated and systematic planning and uniform spread of developmental activities and employment to the rural and sub-urban population close to home and reduce pressure on larger cities like Peshawar. It aims at establishing hierarchy of settlements and developments of satellite, Intermediate, Secondary and Industrial Towns as focal points of future to cater the rural areas and small towns. It will also provide guidance to nation building departments/agencies, Urban Policy Unit, District Governments/TMAs for undertaking integrated and coherent development programs through holistic planning.

4.2 FRAMEWORK FOR DISTRICT SPATIAL PLAN AND BROAD GUIDELINES TO UNDERTAKE THE PROJECT

Khyber Pakhtunkhwa land use and building control act 2021 identify four bodies for implementation and execution of District land use plan

- KP Land Use and Building Control Act has been passed by the Provincial Assembly on 24th of November 2021.
- Under this act the following bodies/forums have to be established on provincial and District level.
  - I. Provincial Land Use & Building Control Council chaired by the Honorable Chief Minister of KP and Minister for LGE& RDD as Vice Chairman with all other concerned minister and administrative sectaries as member of the council. Already notified.
  - II. Provincial Land Use & Building Control Authority headed by Director General with directors and other officers of the related specialties like GIS, Urban Planning etc. Already notified
  - III. District land use planning and management committee would be establish for each district of KP under the chairmanship of D.C and all Public Stakeholders in the districts as its members. Already notified
  - IV. A local planning and enforcement unit would be established in each district which will consist of a District chief planning & Control officer, Planning and Control Officer, and planning & control Inspectors. Its establishment is under process.

The Local Government Act, 2013 empowers TMAs for the function of land use planning but due to the complex nature and involvement of a variety of stakeholders TMAs are unable to do this function efficiently. TMAs only perform the building control function up to some extent only in the urban centers. To implement the Land Use plans, a rational body "Land Use and Building Control Authority" was established which will not only implement the plans but can do so in a coherent and integrated way, and also resolve the inter-district planning issues which may arise during the plan implementation process.

The abundance of local planning authorities without an apex body at Provincial level contributes to the emergence of complex problems such as unclear roles, overlapping functions and responsibilities not fully discharged. These activities impact the growth and development in the region. With no definite policy at the Provincial level, the government employs ad-hoc measures in response to physical development problems. The plans are articulated poorly as the processes involved are not properly followed due to existence of many planning authorities with few qualified Urban & Regional Planners, and lead to little impact in promoting efficient urban and regional development.

Every planning authority has a specific task it performs in ensuring that proper planning is achieved. The local government planning authorities such as Peshawar Development Authority, Mardan Development Authority, Provincial Housing Authority, Khyber Pakhtunkhwa Economic Zones Development and Management Company, TMAs, Development Authority etc. are empowered by law to carry out specific planning roles. provincial land use and building control authority is not meant to take over their roles, but ensure that all plans are prepared within the framework of District Land Use Plans.

Planning authorities have the responsibility of approving planning schemes and the administration of various town and country planning laws and are also empowered to declare any area a planning area within their jurisdiction, after making adequate investigation about

it from PDA. Lack of linkage between the local authorities and the regional authority such as PDA leads to the negligence, as the problem is not really addressed, leading to haphazard development.

The Land Use Plan will help government agencies to improve public facilities and services. The Plan identifies locations for different Land Uses at most suitable locations and directions, which will guide the implementing agency in rationalizing all land uses and objective planning and formulation based on the potential and requirements of the land resource. Implementation of District Land Use Plan (DLUP) will promote potential-based use of the land for maximum land resource conservation. It will also ensure sustainable use of resources for coming generation. The optimum and guided utilization of land is, in fact, the main objective of the Land Use Plan.

It is a road map of sector strategies, subtly integrated, and derived from analysis of surveys and consultations with different stakeholders. District Land Use Planning is more than just long-term planning, where objectives are set for a specific period of time; it is more pro-active, based on anticipated changes in the years to come, thus making corrective alterations in the Plan after appropriate intervals, and involving various stakeholders at different levels of planning process, that may steer the Planning & Development Department, Local Government, Elections & Rural Development Department, City District Government, TMAs, Urban Policy Unit/PLUP, and urban local councils in a focused direction.

Land use and Building control Authority under the auspices of local government department will be responsible for:

- Coordination with districts to resolve inter-district planning issues, if any.
- Coordination with sectoral departments.
- Coordination with local councils.
- Planning, supervision, monitoring and implementation of Project.
- Organizing and conducting various training programs.

The Land use and building control authority shall also keep close liaison with donors and provide full support to induce their intervention in the target districts. It will also coordinate the relevant activities of various departments/agencies and would coordinate annual review meetings with donors and executing line departments. As already stated, Land use and building control authority will be responsible for implementation, administration and coordination of District Land Use Projects in an integrated manner, including financial management, organization of training programs, association with line departments and the NGOs.

It is also important to intensify the involvement of line departments in the area. It is proposed to utilize the services of the experts working in these departments so that they can participate for implementation of the Land Use projects. Similarly, other agencies functioning at provincial and district levels, and having the expertise relevant to the Project, should also be involved in the execution of the Project.

Considering the complexity and enormity of planning issues in the districts, it also seems imperative. The Land use and building control act 2021 highlighted establishment of local planning and enforcement Unit at district level , which will coordinate between the Provincial

land use and Building control council and District Level Departments, authorities, and agencies responsible for implementation of various projects. This arrangement is likely to have salutary effects for achievement of the targets.

4.3 GROWTH DIRECTION FOR PLANNED EXTENSION OF THE CITY

The urban area of district Peshawar, like all other urban areas, needs to expand to cater for the future population. Besides, currently most of the social facilities, institutions and amenity areas are concentrated in the existing urban area; provision has to be made for similar facilities in the peri-urban area which is likely to be urbanized over the next 20 years i.e. the duration of plan period.

The expansion however needs to be guided in the right directions because of the following reasons:

- Urbanization has far-reaching effects on agricultural lands. The process of urbanization usually triggers growth of urban housing, infrastructure, city-specific land-use forms such as recreational areas/stadiums, and public facilities etc. which further diminish cropland around the cities.
- There is thus a need on the part of the Government and the civil society to preserve this valuable natural gift i.e. agricultural land.
- Based on consultants' findings (Soil Capability Map & Distribution of Area by Product) the agricultural land in the district has been divided into three classes i.e. Class 1, Class 2 and Class 3 (Map 5-1).

  Class 1: Agricultural areas which are irrigated and productive; highly valuable are not recommended for Land Use change.

  Class 2: Agricultural areas which are productive but water logged

  Class 3: Agricultural areas which are though productive, but are rain-fed; Land Use may be changed for future urbanization.

It is clear from the map that most of the good quality agricultural land (Class 1 and 2) lie towards North of the District, which must be preserved to the extent possible and urbanization in that direction must not be encouraged. It may also be noted that:

- River Kabul flows towards North of the District, which makes that area prone to flooding.
- West of the District is adjacent to tribal areas (District Mohmand and District Khyber), and that may be a constraint for major expansion in that direction.
- Southern part of the district is adjacent to District Dara Adam Khel, and the area is rocky/hilly and unsuitable for development. Besides, it is far away from the existing urban area of Peshawar.
- There is some mining activity (mostly Bentonite) towards South-Eastern corner, and a fault line passes near the edge of the Southern boundary of the district. Based on the above analysis, it is clear that expansion towards South adjacent to existing urban area is suitable, particularly along both sides of Indus Highway, but the growth has to be contiguous to the existing urban area to achieve economies of scale, as leap-frog developments towards further South will increase the cost of services provision. To

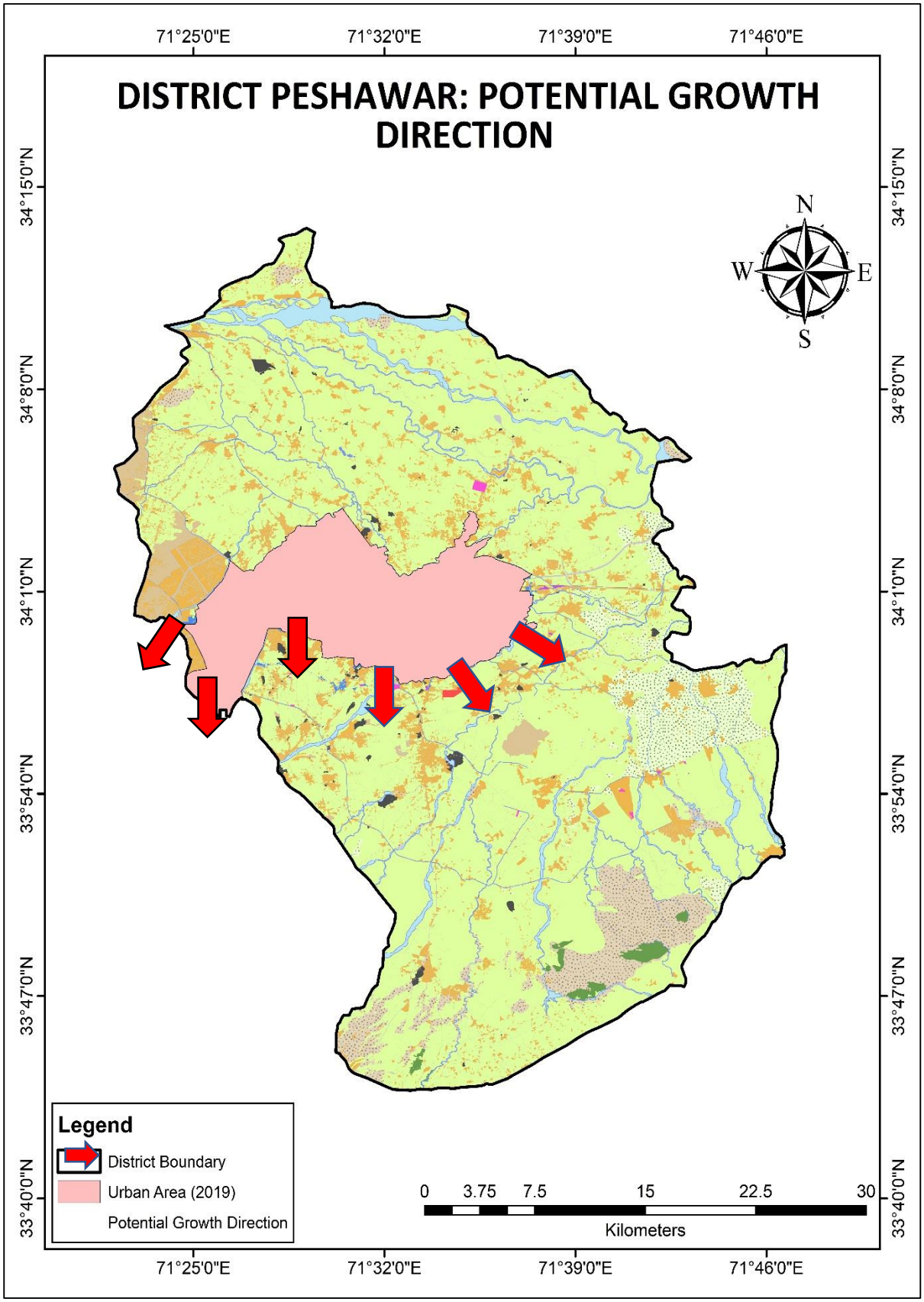
sum up, the area towards near south of the existing urban area, along the Indus Highway is suitable for future urbanization.

- Eastern part of District Peshawar, adjacent to District Nowshera is also suitable for future development, particularly the pockets between railway line and Indus Highway (Ref Figure).

It is clear from the above analysis that for urban expansion, areas close to South and East of existing urban area are optimum growth scenario for expansion of Peshawar.

The existing growth trend in Peshawar is given below

Map 4. 1: Growth Trends in Peshawar



Map 4. 2: Potential Growth Direction Map of District Peshawar

4.4 EXTENSION OF THE URBAN BOUNDARY (2021-2040)

The future urban area includes short term, long term and vertical housing, industrial zone, city centers, declared commercial roads and new roads, etc. As the city's population continues to spiral upward, Urban Peshawar, already home to more than 2.3 million people, has no choice but to build up.

Existing population of Peshawar urban area is 2.3 million, having an area of 147 sq. kms. Current population density of the urban area is 15670 persons per square kms. In the next two decades additional urban population of 2.54 million will be added. To cater the demand of the additional population 132 sq. km area will be added to the existing urban area. Table 4-1 show future urban area calculation of Peshawar.

Table 4. 1: (Scenario 1) Future Urban Area Calculation without densification

Urban Population	**2.3 Million**
Existing Urban Area	**147.00 Sq.Km**
Current Population Density	**15670 P/Sq.Km**
Additional Urban Population (2021-2040)	**2.54 Million**
Future Area Required	**162.14 Sq.Km**
20% Densification	**2.428**
Urban Area (2040) Senario 1	**309.14 Sq.Km**
Urban Area (2040) Senario 2	**279 Sq.Km**

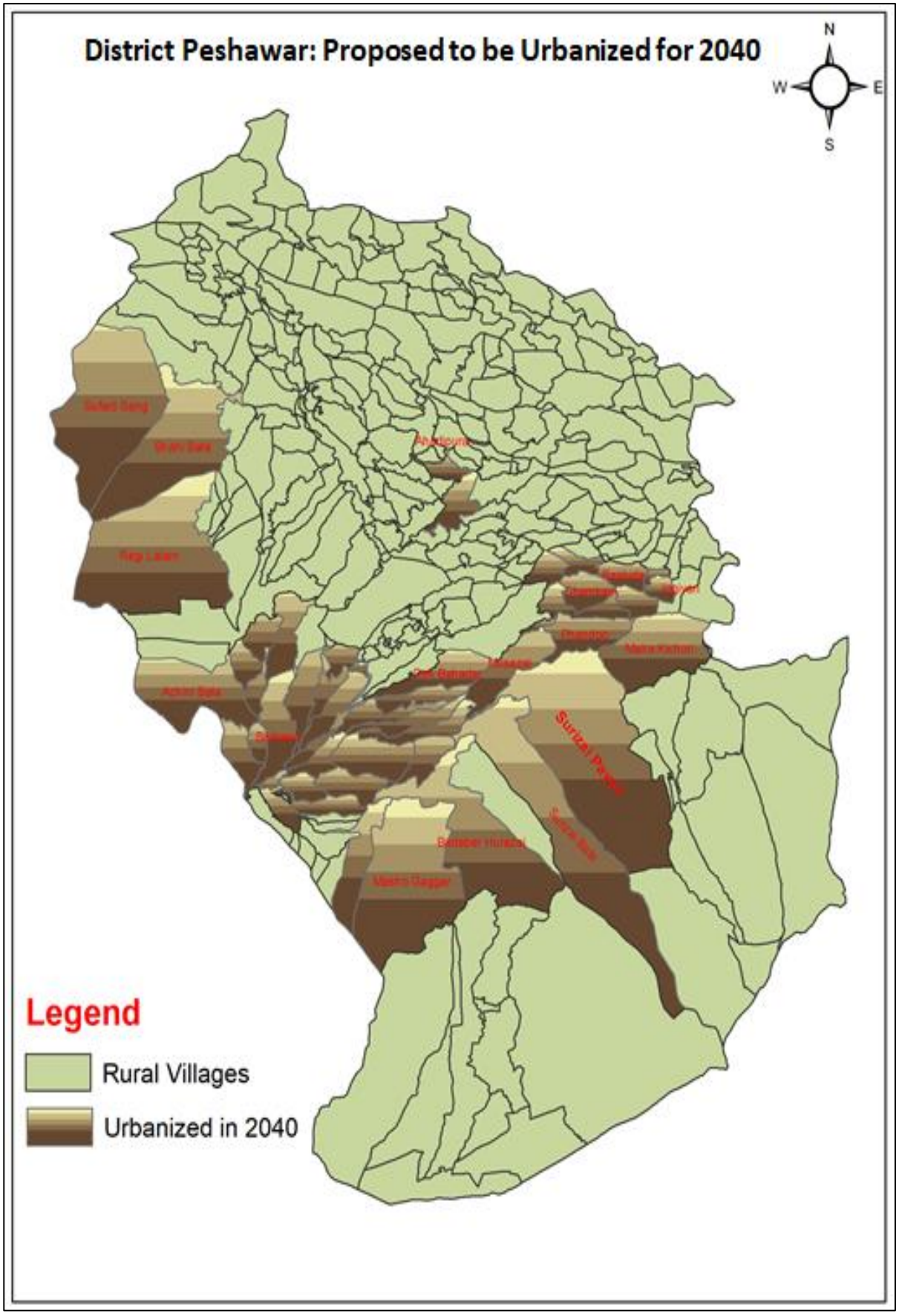
4.4.1 Villages to be urbanized by 2040

The criterion for envisaged urbanization by the year 2040 is not entirely density-based, but also stems from the proposed Land Use strategy. Future densities will be driven by the proposed Land Uses in a particular direction, even if the current densities over there are relatively lower than elsewhere, but expansion in that direction otherwise is desirable. Thus, the proposed trunk infrastructure in a particular direction, future housing, new commercial & industrial areas, health, education & recreational areas, major road network, etc. will attract population there, resulting in enhanced densities.

As already stated, the current urban area of District Peshawar is spread over 147 square km, and the area required for additional urban population during the period 2021-2040 would be 132 sq. km. The urban boundary of District Peshawar by the year 2040 would thus encompass 147+132=279 sq. km. Currently the villages which would urbanize by 2040 are 21, as given in Table 4-2 and shown in Map 4-2.

Table 4. 2: Villages to be Urbanized by 2040

Sr. No	Name	Population	Sr. No	Name	Population
1	Achini Bala	23,817	27	Masho Gaggar	69,750
2	Achini Payan	14,924	28	Masho Khel	12,240
3	Ahadipura	9,686	29	Musazai	19,152
4	Ahmad Khel	23,402	30	Mushtarzai	9,598
5	Alizai	12,484	31	Nodeh Bala	61,608
6	Badaber Hurazai	21,263	32	Nodeh Payan	10,108
7	Badaber Maryamzai	26,912	33	Phandoo	27,525
8	Balolzai	5,319	34	Pushti Khara Bala	23,613
9	Barkas	6,852	35	Pushti Khara Payan	22,693
10	Bazid Khel	18,525	36	Rashida	6,052
11	Chamkani	33,069	37	Regi Lalam	6,706
12	Chua Gujar	12,178	38	Safaid Dheri	27,873
13	Chugal Pura	16,531	39	Sangu	18,692
14	Deh Bahadar	12,135	40	Sarband	32,101
15	Fatu Khel	2,334	41	Shahab Khel	11,580
16	Garhi Mali Khel	3,959	42	Shahi Bala	36,527
17	Garhi Sardar	11,226	43	Sheikh Muhammadi	28,073
18	Garhi Sikandar Khan	4,615	44	Sufaid Sang	35,218
19	Haji Pandoo	6,055	45	Suleman Khel	11,131
20	Jagra	1,625	46	Surizai Bala	35,757
21	Kandi Hayat	1,015	47	Surizai Payan	1,07,079
22	Landi Akhun Ahmad	17,106	48	Tukra No.5	4,691
23	Landi Bala	9,494	49	Utmanzai	9,392
24	Larama	48,321	50		
25	Maira Kichori	29,174	51		
26	Malogo	9,720	52		



Map 4. 3: Villages to be Urbanized Map of District Peshawar

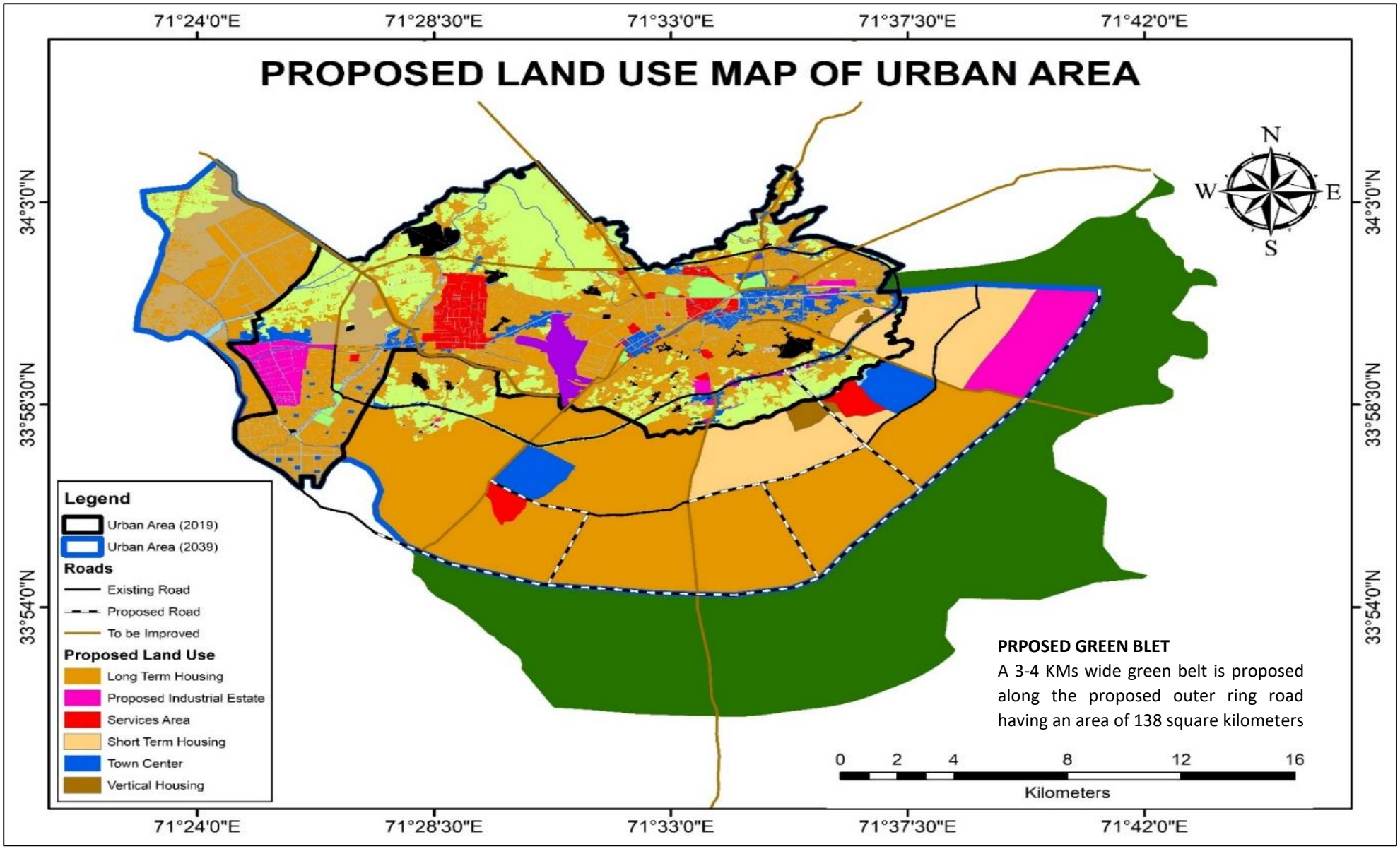
4.4.2 Proposed Green Belt

With the swift progression of urbanization and the rapid expansion of urban populations and insufficient urban space that is necessary for developing has resulted in disorderly city growth, which has led to issues such as traffic congestion, less arable land and less green land. Thus, strategies for effective limiting disorderly urban growth have become a global issue.

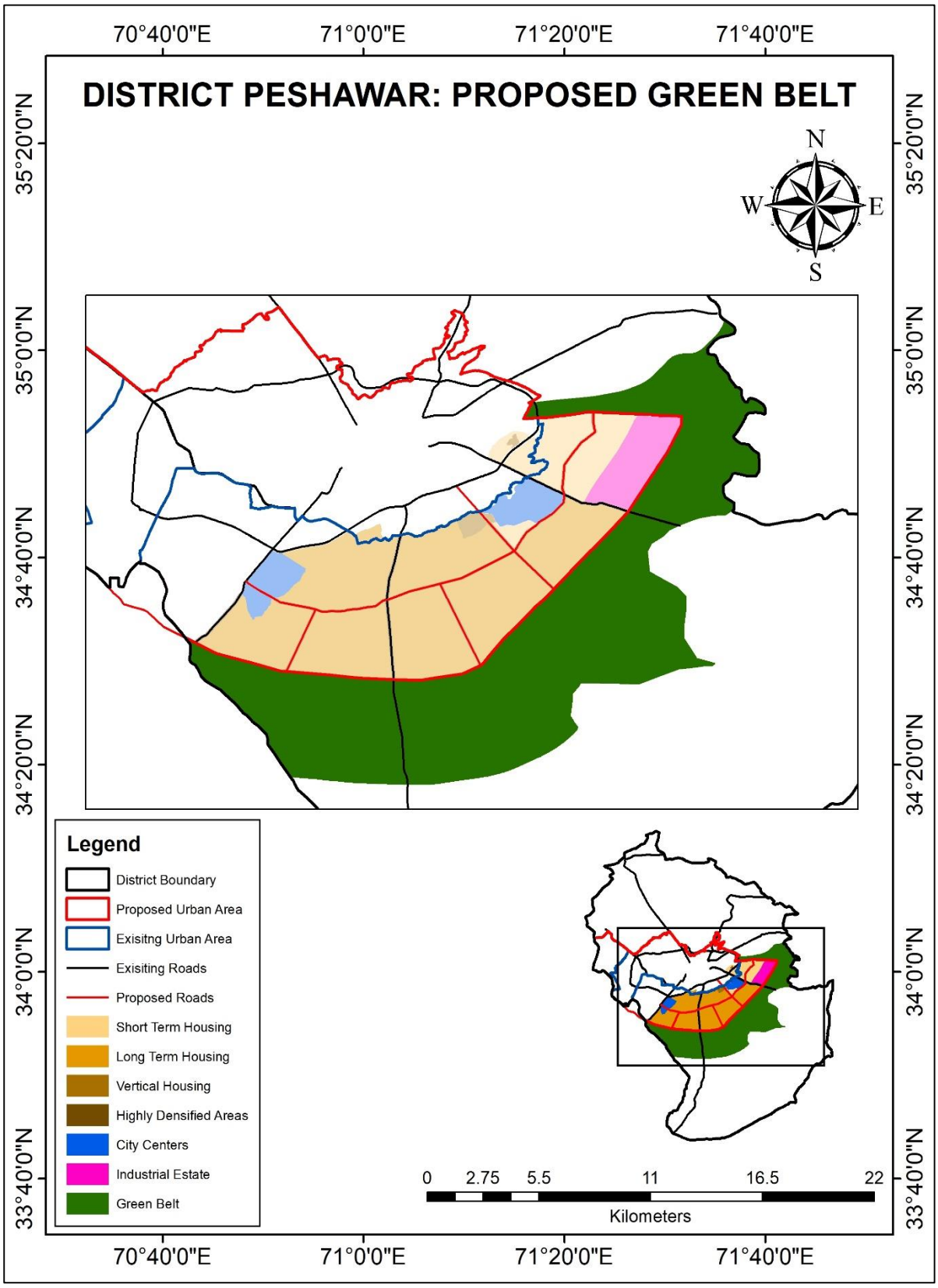
In British town planning, the green belt is a policy for controlling urban growth. The idea is for a ring of countryside where urbanization will be resisted for the foreseeable future, maintaining an area where agriculture, forestry and outdoor leisure can be expected to prevail. The fundamental aim of green belt policy is to prevent urban sprawl by keeping land permanently open, and consequently the most important attribute of green belts is their openness.

A 3-4 kms wide green belt is proposed along the proposed outer ring road having an area of 138 square kilometers. The proposed green belt will control the urban sprawl and haphazard development and will also differentiate the urban and rural boundaries. The proposed green belt will consist of orchard, agriculture and vegetation, no development shall be allowed in the green belt.

Urban green belt is also considered as the lungs of the city as they act as a sink for some of the harmful release by vehicles and industries in the city. Green belt technique is used by both developed and developing countries to prevent sprawl, as an example; most of Indian metropolitan cites like Mumbai, Chennai, Kolkata and Bangalore use green belt techniques to control urban sprawl.



Map 4. 4: Proposed Green Belt Map of District Peshawar



Map 4. 5: Proposed Green Belt Map of District Peshawar

4.5 HOUSING DEMAND (2021-2040)

4.5.1 Existing Housing Stock

The total housing unit in District Peshawar in 2017 was 489843 . The detail of housing units of 1998 and 2017 are given in the Table 4-3.

The housing stock in 2017 has increased with a growth rate of 3.647% in urban and 4.22% in rural sector. On the basis of 2017 and 1998 census household data the current (2021) housing units will be forecasted using the growth rate between 1998-2017 census which are stated above. The current housing units in Peshawar as per projections are 571837 having 272422 urban and 299415 rural units.

Table 4. 3: Existing Housing Stock in District Peshawar[18]

Year	1998	2017	Growth Rate	2021
Urban	119515	236753	3.66	273363.36
Rural	115700	255441	4.26	301829.36
Total	235215	492194	3.96	575192.73

4.5.2 Housing Shortage/Backlog

The main facets that need to be considered for assessing housing backlog include population, household size and the current housing stock. The current (2021) population of the District Peshawar is shown in Table 5-4. The Table shows required number of Houses (@household size 7 as assume in the land use plan), and those currently housing stock available (@ household size of 8.37). The difference between the two is the current housing shortage, which is calculated to be 260,391 as shown in the Table 4-4.

Table 4. 4: Current Housing Backlog in District Peshawar

Category	**Population 2021**	**Housing required**	**Housing stock**	**Housing backlog**
Urban	**2,303,528**	324441	273363	51078
Rural	**2,686,570**	378390	301829	76561
Total	**4,990,098**	**702,831**	**575,193**	**127,638**

4.5.3 Additional Housing Demand

The housing demand in the district over the next 20 years is 922018. During the period 2021-2025, there would a demand of about 141289 houses in the district. The statistics for the subsequent 15 years (2026-2040) and for the entire plan period (2021-2040) are given in Table 4.5.

Table 4. 5: Additional Housing Demand

Year	**Additional Population (2021-40)**			**Additional Housing (2021-40)**		
	Urban	**Rural**	**Total**	**Urban**	**Rural**	**Total**
2021-2025	390238	455129	845367	54963	64103	119066
2025-2040	2150562	2508168	4658730	302896	353263	656159
Total	**2540800**	**2963297**	**5504097**	**357859**	**417366**	**775225**

[18] 1998, 2017 census

4.5.4 Planned In-fill Development

Housing Schemes

There are two main housing schemes, initiated/developed by public sector in Peshawar, i.e. Hayatabad and Regi Model Town. Hayatabad is spread over 3,300 acres providing 22,500 plots. Regi Model Town has been developed over 12,350 acres providing 26,900 plots of different size categories. Regi Model Town has not yet been habituated.

Most of 26,900 plots in Regi Model Town and aggregate of 4,526 plots in approved private housing schemes are lying vacant. Their total number is thus 31,426 plots.

In private sector, there are twenty approved housing schemes, in which DHA, Professors Model Town, Shaheen Housing Complex, Sheikh Yaseen Town, New University Model Town and Zintara Residencies are worth mentioning here.

Planning for In-Fill development

Due to the absence of proper legal and institution frame work, particularly there is no, or very weak development and building control. As a result, the city of Peshawar is sprawling in all direction and in the coming years it will not be possible for the city managers to provide minimum level of urban services to these areas.

Further, due to non-existing of development control mechanism it gives rise to speculation in the house market and as a result the price of land goes beyond the purchasing limit of low- and middle-income groups and they are forced to meet their growing needs from the informal sector by investing in slum and squatter settlements. There is 865 acres of land lying vacant in urban area, i.e. land where no activity is taking place. It needs to be noticed that area under agriculture which is 10,378 acres in urban area is not vacant; agriculture is taking place over it.

Assuming that 45%[19] of available vacant land in urban area will be utilized for housing, the net available area is 408[20] acres; from which 4898 plots can be carved out (@12 houses per acre).

4.5.5 Net Housing Demand in the District

Based on calculations in earlier Sections, the summary of findings and net housing demand is given below:

Table 4. 6 : Net Housing Demand in District Peshawar

category	Additional Housing Demand		Infill development	Net Housing DEMAND		
	2021-2025	2025-2040		2021-2025	2025-2040	Total 2021-2040
Urban	106041	302896	60843	45198	302896	348094
Rural	140664	353263	80000	60664	353263	413927
Total	246704	656159	140843	105861	656159	762020

[19] Based on 45% residentiary area of the total urban area, as given in Table 2.5, Chapter 2 of this Report.
[20] 45% of 907 acres.

4.5.6 Area Requirements

For the total housing demand (additional for next 20 years plus current backlog), gross area required is 79735.2 hectares of which 33695.2 hectares is in urban area and 46040 hectares in rural areas. (Table 4.7).

Table 4. 7: Area Required for Housing (Acres)

Time Period	Urban	Rural	Total
2018-2023	3766	5055	8822
2023-2038	25241	29439	54680
TOTAL	29008	34494	63502

4.5.7 Housing Schemes

The changing sociological dynamics in the urban areas are contributing to an increase in housing needs. The joint family structure in cities is breaking down and nuclear families are spreading fast. People with no shelter used streets as their makeshift dwellings and often faced deadly accidents.

According to the Planning Commission of Pakistan about 300,000 housing units are built annually, mainly in urban areas. The number falls quite short of the demand, and so, gives rise to the backlog in the large urban agglomerations already bulging due to migrations for better healthcare, educational, employment and business opportunities, and safety and security. Katchi abadis and shanty towns then serve the excluded.

In the core city of Peshawar, informally built multi-storeyed structures continued to pose danger for their inhabitants in the face of seismic shocks and rains. Urban land has become a commodity attracting huge investments. Therefore, its prices rise to such high limits that its availability for housing, become impossible especially for low- and middle-income clientele. The large metropolitan centers of city of Peshawar face encroachment of public land, which limits chances of its availability for housing. Political interests define and determine land supply and distribution, while social and development-related demands such as housing become a low priority.

Housing development for middle- and upper-income groups is also a means of real estate investment. Several sub sectors and combination of services like design and construction, brokerage, marketing, financial services and the assistance to realtors to liaise with public agencies are linked to the real estate sector. However, urban and rural poor had no access to such schemes due to ultra-high price tags.

A katchi abadi (squatter settlement) is defined as an informal residential area developed on land owned by public agencies or departments. When the phenomenon of squatting become organized and spread to a sizable proportion of urban residential locations in implementing government policies on regularization, developing and improving katchi abadis, preparing guidelines for implementation of policies, identification of new katchi abadis and their monitoring, conducting socio-economic and cadastral surveys, preparing development schemes and extending leases after fulfilment of conditions are some key tasks undertaken by local development authorities.

The Khyber Pakhtunkhwa Katchi Abadis Act of 1996 has similar provisions for the city of Peshawar and elsewhere. The katchi abadis are scattered all along the city and peripheries.

Many settlements also exist on railway lands. While top government officials have announced the regularization of all abadis on railways lands, the local functionaries often doubt implementation due to administrative and legal reasons.

NAB, Khyber-Pakhtunkhwa took up a case of a Provincial Housing Authority Land Acquisition Collector and his supposed front man for allegedly embezzling more than Rs. 18 million while purchasing land for a housing scheme in Surizai, Peshawar, in July.

Table 4. 8: List of Approved Housing Schemes in District Peshawar[21]

S.NO	NAME	NATURE OF SCHEME	ADDRESS	APPROVAL STATUS	AREA (IN KANALS)
1	Hayatabad Township	Public Scheme	Grand Trunk Road	Approved	27,673
2	Regi Model Town	Public Scheme	Nasir Bagh Road	Approved	35,717
3	Police Colony	Private Scheme	Nasir Bagh Road	Approved	397
4	Media Colony	Public Scheme	Nasir Bagh Road	Approved	264
5	Mulazai Housing Scheme	Public Scheme	Sufaid Sang Road	Approved	196
6	Army Welfare Housing Society	Private Scheme	Kohat Road	Approved	1,460
7	OPF Housing Scheme	Private Scheme	Duranpur Road	Approved	982
8	Education Employees Foundation Housing Scheme	Private Scheme	Charsadda Road	Approved	323
9	DHA	Private Scheme	Nasir Bagh Road	Approved	20,377
10	Askari-6	Private Scheme	Warsak Road	Approved	332
11	New University Model Town	Private Scheme	Nasir Bagh Road	Approved	163
12	Professor Model Town	Private Scheme	Nasir Bagh Road	Approved	400
13	Shaheen Foundation Housing Scheme	Private Scheme	Warsak Road	Approved	388
14	Shiekh Yaseen Town	Private Scheme	Nasir Bagh Road	Approved	1,200

[21] LGE&RDD Department 2021

15	Zintara Residencies	Private Scheme	Ring Road	Approved	382
16	Al-Haram Green Valley	Private Scheme	Grand Trunk Road	Approved	195
17	Ali Villas	Private Scheme	Warsak Road	Approved	134
18	Arbab Cottages	Private Scheme	Warsak Road	Approved	39
19	New City Homes	Private Scheme	Grand Trunk Road	Approved	706
20	New Kakakhel Town	Private Scheme	Dalazak Road	Approved	77
21	New University Villas	Private Scheme	Warsak Road	Approved	45
22	Officers Garden	Private Scheme	Warsak Road	Approved	205
23	Safiya Homes	Private Scheme	Warsak Road	Approved	202
24	Shami Road Garden	Private Scheme	Canal Road	Approved	43

Table 4. 9: List of Un-Approved Housing Schemes in District Peshawar[22]

S.NO	NAME	NATURE OF SCHEME	ADDRESS	APPROVAL STATUS	AREA (IN KANALS)
1	Afridi Town	Private Scheme	Kohat Road	Unapproved	186
2	Al-Hafiz Town	Private Scheme	Ring Road	Unapproved	27
3	Al-Haram Model Town	Private Scheme	Ring Road	Unapproved	409
4	Ali Model Town	Private Scheme	Warsak Road	Unapproved	105
5	Al-Masa Model Town	Private Scheme	Warsak Road	Unapproved	283
6	Al-Moeez Homes-III	Private Scheme	Canal Road	Unapproved	35
7	Arbab Yaseen Town	Private Scheme	Ring Road	Unapproved	76
8	Babu Colony No. 2	Private Scheme	Dalazak Road	Unapproved	22
9	Basher Bagh	Private Scheme	Paggagi Road	Unapproved	101
10	Canal View	Private Scheme	Nasir Bagh Road	Unapproved	207
11	City Oasis	Private Scheme	Ring Road	Unapproved	323
12	City Oasis-II	Private Scheme	Warsak Road	Unapproved	103
13	City Residencia	Private Scheme	Charsadda Road	Unapproved	1,193
14	Cronche Enclave	Private Scheme	Warsak Road	Unapproved	57

[22] LGE&RDD Department 2021

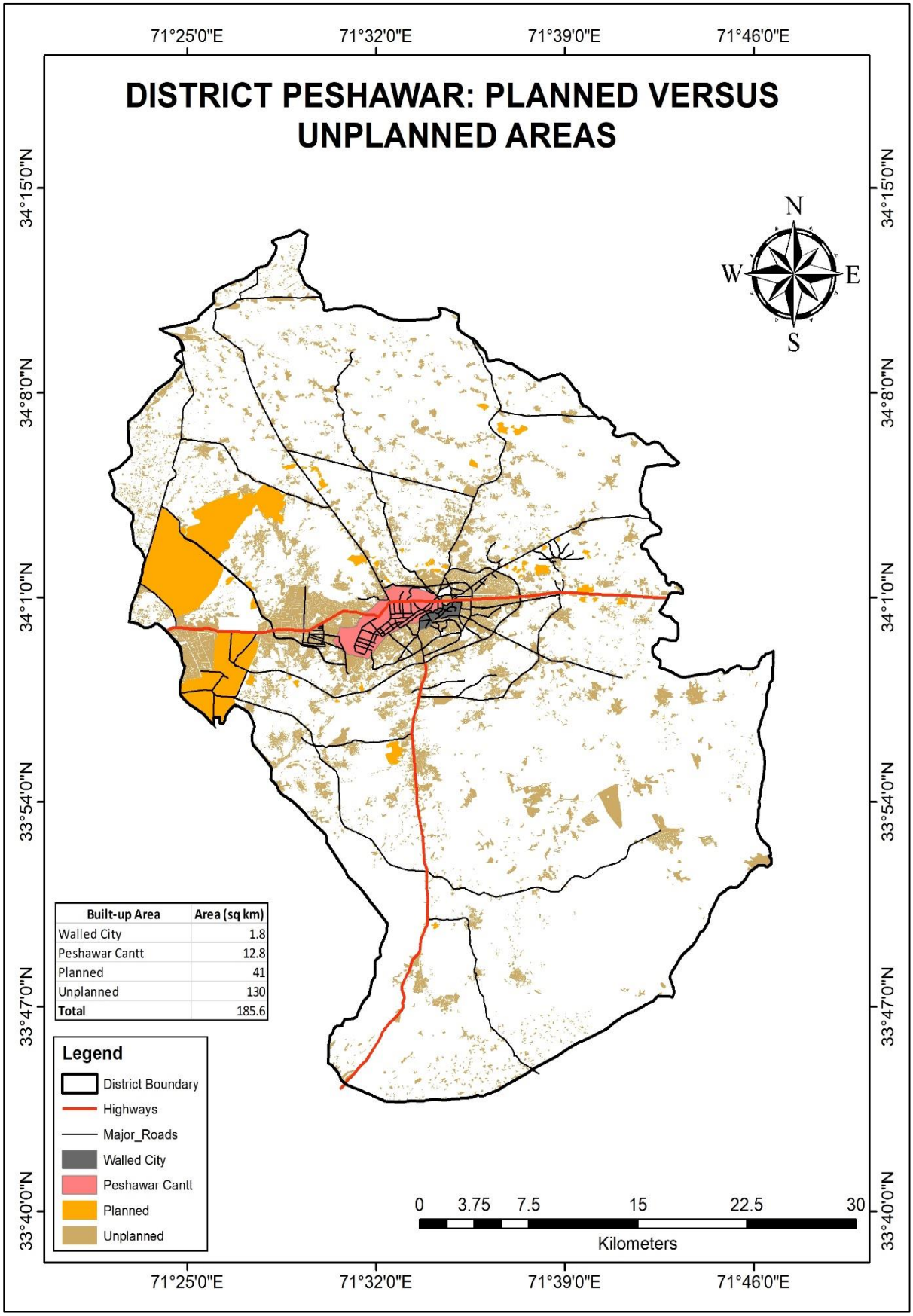
15	Executive Lodges Arbab Sabz Ali Khan Town	Private Scheme	Warsak Road	Unapproved	356
16	Faisal Town	Private Scheme	Warsak Road	Unapproved	38
17	Garden Villas	Private Scheme	Motorway	Unapproved	156
18	Green Cottage	Private Scheme	Warsak Road	Unapproved	113
19	Green Homes	Private Scheme	Dalazak Road	Unapproved	177
20	Gulbahar No. 6	Private Scheme	Ring Road	Unapproved	60
21	Gulshan-e-Peshawar	Private Scheme	Duranpur Road	Unapproved	329
22	Hasham Babar Town	Private Scheme	Warsak Road	Unapproved	367
23	Hayat Gardens	Ghost Scheme	Dalazak Road	Unapproved	
24	Khyber Kalay Housing Scheme	Private Scheme	Ring Road	Unapproved	219
25	Madina Colony	Private Scheme	Ring Road	Unapproved	70
26	Madina Residencia	Private Scheme	Grand Trunk Road	Unapproved	137
27	Mian Abdul Wali Shah Town-II	Private Scheme	Dalazak Road	Unapproved	91
28	Mian Abdul Wali Shah Town-III	Private Scheme	Dalazak Road	Unapproved	88
29	Muslim Villas	Ghost Scheme	Dalazak Road	Unapproved	
30	New & Old Qurtaba Model Town	Ghost Scheme	Charsadda Road	Unapproved	
31	New Muslim City	Private Scheme	Northern Bypass	Unapproved	103
32	New Officers Housing Society	Private Scheme	Northern Bypass	Unapproved	168
33	Northern City	Ghost Scheme	Dalazak Road	Unapproved	
34	Northern Homes	Private Scheme	Warsak Road	Unapproved	163
35	Officers Housing Phase-II & University Garden	Private Scheme	Warsak Road	Unapproved	380
36	Peshawar Enclave	Private Scheme	Charsadda Road	Unapproved	364
37	Peshawar Garden	Private Scheme	Grand Trunk Road	Unapproved	271
38	Peshawar Model Colony	Private Scheme	Dalazak Road	Unapproved	65
39	Professor Model Town-II	Private Scheme	Warsak Road	Unapproved	270
40	Rauf Abad	Private Scheme	Canal Road	Unapproved	440
41	Shams-ul-Qamar Colony	Private Scheme	Ring Road	Unapproved	88

42	Tariq Housing Scheme	Private Scheme	Ring Road	Unapproved	130
43	Tasneem Garden	Private Scheme	Duranpur Road	Unapproved	111

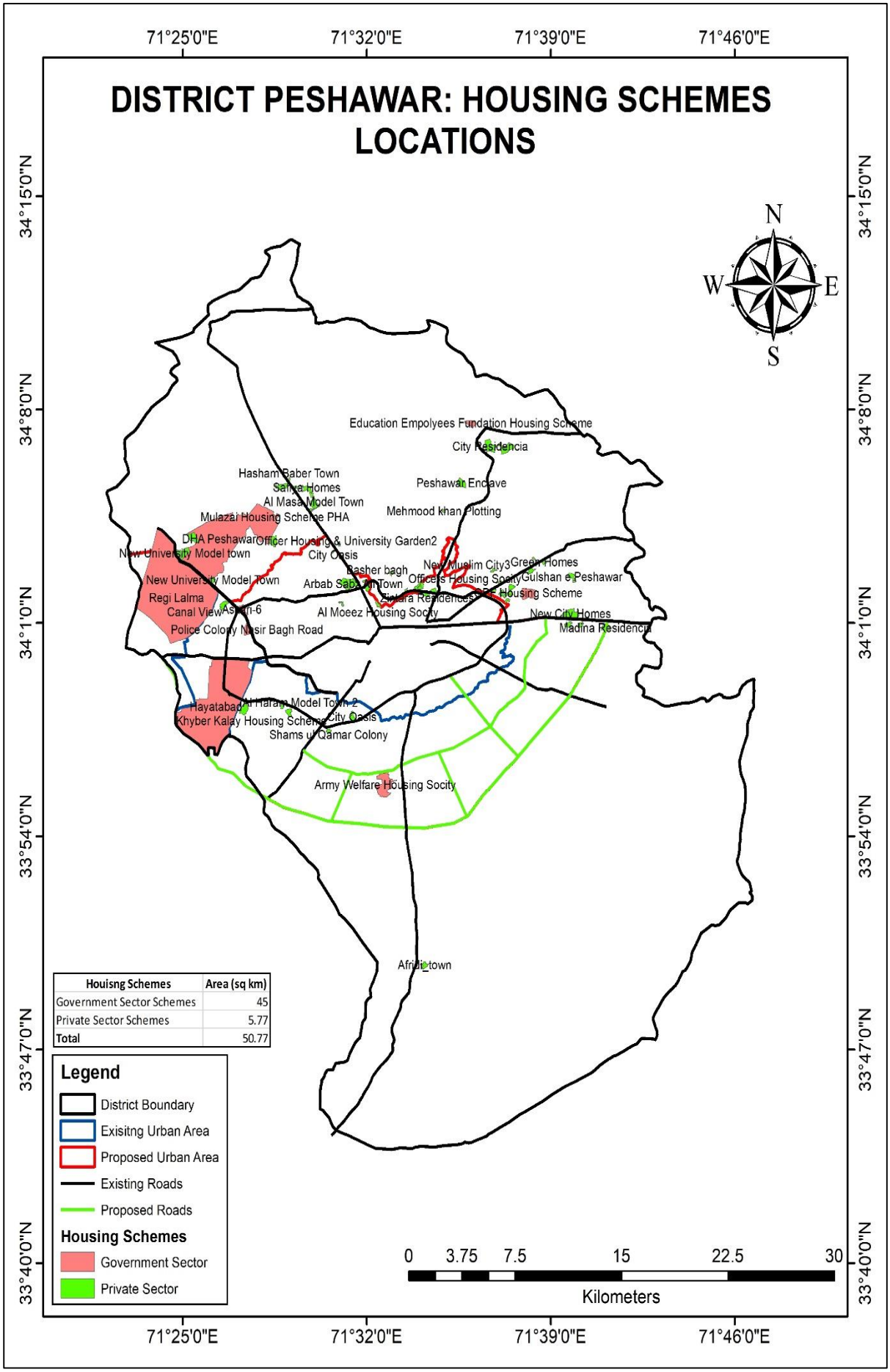
4.5.8 Proposed Locations for New Housing Areas

The proposed location for future housing is spread around the existing urban area, but the major thrust is towards South along Indus Road and towards South-East. Future housing is also proposed as in-fill development in vacant pockets and housing schemes falling within urban area. However, as already stated and as per proposed Land Use strategy, most of the future housing developments are proposed towards South and South-East, but adjacent to existing urban area.

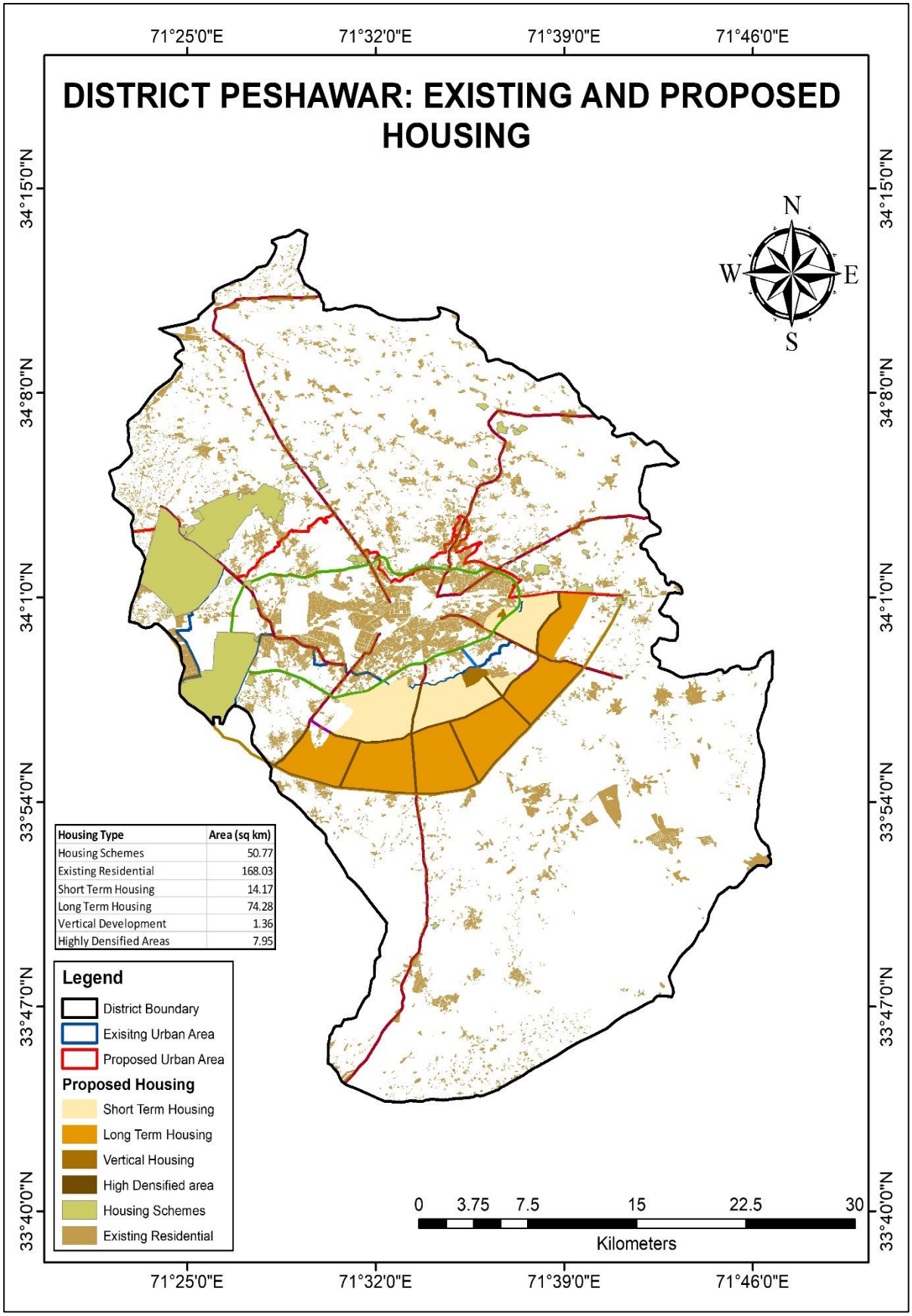
The proposed locations are based on "Strategic Framework for Land Use Planning" already elaborated in Chapter 6, as well as the findings of traffic surveys given in Chapter 4. The highest level of traffic congestion is on Jamrud Road, which is offering a poor level of service, as seen in Table 4.9 of Chapter 4. The PCUs/hour/lane on Jamrud Road is 5,649, which gives it a level of "forced flow" traffic. Because of this, new housing areas are proposed to be located in such a way that the traffic on Jamrud Road will be diverted through a series of ring roads, without causing additional load (in fact reducing traffic) on Jamrud Road which is passing through present urban area. The same is true about GT Road, where the traffic flow is approaching unstable level. Jamrud Road is in fact a continuation/off-shoot of GT Road. Thus, the above argument for location of new housing areas viz-e-viz Jamrud Road also applies to GT Road, on which the PCUs/hour/lane is 2,079, i.e. approaching unstable flow.



Map 4. 6: Existing Housing Map of District Peshawar



Map 4. 7: Housing Schemes Location Map of District Peshawar



Map 4. 8: Existing and Proposed Housing Map of District Peshawar

4.5.9 Densification Through Construction of Condomiums or Vertical Housing

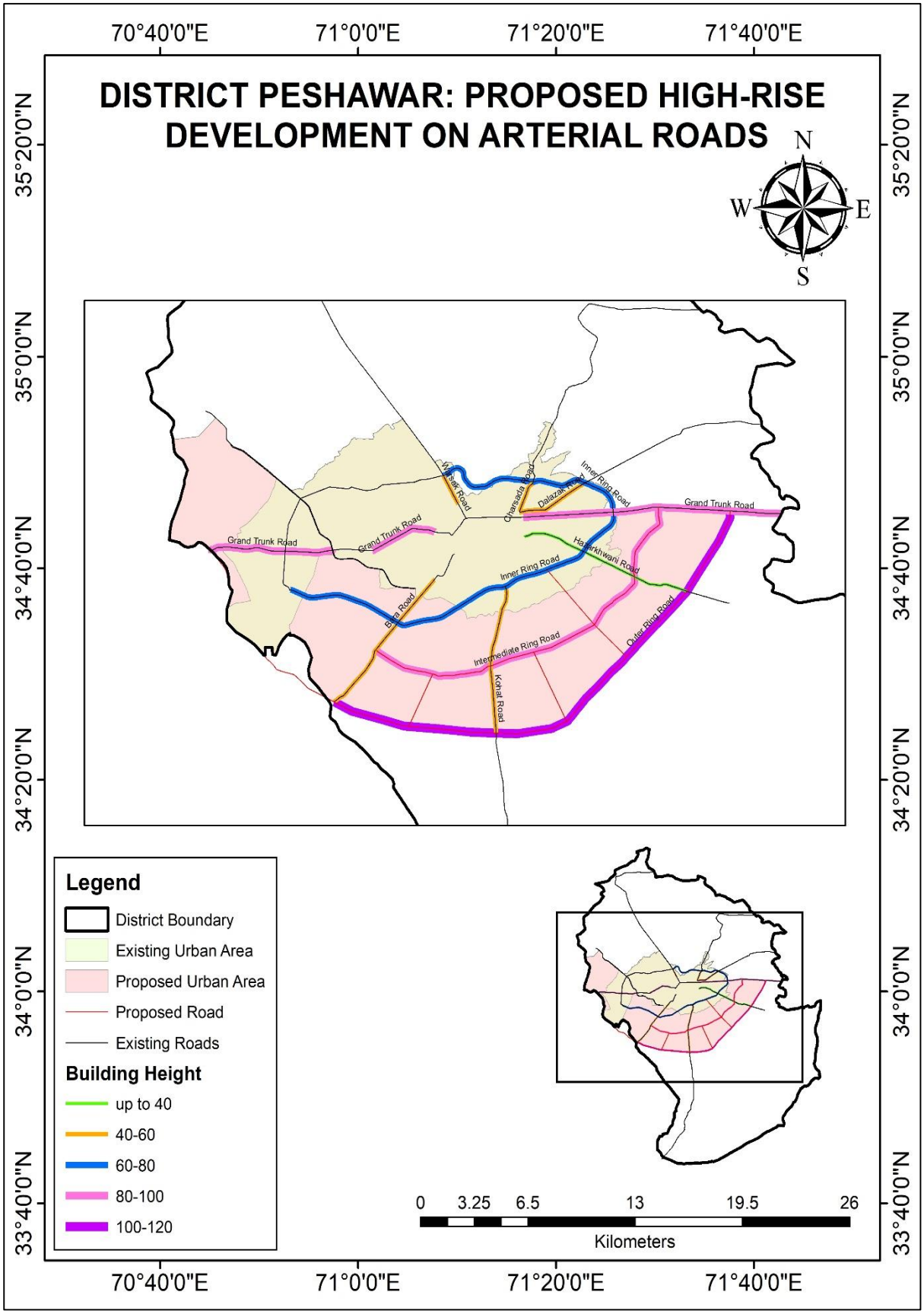
The densification of proposed road will also ensure the development of sustainable public transport system in these areas. The densification and commercial of the proposed roads will transforms these areas into Trans oriented development (TOD) and development of public transport system in these areas. 20% of the projected growth will be accommodated through intensification/densification measure that will reduce the development of horizontal growth of the city up to some extent and will be able to conserve prime agriculture land without densification strategies for planned growth of Peshawar city and land of 162.14 Sq. Km will be required for plan period 2040.

However, if intensification/densification is encouraged and adopted, it will reduce the urban sprawl and comparatively less land will be required for future extension of the city. Our study suggests that through the densification of major arterial roads of the city, it will accommodate 20% of projected growth and we will be able to conserve up to 30 Km of agriculture land.

All major existing and proposed roads will be commercialized with mix land use by 2040. By realizing the importance of commercialization in district Peshawar, the major roads are classified according to building heights. In the above map, each road is categorized in specific building heights. Like the building height along the inner Ring Road will be 60 to 80 feet, the intermediate ring road will be 80-100 feet and on the outer ring road the height will climb to 100-120 feet. All radial roads like Warsak Road, Bara Road, Kohat Road Dalazak Road will climb up to 40-60 feet. All other radial roads in the urban area will have a height upto 40 feet while on double road upto 60 feet height will be permissible. At University Road the permitted height would be 80-100 feet.

Table 4. 10: Total Area Required After High-Rise Development in 2040

Additional Urban Population (2021-2040)	2540800
20% of urban population	508160
Housing units required	72594
Area for housing units in acres	7269
Total area in Sq.km	30
Urban Area (2040) in Sq.km	279



Map 4. 9: Proposed High-Rise Development Map of District Peshawar

4.6 TRANSPORTATION NETWORK - EXISTING SITUATION

The main transport infrastructure in Peshawar is provided by three main highways i.e., the Motorway (M1), the Grand Trunk Road (N5) and the Indus Highway (N55) that further links to several other highways including the Karakoram Highway (N35). Besides, Peshawar has an International Airport (served by both national and international airlines) and two major Railway Stations (City and Cantonment) enabling air, rail and road connections to all of the cities of Pakistan as well as neighboring countries like Afghanistan and China.

4.6.1 Road Network

The M1 section of Motorway connects Peshawar with Islamabad, and joins M2 at Islamabad Interchange as a continuation of Motorway network. The whole stretch of the M1 consists of 6 lanes with a number of rest areas along the route. It has reduced the volume of traffic takes much traffic off the highly used N5.

Unlike motorways, national highways are not controlled-access or limited access. As in the case of motorways, Pakistan's National Highway Authority is responsible for all national highways.

District Peshawar has 19 secondary roads having total length of over 184 Kilometers. There are 107 access roads in District Peshawar, with a total length of about 188 Kilometers. District Peshawar has 18 bridges of various types, width and length. These include pre-stressed girders, steel truss and masonry arch, with length varying between 14.2 m -140 m, width 4.27 m -7.31 m and height 3 m-8 m.

4.6.2 Railway Network

In the past railway was a cheap and reliable transport source in the Pakistan including Khyber Pakhtunkhwa. Due to various factors including political, technical and financial reasons it loosed the means of transportation. The total length of rail track in the province is about 288 km, of which only a nominal portion (From Attock to Peshawar) is operational. The rest of the track is not operational and abundant. In the five districts of Peshawar Valley, the track lengths are as below:

- Peshawar: 31 kms
- Mardan: 51 kms
- Nowshera: 72 kms
- Charsadda: 15.5 kms

Peshawar has two railway stations, i.e. City and Cantonment, both lying on main Peshawar-Lahore–Karachi railway line. At present six trains are operational for passengers, these are Khushal Express, Khyber Mail and Awami Express, Jaffar Express, Khushal Khan Khattak Express and Rehman Baba Express.

4.6.3 Vehicular Forecasts

The projected vehicles in District Peshawar for the years 2019 and 2039, based on average annual growth rate of 3.5% are estimated to be 637,842 and 1,142,933 respectively, as seen in the Table 4.10.

Table 4. 11: Vehicle Forecasts

Vehicle Type	2017[23]	2019[24]	2039[25]
Motorcycles/scooters	212439	250902	456748
Motor cars/jeeps	95703	113031	205767
Tractors	8223	9711	17673
Buses/Mini Buses/Coasters	21446	25329	46112
Rickshaws	22133	26140	47587
Vans/Pick ups	27532	32517	59197
Tractors	30769	36340	66158
Other Vehicles	158987	187773	341832
Total	577232	681744	1241075

4.6.4 Traffic Surveys

4.6.4.1 Traffic Volumes

In order to supplement the above-described traffic data, fresh manual classified counts (MCC) were conducted by the Consultants, on primary roads of District Peshawar at entry and exit points, along with Origin-Destination surveys. The traffic counts were conducted for 12 hours, from 7 AM to 7 PM in January, 2013.

Analysis of the data obtained shows that the peak hours on different roads were as follows:

- Jamrud Road: 5-6 PM
- Charsadda Road: 8-9 AM
- Kohat Road: 10-11 AM
- GT Road: 8-9 AM
- Motorway: 8-9 AM

The detailed statistics are presented in the District Studies Report. Following are the main inferences:

i. Total Traffic volume on the five primary roads of Peshawar (in-coming plus out-going) is 118,810 vehicles, of which maximum is on Charsadda Road (24.61% of total flow, both ways), followed by GT Road (23.75%), Motorway (19.97%), Jamrud Road (18.85%) and Kohat Road (12.82%). The vehicles include all modes of traffic including motorcycles/scooter, car/jeep, wagons/mini buses, buses, pickups, trucks, and tractor trolleys.

ii. The heavy flow on Charsadda Road is because Charsadda is very close to Peshawar in terms of travel time and distance; hence people commute to Peshawar on daily basis, mainly on motorcycles and cars. Thus, the total flow of motorcycles/scooters on the five primary roads, maximum flow (more than 51%) is on Charsadda Road, while their

[23] Khyber Pakhtunkhwa Department of Excise and Taxation
[24] Projected Figures
[25] Projected Figures

flow on Jamrud Road, Kohat Road, and GT Road is 19.23%, 13.09% and 16.51% respectively. These are not allowed on motorway.

This high traffic flow on Charsadda road warrants the need to increase the capacity of the road in future

iii. The flow of cars/jeeps is maximum on motorway (about 26%), followed by Charsadda Road (22.4%), GT Road (19.4%), Kohat Road (17.47%) and Jamrud Road (14.91%).

iv. About one-third of wagons/mini buses ply on motorway, followed by GT Road and Charsadda Road (28% and 27%), Kohat Road (8.6%) and Jamrud Road (4.6%).

v. A different picture emerges in case of large buses. Of the total, only about 1.6% ply on Charsadda Road, while the heaviest flow of buses is on motorway (about 36%), Jamrud Road (about 30%) and GT Road (about 24%). On Kohat Road, the buses plying are 9%.

vi. The heaviest flow of trucks (all categories) and tractor trolleys is on Jamrud Road (about 46%), followed by GT Road (about 27%). On the remaining three roads, it is fairly close ranging from 8 to 10%.

vii. It is clear from the above analyses that most of the light traffic (motorcycles/scooters, cars) ply on Charsadda Road, while heavy vehicles (buses/trucks) move on Motorway, GT Road and Jamrud Road.

viii. To determine level of service against traffic carrying capacity of these roads, maximum traffic flows during peak hour have been converted into equivalent passenger car units (PCUs).

ix. The total traffic volume in peak hour, more than 52% PCUs are on Jamrud Road, followed by GT Road (19%). The figure is lowest for Kohat Road (5.6%), and fairly close for motorway and Charsadda Road (about 10.6% and 12.6% respectively).

x. For determining the existing level of service of roads under the given traffic flow and other conditions, standards of traffic density range as explained in the text were adopted. Level of service is qualitative measure describing operational conditions within a traffic stream. It is seen that Jamrud road is offering poorest level of service, followed by the GT road where traffic flow is nearly unstable. The flow is stable/free flow on Charsadda Road, Kohat Road and Motorway.

4.6.4.2 Origin-Destination Surveys

Traffic Origin-Destination Survey has been conducted on primary highways of District Peshawar at entry/exit points, to have a clear picture of Inter-District travel pattern. Following table presents the number and type of vehicles interviewed during the survey: Following are the main inferences of O-D survey:

i. A total of 1035 vehicles were interviewed of which 38% were cars/jeeps, followed by 20% wagons/mini buses, about 10% pick-ups, 21% trucks of all categories (2 to 6 axle),

Table 4. 12: Number and Type of Vehicles interviewed under Peshawar based Traffic OD Survey

Sr. No.	Vehicles Type	Jamrud Road	Charsadda Road	Kohat Road N-55	GT Road N-5	Motor way M-1	Total Vehicles
1	Car/ Jeep / Taxi	105	78	60	65	90	398
2	Wagons/Mini Bus/ Med Bus	26	33	61	49	33	202
3	Large Bus (over 20 seats)	7	6	19	14	23	69
4	Pickup/ Truck (open back)	22	19	10	20	36	107
5	Truck (2 Axle Rigid)	24	14	13	13	33	97
6	Truck (3 Axle Rigid)	6	6	12	12	12	48
7	Articulated Truck	30	5	10	6	19	70
6	Tractor Trolley	4	21	8	11	0	44
Total		224	182	193	190	246	1035

about 7% buses, and 4% tractor trolleys, as inferred from Table 14.22, Chapter 14 of District Studies Report, Peshawar.

ii. The numbers of vehicles interviewed for origin/destination were fairly uniform on all roads. In terms of percentages, those included on Motorway were 24%, Jamrud Road 21%, while on GT Road and Charsadda Road it was 18% each, and 19% on Kohat Road.

iii. Of those whose destination was Peshawar, about 37% originated from FATA, about 25% from Charsadda, 17% from Nowshera 9% from Islamabad/Punjab, 6% from Mardan and 4% from Afghanistan.

iv. Of those who originated from Peshawar, the destination of 36% was FATA/FANA, about 18% Charsadda, about 16% Islamabad/Punjab, 12% Nowshera, 8% Mardan and about 5% Afghanistan.

Average Daily Traffic on National Highways (2021)

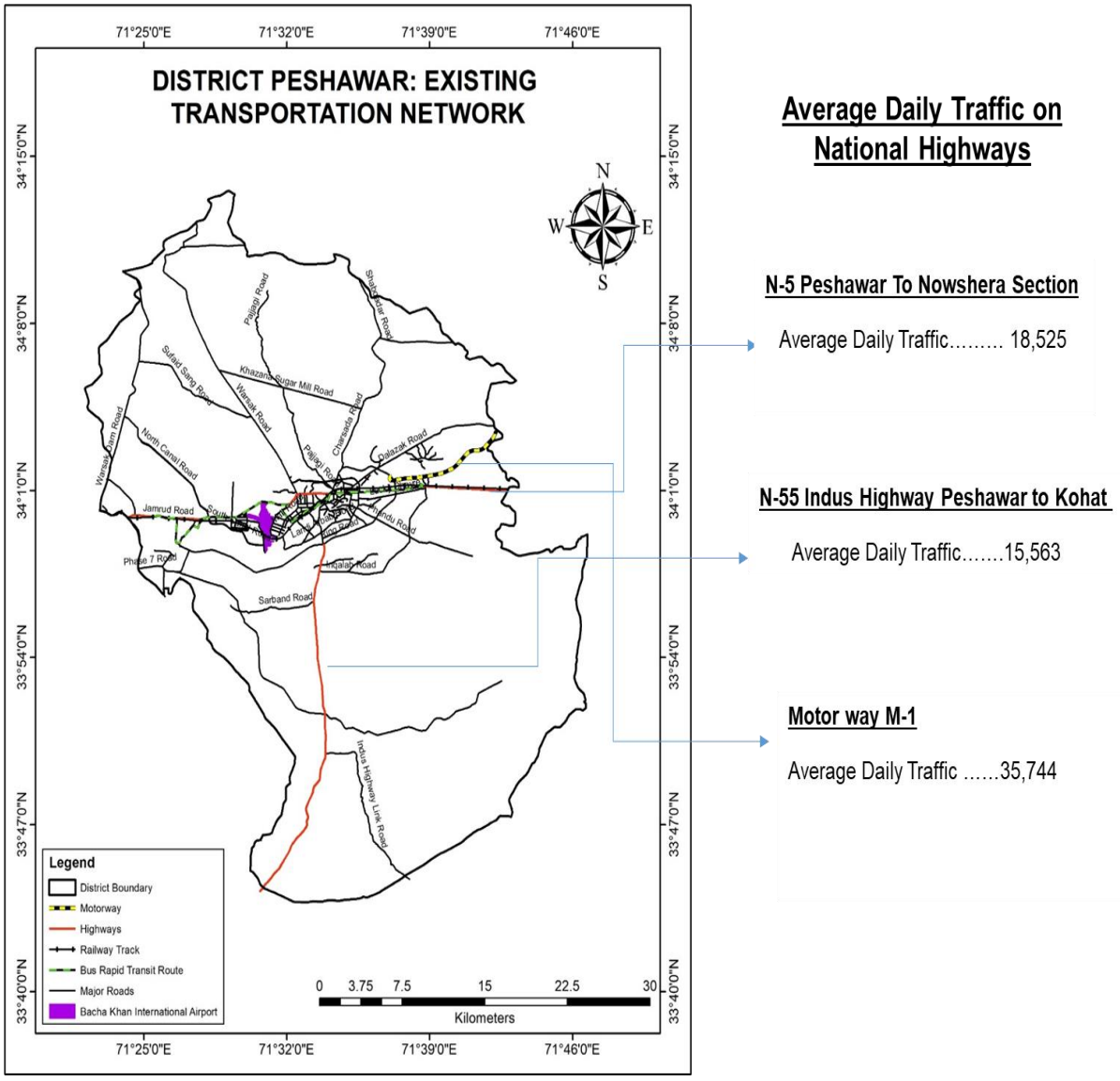
The above-mentioned traffic volume data is the origin destination survey conducted by provincial Land use Plan P&D department. While the data collected from National Highways authority on major national highways are mentioned below

N-5 Peshawar to Nowshera Section Average Daily Traffic…… **18,525**

N-55 Indus Highway Peshawar to Kohat Average Daily Traffic…….**15,563**

Motor way M-1 Average Daily Traffic ……**35,744**

TRANSPORT SECTOR



Average Daily Traffic on National Highways

N-5 Peshawar To Nowshera Section

Average Daily Traffic..... 18,525

N-55 Indus Highway Peshawar to Kohat

Average Daily Traffic.....15,563

Motor way M-1

Average Daily Traffic 35,744

Map 4. 10: Existing Transportation Network Map of District Peshawar (2021)

4.6.4.3 Air Network

Peshawar has an international airport with like other airports of the country, is maintained by Civil Aviation Authority (CAA), regulatory authority to oversees and regulate all aspects of civil aviation in the country.

Yearly around 600,000 passengers including 450,000 international and 150,748 domestic passengers use Peshawar International Airport. 10, 000 metric tons' cargo, both domestic and international was handled from Peshawar Airport.

4.6.5 ON-GOING PROGRAMS

4.6.5.1 Inner Ring Road

The existing southern ring road form GT road to Hayatabad and northern ring road from GT road to Warsak road is completed. The remaining portion of the ring road is under construction; it would form the shape of a ring around the urban area. The on-going route will reduce traffic load on GT Road, Jamrud Road, Pajjagi Road, Warsak Road, Northern Canal Road and will also provide access to all northern primary roads.

4.7 TRANSPORTATION PROPOSALS

Land use and transportation are interconnected. The main theme of urban planning is to manage spatial growth, and now we will move, around is the function of transportation planning. Development density and location influence regional travel patterns, and, in turn, the degree of access, provided by the transportation system can influence land use and development trends. Urban or community design facilitates alternative travel modes. Higher dense mixed land uses can facilitate by bicycle and public transportation, in addition to automobile. Conversely, dispersed land development patterns may facilitate and reduce viability of other travel modes.

In the plan special emphasis has been given to integrate the transportation and land use proposals for urban centers as well as the entire region. In the plan transportation proposals have been aligned with land uses as well as existing land use estimates and assumptions. This has been done to create and maintain the optimal consistency between transportation proposals and proposed land use growth and economic development patterns. Most innovative approaches have been adopted for better integration of land use and transportation proposals. The main approaches include Context Sensitive Solution (CSS) and Transit Oriented Development (TOD).

CSS is an approach that considers the total context within which transportation improvement project exists. It considers the interactions between transportation systems and facilities, and tailors them to local area, human and natural requirements. The goal is to develop the solutions that are acceptable to a variety of parties, relevant to their needs and perspectives – consistent with the "context" of the physical setting.

TOD is compact mixed Land Use development near transit facilities and high-quality walking environments, typically leveraging transit infrastructure to promote socio-economic development. By enhancing attractiveness and serviceability of transportation alternatives,

TOD boosts ridership and reduces traffic congestion, while creating sense of community and place.

Following transportation proposals/ projects are based on the estimates for population, traffic volume, Land Use development, road network capacity, and economic activity.

4.7.1 Completion and Improvement of Inner Ring road

The existing Ring Road should be completed, which would reduce the traffic load on the other major roads.

Provision of Infrastructure for Non-Motorized Transport

The provision of infrastructure only to motorized mode of transport will not solve the issue, there is alike need to include the provision of facilities for non-motorized travel demand e.g. sidewalks, pedestrian bridges, under passages and bicycle lanes, etc. However, these facilities are always susceptible to encroachments; therefore, strict enforcement should be made in order to discourage parking of vehicles and use of these areas for commercial activities. Specially the school going children are suffering badly as they have to cross busy roads during peak hours. Pedestrian bridges may be developed especially in commercial areas and in areas where there are schools. Commercial areas and community places should be pedestrianized.

Appropriate pedestrian phase in signal or installation of push buttons in pedestrian demand areas can be helpful to enhance pedestrians' safety while assisting older, female and people travelling for medical treatment. It is also important to educate general public on the use of traffic related signs, signals, and other markings etc.

The appropriate places for such interventions are.

Warsak road

Saddar Bazar

Shuba Bazar

Dabgri

Khyber Bazar

Ashraf Road

University Campus

4.7.2 Intermediate Ring Road

This road is proposed from the junction of Sarband Road and Bara Road, crossing Indus Highway then joining Inqilab Road and terminating at GT Road, near Chamkani Motorway Interchange. This will also relieve the traffic on primary roads particularly Jamrud Road and GT Road, where the traffic flows have nearly become unstable as already stated.

Peshawar is connected with southern parts of the country through Indus Highway (N–55) and through south eastern side through National Highway (N–5) both terminating at Karachi.

With city's development, it is important to develop road infrastructure to provide direct access to freight and passenger vehicles from National Highway N–5, Motorway M–1 to Indus Highway N–55 bypassing Peshawar city completely.

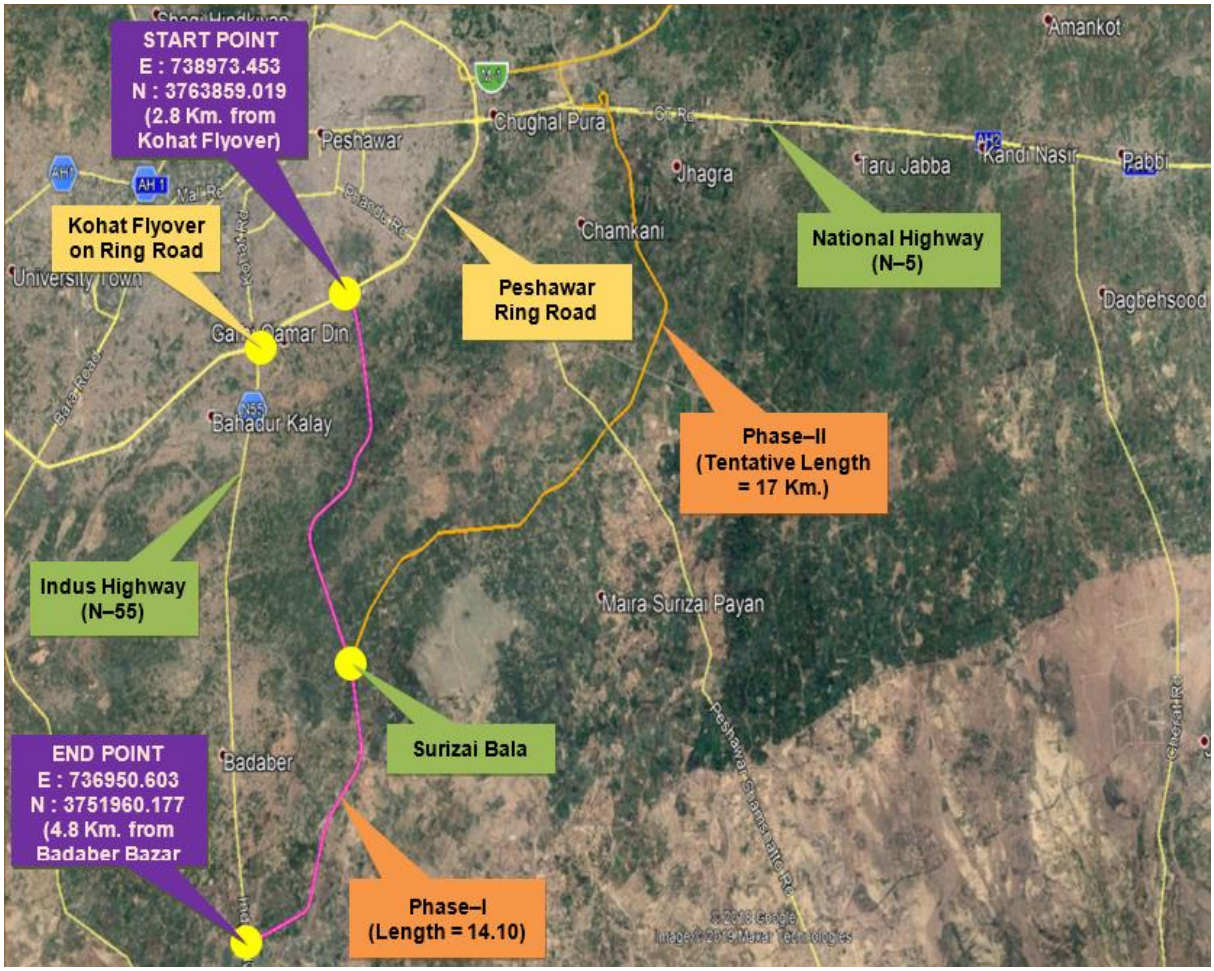
Initial section of Indus Highway (N–55) mostly remained jam in peak hours causing great inconvenience to commuters and locals.

A new road facility to bypass Peshawar City Centre starting from Chamkani on G.T. Road to Indus Highway N–55 terminating beyond Badaber Town (towards Kohat) alongwith Link Road to Peshawar Southern Ring Road at Hazar Khawani.

The project can be executed in two different phases

Phase–I : Peshawar Ring Road to Badaber via Surizai

Phase–II : Surizai to G.T. Road at Chamkani



4.7.3 Express Outer Ring Road

For the planned growth of Peshawar city an inet ring road is essentially required. The semicircular outer ring road will have planned development in the southern part of the city that will pull the growth in the desire directions. It is obvious that new roads lead to development. The proposed outer ring road will induce urban expansion towards South which is the desired direction as already elaborated in earlier sections. There is no continuation of outer ring road towards North where urban expansion is proposed to be discouraged for reasons already explained. Outer ring road is proposed to take off from GT Road beyond

Karkhanu Market, joining Hayatabad-Bara road, crossing Bara River, Sarband Road, Indus Highway, Phandu Road and terminating at GT Road near Kala Mandi.

In future, the proposed outer ring road will experience higher flows of traffic because of expansion of the City. It will thus be essential to keep higher design speed on this road for attracting through trips from radial links. However, safety measures should be taken by introducing service roads where possible and particular attention should be given to points where minor roads intersect outer radial roads. Besides, direct frontage access should be restricted on outer ring road, and all connections should be through service roads.

4.7.4 Improvement/ up-gradation of Inter-City Radial Roads:

To avoid traffic problems on primary roads as a part from decentralization, it can be eased by improving the existing radial roads from the city center towards the outer edges of the city. These include the following roads:

i. Warsak Road
ii. Charsadda Road
iii. Bara Road
iv. Kohat Road
v. Hazarkhwani Road
vi. Dalazak Road
vii. Nasir Bagh Road

The critical junctions coming across the major roads may be considered for possible flyovers/under passes after proper feasibility study, to make the traffic flow smooth.

The above roads have low traffic capacity and need to be widened and kept free from all types of permanent and mobile encroachments.

4.7.5 Construction of Modular Roads

In the Land Use Plan, it has been proposed to create a mesh of new roads in open areas adjacent to the built-up area, particularly towards south, South-East and south-west of the urban area. The proposed roads are based on existing road network and traffic conditions as discussed in upper section. These roads run in the East-West as well as North-South directions, in such a way that each space or module surrounded by these roads has an average area of roughly 4 square km or around 1600 acres. This incremental spatial development will accommodate the future need of the city in planned manner.

Sufficient infrastructure is required to encourage high density development in the new proposed areas identified for future development will reduce the demand of new land currently under agriculture and related land use and the city managers will be able to secure the food basket for the area. The 4 square km module as described above will be bounded by roads having 160 ft right of way. A module will accommodate an average of 75,000 people or around 10,000 houses (@desired 6 persons per house).

4.7.6 Shifting of Traffic-Generating Land Uses

The major traffic generating activities in the inner-City areas, i.e. wholesale commercial activities, administrative areas, and higher-level educational institutions etc. may be gradually

shifted to suitable locations as proposed in the Land use plan. But shifting is a slow and difficult process, and can only be done with consent of all stakeholders.

As an example, the main problem on Warsak road is the traffic generated by the cluster of educational institutes. There is a massive congestion in the peak hours that is why these institutes need to be relocated.

4.7.7 Development of a New International Airport

Bacha Khan International Airport is strategically situated in the heart of Peshawar and is now widely considered as one of Pakistan's major Airports. During the past decade, Airport facilities and infrastructure has reasonably enhanced and upgraded but to continuous increase both passenger and cargo services, the existing airport is unable to increase air traffic. The airport is served by a number of local and foreign airlines, and has a car parking capacity of 230 vehicles which is insufficient to meet the peak hour demand for car parking.

As stated in an earlier section, during year 2010-11, a total of 527,858 passengers including 408,110 international and 119,748 domestic passengers used Peshawar International Airport. In the same year, a total of 7,942 metric tons' cargo, both domestic and international was handled from Peshawar Airport. The congestion increases during Haj flights. These numbers are likely to increase in the years to come. The airport now serves many international destinations. The increasing activities at the airport and the traffic it attracts/generates (which is likely to increase substantially in future) will have many ill-effects for normal flow of traffic in Peshawar. Besides, present location of the airport needs to be re-considered, as it is located close to congested urban areas. In fact, its runway abuts on Jamrud Road and having built-up area all around it. The air traffic is a source of nuisance for the residents nearby. A new airport is therefore suggested over a much larger area, at a location where District Peshawar meets District Nowshera, preferably close to Pabbi and where road network (existing and proposed) adequately meets the airport's traffic and other requirements. This will be further discussed in the District Land Use Plan of Nowshera.

4.7.8 Land Use Integration with Transportation Infrastructure Planning and Policy Development

The long term transport plans and policies should be developed keeping in view the existing and future land use pattern of the city. Like if there is need of proposing a flyover at certain place and the area around it is all residential then it will become very difficult to develop a flyover there. The land use maps may be updated regularly so that better decisions can be made on their basis. There may be better integration of land use with transport policies as trip generation and attraction of particular area which will depend on its land use.

4.7.9 Inter City Connectivity

N-5 Peshawar to Nowshera Section upgraded to Expressway

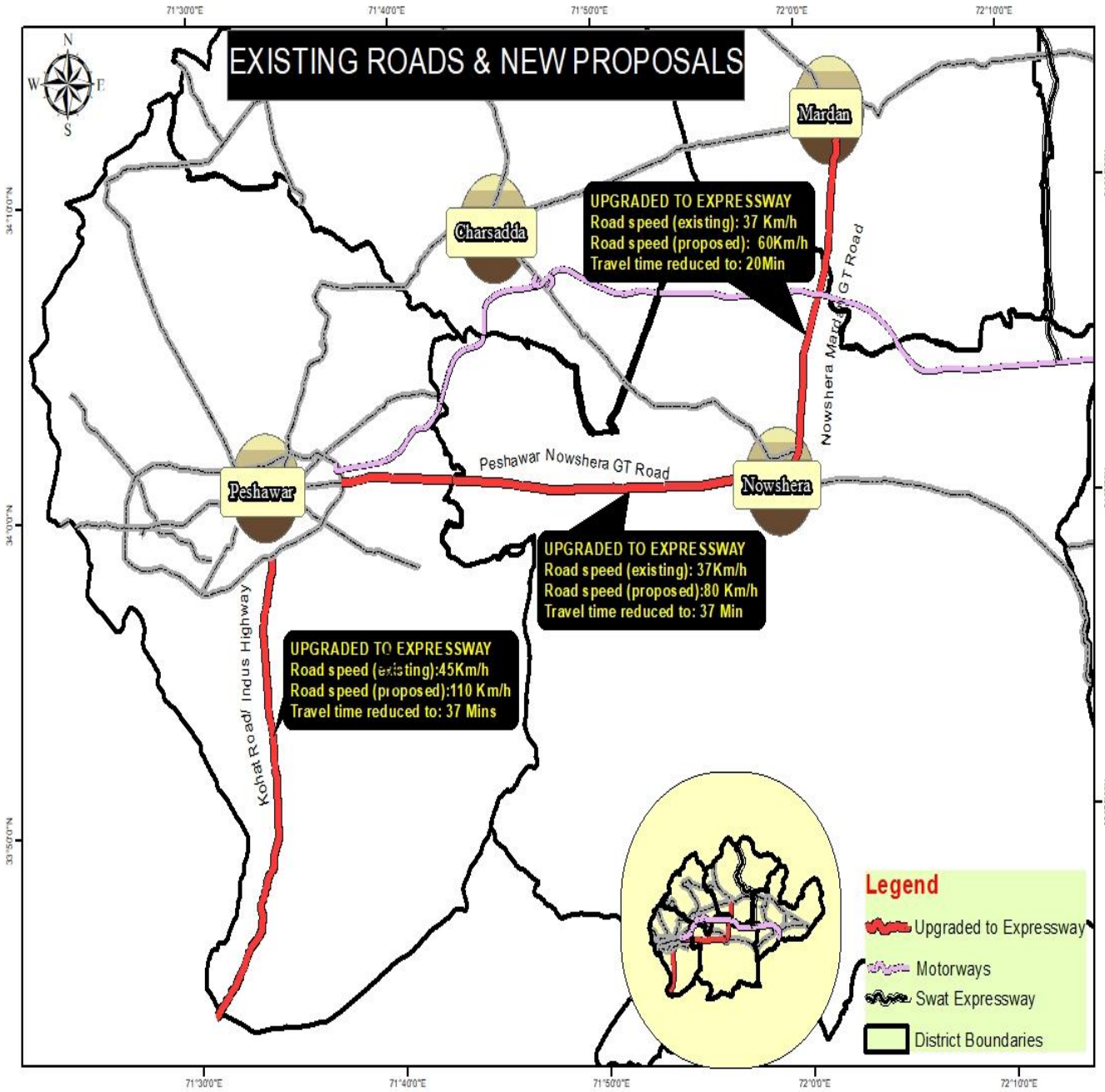
- Reduce the travel time for daily commuters
- Better accessibility for freight from Azakhel dry port to Peshawar and further to Afghanistan through Torkham.
- According to NTRC report total truck movement is 1,763 SB and 1,984 NB

N-45 Nowshera to Mardan Section upgraded to Expressway

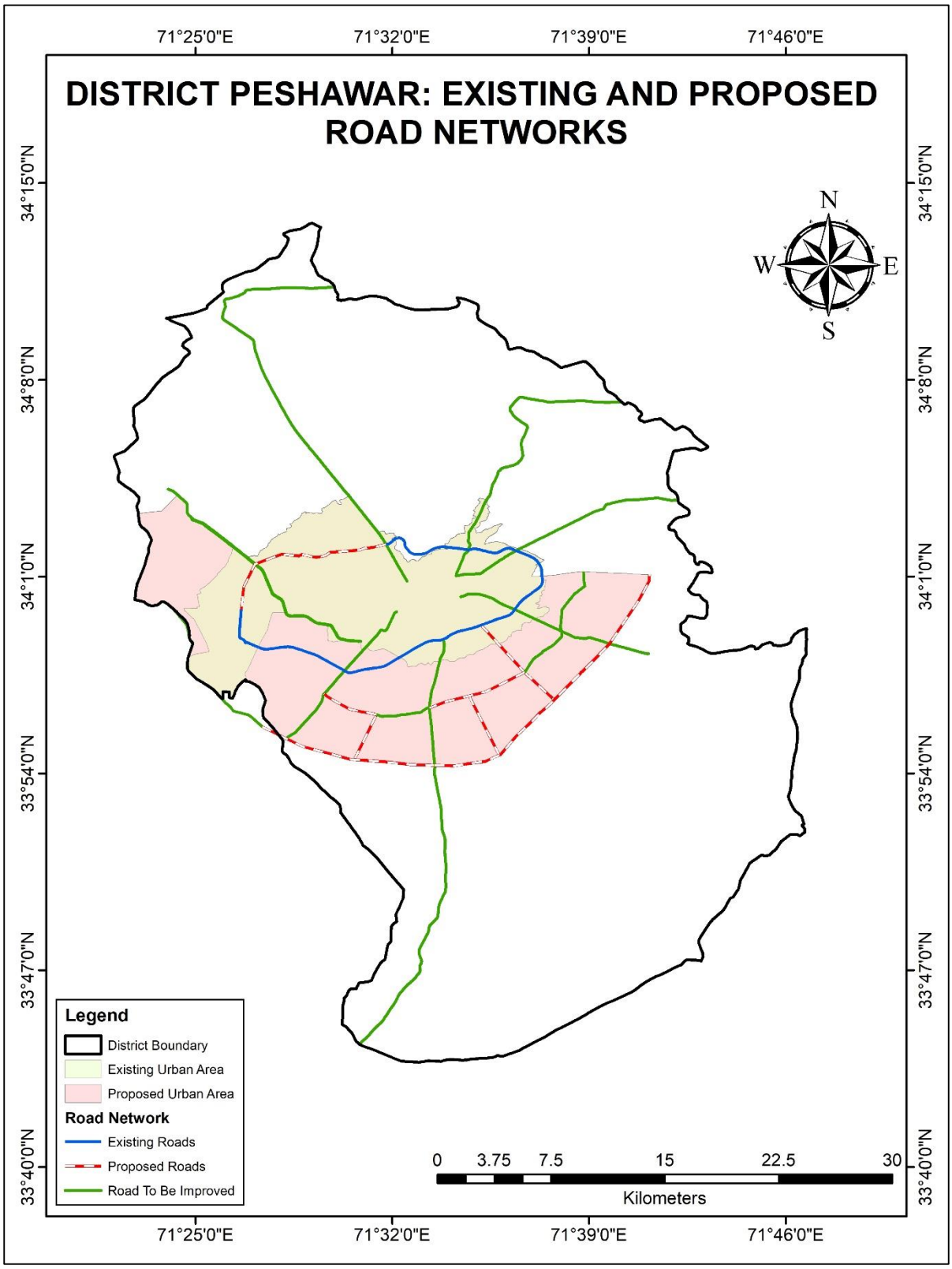
- Improve connectivity for passengers and freight between Nowshera, Risalpur and Mardan.
- Provide easy accessibility to Motorway M-1.
- Improves intercity connection

N-55 Indus Highway Peshawar to Kohat Dualization

- Improved connectivity of Southern part to Nothern part of country and further to Torkham (CAERC)



Map 4. 11: Existing Roads & New Proposails



Map 4. 12: Existing and Proposed Road Networks Map of District Peshawar

PESHAWAR SUSTAINABLE BUS RAPID TRANSIT (BRT) CORRIDOR PROJECT

The city of Peshawar, which has a population of 9.1 million, was lacking the public transport system, which increased the traffic congestion. While there was informal traffic network which included minibuses, wagons, vans, and other vehicles provide public transport. This lack of environmentally friendly public transport not only generated air and noise pollution but also safety of the public. These informal transport systems were lacking designated schedules, irregular stops and stations. The elderly people, women and children Boarding and lodging on these vehicles were very challenging. Finally, vehicles in this informal network tend to be poorly maintained, leading to inefficient fuel consumption, increased emissions, and higher operating costs.

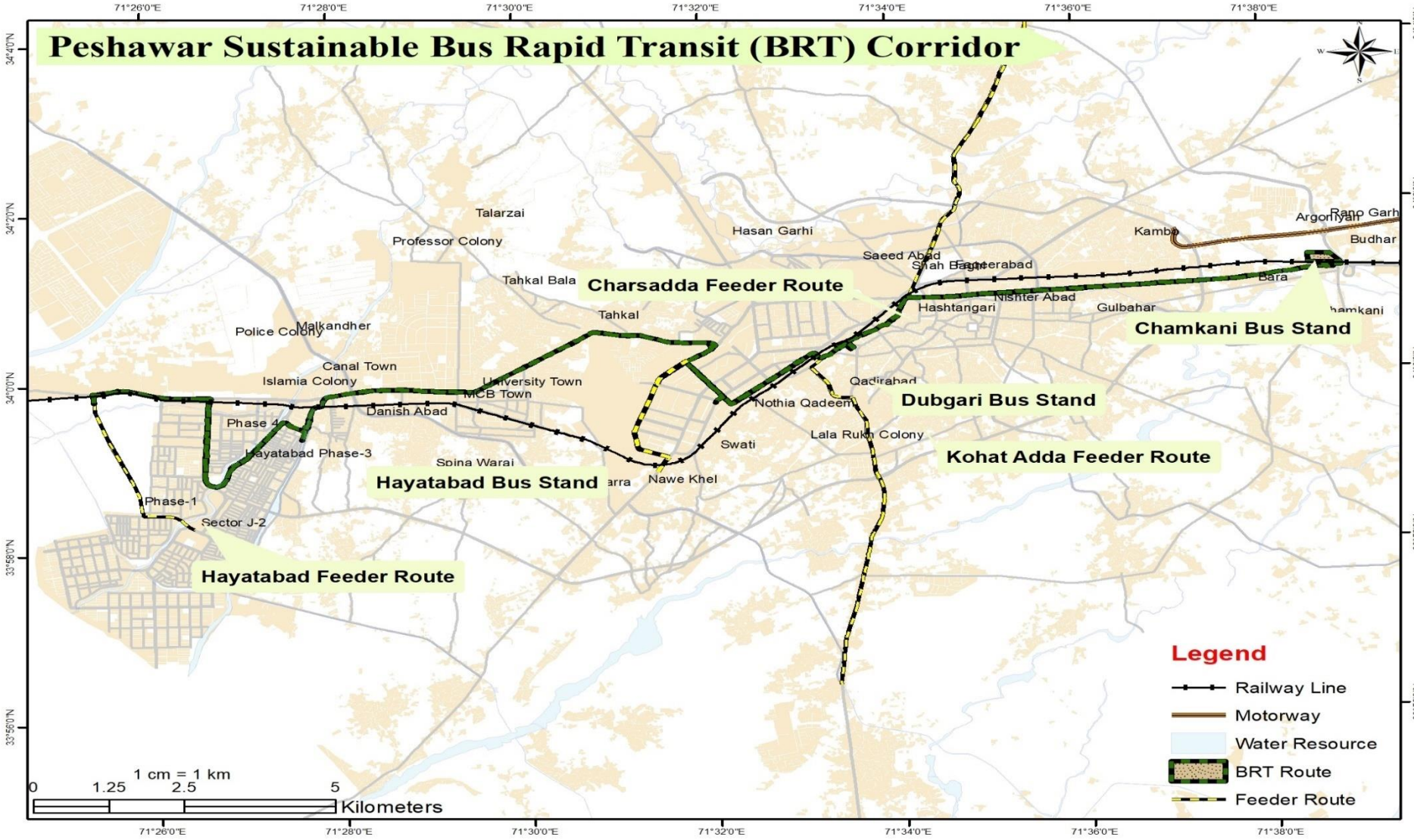
So, to meet these challenges it was proposed to have Sustainable Bus Rapid Transit (BRT) Corridor Project aims to provide high frequency service with multiple routes at district Peshawar.The project is consistent with the Government of Pakistan's Vision 2030, Framework for Economic Growth, and National Climate Change Policy. It supports the priorities set out in the Khyber Pakhtunkhwa Integrated Development Strategy 2014 & 2018, and is aligned with ADB's country partnership strategy and Sustainable Transport Initiative.

ADB supported the legislation for (a) the Khyber Pakhtunkhwa Mass Transit Ordinance, which established the Khyber Pakhtunkhwa Urban Mobility Authority (KPUMA) and was approved in September 2016; and (b) a special purpose vehicle called TransPeshawar, which was licensed in December 2016. The KPUMA is responsible for developing policies and regulations, and planning, coordinating, and funding urban transport at the provincial level. TransPeshawar owned the BRT infrastructure and assets, and is responsible for the BRT operations and management of service contracts. The BRT route map is given below

Feeder System (2022)

There are 148 buses in BRT system of Peshawar with around station and soon the 86 buses will include in the existing fleet. The current routes include the following area

BRT Express Route 01	Chamkani - Karkhano Market (27 Km)
Stopping Route 02	Chamkani - Karkhano Market (27 Km)
BRT Direct Route 03A	Dabgari Garden- Kohat Adda (5 Km)
BRT Direct Route 03B	Malik Saad Shaheed – Shah Alam Pul (9Km)
BRT Direct Route 04A	Mall Road – Pishtakhara Chowk (5 Km)
BRT Direct Route 04B	Chamkani - Malik Saad Shaheed Via Ring Road (10 Km)
BRT Direct Route 05	Mall of Hayatabad – Phase 6 Terminal (7 Km)
BRT Direct Route 06	Mall of Hayatabad – Phase 7 Terminal (8 Km)
BRT Stopping Route 08	Gulbahar Chowk – Mall of Hayatabad (15 Km)
BRT Express Route 09	Gulbahar Chowk – Phase 6 Terminal (22 Km)
BRT Express Route 10	Hospital Chowk – Kohat Adda (27 Km)



Map 4. 13: Peshawar Bus Rapid Transit (BRT) Corridor

4.7.10Commercial and Trade Centers

Peshawar is the largest city of Khyber Pakhtunkhwa, a major trade and commerce center and plays a vital role in the economy of the province. Historically Peshawar being a gateway to central Asia was a route for traders and tourists, most of the exports and imports to central Asia from the region were through Khyber Pass. In 1975, Peshawar had largest number of hotels and restaurants in the province. The city has a mix of modern and historical, traditional and culturally rich heritage even commercial sector.

At present this sector provides almost 50,000 full time jobs in addition to almost equal number of jobs in service industry, i.e., transport, sales, marketing and advertising etc. It also includes small scale trade, neighborhood shops, cottage Industry, and other sectors like transport, construction and Bara markets (consumers' goods markets of imported items located in the city and the peri-urban tribal belt along Hayatabad).

Table 4. 13: Trade and Commerce Linkages of Peshawar at International, National and Regional Levels[26]

Level	In-Coming Commodities	Out-Going Commodities
International	Pulp, grapes, apple, orange, melon, pomegranate (Kabul), vegetable seeds (USA, Japan, India & France)	Potatoes, onion, eggplant, cabbage, mango, orange [Kin], peach, pomegranate (Kabul) Tomatoes, bitter gourd (Dubai) Goats imported from Punjab and exported to Iran and Afghanistan.
National	Potatoes, tomato, turnip etc. (Punjab) banana (Sindh) Apple, pomegranate, melon (Quetta) Carrot (Lahore) Livestock (Lahore, Okara, Bahawalpur, Multan, Bhakkar, Sialkot, Sahiwal, Faisalabad, Attock, and Rawalpindi).	Grapes, apple, orange, Japan fruit (Amluk), melon, lady finger, bitter gourd, pomegranate (Punjab), gur
Regional	Potatoes, onion, cabbage, eggplant, peach, Japan fruit (Amluk), Swat peach (Peshawar) Plum (Peshawar, Mardan and Nowshera) Oranges, (Dir, Malakand, Kaka Sahib) Japan Fruit (Dir) Grapes, apple (Waziristan) Gur	---
Sub-Regional/Local	---	Mango, plum, banana, potatoes, apple, tomatoes, carrot

Some of the commercial centers of the city are centuries old, and have historic and cultural value. There is merchandise from all over central Asia here. Oriental Rugs, Afghan jewelry,

[26] http://wiki.answers.com/Q/diiference_between_commerce_trade

tribal handicrafts, wood carving, spices and all kinds of fabrics are available in this city. Due to proximity of the Pak-Afghan, some bazaars (commercial areas) are very attractive.

The level of commercial activity varies with the area. Peshawar has an inner-city area, which is enclosed within a city wall and has sixteen gates. Within the walled city small consumers' activity and some trading takes place. Karkhano Market, a famous shopping center has lot of attractions for the buyers all around the country. Bara Market, a commercial center is situated at a corner of Khyber Agency. It is a market having Pakistani as well as foreign made commodities, smuggled through Afghan Transit system. Bara is another commercial area being used for the trade of multiple items. Other famous bazaars of Peshawar are:

Table 4. 14: Trade and General Markets in District Peshawar[27]

Sr. No	Trade Markets	General Markets
1	Saddar Bazaar	Nawab Market Hayatabad Phase 6 Road
2	Board Bazaar	Aashiq Market near Jamrud Barra Link Road
3	Khyber Bazaar	Tatara Market Lalazar Avenues
4	Meena Bazaar	Umar Farooq Market Hayatabad Phase 5
5	Jewellery Bazaar	Insaf Abdali Market near Ring Road
6	Machhi Hatta	Afridi Market Hayatabad Phase 4
7	Chirvi Kobaan	Rohela Market Hayatabad Phase 3
8	Dabgari	Basharat Market Hayatabad Phase 3
9	Mochi Lara	Yousafzai Market Hayatabad Phase 3
10	Tandoor Sazan	Bakhat Khan Market Main Road Hayatabad Phase 3
11	Sarbanan	Tatara Market Lalazar Avenues
12	Feelbanan	Lalazar Market Hayatabad Phase 1
13	Chowk Abraisham Garan	Shamali Market Lalazar Avenues
14	Sarafa Bazaar	Super Market Hayatabad Phase 1
15	Misgaran	Tariq Market Hayatabad phase 2
16	Kullah Dozaan	Abu Hanifa Market Hayatabad phase 2
17	Pakhisazan	Alif Gul Market Hassan Garhi 1
18	Dandi Garan	Abdul Wahab Market Hassan Garhi 1
19	Batair Bazan	Izat Khan Market Hassan Garhi
20	--	Orakzai Plaza near Circular Lane
21	--	Defense Market Defence, Peshawar Cantt
22	--	Mall Tower in Peshawar Cantt
23	--	Arbab Road in Peshawar Cantt
24	--	Saddar Road in Peshawar Cantt
25	--	FC Plaza on Nowthia Road
26	--	Nowthia Bazar Saddar Road
27	--	Falaksher Plaza Cantt area near Gora Bazar
28	--	Muslim Plaza Sir Syed Road
29	--	Shoes Market Cantt Area
30	--	Khyber Super Market Landi Arbab Road

[27] Field Survey

Sr. No	Trade Markets	General Markets
31	--	Askari Super Market Shaheen Town
32	--	Harma Plaza Tehkal Payan(Uper)
33	--	Mustafa Market Tehkal Payan(Lower)

4.7.11Demand and Supply Analysis of Current Commercial Area

The current commercial area gap has been calculated as below:

Table 4. 15: Future Commercial Area Required (2021-40)

Urban Population (2021)	2279951
Commercial Area Required (@0.5 acres/1000 persons)[28]	1040
Current Area Under Commercial Land Use[29]	743.7
Commercial Area Deficiency	296.3

4.7.12Future Plan

Because of market forces, rapid land use conversions are taking place, particularly from residential to commercial. This is creating multifarious problems including traffic congestion, pollution, delays, inefficient energy consumption, and loss of community character. The relationship between uses such as residential, commercial, industrial, institutional, educational and recreational, and the intensity of each use, directly impacts the City's character and quality of life. Any Land Use conversion thus deserves thorough review by the concerned planning agency, whichever is relevant for a particular location.

Peshawar has few city-level planned commercial centers with adequate parking. Generally, Land Use pattern in Peshawar is mixed and commercial activities take place in many residential areas and along main roads. This trend is more pronounced in densely populated residential areas where ground floor is used for commercial purposes and subsequent floors for habitation. This is particularly true for inner areas of Peshawar.

Future Land Use policy for Peshawar should respect the fact that much of Peshawar's distinct character lies in its diversity of Land Uses, and its physical, economic and cultural characteristics. Complete segregation of Land Uses, particularly in the inner areas is neither possible nor desirable. However rampant Land Use conversions, which impede easy flow of traffic and a non-amenable living environment for the local residents must be controlled. Congestion is not the only curse of indiscriminate Land Use conversion. It also puts further pressure on the already overburdened infrastructure and public services. Commercial areas are of course part and parcel of any human habitat. Planned commercialization itself is not bad; it is the indiscriminate conversion of Land Uses which should be controlled.

[28] Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 307, Table 10.4 (Adapted).

[29] Base Map

Commercial activities of higher order like wholesale markets and trade centers are presently fragmented, located in different parts of the City. A separate, properly planned Trade Zone for Peshawar will maximize the aggregate convenience of traders and the inhabitants. It is important to realize that a goal for Peshawar's development includes accepting a larger share of Khyber Pakhtunkhwa's commercial and industrial growth. By providing such a Centre, the present Central Business District of Peshawar and the inner city can be decongested, and the residents can avoid areas of traffic clogging.

Table 4. 16: Future Commercial Area Required (2021-40)

Year/Period	Urban Population[30]	Commercial Area Required (@0.5 acres/1000 persons)[31]
2021	2303528	
2025	2693766	
2040	4844328	
Additional Urban Population (2021-2025)	390238	195
Additional Urban Population (2026-2040)	2150562	1075
Total Additional Urban Population (2021-2040)	2540800	1270

Future Commercial Area Requirement

The proposed Trade Zone will cater for all kinds of clientele, and attract regional, city and local trade. It will include wholesale markets which are usually associated with bulk disposal of grains, fruits, vegetables, meats, and will also have large warehousing and storage facilities. The future commercial area requirements are given in Table 5.14.

It is clear from the above that by the end of plan period, the total commercial area requirement would include 296.3 acres to meet the current deficiency, and 1142 Acres[32] to meet the future requirement. The total would be thus 296.3+1142 = 1438.3 acres.

4.7.13Proposed Commercialization of Arterial Roads

In District Peshawar the maximum permitted height of commercial building is 80' in the town centers, while up to know no town center is declared in the city. As the potential growth direction of the city is toward the southern side, the existing ring road will become a hub for commercial activities in the future. A 250 feet wide strip along the existing southern ring road from Achni (Hayatabad Bridge) to G.T Road (Pir-Zakori bridge) covering an area of 3.6 sq. km shall be declared as commercial road having the permitted height up to 120'.

Along the proposed commercial road, the existing GT Road will also be declared as commercial road with a permitted height of 80'. The commercial area would consist 200 feet area on both side of the road.

[30] Urban Population of the District in 2021 projected for the respective years using 1998-2017 urban growth rate of 3.99%.

[31] Source: Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 307, Table 10.4 (Adapted)

[32] Chapter 5, Table 5-13 of this Report

Mix land use will be encouraged in the declared zone with the most prominent features of offices, showrooms, malls, apartments, flats, public buildings, impulse shop, convenient shops and demand shops.

4.7.14Constraints

In District Peshawar there is a great potential to enhance district's income manifold by allocating more land and financial resources to local business and trade to meet local demands and develop export-oriented production in Khyber Pakhtunkhwa.

The District Peshawar would have to depend more heavily on safety and security of people and assets for the desired rapid commercial growth. Businesses and commerce shall be evolved and developed like the other developed countries. To this end the skill improvement, and increase in efficiency with which new processes are adopted. To this end the flow of information, better infrastructure, availability of funds and quality inputs, and investor/entrepreneurs' managerial capabilities shall be streamlined. Empirical evidence shows that suitable commercial, financial, economic and trade policies directly influence the productivity and economic growth.

Some of the major constraint to sustainable development of commerce and trade are listed below:

i. Lack of properly planned and developed land
ii. Threat due to terrorism and absence of emergency disaster response, like firefighting, and emergency exits, as such many lives assets and property have been damaged during recent terrorists' attacks.
iii. Large fluctuation in prices and rates of products and services
iv. Frequent power outages
v. Uncontrolled inflation
vi. No standardization for specifications of products
vii. Lack of quality standards
viii. Lack of adequate and proper car parking area
ix. Absence of loading and unloading bays
x. Lack of solid and liquid waste disposal.
xi. Life threatening mix of petrol pumps, CNG stations, hotels, restaurants and motels
xii. Mixed and conflicting land use of education, health, residential small industry and commercial land use.
xiii. Absence of basic facilities for the customers like toilets, rest areas, lockers etc.
xiv. Lack of firefighting safety and security system
xv. Mix of hazardous and nonhazardous commercial uses.

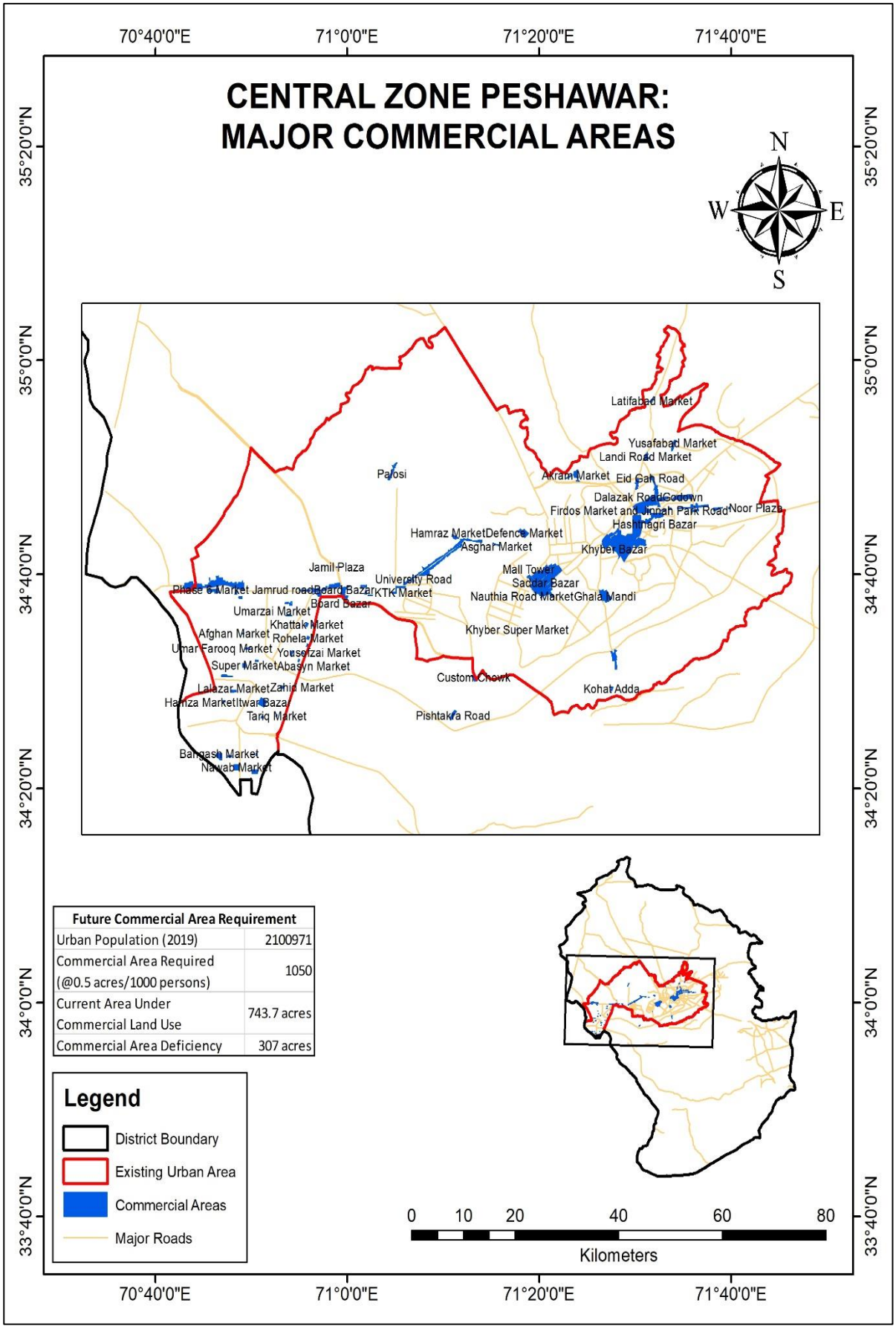
4.7.15Recommendations

It is recommended that the provincial government should formulate policies to encourage private sector investors to strengthen the trade and commerce sector. To this end the provincial and local government may adopt following:

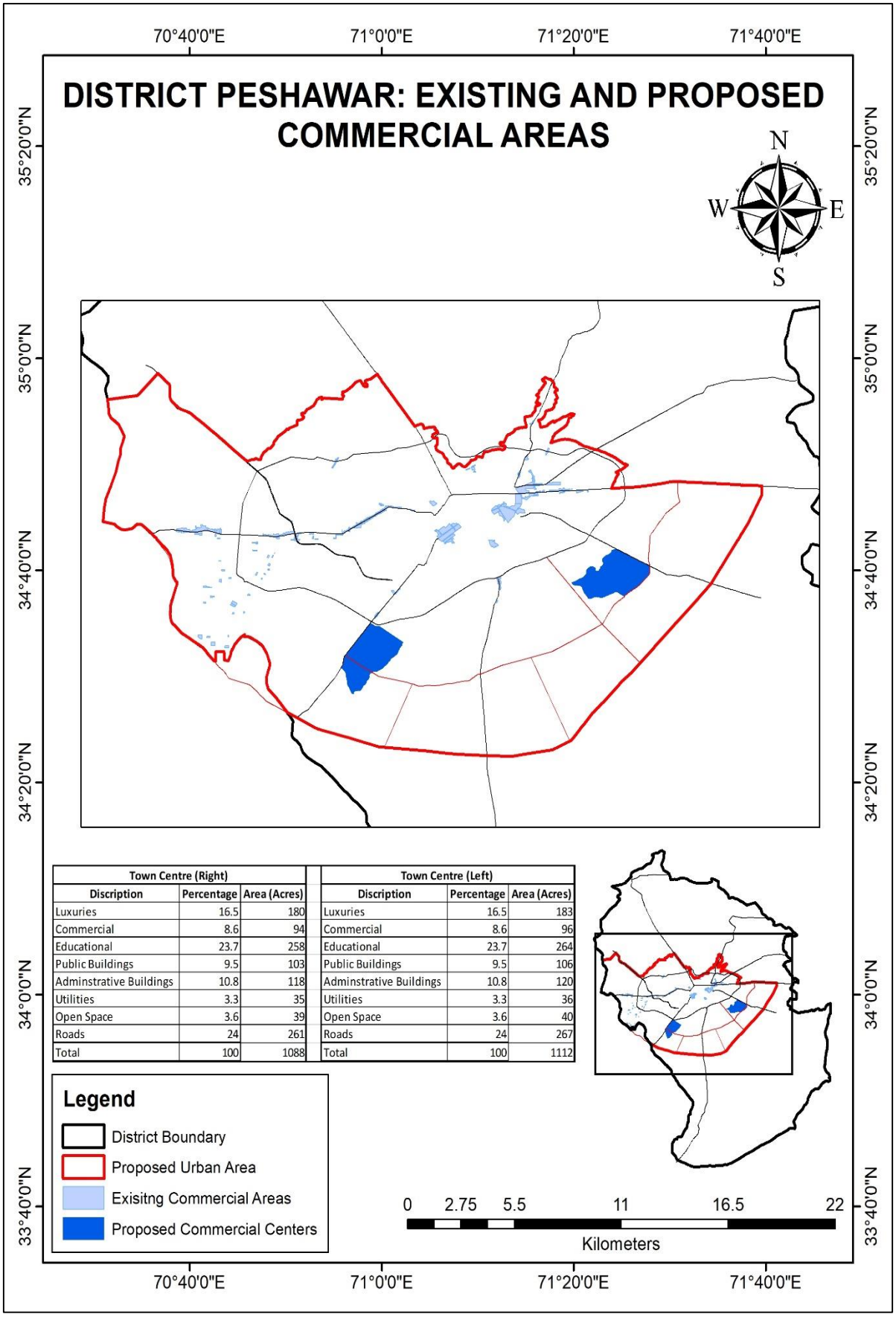
- **Availability of infrastructure**
  - Transportation network
  - Water supply and drainage
  - Solid waste collection and disposal
  - Electricity
  - Communication links
- **Availability of developed and secured land**
  - Properly zoned for different types of trade and commerce by size and type
  - Security and peaceful environment
- **Upgrade Quality of Human resources**
  - Skilled
  - Unskilled
  - Managerial
- **Capital – on easy terms; availability of finances for**
  - Initial capital for investment
  - Running capital
- **Environmental Issues**
  - Mitigation of pollutants
  - Air pollution – Gaseous emission
  - Waste Water
  - Noise
  - Solid waste
  - Odors
  - Aesthetics
  - Effective disposal of recyclables, and other wastes

- **Social environment,**
  - Availability of
    - Schools,
    - Commercial areas & markets, both for workers & for the products
    - Housing

- Congregation/Religious places mosques, etc.
- Community facilities
- Hospitals, clinics
- Entertainment areas in close vicinity to the industrial area
- Open spaces parks and play grounds
- Efficient transport system



Map 4. 14: Major Commercial Areas Map of District Peshawar



Town Centre (Right)		
Discription	Percentage	Area (Acres)
Luxuries	16.5	180
Commercial	8.6	94
Educational	23.7	258
Public Buildings	9.5	103
Adminstrative Buildings	10.8	118
Utilities	3.3	35
Open Space	3.6	39
Roads	24	261
Total	100	1088

Town Centre (Left)		
Discription	Percentage	Area (Acres)
Luxuries	16.5	183
Commercial	8.6	96
Educational	23.7	264
Public Buildings	9.5	106
Adminstrative Buildings	10.8	120
Utilities	3.3	36
Open Space	3.6	40
Roads	24	267
Total	100	1112

Map 4. 15: Existing and Proposed Commercial Areas Map of District Peshawar

4.8 EDUCATION SECTOR

Vertical hierarchy is a basic feature in the delivery of formal education. It may be visualized as a pyramid, its base comprising of many hundreds of primary schools, while at the top may be a few universities providing specialized education to much lesser number of post graduate students. Specialized institutions such as universities are virtually limited to metropolitan cities. According to National Reference Manual for Planning & Infrastructure Standards[33], a unit at each level is fed by a catchment comprising 3-7 facilities of the next lower level. The next lower level in case of universities is Degree Colleges, which presently are 24 in District Peshawar, with a requirement of another 14 over the next 20 years, as would be seen in the section below. Thus, for these 38-degree colleges (present and future), as per criteria described above, 3-4 universities are required. Peshawar already has 17 universities, seven in public sector and ten in private sector. But these are justified as Peshawar is the capital city, and its area of influence is the entire province, and not just District Peshawar.

4.8.1 Spatial Distribution Educational Facilities[34]

The total number of government primary school in District Peshawar is 1196 with 287891 enrolled students. The number of teachers is 6549 with student to teacher ratio of 43.95. While the number of government middle schools is 179. The total number of students in middle schools is 74658 with 978 teachers and with student/teacher ratio of 76.34. The details of number of private schools are given in the table 4.17.

The number of government high and high secondary school is 156 and 50. Total number of enrolled students is 32483 and 8172 with 2395 and 1791 teachers and with student/teacher ratio of 13.56 and 4.56. Enrollment of private students and their ratio to teachers are given in the table 4.19.

Table 4. 17: Educational Institutes in District Peshawar (2018-2019)[35]

Institutions	Number			
	Total	Male	Female	Private[36]
Primary	1196	673	523	304
Middle	179	91	88	520
High	156	88	68	496
Higher Secondary	50	32	18	113
Universities	41	27		14

[33] Source: Environment and Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Section 6.1.2, Page 102.

[34] Source: Development statistic of Khyber Pakhtunkhwa, page 101-107, District wise number of primary, middle, high, high secondary schools and colleges.

[35] Source: Development statistic of Khyber Pakhtunkhwa-2020

[36] PSRA

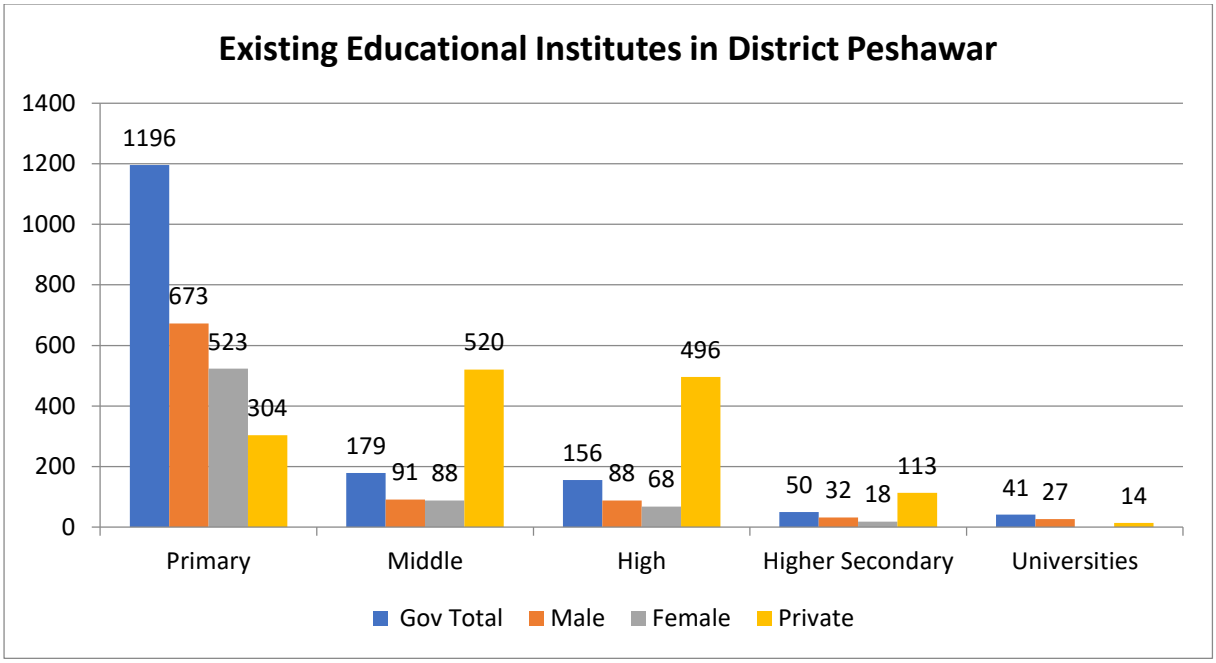


Figure 4. 1 Educational Institutes in District Peshawar

Table 4. 18: Govt Schools Teacher-Student Ratio in District Peshawar (2018-2019)[37]

Institutions	Students			Teachers			Teacher-Student Ratio
	Total	Male	Female	Total	Male	Female	Govt
Primary	287,891	150,678	137,213	6,549	3,784	2,765	44
Middle	74,658	43927	30731	978	501	477	76.43
High	32,483	19112	13371	2,395	1,347	1048	13.56
Higher Secondary	8,172	4526	3,646	1,791	1084	707	4.56

Table 4. 19: Private Schools Teacher-Student Ratio in District Peshawar (2021)[38]

Institutions	Private		
	Students	Teachers	Student- Teacher Ratio
Primary	46991	2401	19.6
Middle	114771	5313	21.6
High	219321	9557	22.9
Higher Secondary	59451	2721	21.8

[37] Source: Development statistic of Khyber Pakhtunkhwa-2020
[38] Source: PSRA

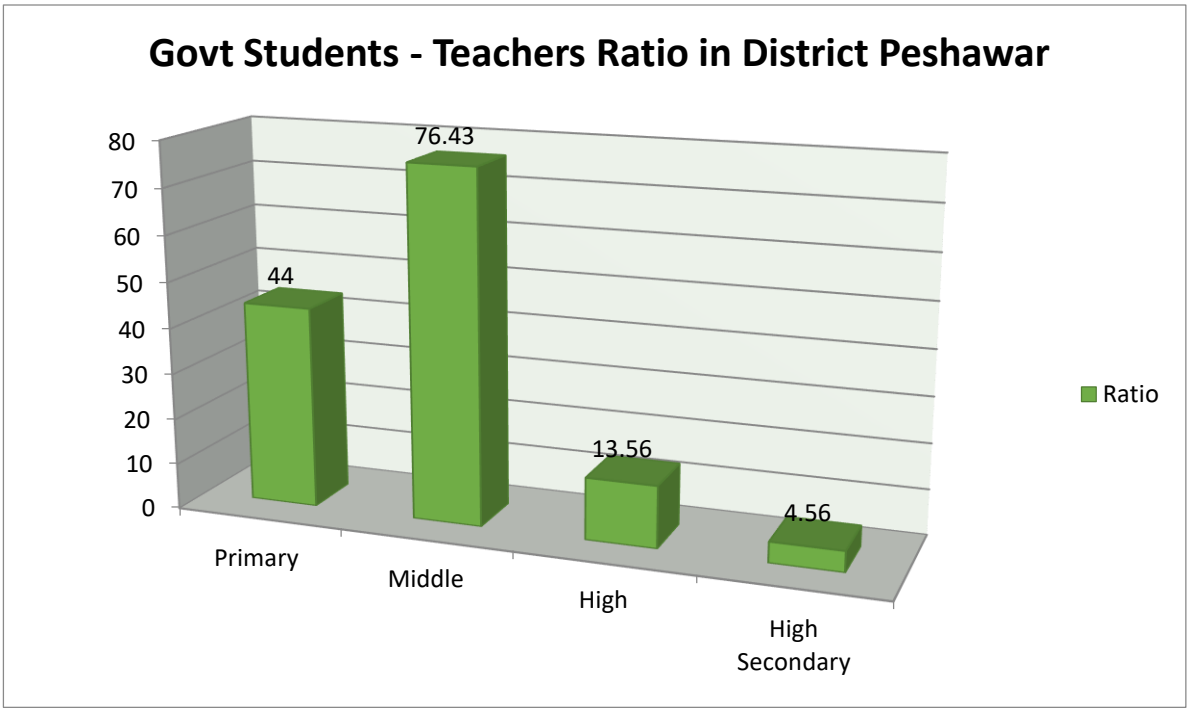


Figure 4. 2 Govt Students-Teachers Ratio in District Peshawar

4.8.2 Literacy Ratio

A person was treated as literate in 1998 Census if he could read newspaper or a journal of the same standard and could write a simple letter in any language. The literacy is measured as the ratio, in percentage, of literate population to corresponding population aged 10 years and over. The literacy ratio in Peshawar District has increased from 41.79 percent in 1998 and 52 percent in 2017. The literacy ratio for males in 2017 was 66 percent, as against 38 percent for females. The ratio is much higher in urban areas when compared with rural areas, both for males and females. Table 4.18 shows literacy ratio for District Peshawar by rural and urban areas for the years of 1998 and 2016-2017.

Table 4. 20: Literacy Ratio[39]

Area	1998			2016-2017		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Overall District	41.79%	55.97%	25.85%	52%	66%	38%

[39] Source: Development statistic of Khyber Pakhtunkhwa-2020

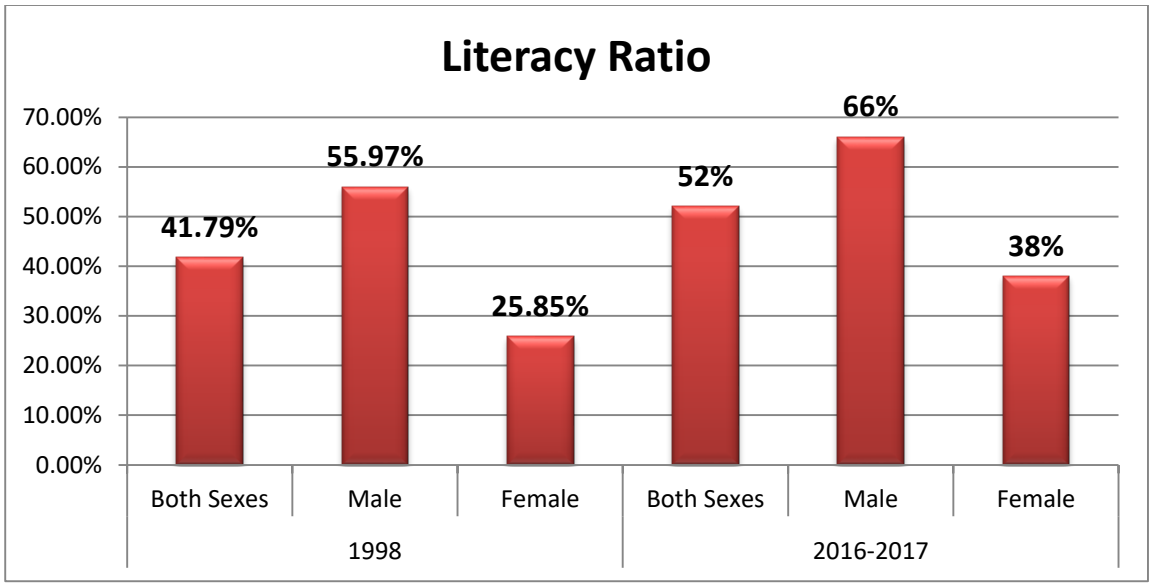


Figure 4. 3 Literacy Ratio in District Peshawar (2017)

4.8.3 Participation Rates

Participation Rate is defined as the total enrolment, divided by the population of the age-group, which corresponds to a specific level of education. Participation rate is calculated by only that part of the enrolment which corresponds to the age-group of the level considered. The age-group of the population eligible for primary stage education is 5-9 years.

At primary level, the participation rate in District Peshawar for both sexes is around 42 (41 for males and 42 for females). At middle and high level the participation rates in the same order are around 18, 20 and 16 as shown in the Table 4-20.

Table 4. 21: Participation Rates in the District (2018-2019)[40]

Schools	Total	Male	Female
Primary	42	41	42
Middle and High	18	20	16

[40] Source: Development statistic of Khyber Pakhtunkhwa-2020

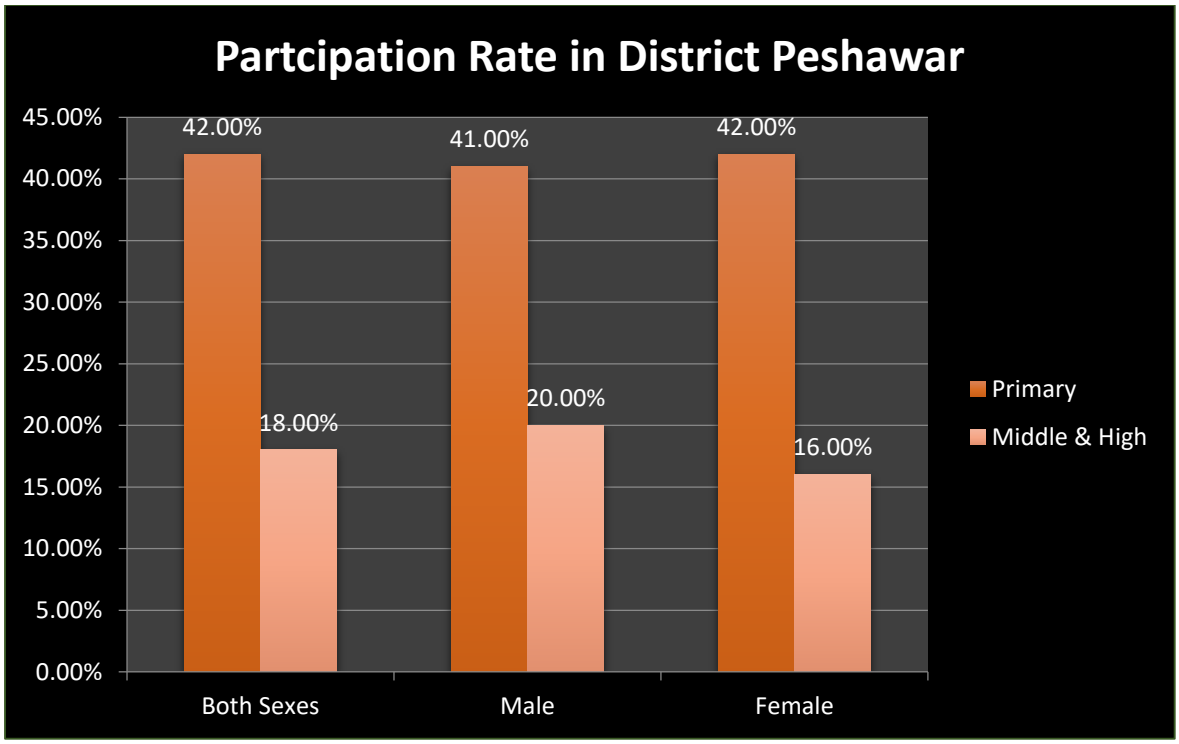


Figure 4. 4 Participation Rate in District Peshawar (2018-2019)

4.8.4 Education Sector: Short-Term Planning Proposals (2021-2025)

The location of facilities and services such as education are a function of the distribution of population within the district. It is estimated that during the short-term plan, the District Peshawar require 113 additional primary schools, 71 secondary schools and 2 college. Tables 4.20 to 4.22 below give requirements for urban as well as rural areas of District Peshawar.

It is envisaged that primary and secondary schools will form part of the residentiary use. Their location has been broadly identified in terms of corridors, but exact location and space requirements, especially for primary schools would be governed by the detailed planning and designing of the relevant areas.

Colleges are proposed to be provided with balanced distribution over the city, corresponding with the distribution of population. The sites for these institutions should be scrupulously reserved, no matter how long these may take in actually being built.

Table 4. 22: Additional Primary Schools Required in Short-Term Plan (2021-2025)

District Area	Population 2021	Population 2025	Additional Population (2021-2025)	No. of Primary Schools Required @1 PS for 7,500 pop.) [41]	Aggregate Land required (@1 acre/PS) [42]
Urban	2,279,951	2,638,612	358,661	48	48
Rural	2,713,419	3,202,491	489,072	65	65
Total	4,993,370	5,841,103	847,733	113	113

Table 4. 23: Additional Secondary Schools Required in Short-Term Plan (2021-2025)

District Area	Population 2021	Population 2025	Additional Population (2021-2025)	No. of SS Required @1 SS for 12,000pop.) [43]	Aggregate Land required (@ 4acre/SS) [44]
Urban	2,279,951	2,638,612	358,661	30	120
Rural	2,713,419	3,202,491	489,072	41	164
Total	4,993,370	5,841,103	847,733	71	284

Table 4. 24: Additional Colleges Required in Short-Term Plan (2021-2025)

District Area	Population 2021	Population 2025	Additional Population (2021-2025)	No. of Colleges Required @1 College for 4,00,000pop.) [45]	Aggregate Land required (@ 10acre/C) [46]
Urban	2,279,951	2,638,612	358,661	1	10
Rural	2,713,419	3,202,491	489,072	1	10
Total	4,993,370	5,841,103	847,733	2	10

[41] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[42] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.
[43] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[44] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.
[45] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[46] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.

4.8.5 Education Sector: Long-Term Education Planning Proposals (2026-2040)

Tables 4.24 to 4.26 provide long-term requirements (2026-2040) for primary, secondary schools and colleges in terms of numbers and space requirements.

Table 4. 25: Additional Primary Schools Required in Long-Term Plan (2026-2040)

District Area	Population 2026	Population 2040	Additional Population (2026-2040)	No. of Primary Schools Required @1 PS for 7,500 pop.) [47]	Aggregate Land required (@1 acre/PS) [48]
Urban	**2,693,766**	**4,844,328**	**2,150,562**	**287**	**287**
Rural	**3,141,699**	5649867	**2,508,168**	**334**	**334**
Total	**5,835,465**	**10,494,195**	**4,658,730**	**621**	**621**

Table 4. 26: Additional Secondary Schools Required in Long-Term Plan (2026-2040)

District Area	Population 2026	Population 2040	Additional Population (2026-2040)	No. of SS Required @1 SS for 12,000 pop.) [49]	Aggregate Land required (@4 acre/SS) [50]
Urban	**2,693,766**	**4,844,328**	**2,150,562**	**179**	**716**
Rural	**3,141,699**	**5,649,867**	**2,508,168**	**209**	**836**
Total	**5,835,465**	**10,494,195**	**4,658,730**	**388**	**1,552**

Table 4. 27: Additional Colleges Required in Long-Term Plan (2026-2040)

District Area	Population 2026	Population 2040	Additional Population (2026-2040)	No. of Colleges Required @1 college for 4,00,000 pop.) [51]	Aggregate Land required (@10 acre/C) [52]
Urban	2,693,766	4,844,328	2,150,562	5	50
Rural	3,141,699	5,649,867	2,508,168	3	30
Total	**5,835,465**	**10,494,195**	**4,658,730**	**8**	**80**

[47] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[48] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.
[49] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[50] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.
[51] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 109, Table 6.4.
[52] Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Page 110, Table 6.5.

4.8.6 Proposed Locations of Future Educational Facilities

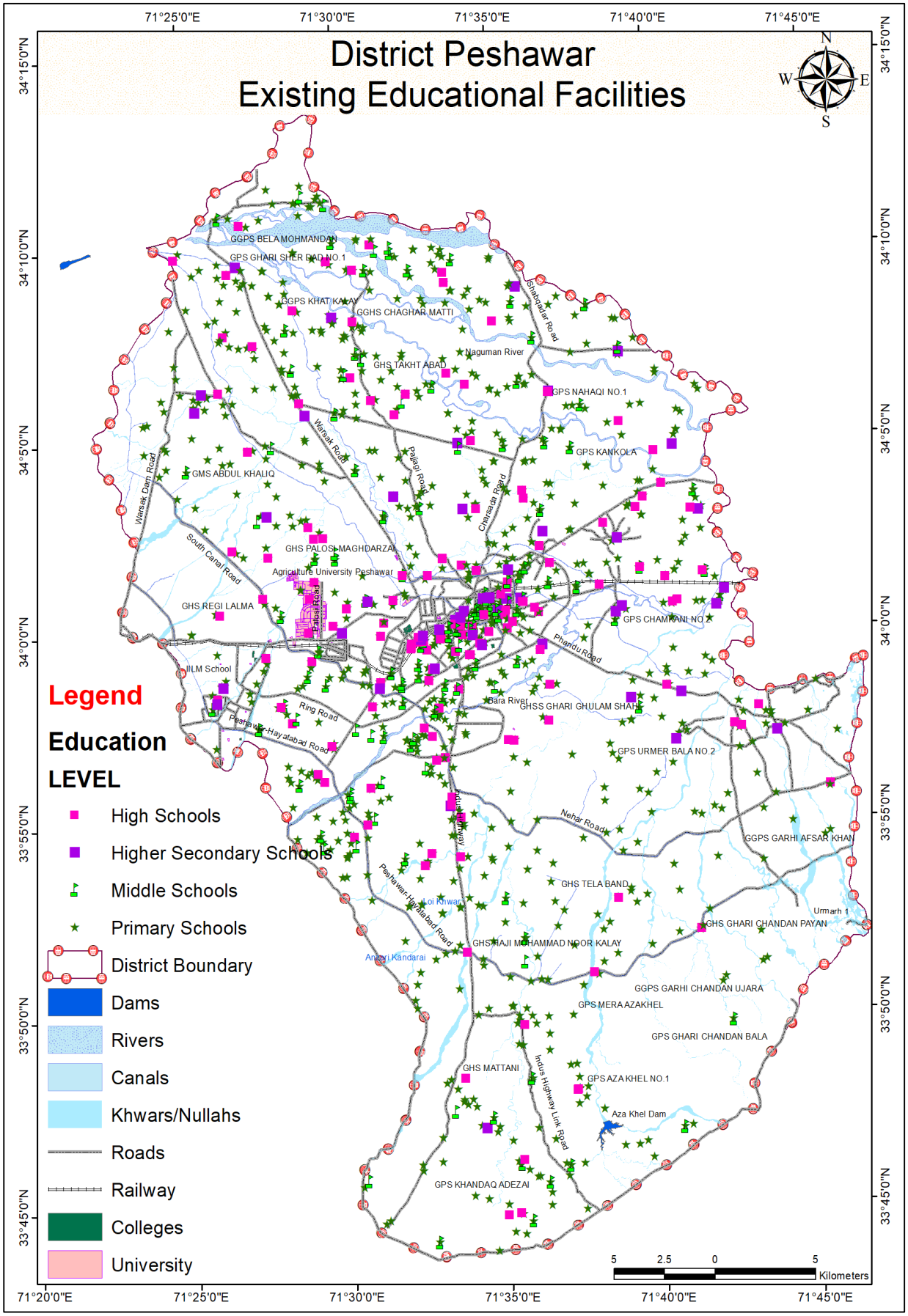
Primary schools should obviously be within existing or planned housing areas which they will be serving. These should be within easy walking distance of houses, away from the busy roads. Secondary schools should have good access by car and safe access by foot. These should not be located along busy roads carrying fast traffic. Primary and secondary schools are residentiary uses and their exact location can be marked at the detailed planning stage of proposed housing areas. Higher Educational institutions such as degree and post graduate colleges/universities may be located in the Town Centre. Besides, an Educational City is also proposed by the Provincial Government to be established along motorway in District Nowshera, which is at about 35 minutes' drive from Peshawar. The Education City will accommodate many universities and allied facilities.

Following are the proposed guide lines for location of educational institutions:

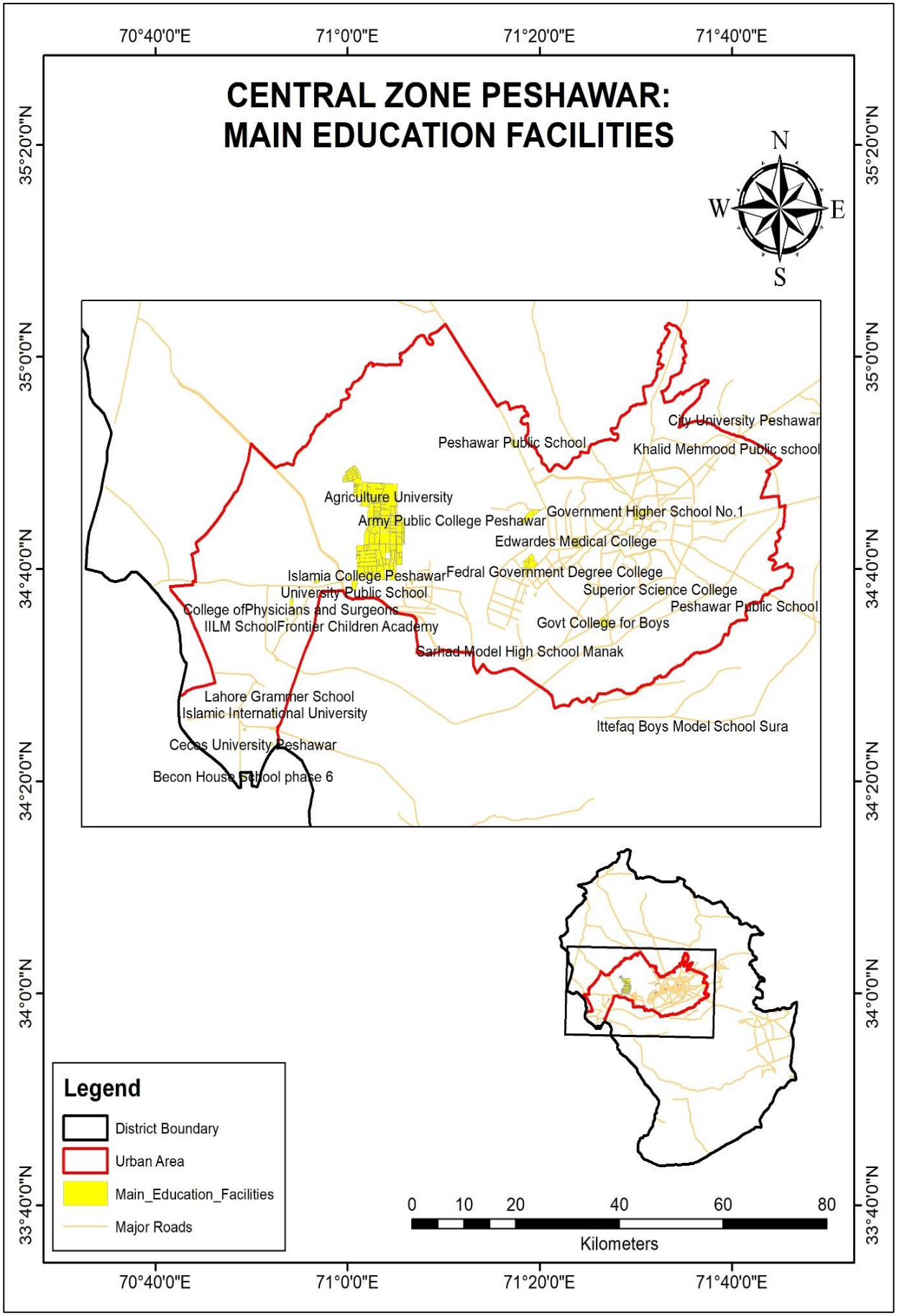
Table 4. 28: Locational Guidelines for Educational Institutions[53]

Sr. No	Educational Institutions	Locational Guidelines
1	Primary School	• Close to existing or planned housing areas which they will be serving. • Within easy walking distance of houses. • Generally located centrally in a residential mohalla, away from the busy roads. • Catchment area for urban schools: 0.5-1 km. • Catchment area for rural schools: 2.2 kms.
2	Secondary School	• Should have good vehicular access and safe access by foot. • Away from schools of opposite gender. • Away from major busy roads carrying fast traffic. • Be located on roads with good linkages to their catchment area. • Catchment area for urban schools: 1.25-2.45 km. • Catchment area for rural schools: 5-10 kms.
3	Inter College	• Catchment area for urban Schools-Boys: 2.75-4 km. • Catchment area for rural Schools-Boys: 10-15 kms. • Catchment area for urban schools-Girls: 3.25-5 km
4	Degree College	Large city.
5	University	Metropolitan City surroundings.

[53] Source: Environment & Urban Affairs Division, Govt. of Pakistan, from National Reference Manual on Planning & Infrastructure Standards, Chapter 6, Section 6.1 (adapted).



Map 4. 16: Existing Educational Facilities Map of District Peshawar



Map 4. 17: Main Educational Facilities Maps of District Peshawar

4.9 HEALTH SECTOR

4.9.1 Health Facilities in District Peshawar

A health institution is defined as an institution which provides health services, curative and preventive to all specific classes of the public as outdoor/indoor patients. There is a hierarchy of health institutions as defined below:

Table 4. 29: Existing Health Institutes in District Peshawar VS Khyber Pakhtunkhwa[54]

District/Tehsil	Hospitals		RHCs		Dispensaries		BHUs	T.B Clinics		Others	Private	
	No.	Beds	No.	Beds	No.	Beds	No.	No.	Beds	No.	No.	Beds
Peshawar District	22	5292	4	62	45	0	54	5	52	5	30	728
Khyber Pakhtunkhwa	196	20385	125	1802	973	12	943	73	52	200	75	1275

4.9.2 Major Disease in Last Two Years

Coronavirus or COVID19: The coronavirus or COVID19 pandemic is an ongoing pandemic caused by severe acute respiratory syndrome. The first case of corona was identified in early December, 2019 in Wuhan province of China. The WHO declared public emergency on 30th January, 2020 and later a pandemic on 11th March 2020. At present (April 8, 2021), more than 132 million cases and 2.88 million deaths have been confirmed due to COVID19 making it one of the deadliest pandemics in history[55].

The common symptoms of COVID19 includes dry cough, fever, tiredness, aches and pains, sore throat, headache, loss of taste, and diarrhea and serious symptoms include difficulty in breathing, chest pain, and loss of speech or movement. The precautionary measures required for preventing one from getting exposed to COVID19 includes: use of face mask, wash hands frequently for 20 seconds etc[56].

First case of COVID19 was registered in Pakistan on 26th February, 2020 in Karachi. In Khyber Pakhtunkhwa, 88099 cases and 2363 deaths due to COVID19 were registered till March 31, 2021. 76640 people have recovered from COVID19 in Khyber Pakhtunkhwa. Peshawar has been severely affected by COVID19 having 36212 cases and 1258 deaths are registered till March 31st, 2021. 31323 people have recovered from COVID19 in Peshawar.[57]

Table 4. 30: Corona Cases in District Peshawar Vs Khyber Pakhtunkhwa (March, 2021)

Corona Cases in District Peshawar Vs Khyber Pakhtunkhwa (March, 2021)						
	Cases total	24hrs	Deaths total	24hrs	Recoveries	Active Cases
Kpk	88099	1044	2363	21	76640	9096
Peshawar	36212	419	1258	13	31323	3631

[54] Source: Bureau of Statistics, Planning & Development Department, Govt. of Khyber Pakhtunkhwa, Khyber Pakhtunkhwa Development Statistics, 2010, Page 142.

[55] https://en.wikipedia.org/wiki/Coronavirus

[56] https://covid.gov.pk/

[57] http://healthkp.gov.pk/public/uploads/sitrep_Sitrep%20-%202021_03_31.pdf

Dengue: In 2017 dengue epidemic spread in Peshawar, larger incidents of dengue fever were reported in Peshawar by month of August. Initially according to the health department of Khyber Pakhtunkhwa 4,320 suspected were received by Khyber Teaching Hospital Peshawar on 831 was found positive. About a dozen lives were already eaten up by dengue since by the month of July. Due to the carelessness of health authorities of Khyber Pakhtunkhwa Government, 11 effected patients had died and over 7 hundred have been affected with the disease. In 2016, the major diseases reported in public hospitals were fever, sepsis and asphyxia.

Fever, also known as pyrexia and febrile response, is defined as having a temperature above the normal range due to an increase in the body's temperature set-point. There is not a single agreed-upon upper limit for normal temperature with sources using values between 37.5 and 38.3 °C (99.5 and 100.9 °F). This is more common in young children. Fevers do not typically go higher than 41 to 42 °C (105.8 to 107.6 °F).[58]

Sepsis is a life-threatening condition that arises when the body's response to infection causes injury to its own tissues and organs. Common signs and symptoms include fever, increased heart rate, increased breathing rate, and confusion. There also may be symptoms related to a specific infection, such as a cough with pneumonia, or painful urination with a kidney infection.[59]

Asphyxia or asphyxiation is a condition of severely deficient supply of oxygen to the body that arises from abnormal breathing. An example of asphyxia is choking. Asphyxia causes generalized hypoxia, which affects primarily the tissues and organs. There are many circumstances that can induce asphyxia, all of which are characterized by an inability of an individual to acquire sufficient oxygen through breathing for an extended period of time. Asphyxia can cause coma or death.[60]

4.9.3 Constraints

The emphasis in the past has been to increase the quantity of health-related services, i.e. number of doctors, rural health centers, basic health units etc. The numbers are important, but equally important is functionality of health centers. Most of these are not as functional as they should be, because of various factors such as shortage of medicines or staff, often both.

The above factors become constraints due to the following reasons:

- The zeal to meet the numerical target has compromised the quality and type of facility provided.
- The end result has been unmanned and unsupervised health services.
- The focus has been on quantity rather than quality and performance.

[58] https://en.wikipedia.org/wiki/Fever
[59] https://en.wikipedia.org/wiki/Sepsis
[60] https://en.wikipedia.org/wiki/Asphyxia

- While facilities have been provided in many areas, the absence of medical staff allocated to those facilities has made them less effective.
- There are weaknesses in managerial, administrative, and coordinating to ensure the efficiency of health delivery mechanism.
- The private sector in health is quite strong in District Peshawar, but week in rest of the province.
- However, private sector has profit motive. There is at present no mechanism whereby the private sector can support efforts of the government in providing healthcare to those who cannot afford the higher private sector prices.

4.9.4 Recommendations and Conclusions

- Health Sector needs to be emphasized as in Land Use Plans, as it profoundly impacts the health of people who live and work there.
- There is a need to focus attention towards developing broad policies and general strategies to improve community design and building practices and reverse the negative trends related to human health.
- There needs to be a clear view of what is required to be done in key areas, and the measures to be taken to achieve the envisioned goals. The National Health Policy provides guidelines to the provinces while implementing plans in the health sector in accordance with their requirements and priorities.
- It is important to study the contribution of private sector in provision of health facilities. Of the total 172 hospitals in the province, 80% are government owned and about 20% are being run by private sector. The situation however, is quite different in case of District Peshawar, where about 64% hospitals are in private sector against 36% government hospitals.
- In the province, more than 90% beds are in hospitals and 8.5% in rural health centers. In district Peshawar however, about 98% of the total beds are in hospitals as against other institutions. Comparing district with the Province, around 31% of the total beds in the province are in District Peshawar.
- In the Province, about 91% of the beds are in government institutions as against 9% in private institutions. In District Peshawar, these percentages are 79% and about 21% respectively. Thus, Private sector needs to be encouraged to increase number of beds in their health institutions.

4.9.5 Health Sector: Short-Term Planning Proposals (2021-2025)

i. Provision of Basic Health Units

The total number of UCs (urban as well as rural) in the District is 92, of which 51 UCs are urban/urbanizing and remaining 41 UCs are rural. Of the 51 urban UCs, 44 UCs are in municipal corporation and the remaining 7 are in the process of transforming into urban areas. In 41 rural UCs, there are 48 BHUs, averaging more than 1 BHU per rural UC. Among

these, there are 17 rural UCs without any BHU, 18 having one BHU, five with two BHUs and 5 UCs having 3 or more BHUs. This is understandable, as BHUs are basically meant for rural UCs. The 51 urban/urbanizing UCs are well served with medical facilities, and are not dependent on BHUs. These lie in the Core of Peshawar and include hospitals, medical centers and private health institutions.

However, as already stated, 17 rural UCs of the District are without any health facility, and need at least one BHU in each. The consultants did not come across any health standards manual in KPK, and therefore consulted District Planning Manual of Punjab. The standards given in National Reference Manual is to provide one Basic Health Unit for every 10,000 persons. The District Planning Manual[61]however states that due to resource constraint, it might be more practicable to set up at least one basic health unit in every union council. However, population is not the sole criteria for estimating the number and location of BHUs. The Manual provides the yardstick for selecting a village where BHU is to be located.

The details are provided in Table 4.28.

Table 4. 31: Rural Union Councils with Number of BHUs in District Peshawar

Sr. No	Rural UCs Vs BHUs	Number of UCs	Names of UCs[62]
1	UCs with no BHU (map with population)	17	Garhi Sardad, Panam Dheri, Dag, Khatki, Kankola, Nahqai[63], Hassan Ghari No. 1, Azakhel, Ulman Khel, Umar Miana, Umar Bala, Maryamzai, Surizai, Mera Kachori, Badhher, Badber, Malanni, Shahi Bala
2	UCs with 1 BHU	18	Palosi, Kaneza, Pajagi, Takhtabad, Garhi Khazana, Hayana Payan, Budni, Lala, Larama, Umar Payan, Sher Kera, Adezar, Masho Goggar, Shekhan, Sheikh Muhammadi, Bazid Khel, Chamkanni, Pakha Ghulam
3	UCs with 2 BHUs	5	Kafor Dheri, Malkandhir, Hassan Ghari No. 2, Musazai, Wadpaga
4	UCs with 3 BHUs	4	Jogani, Chagharmatai, Mathra, Gulbela
5	Urbanised/Partially urban UCs with BHUs	6	Sambanda, Achini Bala, Pushtakhara, Hayatabad No. 1, Cantonment, Asia

ii. Provision of Rural Health Centers (RHCs)

Based on population criteria of 1 RHC for 75,000 populations[64], a total of 43 RHCs are required by the end of short-term plan period. The existing number of RHCs is 4, entailing a net requirement of 37 RHCs in rural areas of the District.

[61] Planning and Development Board, Government of Punjab, District Planning Manual, page 58.
[62] Part of Shahi Bala UC in Serial No. 1 and Musazai and Wadpaga in Serial No. 3 are in urban area.
[63] At Nahqai there exists an RHC.
[64] Source: Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Table 6.7, Page 122.

The required number of RHCs may be provided preferably in a larger village/settlement for the short-term plan.

Table 4. 32: Rural Health Centers Required in the Short-Term Plan (2021-2025)

Rural Health Centers Required in the Short-Term Plan (2021-2025)						
Rural Population 2021	**Rural Population 2025**	**Existing RHCs**	**Current Requirement**	**Current Shortage**	**RHCs Required in 2025**	**Net RHC's Required by 2025**
2686570	3141699	**4**	**35**	**31**	**41**	**37**

iii. Increasing Number of Beds

Applying the national standard of 2 beds per 1000 persons[65], number of beds required at the end of short-term period are 11682, while the existing number of beds are 6134. Thus additional 5548 beds will be required by the year 2025. (Table 4.29).

Table 4. 33: Number of Beds Required in the Short-Term Plan (2021-2025)

Number of Beds Required in Short Term Plan (2021-2025)						
Population 2021	**Population 2025**	**Existing number of Beds**	**Current Requirement**	**Current Shortage**	**Number of Bed required in 2025**	**Future Beds Required by 2025**
4990098	**5835465**	**6134**	**9980**	**3846**	**11670**	**5536**

4.9.6 Health Sector: Long-Term Planning Proposals (2026-2040)

i. Provision of Basic Health Units

For the period 2026-2040, the consultants propose that each union council should have at least two BHUs. There are already 5UCs each having two BHUs, and another 4UCs having 3 BHUs. Besides there are six UCs each of which at present have one BHU, but these are in urban/urbanizing area, and during the period 2021-2040 these are likely to be fully urbanized having easy access to urban amenities. At present there are 17 UCs which have no BHU, and it has already been proposed in the previous section that these should be provided one BHU in the short-term plan period. Besides there are at present 18 UCs having one UC each. The consultants propose that both of these categories of UCs should have two BHUs each during the long-term plan period i.e. 202600-2040. These UCs are listed below:

[65] Source: Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual for Planning & Infrastructure Standards, Section 6.2.2, Page 122.

Table 4. 34: Union Councils Proposed to have Two BHUs in the Long-Term Plan (2026-2040)

Garhi Sardad, Panam Dheri, Dag, Khatki, Kankola, Nahqai, Hassan Ghari No. 1, Azakhel, Ulman Khel, Umar Miana, Umar Bala, Maryamzai, Surizai, Mera Kachori, Badhher, Badber, Malanni, Shahi Bala, Palosi, Kaneza, Pajagi, Takhtabad, Garhi Khazana, Hayana Payan, Budni, Lala, Larama, Umar Payan, Sher Kera, Adezar, Masho Goggar, Shekhan, Sheikh Muhammadi, Bazid Khel, Chamkanni, Pakha Ghulam

ii. Provision of Rural Health Centers (RHCs)

Based on population criteria of 1 RHC for 75,000 population[66], a total of 75 RHCs will be required by the year 2040. During the short-term plan of first five years (2021-2025), 41 RHCs are proposed to be provided. If this proposal is implemented, 34 additional RHC will be required during 2021-2040.

Table 4. 35: Rural Health Centers Required in the Long-Term Plan (2025-2040)

Rural Health Centers Required in the Long-Term Plan (2025-2040)				
Rural Population 2025	**Rural Population 2040**	**RHCs Required in 2040**	**Existing RHCs up to 2025**	**Future RHC's Required by 2040**
3141699	5649867	75	41	34

iii. Increasing Number of Beds:

Applying the national standard of 2 beds per 1000 persons[67] to the additional population during 2025-2040, number of additional beds required at the end of long-term period would be 9318, as calculated in Table 4.33.

Table 4. 36: Number of Beds Required in the Long-Term Plan (2025-2040)

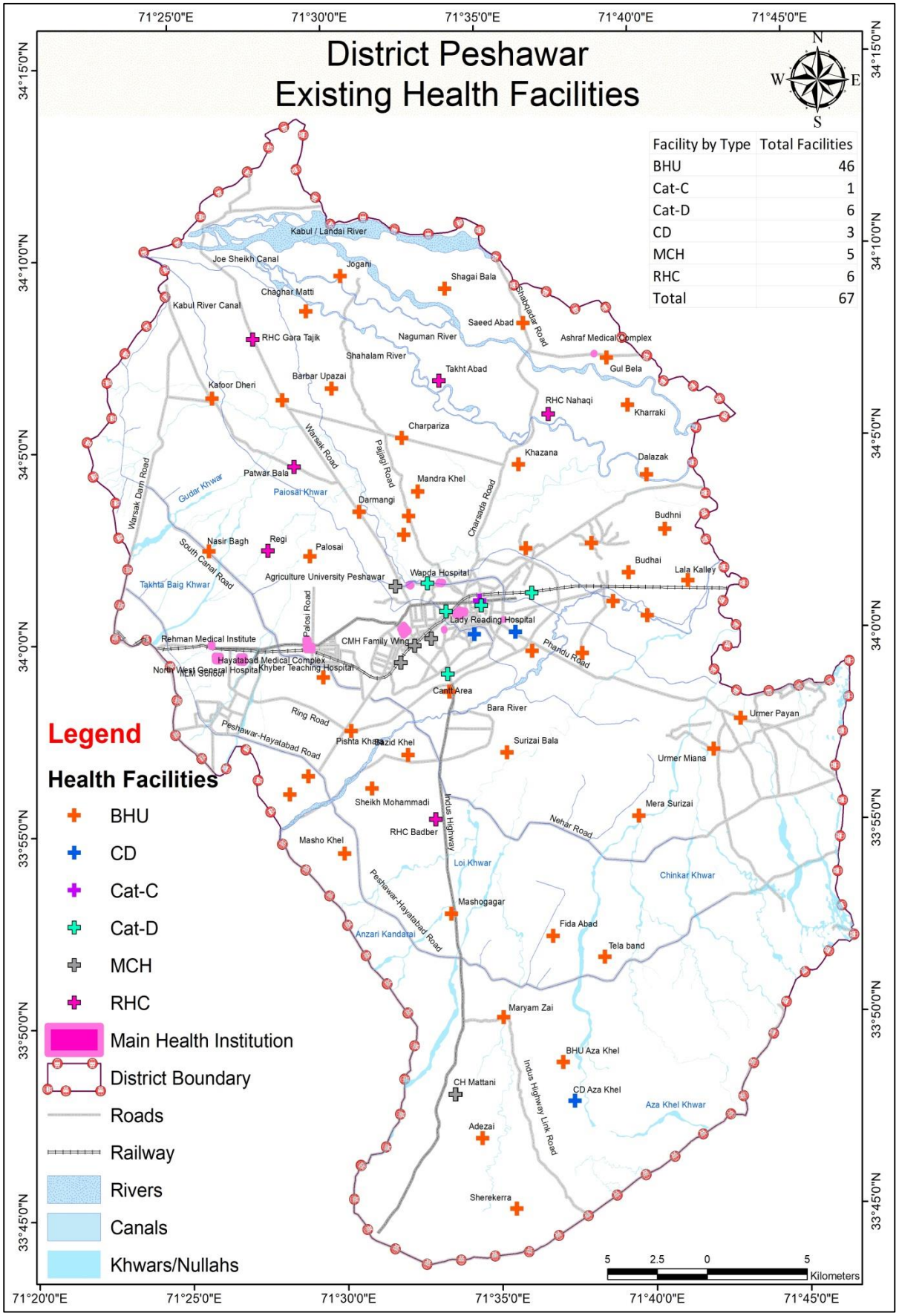
Number of Bed Required in Long Term Plan (2026-2040)				
Population 2025	**Population 2040**	**Number of Bed required in 2040**	**Existing number of Beds upto 2025**	**Net Required by 2040**
5835465	**10494195**	**20988**	**11670**	**9318**

[66] Source: Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Table 6.7, Page 122.

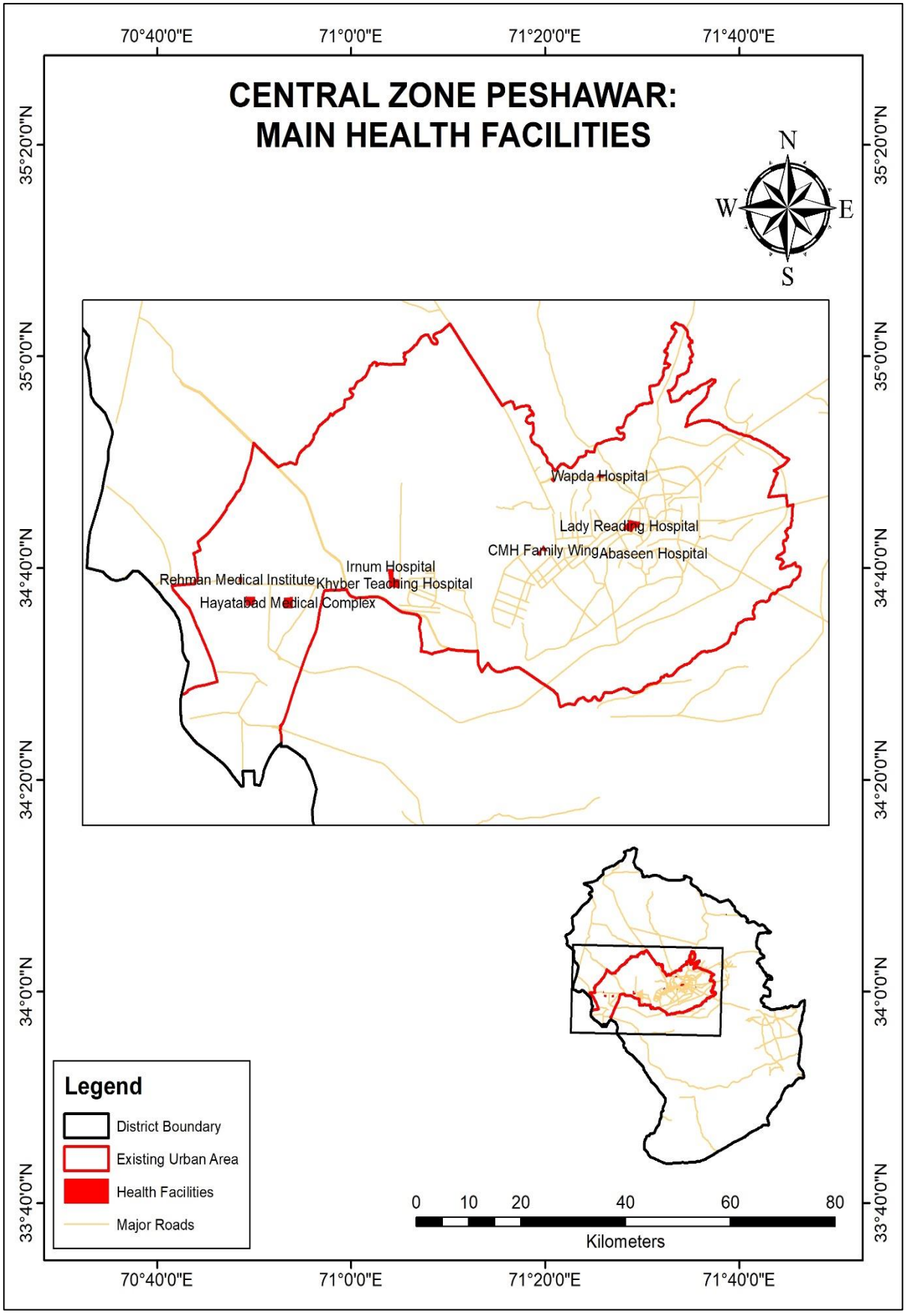
[67] Source: Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual for Planning & Infrastructure Standards, Section 6.2.2, Page 122.

4.9.7 Proposed Locations of Future Health Institutions

The lowest level of health facilities is the Basic Health Unit (BHU), and it is proposed that there should be at least one BHUs in each union council. These may be located in rural growth zone, or other centrally located villages in the context or rural growth zone. Depending on the terrain and communications, 5 to 10 BHUs will be linked to the next level of health facilities i.e. Rural Health Centers. In urban area, it is by-passed in the steps of the hierarchy by polyclinic or General Hospital. While polyclinic can be sited at a suitable location within a residentiary area, the hospital should be located in the proposed institutional zone.



Map 4. 18: Health Facilities Map of District Peshawar



2960

Map 4. 19: Main Health Facilities Map of District Peshawar

4.10 RECREATIONAL FACILITIES

In Peshawar, disappearance of incidental open spaces and inadequate provision of planned open spaces is a problem. Provision of spaces for active outdoor recreation is hindered by high land prices, pressure on land and high population densities. Thus, reserving land for recreational purposes has to be stressed against many competing demands for land.

4.10.1 Sports Facilities in District Peshawar

Sporting events have played pivotal roles in creating healthy communities around the globe. Today, contests pushing physical limits are more popular than ever before. As interest in health and longevity continues to rise, and government business continues to see sporting events as sound investment and long-lasting impact, sports can play a vital role in shaping a vigorous society for foreseeable future. Peshawar District as the provincial headquarter of KP has both provincial and international scale sports facilities the details of which are as follow;

- Qayyum Sports Complex
- Hashim Khan Sports Complex
- Peshawar Club Ground
- Hayatabad Sports Complex
- Arbab Niaz Cricket Stadium
- Peshawar Golf Course

Beside this Peshawar has also a number of cricket academy like Islamia Cricket Academy, Malik International Cricket Academy, etc.

4.10.2 Entertainment

Entertainment is a reception phenomenon with basic factors such as joy, fun and it is pleasant, easy, tand agreeable, without being compulsory and demanding, while Tourism is dependent on various industries /activities to produce the final offering to tourists. The entertainment is one of the industries that significantly contribute to the tourism experience. In case of Peshawar, the entertainment industry consists of hotels and restaurants.

Hotels

As Peshawar is the largest city and administrative headquarter of KP with rich heritage which attracts people and have a huge number of hotels and guest houses in which some of the major hotel are as follow.

- Pearl continental hotel
- Shelton Accommodators
- Emaraat Hotel
- Shelton’s Rezidor
- Shelton’s Green Hotel
- Hotel Grand
- Shelton VIP
- Shelton Guest House
- Taj Palace Hotel
- Rose Hotel
- Amin Hotel

Restaurants

There are different types of restaurants in Peshawar, from international chains to local chains restaurants and from homemade to fast-food and from traditional to continental. Category wise names of some famous restaurants are given below.

Table 4. 37: List of Restaurants in District Peshawar

International	Chinese	Local	Traditional
KFC	Hong Kong Restaurant	Café Crunch	Charsi Tikka Shop
Pizza Hut		Café 99	Traskoon
McDonald's		Jans Deli	Habbi Restaurant
Burger King		Food District	Nisar Khan Charsi Tikka
Hardee's		Wa Khan	Khwandona
Mr. Cod	Silver Dragon Restaurant	Chief Burger	Shiraz Ronaq
Cone Heads		Food Punch	Usmainia Restaurant
Flipperz Pizzeria		Taste in Train	Shelton's Green
		Chayee Khana	Hujra Restaurant
Gloria Jeans		Quetta Chaye	Islamia Restaurant
		Hunger Lounge	Bannu Beef Pulao

Important Religious Places

Peshawar has been serving as a main economic and political hub of South-East Asia for centuries. People from different ethnic and religious background came here, some of them even settled in Peshawar permanently. This is the reason for such diversity in religions in Peshawar. Some of the important religious places in Peshawar are given below:

Table 4. 38: List of Religious Places in District Peshawar

Masjid	Churches	Temples	Gurudwara
Masjid Al-Zarghoni	NACP Church	Kalibari Mandir	Gurudwara Bhai Jogo Singh
Sunehri Masjid	All Saints Church	Goraknath Mandir, Gor Khatri	
Takhto Jumat	Diocese of Peshawar		
Masjid Qasim Ali Khan	ST. Johns Church	Dargah Pir Ratan Nath Jee Hindu Mandir	
Sethian Masjid	Cathedral Church		
Darwesh Masjid	ST. Joseph's Catholic Church	Nandi Mandir	
Speen Jumat			
Masjid Muhabat Khan	Assembles of God Church	Balmiki (Valmiki) Mandir	
Tablighi Masjid			

4.10.3 Museums

Peshawar has two main museums; the Peshawar museum founded in 1907 in the memory of Queen Victoria and the City Museum "the archeological site of Gorkhatri" located in at the hearts of wall city which is the highest place in Peshawar having a huge deposit of historical periods commencing from the Indo-Greeks or earlier period. There are also several other museums in Peshawar like Pashtun Culture Museum, SSAQ Museum, Seti House Museum and Kapoor House.

4.10.4 Libraries

Peshawar Public Library which is recently renamed as Shuhada-e-APS Public Library is one of the largest Public Library of the Province of Khyber Pakhtunkhwa having collection of more than 140,000 books on different subjects. The Library is providing services throughout the week including Saturday and Sunday. There are also several other libraries in the district like;

- Rahman Baba library
- Central Library, University of Peshawar
- Garrison Recreational Center Library
- Imam Bukhari Maktaba

4.10.5 Zoos

Peshawar zoo is established by the previous government in 2017. The zoo is located near PFI, spread over an area of 29 acres. Beside Peshawar zoo, two small size zoos are also located in Peshawar which are well known, Garrison Mini Zoo and Bagh-e-Naran Zoo.

4.10.6 Open Spaces

The existing main open arespaces in Peshawar are as follow:

- Army Stadium: It is an amusement park for children and families with restaurants, banks, play pens and shopping arcade.
- Bagh-e-Naran: is situated in Hayatabad; the largest and most beautiful park in Peshawar.
- Jinnah Park: Situated opposite Historic Bala Hissar Fort, close to Asamai Gate and Lady Reading Hospital.
- Wazir Bagh: Laid in 1802, by Fatteh Khan, during the rule of the Durrani ruler Prince Shah Mahmood Durrani.
- Ali Mardan Khan Gardens: Formerly Company Bagh now Khalid Bin Waleed Park.
- Shahi Bagh: A small portion of which constitutes the current site of Arbab Niaz Stadium.
- Garrison Park: Located at prime location of Shami Road under army control.
- Tatara Park: Located in Hayatabad for children and families.
- Chacha Younis Park: Located on G.T Road near Hashtnagri.
- Khalid Bin Waleed Park

- Sher Khan Shaheed Park
- Khyber Park
- Shalman Park
- Phase 4, Sector N4 Park
- Phase 3, Ladies Park
- Ghani Bagh
- Rahim Park
- Cantonment Park
- Shaheed Tahira Qazi Ladies Park

4.10.7 Historical Places

Peshawar being a historical city geographically located near the eastern end of historical Khyber Pass has various heritage sites. The most prominent heritage sites are as follow:

Qilla Bala Hissar

Qilla Bala Hissar occupies a dominant position towards north-western corner of Peshawar City. It was originally built by the first Mughal Emperor Babar, destroyed by Sikhs and rebuilt by British. It came in possession of the English after annexation of the Punjab in 1849 who renovated it as seen today. Now Qilla Bala Hissar is the headquarter for the Frontier Corps. This heritage site needs to be open for tourist which will attract a lot of tourist from whole region and will boost the district as well as provincial economy.

Shahji-ki-Dheri

The name of the Shahji Ki Dheri is given to the ancient Kanishka Chaitya monument situated at a distance of a quarter mile to the south west corner of city of Peshawar. This is called so because of it being in the possession of Syeds who are generally known as Shahji. Two monuments laying east and west respectively present the Stupa and Sangharama mentioned by the Chinese pilgrims.

Masjid Mahabat Khan

The Mahabat Khan Mosque, sometimes spelt Mohabbat Khan Mosque, is a 17th-century Mughal-era mosque in Peshawar, Pakistan. The mosque was built in 1630, and named after the Mughal governor of Peshawar, Nawab Mahabat Khan bin Ali Mardan Khan, known alternatively as Mahabat Khan and Ali Mardan Khan.

Islamia College, Peshawar

It is a public sector university located in midst of Peshawar, Khyber Pakhtunkhwa, Pakistan. Founded by the personal initiatives led by Sir S.A. Qayyum and Sir George Roos-Keppel in 1913, it is one of the oldest institutions of higher education in Pakistan, and its historical roots are traced from the culminating point of the Aligarh Movement. The university provides higher learning in arts, languages, humanities, social sciences and modern sciences.

Gorkhatri

Gorkhatri in the ancient city of Peshawar was identified by Alexander Cunningham with the Kanishka stupa, the giant Stupa of Indian King Kanishka the Great, while Professor Dr. Ahmad Hasan Dani identified it with the place where the famous tower of the Buddha bowl once stood.

Peshawar Museum

The Peshawar Museum is a museum located in Peshawar, capital of Khyber Pakhtunkhwa, the province of Pakistan. The Peshawar Museum is notable for its collection of Buddhist artwork dating from the ancient Gandhara Empire.

Namak Mandi

The old city of Peshawar is a treasure hiding gems of historical significance. When you begin exploring the city, you will discover soon a place called Namak Mandi (The Salt Market). According to an old dweller of Peshawar city, this place was once a center for salt trade in the region. In the pre-partition era when the city looked deserted and the sound of a horse's hoofs dragging a tonga could be heard at the last stretch of the road due to the lingering quietness the salt traders used to have their stacks of salt preserved in the go-downs of Namak Mandi. People, majorly from neighboring countries, would come here and barter this salt with a variety of everyday commodities. Over the years, this business diminished, but the place has retained the name that it earned recognition from decades ago.

Clock Tower

The Cunningham Clock Tower in Peshawar, Khyber-Pakhtunkhwa, Pakistan, was built in 1900, "in commemoration of the Diamond Jubilee of Her Majesty the Queen Empress". The tower was named after Sir George Cunningham, former British governor and political agent in the province.

Khan's Club, Peshawar City

Khan's club is a boutique hotel in Peshawar, Pakistan. The hotel is housed in a restored Hindu haveli that was built in 1793 by the Howrah family and is owned by Bashir Ahmed Awan.[1] It was opened on November 3, 1995 by Irish-American Martin Jay Davis (known as Ashley), who designed and spent one year renovating the haveli with 76 refugee master artisans from Afghanistan. All fixtures, furniture and artwork were produced by Afghan refugees and Pakistani craftsmen. The haveli was restored by Davis in order to promote cultural understanding in Peshawar of the importance of heritage preservation and the promotion of the arts. Davis spent 13 years in Peshawar (between 1990-2003) promoting and preserving the arts of Afghanistan and Pakistan's Khyber Pakhtunkhwa province.

4.10.8 Future Metropolitan Park, City Stadium/Park Area Requirements.

Table 4. 39: Recreational Facilities Demand of District Peshawar (2021-2040)

Active Recreational Facilities					
S. No	**Category**	**Additional Population**	**Type**	**Active Recreational Facilities Required**	**Area Required (Ha)**
1	**Urban**	2283708	Cricket	8	16
			Foot Ball	11	15.4
			Hockey	11	16.5
			Community Play Ground	23	49.2
			Neighborhood Play Ground	91	148.3
2	**Rural**	2665084	Cricket	9	18
			Foot Ball	13	18.2
			Hockey	13	19.5
			Community Play Ground	107	229
			Combine Play Field	27	57.8
Total		**4948792**		**313**	**587.9**
Passive Recreational Facilities					
Category		**Additional Population**	**Type**	**Active Recreational Facilities Required**	**Area Required (Ha)**
Urban		2540800	City Park	6	72
			Community Park	23	92
			Neighborhood Park	91	295.75
			Mohalla Park	365	584
Rural		2963297	City Park	7	84
			Community Park	27	108
			Neighborhood Park	107	347.75
			Mohalla Park	426	681.6
Total		**5504097**		**1052**	**2265.1**

4.10.9 Conserving Areas of High Landscape and Tourism Value

For areas of high landscape value, the primary responsibility for protective measures lies with relevant line departments, in coordination with the Environmental Protection Agency (EPA).

In context of Peshawar, such areas include prime agricultural land around the urban area, as well as in the Northern part of the district, and rivers and their tributaries flowing through the district. These help to maintain the integrity and diversity of ecosystems, protect flora and fauna, and facilitate ecological processes such as water flows, soil regeneration, nutrient cycling and so on, which is vital for all life. Due to population pressures, such areas need to be managed with a sustainable balance of human populations.

Lack of protective measures in these areas is resulting in loss of their natural beauty and environmental degradation. These areas need serious attention as their delicate eco-system is getting unbalanced because of uncontrolled and unregulated physical developments. The

remedial measures in the past have been inadequate, resulting in major damages to these environmentally sensitive areas.

Owing to various historic and institutional reasons, the effectuation of protective measures including Land Use and building control regulations have remained limited to major urban centers. Rural and special areas such as above have been largely neglected resulting in their haphazard and uncontrolled growth and negative impact on the areas of high landscape value. In these areas, the problems get proliferated and involve heavy financing to cure. Scarce budgetary resources constrain such an option. Under the circumstances, it is feared that some of the problems of special areas may become impossible to eradicate unless some timely measures are adopted. A cogent solution is therefore need of the hour. This calls for strict protective measures for these areas, which are as below:

To conserve natural beauty of such areas, development should not be allowed in areas where it may block views or vistas of outstanding quality.

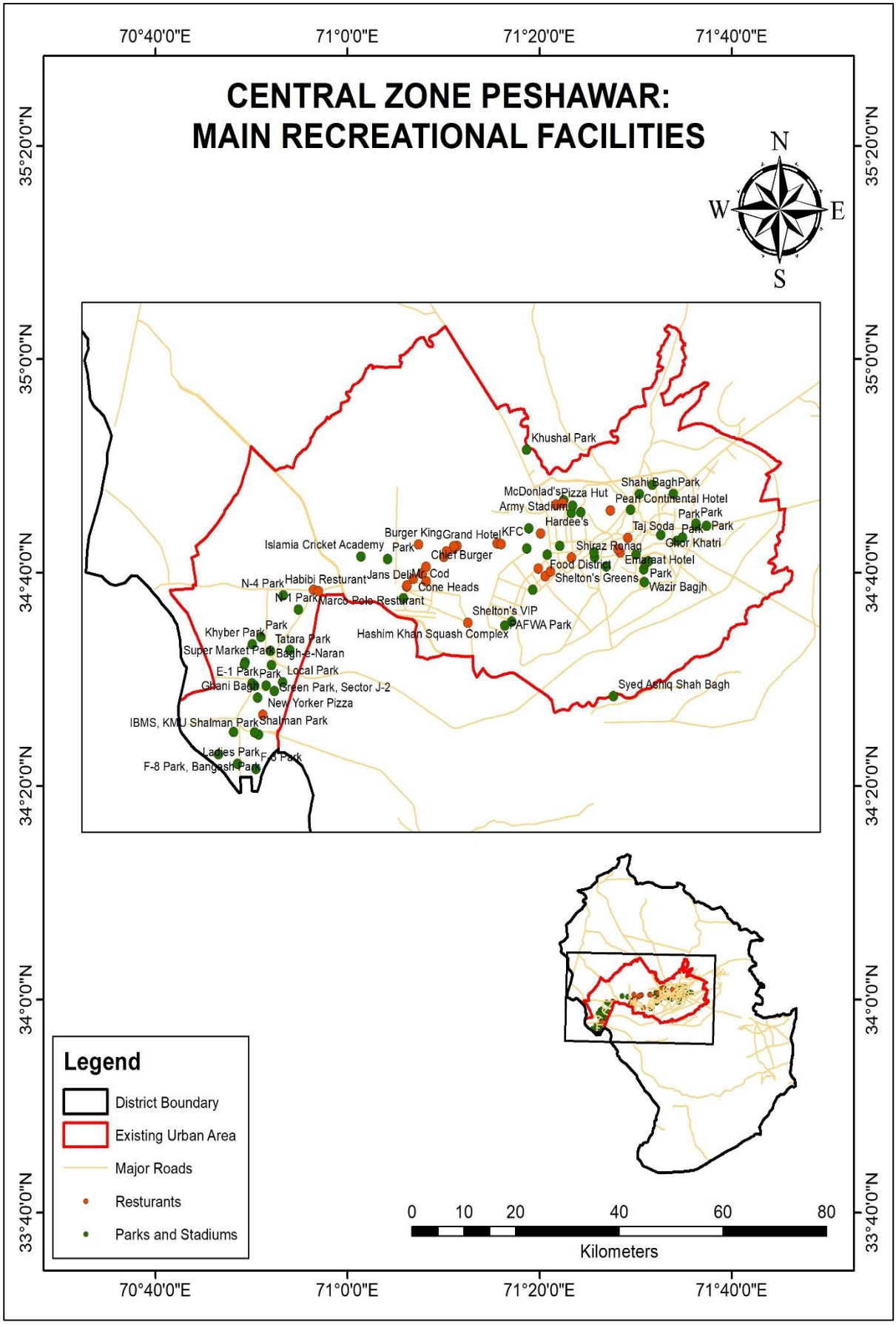
There should be a ban on new housing schemes in areas of high landscape value.

Developments near rivers/water bodies and other flood prone areas should be discouraged not only for aesthetics, but also for reasons of safety, since floods can cause immense damage to life and property, natural vegetation and agriculture as has been witnessed in recent floods.

An important consideration for areas of high landscape values should be to regulate their growth and to make such areas environmentally sustainable. Involvement of private sector in development efforts for areas of high landscape value in view of funding constraints in the public sector should be encouraged.

Land Use and building control regulations, if implemented properly, are effective tools to ensure the preservation of physical environment. These may include:

- Ban on construction of all type of buildings within 5 kms of river banks.
- Ban on disposal of liquid and solid waste into rivers/streams.
- No industrial activity in areas of high landscape value.
- Protect the water flowing through the area from any form of pollution.
- Control damage/destruction of vegetation.



Map 4. 20: Main Recreational Facilities Map of District Peshawar

4.11 INDUSTRIES

There is a total of 612 industrial units in Peshawar, of which 509 are operational and 105 are closed. Industries can be categorized in different ways, such as on the basis of capital investment, labor force employed or the extent and magnitude of pollution produced. In this chapter, industries in District Peshawar have been categorized on the basis of labor force.

4.11.1 Spatial Distribution Heavy, Medium and Light Industrial Zones/Small Industries Estates:

Industries can be categorized in different ways, such as on the basis of capital investment, labor force employed or the extent and magnitude of pollution produced. In this chapter, industries in District Peshawar have been categorized on the basis of labor force.

There is a total of 612 industrial units in Peshawar, of which 105 are closed and 509 are operational. These 509 running units include a sugar & distillery, employing a total of 525 persons, which is only 3.6% of the total industrial labor in the district. Besides, there are no medium level industry units according to labor force per unit. On the basis of above criteria, the industrial units in District Peshawar may be categorized as given in Table 5.37.

Table 4. 40: Categorization into Heavy, Medium and Small Industries[68]

Categories	No. of Employees	Nature of Industry	No. of Industrial Unit	No. of Employees	% With Total Employees
Heavy	More than 500	Sugar & Distillery	1	525	3.6
Medium	100-499	Printing	1	285	1.85
Small	Less than 100	Others	610	14043	94.55
Total			**612**	**14853**	**100**

The spatial spread of industries is shown on the map. Most of the industrial units (about 83%) lie inside the planned industrial estates. The heavy industry (sugar mill) is located on Charsadda Road. As already stated, there are two types of industries that lie inside the planned industrial estate. Small industries are scattered throughout the district, such as along the major roads or in the periphery of the Peshawar urban area. A linear ribbon of the many small industries lie along the Grand Truck road close to the Islamabad-Peshawar Highway.

4.11.2 Number of Industries by Types, Units and Employments

The total number of industrial units is 612 in which 14853 people are employed. Hayatabad Industrial Estate contain 45 types of industries with 372 units and 11871 employments. Kohat Road Industrial Estate contains 18 types of industries with 104 units and 969 employments, while the remaining 136 industrial units with 2013 employments are scattered within the city.

[68] Directory of Industrial Establishments 2011

Table 4. 41: Number of Industry by Type, Units and Employments[69]

Sr. No	Nature of Units	Jamrud Industrial Estate		Kohat Road Industrial Estate		Scattered Industries		Total Industries	Total Employments
		Units	Employment	Units	Employment	Units	Employment		
1	Vegetable Ghee	3	167	-	-	1	55	4	222
2	Flour	2	15	4	27	42	696	48	738
3	Milk & Milk Based	2	0	-	-	-	-	2	0
4	Biscuits	22	318	1	6	6	85	29	409
5	Dall	3	27	-	-	-	-	3	27
6	Cold Storage	1	15	-	-	5	43	6	58
7	Meat Processing	2	43	-	-	-	-	2	43
8	Beverages	10	416	-	-	1	13	11	429
9	Ice	2	15	4	23	12	70	18	108
10	Processing canning & Preservation	2	48	1	7	-	-	3	55
11	Feed	1	0	-	-	-	-	1	0
12	Foam	1	0	-	-	-	-	1	0
13	Polyester/Acrylic/Texturized	1	26	-	-	-	-	1	26
14	Woolen	2	158	-	-	-	-	2	158
15	Carpet	2	134	-	-	11	94	13	228
16	Hosiery	1	0	-	-	1	0	2	0
17	Garments	5	9	2	10	-	-	7	19
18	Cotton	2	75	-	-	-	-	2	75
19	Leather	4	25	1	20	4	34	9	79
20	Wood & Wood Products	11	533	-	-	1	30	12	563
21	Furniture	18	344	11	139	2	8	31	491
22	Paper & Paper Board	4	465	-	-	-	-	4	465
23	Paper Packages	19	414	-	-	-	-	19	414
24	Printing	27	492	9	77	1	285	37	854
25	Chemicals	17	695	2	23	1	0	20	718
26	Pharmacy	44	1951	7	50	-	-	51	2001
27	Match	16	1517	-	-	-	-	16	1517
28	Soap	5	94	-	-	1	6	6	100

[69] Development Statistics-2018

Sr. No	Nature of Units	Jamrud Industrial Estate		Kohat Road Industrial Estate		Scattered Industries		Total Industries	Total Employments
		Units	Employment	Units	Employment	Units	Employment		
29	Adhesive	5	132	-	-			5	132
30	Paints	1	10	-	-	1	20	2	30
31	Faber Glass	3	61	-	-	-	-	3	61
32	Formica	1	70	-	-	-	-	1	70
33	Rubber & Plastic Goods	23	1040	10	84	1	8	34	1132
34	Petroleum	3	95	-	-	-	-	3	95
35	Ceramics	3	200	-	-	-	-	3	200
36	Glass	2	175	-	-	-	-	2	175
37	Cement Based	8	207	-	-	2	14	10	221
38	Marble	28	496	-	-	34	424	62	920
39	Poultry Farm	3	0	-	-	-	-	3	0
40	Engineering	47	1047	12	105	2	21	61	1173
41	Electronic Goods	6	184	3	19	-	-	9	203
42	Other Metal Products	1	25	3	35	-	-	4	60
43	Auto Rikshaws/Motor Cycle	1	50	-	-	-	-	1	50
44	Aluminum	6	54	3	45	-	-	9	99
45	Gases	2	29	3	28	-	-	5	57
46	Cosmetics	-	-	1	9	-	-	1	9
47	Arms	-	-	27	262	7	107	34	369
	Total	**372**	**11871**	**104**	**969**	**136**	**2013**	**612**	**14853**

4.11.3 Spatial Distribution of Brick Kilns

Brick Kilns are located on the periphery of Peshawar City, mainly towards the Southern area. Untreated gaseous emission of smoke from these kilns are damaging the upper layer of the atmosphere. These emissions often cause a thick black smoke cover, especially in the evening.

Air travels in a straight line and remains in the kiln for a shorter duration as the combustion zone is smaller. Therefore, the air does not get sufficient amount of time to properly mix with the fuel, resulting in incomplete combustion.

Production of Bricks through Natural Draft Zigzag Kiln

Natural Draught Zigzag firing kiln is a moving fire kiln in which the fire moves in a closed rectangular circuit through the bricks stacked in the annular space between the outer and the inner wall of the kiln.

The bricks are stacked in such a manner to guide the air flow in a zigzag path. Zigzag flow increases the air flow path length and turbulence in the air, thereby resulting in improved combustion & heat transfer rate and uniform temperature across the kiln cross section. Also, the long firing zone and fuel feeding practice improves the combustion efficiency of the kiln. The main innovation in natural draught zigzag kiln is that while traditionally zigzag firing was done with the assistance of fan draught, in this kiln the zigzag operation is achieved through the chimney draught. The main advantages of natural draft zigzag kilns are reduced energy consumption, reduced pollutant emissions and improved product quality. The conversion would create better working conditions of labor and surrounding community, help reduce coal consumption by 30-40% per kiln and bring down up to 80% the particulate matter emission, ensure more profit for brick owners, and double kiln production.

Because of zigzag flow and better operating practices and kiln design, natural draft zigzag kilns are more energy efficient and less polluting. These Kilns increase the profitability of the enterprise because of reduced fuel cost and increased revenue due to better product quality.

4.11.4 Existing & Future Industrial Programs

Annual Development Program 2017-18 Khyber Pakhtunkhwa having three programs in district Peshawar; improvement, rehabilitation and modernization of industrial Estate Peshawar. Estimated cost is millions Rs.789.574. Second is revamping up-grading of the government printing and stationery department Peshawar, estimated cost is millions Rs.431.259. While new projects are purchases of land for establishment of trucking terminal at Peshawar having total cost of Rs.1200. Second, new Program is purchase of land for 2nd Industrial Estate at Peshawar so required budget is Millions Rs.500.

4.11.5 Current Industrial Area Gap

Table 4. 42: Calculation of Current Industrial Area Gap in Urban Area

Urban Population	2303528
Industrial Labor Force @5%	115177
Industrial Area Required (@40 Worker Per Acre)	2879.41
Current Area Under Industries	1857
Industrial Area Deficiency	**1022**

4.11.6 Future Industrial Area Requirement

The industrial area requirement in District Peshawar has been calculated on the basis of additional population for the first 5 years of plan period (2021-2025) and subsequent 15 years (2026-2040). The anticipated industrial labor force in these periods was calculated on the basis of 5% participation rate, and industrial area by applying the standard of 40 industrial workers per acre. The results are presented in the Table 4-40 below. It is clear that over the entire plan period; 3175 acres would be required which includes 487 Acres in the short-term (2021-2025) and 3175 acres in the long-term period (2026-2040).

Table 4. 43: Future Industrial Area Requirement in Urban Area

Parameters	Short-Term Plan (2021-2025)	Long Term Plan (2026-2040)	Total
Additional Population	390238	2150562	2540800
Industrial Labor Force[70]	19511	107528	127039
Industrial Area Required[71] (Acres)	487	2688	3175 Acres

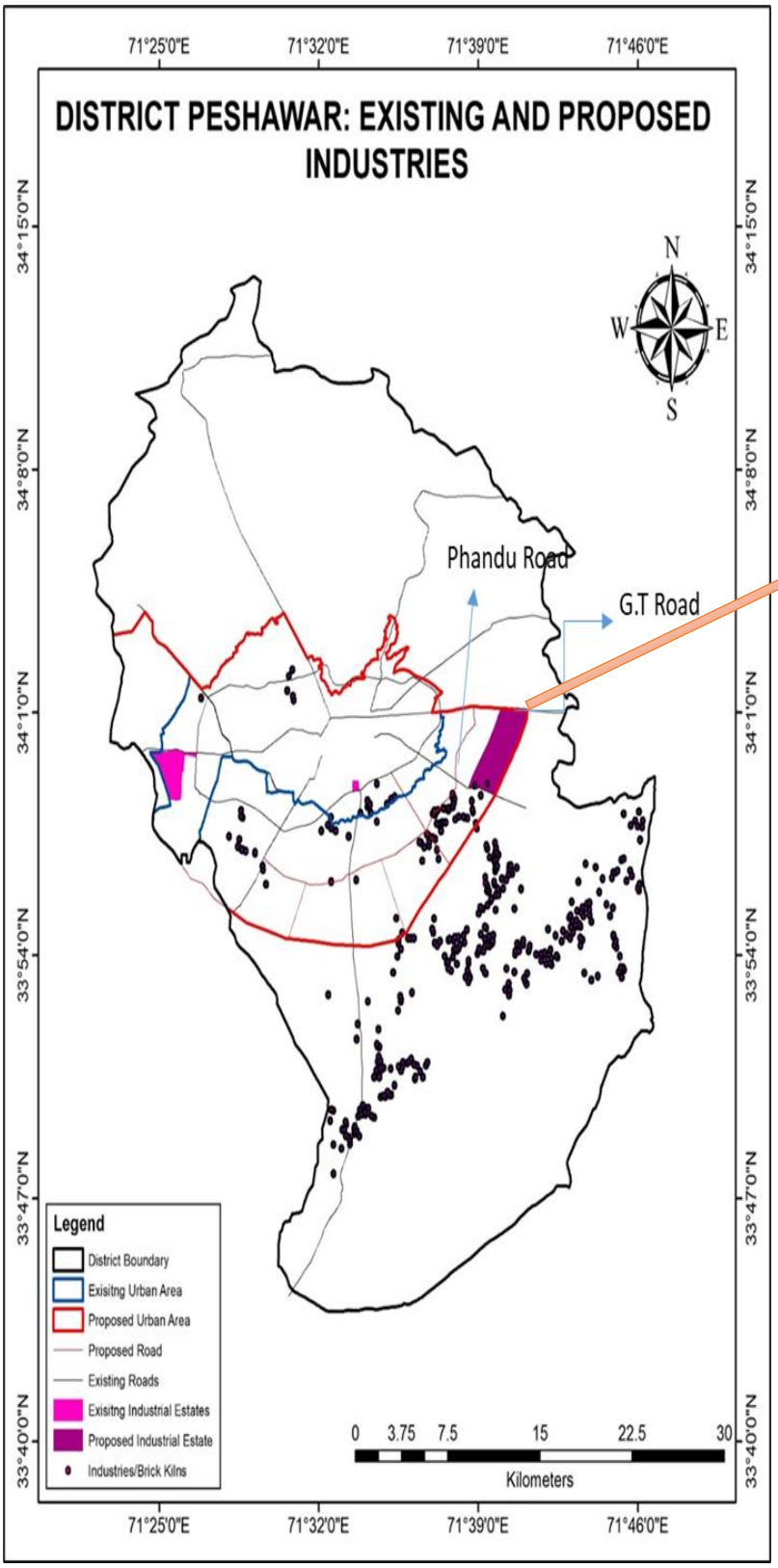
[70] @ 5% participation rate; Source: Pakistan Bureau of Statistics, Govt. of Pakistan, Labor Force Statistics 2008-2009, Table 21 (www.pbs.gov.pk). Labor force participation rate given here is 7.46% for population of 10 years & above. Averaging it over the gross population, the participation rate comes out to be around 5%.

[71] Source: Environment & Urban Affairs Division, Govt. of Pakistan, National Reference Manual on Planning and Infrastructure Standards, Section 5.3.1.2, Page 89. The Manual recommends 50 industrial workers per acre. In case of Peshawar, the standard adopted is 40 industrial workers per acre.

4.11.7 Proposed Industrial Location

The proposed industrial estate is located on the eastern side of the proposed Outer Ring Road between Phandu Road and G.T Road.

The proposed location is in line with the proposed Land Use strategy i.e. urban growth to take place South of existing area. New residential areas are proposed around it, which may include labor colonies and low-income housing areas. These will minimize distances and travel times, as the industrial estate is likely to generate substantial employment opportunities.



- **Area= 2,173**
- **The proposed location is in line with the proposed Land Use strategy along South**
- **New residential areas are proposed around it, which may include labor colonies and low-income housing areas.**
- **These will minimize distances and travel times, as the industrial estate is likely to generate substantial employment opportunities.**

Map 4. 21: Existing and Proposed Industries Map of District Peshawar

4.12 AGRICULTURE SECTOR

Agriculture constitutes the largest sector of our economy. Majority of the population is directly or indirectly dependent on this sector. It contributes about 24 percent to Gross Domestic Product (GDP) and accounts for almost half of the employed labor force. With its 60 contributions to exports, it remains the largest source of foreign exchange earnings.

Ensuring food security and controlling food inflation are the main tasks for macroeconomic policymakers, especially in the context of poverty alleviation interventions. The issues call for a multi-pronged strategy to make agriculture sector efficient, completive and sustainable.

Peshawar cultivated tracts consist of a rich, light and porous soil, composed of a pretty even mixture of clay and sand, which is good for cultivation of wheat, maize and sugarcane. The Kabul River enters the district at Warsak and flows in the southeastern direction in the upper northern half of the district. It is divided into several channels. The two main channels are the Adezai or Hajizai in the north and the Naguman in the south. The Bara River enters District Peshawar south of Jamrud Fort and flows in the south-eastern direction through the District into Nowshera District.

District Peshawar is famous for producing both food and cash crops. The main crops of the area are sugarcane, wheat, maize, barley, fodder and different kind of fruits and vegetables. The main sources of irrigation in the district are canals and tube-wells. Lift irrigation and well irrigation are also practiced to a limited extent. Main livestock in the district are assess, buffaloes, cattle, goats, horse, mules and sheep. There are also several poultry farms in the district.

Agriculture is the principal occupation of the rural area. Besides agriculture, numbers of manufacturing industries have absorbed a large number of skilled and unskilled labors. There is also a large section population in government service, banking, business, industries and other autonomous and semi-autonomous bodies. (District Officer Agriculture, Peshawar).

4.12.1 Area Under Cultivation

According to the Crop Statistics Khyber Pakhtunkhwa, the total reported area of district Peshawar is 152761 hectares, out of which according to the year 2018-19 the total cultivated area is 84119 hectares containing the sum of “net area sown” and “current fallow” i.e. 55% of the total reported area. Area that is considered not available for cultivation are either barren or mountainous land, area under roads, canals, rivers and all such areas which are not utilized for agriculture purpose.

Table 4. 44: Agriculture Land Use Utilization in District Peshawar[72]

Year		2015-16	2016-17	2017-18	2018-19
Total Reported Area		126661	152761	152761	152761
Cultivated Area	**Total**	**78854**	**84086**	**84086**	**84119**
	Net Sown	77142	77689	77689	82833
	Current fallow	1712	6397	6397	1286
Cropped Area	**Total**	**78717**	**81901**	**81901**	**84501**
	Area sown more than once	1575	4212	4212	1668
Un-cultivated Area	**Total**	**47807**	**68675**	**68675**	**68642**
	Culturable waste	19629	22902	22902	22869
	Forest	105	542	542	535
	Non-available for cultivation	28073	45231	45231	45238

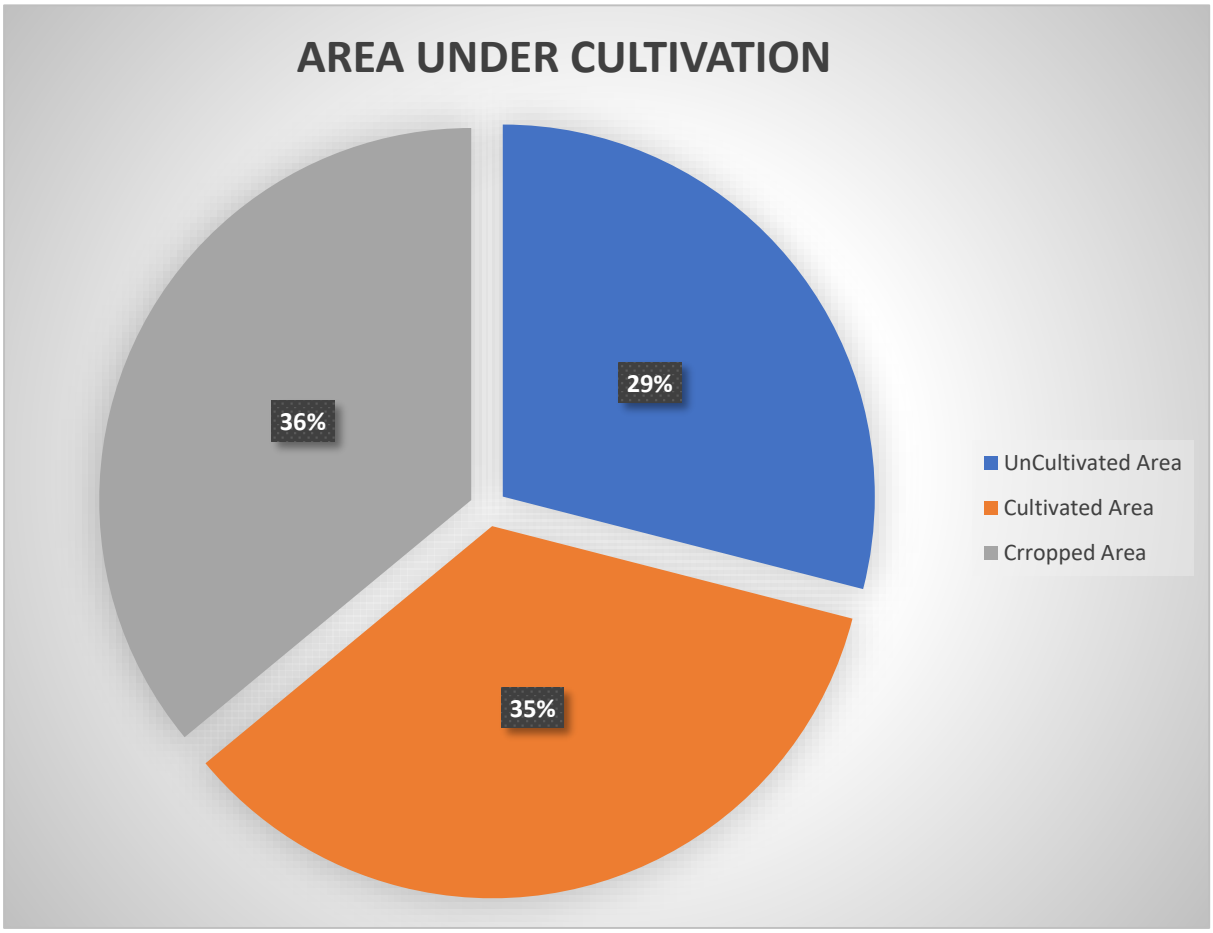
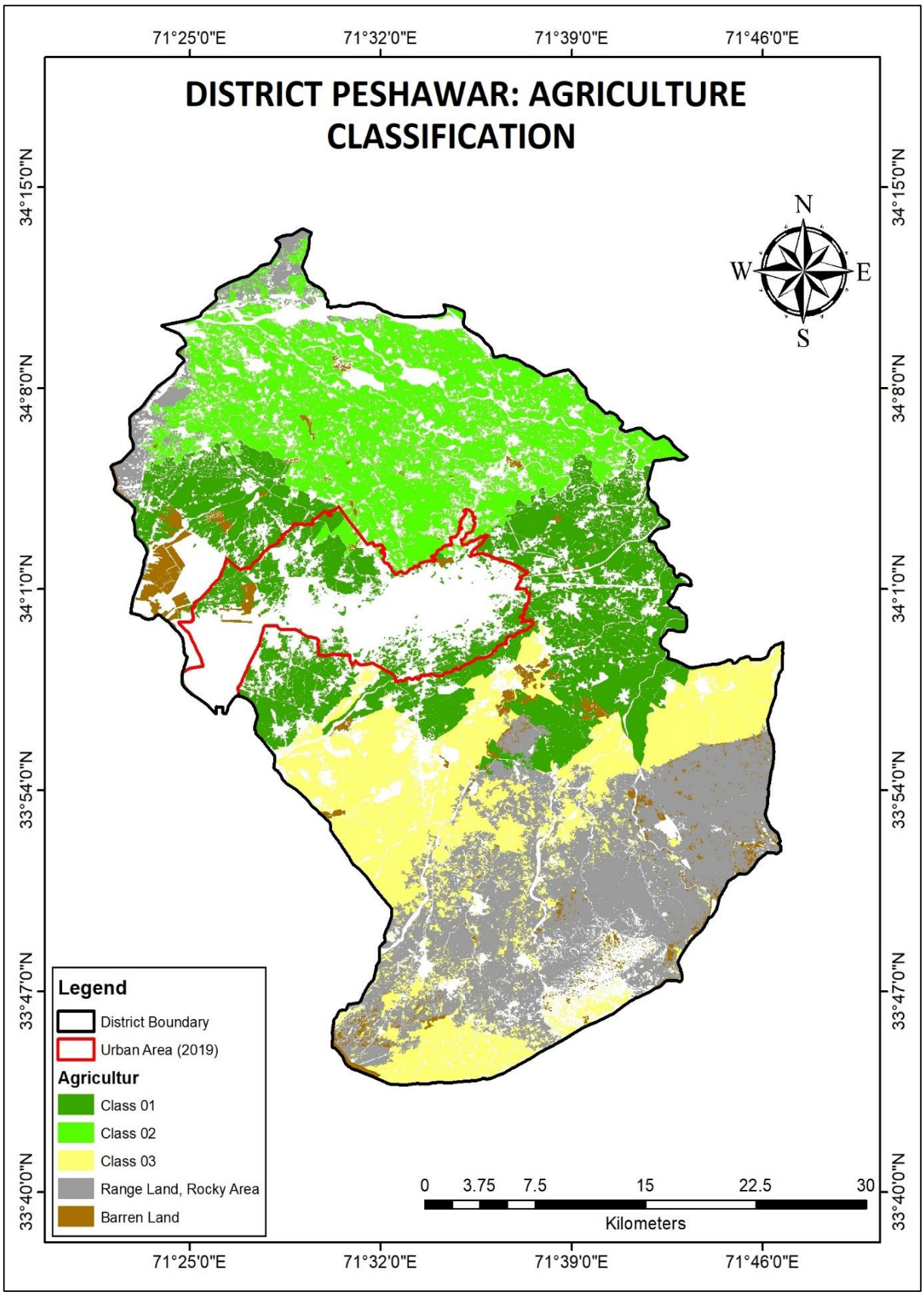


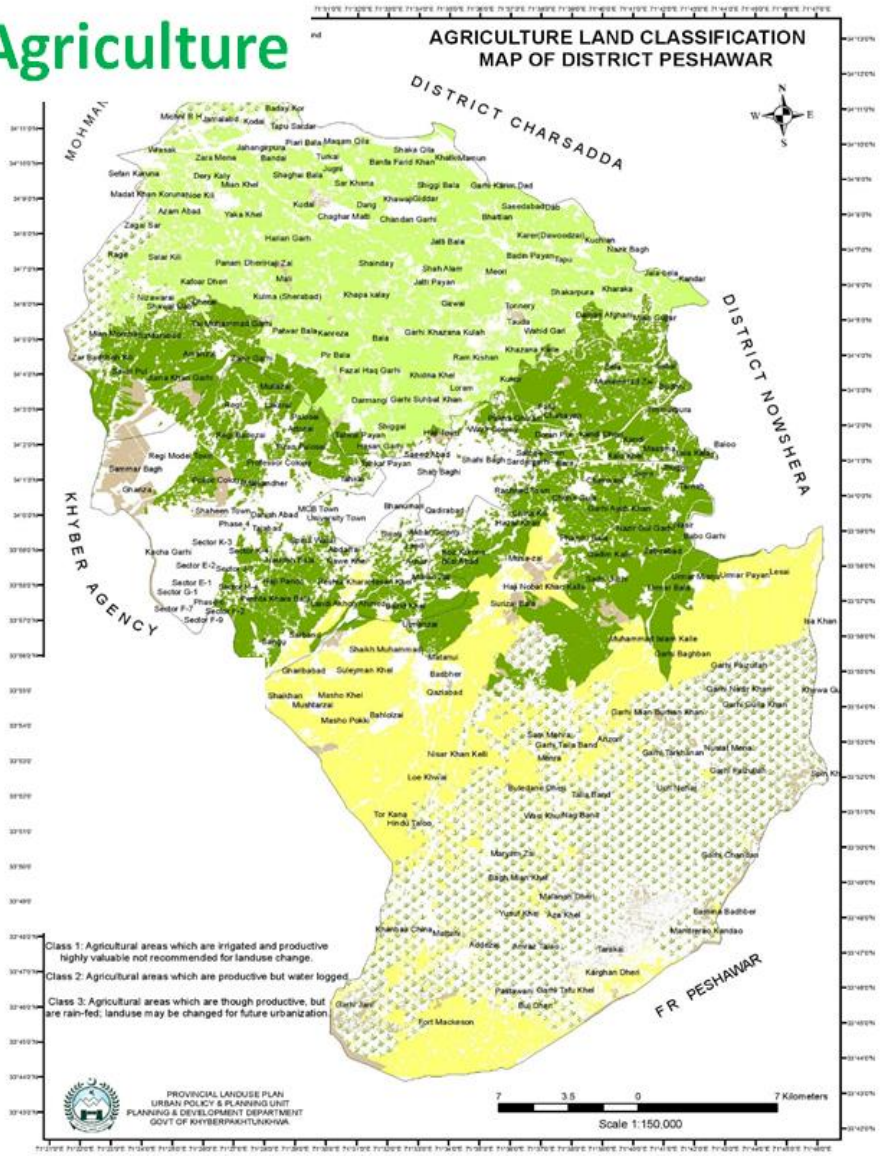
Figure 4. 5 Area Under Cultivation in District Peshawar

[72] District wise land use utilization in KP, Development Statistics of KP-2020



Map 4. 22: Agriculture Classification Map of District Peshawar

A.Agriculture

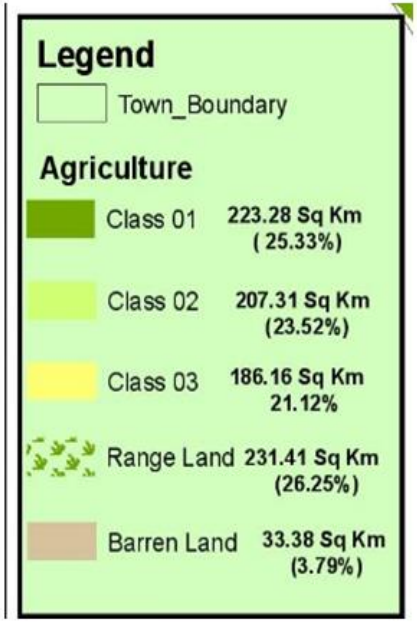


Agriculture Land Classification

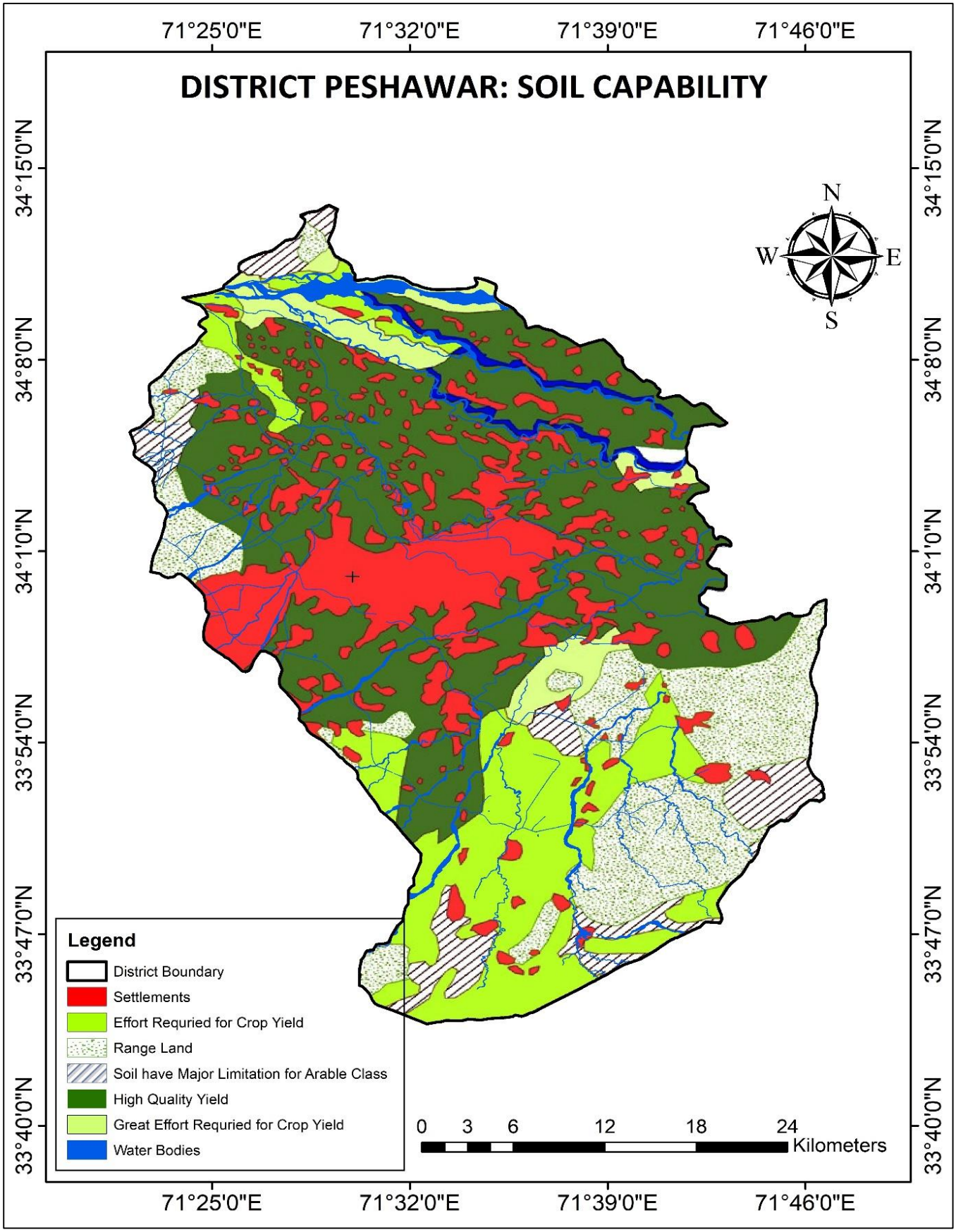
Class 1: Agricultural areas which are irrigated and productive; highly valuable not recommended for Land Use change.

Class 2: Agricultural areas which are productive but water logged

Class 3: Agricultural areas which are though productive, but are rain-fed; Land Use may be changed for future urbanization.



Map 4. 23: Agriculture classification Map of District Peshawar



Map 4. 24: Soil Capability Map of District Peshawar[73]

[73] Soil Survey of Pakistan

4.12.2 Distribution of Area by Product

Agricultural activities in plain areas of Pakistan are performed in two seasons. Those crops which are cultivated before the beginning of winter season and harvested in early summer are known as "rabi crops". They include wheat, barley, grams, oil seeds, pulses, etc. But those crops which are grown in the beginning in summer and their picking or harvesting takes place in early winter are called "Kharif Crops". These may include rice, sugarcane, millets and maize etc.

A vegetable is an edible plant or part of a plant, but usually excludes seeds and most sweet fruit. This typically means the leaf, stem, or root of a plant. Total area occupied by the vegetables during 2016-17 was 2549 hectares with a production of 31654 tons having 60% kharif and 40% rabbi production. Many hundreds of fruits, including fleshy fruits like apple, peach, pear, kiwifruit, watermelon and mango are commercially valuable as human food, eaten both fresh and as jams, marmalade and other preserves. Fruits are also used in manufactured foods like cookies, muffins, yogurt, ice cream, cakes, and many more. Many fruits are used to make beverages, such as fruit juices (orange juice, apple juice, grape juice, etc.) or alcoholic beverages, such as wine or brandy. Apples are often used to make vinegar. Fruits are also used for gift giving; fruit basket and fruit bouquet are some common forms of fruit gifts. The main fruits grown in the district are apricot, peach, plum, loquat, etc. The total area occupied by various fruits during 2016-17 in District Peshawar was 2521 hectares with a production of 12,601 tons, as compared to the session 2014-15 the total area occupied by various fruits were 2480 hectares with an average annual production of 15652 tons. Year wise statistics of crops, fruits and vegetables are presented in Table 4.43.

Table 4. 45: Distribution of Area by Crops in District Peshawar (Hectare)[74]

Product	2016-17			2017-18			2018-19		
	Area (ha)	Production (Ton)	Yield per Hectare in Kg	Area (ha)	Production (Ton)	Yield per Hectare in Kg	Area (ha)	Production (Ton)	Yield per Hectare in Kg
Wheat	34946	74980	2146	38688	72223	1867	38553	76547	1986
Maize	16352	30192	1846	1772	30363	1779	17000	30818	1813
Rice	340	714	2100	343	720	2099	339	715	2109
Barley	73	79	1082	120	116	967	145	167	1152
Sugarcane	10760	558884	51941	10729	556903	51906	10743	557506	51895
Rape Seed & Mustard	30	42	1400	128	105	820	81	70	864
Rabi Vegetables	688	12732	18506	652	11561	17732	648	11363	17535
Kharif Vegetables	1861	18922	10168	1909	18949	9926	1888	18942	10033
Rabi Fruits	231	2155	9329	253	2231	8818	261	2268	8690
Kharif Fruits	2290	10446	4562	2343	11060	4720	2349	11085	4719

[74] Development Statistics-2020

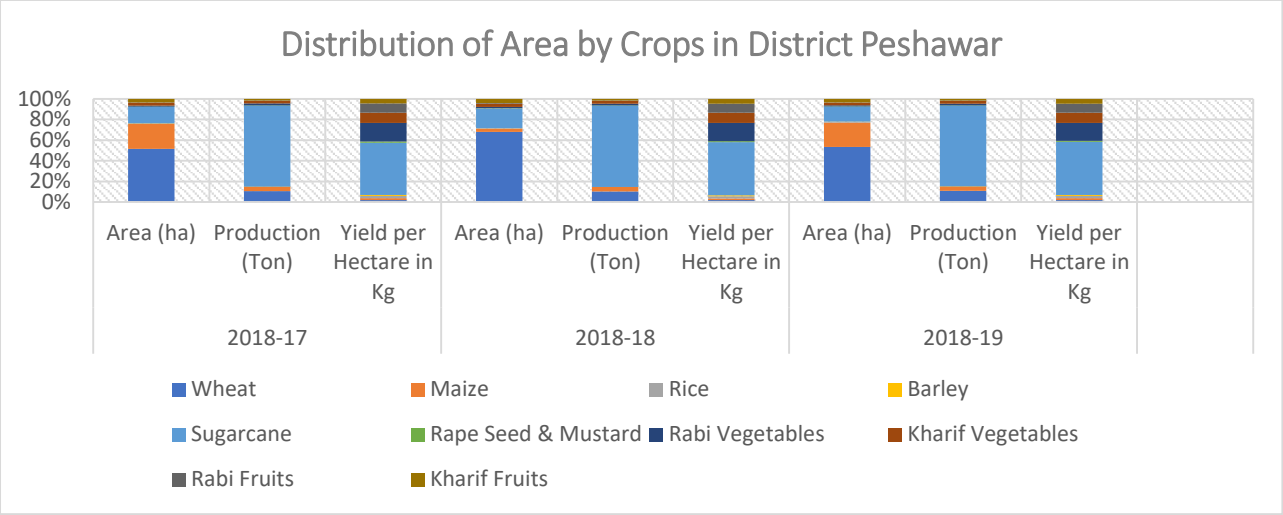


Figure 4. 6 Year-wise Crops Production in District Peshawar

4.12.3 Water Management and Type of Irrigation

According to the United Nations' "UN World Water Development Report", the total actual renewable water resources decreased from 2,961 m^3 per capita in 2000 to 1,420 m^3 per capita in 2005. A more recent study indicates an available supply of water of little more than 1,000 m^3 per person, which puts Pakistan in the category of a high stress country. Using data from the Pakistani federal government's Planning and Development Division, the overall water availability has decreased from 1,299 m^3 per capita in 1996-97 to 1,101 m^3 per capita in 2004-05. In view of growing population, urbanization and increased industrialization, the situation is likely to get worse. Nevertheless, excessive mining of groundwater goes on. Despite a lowering water table, the annual growth rate of electric tube-wells has been indicated to be 6.7% and for diesel tube-wells to be about 7.4%. In addition, increasing pollution and saltwater intrusion threaten the country's water resources. About 36% of the groundwater is classified as highly saline.

Table 5-44 shows the total irrigated area and types of irrigation used for agriculture irrigation. The total reported area in 2018-19 is 78696 hectares in which 27780 hectares is irrigated by government canals and 43067 hectares is irrigated by private canals while the rest of area is irrigated by farmers through different methods like tube wells, wells, left pump, etc.

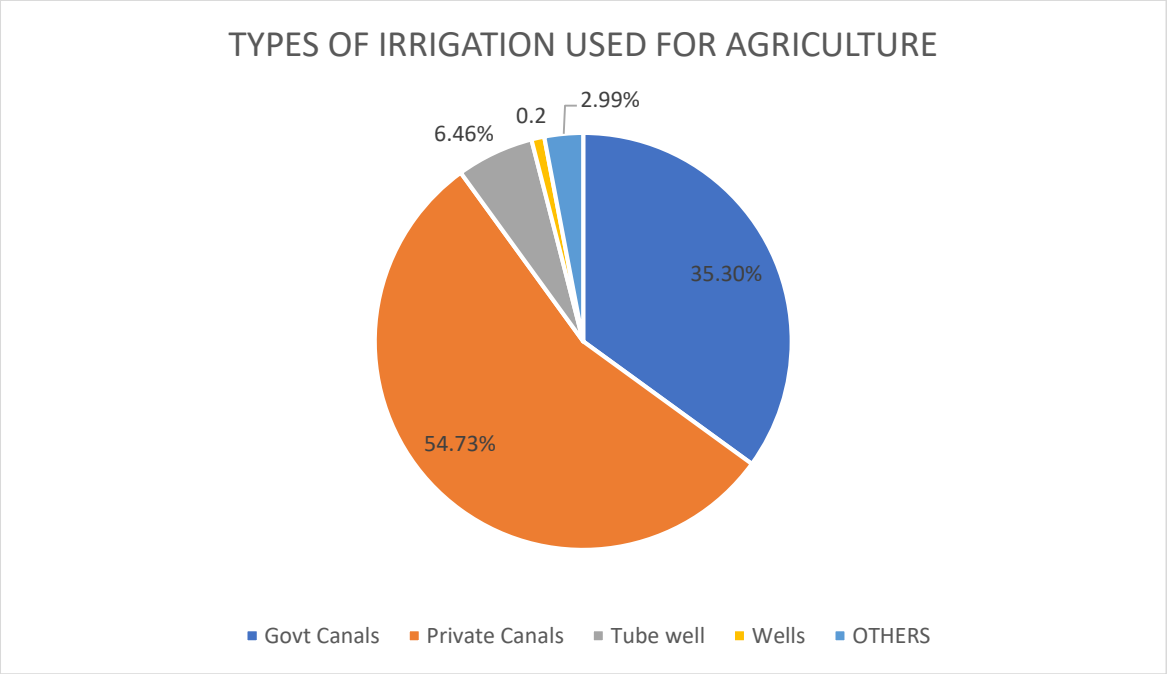


Figure 4. 7 Types of Irrigation Used for Agriculture in District Peshawar

Table 4. 46: Type of Irrigation Used for Agriculture in District Peshawar[75]

Year			2016-2017	2017-18	2018-19
Irrigated	Total		73749	78127	78696
	Canals	Govt	27265	28933	27780
		Private	37458	41122	43067
	Tube wells		5235	5289	5082
	Wells		1461	160	155
	Others		2085	2373	2360

4.12.4 Constraints

i. Lack of Education and Technical Knowledge

Most farmers of the district are un-educated and lack of technical knowledge. They are unable to understand the modern scientific methods of agriculture and often remain ignorant of good means to protect and increase their yield. Their production is therefore low.

ii. Lack of Capital and Burden of Debts

Majority of farmers are poor and they often live in a hand to mouth condition. Most of them are always under heavy burdens of debts. So due to lack of capital they cannot afford to purchase modern implements, fertilizers, improved seed, etc. Hence, they cannot attain the required standards.

[75] Development Statistics-2020

iii. Adherences to the Old Traditional Farming

Most of the farmers of the locality are still stuck to the old traditions of their forefathers. Because of small holdings of land and poverty they are unable to acquire and use modern technology. That is why their yield is lower than that of other provinces of the country.

iv. Water Logging and Salinity the Ailment to Soil

As some parts of the district are facing water logging and salinity problems which can adversely affect the crop productivity.

v. Uneconomical Land Holdings Size

Due to division of lands in family's generation by generation the lands are not enough to even fulfill the family needs. These small farmers do not get credit facilities to purchase seeds, pesticides, fertilizers, etc.

vi. Scarcity of Water for Irrigation

Optimum portion of the district face irrigation water shortage which affects the cropping pattern of the district, so the irrigation sources should be improved.

vii. Pests and Crop Diseases Break Through

Due to lack of agricultural education and methods of modern research, the farmers of the locality cannot control the various diseases of crops and attacks of pests and insects.

viii.Poor Means of Transportation

Many villages of the district have no or poor roads to the markets. So, farmers have to face innumerable hardships to sell their products. Hence the farmers take very little interest in their profession and so the production suffers.

ix. Low Yield per Acre of Crops, Fruit and Vegetables

The average yield of the district is much lower than the required yield, as there is a huge gap between the productive yield and wanted yield.

x. Water Wastage

Water wastage is very high in the locality. The archaic method of flood irrigation is still in practice in whole of the district.

4.12.5 Recommendations

- Those areas of the district which have water logging and salinity problems should be covered through crops like sugarcane and rice or through plantation of eucalyptus and poplar trees.
- Those farmers who have made their own tube wells, their water canals should be concreted to decrease their water loses and fuel consumption and increase their profitability.
- The area which is still cultivable waste should be able for cultivation through land reclamation, leveling irrigation, etc.
- As agriculture is directly related to water availability for that purpose either modern methods of irrigation composed of drip, sprinklers or tickle irrigation systems should be incorporated or additional water reservoirs should be started immediately.

- Plastic tunnels technology and organic farming should be encouraged among farming community, so that the farmers not only get better yield from a small piece of land but also through organic farming will improve soil fertility.
- Provide adequate credit facilities to the farmers, so the government should encourage commercial banks to provide credit to small farmers in addition to Zarai Taraqiati Bank.
- Resistant varieties and quality seeds according to the locality should be recommended by the government at lowest price and at the right time, so that the farmers can get better yield.
- The farmers should be aware about pest and disease attack through extension staff so that they can be able to control pest and diseases before damage to the crop.
- Transportation system should be improved so that the farmers can be able to bring their goods to the market easily.
- The seed certification and fertilizer quality should be strictly checked and regulated by the Federal Seed Certification and Registration Department on regular basis.
- Competition among the farmers for best production should be encouraged.

4.13 MINING

4.13.1 Mine and Mineral Resources in District Peshawar

There are two main types of minerals in District Peshawar i.e. Bentonite and minor minerals such as sand, bajri and gravel.

Bentonite is the only industrial type mineral extracted in the District, while minor minerals are sand, bajri and gravel, which are extracted from small streams and rivers banks. It usually forms from weathering of volcanic ash, most often in the presence of water. It is mined in District Peshawar in the areas of Aza Khel and Garhi Chandan. There is a total of seven leases for it, the aggregate lease area being 6,055 acres. The details of production of Bentonite in District Peshawar is given in table below 4-46.

Production (tonnes)			
Mineral	**2016-17**	**2017-18**	**2018-19**
Bentonite	**12029**	**1447**	**927**

Sand, gravel and bajri are categorised as minor minerals, these are excavated through dredging on the banks of river/stream/nulla side around Peshawar city. These are auctioned in blocks. The excavated material in tons is not recorded. Their leases are granted for one year only.

4.13.2 Environment Risks Due to Mining Activities

Mining is a hazardous activity; in addition, mines or queries are generally located in remote areas lacking the means of communication and civic amenities of town and cities. In District Peshawar indiscriminate mining activities being undertaken by private sector mine operators are causing irreparable damage to the environment, like destruction of landscape, nuisance caused due to dusty operations, etc. The mine operators due to lack of knowledge and awareness about the environmental problems do not pay much attention to adopt appropriate remedial measures.

Even if they know about the problem, due to lack of enough financial resources they hesitate to invest on protection of environment from adverse effects of their mining activities. Such activities are also creating significant health and safety related problems to workers. Workers due to lack of awareness about their own health and safety continue to work under hazardous conditions. The employer in a bid to earn maximum profit in shortest possible time often ignore safety of workers

4.13.3 Khyber Pakhtunkhwa Mineral Policy 2016

Bentonite clay is dig out in the southern and south-eastern part of the district, there is no metallic, gas or gemstones which are mined /exploited in this District. Minor minerals i.e., sand, bajri and gravel are also extracted from small streams and rivers banks.

The Core Policy Principals of Khyber Pakhtunkhwa Mineral Policy 2016

- To establish an internationally competitive, stable and conducive business climate to attract and sustain local and foreign investment for a steady increase in mineral production by lawful means;
- To give preference to integrated mining operations with linkages to upstream and downstream mining and processing related activities;
- To formulate a fiscal and regulatory regime that ensures fair value for Khyber Pakhtunkhwa while offering equitable rewards to private investors in minerals;
- To encourage and facilitate mining by legal means and prevent all illegal mining activities without fear or favor, and to frame stringent laws to deal with illegal mining activities.
- To ensure predictable mechanisms for the evaluation of competing land, water and other resource-use options;
- To eliminate and mitigate adverse social conditions and environmental degradation attributed to mining and related activities;
- To support and enable artisanal and small-scale mining activities that create employment, generate revenues and help reduce poverty, especially in rural areas;
- To ensure equitable distribution of benefits from mining and related activities to meet current and future public needs;
- To establish an effective and transparent administration and management of the mineral sector;
- Give preference to local value addition and processing of indigenous minerals.

4.13.4 Constraints and Recommendations in Mineral Sector

Khyber Pakhtunkhwa is endowed with in exhaustible resources of variety of minerals. To exploit these resources, the DGMM and other public sectors stake holders have to address following constraints:

- Bentonite is the most abundant mineral found in District Peshawar; it is found towards the southern side of the District. This area should be declared as mining zone and proper services and facilities should be provided in the area.
- To explore and evaluate the identified mineral deposits on scientific lines

- With the help of drilling and other geophysical methods reserve of mineral deposit have to be calculated.
- Geo chemical studies of each potential mineral deposit is necessary
- Capacity building is needed to meet the requirement of mining industry.
- In order to demonstrate mineral potential a systematic data generation and its documentation on sustainable basis is needed
- A step wise documented procedure be given in a booklet for starting a business in mining which should include, how to apply/renew/mine for a lease, what mining method one should adapt to mine/extract a particular mineral, what are the potential market and where to get human resource. All such information should be available free of cost. It will help the private entrepreneur to invest in mining sector.
- Other effective dissemination of mineral data as source of information should be used to attract as well as facilitate investment
- Bankable document on development of mine deposit be prepared so that banks can provide loans to the prospective entrepreneur in mining sector.
- Developing of curriculum for graduate/post graduate studies to suit the local mineral industry.
- Specialized training in coordination with public and private sectors should be arranged by the academia.
- Market oriented training and workshops be held on sustainable basis for the different levels of stake holders for the improved mining and market practices.
- R&D work should be conducted using indigenous technology for value addition of mineral product to suit the local and international market.
- In gemstones an accredited laboratory should be established to evaluate finished and uncut gems for marketing of gems in international market.

4.14 POWER AND DEVELOPMENT

Power sector is an important part of provincial land use plan. This plan is being prepared to provide systematic planning and to coordinate development activities for next 20 years for rural and urban population.

In the province of Khyber Pakhtunkhwa, electric power generation, transmission and distribution is facing a number of significant challenges. These include availability of reliable and affordable power, rehabilitation of aging and inadequate transmission and distribution system, and efficient construction, operation and maintenance.

4.14.1 Existing Generating Capacity

Electric power sector in Peshawar such as transmission and distribution are managed by PESCO (Peshawar Electric Supply Company). The Capacity of Power generation is limited to existing Warsak Dam only which has a design capacity of 243 MW, delivering 208 MW in summer, and 173 MW in winter.

4.14.2 Existing Shortfall

The quantity of electric power generated is not enough to fulfill the demands of country, which necessitates load shedding. Serious efforts are not made for efficiency improvements, maintenance and repair of power plants. The shut downs of plants become more frequent due to this reason. The ongoing Hydro Electric Power Projects has delayed to complete. According to Sustainable Development Policy Institute, the delay of 18 Hydro Power Plants led to an energy crisis and power short fall. Alternative energy power projects are not developed on large scale. Non-payments of fuel bills to some of Independent Power Producers (IPP's) by the government is causing shutting down of these power plants.

Table 4. 47: Power Shortfall – Khyber Pakhtunkhwa Vs District Peshawar[76]

S. No	Description	Khyber Pakhtunkhwa	Peshawar District
1	Average Demand	2100 MW	405 MW
2	Peak Demand	2487 MW	505 MW
3	Available Power	1179 MW	277.35 MW
4	Short Fall	921 MW	127.65 MW
5	Short Fall %	43.8 %	31.52 %

4.14.3 National Electricity Policy 2021

The Ministry of Water and Power of the Government of Pakistan has developed National Electricity Policy. The National Electricity Policy identifies the major goals sought to be achieved for the power sector, and in this respect, provides policy directions. It also provides the key guiding principles to develop subservient frameworks that will steer the decision making in the power sector to achieve identified goals. However, plans for implementation or specific operational instructions have not been prescribed, which shall be prepared by the Government in the form of periodic National Electricity Plans. Such plans may also provide guidelines for specific initiatives for a particular subsector / segment of the power sector.

GOALS FOR THE POWER SECTOR

- **ACCESS TO AFFORDABLE ENERGY**

  Accessibility of electric supply to all areas, including rural areas, at affordable rates is the cornerstone of socio-economic development. Making power available, when it is not affordable, has limited value. The Government shall strive to ensure that electricity is accessible to all consumers at rates which commensurate with their ability to pay, coupled with development of an efficient and liquid market design. A liquid market design and affordable supply of electricity would also contribute vastly to the financial turnaround and commercial viability of the power sector.

- **ENERGY SECURITY**

  Energy security, including uninterrupted availability of energy sources, is an essential goal for the power sector. The Government shall endeavor to diversify the fuel mix of the generation capacity in the country, through optimal utilization of energy resources, such as hydro, renewable sources, coal, natural gas and nuclear.

[76] Peshawar Electric Supply Company

- **SUSTAINABILITY**

  The sustainability of the power sector is of paramount importance, and all sector entities shall strive to take such steps as are required to ensure such sustainability. This shall include: measures to minimize environmental degradation, technical and operational sustainability, integrated development of the power sector, and financial self-sustainability, including progressive elimination of circular debt. The energy intensity optimization, coupled with enhanced energy efficiency and conservation measures, will also contribute towards overall sustainability.

4.14.4 Provincial Power Policy

- Government of Khyber Pakhtunkhwa is fully aware of the private investors' needs of having a simple and transparent framework for their investment by providing all facilities for safe investment in an environment of fair competitive concessions and attractive return on investment. The development narrative of the provincial government so contained in the Strategic Development Partnership Framework (SDPF) and Economic Growth Strategy (EGS) recognizes power generation as a definitive indicator of economic growth and has therefore, spelt out the objectives and processes in an enabling regulatory regime. Encouraging local and foreign investment is a key feature of the government policies in order to develop the infrastructure and power projects in Khyber Pakhtunkhwa. These concessions and incentives are fully in accord with the concessions and incentives provided by the Federal Government.
- In view of the above, the GoKP has announced a new hydro power policy (2016) which offers enhanced incentives and simplified processing mechanism for setting up of power generation plants to bridge the demand supply gap in the minimum time through generation of affordable electricity. To achieve these purposes, the GoKP has designated Pakhtunkhwa Energy Development Organization (PEDO) as the one window facilitator and implementation agency of the policy.
- Khyber Pakhtunkhwa Hydro Power Policy 2016 offers profitable business opportunity, modern engineering and technical processes, lower costs of doing business so that local and international investors may fully participate as partners in the development of hydro power projects.

4.14.5 Constraints

- Safe and reliable transmission and distribution of electricity is a major problem due to weak infrastructure of Transmission Lines and Grid Stations. Shut down and tripping are more frequent due to this problem.
- Seasonal variation in hydro power generation due to less water available in winter is a serious problem. Therefore, full capacity of hydro power cannot be generated in winter season.
- Some of the thermal power plants are run by fuel oil, which is an imported item, the cost of electricity generation is very high as compared to other renewable energy systems
- Coal is available in very large quantity but federal government does not encourage power production from coal.
- Power production from solar energy is not developed on large scale. Peak demands during the day can be met with the support of this energy

4.14.6 Recommendations

i. Federal and Provincial Govt should launch a large-scale expansion program to use the renewable Hydro Electric Potential for power generation.

ii. Coal is one of the principal minerals available in abundance in the country. Govt. should develop a policy to install large power plants to utilize this mineral, at district level, small scale coal gasification plants can be installed to add to existing power generation.

iii. Solar energy is available free of cost and there is a need to develop and popularize the solar power plants on large scale at district level.

iv. The provincial Govt. should increase awareness among the public to use renewable energy. A commercial module shall be developed so that the private sector can follow the same line.

v. The available infrastructure of transmission lines and grid stations should be repaired and upgraded to reduce technical losses and to reduce shut downs. The ratio of HT to LT line length needs to be improved by extending more HT lines. Selective re-conducting of heavily loaded feeders should be done to reduce HT losses.

vi. Illegal consumer and losses can be reduced to an acceptable limit as follows:

- The Open conductor LT lines are notoriously vulnerable to unauthorized hooking or kunda connections. Some of the open LT transmission lines should be replaced with new technology, covered multiplex conductors. This would assist in limiting loss from this source
- Approximately 95% of PESCO meters are still of the old Electro-Mechanical type. These are vulnerable to slowing and tampering by any one. Large-scale meter tampering, and illegal kunda connections are done with the help of company employees. Therefore, replacement of these meters with electronic units will reduce meter tempering.

4.15 ECONOMIC DEVELOPMENT AND LAND USE PLAN

Land is a finite physical entity in terms of its topography and spatial nature; a broader integrative view also includes natural resources: the minerals, water, geology and the soils biota that the land comprises. The Land Use spatially occurs horizontally and can change only in terms of location, area, zoning and type of use; the resources which have been studied under different sectors and grouped into four broad categories are liable to change with technology, time, demand and exploitation of resources. Investment in particular sector will result vertical growth and will bring changes in the economic base of the region.

The District Peshawar Land Use Plan is based on exhaustive data collection situation. For economic development the district land resources are used in ways that take advantage of all these sectors; More over by examining all uses of land in an integrated manner, makes it possible to minimize conflicts, to choose better trade-offs and to link social and economic development with spatial land use and land resources, that will help achieve the objectives of sustainable development. The essence of the integrated approach finds expression in the coordination of varied sectors planning and management activities concerned with various aspects of land use and land resources.

4.15.1 Physical Context

Climate directly contributes to agriculture production, soil fertility and socio-economic prosperity of a region either positively or negatively while the climate of Peshawar is moderate, therefore, its impact on land use planning and economic development will be negligible.

The geological study of Peshawar District indicates that there are limited natural resources. The soil is suitable both for agriculture and building construction. About 80% land is covered by recent river, stream and flood plain deposits while the rest 20% area is covered by other rock types which are revealed in the outcrops to the West, South-West and South of the District. In the Peshawar District Land Use Plan, separate mining zone has been marked which will contribute to the economy of the region.

The District Peshawar in general and the city of Peshawar in particular facing various environmental issues. Environmental problems both in the urban area and the peri-urban area are quite pronounced; pollution of surface and subsurface water, air and noise pollution that emerge from lack of implementing EPA Act and siting of non-compatible Land Uses, non-availability of proper sanitation system, burning of waste, improper disposal of hazardous waste and haphazard traffic. It is recommended that the environmental management shall be recognized as a high priority sector and propose to establish environmental accountability. It is also recommended that the department responsible for industrial and municipal wastewater and waste disposal shall be encouraged and mandated to recognize their responsibility for environmental management. Environment is a cross cutting theme and indirectly and directly impacts economic and social sectors, investment in this sector by adopting proper Land Use and mitigating hazards will have a multiplier effect on the economy.

Floods have direct impact on economy of a region as it results in damage to life and assets. During 2010 and 2012, vast area was affected by floods. In the Land Use Plan Flood porn areas has been identified and development of major infrastructure has been prohibited in such areas urban development or any other developments that may result in loss of life and property during floods has been prohibited. Area liable to flooding has been earmarked for farming/plantation. This will result in minimizing the adverse effect on economy, thus contributing to economic growth.

The KP government initiated a participatory program to decline water logging in the province through Billion tree afforestation program. Water logging and salinity is inversely proportion to agriculture production and economy of a region. It is recommended that a two-prong approach should be adopted.

- An awareness program should be started to educate the farmers with proper irrigation and up-to-date agriculture; which will enhance utilization of water-logging and salinity zones.
- Program like OWFM and the RSP should be recommended to boost the agriculture economy and shown remarkable success in declining water logging and salinity through partnership basis programs.

4.15.2 Social Context

Demographically population and its composition by age and gender and its spatial spread along a time series is one of the basic factors affecting both the Land Use and economic growth. Demographic growth and economic growth are inverse; the higher the population growth the lower the economic growth. Additionally, education, level of skills, labor force, and the

proportion of dependent population are some of the factors that also affect Land Use and economy. Proper demographic projections for District Peshawar for the next 20 years using different forecasting model such as regression analysis, extrapolation and cohort-survival method were carried out. The current (2021) population of District Peshawar is estimated to be 4.9 million, likely to increase to about 10 million in the year 2040.

Housing is another vital factor; as it impacts both the Land Use, and employment, generating in construction and service industry. Integrated approach has been used for identifying location for housing in the Land Use Plans. All factors that affect housing demand and supply such as income, land values, proximity to urban services, availability of transportation linkages, employment opportunities, cost of infrastructure, availability of construction materials and technology; health and education facilities have been considered. Prime agricultural land has been reserved for agriculture only and conversion of prime agricultural land to housing and other urban uses has been prohibited. The total housing required for the next 20 years, including the existing backlog, is estimated to be 832228. This will generate economic activity both during land development and construction as well as employment in education, health, commerce and transportation.

Education sector play a pivotal role in land use planning and significantly impact the access to quality educational opportunities within convenient distribution of land uses particularly in large urban centers. The educational opportunities in Peshawar have attracted many new residents and businesses. There is a wide range of educational opportunities available in the District. However, the Land Use Plan should also encourage education sector to establish new institutions that provide people with the skills they need for the changing job market.

The educational facilities and axillary service both the local population and regionally areas at the district and even provincial level for higher and special education. The accompanied economic activities are direct employment for teaching and other jobs and indirect economic activities for serving large segments of population in and around the universities, technical colleges, medical colleges and training institutes. Additionally, it also generates economic activities in transportation sector, small business of stationery & Books, computers and other accessories. Finally, the trained and skilled youth in the district will ultimately serve the province and the nation, thereby generating higher and will contribute to national and environmental GDP.

The Land Use for health is spatially spread at two tiers, the local or micro level health centers which are located close to the residential areas, and in the rural areas, and the hospitals which work at district, regional and even provincial level for inpatient and outpatient facilities. There is a strong linkage between health and economic growth; a healthier citizen is more productive and contributes substantially to district economy. This institution also results in providing jobs for the medical professionals and para-medics as well as generate small business activities for the health sector such as medical store, labs and private clinics, etc. Intervention to health facilities, district Peshawar is already situated and there is no further need of large heath facilities but special attention must be given to improved health services. ‘

Industries play a key role in economic magnification of a city. Industry delivers products to the market, engenders revenue and generates employment. Peshawar has enough number of scattered industries with two industrial estates located in Hayatabad and Kohat road, while for future development a site for third industrial estate has been proposed in the DLUP. Industries in the city center cause environmental degradation, traffic congestion and overcrowding which

impacts the residents as well as its city, therefore the consultants suggest that a policy should be adopted to restrict industries in the city centers.

Trade and Commerce is the major income and employment-generating sector of the district. large proportion of population of all ages directly or indirectly depends on commerce and trade related activity. The Land Use under trade and commerce at present is widely spread intermixed with residential areas and spreads along all roads and streets. Being the provincial headquarter and a regional hub for adjoining towns and even for Afghanistan, the District has trade and commerce linkages at international, national and regional levels. Provincial head offices of major banks, whole sale markets and centers for import and export of goods and services are also located in Peshawar city. Areas under the use of trade and commerce are proposed in a planned way which will generate employment and income directly and indirectly thus contributing to the economic development of the region and the province.

Recreational facilities and open spaces contribute to the health and environment of a community; which in turn indirectly impacts economic development. The Land Use under recreation is declining which needs immediate attention. Around 9 parks and play grounds where rehabilitated and upgraded under the beautification plan of the urban policy unit that has significantly increased the number of functional open spaces in city but the number of parks and play grounds are still far below to fulfill needs of the current population. The major open spaces/parks in District Peshawar are Army Stadium, Bagh-e-Naran, Jinnah Park, Wazir Bagh, Ali Mardan Khan Gardens, Shahi Bagh, Garrison Park and Tatara Park etc. Besides, there are a number of historical places such as Qilla Bala Hissar, Mahabat Khan Mosque, ShahjiKi Dheri, Peshawar University, Islamia College Peshawar, Peshawar Museum and Namak Mandi etc. These parks collectively do not meet the criteria for open spaces, parks and recreational facilities for the present population. The proposed land use includes development of parks and play grounds which will have a direct and indirect impact on the economy of the region.

4.15.3 Physical Infrastructure

Infrastructure is a key ingredient for continued growth, productivity and economic development. Conceptually, physical infrastructure may affect aggregate output in two ways: first, directly because infrastructure services enter production as an additional input, and second, because they raise total factor productivity by reducing transaction and other costs thus allowing a more efficient use of conventional productive inputs. In the Peshawar district four sectors namely: Water Supply, Sewerage & Drainage; Traffic and Transport, Power and Telecommunications are included in this section. Details by each of these sectors are presented below:

Most of District Peshawar has piped water supply system, which is underground and does not show as a zone in the Land Use, however the waterworks and OHRs and surface reservoirs take up some land, but that too is so negligible when considered at the district level. The major Land Use in this sector is the open drains and the treatment works for sewage and disposal stations. The condition and efficiency of the WASH system directly has a direct linkage to the economic development. Enhancing the quality and quantity of water, and collection and treatment of municipal and industrial waste water in accordance with the KP Environmental act 2014 has been recommended by the consultants. The improved infrastructure of WASH will have direct impact on the economy of the region, as safe water will contribute to health of the citizens and be available for businesses and industries. Waste water and sanitation is not a threat but an opportunity where we can find green employment. Proper disposal of wastewater will result in

reduction of pollution and contamination of surface and subsurface water, that will help in reduction of water born diseases.

Transportation network influences land use and development trends, therefore there is a need of integrating transportation and land use proposals. The main transport infrastructure in Peshawar is provided by the Bacha Khan International Airport, (Peshawar served by both National and International airlines) two major Railway Stations Namely City and Cantonment (operated by Pakistan Railways), three main highways specifically the Motorway (M1), the Grand Trunk Road (N5) and the Indus Highway (N55), and links to several other highways.

Based on analytical review of the existing conditions of traffic and transport in District Peshawar, the Consultants have proposed an Inner Ring Road, Intermediate Ring Road, and access control Outer Ring Road. These roads have been integrated with the Land Use proposals, and also to reduce traffic load on Jamrud Road and its off-shoots passing through congested urban. Peshawar being the provincial capital and the largest city of KPK, and with prevailing transportation problems on its major roads justifies a mass public transport system, in the form of Bus Rapid Transits with dedicated lane.

The impact of the ring roads, mass transit system and creation of a planned city center will result in efficient movement of goods and passengers providing intercity and intra city linkages, which will directly contribute to the economy of the region and result in enhanced regional income. This strategy will also generate economic activity by creating employment during construction period and later in the transport sector as drivers, cleaners, managers, maintenance workers, gas stations repair shops and a host of other activities.

Power sector is an important part of DLUP, to provide systematic planning and to coordinate development activities for next 20 years for rural and urban population. Electric power sector in Peshawar such as transmission and distribution are managed by PESCO (Peshawar Electric Supply Company).

The Capacity of Power generation is limited to existing Warsak Dam only which has a design capacity of 243 MW, delivering 208 MW in summer, and 173 MW in winter. No other site is available for Hydel Power generation in Peshawar.

There is a need to encourage and popularize the solar power generation at district and local level. The available infrastructure of transmission lines and grid stations should be repaired and upgraded to reduce technical losses. The power has a direct linkage with economic development and once improved and made sustainable the economy of the area will grow further.

The process for planning and developing telecom services have to be in line with Land Use planning strategies, so that regulations related to radio frequency engineering standards can be used as illustrative planning tool that coincides with the underlying zoning. Co-relating Land Use planning with telecom infrastructure protects aesthetics and property values by helping in controlling the number of future sites that are located in an area. There is a total of 40 telephone exchanges in District Peshawar and 91 broad band sites. Other telecom services in Peshawar include PTCL V Phone (Wireless) and DSL. Telecom assets are a special class of IT assets that require an accurate inventory for effective financial management.

4.15.4 District Resources

Peshawar district is very rich in natural resources including; Agriculture, livestock, water, minerals and forestry. The former two are developed in the rural areas around the Peshawar Urban area, while minerals and forestry still need to be exploited to optimize their use, water resources both as natural surface water and subsurface water are sufficient, however, the contamination due to the leachate from solid waste and wastewater as well as chemical and fertilizer overflow from agriculture is affecting the surface water producing a threat to the quality of water and survival of flora and fauna. Brief of each of these resources and their impact on the economic development of the district is presented below:

Urbanization is often considered to have negative impacts on agriculture; for instance, from the loss of agricultural land to urban expansion and an urban bias in public funding for infrastructure, services and subsidies. However, due consideration has been given to this aspect in the district Land Use plan and prime agricultural land in the North has been retained for agricultural Land Use, with recommendations to discourage urbanization related activity in that area. Considering that the District Peshawar is famous for producing both food and cash crops it is recommended that:

- Areas affected by water logging and salinity Issues should be used for tree plantation and crops.
- Farmers using tube wells for irrigation should be encouraged and channels will be lined by concrete to decrease the water losses and fuel consumption, that will increase their profitability.
- The area which is still cultivable waste should be enabled for cultivation through land reclamation, leveling, irrigation, etc.
- The farmers should encourage to use modern methods of irrigation such as drip, sprinklers or tickle irrigation systems should be incorporated or additional water reservoirs should be started.
- Farm to market roads should be improved so that the farmers are able to bring their goods to the market easily.

These interventions will result in higher farm income and economic growth of the district and the province.

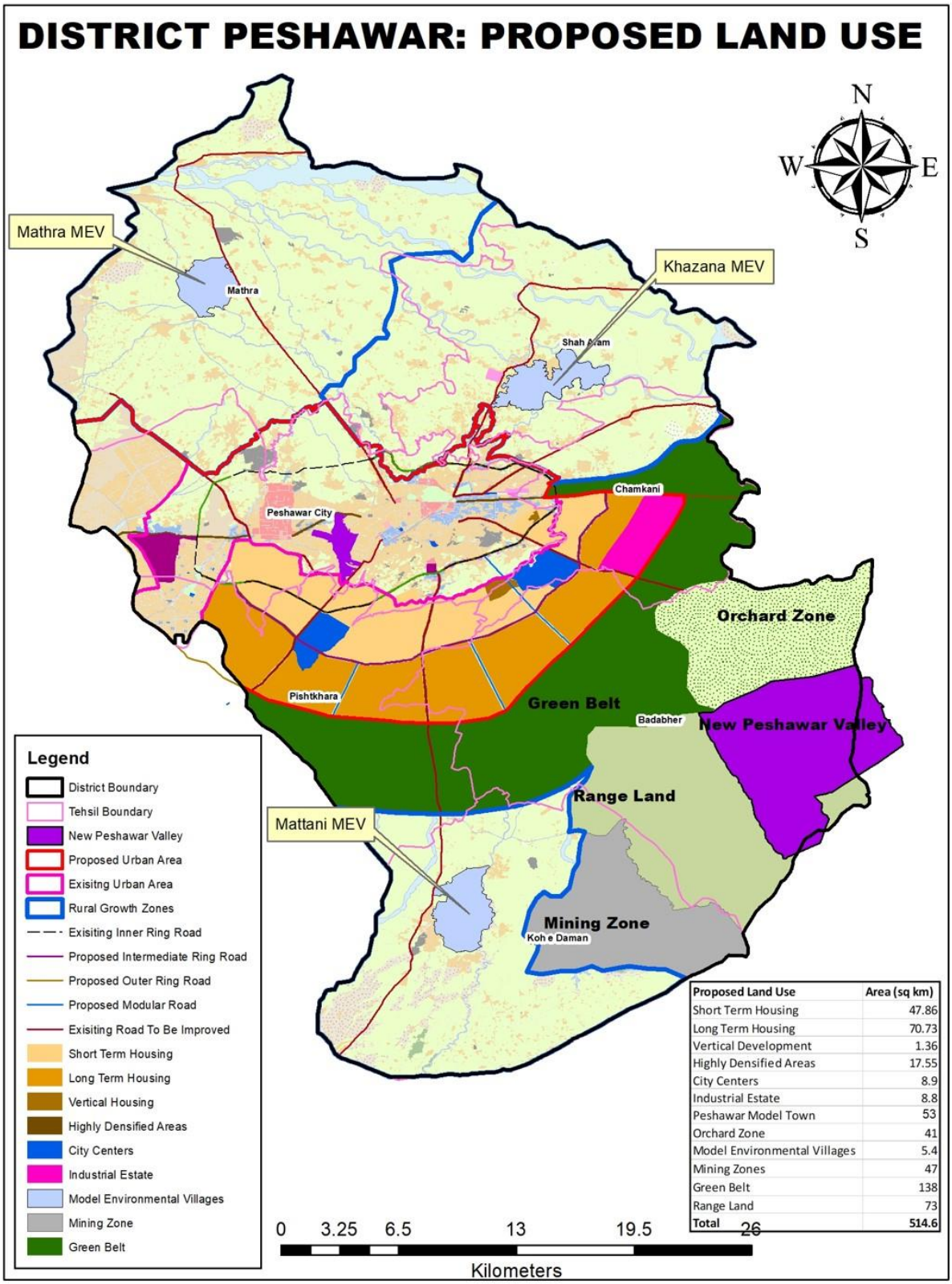
The District has a potential of increasing the value of livestock, and a zone has been reserved for pastures and rangeland. Livestock in the District comprise goats (36%), followed by cattle (30%), buffaloes (19%) and sheep (9%). While 6 % of the livestock is camels, horses, mules and donkeys. Additionally, there are 430 poultry farm and 63 fish farms in District Peshawar.

The livestock sector in Khyber Pakhtunkhwa, despite having great potential for poverty alleviation, has not developed on commercial lines because of paucity of funds, capacity and technology constraints. Another important benefit of livestock is the best utilization of the passive woman labor force which makes more than 50% of national population. Besides the above some Non-Governmental Organizations are also working for improvement of the socio-economic status of the livestock farmers. The product of livestock especially goats both slaughtered and live are mostly exported to Afghanistan and Middle East, this potential shall be exploited to increase the provincial income and economic development of the region.

In Peshawar District the main source of water is the dug and tube wells which draw ground water from the three aquifers namely, Kabul River and its canals including Warsak Canal, Swat River and its tributaries and rainwater fed aquifer close to the hills. The depth of the groundwater table is less than 5m, except in the vicinity of the mountains and in a smaller region in the South-East of the plain, where it ranges from 5 to 3mm. For economic development and increase in rural income the government of KPK under the existing irrigation and agricultural system is committed to increasing productivity of poverty alleviation and greater economic benefits. To this end, programs are being initiated for increasing yield and value of crops and reducing farm inputs especially water. By increasing the productivity of water, the GoKPK will on one hand achieve higher agricultural income as a means of intensifying agricultural production, while on the other hand this program will result in reducing environmental degradation. The existing water resource delivery system is inequitable and unpredictable, and many schemes demonstrate a marked absence of proper planning. In many areas, tube wells have been installed without assessing the underground water situation. Similarly, there is no inter-sectoral coordination or consensus in the construction of small dams.

The District of Peshawar is not very rich in mineral resources. Only bentonite clay is extracted in the southern and south-eastern part of the district, there is no metallic, fuel/energy minerals or gemstones which are mined /exploited in this District. Minor minerals i.e., sand, bajri and gravel are also extracted from small streams and rivers banks. Marble cutting and polishing units in the District. Mining of bentonite mostly takes place towards south/south-eastern end of the District, which has been earmarked as a 'mining zone'. This sector needs to be developed both for trained manpower and extraction mining. The economic contribution of the mining sector in Peshawar District is quite low and needs to be institutionalized and enhanced.

The northern part of KP province is very rich in the forest resources, however, in Peshawar district there are hardly any forests. The area under forests in the District is less than 0.1% of the total forest area of the district. Forest playing a vital role in environment protection and have multiple advantages beside beautification. It is suggested that ribbon forestry shall be encouraged by planting trees along the highways, roads and canals.



Proposed Land Use	Area (sq km)
Short Term Housing	47.86
Long Term Housing	70.73
Vertical Development	1.36
Highly Densified Areas	17.55
City Centers	8.9
Industrial Estate	8.8
Peshawar Model Town	53
Orchard Zone	41
Model Environmental Villages	5.4
Mining Zones	47
Green Belt	138
Range Land	73
Total	514.6

Map 4. 25: Proposed Land Use Map of District Peshawar

CHAPTER 5: LAND USE PLANNING FOR RURAL AREAS

5.1 POLICY GUIDELINES FOR SUSTAINABLE DEVELOPMENT OF RURAL AREAS

The peripheral area and countryside of Peshawar is a fertile and productive agricultural land. The agricultural land in the vicinity of the built-up area however, has been gradually absorbed by urban growth. Consequently, the agricultural main-stay and the rural character and economy of the surrounding villages have shattered. These rural settlements are gradually getting converted to "entrapped urban villages". Agricultural land exists all around the urbanized area of Peshawar, particularly in the northern and southern directions. It is dependent upon the extent of arable soil and availability of irrigation water. The agricultural tracts northern part of the district is more productive, as these are served with water courses in form of canals and irrigation minors. Thus, this area is declared as an Agricultural Zone-I, lying between the proposed Outer Ring Road and the district boundary.

As already stated, agricultural land exists all around the urbanized area of Peshawar, particularly in the northern and southern parts. The better-quality agricultural land lies towards north of the city, served with water courses in form of canals and irrigation minors which, with varying degrees' flow throughout the year. The southern part of the District is lesser productive in terms of agriculture, but has been declared as Agricultural Zone-II.

This Section proposes guidelines on different aspects of land use planning in rural areas of the district. Planning policies should facilitate and promote sustainable patterns of development in rural areas. This should include policies to sustain, enhance and, where appropriate, revitalize rural settlements and villages for strong, diverse, economic activity, whilst maintaining local character and a high-quality environment. To ensure this, local planning authorities should be aware of the circumstances, needs and priorities of the rural communities and businesses in their area, and of the interdependence between urban and rural areas.

People who live or work in rural areas should have reasonable access to a range of services and facilities. Local planning authorities should facilitate and plan for accessible new services and facilities, particularly where there is an identified need for new or expanded services to strengthen the role of a particular local service center. It should also be ensured that where possible, new development in identified service centers is supported through improvements to public transport, and to walking and cycling facilities; and support mixed and multi-purpose uses that maintain community vitality.

The Planning Authority should also support the provision of small-scale, local facilities to meet community needs outside identified local service centers, particularly where they would benefit those rural residents who would find it difficult to use more distant service centers. These local facilities should be located within or adjacent to existing villages and settlements where access can be gained by walking, cycling and (where available) public transport.

There needs to be a positive approach to planning proposals designed to improve the viability, and community value of existing services and facilities, e.g. village shops and post offices, rural petrol stations, mosques and community buildings, that play an important role in sustaining village communities.

Many villages are of considerable historic value, or make an important contribution to local rural character. Planning authorities should ensure that development respects and, where possible,

enhances these particular qualities. It should also contribute to a sense of local identity and regional diversity and be of an appropriate design and scale for its location.

Planning authorities should take a positive approach to innovative, high-quality contemporary designs that are sensitive to their immediate setting and help to make country towns and villages better places for people to live and work.

It should be ensured that the quality and character of rural areas is protected and, where possible, enhanced. There should be particular regard to any areas that have been statutorily designated for their landscape, wildlife or historic qualities where greater priority should be given to restraint of potentially damaging development.

The objective of sustainable developments in rural areas is to raise the quality of life and the environment in rural areas through the promotion of:

- Good quality, sustainable development that respects and, where possible, enhances local distinctiveness and the intrinsic qualities of the countryside; and
- Continued protection of the open countryside for the benefit of all, with the highest level of protection for our most valued landscapes and environmental resources.
- To promote more sustainable patterns of development:
- Focusing most development in, or next to, existing towns and villages;
- Preventing urban sprawl;
- Promoting a range of uses to maximize the potential benefits of the countryside fringing urban areas; and
- Providing appropriate leisure opportunities to enable urban and rural dwellers to enjoy the wider countryside.
- To promote sustainable, diverse and adaptable agriculture sectors where farming achieves high environmental standards, minimizing impact on natural resources, and manages valued landscapes and biodiversity; contributes both directly and indirectly to rural economic diversity; is itself competitive and profitable; and provides high quality products that the public wants.

5.1.1 Key Principles

i. Sustainable development is the core principle and foundation of good land use planning. The following key principles should be applied:

Decisions on development proposals should be based on sustainable development principles, ensuring an integrated approach to the consideration of:

- Social inclusion, recognizing the needs of everyone;
- Effective protection and enhancement of the environment;
- Prudent use of natural resources; and
- Maintaining high and stable levels of economic growth and employment.

ii. Good quality, carefully-sited accessible development within existing towns and villages should be allowed where it benefits the local economy and/or community (e.g. affordable housing for identified local needs); maintains or enhances the local environment; and does not conflict with other planning policies.

iii. Accessibility should be a key consideration in all development decisions. Most developments which are likely to generate large numbers of trips should be located in or next to towns or other service centers that are accessible by public transport, walking and cycling. Decisions on the location of other developments in rural areas should, where possible, give people the greatest opportunity to access them by public transport, walking and cycling, consistent with achieving the primary purpose of the development.

iv. New building development in the open countryside away from existing settlements, or outside areas allocated for development in development plans, should be strictly controlled; the overall aim is to protect the countryside for the sake of its intrinsic character and beauty, the diversity of its landscapes, heritage and wildlife, the wealth of its natural resources so it may be enjoyed by all.

v. Priority should be given to the re-use of previously-developed ('brownfield') sites in preference to the development of greenfield sites, except in cases where there are no brownfield sites available, or these brownfield sites perform so poorly in terms of sustainability considerations (for example, in their remoteness from settlements and services) in comparison with greenfield sites.

vi. All development in rural areas should be well designed and inclusive, in keeping and scale with its location, and sensitive to the character of the countryside and local distinctiveness.

5.1.2 Agriculture and Farm Diversification

Agricultural Development

The Government recognizes the important and varied roles of agriculture, including in the maintenance and management of rural areas. Thus, there is a need to proposals that will enable farming and farmers to:

- Become more competitive, sustainable and environmentally friendly;
- Adapt to new and changing markets;
- Diversify into new agricultural opportunities
- Broaden their operations to 'add value' to their primary production.

The presence of best and most fertile agricultural land should be taken into account alongside other sustainability considerations (e.g. biodiversity; the quality and character of the landscape; its amenity value or heritage interest; accessibility to infrastructure, workforce and markets; maintaining viable communities; and the protection of natural resources, including soil quality).

Where significant development of agricultural land is unavoidable, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality, except where this would be inconsistent with other sustainability considerations. If any undeveloped agricultural land needs to be developed, any adverse effects on the environment should be minimized.

Sediment Load and its Effect on Agriculture

Ground water is the major source of public water supply. The Peshawar Municipality, and its surrounding areas like cantonment and other settlements form a part of main hydrological basin. The ground water used in Peshawar is the part of the major aquifer system of Peshawar valley basin. As the sediments play an important role in hydraulic and geometric nature of aquifer, hence it is imperative to have a brief understanding about the deposition of alluvial sediments.

Peshawar is a closed basin surrounded by hills on all sides, which have made it an inter-mountain basin. The sediment from the hills are brought into the basin by the streams and water courses (nullahs) originating in them and finally terminating into the basin. The basin exhibits semi lacstrin environments of deposition resulting in accumulation of thick clays in the central part, however, Hayatabad and surrounding areas being close to the hills, experience a deposition of boulders and coarse material. While the farther areas experience a different phenomenon, as the silt gets deposited there.

There are three major aquifer systems: 1) Phratic (water table) aquifer system and 2) confined (artesian) aquifer system, 3) flood plains, streams aquifer. Water table in the aquifer is found to a depth of 125 meters below ground surface and is mainly composed of coarse sand and gravels.

The Peshawar inter-mountain basin is a broad, oval shaped depression comprising of a thick sequence of lacustrine, deltaic and fluvial sediments overlain by loess and alluvial deposits dated at 2.8 to 0.6 Ma (Hussain et al. 1998). These sediments, consisting mainly of sand and gravel, form productive aquifers in the north and south of the basin

In the central part, the coarse sediments are inter-bedded with clay, silt and sandy silt, attaining its maximum thickness and providing semi-confinement for a number of aquifers. Khyber, Attock-Cherat and Lower Swat-Buner piedmont aquifers occur on the periphery of the basin, whereas flood plain and lacustrine aquifers occupy the central part of the basin.

Sedimentary rocks in the basin are layered with regionally continuous aquifers inter-bedded with aquitards. Deep basal aquifers are commonly composed of un-cemented sandstones and/or karstic carbonates, whereas aquitards consist typically of fine-grained limestone, mudstone, evaporites, and crystalline basement.

Hydraulic conductivity in the basin ranges from 30-60 m/day and average specific yield is 12%. Water table elevation varies considerably in the area. It ranges from less than 100 m in the southern portion to more than 1500 m in the mountainous north (in relation to the mean sea level).

Much of the sediment supply to rivers and other water bodies, is attributed to agriculture, as a result of erosion. The loss of top soil by sheet erosion and gully erosion, generates sediment, which moves down to rivers. Soil erosion is usually the result of poor agricultural and irrigation practices. It is known that, soil is rendered as a wasteland due to the practices, which are not conducive to proper use of soil. The resulting unproductive soil is subjected to erosion, due to weathering processes, causing sediment load, which finds its way to water bodies. In addition to high turbidity that is caused in water bodies, due to sediments, ecological impacts are caused, as a result of deposition in river beds. These ecological impacts are more pronounced in downstream areas.

5.1.3 Tourism and Leisure

Tourism and leisure activities are vital to many rural economies and sustaining many rural businesses. Tourism industry is a significant source of employment to support the prosperity of villages, local heritage and culture.

Sustainable rural tourism and leisure developments that benefit rural businesses, communities and visitors and which utilize and enrich, but do not harm, the character of the countryside, its towns, villages, buildings and other features.

Area with high landscape value, nature conservation or historic qualities should be recognized and designated as such. The provision of essential facilities for tourist visitors is vital for the development of the tourism industry in rural areas.

5.2 RURAL SETTLEMENTS IN DISTRICT PESHAWAR

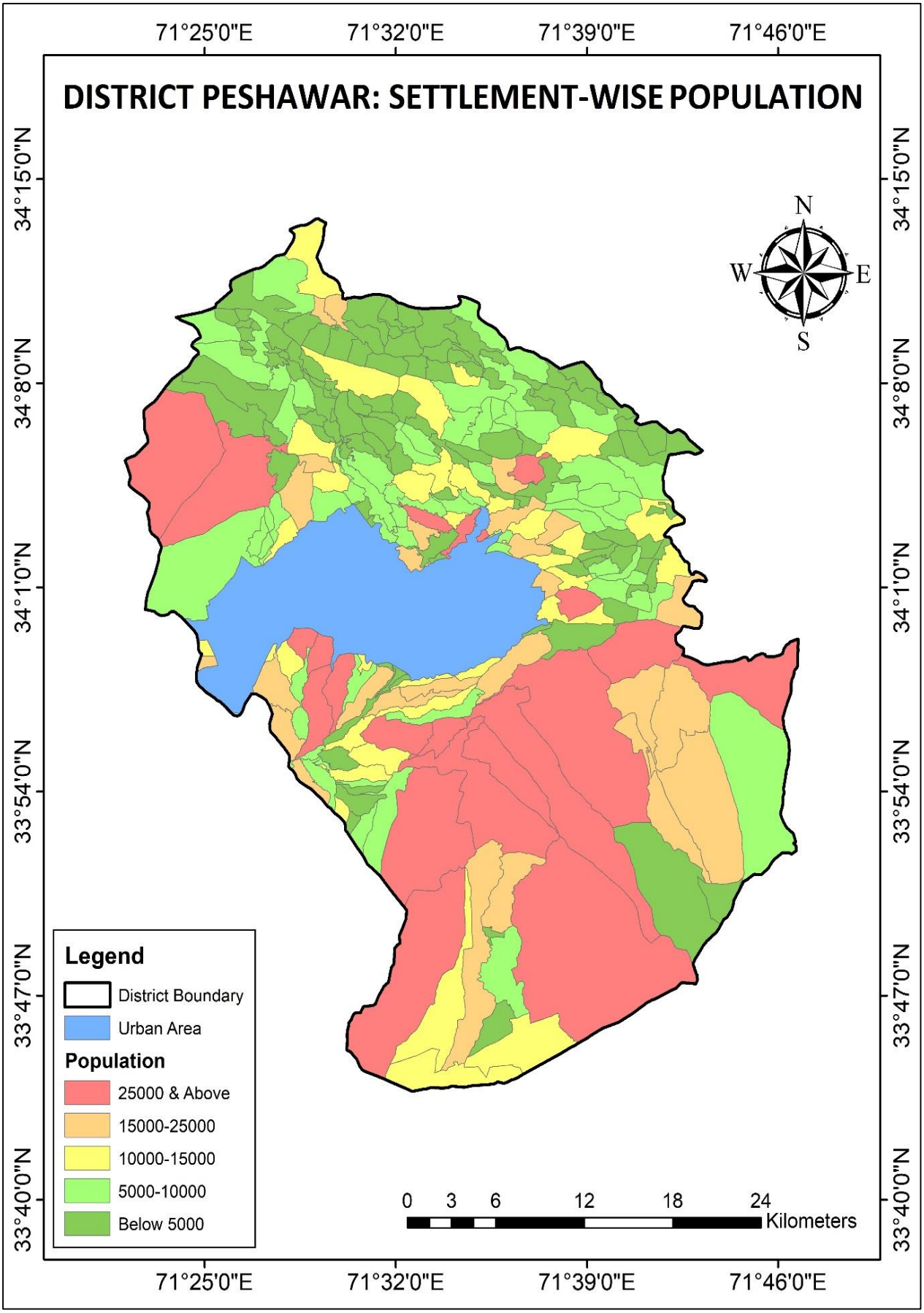
5.2.1 Rural Settlements

As per District Census Report of District Peshawar, there are 247 rural settlements in the districts in the year 2017. For analysis rural population is categorized into five class the detail of which is tabulated below.

Table 5. 1: Number of Rural Settlements in Peshawar District

Sr. No	Category	Settlements
1	25000 & Above	Sorizai Payan,Mashoo Gaggar,Noudeh Bala,Larama,Mattani,Toda,Shahi Bala,Sorizai Bala,Sufaid Sang,Aza khel,Chamkani,Sarband,Urmar Payan,Maira Kachori,Shekh Mahmadai,Sufaid Dheri,Phandu,Badaber Maryamzai,Pajagi,Urmar Miana
2	15000 - 25000	Pakha Ghulam,Achani Bala,pushti kara bala,Ahmad Khel,Pushti Khara Payan,Badaber Hurazai,Khazana,Khulizai,Shekhan,Fatu Abdul Rahem,Musazai,Sangu,Urmar bala,Bazid Khel,Mulazai,Garhi Baghban,Ghari Faizullah,Landi Akhun Ahmed,Panam Dheri,Maryamzai,Shagi Hindkiyan,Chughol Pur,Kukar,Tarnab,Deh Faqir
3	10000 - 15000	Achani Payan,Badaber Hurazai Mera,Chaghar Matti,Ulizai,Regi Ulfat zai,Wadpaga,Haryana Payan,Alizai,Mathra,Haryana Bala,Mashoo Khel,Choha Gujjar,Deh Bahadur,Isa Khel Topchian,Takht Abad Awal,Budhu (Samar Bagh),Shahab khel,Sherkera Adizai,Sardar Ghari,Sherkera Mushtarika,Suleman khel,Doran Pura,Choli,Garhi Chandan,Qila Sha Baig,Budhni,Nichapa Payan,Lala,Noudeh Payan,Shakar Pura,Pasani
4	5000 - 10000	Mulago,Ahadipura,Kalo Khel,Mushtarzai,Landi Bala,Utmanzai,Jatti Payan,Dhaag,Urmar Maira,Regi Rukizai,Maira Mushtarika,Pir bala,Galje Kandar Khel,Kaniza,Isa Khel Hamid,Daman-e-Afghani,Zarmandi (Michani),Jatti Bala,Ghari Chandan,Shah Alam,Jogyan,Ram Kishan,Regi Yousafzai,Gulozai,Mian Gujar,Barkas,Dalazak,Lakri Kaniza,Kochian,Regi Lalma,Nahaqi,Mewra,Garhi Baloch Abad,Dar mangai,Bunyadi,Zor mandi,Jhalarian,Gulbela,Muhammadzai,Mandra Khel,Haji Pando,rashida,Nasar Pur,Terai Payan,Patwar Payan,Daman-e-Hindki,Saiban,Garhi Sherdad,Mamoon,Bela Niko Khan`,Regi Badazai,Alizai (Daudzai),Budhai,Kara Khel,Garhi Fazal Haq,Garhi Hamza,Gara Tajak,Behlool Zai,Gulabad,Terai Bala,Yousaf Khel

Sr. No	Category	Settlements
5	Below 5000	Bela Momandan,Tukra no.5,Kafor Dehri,gari sikandar khan,Taimber pora,Shahinda,Kareray,Bela Bramd Khel,Nichapa Bala,Kochiyan,Kapa,Dheri Kalay,Palosai Talarzai,Ghari Mali Khel,Patwar Bala,Mashoo Peki,Charpriza,Barber,Hargoni,Kankola,Garhi Sharif Khan,Shagi Bala,Har say badin,Kharaka,Jala Bela,Naimi,Garanga Payan,Anizai,Garanga Bala,Babuzai,Sarkhana,Bhatian,Shagi Payan,Shahi Payan,Garhi Jani,Ghari Karim dad,Wazir Kali,shagli bala,Zara Miana,Ghoi,Dab,Kolma Sherabad,Garhi Sarfraz,Fatu Khel,Garhi Mir Tayyab,Khat,Kala,Khawaji,Mian Khel,Nelawi,Nissata,Garhi Ali Miuhammad,Jogni,Ghari rano,Hassanabad,Karyana,Masma,Palusi Maqadar Zai,Sher Kalay,Melogan,Landi Daudzai,Najoi,Qadarabad,Ghari Khazanchi(Yaseenabad),Garhi Gula,Jagra,Char Gulla (Sheikh Killi),Sahibi,Choh,Mahal Salo,Khatki,Dang Lakhta,Kandi Delawar,Khatar,Zara Payan,Takht Abad Dom,Palusi Attu Zai,Garhi Sadoo,Shaggi Payan,Boda Kandar Khel,Ghari Chandan,Kandi Hayat,Garhi Sherdil,Sara Sang,Hajizai,Pyari Payan,Malo,Ghari Shamshato,Mandona,Bagh Miankhel,Pyari Bala,Char Gulla,Yarghajoi,Fateh Qila,Haryan Ghar,Garhi Shah Mohamad,Jabba Jungle,Chaba,Gedar (Khanpur),Zara Bala,Banda Payan,Yakh dand,Hamid Qala,Banda Bala,Garhi Banjar,Chak maziabad,Kadi Korona,Aloo Killi,Mashai,Chel Gazi



Map 5. 1: Settlement-Wise Population Map of District Peshawar

5.2.2 Growth Pattern of Rural Settlements

Based on the populations of villages as given in the census reports of 1998 and 2017, growth rate of each rural settlement was calculated, based on which these settlements have been divided into 3 categories as per following criteria:

- Rapidly growing villages (growth rate above 7%)
- Moderately growing villages (growth rate between 4%-7%).
- Slowly growing villages (growth rate below 4%)

The results are presented in Table 5.2. As seen, of the total 247[77] rural settlements, 19 villages are rapidly growing, 73 have moderate growth and 155 villages have slow growth.

Table 5. 2: Growth Rate of Rural Settlements in District Peshawar

Growth Category	Growth Rates	No of Settlements
Fast Growing	Above 7%	19
Moderate Growing	4-7%	73
Slow Growing	Below 4%	155

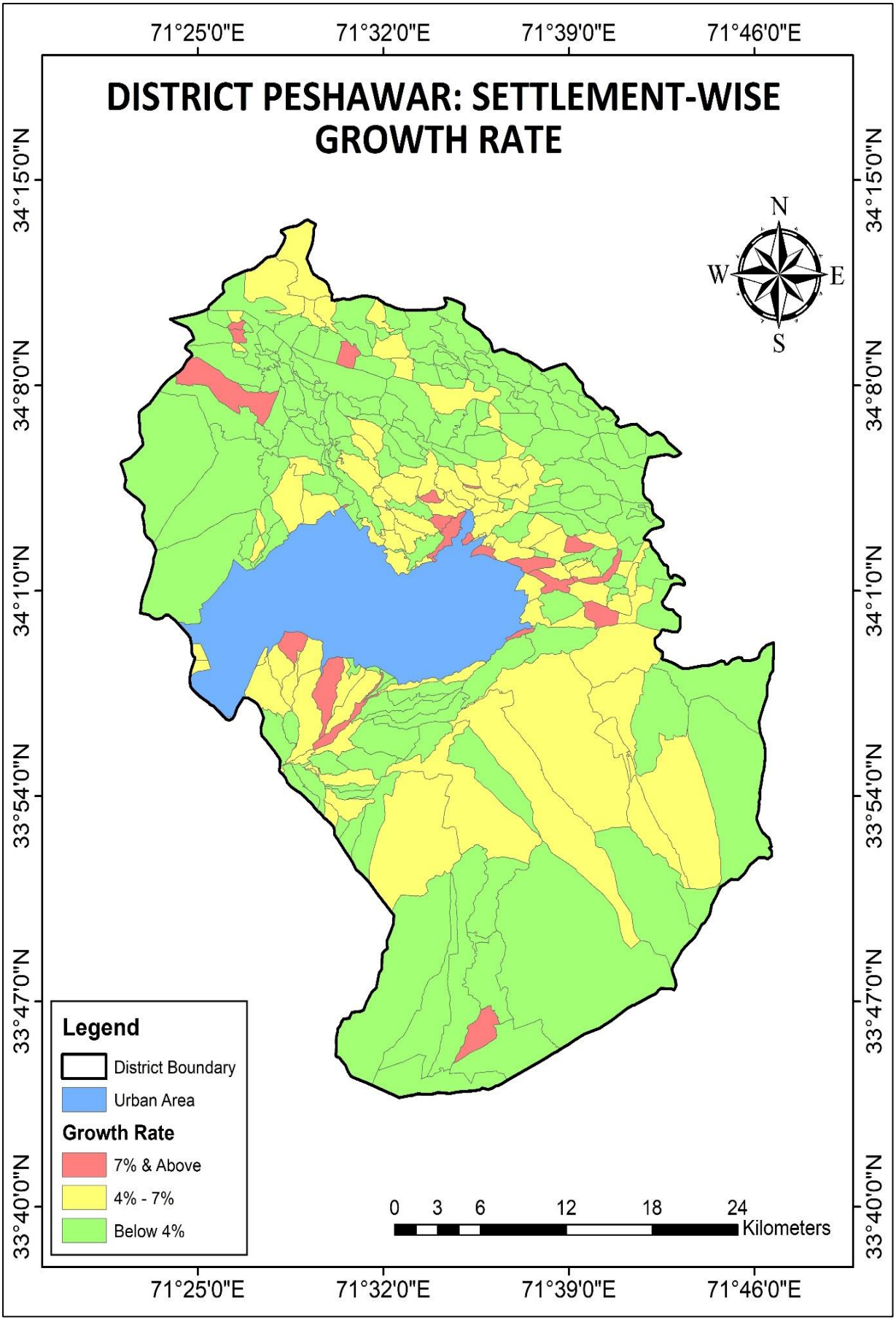
5.2.3 Rapidly Growing Rural Settlements

As seen in Table 5.2, there are 19 fast growing villages in District Peshawar. There is however vast variation in their growth rates, ranging from 7% to over 20%, as calculated by consultants from census reports of 2017 and 1998. Such settlements therefore have been further sub-categorized into the categories as shown in Table 6.3, based on their growth rates. Based on these categories, names of villages falling in each category are given in Table 6.4.

[77]A few villages in 1998 Census were not listed, and hence their growth rate could not be calculated.

Table 5. 3: Rapidly Growing Settlements in District Peshawar

Category	Growth Rate	Settlements
High	Above 7%	Fatu Khel,Tukra no.5,Garhi Mir Tayyab,Garhi Banjar,Palusi Maqadar Zai,Jhalarian,Kalo Khel,Sardar Ghari,Doran Pura,Noudeh Bala,Isa Khel Topchian,Palusi Attu Zai,Garhi Sarfraz,Jogni,Zara Miana,Jagra,Choh,Phandu,Larama
Medium	4% to 7%	Mulazai,Garhi Baghban,Banda Bala,Ahadipura,Haryana Bala,Kaniza,Qila Sha Baig,Haryana Payan,Budhai,Ghari Faizullah,Achani Payan,Zarmandi (Michani),Garhi Hamza,Toda,Sorizai Payan,Ghari Khazanchi(Yaseenabad),Pajagi,Barkas,Hargoni,Choha Gujjar,Pushti Khara Payan,Lakri Kaniza,Dar mangai,Jogyan,pushti kara bala,Zor mandi,rashida,Deh Faqir,Garhi Baloch Abad,Kukar,Mashoo Peki,Pir bala,Masma,Terai Bala,Khawaji,Jatti Bala,Chughol Pur,Fatu Abdul Rahem,Saiban,Mashoo Gaggar,Naimi,Landi Akhun Ahmed,Nichapa Bala,Pakha Ghulam,Shagi Hindkiyan,Achani Bala,Zara Payan,Deh Bahadur,Mulago,Maira Kachori,Panam Dheri,Sorizai Bala,Sarband,Shahinda,Wadpaga,Khazana,Chak maziabad,Mahal Salo,Kapa,Urmar bala,Ram Kishan,Kala,Regi Rukizai,Terai Payan,Shahab khel,Mashoo Khel,Choli,Garhi Sherdil,Ghari rano,Garhi Fazal Haq,Sufaid Dheri,Kankola,Haji Pando
Low	Below 4%	Alizai (Daudzai),Nasar Pur,Garhi Ali Miuhammad,Kara Khel,Har say badin,Tarnab,Yakh dand,Garanga Payan,Nichapa Payan,Ahmad Khel,Mamoon,Gulabad,Mushtarzai,Shakar Pura,Shekhan,Isa Khel Hamid,Chaba,Sherkera Adizai,Hassanabad,Chamkani,Mattani,Bela Niko Khan`,Kareray,Najoi,Bela Momandan,Mandra Khel,Sangu,Musazai,Bazid Khel,Gulbela,Regi Badazai,Mathra,Shahi Bala,Shah Alam,Lala,Budhu (Samar Bagh),Regi Ulfat zai,Charpriza,Dheri Kalay,Sufaid Sang,Ghari Mali Khel,Urmar Maira,Taimber pora,gari sikandar khan,Kochian,Palosai Talarzai,Khulizai,Pyari Payan,Kolma Sherabad,Qadarabad,Dalazak,Gara Tajak,Kafor Dehri,Suleman khel,Nissata,Garhi Sharif Khan,Alizai,Ghari Karim dad,Jatti Payan,Mian Khel,Sara Sang,Yousaf Khel,Urmar Miana,Garhi Sherdad,Bunyadi,Barber,Nahaqi,Shagi Bala,Aza khel,Maira Mushtarika,Shaggi Payan,Maryamzai,Garhi Chandan,Muhammadzai,Malo,Galje Kandar Khel,Dab,Patwar Payan,shagli bala,Melogan,Ulizai,Daman-e-Afghani,Landi Bala,Sher Kalay,Babuzai,Gulozai,Takht Abad Awal,Badaber Maryamzai,Behlool Zai,Ghari Shamshato,Pasani,Chaghar Matti,Garhi Sadoo,Takht Abad Dom,Shahi Payan,Khat,Dhaag,Regi Lalma,Bagh Miankhel,Ghoi,Gedar (Khanpur),Shagi Payan,Ghari Chandan,Daman-e-Hindki,Sahibi,Urmar Payan,Garanga Bala,Jala Bela,Fateh Qila,Nelawi,Wazir Kali,Budhni,Bhatian,Kharaka,Garhi Gula,Khatar,Mian Gujar,Karyana,Sarkhana,Patwar Bala,Mewra,Boda Kandar Khel,Landi Daudzai,Utmanzai,Anizai,Kandi Delawar,Badaber Hurazai,Hajizai,Bela Bramd Khel,Dang Lakhta,Noudeh Payan,Garhi Jani,Yarghajoi,Haryan Ghar,Shekh Mahmadai,Sherkera Mushtarika,Char Gulla (Sheikh Killi),Kochiyan,Ghari Chandan,Mandona,Pyari Bala,Kandi Hayat,Jabba Jungle,Garhi Shah Mohamad,Regi Yousafzai,Hamid Qala,Banda Payan,Khatki,Mashai,Aloo Killi,Zara Bala,Char Gulla,Chel Gazi,Badaber Hurazai Mera,Kadi Korona



Map 5. 2: Settlement-Wise Growth Rate Map of District Peshawar

5.3 RURAL DEVELOPMENT THROUGH GROWTH CENTERS

For rural development, it is important to conceive a strategy of developing growth centers aimed at strengthening local governments' financial and administrative capabilities, and improved channels for effective citizen participation in solving problems of common concern. This calls for additional investments in infrastructure and the provision of incentives for micro/cottage industries and services to be located in the identified growth centers. In rural areas, opportunities need to be created to make rural life more bearable, so that these areas can retain their human capital for agricultural, agribusiness and off-farm activities instead of losing them to the urban centers where opportunities may be limited. This would entail developing rural infrastructure including schools and health clinics and feeder roads to enhance market access for farming households.

No regional development concept or theory has received greater attention among regional planners than growth pole theory. It has been subject to various definitions and interpretations, and its application has spread across the globe considerably. The growth pole theory, as originally formulated, assumes that growth does not appear everywhere at the same time, but it manifests itself in "points" or "poles" of growth, and the growth spreads by different channels and eventually affects the economy as a whole.

In order to attract private sector initiative to accelerate employment-generating activities in the rural areas, it is important to provide urban amenities in rural areas with the objective of stimulating high growth in rural economies. The development of agribusiness and agro-industrial enterprises should be the starting point of any sustainable industrialization process. Agribusiness and agro-industry development can be catalyzed by supporting funding for installation, rehabilitation, and operation of critical infrastructure of "public good" nature that connect rural to urban centers and help integrate the rural economies with the more advanced urban economies.

Such critical infrastructure includes feeder roads, telecommunications systems, public utilities (water supply and sanitation, and energy), and transport facilities. Market access is key to a sustainable increase in agricultural and related products, for without improved access to markets, increases in agricultural productivity cannot translate into higher incomes. Urban bias in terms of investment and infrastructure, in isolation of rural area can be detrimental and costly for the concerned district/region as a whole. These negative aspects may include:

- Proliferation of urban sprawl;
- Premature conversion of rural agricultural land and timberland into urban
- Uses;
- Escalation in urban-fringe land prices;
- Lowering water quality due to disturbance of the natural hydrological
- Function;
- Impairing the quality of rural living.

For District Peshawar, a number of villages throughout the District have been identified which are proposed to be developed as growth centers in the district rural system. These would be the places that could grow to fill the gap between the urban area and smaller villages.

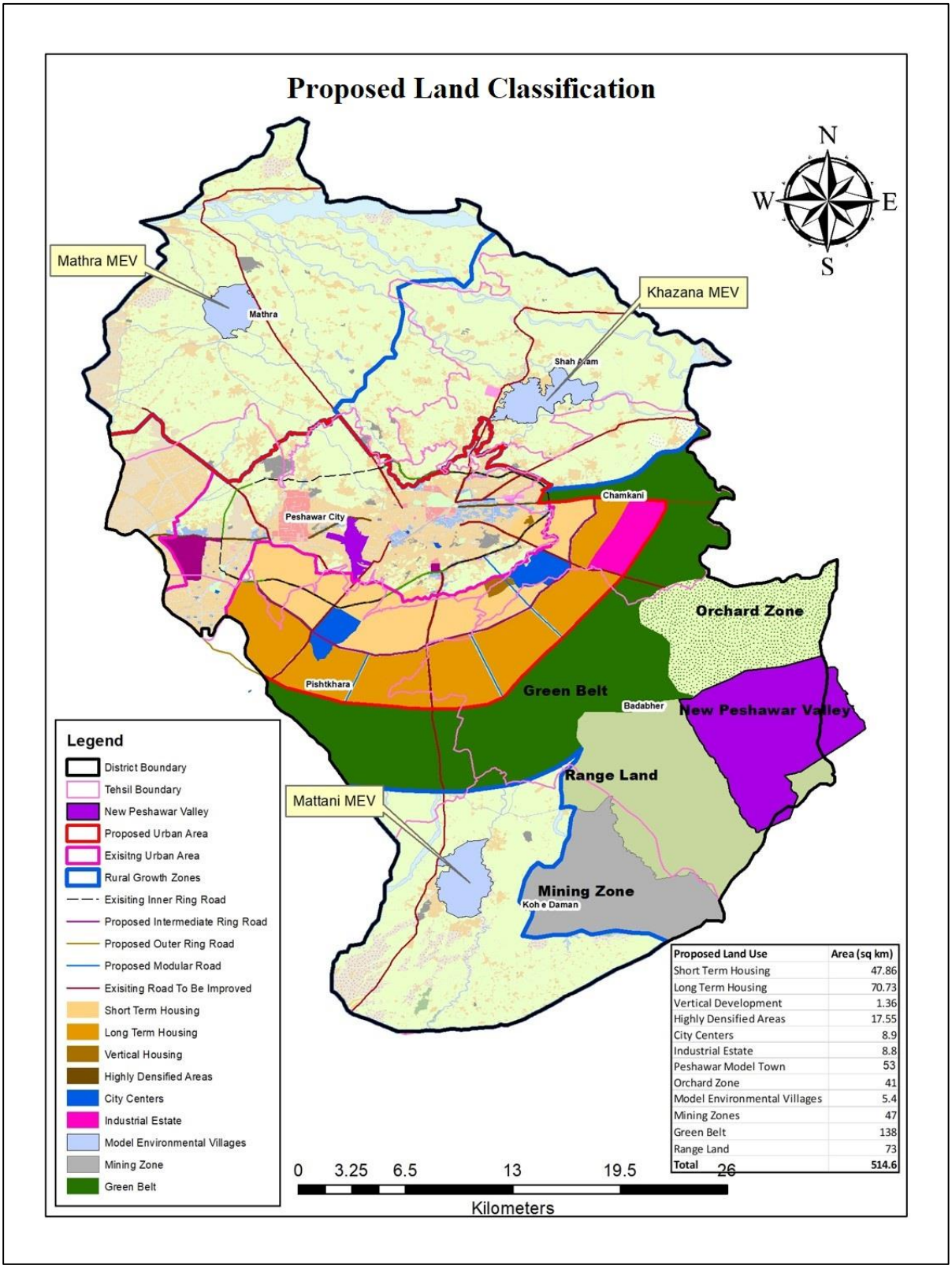
There are 92 union councils in the District, of which 34 are urban and 58 are rural[78]. To reduce migration to urban areas, a number of measures can be taken such as employment opportunities near or around the villages, better inter-village road connectivity, provision of basic facilities such as good healthcare, quality education, provision of adequate infrastructure and physical improvement of villages including village streets and houses.

To achieve the above, rural area of district Peshawar is proposed to be divided into a number of rural zones, and a centralized village within each such zone designated as Growth Centre for the rural zone as shown in (Map 5-4). The Growth Centre will have a model environmental village with the following facilities to serve the rural zone.

5.3.1 Facilities in Rural Growth Centers

- Model Rural Health Centre
- High/Higher Secondary School Veterinary Centre
- Repair shops for tractors and other agricultural implements
- Agro-based micro industrial sector
- Good quality rural roads, connecting Growth Centre with other main villages of the rural zone, and also a road connecting Growth Centre with the nearby highway/major road.
- Transport terminal
- Fruit/vegetable market, which may serve as sale as well as purchase point
- Grain market/warehouse, where applicable
- Post Office
- Banks
- Revenue Office
- Play Field
- Sub-Police Station

[78] Source: KPK Land Use Project, District Studies Report Peshawar, Chapter 6.



Map 5. 3: Proposed Land Classification Map of District Peshawar

5.3.2 Model Environmental Villages

As explain in the earlier section each growth zone will contain a growth center to reduce rural migration toward large urban centers. A model environmental village is proposed in every growth center which will provide urban service in rural environment to the nearby villages.

Table 5. 4: Population Forecasts of Rural Growth Zones

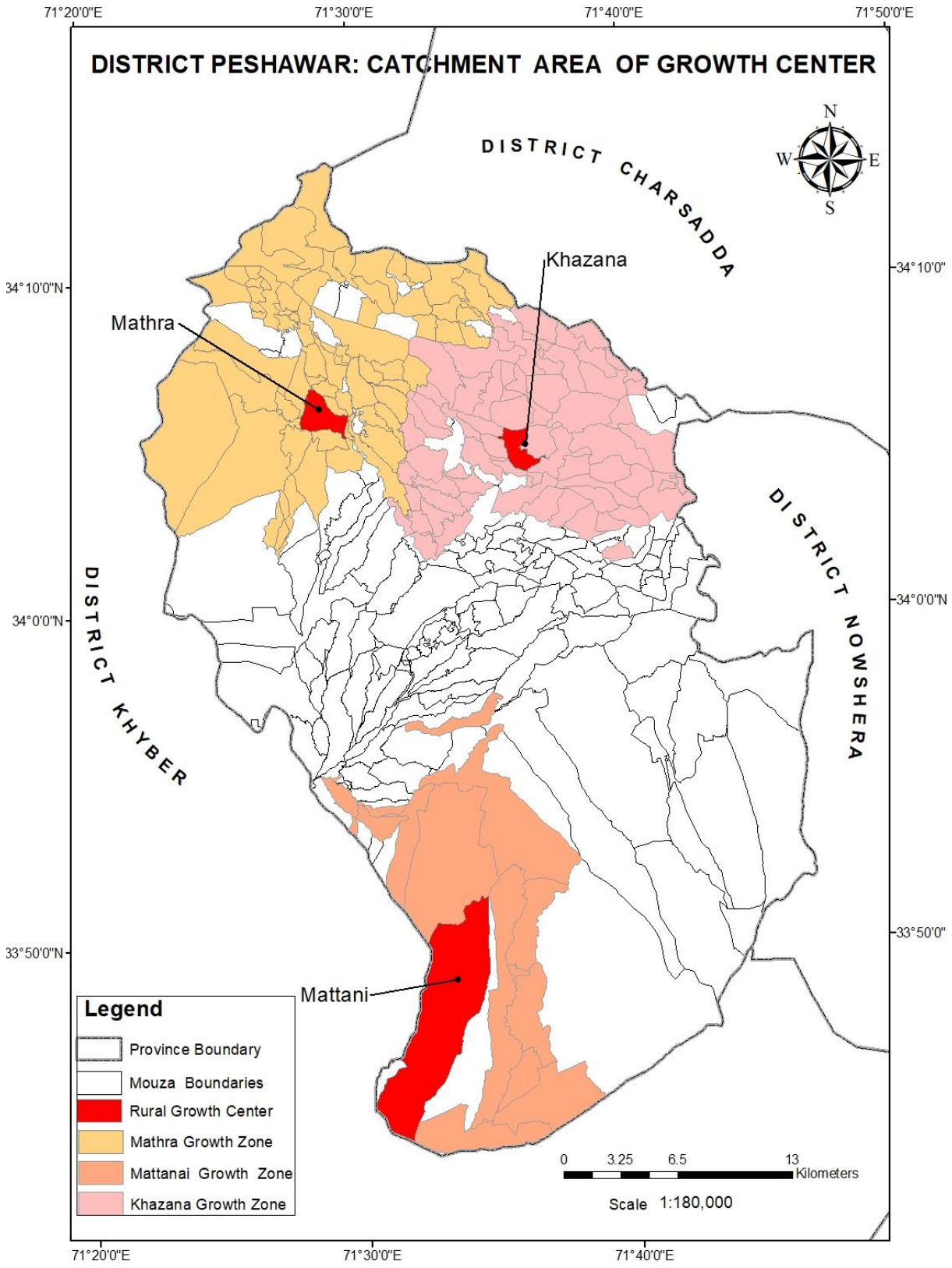
Name	Population 1998	Population 2017	Population 2021	Population 2025	Population 2040
Mattani	141668	257292	299839	349422	620274
Khazana	239379	538864	627974	731819	1299083
Matra	177951	329995	384565	448159	795545
Total	558998	1126151	1312378	1529400	2714902

Table 5. 5: Settlement-wise List of Rural Growth Centers

Rural Growth Zone	Growth Center	Settlements
Mattani	Mattani	Mattani, Ulizai, Sherkera Adizai, Sherkera Mushtarika, Pasani, Khulizai, Yousaf Khel, Bagh Miankhel, Maryamzai, Kara Khel, Anizai, Mashoo Peki, Mushtarzai Mera, Mashoo Khel Mera, Behlool Zai, Mashoo Gaggar, Badaber Hurazai
Khazana	Khazana	Budhni, Mian Gujar, Sahibi, Daman-e-Afghani, Shakar Pura, Kharaka, Gulbela, Mashai, Landi Daudzai, Jala Bela, Mandona, Bela Niko Khan, Daman-e-Hindki, Dalazak, Muhammadzai, Gulozai, Ghari Khazanchi(Yaseenabad), Choh, Wadpaga, Kochiyan, Garhi Sharif Khan, Dab, Kareray, Nahaqi, Harsaybadin, Toda, Babuzai, Zormandi, Kankola, Fatu Abdul Rahem, Kukar,Budhu (Samar Bagh), Bunyadi, Khatar, Nichapa Bala, Khazana, Saiban, Ghoi, Shah Alam, Mewra, Garhi Hamza, Garhi Gula, Isa Khel Hamid, Bhatian, Jatti Bala, Jatti Payan, Qadarabad, Haryana Payan, Larama, Haryana Bala, Ahadipura, Garhi Mir Tayyab, Choli, Alizai (Daudzai), Gulabad, Takht Abad Dom, Takht Abad Awal, Charpriza, Garhi Fazal Haq, Isa Khel Topchian, Mandra Khel, Pajagi, Terai Bala, Terai Payan, Deh Faqir, Jaba Jungle, Shagi Hindkiyan, Dar mangai, Garhi Banjar
Matra	Matra	Khatki, Mamoon, Shagi Bala, Bela Bramd Khel, Banda Payan, Banda Bala, Shagi Payan, Gedar (Khanpur), Hassanabad, Khawaji, Dang Lakhta, Naimi, Nelawi, Sarkhana, Jogni, Pyari Bala, Wazir Kali, Bela Momandan, Zarmandi (Michani), Pyari Payan, Qila Sha Baig, Chaghar Matti, Khat,Sher Kalay,Dheri Kalay,Garhi Sherdad,Kadi Korona,Zara Payan,Zara Bala,Maira Mushtarika,Zara Miana,Garhi Sarfraz,Garhi Sherdil,Hamid Qala,Panam Dheri,Mian Khel,Aloo Killi,Garhi Chandan,Chel Gazi,Garhi Sadoo,Gara Tajak,Haryan Ghar,Garhi Ali Miuhammad,Yarghajoi,Char Gulla,Hajizai,Maloo,Mathra,Galje Kandar Khel,Barber,Garanga Bala,Garanga Payan,Nissata,Shahinda,Kapa,Kolma Sherabad,Kaniza,Boda Kandar Khel,Dhaag,Patwar Payan,Shahi Payan,Patwar Bala,Sara Sang,Kafor Dehri,Mulazai,Regi Yousafzai,Regi Rukizai,Regi Badazai,Sufaid Sang,Shahi Bala

Table 5. 6: Area Required for Model Environmental Villages

Sr. No	Services	Area (Acres)		
		Mattani Rural Zone	**Khazana Rural zone**	**Matra Rural Zone**
1	Rural community Hospital	2.47	2.47	2.47
2	College	0	10	10
3	secondary school	4	4	4
4	Repair shops	2.47	2.47	2.47
5	Agro-base micro industry	157	239.9	97.6
6	Transport terminal	0.5	1	1
7	Fruit market	3	4	4
8	Vegetable market	3	4	4
9	Post office	0.5	0.5	0.5
10	Bank	0.2	0.2	0.2
11	Revenue office	0.2	0.2	0.2
12	Open Spaces & Parks	125.637	191.939	78.142
13	Police Station	0.25	0.25	0.25
14	Go downs	1	1	1
15	Commercial	62.8185	95.9695	39.071
16	Residential	1570.4625	2665.8	1302
17	Fire Station	0.5	0.5	0.5
Total Area (Acres)		**1934.008**	**3224.1985**	**1547.403**
Served Population		**125637**	**191939**	**78142**

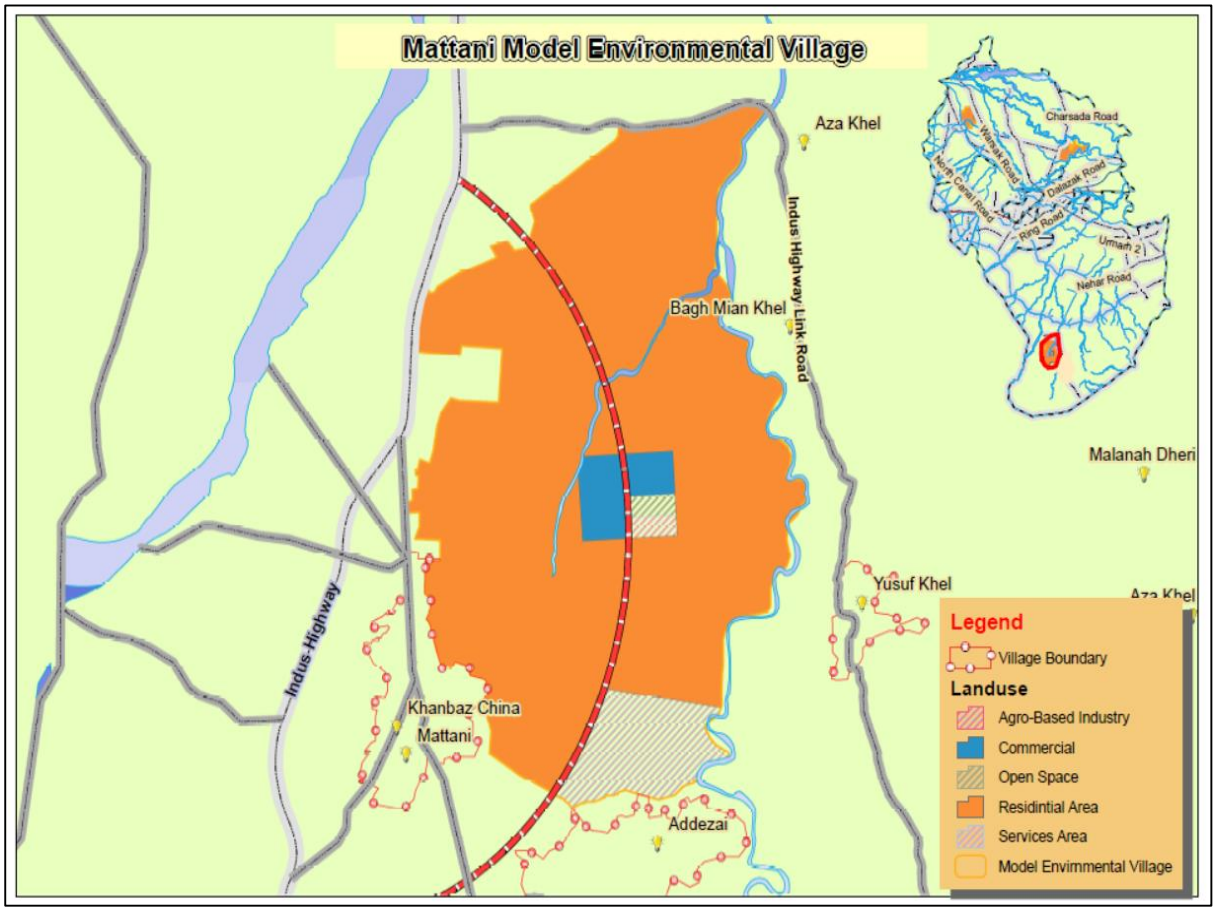


Map 5. 4: Catchment Area of Rural Growth Centers

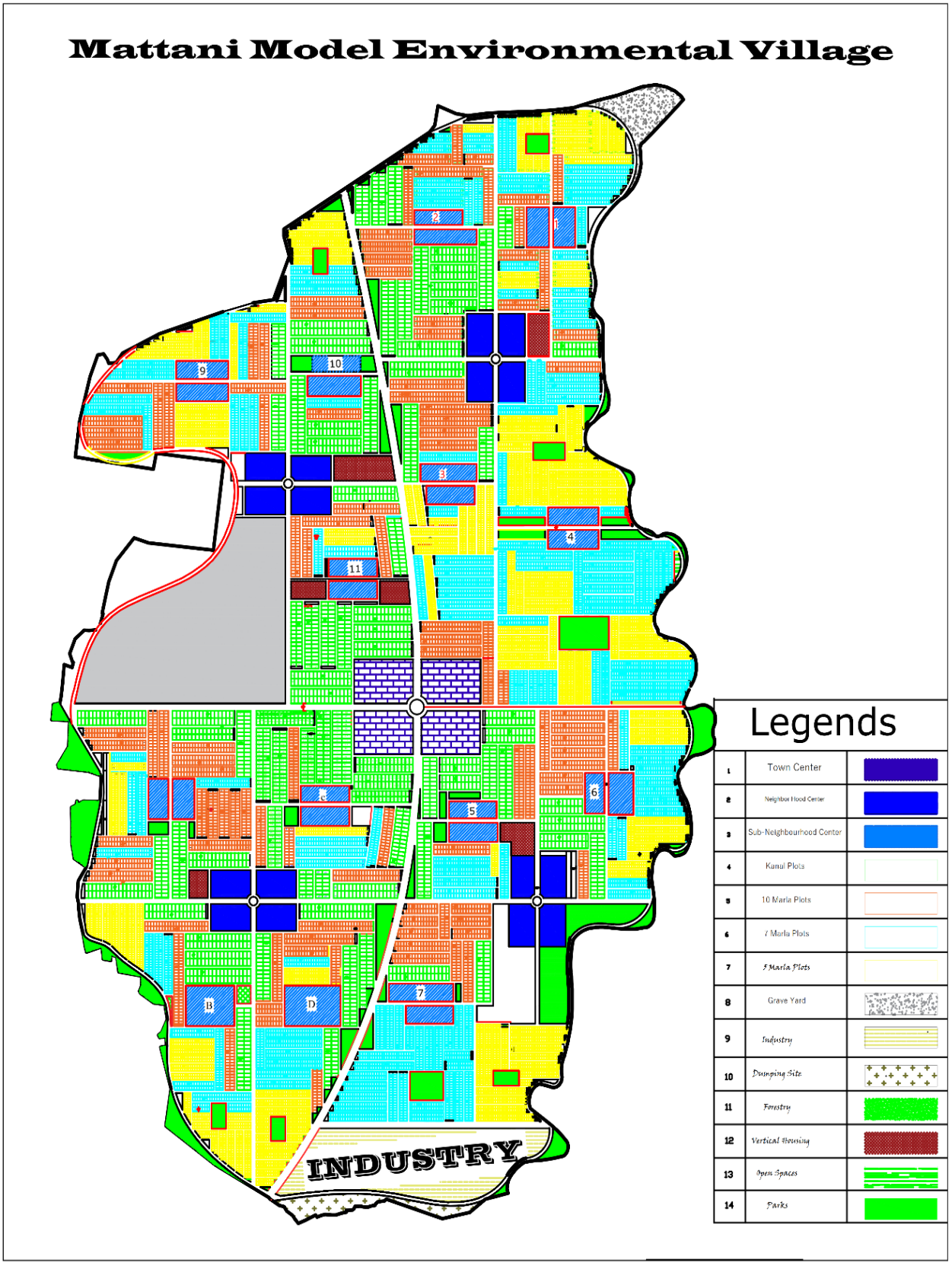
5.3.3 Mattani Model Environmental Village

Table 5. 7: Size-wise Plots Details

Sr. No	Plots Size	Number of Plots
1	1 Kanal	3016
2	10 Marlas	3943
3	7 Marlas	6488
4	5 Marlas	6827

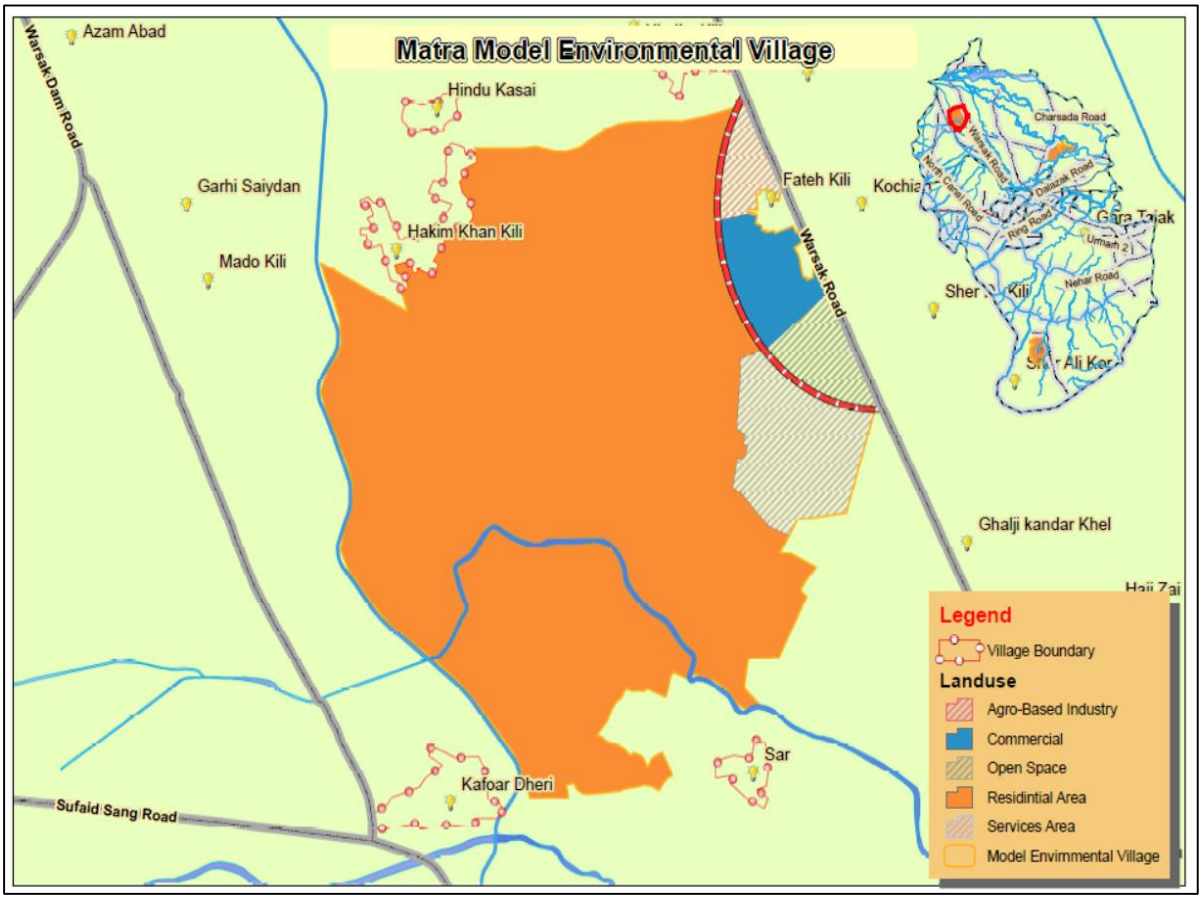


Map 5. 5: Location Map of Mattani Model Environmental Village



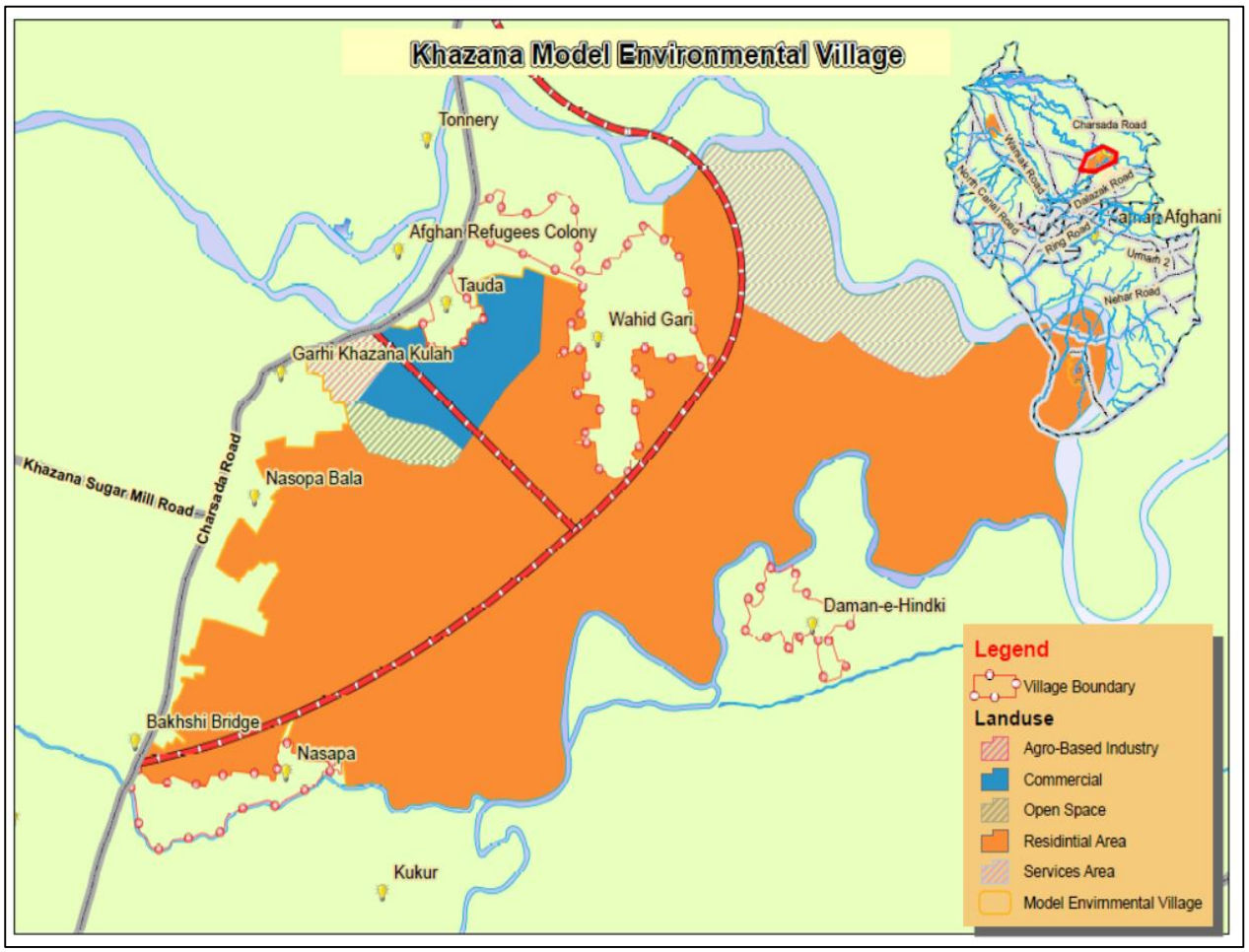
Map 5. 6: Layout of Mattani Model Environmental Village

5.3.4 Matra Model Environmental Village



Map 5. 7: Location Map of Matra Model Environment Village

5.3.5 Khazana Model Environmental Village



Map 5. 8: Location Map of Khazana Model Environmental Village

CHAPTER 6: REGIONAL PLANNING CONTEXT

Regional planning deals with the efficient placement of land-use activities, infrastructure, and settlement growth across a larger area of land than an individual city or town as against urban planning which deals with the specific issues of city planning. A 'region' in planning terms can be administrative or at least partially functional and is likely to include a network of settlements and character areas. In the context of Land Use planning encompasses the entire Peshawar Valley comprising of the administrative five Districts i.e. Peshawar, Mardan, Nowshera, Charsadda and Swabi.

Regions require various Land Uses; protection of farm land, cities, industrial space, transportation hubs and infrastructure. Regional planning is the science of efficient placement of infrastructure and zoning for the sustainable growth of a region. Regional planning can address region-wide environmental, social, and economic issues which may necessarily require a regional focus.

Regional Plans direct certain levels of development to specific cities and towns in order to support and manage the region depending on specific needs.

The essential components of regional planning include the following:

- Hierarchy of Settlements.
- Growth trends and sphere of Influence of urban settlements with in the Region.
- Reducing pressure on Urban Centers.
- Establishing development corridors, new towns, and planning for rural areas.

All these aspects in the context of Peshawar Region are discussed below:

6.1 HIERARCHY OF SETTLEMENTS

6.1.1 Objectives of Hierarchy of Settlements:

The overall objective of establishing hierarchy of settlements is to describe and understand the existing structure of the network of settlements (cities and towns) in Peshawar Valley as a key consideration in the formulation of development strategies and projects. Structure is determined by the functions and roles of the settlements.

Major objectives of the Settlement Hierarchy are as below:

- Accommodate and promote the development of linkages and infrastructure servicing of these Towns.
- Accommodate and promote proper planning and sustainable development in their environs
- Promote the role of these towns as economic, social and cultural centers for the surrounding areas
- Promote growth in smaller towns to allow for balanced and coordinated development throughout Peshawar Valley.
- Promote linkages between larger and smaller towns in order to distribute the resulting influence throughout the region.
- Promote the strengthening of towns as employment and service centers and as attractive residential centers

6.1.2 Hierarchy of Settlements and Land Use Planning

For Land Use planning, it is important to determine the hierarchy of settlements. It helps to achieve objectives of the Project in order to set out a clear order of preference for the location of different developments. The larger cities having higher threshold population will need higher order services to serve their own as well as their threshold populations; and vice versa. Peshawar for example, being the provincial headquarter and the most populous city of the province, has higher order facilities than Mardan and Mardan has high order facilities than Charsadda. In district Charsadda, Charsadda town needs higher order facilities than its smaller urban centers such as Utmanzai or Tangi; and such smaller urban centers need more facilities than the surrounding villages.

The hierarchy of settlements in case of Peshawar Valley has been determined on basis of following criteria:

- Population
- Location (e.g. lying within Peshawar Valley Development Corridor or not)
- Number of beds per thousand population
- Number of universities
- Availability of airport
- Administrative status of settlement (i.e. District or Tehsil headquarter).

Scoring for each of the above was done as below:

Table 5. 8: Characteristic-wise Distribution of Score

Characteristics	Score
Settlement Population	1 for every 100,000 population
Location with respect to Peshawar Valley Development Corridor	• Inside: 2 • Outside: 0
Number of hospital beds per thousand population	• < 0.3 beds/1000 population: 1 • 0.3 to 1 bed/thousand population: 3 • > 1 bed/1000 population: 5.
Number of universities	• One score per university. • If the number of universities exceeds 10, they get a maximum score of 10.
Availability of airport	• Airport available: 3 • Airport not available: 0
Administrative status of settlement (i.e. District or Tehsil headquarter).	• District Headquarter: 2 • Tehsil Headquarter: 1

Table 5. 9: Hierarchy of Settlements Score-wise

Settlements	Population Score		Location (inside/Outside RDC)	Number of Hospital Beds/1000 Population	Number of Universities	Airport	Administrative Status (DHQ/THQ)	Total Score	Hierarchy
	Population (2017)	Score							
Peshawar	1,970,042	19.70	2	2.83	13	3	2	42.53	42.53
Mardan	358,604	3.58	2	1.02	4	0	2	12.06	12.6
Swabi	155,361	1.55	2	2.09	1	0	2	8.64	8.64
Takht Bhai	80,721	0.80	2	0.86	0	0	1	4.66	4.66
Charsadda	145,312	1.45	2	1.66	0	0	2	7.11	7.11
Nowshera	197,673	1.97	2	1.01	3	0	2	9.98	9.98
Shabqadar	91,851	0.91	2	1.03	0	0	1	4.94	4.94
Pabbi	55,255	0.55	2	1.37	0	0	1	4.92	4.92
Jahangira	85,722	0.85	2	0.00	0	0	1	3.85	3.85
Topi	52,983	0.53	2	0.94	1	0	1	5.47	5.47
Risalpur Cantt	36,653	0.37	2	0.00	0	0	0	2.51	2.37
Aman Garh Industrial Area	38,624	0.39	2	0.00	0	0	0	2.55	2.39
Tordher TC	41,420	0.41	0	0.00	0	0	0	0.49	0.41
Zaida MC	31,949	0.32	0	0.00	0	0	0	0.38	0.32
Tangi	33,012	0.33	2	2.35	0	0	1	5.68	5.68
Utmanzai	30,747	0.31	2	0.00	0	0	0	2.34	2.31
Akora Khattak	29,293	0.29	2	1.73	0	0	0	4.02	4.02
Nawan Killi	26,161	0.26	2	0.00	0	0	0	2.29	2.26
Cherat Cantt	2,265	0.22	0	0.00	0	0	0	0.06	0.22

6.1.3 Conclusions

Peshawar is the primate city of Khyber Pakhtunkhwa. In other words, it is disproportionately larger than any other town or city in the urban hierarchy. The sheer size and activities of Peshawar becomes a strong pull factor, bringing additional residents to the city and causing the primate city to become even larger and more disproportional to smaller cities in the Province. Being a primate City, Peshawar is different from Mardan, Nowshera and Charsadda in terms of population, area of influence and services provided.

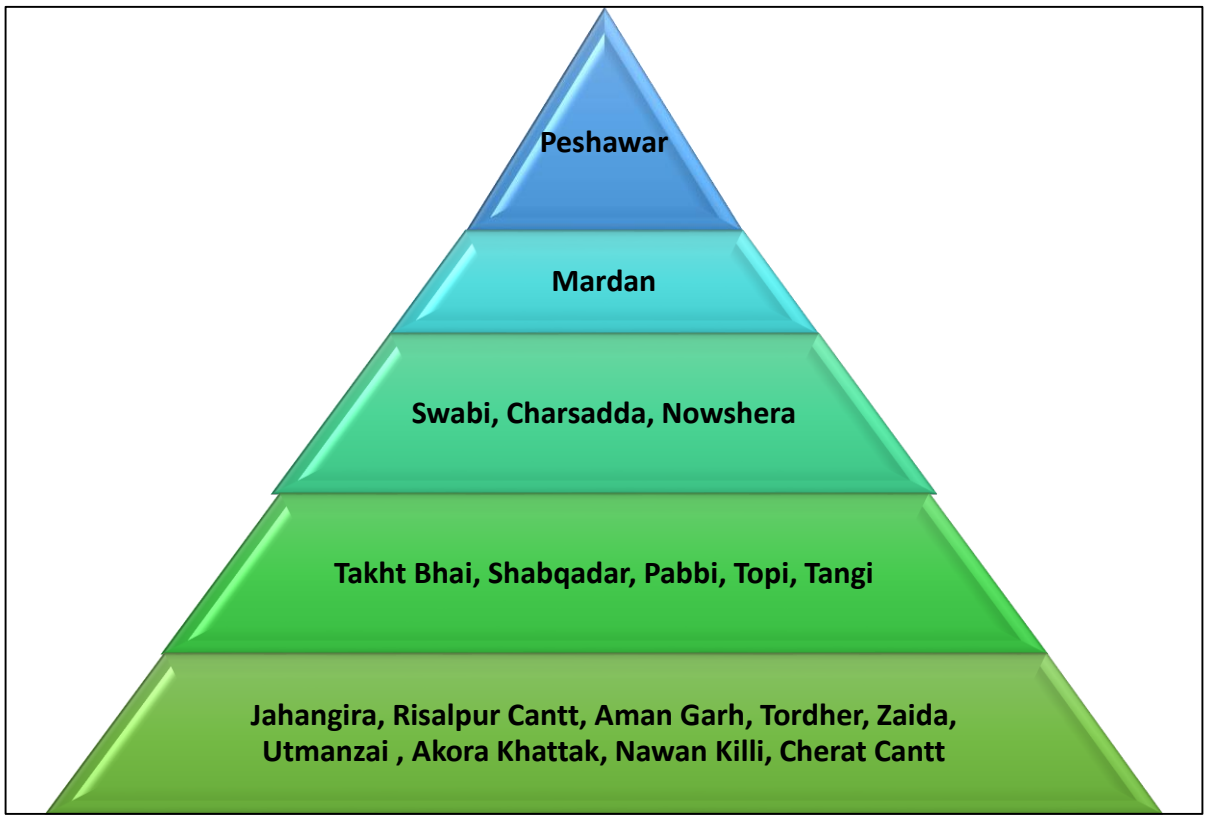
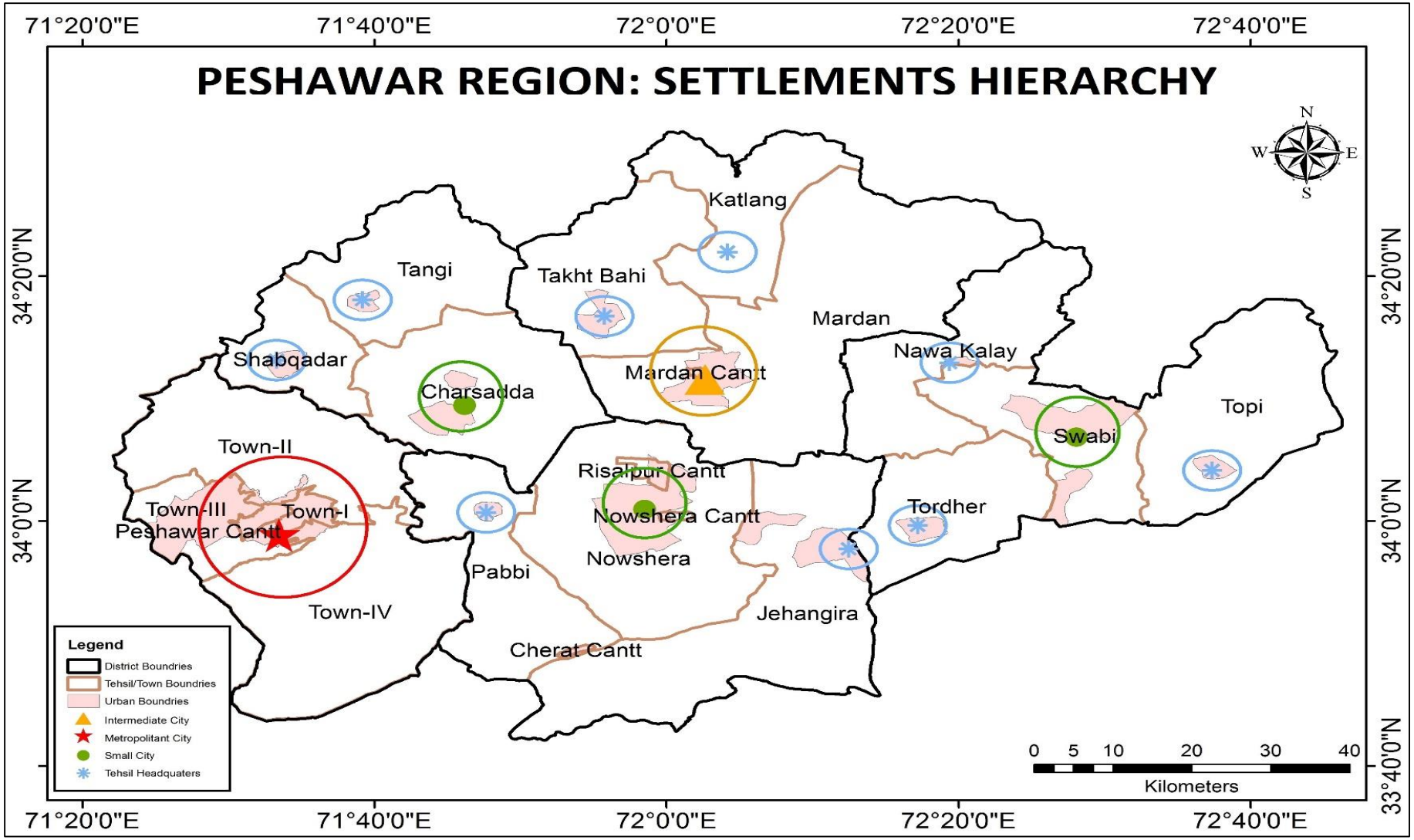


Figure 6. 1 Hierarchy of Urban Settlements in Greater Peshawar Region

The above analysis indicates that Peshawar (the primate City) and Mardan (Category 1 settlement) have greater area of influence than settlements lower in hierarchy. Similarly, Category 2 settlements (Swabi, Takht Bhai, Charsadda, and Nowshera) have wider catchment area than Category 3 settlements, and so on.



Map 6. 1: Settlements Hierarchy Map of Peshawar Region

6.2 GROWTH TREND OF URBAN SETTLEMENTS

According to 2017 initial census reports, there were 21 urban settlements in the Peshawar Region. The same urban areas were also a part of the 1998 census report. In 1981 however, there were 17 urban settlements in the region, as four settlements at that time did not have urban status. These included University Town in District Peshawar, and Topi MC, Zaida MC and Tordher MC in District Swabi. Since 1981, significant urbanization has taken place; existing urban settlements have grown and new urban settlements have sprung up. For example, in the context of Peshawar, newly urbanized (or to be urbanized) areas include Hayatabad Township, Regi Model Town and a number of private developments. However, these are relatively new developments and their populations cannot be compared in time-series context.

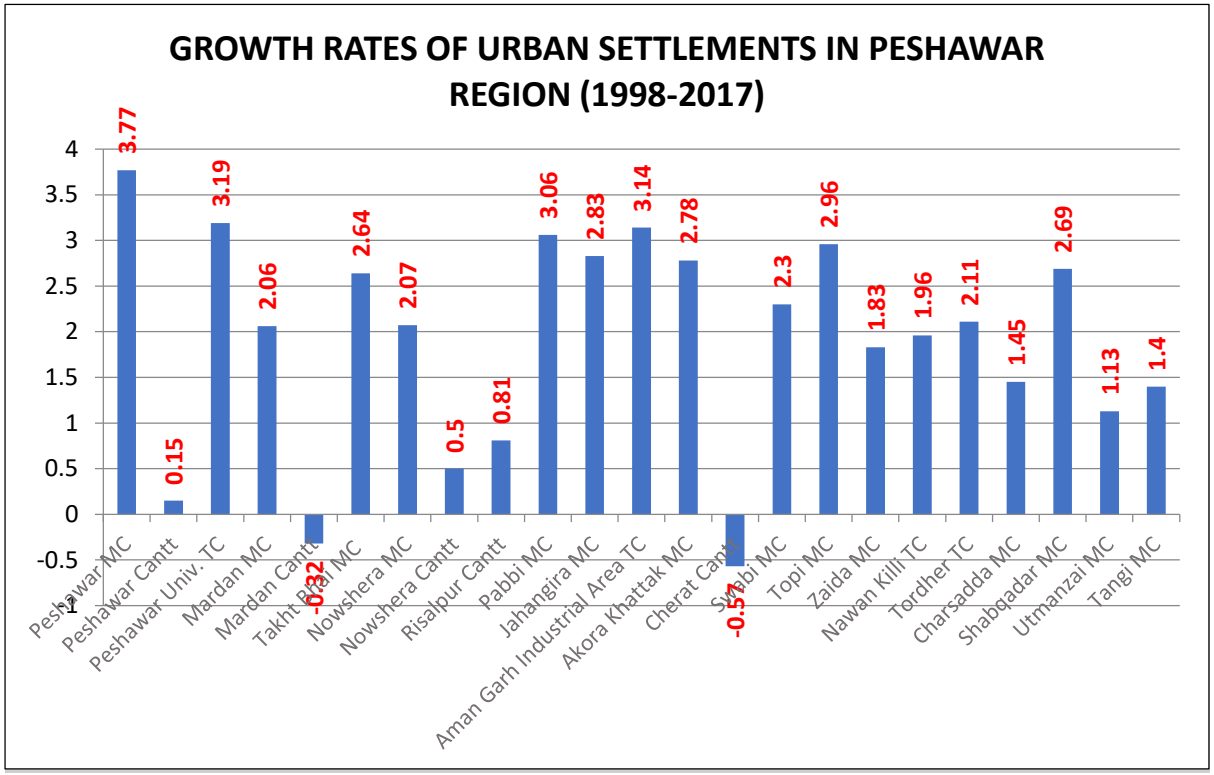


Figure 6. 2 Growth Rates of Urban Settlements in Peshawar Region[79]

[79] Growth Rate has been calculated from the Initial Census Reports-2017

Table 6. 1: Growth Rates of Urban Settlements in Peshawar Region

Districts	Tehsils	Urban Settlements	Population (Census Year)		Growth Rate
			1998	2017	
Peshawar	Peshawar	Peshawar MC	910,807	1,893,361	3.77
		Peshawar Cantt	68,740	70,741	0.15
		Peshawar Univ. TC	3,269	5,940	3.19
Mardan	Mardan	Mardan MC	238,629	351,733	2.06
		Mardan Cantt	7,297	6,871	-0.32
	Takht Bhai	Takht Bhai MC	49,202	80,721	2.64
Nowshera	Nowshera	Nowshera MC	56,576	83,567	2.07
		Nowshera Cantt	33,237	36,564	0.5
		Aman Garh Industrial Area TC	21,476	38,624	3.14
		Risalpur Cantt	31,416	36,653	0.81
	Pabbi	Cherat Cantt	2,527	2,265	-0.57
		Pabbi MC	31,153	55,255	3.06
	Jehangira	Jehangira MC	31,115	52,839	2.83
		Akora Khattak MC	19,530	32,883	2.78
Swabi	Swabi	Swabi MC	80,157	123,412	2.3
		Zaida MC	22,656	31,949	1.83
	Topi	Topi MC	30,458	52,983	2.96
	Razzar	Nawan Killi TC	18,082	26,161	1.96
	Lahor	Tordher TC	27,861	41,420	2.11
Charsadda	Charsadda	Charsadda MC	87,218	114,565	1.45
	Shabqadar	Shabqadar MC	55,439	91,851	2.69
	Tangi	Utmanzai MC	24,848	30,747	1.13
		Tangi MC	25,346	33,012	1.4

6.3 URBAN CENTERS AND ITS SPHERES OF INFLUENCE

The sphere of influence of a settlement describes the area that is served by a settlement, for a particular function. Its sphere of influence for different functions may cover vastly different areas. For instance, a supermarket may attract people from a 20-KM radius, whilst a leisure activity, such as going to the city park may attract them from far further away.

The larger a settlement, greater its sphere of influence as it has a wider range of services and functions to attract people to go there. This is shown in the diagram below. A small village may only have a village store selling the daily newspaper and food such as bread and milk. People will only travel the shortest distance they need to buy these products. They are described as being convenience goods. In other words, something that can be bought easily and for the same price all over the place.

A larger town would have a wider sphere of influence because it would have shops and services that are more specialized, and so people would be willing to travel further to avail them. The range of service describes the maximum distance that someone would be willing to travel to obtain that good or service. The threshold population of a good or service is the minimum number of people needed to allow that service or facilities to be successful. The more specialized an activity or service will require a higher threshold population. The same applies to settlements as given in the diagram below.

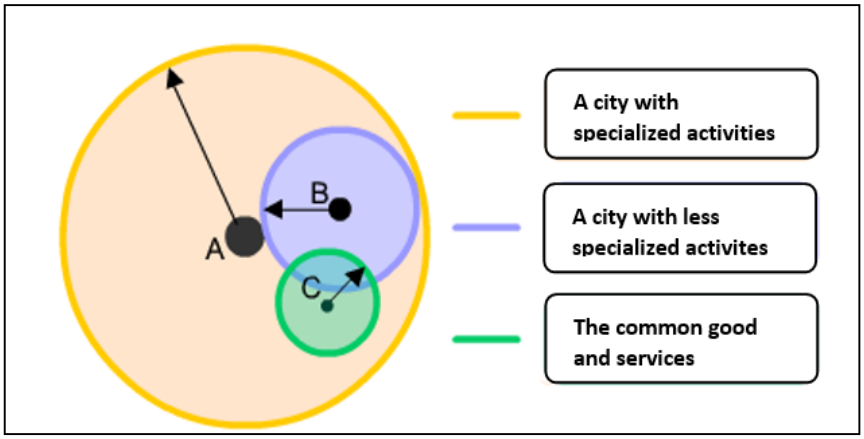


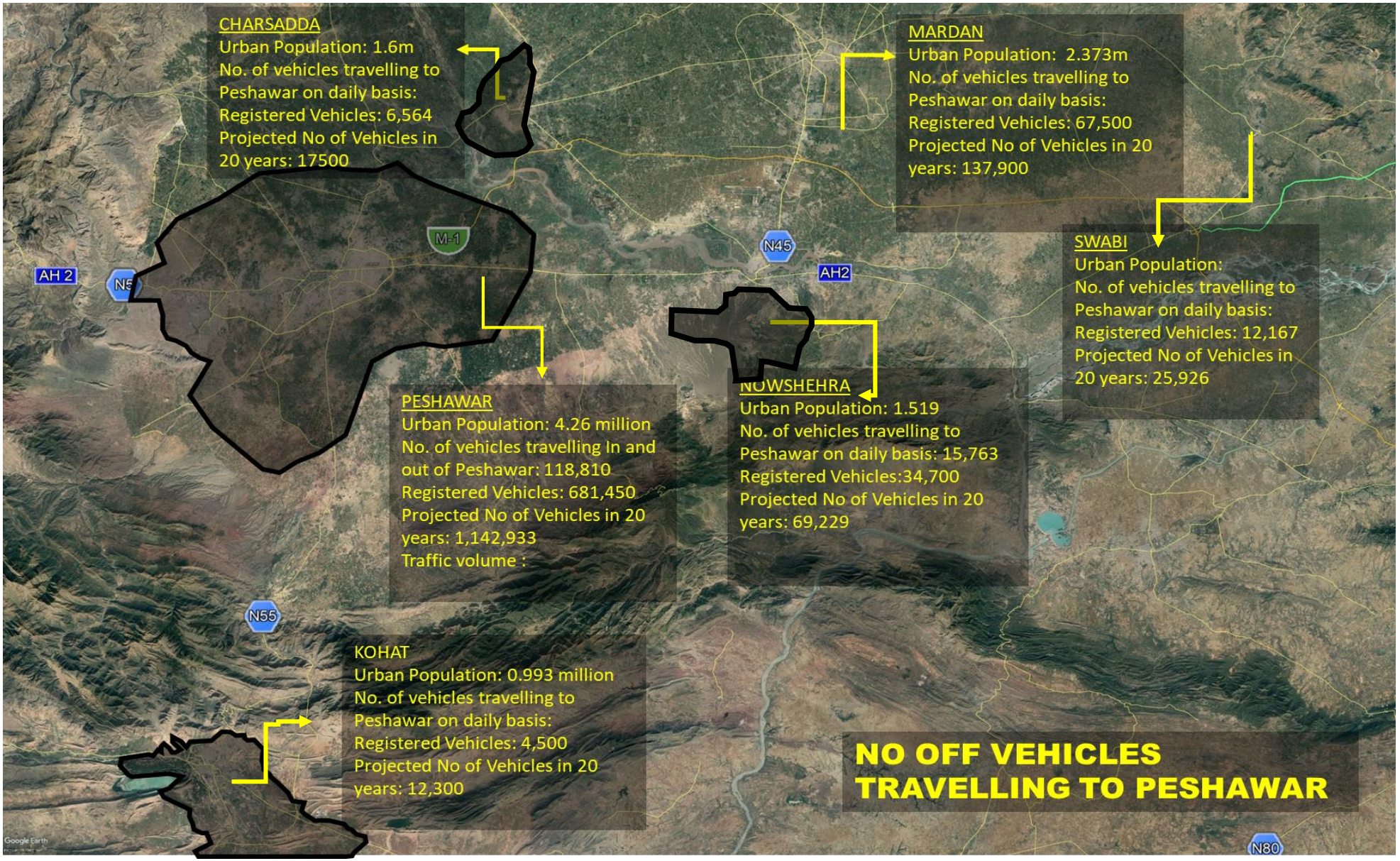
Figure 6. 3 Centers and their Spheres

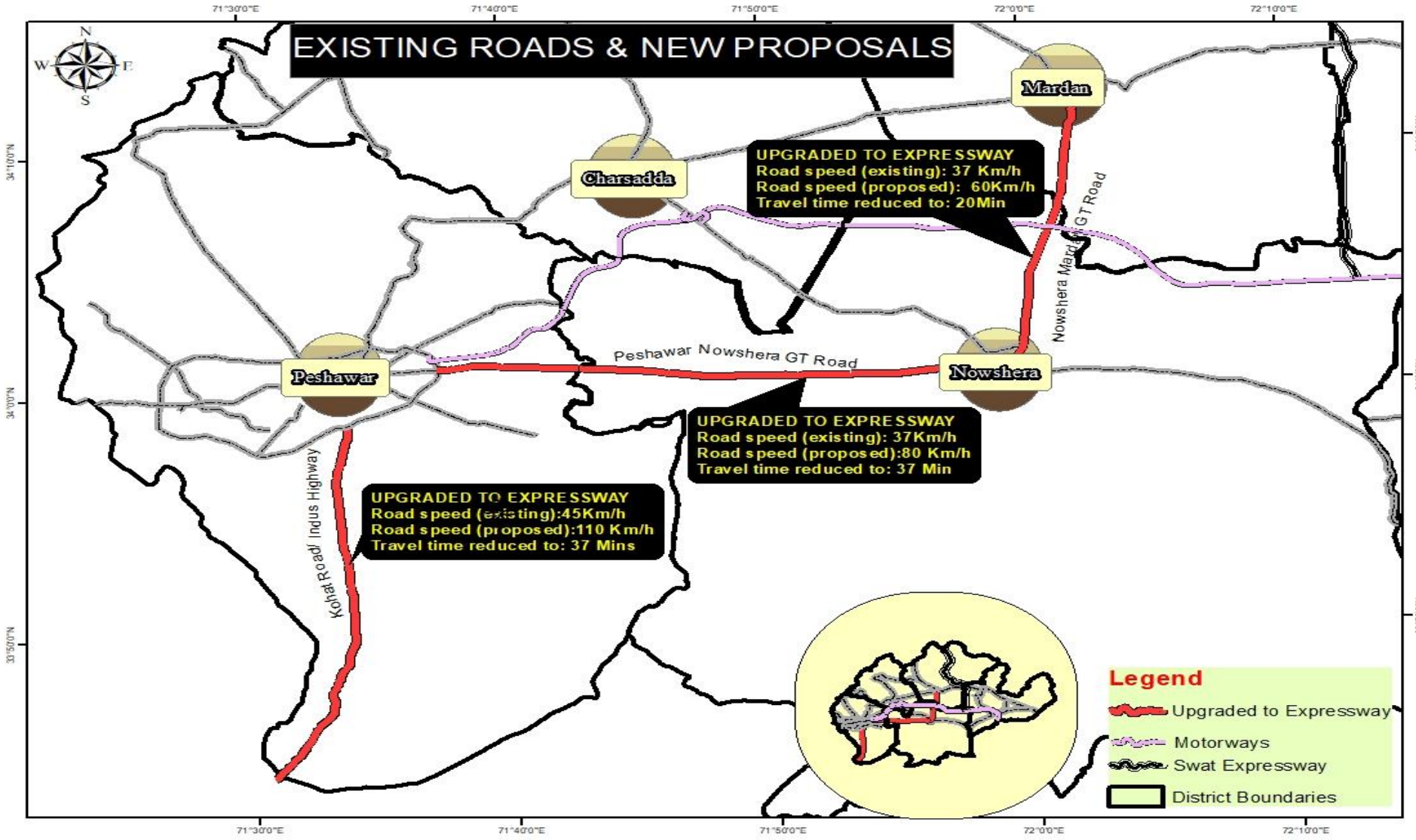
Gravity models measure the pulling power of competing locations, whether cities, shopping centers or towns and the influence this has on the customers that reside within the boundaries. Models identify a boundary line, called the breaking point, at which customers that reside within the boundaries, either one side or the other of the line. Calculations can specify a particular breaking point or point of maximum pull between two settlements.

Breaking point between two urban settlements can be calculated by the formula:

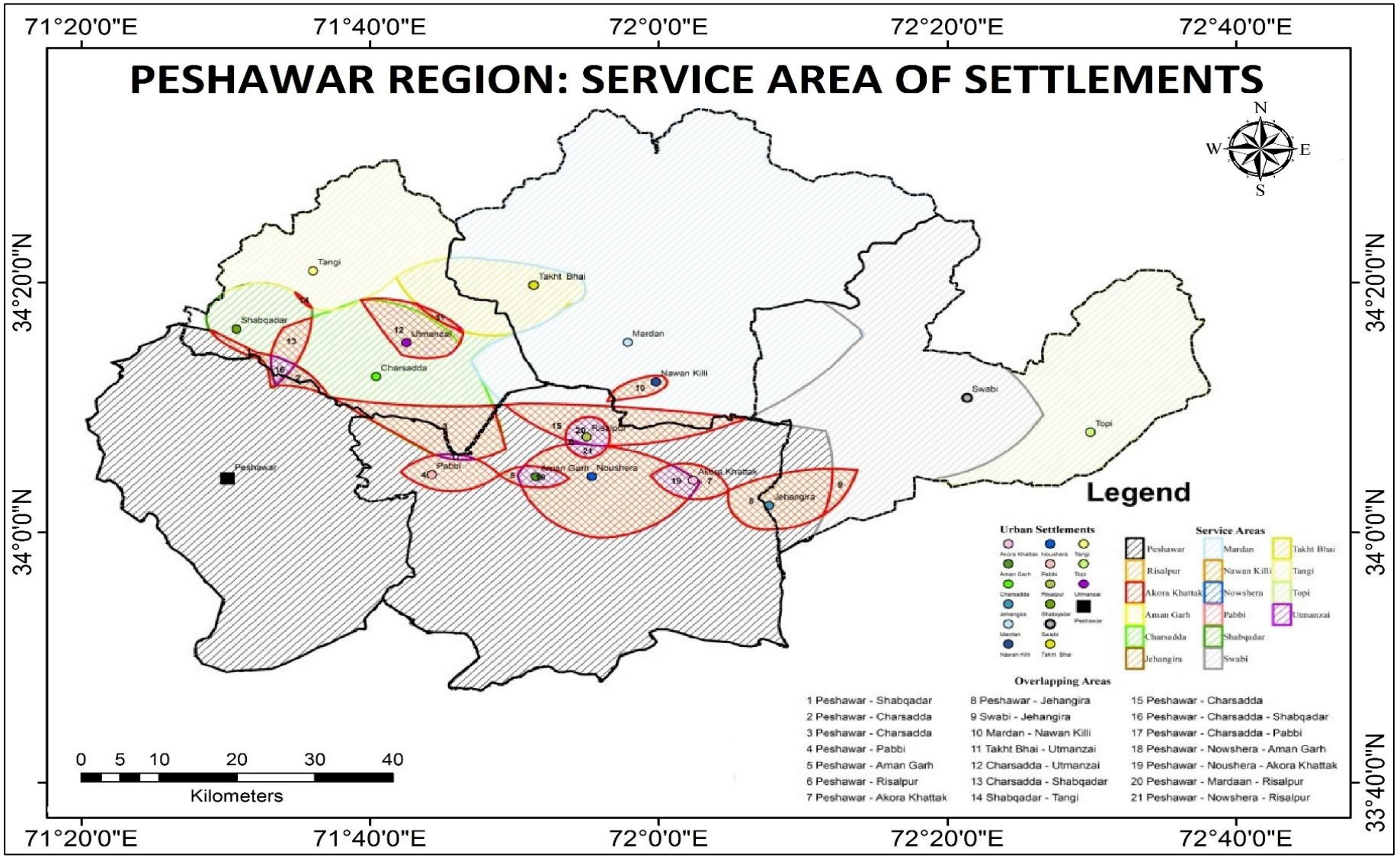
$$\text{The breakpoint from A} = \frac{\text{Distance from center A to center B}}{1 + \sqrt{(\text{population B/population A})}}$$

Boundary line of area of influence an urban settlement can then be drawn by a smooth line joining all the breaking points. The sphere of influence or service areas of urban settlements in Peshawar Valley, using the above methodology has been calculated and shown in the figure below.


CHARSADDA
Urban Population: 1.6m
No. of vehicles travelling to Peshawar on daily basis:
Registered Vehicles: 6,564
Projected No of Vehicles in 20 years: 17500
MARDAN
Urban Population: 2.373m
No. of vehicles travelling to Peshawar on daily basis:
Registered Vehicles: 67,500
Projected No of Vehicles in 20 years: 137,900
SWABI
Urban Population:
No. of vehicles travelling to Peshawar on daily basis:
Registered Vehicles: 12,167
Projected No of Vehicles in 20 years: 25,926
PESHAWAR
Urban Population: 4.26 million
No. of vehicles travelling In and out of Peshawar: 118,810
Registered Vehicles: 681,450
Projected No of Vehicles in 20 years: 1,142,933
Traffic volume :
NOWSHEHRA
Urban Population: 1.519
No. of vehicles travelling to Peshawar on daily basis: 15,763
Registered Vehicles:34,700
Projected No of Vehicles in 20 years: 69,229
KOHAT
Urban Population: 0.993 million
No. of vehicles travelling to Peshawar on daily basis:
Registered Vehicles: 4,500
Projected No of Vehicles in 20 years: 12,300
NO OFF VEHICLES TRAVELLING TO PESHAWAR
M-1
N45
AH2
AH 2
N5
N55
N80



Map 6. 2: Existing Roads & New Proposals



Map 6. 3: Services Areas of Settlements Map of Peshawar Region

6.4 REDUCING PRESSURE ON LARGE URBAN CENTERS

Development is a two-pronged strategy, based on the classical debate of efficiency Vs. equity. Focusing on efficiency, there is a need to identify 'development corridors' in the region where returns against investments made would be maximum; and in these corridors private sector would also be interested to invest. These corridors are thus 'investment zones', encompassing cities as well rural areas. Thus, these will benefit not only urban areas, but also rural settlements which lie in it; resulting in better rural development and hence help to retard migration flows to urban areas. In fact, these development corridors will also have a spill-over effect even outside these corridors.

To efficiently reduce migration pressure on larger Urban centers, there is an emergent need to establish new towns at feasible locations. This will however not help unless these are coupled with adequate employment opportunities and other necessary facilities, which make them attractive for the people to live in, and can restrain them to move towards bigger urban centers.

The third factor to reduce migration is sustainable rural development, in which each district should be divided into a number of "Rural Growth Zones", each zone to comprise of few union councils, and within each zone a centrally located village would act as 'Rural Growth Centre', which will have better inter-village road connectivity as well as access to the nearest main road, provision of basic facilities such as good healthcare, quality education, provision of adequate infrastructure and physical improvement of villages including village streets and houses.

To sum up, the parameters for reducing migration to bigger urban centers are as below:

- Identification of Development Corridors
- Establishment of New towns at appropriate locations with employment opportunities
- Sustainable rural development

These are elaborated in subsequent sections.

6.5 REGIONAL DEVELOPMENT CORRIDOR (RDC)

Regional Development Corridor (RDC) is a major project of Peshawar Region being proposed under the Khyber Pakhtunkhwa Land Use Project. Development corridors are described as transport (or trade) corridors with under-utilized economic potential in their environs, the development of which would be explored through spatial planning and development projects. They are therefore, seen as a means of prioritizing and promoting inter-related infrastructure and large-scale economic sectoral investments in defined geographic areas and optimize the use of existing infrastructure and resources. RDC can become the framework and platform for comprehensive and integrated development in the region. RDC needs to be given great importance as well as active promotion.

RDC will be of great significance to the development of Peshawar Valley which will provide new opportunities, new vision as well as new impetus to the developmental activities. It will effectively promote the economic and social development of the valley. The construction of RDC will enhance connectivity and integration of developmental efforts of the five Districts, which is in the fundamental interests of the people.

As a large and systematic project, which covers 2021-2040, RDC needs joint and unremitting efforts by the provincial government, companies and all social sectors of Khyber Pakhtunkhwa. In the process of its construction, there is a need for scientific planning, step by step implementation, consensus among Districts through consultation, mutual benefit and win-win results, as well as ensuring quality and safety. Greater Peshawar Region should agree to make a list of prioritized or early harvest projects as well as the long-term plan for RDC. The prioritized or early harvest projects mean the projects which will be completed before 2025, and others by 2040. RDC is a vision with the long-term planning up to 2040.

The central role of the RDC would include establishment of new towns, special economic zones including industrial estates, and transportation infrastructure. Besides, there can be projects in the fields of financial services, science and technology, tourism, education, poverty alteration and city planning, etc.

To promote the establishment of RDC, the provincial government needs to set up RDC Committee, under which there would be a number of working groups for projects till 2025, long-term planning, transportation infrastructure, new townships and special economic zones.

Efforts are to be made to improve the livelihood of the local people, particularly the construction of educational, medical, and vocational institutes. Although hydro-electric projects will be located outside RDC framework, feasibility studies will have to be conducted for Solar and wind Power Projects in the proposed corridor.

Efficient, fast transportation network is of vital importance to the economic development. The existing transportation system of Peshawar should be upgraded on priority basis through systematic planning and link it with Annual development plan (ADP). New routes can be proposed to increase accessibility and avoid congestion. At the same time, feasibility study needs to be conducted for upgrading railway network in the Peshawar Region (Peshawar region circular Railway).

The RDC aims to benefit the economic and social development of all regions in Khyber Pakhtunkhwa and provide effective inter-district connectivity. With the implementation of various projects, RDC will play an increasingly important role in promoting the economic development and uplifting living standard across different parts of of the Province. These projects will help boost employment and tax collection, strengthen the provincial road connectivity, promote economic development as well as improve people's living standard.

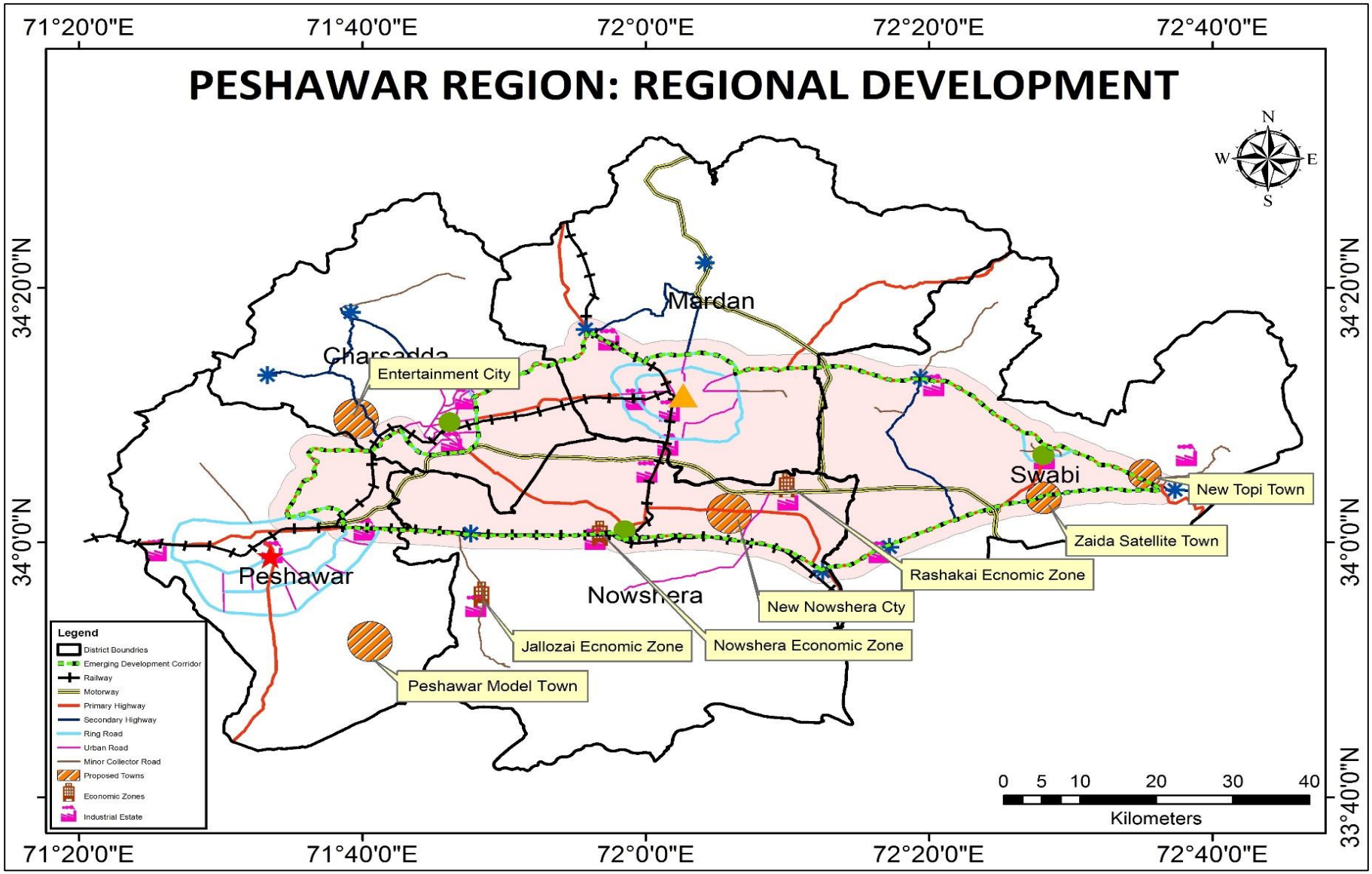
The proposed development corridor encompasses the area between GT Road and Motorway, and well beyond it to cover Mardan-Charsadda Road.

It is important that the identified corridors should be able to generate densification activities, and efforts to stimulate SMEs in the proposed corridors. It is also important to establish an appropriate legal and institutional framework before the project gets rolling.

It needs to be ensured that no speculation is generated around the corridor with unrealistic expectations for the communities involved which may not be fulfilled in terms of anticipated investments in certain areas of the corridor. The proposed corridors may generate notable successes in private sector investments into regional infrastructure development, industrial development and natural resources exploitation. To get maximum benefit from CPEC, these

corridors should be linked with CPEC. This will help the provincial government to attract both national and international investors.

The corridor approach represents an understandable and reasonably objective way to prioritize regional infrastructure projects, stimulate investments into productive capacity and achieve economic densification.



Map 6. 4: Regional Development Corridor in Peshawar Region

6.5.1 On-Going Projects in the Region

Rashakai Economic Zone

Rashakai Economic Zone is spread over an area of about 1,000 acres of land and is located on M1 motorway at Mardan interchange and links to CPEC through Burhan interchange. Due to its central position in the Province, it is envisaged to be an imminent trade hub. The Economic Zone will also host an IT Park of 100 acres in collaboration with the Board of ITKP. The strength of this zone is its strategic location by being connected to districts and a resource pool which has a predominant investment favorability for industries in fruit & food packaging, textile and auto manufacturing. Further expansion of around 5,000 acres is also under consideration.

Jalozai Economic Zone

This economic zone is spread over an area of 257 acres. It will be a strategic location for small and medium enterprises. The economic zone connects to GT Road through a link road of about 15 kms from Pabbi. The industrialists of Jalozai Economic Zone will have readily available trained human resource due to its location in the center of a settled area, which also has a long-established industrial tradition. It will have access to plenty of natural resources and agricultural products.

Nowshera Economic Zone

It spreads over an area of 100 acres and is situated on GT Road. The zone is located at a distance of about 50 Kms from Peshawar near Mardan interchange on Islamabad-Peshawar motorway section.

Jalozai Housing Scheme

The Jalozai site is also located in district Nowshera on main Cherat Road, approximately 8 km from main GT Road near Jalozai industrial estate. Total area of scheme is 8905 kanals, while the number of plots is 8,044.

Peshawar Model Town/Peshawar City Valley

Peshawar Model Town will be constructed over an area of 1,08,500 kanals of land with a provision of 81,000 plots. The Model Town will be linked with GT Road and Motorway through a nine-kilometer expressway. The procurement of 8000 kanal land completed till to date for Peshawar City valley project. Peshawar Development Authority approved the inception report Peshawar City Valley project an work has been started. The Housing Scheme will be established on 106400 kanal land. Out of total area the residential plot and apartments will be established on 41% of the total land, 25% area for roads, 16% for parks and open spaces, 7 %area for public/govt offices and 5 % area will be used for commercial purposes. At initial stage of this project, 62056 plots will be included of different categories. The details are given below:

No	Plot size	Nos
	3 marla	16312
	5 marla	17201
	7 marla	3402
	10marla	9526
	I kanal	13415
	2 kanal	1494

	4 kanal	706
	Total	62,056 Plot

New Railway Network

The Greater Peshawar Region Mass Transit - The Circular Rail Project Phase I

Govt. of Khyber Pakhtunkhwa is establishing a commuter Rail Network,

"**The Greater Peshawar Region Mass Transit** – **Circular Rail Project"**

The project was approved during the 6th JCC meeting of China Pakistan Economic Corridor (CPEC) held on 29th December 2016. A Memorandum of Understanding (MoU) was signed between GoKP & CCCC (China Communications Construction Co. Ltd) in August 2016 to carry out a feasibility study.

Study Scope

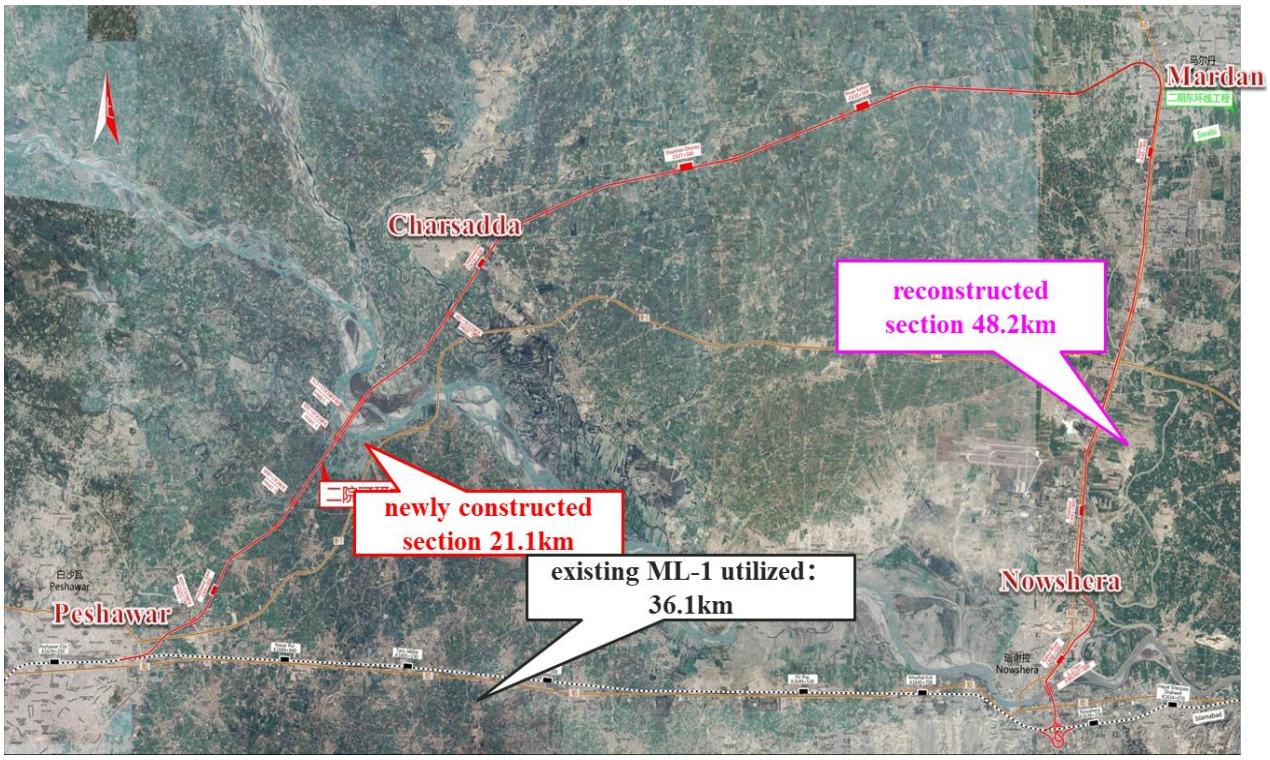
Phase I is west circular rail (Peshawar - Charsadda - Mardan - Nowshera- Peshawar), with a total length of **105.4km**.

It will connect **Peshawar-Nowshera-Mardan-Charsadda** in **Phase-I** while **Swabi, Jahangira and Dargai** in **Phase-II**

Serve 12 Million (41%) of the total provincial population (29.2 Million) approx. 202 km & 25 stations. The Train every 20 minutes initially and will cover average distance is 8 Km between stations. While 15,700 daily ridership in 2023 and 22,700 daily ridership in 2030

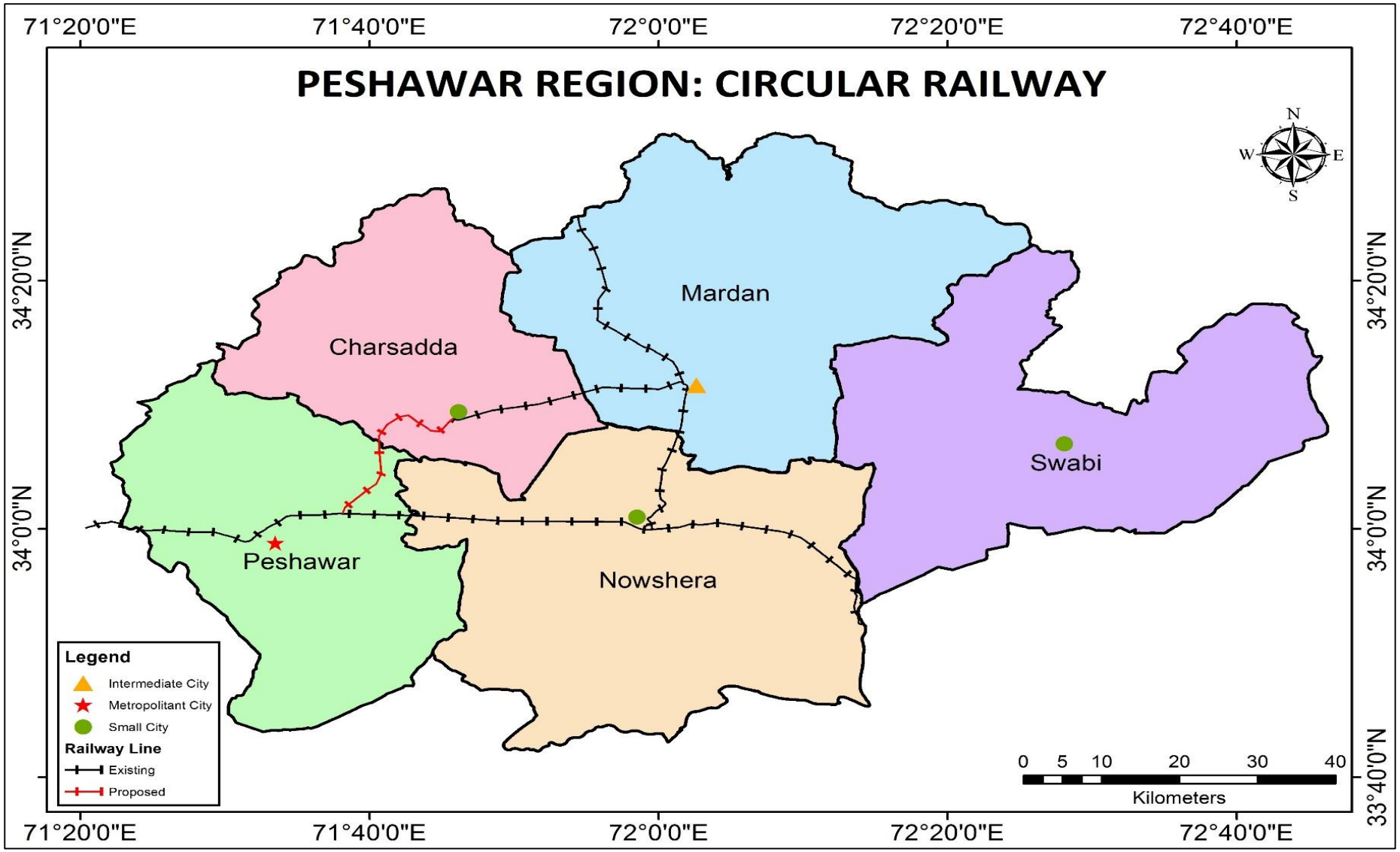
Geographic Location & Route of the Proposed Project

The route passes through the following four major cities: **Peshawar, Charsadda, Mardan** and **Nowshera**, stretching **105.4km** long in total, including **21.1km** of newly constructed section, **48.2km** of reconstructed section and **36.1km** of the existing ML-1 utilized for the project.



.

SN	Origin	Destination	Via	Grade	Passenger train pair		
					2025	2030	2040
1	Peshawar	Peshawar	Charsadda, Mardan, Nowshera	Express train	7.5	10	17
2	Peshawar	Peshawar	Charsadda, Mardan, Nowshera	Regular train	3.0	4	8
3	Peshawar	Islamabad	Nowshera, Ghaniabad	Regular train	6.8	9	10
4	Peshawar	Lahore	Nowshera, Ghaniabad, Islamabad , Rawalpindi	Regular train	3.8	5	6
5	Peshawar	Karachi	Nowshera, Ghaniabad, Islamabad , Multan, Hyderabad	Regular train	0.8	1	1
6	Peshawar	Karachi	Charsadda, Mardan, Nowshera, Ghaniabad, Islamabad	Regular train	3.0	4	5
7	Peshawar	Karachi	Nowshera, Mardan, Swabi, Ghaniabad, Islamabad	Regular train	/	/	2
8	Mardan	Mardan	Swabi, Ghaniabad, Nowshera	Express train	/	/	18
Total					**25**	**33**	**67**



Map 6. 5: Peshawar Region Railway Network

6.6 FEASIBLE LOCATIONS FOR NEW TOWNS

Three location are identified for proposed town ships namely Tangi model town, Takht Bhai Extension, Topi New Town

6.6.1 Tangi Model Town, District Charsadda

Being close to Peshawar metropolis and hence under its shadow effect, Charsadda has not developed industrially as it should have, particularly for agro-based industry. Besides, being close to Peshawar it has many locational advantages. Charsadda also function as a satellite town of Peshawar most people commute daily from Charsadda to Peshawar and back increasing traffic load. Further, people who can afford, tend to build houses in Peshawar causing its sprawl and related issues. A well-planned town near Tangi with required urban facilities and services in District Charsadda will help to control this trend and also provide impetus to the District (and hence regional) economy.

6.6.2 Takht Bhai Extension Town, District Mardan

As the name suggests, is a planned extension of the existing Takht Bhai Settlement in District Mardan. The existing urban settlement of Takht Bhai is the fastest growing urban settlement in Peshawar Region; its growth rate was 2.64% during the period 1998-2017. It is the highest rate among all urban settlements in District Mardan. It is also the second largest settlement of District Mardan, after Mardan City. Takht Bhai is situated 15 km from Mardan on Swat-Malakand Road. In 1908/9 the ancient Buddhist history was discovered in the mountains.

Some of the possessions of the Buddhist houses and buildings have been taken away illegally. The population is expanding and new houses are being built in and around Takht Bhai. If ignored for a few more years, the tourist and historic attractions will disappear. The authorities need to draw a boundary line, so stop further encroachments. There is a need for a new township at an appropriately located site near Takht Bhai, along with appropriate living environment, along with tourist rest houses and restaurants where people can relax before and after they embark for the on-wards mountain journey. This will reduce pressure on Mardan City and will also help to develop Northern part of Mardan District, as Takht Bhai will become a growth pole for this part of the region.

6.6.3 New Topi Model Town, District Swabi

Topi Town lies in the Eastern part of District Swabi. It is located to the West of Tarbela Dam, the world's largest earth filled dam, which is also the largest hydroelectric generation project in Pakistan. Topi is home to Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (GIKI), one of the premier technical universities of Pakistan. Gadoon Amazai Industrial Estate, is also a few kms North-East of Topi. All these key Land Uses i.e. Tarbela dam, GIKI, Gadoon Amazai Industrial Estate and the geographic location of existing Topi settlement justify a well-planned New Town (New Topi) adjacent to existing Topi settlement.

CHAPTER. 7: SCHEDULE FOR REGULAR MONITORING, EVALUATION & UPDATING

7.1 EXISTING STRUCTURE

Regular monitoring, evaluation and updating of the Land Use Planning System at District level are important features of the Project, particularly because of involvement of assembly and integration of geographic information. Based on this system, alternative spatial development strategies over the years can be developed depending upon changed circumstances.

Land use planning refers to the process by which land is allocated between competing and sometimes conflicting uses in order to secure the rational and orderly development of land in an environmentally sound manner to ensure the creation of sustainable human settlements.

The land use planning process consists in the main of the two twin functions of the of Development/Land use Planning and Development Control. Of necessity, these two functions are basically maintained by relevant literature review, primary and secondary data, analysis/research and mapping which are also major components of the land use planning process.

Land-use planning does not exist in isolation. It is necessary to view and review land-use planning as an integral part of the process of national growth and development. Among other things, this process seeks to identify, articulate and satisfy the basic social/human needs of a country's population within the context of available economic/financial resources and technical knowledge as in case of our province Khyber Pakhtunkhwa.

The Land Use Plans covered the 22 sectors which meet the need of the public. For instance, they need housing; jobs; education; opportunities for recreation; transport; and basic services like water, electricity, clean air and health care. Social planning and policies attempt to take care of the basic social needs of the country's population. Economic planning and policies seek to ensure that the country has a sound economic base which provides revenue to finance government operations and pay for provision of services to the public while also ensuring that jobs are available to the country's labour force.

Land-use planning seeks to accommodate these needs within a technical and spatial framework. While houses must be built for the population for example, they cannot be provided in a swamp; or an area that is unsuitable for housing development because of its terrain, vulnerability to natural or other disasters, or inability to physically support the building; or in an area that endangers the health and safety of the occupants or other members of the public.

Similarly, economic decisions to focus on tourism, manufacturing industry or agricultural development as the basis of the country's economic development must be translated into land-use terms. First, each of these activities use land. Furthermore, some areas of land are more suitable for some types of activities than others and some activities have negative impacts on the terrestrial (land) and/or marine (sea) environments. Also, use of land for one activity often prevents its use for another activity at the same time.

LAND USE & BUILDING CONTROL AUTHORITY:

Land use planning also takes place within a legal context. At this stage, suffice it to say that the legal context provides the justification for undertaking and implementation of land use planning and sets out the powers and duties of the agency responsible for the planning function - the Development Control Authority. The legislation also sets out the procedures to be followed, the matters to be covered in executing both the development planning and development control functions. The law also makes provision for revising and changing land-use plans and policies to ensure that they are always current and relevant to the country's development needs.

The law also provides for remedies for those persons affected by planning and development decisions/activities and penalties for those who fail to comply with the provisions of the legislation

So, for this reason the provincial assembly approved the proposed KP Land Use and Building Control Authority Act, 2021 to keep a check on illegal construction on agricultural land and unplanned expansion of cities, according to news sources.

Governance structure of the Building Control Authority includes

1: Provincial Land Use & Building Control Council.

2: The Local Planning & Enforcement Unit

3: District Land Use Planning & Management Committee

The provincial Land Use & Building Control Council is headed by Chief Minister of Khyber Pakhtunkhwa.

The council includes representation of the provincial cabinet, relevant administrative secretaries and experts from private sectors. It will approve land use plan for any district and necessary amendments to it.

Besides the approval of land use plans and master plans of districts, the council would also provide policy framework and work as an oversight body for the implementation of policies in that regard.

Under this law, committees will be formed in all districts with deputy commissioners heading them and heads of the related departments working as their members.

The district committee will prepare land use plan at district level and forward it to the provincial council for final approval. The district committee will also ensure implementation of the approved land use plan at district level.

While at tehsil municipal administration level, the establishment of an inspectorate had been proposed to ensure the maintenance of land use records and take action against violators of the building laws and by laws.

The Act also sought the formation of tribunals to address the complaints of citizens regarding the land use plan.

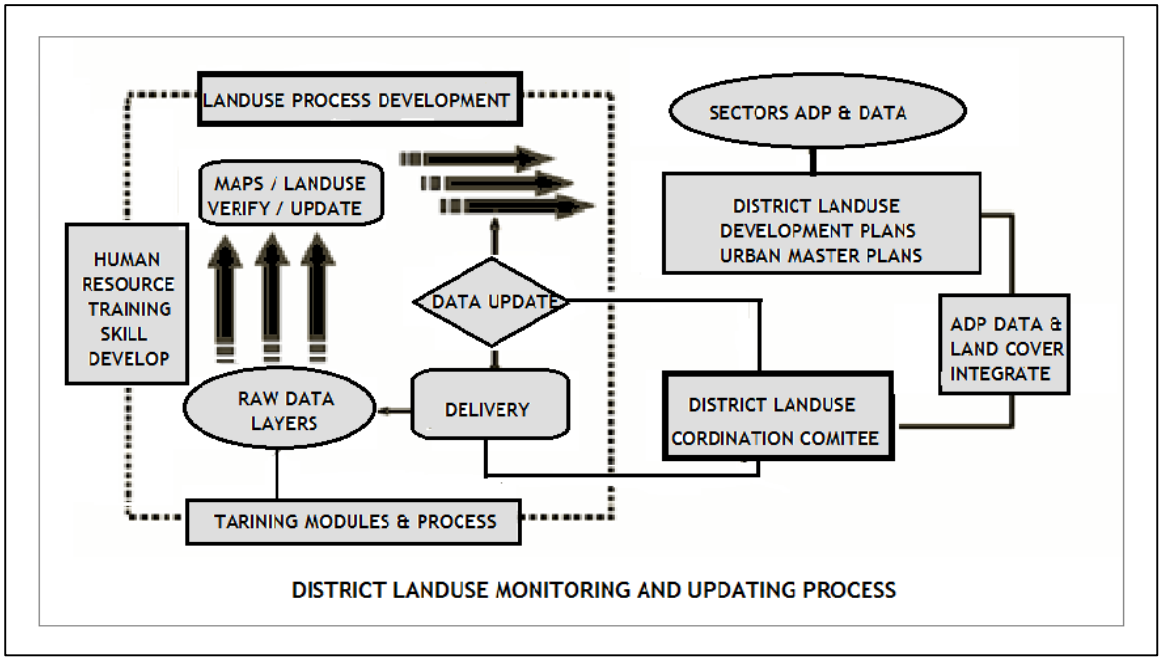


Figure 7. 1 Proposed Structure

The GIS based Land Use plan can be used by various departments/agencies for the purpose of data updating and enhancement. The data sharing and the information updating will be a two-way process as both the stake holders and the government departments/ agencies will be able to exchange information and achieve continuous improvement in the quality and quantity of information.

Generally, the Land Use plans in the past were produced using traditional sectoral land cover plans, which described a state of land cover by sectors and plans to be implemented independently without any coordination with other sectors. The result was that more often some sectors were over emphasized and received higher investment, while others which are equally important were marginally developed. Though the process was continuous and cyclical in nature, however there was no coordination and no Land Use was available at district or provincial level. It was considered a purely town planning subject limited to urban areas only.

The approach used while preparing this Plan focuses on planning based on updated sectoral data and electronic mapping using the Geographical Information systems based on the identification of needs and goals. This coupled with the formulation and evaluation of alternative courses of action, resulted in mapping the information in different layers. This strategy needs updating, developing and implementing the Geographical Information System (GIS) as a new tool and approach for planning. A well-integrated and comprehensive database is an important element that could determine the ultimate success of GIS application in development planning.

The functionality of Land Use Plan can be enhanced by coordinating with all the departments and developing data integration tools to existing system. Consequently, it will be used to assist decision-making, taking into account among other things, the current scenarios of the proposed development, physical constraint and future impacts.

Implementation of District Land Use Plan necessitates development of a module for capacity building of institutions via skill improvement of human resources; and coordination amongst

different sectors/departments. It is also recommended to develop web-based GIS Land Use maps for implementation of development plan and for project monitoring. This information should be made available and accessible to the general public with a special application for feedback (refer Figure above).

Proper and effective planning generally involves close monitoring growth, review of Annual Development Plans as well as policy appraisal. Plan Implementation calls for comprehensive information concerning the past, present and future. As spatial representation is critical to development, the attribute data related to the problems or issues to be addressed needs to be translated into spatial manifestation to ease the process of analysis and decision making. A Planning Authority under the LGE&RDD is established, to develop, implement and continually update the mapping via GIS calls for planning and monitoring functions, especially to integrate, assemble and coordinate the information obtained from a wide range of sectors, departments and sources.

An Electronic Data Bank (EDB) should be developed to serve as the eyes and ears to the monitoring process, so as to help in the surveillance of compliance with planning proposals. The EDB shall be provided inputs by all the departments and it is estimated that almost 130 person months of senior level officials, GIS experts and data entry personnel will be involved in managing and updating the EDB. Of these some 120 man-months will be consumed by the respective departments while a Deputy Director assisted by the GIS expert, and data entry persons as well assistants involving 40 person months will be required at the central coordinating office where the district Land Use plans will be updated.

Methods of creating, obtaining and distributing information for the purpose of mid-term reviews, which shall determine policy and implementation issues for further improvement, are imperative. Additionally, for monitoring the process of updating the geospatial information of Land Use; vertical integration of the developed and maintained datasets is essential. To this end the information from TMAs, Development Authorities and line departments at the provincial and district levels should be given due consideration and the relevant persons at each organization shall be properly trained to follow the monitoring software and develop electronic data base.

The P&D Department /Urban Policy Unit established at the provincial level should be expanded to include the incorporation of the GIS into the development plan preparation process at all planning hierarchy, be it the macro or micro level. As such, GIS technology shall be applied in planning activities, which essentially include plans formulation as well as development control.

The use of web-based GIS will be the best approach in overcoming the constraints in development planning, setting targets and resolving disputes involved in the planning process. When the system is properly monitored and updated on regular basis with access to the general public, it will provide huge potential for improving the planning system especially in terms of transparency and accessibility and consequently contributes to better governance.

At present the land records both for urban and rural areas are managed by the age old Patwari system, which has all the record of landholdings and Land Use. The district land use plans and the EDBs will enable the Urban Policy Unit/ P&D Department to update and have easily accessible land records by type, geospatial information, and liable to any disaster such as floods, landslides, earth quake etc.

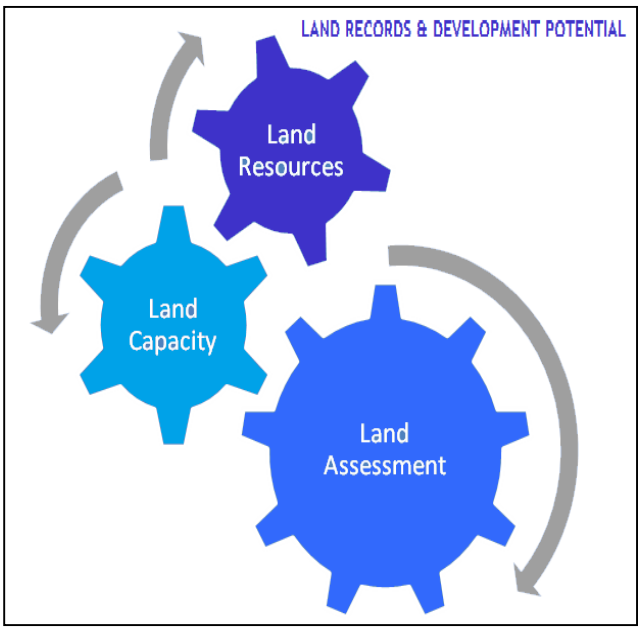


Figure 7. 2 Land Records and Development Potential

Regular updating and electronic monitoring of the land cover will enable the provincial government to introduce a transparent method of land revenue/ property tax and tax on commercial, industrial, agricultural and other Land Uses. This will help the Provincial Revenue Department to update its records and collect the property tax and land revenue etc.

Based on the land cover and Land Uses the provincial government/district government will be able to introduce plans and programs for tree plantation, forestation and land conversion thus enhancing both personal income and provincial income. The development of range lands and forests will also help to achieve the goals of environmental protection.

The electronic data sharing with the citizens and the government departments will be more efficient, more effective, and cost effective, as with a click any one will be able to update its records and initiate information coordinating between stakeholders.

The Land Use development plans monitoring in GIS will support the P&D Department of KPK, and the Urban Unit in controlling and monitoring development projects. The implementation will be strongly supported by the EDB & GIS which will provide inputs for the planning information needed through continuous data gathering, updating and, storage.

The District Land Use Plan Monitoring emphasizes on Geospatial physical planning involving spatial data, location and land use activities of proposed development. It will be possible to check whether land use development in the District complies with the planning proposals in the district by comparing current land use development with that proposed.

A series of workshops and trainings may be arranged to ensure smooth technology transfer to acquire the appropriate knowledge and skills to users. The training modules will serve as a supporting factor to GIS capacity building, covering various aspects including competency, infrastructure, procedures and resources essential for overall monitoring, evaluation and updating of Land Use plans.

Table 7. 1: Sectors, Tasks and Manning

Sr. No	Sectors	Tasks	Personnel
1	Industries & Commerce	Industrial Estates, Future Development Plans, Type of Industries, Land cover, Data, Annual ADP	Supervisor, Software Manager
2	Agriculture	Cropping Pattern, Land cover, Data, Annual ADP	Supervisor, Software Manager
3	Irrigation	Canals, Wells, Tubewells, type of irrigation, Other data, ADP and Land Cover	Engineer, Data Entry Clerk,
4	Water Resources	Rivers, Canals, Wells, Tubewells, Land cover, Data, Quantity of water, Annual ADP	Engineer, Data Entry Clerk,
5	Water Logging and Salinity	Data on SCAP, Land cover, Data, Financing, Annual ADP	SCARP In charge, Data Entry/ GIS Expert
6	Water Supply and Sewage	Urban Plans, Land cover, Data, Annual ADP	Municipal Engineer, GIS Expert
7	Climate & Weather	Information from Meteorological Department, Data, Annual ADP	Met Officer and Data Entry Clerk
8	Floods/ Disaster	Land cover, Data, Financing, Annual ADP	Engineer, Data Entry Clerk,
9	Environment	Land cover, Data, Financing, Annual ADP	
10	Communications	Land cover, Data, Financing, Annual ADP	
11	Transportation	Land cover, Data, Financing, Annual ADP	
12	Rail and Air	Land cover, Data, Financing, Annual ADP	
13	Housing	Land cover, Data, Financing, Annual ADP	
14	Demography	Data on settlements, Financing, Annual ADP	Demographer
15	Health	Hospitals, Health Centers by location, size and type, Land cover, Data, Annual ADP	Dy. Secy Health, Information Manager
16	Education	Data on Schools, Higher Education, Training Institutes, by size, type and location, Education Plans and Annual ADP	Dy. Secy Education, GIS Expert and Information Manager

Sr. No	Sectors	Tasks	Personnel
17	Tourism/ Entertainment	Hotels, Historic Places, Pars, resorts etc., Data, Annual ADP	Tourism Officer, and Data Entry Clerk
18	Urban Planning/ Expansion	Information from TMAs, Development Authorities, Land cover by type, Urban Land Use, Data, Transportation Network and Annual ADP	Urban Planner and GIS Expert
19	Existing Land Use	District level Land Use and Land cover by Type, vacant, rage land, Development Plans for Land Use change Data, and Annual ADP	Supervisor and GIS Expert
20	Mining	Type, size and location of mines, Land cover, Data, Annual ADP	Information from Dy. Director Mining Department, Data Entry Clerk

Table 7. 2: Schedule of Expenditure

Sr. No	Sectors	Staffing
1	industries & Commerce	Supervisor,
		Software Manager
2	Agriculture	Supervisor,
		Software Manager
3	Irrigations	Engineer
		Data Entry Clerk,
4	Water Resources	Engineer
		Data Entry Clerk,
5	Water Logging and Salinity	SCARP In charge
		Data Entry/ GIS
6	Water Supply and Sewage	Municipal Engineer
		GIS Expert
7	Climate & Weather	Met Officer
		Data Entry Clerk
8	Floods/ Disaster	Engineer
		Data Entry Clerk,
9	Environment	Engineer
		Data Entry Clerk,
10	Communications	Engineer

Sr. No	Sectors	Staffing
		Data Entry Clerk,
11	Transportation	Engineer
		Data Entry Clerk,
13	Housing	Engineer
		Data Entry Clerk,
14	Demography	Demographer
15	Health	Dy. Secy Health
		Information Manager
16	Education	Dy. Secy Education
		GIS Expert
		Information Manager
17	Tourism/ Entertainment	Tourism Officer
		Data Entry Clerk
18	Urban Planning/ Expansion	Urban Planner
		GIS Expert
19	Existing Land Use	Dy. Director/ Senior level planner
		Supervisor/ Coordinator
		GIS Expert
20	Mining	Information from Dy. Director Mining Department
		Data Entry Clerk
	Professionals @ Rs.250,000/month Others @ Rs. 150,000	
	Other Costs 75 % of above	

7.1 ZONING

The total area of the district needs to be divided in different Land Use zones, as there is a strong need to clearly delineate zonal boundaries to distinguish between residential, large-scale commercial, industrial and other Land Uses in the District. The purpose is to control and direct the use and development of land and properties. Primarily objective of zoning is to improve the efficiency derived from agglomeration economies, ensure minimum standards

of health and safety and provide land for public goods and services. The criteria for earmarking the zones have been based on the following characteristics:

- Physical and spatial Characteristics
- Predominant Land Uses
- Intensity of development

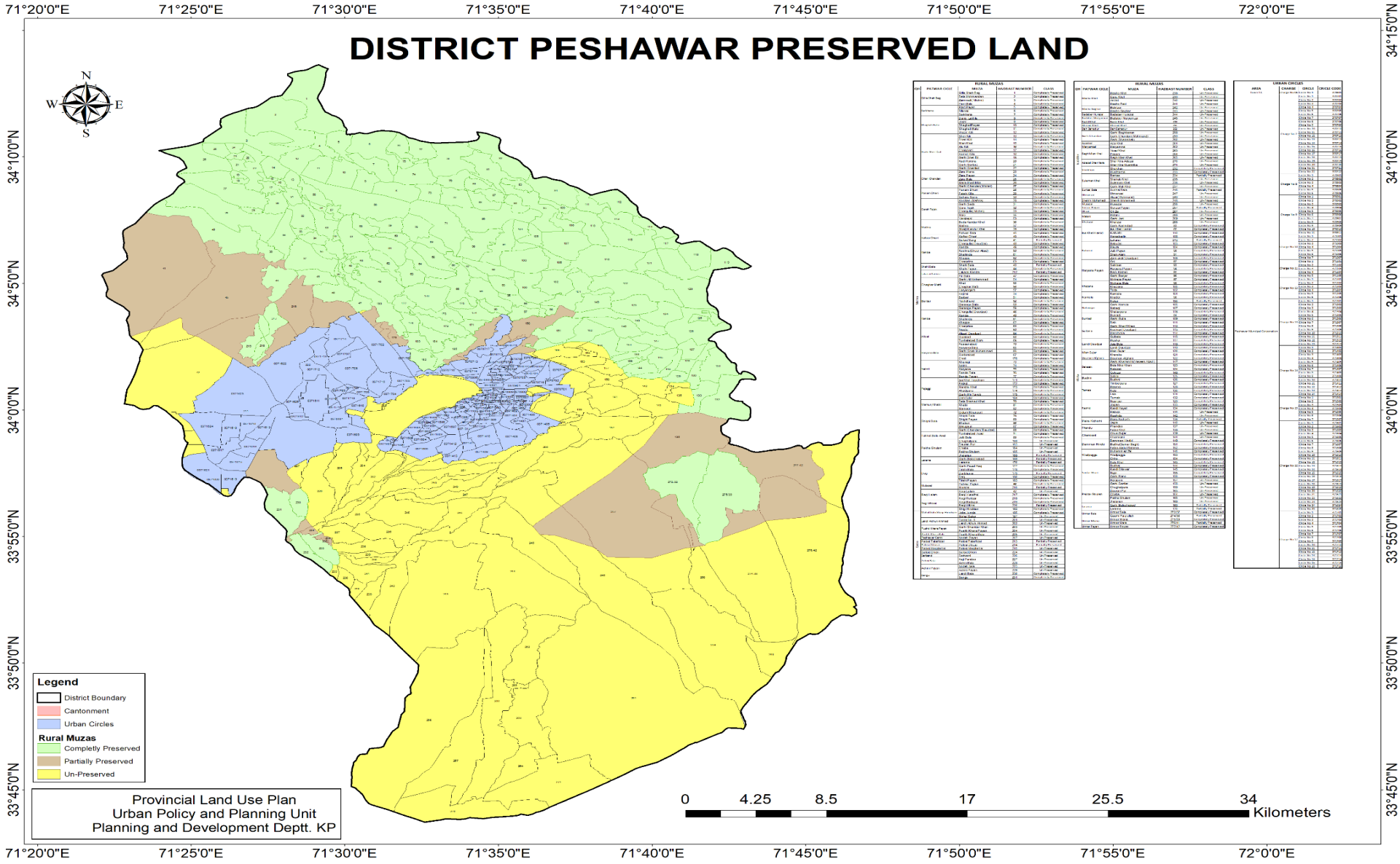
In the District Land Use Plan, like all other zones, specific Land Use parameters have been formulated for different zones to facilitate better and effective planning control in the area.

In this Chapter, specific set of parameters have been proposed for better Land Use control in each zone; these regulations are mainly influenced by the characteristics of the zones, and their perceived development pattern.

In Chapter 6, a Land Use strategy has been proposed for Peshawar, including location and allocation of major Land Use zones. For each of the proposed zones, it is important to have Land Use parameters, to facilitate effective planning control. The agricultural area should be preserved in a manner that its character as a green belt is protected to maximum possible extent. In the existing built-up areas, there should be a gradual shifting of non-conforming uses from a particular zone so as to cause minimum hardship to the owners of non-conforming uses. The obnoxious industries may for example be assigned high priority for shifting, depending on the nuisance of the industries. It is high time that stringent steps are taken to adopt a clear cut policy based on identification and gradual elimination of non-conforming uses located in various zones.

Land Uses permitted/permitted on appeal in different planning zones of Peshawar are proposed in sections below. Permitted Land Uses are those, which the City Government/Planning Agency may allow in a particular zone. Land Uses that can be 'permitted on appeal' should be carefully scrutinized by the planning agency and decided upon on case-to-case basis. Uses not specifically provided in a particular zone are prohibited and should not be permitted. The important thing to emphasize is that a building or Land Use shall not be used in a manner inconsistent with the prescribed use.

Zone-wise regulations considering compatibility of various Land Uses are proposed in section below:



Map 7. 1: District Peshawar Preserved Land

7.2 LAND USE COMPATIBILITY

7.2.1 Rules for Residential Zones:

Table 7. 3: Regulation for Residential Zones

Residential	Uses Permitted	Uses Permitted on Appeal
Low Density Residential	Detached/semidetached dwellings Mosques Primary/High Schools Clinics/Dispensaries Social/Cultural Institutions Local Shopping Areas/Retail Shops Offices of Professionals with adequate parking facilities Parks and Playgrounds Local Recreational Uses Non-commercial vegetable gardens and nurseries. Ancillary uses clearly incidental to residential uses, which must be free from nuisance and hazard.	Commercial Offices and Service Shops of Local Character[80]. Raising of poultry for non-commercial purposes[81]. Petrol pump, gas filling station. Taxi/rickshaw stand.
Medium Density Residential	Apartment Buildings / Multi-family dwellings Colleges and Research Institutions Hostels, Guest Houses Offices of TMAs/other tiers of Local Govt. All uses permitted in low density residential zones[82]	All uses permissible on appeal in low-density residential zone. Restaurants and hotels Hospitals[83] Petrol and Gas filling stations[84].
High Density Residential	All uses permitted in Medium Density Zone Public Utilities and Buildings Recreational Uses	All uses permitted on appeal in medium density zone.

[80] Should be located in local shopping center

[81] Provided the birds are properly segregated from the habitable parts of the house.

[82] Subject to density limitations specified for the sub-zone.

[83] Not treating contagious diseases and mental patients

[84]Should be on sites located along roads having at least 30 meters right-of-way and 100 meters away from a crossing of two primary roads or a roundabout.

Residential	Uses Permitted	Uses Permitted on Appeal
	Taxi and Rickshaw Stands	
Major Commercial Areas	Shopping plazas, Shops and commercial centers, educational institutions, recreational places, parks and open spaces, public and religious buildings and service industries and firefighting arrangements governed by the building and space regulations.	Petrol filling stations, Hospitals, residences, transport terminals, cinemas, clubs and all sort of storage.

7.2.2 Rules for Educational Zone:

Table 7. 4: Regulation for Education Zone

Zone	Uses Permitted	Uses Permitted on Appeal
Educational Zone	Educational and Research Institutions Offices of Social and Cultural Organizations Religious Institutions Parks, Memorials and Monuments Recreational Uses Public Utilities and Buildings Community Facilities, Arts Councils and Auditoriums Government Offices Taxi Stands, Bus Halts Approved Parking Provisions	Hotels Offices of Commercial Institutions Restaurants and Clubs Commercial Recreational uses like theatre halls and cinemas Petrol and gas filling Station Limited Retail Shopping

7.2.3 Rules for Trade Zone:

Table 7. 5: Regulations for Trade Zones

Zone	Uses Permitted	Uses Permitted on Appeal
Trade Zone	Wholesale/retail commercial markets and establishments. Restaurants/Hotels. Business and professional offices Transportation Terminals Recreational Uses Public utilities and buildings Approved parking provisions.	Petrol and gas filling stations Hospitals not treating contagious diseases or mental patients.

7.2.4 Rules for Industrial Zones:

Table 7. 6: Regulations for Industrial Zones

Zone	Uses Permitted	Uses Permitted on Appeal
Light-Medium Industrial Area	Auto-Mechanic Shops/Yards Motor Bargains Cottage Industrial Units Warehouses and Storage Public Utilities and Buildings Canteens Agriculture (until the area is required for development) Approved Parking Loading and Unloading Provisions Dwellings for watch and ward staff	Bus and Truck Terminals Railway passenger and freight terminals Petrol and gas filling stations Taxi stands Junk Yards Recreational facilities for employees.
Medium-Heavy Industrial Area	All categories permitted in the light-medium industrial zone. Warehousing, storage depots[85] and incidental uses. Approved Parking Loading and unloading provisions. Dwellings for labour and watch and ward staff.	All categories permissible on special appeal in Light-Medium industrial zone. Warehousing of perishable and inflammable commodities.

[85] Only non-perishable and non-inflammable commodities

7.2.5 Rules for Recreational Areas:

Table 7. 7: Regulation for Recreational Areas

Zone	Uses Permitted	Uses Permitted on Appeal
Recreational Areas	Recreational areas including parks, playgrounds and related uses. Youth hostels and clubs Taxi and rickshaw stand Bus halts and car parking areas. Dwellings for watch and ward staff. Public utilities and municipal facilities.	Restaurants and establishments selling eatables Incidental recreational uses. Graveyards Adequate parking provisions.

7.2.6 Rules for Agricultural Zone:

Table 7. 8: Regulations for Agricultural Zone

Zone	Uses Permitted	Uses Permitted on Appeal
Agricultural Zone.	Agriculture Horticulture Dairy and poultry farming Milk chilling and pasteurization centers Existing settlements Community facilities and public utilities Servicing/repair of farm equipment and machinery.	Storage, processing and sale of farm products in the zone where produced. Sale of agricultural supplies Parks and recreational uses Retail shopping and service uses
Green belt	Agriculture Horticulture Dairy and poultry farming Milk chilling and pasteurization centers Existing settlements Community facilities and public utilities Servicing/repair of farm equipment and machinery.	Not allowed

GOVERNMENT OF KHYBER PAKHTUNKHWA
LOCAL GOVERNMENT, ELECTIONS & RURAL DEVELOPMENT DEPARTMENT

No.SO(UADAs)/LG/1-34/LUBC/2022
Dated the Peshawar, 15th ASeptember,2022

To

1. Minister for Local Government and Rural Development Khyber Pakhtunkhwa
2. Minister for Agriculture, Livestock and Cooperative Khyber Pakhtunkhwa
3. Minister for Industries Khyber Pakhtunkhwa
4. Minister for Environment Khyber Pakhtunkhwa
5. Senior Member Board of Revenue, Revenue and Estate Department
6. Secretary to Government of KP, Housing Department
7. Secretary to Government of KP, Public Health Engineering Department
8. Secretary to Government of KP, Communication and Works Department
9. Secretary to Government of KP, Irrigation Department
10. Secretary to Government of KP, Transport and Mass Transit Department
11. Secretary to Government of KP, Environment Department
12. Secretary to Government of KP, Industries Department
13. Secretary to Government of KP, Agriculture, Livestock and cooperative Department
14. Secretary to Government of KP, Local Government and Rural Development Department
15. Professor Dr. Rawid Khan, Deptt: of Civil Engineering, UET Peshawar
16. Mr. Abdul Halim Paracha, Master in Civic Design, United Kingdom
17. Mr. Hifz-Ur-Rehman, Ex-Secretary
18. Mr. Adnan Ahmad Khan, HOD Architecture Department, CECOS University of I.T and Engineering Sciences, Peshawar
19. Dr. Nasir Javed, (Ex-PAS Officer) Urban Development Specialist

Subject: **1ST MEETING OF THE PROIVINCIAL LAND USE AND BUILDING CONTROL COUNCIL KHYBER PAKHTUNKHWA HELD ON 14/09/2022.**

Sir:

I am directed to refer to the subject noted above and to state that 1st meeting of the Provincial Land Use and Building Control Council was held on 14/09/2022 at Chief Minister House under the kind chairmanship of the Honorable Chief Minister Khyber Pakhtunkhwa. During meeting the plans were principally approved, however, the Honorable Chief Minister has very kindly directed to share copies of all the six completed District Land Use Plans of District Peshawar, Mardan, Swabi, Charsadda, Nowshera and Abbottabad with all members of the Council for their views/comments and inputs with in one week time positively.

I am further directed to enclose here with soft copies of the completed District Land Use Plans (DLUPs) of District Peshawar, Mardan, Swabi, Charsadda, Nowshera and Abbottabad for your views/comments and inputs within one week time positively for further processing of these plans please.

Section Officer (UADAs)

Endst: No. & Date Even:

Copy Forwarded to:

1. The PSO to Chief Minister Khyber Pakhtunkhwa
2. The PS to Additional Chief Secretary P&D Department
3. The DG, Provincial Land Use and Building Control Authority, LGE &RD Department
4. The Executive Director, UPPU, P&D Department
5. The Project Manager PLUP, UPPU, P&D Deprtment

Section Officer (UADAs)

19/9/22

MINUTES OF 1ST MEETING OF PROVINCIAL LANND USE AND BUILDING CONTROL COUNCIL KHYBER PAKHTUNKHWA. HELD ON 14/09/2022.

In order to discuss and approve the finalized District Land Use Plans of six Districts of Peshawar, Mardan, Nowshera, Charsada, Swabi and Abbottabad, 1st meeting of the Provincial Land Use and Building Control Council was held on 14/09/2022 at 11:00 AM at Chief Minister House under the kind chairmanship of the honorable Chief Minister Khyber Pakhtunkhwa.

Mr. Shahab Ali Shah, Additional Chief Secretary P&D Department briefed the forum on the objectives of the Land Use Plan and specially the importance and need of the District Land Use plans for streamlining the development. The purpose of the preparation of these plans is to ensure optimum utilization of land through better management for getting maximum benefit out of it. Peshawar's population is growing at 3.99% which indicates that the population will almost become double after 18 to 20 years. These plans will be a policy document and will serve as planning guidelines for line departments to regulate development at the district level and to know as to how to cater the needs and demands of the growing population in the next twenty years. He further explained that through a comprehensive study suitable zones have been identified in each of the district for each sector like Housing, industries, Tourism, Agriculture land and Livestock, Health services, Education services, Communication/Transport, Parks and green areas, recreational facilities, public buildings, Forest and Range lands, Mines and Minerals, Energy and Power, Trade and Commerce and Natural hazards etc. These plans have been shared with the relevant stakeholders at various planning stages. He requested the chair for principal approval of these plans so that its implemented may be started.

Planning and Development Department, UPPU, gave a detailed presentation of the district land use plan of Peshawar District, whereas the land use proposals contained in each of the remaining five District Land Use Plans were also presented and discussed in details. The forum appreciated all these plans.

The Honorable Chief Minister Khyber Pakhtunkhwa also appreciated the efforts of the Planning and Development Department. The honorable Chief Minister after detailed discussions directed that:

- These plans shall be in line with the Plans and Policies of the Departments and there shall be no overlap and duplication.
- These plans shall be shared with the concerned administrative secretaries/members of the councils for their views/comments and inputs, if any, within one week time positively, before circulation of the minutes.
- All the Departments shall execute/implement these Plans in letter and spirit.

- Agriculture Department was directed to stop any further housing activities on the agriculture lands.
- The LG&RDD was directed that PDA/TMAs may not issue any NOCs for any housing societies/schemes towards North of District Peshawar. Such like NOCs, if required, shall be issued towards south of District Peshawar in the area specified for housing sector under the DLUP Peshawar.
- Progress of the Population department regarding the population control shall be reviewed.
- All the illegal encroachment along the rivers and streams side shall be stopped.
- Grievances redressal mechanism shall be established at District as well as provincial level so as to address any complaint regarding these District Land use plans.
- Similar District Land Use Plans shall also be prepared for all the remaining District of Khyber Pakhtunkhwa including newly Merged Districts.

Decision:

After detail discussion the following decisions were arrives at:

1. All the Six completed District Land Use Plans of District Peshawar, Mardan, Nowshera, Charsadda, Swabi and Abbottabad were principally approved for their further implementation and execution at District level.

The meeting ended with a vote of thanks from and to the chair.

FIRST MEETING OF THE PROVINCIAL LAND USE AND BUILDING CONTROL COUNCIL DATED 14/09/2022

PARTICIPANT LIST

S.No	Name	Designation	Contact No	Signature
1	S.M. Shah	Minister	0344751114	[signature]
2	FAISAL AMIN	MIN	03345152307	[signature]
3	Abdul Karim	SP Env Com Industry	03135283001	[signature]
4	AMBER ALI KHAN	Secretary Housing	0344-9271558	[signature]
5	Rawid Khan	Prof. UET	0300 5734427	[signature]
6	Muhammad Asif	SSC(Dev) DS LCBA	0301-5971257	[signature]
7	Adnan A. Khan	Architect	0301-8498899	[signature]
8	Abdul Halim Paracha	Urban & Regional Building Control Specialist	0301-8595859	[signature]
9	Idrees	Secretary	03335553382	[signature]
10	Jamil Gul	C&W Spl: Secy	03105880999	[signature]
11	Anwar Latif	Secy P&D	091 9210316	[signature]
12	Abid Majeed	Secy Env		[signature]
13	M. Nauman	Add: Sec	03036077773	[signature]
14	Zakir Hussain	SMBR		[signature]
15	Shahab Ali Shah	ACS		[signature]
16	Zaheer ul Islam	Sec LG		[signature]
17	Taimoor Jhagra	Minister Fin & Health	—	—