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Strategic Environmental Assessment of the

Master Plan for Gilgit City

National Impact Assessment Programme

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Table of Contents

Exhibits

List of Abbreviations

ADB	Asian Development Bank
AKDN	Aga Khan Development Network
AKPBS	Aga Khan Planning and Building Services
APCC	Annual Plan Coordination Committee
APSC	Army Public School and College
BIS	Bureau of Indian Statistics
CDA	Capital Development Authority
CMH	Civil Military Hospital
CMP	Conceptual Master Plan
DHQH	District Headquarter Hospital
ECE	Early Childhood Education
EF	Environmental Framework
EIA	Environmental Impact Assessment
EV	Environmental Value
EW	Environment Wing
FAR	Floor Area Ratio
FSP	Financial Sustainability Plan
FWO	Frontier Works Organization
GB	Gilgit-Baltistan
GBEPA	Gilgit-Baltistan Environmental Protection Agency
GBLA	Gilgit-Baltistan Legislative Assembly
GCM	Global Climate Model
GDA	Gilgit Development Authority
GIS	Geographical Information System
GLOF	Glacial Lake Outburst Flood
GoGB	Government of Gilgit-Baltistan
GoP	Government of Pakistan
HBP	Hagler Bailly Pakistan Pvt. Ltd.
IF	Institutional Framework
IUCN	International Union for Conservation of Nature
KDA	Karachi Development Authority
KIU	Karakoram International University
KKH	Karakoram Highway
KPK	Khyber Pakhtunkhwa
KW	Kilowatt
LDA	Lahore Development Authority
LPG	Liquid Petroleum Gas
MC	Municipal Corporation

MoCC	Ministry of Climate Change
MSW	Municipal Solid Waste
MW	Megawatt
NAPWD	Northern Areas Public Works Department
NCEA	Netherlands Commission for Environmental Assessment
NCP	Non-Custom Paid
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organization
NIAP	National Impact Assessment Programme
NLI	Northern Light Infantry
NSDWQ	National Standards for Drinking Water Quality
PA	Protected Area
PakEPA	Pakistan Environmental Protection Agency
PC	Planning Commission
PCO	Pakistan Census Organization
PEPAC	Pakistan Environmental Planning and Architectural Consultants Ltd.
PGR	Population Growth Rate
PKR	Pakistani Rupees
PMD	Pakistan Meteorological Department
PSDP	Public Sector Development Programme
PWD	Public Works Department
SAA	Sikander Ajam Associates Pvt. Ltd.
ROW	Right-of-Way
SEA	Strategic Environmental Assessment
SUPARCO	Space and Upper Atmosphere Research Commission
ToR	Terms of Reference
UNO	United Nations Organization
UNOPS	United Nations Office for Project Services
USD	United States Dollar
WASA	Water and Sanitation Authority
WASEP	Water and Sanitation Extension Programme
WB	World Bank
WCS	Wildlife Conservation Society
WSCC	Water Supply and Sanitation Collaborative Council
WWF	World Wildlife Fund

Glossary

Adda	Bus stand.
Awami	People's property.
Brownfield Site	In the context of this report, brownfield sites are areas or land with some form of infrastructure on them, such as houses or roads.
Environmental Value	In this report, an EV is defined as the flow of services that the physical and socioeconomic features of Gilgit presently provide and can provide in the future, if adequately developed, and which are vital to the well-being of the inhabitants of the city.
Gilgit	The boundaries of the city considered for the SEA are those defined by the jurisdiction of the GDA. This is the same area that would be affected by the future Master Plan.
Greenfield Site	In the context of this report, greenfield sites are agricultural or grazing areas in the city or on barren land with no existing development.
Jalawan	Nomads.
Kachi Abadis	Informal settlements.
Knots	A cluster of local dwellings.
Katchi	Also known as kuchha. Ramshakle houses constructed of less-durable material, such as mud, bamboo, reeds or thatch.
Marla	A traditional unit of area used in Pakistan. One marla is equal to 25.29 square meters.
Maund	A measure of weight; approximately 40kg.
Mohalla	A cluster of residential dwellings.
Moza	Administrative subdivisions in Gilgit.
Nullah	A stream.
Numberdar	A local term used to designate the village headman in different parts of Gilgit-Baltistan, also known as 'Lumbardar' or 'Tarangpa.'
Sabzi Mandi	Vegetable and fruit market.
Semi-pukka	Houses built of a mix of construction materials used in katchis and pukkas.

1. Introduction

The Government of Gilgit-Baltistan (GoGB) wishes to improve the infrastructure and living standards of major towns in Gilgit-Baltistan (GB) province based on modern urban planning principles. To implement this vision, it established the Gilgit Development Authority (GDA) under Section 4 of the Gilgit-Baltistan Development of Cities Act, on May 18, 2012. One of the GDA's responsibilities is the development of a Master Plan for Gilgit City (the 'Plan'). Its purpose is to bring positive change in the quality of the lives of the city's inhabitants.

The Plan would focus on the projected population growth in Gilgit and the expected future demand for utility services, education, health, infrastructure development, tourism, disaster management, solid-waste management, housing and employment. Once approved and notified, the Plan will serve as the basis for future urban development in the city. The following points outline the objectives of the Plan:

- The Plan will focus on the sustainable development of Gilgit's physical and social infrastructure in order to achieve economic progress and increase the living standards of inhabitants.
- Efforts will be made to preserve the rich cultural, ecological and environmental splendor of Gilgit by promoting awareness among its inhabitants and by devising environmentally friendly development strategies.
- Gilgit will enjoy financial sustainability, industrial development and economic progress. Land, water and energy resources will be optimized to reduce waste and raise living standards in the city.

The International Union for Conservation of Nature (IUCN), as part of its National Impact Assessment Programme (NIAP)[1], acquired the services of Hagler Bailly Pakistan Pvt. Ltd (HBP), to be national consultants, and Dr. David Annandale, an international strategic environmental assessment (SEA) expert, to carry out a Strategic Environmental Assessment (SEA) of the Plan.

1. Since November 2009, the Government of Pakistan (GoP) and the IUCN have jointly implemented the National Impact Assessment Programme (NIAP) with the aim to contribute to sustainable development in Pakistan. The government of Pakistan intends to do so by strengthening the Environmental Impact Assessment (EIA) process and introducing SEAs in national development planning. The implementation partners of the programme included the Pakistan Environmental Protection Agency (PakEPA); the Environment Wing (EW) of the Ministry of Climate Change (MoCC) and the GDA under the Planning Commission of Pakistan (PC). Additionally, the Netherlands Commission for Environmental Assessment (NCEA) had an advisory role in the project and provided technical advice.

1.1 Objectives of the SEA

Work on the Plan had not started at the time the SEA was initiated. The SEA was therefore conducted as an ex-ante exercise to provide an environmental and sustainability framework for the future development of the Plan. It is hoped that the results and recommendations of the SEA will be integrated into the development of the Plan and will contribute to the incorporation of environmental considerations through all stages of its future development.

Accordingly, the outcomes of the SEA include an Environmental Framework, a Conceptual Master Plan (CMP), a Financial Sustainability Plan (FSP) and an Institutional Framework (IF). Based on these outcomes, a set of draft Terms of Reference (ToRs) have also been prepared to assist the GDA in engaging consultants for the development of the future Plan (Appendix A).

The Conceptual Master Plan is based on an Environmental Framework (EF), which identifies the Environmental Values (EVs) of various physical and socioeconomic-environmental features of Gilgit city (hereinafter referred to as 'Gilgit' or 'the city'). These EVs are considered critical for the welfare and prosperity of the inhabitants of the city and are therefore vital to the preservation and enhancement of any future development there. A description of the EVs is followed by a discussion on the different barriers to realization, which are, at present, hindering the different environmental and socioeconomic features in the city from fulfilling their environmental functions. Any future development in the city must address these barriers and enhance the EVs of all the physical and socioeconomic-environmental features of the city. Therefore, a discussion on the EVs and the barriers to realization of each of the environmental features ends by recommending priority interventions. These interventions are the foundation around which the CMP is developed. While the CMP builds on the structural or town-planning aspects of the interventions for the city, the FSP and the IF build on the financial and institutional recommendations respectively.

The SEA, through the Environmental Framework, Conceptual Master Plan, the Financial Sustainability Plan and the Institutional Framework, aims to provide a clear, concise and measurable set of goals and objectives for future development in Gilgit. It is hoped that the SEA will become a policy tool for the Gilgit Development Authority and provide guidance to future master planners, the inhabitants of the city, and other stakeholders in the future development, re-development and enhancement of the city. As a policy document, the SEA can serve as a framework for residents and decision-makers to conceptualize how the city should look and function, in terms of residential and commercial zoning, development of parks, open spaces, trails, recreational facilities and the enhancement of tourism and culture.

1.2 Scope of the SEA

The recommendations in the CMP are designed to take into account growth within the city up to the year 2025. The objectives of the CMP are to ensure that future developments take Gilgit towards financial independence, empower local communities and enhance both the city's physical and socioeconomic environment. It is envisioned that, as a capital of the newly formed autonomous province of Gilgit-Baltistan (GB), Gilgit should develop into an urban landmark that befits a capital city.

In developing the CMP (Section 3), the first step was to estimate the projected 2025 population of the city. This helped identify future socioeconomic trends, which were used to estimate the number of households in the city by that year and thus the size of the future demand for various urban services. These included the expected demand for health and education facilities in the city and the demand for residential, commercial, recreational and industrial space.

Along with the projected population, Gilgit's new role as a capital city would result in its increased future trade linkages with other parts of GB and

Pakistan. A larger population would also result in growth in the retail market from a burgeoning tourist industry and growth in the city's potential of becoming a provincial center of higher education.

Based on the different aspects mentioned above, the CMP provides a preferred strategy for urban growth, as it would cater to the demand for different services by 2025 while preserving the EVs of the various physical and socioeconomic-environment features identified in the EF. The preferred strategy was determined after assessing the different options for growth in the city.
In the preferred strategy outlined in the CMP, the existing transit corridors are considered while also proposing new transportation routes and inter- and intra-city bus links. The hierarchy of different sizes of roads in different parts of the city is also established, with potential road-widening schemes suggested for pedestrian and vehicular movements. Sustainability issues in terms of recycling solid waste and sewerage systems were also taken into account. A solid-waste distribution network is also proposed.

The preferred strategy also looks into the preservation of existing agricultural lands and the development of more opportunities for subsistence agriculture in the city. Land coverage of forest will also be increased to enhance biodiversity. In future, the city will require green areas to act as its 'lungs' to counter emissions from future industrial growth. Gilgit, being the main urban area within the newly formed autonomous province, will require administrative and civic areas to be defined in any future city expansion.

The promotion of the tourism sector is a major priority of the preferred strategy for future growth. The existing growth pattern adversely impacts the natural beauty of the city and its surroundings. The preferred strategy for growth, therefore, provides opportunities for development, which at the same time also protect the aesthetic features of the city. It also considers the preservation of archeological sites and the development of various recreational parks along the riverbanks and nullahs.

Sectarian conflicts in Gilgit are a source of constant tension in the city. Recent acts of violence have marred its peaceful image. This has adversely affected the tourism industry there and also in the province in general. The preferred strategy for growth, therefore, also takes into account ways and means to promote inter-communal harmony in Gilgit.

Vision, imagination and urban-planning-design skills are the necessary key ingredients for the future development of Gilgit. The strategies for growth and development in the CMP cater to the rising expectations and demands of the modern economy while safeguarding the environment and heritage.

The SEA, through the Financial Stability Plan, also introduces the concept of financial sustainability as part of the town planning process for Gilgit. Government organizations in Gilgit, including the Gilgit Development Authority (GDA), the Gilgit Municipal Corporation (MC) and the Water and Sanitation Authority (WASA) are the institutional bodies engaged in the maintenance of basic utilities, such as water supply and sewerage management, solid-waste management and infrastructure management. The FSP, introduced in Section 4, therefore provides general guidelines to these bodies that will enable them to implement the CMP strategies. The FSP will calculate the approximate capital and operational costs of the provision of basic utilities in Gilgit and will identify the revenue-generation potential available in the city.

The role of the city administration will remain pivotal in the effective implementation of the CMP. Therefore, Section 5 proposes a framework for the roles and responsibilities of the institutions in Gilgit involved in the development of the city. Government organizations in Gilgit, including the GDA, the Gilgit MC, the GBEPA, and the Forest,

Exhibit 1.1: Location of Gilgit City

Wildlife and Environment Department are the institutional bodies addressed in this section. The framework provides general guidelines that will assist these institutions to address the recommendations of the CMP related to the following:

- Water rights, distribution and quality;
- Land-use zoning and development;
- Buildings and infrastructure development;
- Roads, public streets and traffic management;
- Encroachment control;
- Drainage network;
- Solid-waste management; and,
- Protection of forests and Protected Areas (PAs).

1.3 SEA Study Area

Gilgit is the capital city of the province of Gilgit-Baltistan (GB), which is located in northern Pakistan. In September 2009, the Northern Areas Administration—controlled directly by the Federal Government in Islamabad—was renamed the Government of Gilgit-Baltistan (GoGB) and the affairs of the province were transferred from the center to the province. GB has a total area of 72,496 km2 and is divided into seven districts; Gilgit is located in the Gilgit District (Exhibit 1.1). The population density of the province is 14 persons per square kilometer.[2] It has immense hydropower-generation potential on account of its mountainous terrain and hydrological features with five major rivers, including the Indus, which runs through it. It also has an important geo-political location being the only viable road link between Pakistan and China. Exhibit 1.2 provides a comparison of socioeconomic indicators of GB with the national averages of Pakistan. GB is one of the most under-developed regions of the country.

The focus of the SEA, however, is the city of Gilgit (Exhibit 1.3). The boundaries of the city considered for the SEA are those defined by the jurisdiction of the Gilgit District Authority. This is the same area that would be affected by the future Plan. Hence, the 'Study Area' for the SEA is the entire city, as illustrated in Exhibit 1.4. The SEA, however, also took into account, where relevant, known wildlife sanctuaries, community hunting areas, conservation areas, game reserves and river catchments surrounding Gilgit that may be affected by future developments in the city. The Study Area of the SEA, therefore, is comprised of two parts:

I. A mix of seven zones identified by the 1977 Gilgit Master Plan.[6] Exhibit 1.5 illustrates the seven zones, which are listed as follows:
   - Town Nucleus: Gilgit's administrative, political and educational hub.

Exhibit 1.2: Comparison of Socioeconomic Indicators of GB with the National Average[3]

Indicator	*Gilgit Baltistan*	*National*
Per Capita Income (USD):	350	1046
Literacy Rate (%):	38	56
Health Care:[4]	1 : 4100	1: 1212
Maternal Mortality Rate:[5]	600 / 100,000	272 / 100,000
Population Density (persons per sq. km):	12	166

2. Population Census Organization, Government of Pakistan. (1998). District Census Report of Gilgit. Islamabad: Population Census Organization, Statistics Division.
3. Government of Pakistan. (2009-2010). Pakistan Economic Survey. Ministry of Finance.
4. The Health Care Services ratio indicates the availability of medical resources to the population. A ratio of 1:100 implies that, in a given area, 1 person out of 100 residents has access to medical resources.
5. The Maternal Mortality Rate provides the annual number of female deaths per 100,000 live births from any cause related to a pregnancy in a given population sample.
6. S.Qutub, Ayub.1977. Gilgit Master Plan, Pakistan Environmental Planning and Architectural consultants.

Exhibit 1.3: Gilgit City and Surroundings

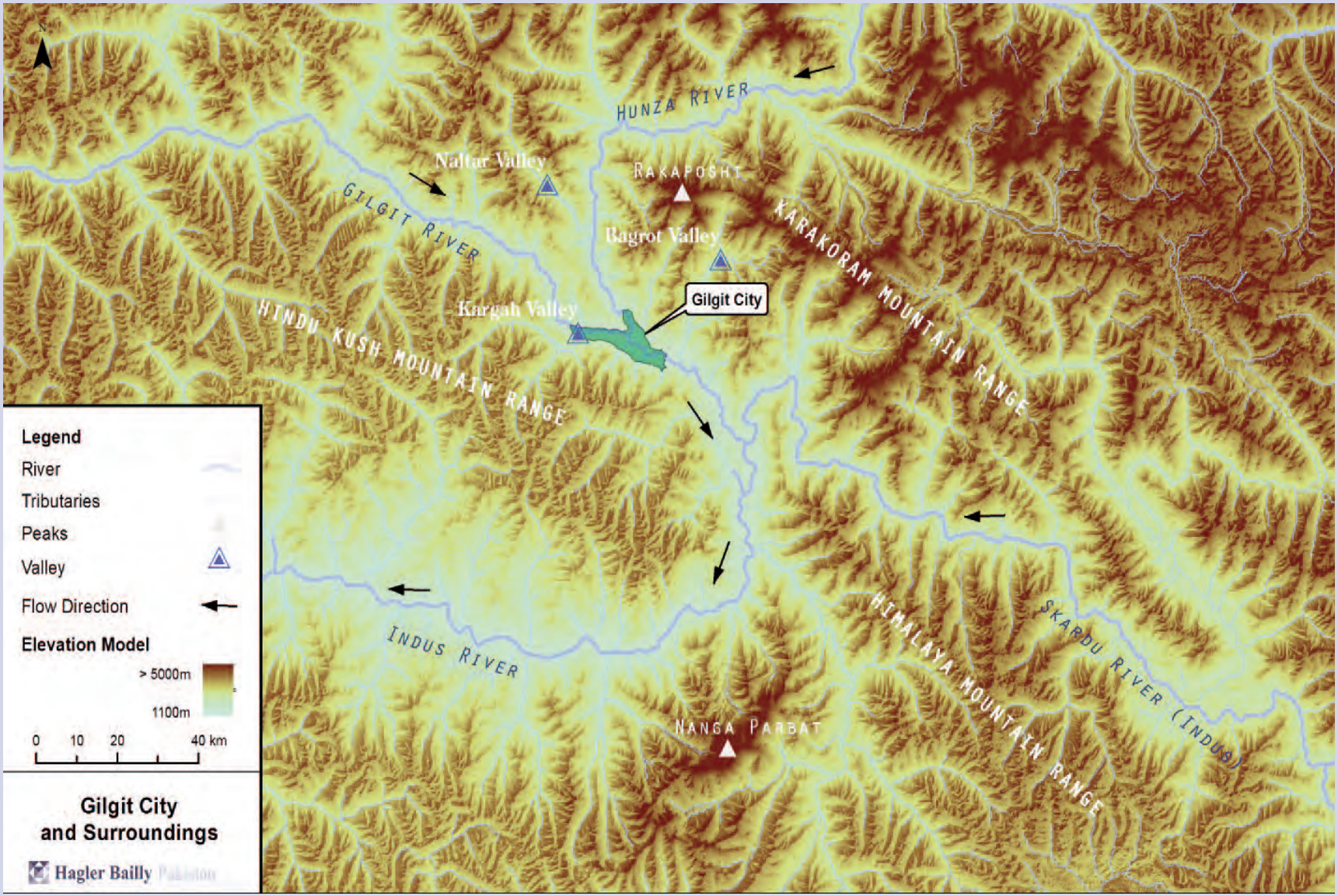


Exhibit 1.4: Study Area of the SEA

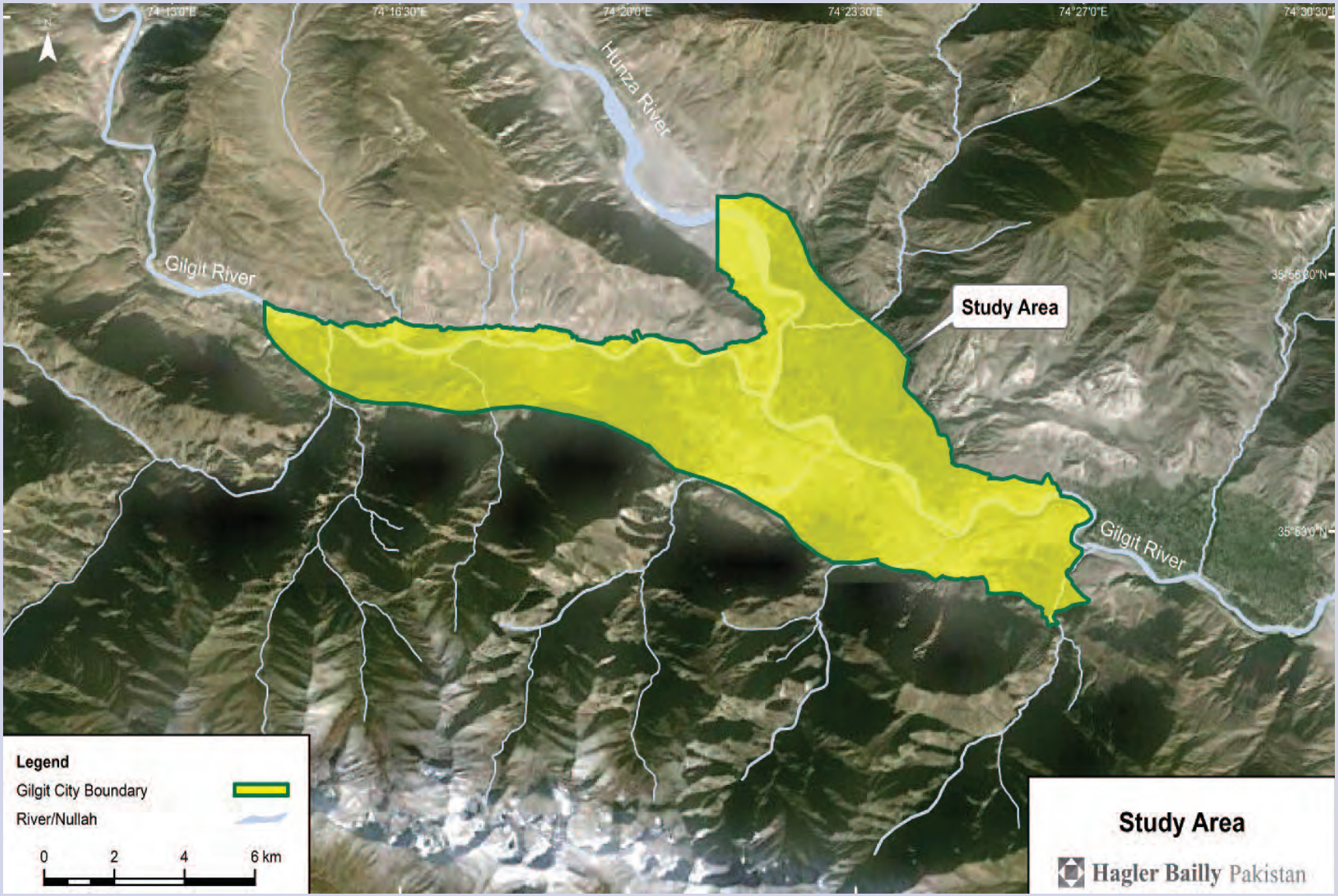
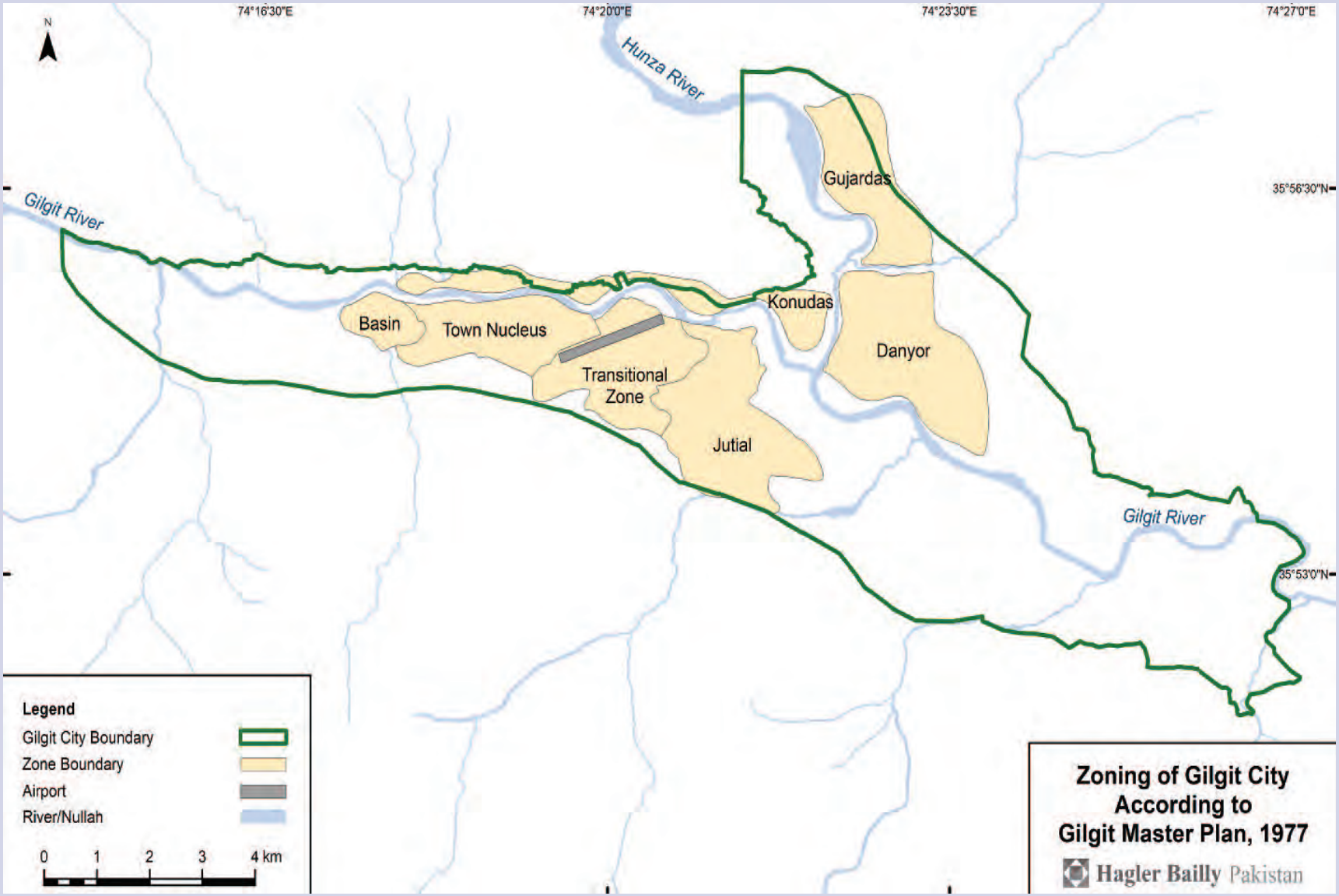


Exhibit 1.5: Zoning of Gilgit City according to the Gilgit Master Plan of 1977



- Transition Zone: an area with agricultural land and small villages where subsistence farming takes place.
- Konudas Plateau: a rocky, infertile, narrow strip of land.
- Gujardas: a rocky, infertile, narrow strip of land.
- Jutial: a barren plateau.
- Basin: an agrarian area with small land holdings next to the Gilgit River.
- Danyor Plain: a rural periphery comprising mainly of agricultural, pastoral and riverside flood plains.

II. The administrative divisions, locally known as 'Mozas', of Sakwar, Minawar and Mohammadabad, are relatively less densely populated areas on the east and southeastern periphery of the city. These comprise mainly of agricultural and pastoral plains. All the mozas in the city are illustrated together on a map in Exhibit 1.6.

1.4 Three Phases of the SEA

The Strategic Environmental Assessment was conducted in three phases. The activities in Phase 1 were designed to help develop the Environmental Framework by identifying existing physical and socioeconomic-environmental features of Gilgit. For this purpose, stakeholder consultations and site visits were conducted by Hagler Bailly Pakistan Pvt. Ltd. (HBP) from 16 to 18 September, 2013, accompanied by representatives from the Gilgit Development Authority (GDA), the Environmental Protection Agency of Gilgit-Baltistan (GBEPA) and the International Union for Conservation of Nature (IUCN). Those consulted included government officials, secretaries, ministers and representatives of NGOs active in the city (please see Appendix B for a complete report on stakeholder consultations).

The focus of Phase 2 activities was the development of the CMP based on the EF developed at the end of Phase 1. For this purpose, the HBP team undertook another field visit on 11 to 14th December 2013. The HBP team was also accompanied by Mr. Sikander Ajam, a town-planning expert from Sikander Ajam Associates Pvt. Ltd (SAA). Along with the Conceptual Master Plan, the Financial Sustainability Plan and Institutional Framework were also developed during this phase.

Phase 3 was designed to provide an opportunity for all concerned stakeholders in Gilgit to influence the SEA recommendations by reviewing and providing feedback on the draft outcomes of the CMP, the FSP and the IF. The draft outcomes developed at the end of Phase 2 were finalized in Phase 3 and were based on the feedback received from the stakeholders and comments shared by them during a consultation workshop organized in Gilgit, on May 5, 2014. Also prepared at the end of this phase were draft Terms of Reference (ToRs) for the GDA to engage consultants for developing the Plan in the future.

1.5 Structure of the SEA Report

This SEA report is organized according to the following structure:

Section 1 – Introduction

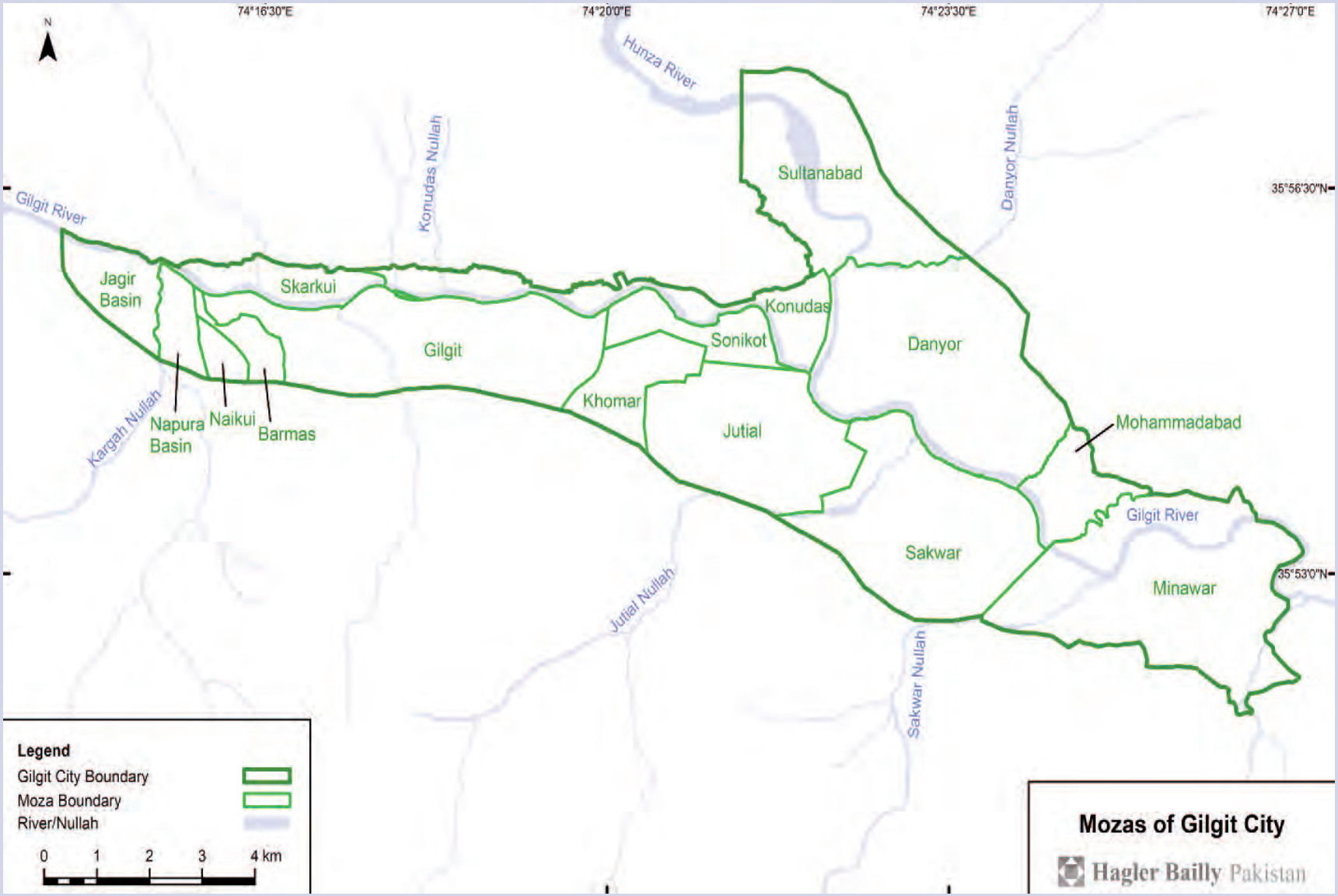
Section 2 – Environmental Framework

Section 3 – Conceptual Master Plan

Section 4 – Financial Sustainability Framework

Section 5 – Institutional Framework

Exhibit 1.6: Mozas in Gilgit City



2. Environmental Framework

This section describes the existing physical environment and socioeconomic status of Gilgit. An environmental framework is developed based on these and highlights the Environmental Values (EVs) of various physical and socioeconomic-environmental features of Gilgit. These EVs are considered critical for the welfare and prosperity of the inhabitants of the city and, therefore, vital to the preservation of any future developments there. The information compiled in this section was collected from a variety of primary and secondary sources, including data collected during site visits by HBP. A list of references is provided at the end of this report.

Section 2.1 describes the topography, climate, land use, water resources, and air quality of the city. Section 2.2 describes the ecology of the city, with a discussion on mammals, birds, vegetation, herpetofauna, fish and protected areas in and around it. Section 2.3 describes the socioeconomic status of the city's inhabitants and provides estimates of population growth, waste generation and power demand. It also highlights the link between the city's environmental features and the socioeconomic conditions of its inhabitants. In this report, an EV is defined as the flow of services the physical and socioeconomic features of Gilgit presently provide and can provide in the future, if adequately developed, and which are vital to the well-being of the inhabitants of the city.

Based on the EVs, Sections 2.4 and 2.5, respectively, describe an environmental framework for the environmental features of Gilgit, grouped into the following physical and socioeconomic-environment categories:

- Physical-Environment Features
  - Agricultural Fields and Grazing Areas
  - Forests
  - The Gilgit and Hunza Rivers and their riverbanks
  - The Nullahs
  - Gilgit's Air Quality

- Socioeconomic-Environment Features
  - Multiculturalism in the city
  - The City Center
  - Thoroughfares in the city
  - Cultural Heritage and Recreational Areas

The EVs of each of these features are identified and discussed in detail in Sections 2.4 and 2.5. Examples of some of the EVs include the provision of clean drinking water, the provision of local agricultural produce and the potential to attract tourism. These would lead to the diversification of Gilgit's economy; improved health and wellbeing of its inhabitants; the enhancement of community harmony, and the promotion of tourism.

A description of the EVs is followed by a discussion on the different barriers to realization, which are, at present, hindering the city's different environmental and socioeconomic features from fulfilling their environmental functions. Any future development in the city must address these barriers and enhance the EVs of all its physical and socioeconomic-environmental features. Consequently, a discussion on the EVs and the potential barriers associated with each of the city's environmental features ends by recommending priority interventions. These interventions are the foundation around which the CMP is developed, as discussed in Section 3. While the CMP builds on the structural, or town-planning, aspects of the interventions for the city, the FSP (Section 4) and the IF (Section 5) build on the financial and institutional recommendations respectively.

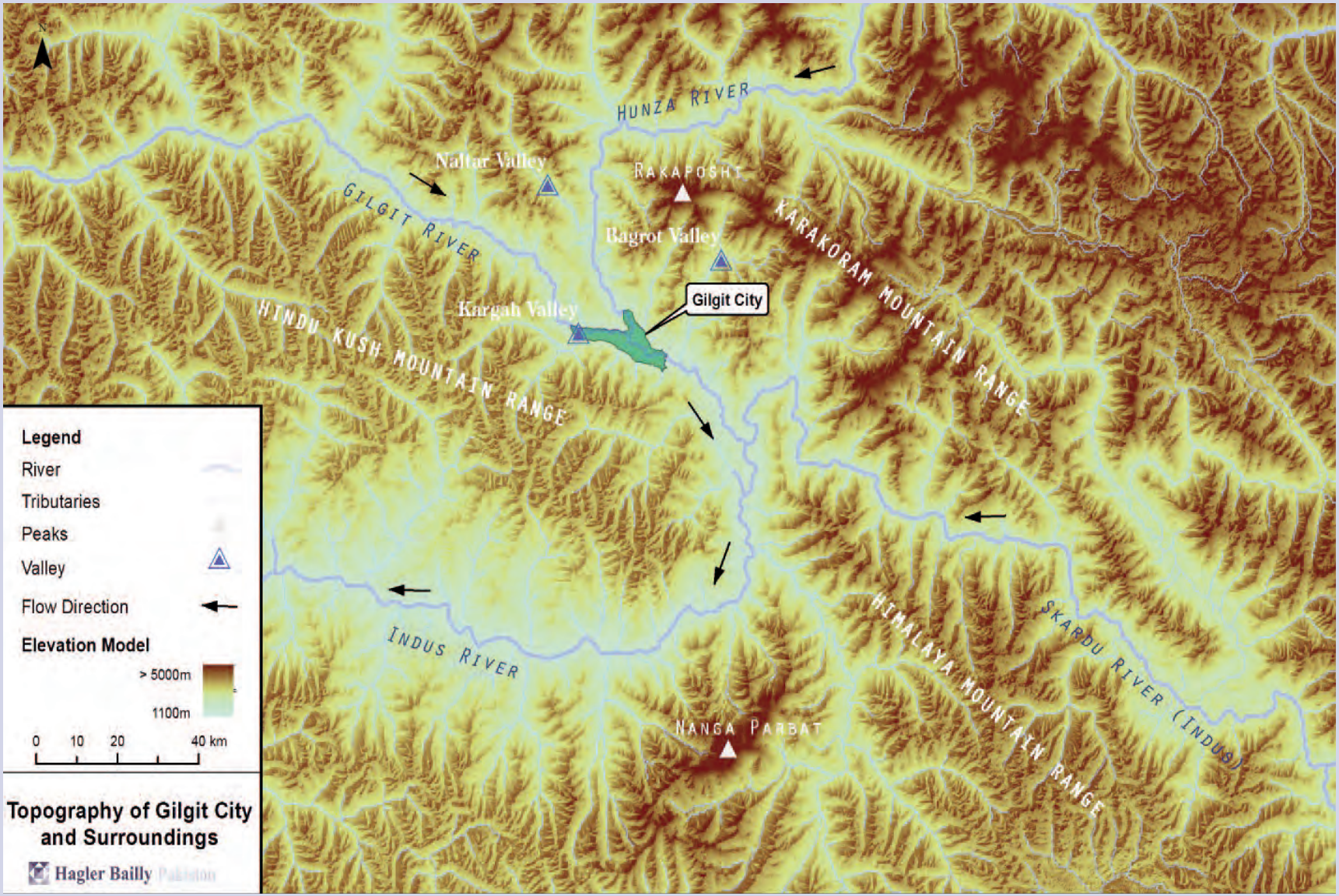
2.1 Physical Environment

Gilgit is located in a valley surrounded by mountains. The general elevation of the city is around 1,500 meters (m) and it is a semi-arid region that receives little annual precipitation.

2.1.1 Topography

Gilgit-Baltistan (GB) is home to three mountain ranges: the Himalayas, the Karakoram, and the Hindu Kush. Most elevations in the province are at least 1,500 m above sea level, with more than half the area above 4,500 m. Three of the world's highest peaks, K2; Nanga Parbat; and Rakaposhi, are located in this province. Gilgit is located at the foothills of the Karakoram Mountains, roughly at the junction between the three mountain ranges. The average altitude of the city is 1,500 ft. Gilgit is surrounded by steep mountains with little or no vegetative cover. It lies at the intersection of the Gilgit and Hunza Rivers at a place locally known as Duo Pani. It is surrounded by peaks that range from 1,600 m to 2,000 m on either side of the valley. The topography effectively cuts off the entire province from Pakistan's mainland and, therefore, creates geographical barriers that affect economic and administrative processes in GB. Exhibit 2.1 illustrates the mountainous terrain around the city.

Exhibit 2.1: Topography of Gilgit City and Surroundings



2.1.2 Climate

The dominant weather of the city is winter, which lasts eight to nine months a year. Gilgit District is surrounded by glaciers that are receding due to the rising temperatures that are consistent with global warming. River flow can, therefore, be highly variable and pose threats to the stability of landscapes especially in the vicinity of streams. Future temperature projections by Global Climate Models (GCMs) suggest that the temperature in Gilgit may become 7°C higher than the present level by the end of the 21st century.[8]

According to GDA officials, two decades ago there were no air conditioners or electric fans in houses and public and private buildings in GB. Now, these amenities are seen as a necessity during summer, as the day temperatures exceed 40°C sometimes for more than 10 consecutive days. The average high temperature is 36.1°C in summer and the average low temperature is -2.7°C in winter. Recent studies[9] conducted on climate change and impact assessment show that a significant warming trend has been noticed in GB during the last two decades. This has affected the socioeconomic conditions of the population in terms of the increased costs of cooling and providing a water supply for domestic use and for irrigation.

Snowfall shuts down trade routes to China for more than three months each year. About 40% of all flights between Gilgit and Islamabad were cancelled in 2009 on account of bad weather conditions.[10] Northern monsoons bring torrential rains, which result in landslides, floods and higher water turbidity in rivers.[11] Nevertheless, the mild weather during summer tends to be a source of attraction for tourists from across Pakistan. Exhibit 2.2 lists the mean monthly temperatures and precipitation in Gilgit, averaged over a period of 19 years from 1981 to 2010.

2.1.3 Land Use

Exhibit 2.3 illustrates a land-use map for Gilgit, based on the data provided by the GDA. Exhibit 2.4 provides the proportion of areas covered by different uses. This section describes land-use features in Gilgit by dividing the city into seven zones according to the Gilgit Master Plan of 1977.[14] Exhibit 1.5 illustrates the zones, which are as follows:

- Town Nucleus
- Transition Zone
- Konudas Plateau
- Gujardas
- Danyor Plain
- Jutial
- Basin

The city is spread longitudinally along the northern and southern banks of the Gilgit River. The southern bank of the river mainly contains the historic city center with commercial areas,

Exhibit 2.2: Mean Monthly Precipitation and Temperature in Gilgit averaged from 1981-2010[12]

Parameter	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Extreme*
Max Temp (°C):	9.3	12.0	17.9	23.9	28.4	34.3	36.1	35.3	31.6	25.3	17.8	11.0	45.0
Min Temp (°C):	-2.7	0.2	5.4	9.4	11.7	15.2	18.8	18.1	12.7	6.6	.0.6	-2.4	-11.1
Precipitation (inches)	3.9	6.6	12.1	25.5	25.2	11.8	14.7	15.6	8.6	6.8	3.1	6.3	54.6[13]

8. Pakistan Meteorological Department. (2013). Technical Report on Climate Change in Pakistan. Islamabad: GoP
9. Pakistan Meteorological Department. (2009). Climate Change Indicators in Pakistan. Islamabad: PMD.
10. The World Bank, Asian Development Bank, Government of Pakistan. (2010). Gilgit Baltistan Economic Report-Broadening the Transformation. WB, ADB, GoP.
11. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
12. Pakistan Meteorological Department. (2013). Technical Report on Climate Change in Pakistan. Islamabad: GoP
13. This figure represents the maximum recorded precipitation over a 24-hour period.
14. Pakistan Environmental Planning and Architectural Consultants Limited (1977). Gilgit Master Plan.

administrative buildings, an airport, bus stands, historic settlements, open recreation areas and a polo ground. The north bank of the river is fed by the Konudas Nullah and has an administrative core called Konudas. There is a settlement in this region called Mujahid Colony and the newly constructed Karakoram International University (KIU) is also located on this side of the city.

Most of the land in Gilgit is privately owned.[15] Land settlements are of two types: formal and informal. Informal settlements are also known as Kachi Abadis. Such settlements have no land or water rights. Although there are few such settlements in Gilgit, their lack of available water resources is a major concern.[16]

Land prices near the airport and the city nucleus, shown in Exhibit 2.3, are relatively higher compared to the rest of the city. One kanal (505 m2) of land in Jutial costs approximately Rs. 5,000,000 (US$ 46,510).[17]

Exhibit 2.3: Land-Use Map for Gilgit City

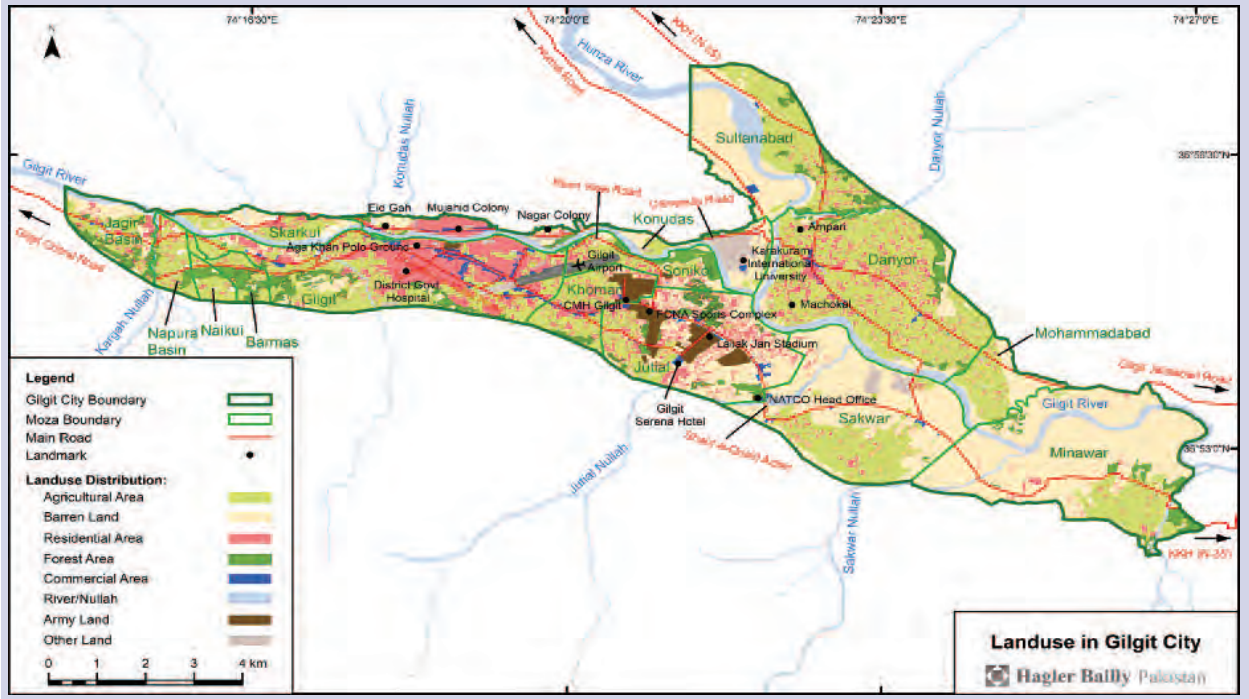


Exhibit 2.4: Land-Use Area in Gilgit City

Land Use	*(km2)*	*Area (%)*
Agricultural Area:	21.2	22
Commercial Area:	1.0	1
Residential Area:	9.4	10
Forest Cover:	3.8	4
Vacant Land:	23.8	24
Total;	97.9	100

15. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
16. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
17. Ibid.

Residential Areas

The total number of residential buildings in the city, based on an average per-household size of eight persons, is approximately 11,546.[18] In Gilgit, 60%of the houses are semi-pukka[19], 35%percent are pukka, while the remaining 5% are kuchha. Three percent of the population lives in two-storey buildings.[20] Residences are usually constructed using earth, wood and soil stones. The poor construction standards are used when building houses makes them prone to natural hazards. However, in new developments around the city, cement and bricks are now being used.[21] Residential land in Gilgit has been expanding irregularly since 1947.

Average residential plot sizes vary from 10 marlas (250 m^2) to two kanals (1,010 m^2). Some plots stretch from three kanals (1,515 m^2) to five kanals (2,525 m^2). Their haphazard demarcations hinder the construction of roads, the provision of electricity, and also drainage and water supplies in the area.[22] Most alleyways are so narrow only pedestrians can pass through them. Clusters of residential dwellings, known as mohallahs or khots in the local language, are situated near watercourses because of easy access to water.[23]

Commercial Areas

The intersection of Shaheed-e-Millat and Raja Bazaar Roads is taken as the center or nucleus of Gilgit (Exhibit 2.3). This is the main commercial hub of the city. Shops sell kitchen goods, textiles, shoes, crockery, travel bags and souvenirs. Vendors with handcarts selling jewelry, textiles, bags and shoes are sometimes seen on roadsides.

The Northern Light Infantry Regiment (NLI) Market is another important commercial area of the city. Shops in this area sell jewelry, textiles, bags, shoes, gems and crockery. Most of the goods at the NLI Market are imported from China. On the south node of the city, the Jamat Khana Bazaar sells items for daily use, along with bakery products, fresh fruits, vegetables and meat.

Agricultural Areas

Only 2% of total land area in all of GB is arable.[24] In Gilgit, agriculture accounts for 23% of the residents' total livelihood.[25] Irrigation is done through manmade drains and river water. Agricultural products in the area include vegetables, fruits, dry fruits and fodder. According to Exhibit 2.4, almost 22%, or 21.8 sq km, of the total city area is covered by agricultural fields. Site visits by HBP team members revealed that farmers are still using traditional ploughing and harvesting methods. A large amount of fruit gets wasted due to improper packaging and inadequate modes of transporting goods to distant markets.[26] In recent years, the proportion

18. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
19. There are three general classes of housing in Pakistan: pukka houses, built of substantial material such as stone, brick, cement, concrete, or timber; katchi (or kuchha ["ramshackle"]) houses, constructed of less-durable material (e.g., mud, bamboo, reeds, or thatch); and semi-pukka houses, whose construction materials are a mix of the two.
"Housing." Encyclopedia Britannica Online. Encyclopedia Britannica, n.d. Web. 15 Nov. 2013. <http://www.britannica.com/EBchecked/topic/438805/Pakistan/276147/Housing>.
20. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
21. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
22. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
23. Ibid.
24. Environmental Protection Agency-Gilgit-Baltistan. (2013). Environmental Profile of Gilgit-Baltistan. Gilgit: EPA-GB.
25. Observation has been made using the Land Use Map shown in Exhibit 2.3.
26. Karrar and Iqbal, 2011, Gilgit Report, .UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.

of agricultural land has been decreasing due to encroachment by the commercial and private sectors.[27]

2.1.4 Water Supply and Drainage

Gilgit's sources of water supply include lakes, springs, reservoirs and ground water. Glacial melt is the primary source of water supply. Glacial water flows in the form of nullahs,[28] which eventually discharge into the Gilgit River. The key nullahs in and around the city are Jutial, Konudas, Kargah and Danyor. Jutial Nullah provides the city with most of its irrigation and drinking water.[29] The Gilgit and Hunza Rivers and the key nullahs of Gilgit are shown in Exhibit 2.5. Photographs of the Gilgit River and the Kargah Nullah are shown in Exhibit 2.6.

The Gilgit River flows through Gilgit from west to east. The Hunza River flows from the north and joins the Gilgit River at the Duo Pani: the Gilgit-Hunza confluence occurs near Karakorum International University (KIU). River flow is highest from July to September when snow melts in the mountains. Torrential rains result in landslides, heavy flooding and high turbidity in river water. Irrigation is dependent on river water and glacial melts.[30]

Five drinking-water supply complexes exist in the south of Gilgit and are recharged by two water channels.[31] This system of water-supply complexes was built in the late 1970s to meet the demands of the time and they are still currently in use by the city residents . Exhibit 2.5 indicates the location of these complexes. Their names and locations are as follows:

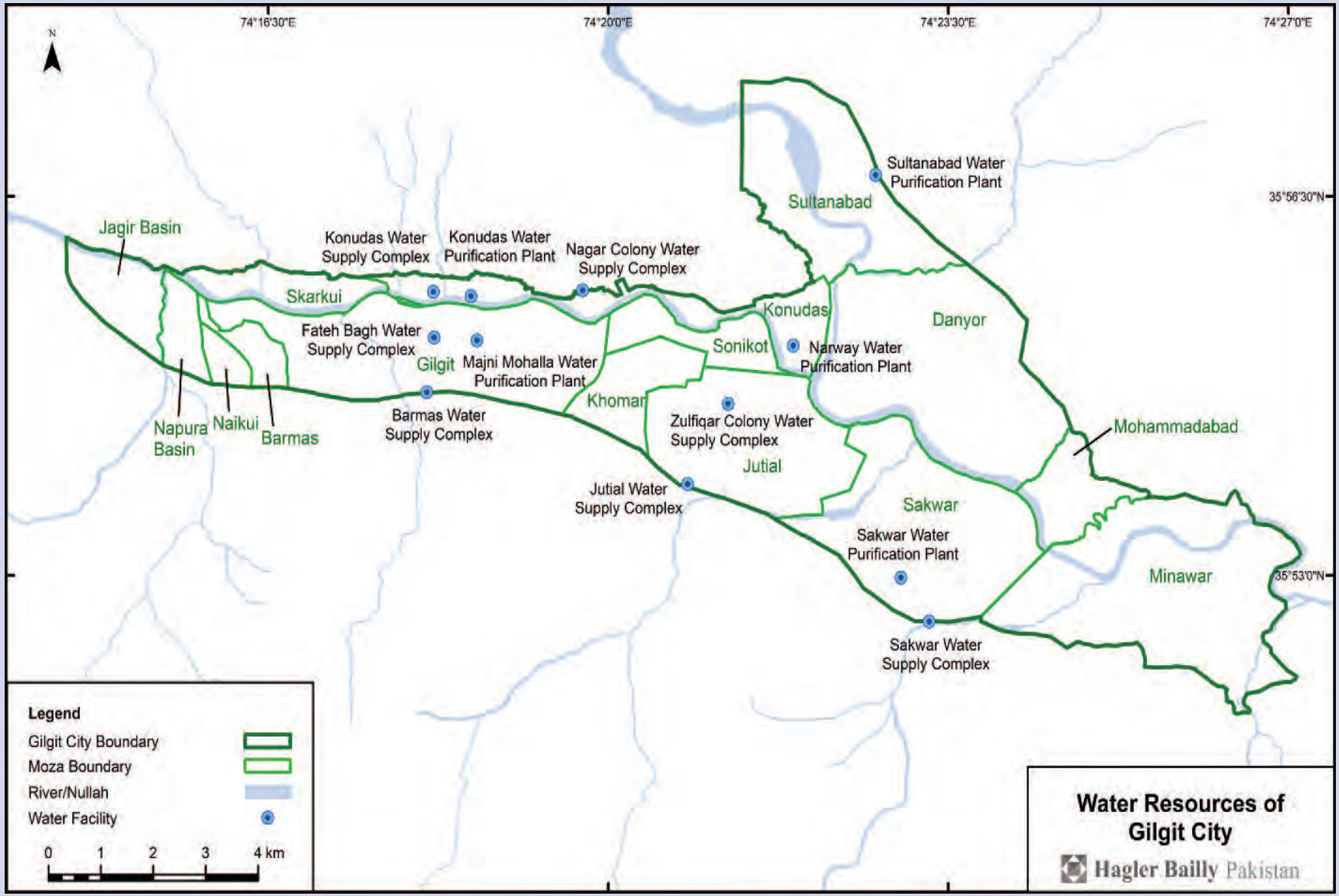
- Burmus Water Supply Complex, Majni Mohalla, Gilgit
- Jutial Water Lift System, Sonikot
- Jutial Lift Water Supply Complex, Zulfiqar Colony
- Water Supply Complex Danyor Chikas, Choke Area
- Gilgit Filtration Plants – Army Public School and College (APSC) Filtration Plant and District Headquarter Hospital (DHQH) Filtration Plant

The existing water supply system is comprised of the above five water complexes and supplies 67 liters (l) of water per capita per day.[32] A socioeconomic survey of Gilgit conducted by the Government of Pakistan, in 1994, indicates that 92% of the households in the city have access to a piped water-supply system.[33] Households in some parts of the city make use of wells due to the unreliability of the water-supply system there.[34] Ground-water quality in Gilgit is better than surface-water quality.[35] The existing pipe water-distribution network, however, does not supply adequate pressure for the required amount of water. In some areas, the pipes are in a damaged condition due to rusting. And in other areas, at higher altitudes in the city, pipes are regularly damaged by the expansion of frozen water during the winter.[36]

The water-storage and distribution capacity of the water-supply complexes at present is inadequate in meeting the city's existing water demand. The expansion of the existing system is problematic due to the lack of available space and the paucity of financial resources. A survey conducted by the

27. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
28. A Nullah (pl. Nullahs) is a small and narrow watercourse/stream.
29. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
30. Ibid.
31. Ibid.
32. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
33. Ibid.
34. Ibid.
35. Haider Raza, M. H. (1998). Seasonal Investigation of Drinking Water Quality. Sanitation and Water for All (pp. 357-360). Islamabad: 24th WEDC Conference.
36. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.

Exhibit 2.5: Water Resources of Gilgit City



IUCN indicates that the present storage capacity of all of the water supply complexes is around 15 times less than the actual demand.[37]

According to data from the District Headquarter Hospital, in Gilgit, in 1999, more than 60% of reported illnesses were related to poor water and sanitation conditions. In a survey conducted by the Water and Sanitation Extension Programme (WASEP), in 1999[38], all five water complexes in Gilgit were found to be highly contaminated with fecal matter. Water in the channels was also found to be contaminated by activities such as the washing of clothes and utensils. Water-treatment plants do not exist in the city. Water channels are de-silted and repaired by villagers on a self-help basis.

Drainage

The Northern Areas Public Works Department (NAPWD) has constructed a network of roadside sanitary drains for Gilgit. The Frontier Works Organization (FWO) has also constructed similar drains along the Karakoram Highway (KKH).[39] These drains are constructed for the collection of storm water and are not meant for municipal grey water. Existing drains along roadsides do not have the capacity to adequately capture the larger volumes of storm water that occur during the rainy seasons. The kuchha and pukka household drains in the mohallas and residential colonies are constructed on a self-help basis.

Exhibit 2.6: Water Channels in Gilgit City

View of Gilgit River

View of Kargah Nullah

37. Ibid.
38. Ibid.
39. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx

During HBP's site visits, instances of drain blockages and clogging due to garbage dumping and improper maintenance were a regular sight. Exhibit 2.7 provides an illustration of some of the drains in residential and commercial areas of Gilgit.

Drainage water is mostly used for irrigation. The excess is released in an untreated state into the Gilgit and Hunza Rivers. The two main nullahs are also the primary sources of water supply in the city, the Jutial Nullah and the Konudas Nullah, but the unchecked dumping of waste into these nullahs by city residents has led to contamination.[40]

Poor drainage in Gilgit results in high water tables in areas situated at the tail end of the city, such as Kashrot, Majni Mohallah, Amphrey and the Airport. The water table is creating problems for building and construction projects in these areas.[41]

2.1.5 Air and Noise

The IUCN, along with the Space and Upper Atmosphere Research Commission (SUPARCO)[42] conducted an air-quality survey, in Gilgit, in 1998.[43] According to the survey, the air quality in Gilgit is relatively better than that of the main cities of Pakistan, especially Islamabad, Lahore and Karachi. However, the survey also reported

Exhibit 2.7: Drainage in Gilgit

Drain passing through a residential area in Gilgit

Drain in a commercial area of Gilgit

40. Ibid.
41. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
42. SUPARCO is Pakistan's national space agency mandated to conduct research and development in space science and space technology. It works towards developing indigenous capabilities in space technology and promoting space applications for the socioeconomic uplift of the country. www.suparco.gov.pk
43. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.

that burning waste in open air, excessive deforestation, and traffic pollution is leading to higher levels of carbon dioxide, carbon monoxide and sulfur oxidesin the atmosphere. During a site visit by the HBP team, in September 2013, local women reported an increase in respiratory illnesses and skin allergies among children and pregnant women.

Noise does not pose a serious problem in Gilgit, due to the lack of industrial areas in the city. Major noise sources include general traffic, construction machinery and tractors. In the future, however, noise pollution may be aggravated as trade routes expand around residential areas.

2.1.6 Forests

Forests cover four percent of the total land in Gilgit[44]. More information on vegetation in the city can be found in Section 2.2.1.

Winter is the dominant season in Gilgit. As the city faces regular power shortages, residents depend on wood and timber to keep their houses warm. Forests are, therefore, an essential source of fuel for the city. This results in massive deforestation in the area, which leads to the loss of species and ecological disintegration, as well as soil erosion and loss of soil fertility.[45]

2.1.7 Natural Hazards

Gilgit and its surrounding valleys are highly susceptible to natural disasters such as landslides, flash floods and avalanches, which affect civic life in the city and areas within its vicinity. According to the Pakistan Meteorological Department (PMD), Gilgit is located in a seismically active zone with a shake potential equivalent to an earthquake of magnitude 6 to 7 on the Richter scale.

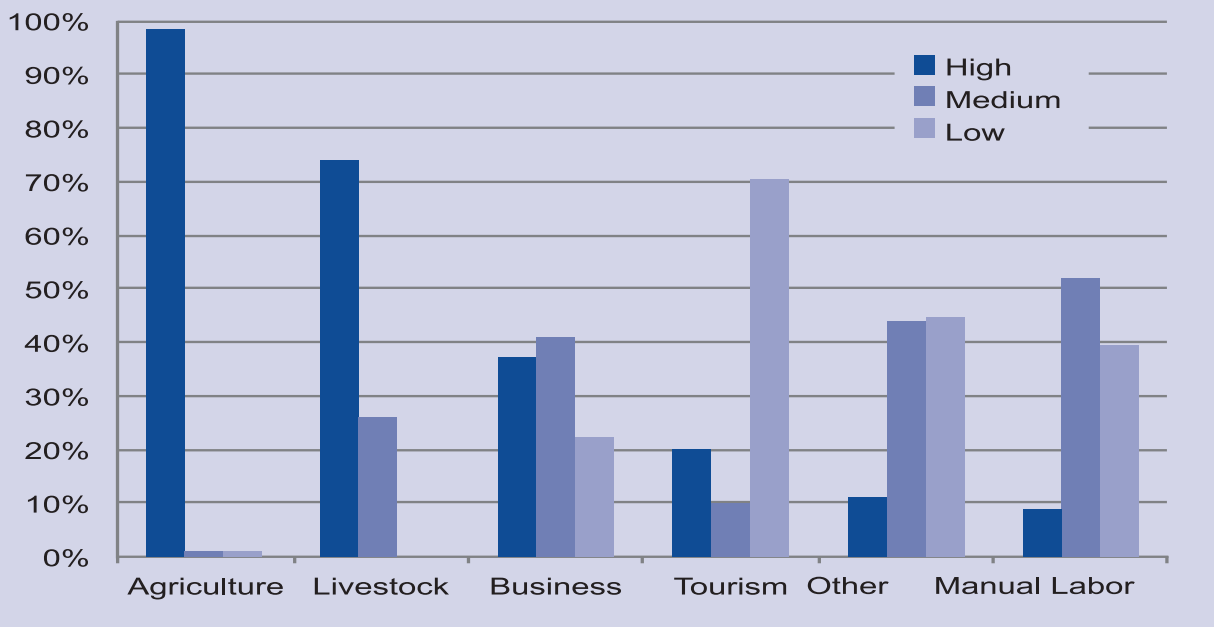
A recent example of the types of natural hazards facing Gilgit is the Ata Abad Lake, which formed due to a massive landslide in 2010 and dammed the Hunza River. The unstable lake poses a threat to the downstream populations of Gilgit and Oshkan Das.[46] Exhibit 2.8 categorizes natural disasters according to their frequency of occurrence in Gilgit District. Exhibit 2.9 indicates the percentage of the population in Gilgit District, engaged in different sources of livelihood, at risk from natural disasters. More than 90% of inhabitants engaged in agriculture and 70% in livestock are likely to be highly affected by natural disasters there. With agriculture making up 23% of the source of livelihood for Gilgit's inhabitants, the economy of the city is at a significant risk of being adversely affected by natural disasters.

Exhibit 2.8: Natural Disasters in Gilgit District[47]

Type of Disaster	*Gilgit District*			
	Occurrence	*Risk*		
		High	*Medium*	*Low*
Earthquake:	*No*	■		
Landslide/Rock Fall/Mudflow:	*Yes*	■		
Glacial Movement/Avalanche:	*Yes*	■		
Flash Flood/Riverine Flood:	*Yes*	■		
Glacial Lake Outburst Flood (GLOF)	*No*		■	
Snow Storm:	*Yes*		■	
Wind Storm:	*Yes*			■
Lightening:	*Yes*		■	
Drought:	*Yes*		■	
Epidemic:	*Yes*		■	
Road Accident:	*Yes*		■	
Wild Fire:	*No*			■
Ethnic and Sectarian Violence:	*Yes*	■		

44. Information is taken from the Land use map for Gilgit (Exhibit 3.3) developed by the GDA.
45. Ross W. Gorte, P. A. (2010). Deforestation and Climate Change. Congressional Research Service, Washington, USA.
46. Calligaris, C. M. (2010). Executive summary on Attabad landslide survey in Hunza. Ev-K2-CNR, pp 1-20.
47. Karrar and Iqbal, 2011, Gilgit Report, .UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.

Exhibit 2.9: Level of Risk from Natural Disasters to different Sources of Livelihood in Gilgit District[48]



2.2 Ecological Baseline

Gilgit is located in a river valley in the southwest of the Karakoram Range. The climate is arid, as monsoon systems break against the southern slopes of Himalayas, about 150 km south of Gilgit, and the average annual rainfall ranges from 120 to 240 millimeters (4.7 to 9.4 inches). Agriculture depends on water that is diverted from mountain streams and rivers fed by snow melt at higher altitudes. More information on Gilgit's climate can be found in Section 2.1.2. The biodiversity of Gilgit and its surroundings is adapted to these extreme variations in climatic and geographical conditions.

The city is urban and largely a degraded habitat. However, the hills in the vicinity of the city and the adjacent valleys, particularly the forests in the Kargah and Jutial Valleys, provide habitat for faunal species, including mammals, birds and herpetofauna. The Gilgit and Hunza Rivers and the smaller nullahs contain both endemic and exotic fish species. A list of the flora and fauna reported from the city is given in Appendix C.

2.2.1 Vegetation

The vegetation in the city falls in the Dry Sub-Tropical Scrub Zone and Dry Temperate Coniferous Forest Zone. The former is located at lower elevations and southern slopes of mountains especially along the Gilgit and Hunza Rivers. The latter consists of forests found in the inner or northerly slopes of the Himalayas, which are less susceptible to monsoons. The dry temperate coniferous forests occur between elevations of 1,500 to 3,400 meters. These forests are characterized by fewer deciduous tree species, although coniferous species predominate.

Forests occur in the valleys, including the Naltar and Bagrot Valleys and also in the vicinity of the Jutial Nullah. Typical tree species in these forests include Picea smithiana, Cedrus deodara and Pinus willichiana. Smaller shrubs include Quercus ilex and Junglus regia and scattered shrubs of Artimesia maritima, Ephedra intermedia, Indigofera gerardiana, Sambucus ebulus, Sorbaria tomentosa, and Plectranthus rugosus. These forests not only provide habitat for faunal species but also provide timber the locals use for domestic and commercial purposes.[49]

48. Ibid.
49. Sheikh, M. I. & M. Hafeez. 1977. Forests and Forestry in Pakistan. Pakistan Forest Institute, Peshawar.

2.2.2 Mammals

Mammals reported in and around the outskirts of the city include members from the family of Vespertilionidae, Canidae, Felidae, Sciuridae, Muridae and Mustelidae. Large mammals, such as the Snow Leopard Panthera uncia, Common Leopard Panthera pardus, Wolf Canis lupus, and Red Fox Vulpes vulpes, have been reported in the hills surrounding the city. In addition, small mammals, such as bats and rodents, have been reported from inside the city limits.[50]

Mammals included in the IUCN Red List[51] are the Woolly Flying Squirrel Eupetaurus cinereus and Snow leopard Panthera uncia, both of which are listed as Endangered. The Common Leopard Panthera pardus, Eurasian Otter Lutra lutra and Royle's Mountain Vole Alticola roylei are listed as Near Threatened.

The Snow Leopard Panthera uncia is closely associated with the alpine and sub-alpine ecological zones. They favor steep terrain well broken by cliffs, ridges, gullies, and rocky outcrops.[52]

The Woolly Flying Squirrel Eupetaurus cinereus is currently known only in a small region in northern Pakistan — Diamer and the southern Gilgit Districts — though, there are some unsubstantiated reports of its occurrence in China and India.[53] Estimates in 1996, based on available habitat and local knowledge, suggest a population in the core region of Diamer of between 1,000 and 3,000.[54] There is no recent information available on the population abundance of this species elsewhere in South Asia.[55]

2.2.3 Birds

More than a hundred bird species have been reported around the city.[56] These include passage migrants, vagrant, resident, breeding and irregular visitors. The altitudinal migratory birds descend from higher altitudes during the winter months. Typical bird species found here include Snow Partridge Lerwa lerwa, Chukar Alectoris chukar, Common Quail Coturnix coturnix, Common Hoopoe Upupa epops, Common Swift Apus apus, Rock Pigeon Columba livia and Common Kestrel Falco tinnunculus.[57] No Endangered or Critically Endangered bird has been reported from the area. The only bird included in the IUCN Red List is the European Roller Coracias garrulus, which is listed as Near Threatened.

2.2.4 Herpetofauna

Reptile species found in and around the city are dominated by the family Agamidae. Species reported include Himalayan Agama Laudakia himalayensis, Pakistan Agama Laudakia pakistania and Blue Rock Agama Laudakia tuberculata. Geckos are represented by Baltistan Gecko Altiphylax stoliczkai and Batura Bent-toed Gecko Cyrtodactylus baturensis. The Bengal Monitor Varanus bengalensis has also been reported from the area.[58] Most of these species have not been assessed for their conservation importance in the IUCN Red List. The reptile species are adapted to living at high altitudes and many are endemic (Appendix C).

Among the amphibians, toads from the family Bufonidae are present including Batura toad Bufo pseudoraddei baturae and Ladakh toad Bufo lastastii.

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50. Roberts, T. J. 1997. The mammal of Pakistan. 2nd edition. Oxford University Press, Karachi: 525 pp.
51. IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 5 October 2013.
52. Jackson, R., Mallon, D., McCarthy, T., Chundaway, R.A. & Habib, B. 2008. Panthera uncia. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 09 October 2013.
53. Zahler, P. 2010. Eupetaurus cinereus. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 08 October 2013.
54. Ibid.
55. Molur et al. 2005, Status and Red List of Pakistan Mammals. Biodiversity Programme IUCN Pakistan
56. Roberts, T. J. 1992. The birds of Pakistan. Vols. 2, Oxford University Press, Karachi, Pakistan.
57. Sheikh, K. 2000. Some Findings on the IUCN-Red Data Book Avian Species from Naltar Valley, Northern Pakistan. 4 (1) 1-4 pp. Pakistan Journal of Ornithology.
58. Baig, K. J. (In press). Annotated checklist of the amphibians and reptiles of the northern mountain region and Potwar plateau of Pakistan with English common names.

2.2.5 Fish

The main water bodies in Gilgit include the Gilgit and Hunza Rivers and smaller streams or nullahs such as the Kargah, Jutial, Sakwar and Bargrot Nullahs (Exhibit 2.6). The Hunza River is comparatively smaller and more turbid compared to the Gilgit River, and the latter has a much higher diversity of aquatic fauna due to less turbidity. More details on water resources are provided in Section 2.1.4.

Little information is available on the distribution, population size and population trends of the fish species in the rivers and nullahs. However, at least eight fish species are found in these waters. Prominent among them are the Rainbow Trout Oncorhynchus Mykiss and Brown Trout Salmo trutta, both of which are exotic fish species. The Brown Trout was introduced in Gilgit Agency during the early 1900s. Other trout species include the Kunar Snow Trout Racoma labiata and Himalayan Snow Trout Schizothorax plagiostomus. Endemic fish species found in the city include the Chitral Loach Triplophysa choprai, Triplophysa Loach Triplophysa microps and Yasin Triplophysa Loach Triplophysa yasinensis.[59] [60]

The role of fish in supporting the livelihood of rural communities in GB has not been well documented. However, fish constitute a source of food protein and vitamin A for many mountain communities. Most of the fish caught by local people is consumed within households, but it is also sometimes offered for sale.[61]

In Gilgit, the trout species are socioeconomically important since they not only provide food for the local communities but are also used for commercial fishing and attract tourists for recreational fishing.

Over-exploitation has reduced the population of many species to alarming levels in GB. Fish fauna is also under threat from introduced species and human activities such as logging, the use of pesticides, the construction of roads, and the diversion of water for irrigation.[62]

2.2.6 Protected Areas

Several protected areas (PAs) have been created over the last 25 years in GB. However, many of these lack effective management systems. Under existing laws, wildlife sanctuaries provide greater protection than do national parks. Game reserves only regulate hunting and, consequently, afford no protection to the habitat.[63]

The Protected Areas (PAs) around the city (Exhibit 2.10) are discussed below. The boundaries of these PAs are vague, as they are not clearly defined in government publications. Therefore, for the purpose of this report, each PA is shown by using point indications, and the covered area, where available, is specified. The responsibility for managing these areas lies with the Forest, Wildlife and Environment Department of GB. NGOs working on conserving the ecological resources and community-uplift schemes include the World Wide Fund for Nature (WWF-P), the International Union for Conservation of Nature (IUCN-P), the Snow Leopard Foundation and the Wildlife Conservation Society (WCS).

The PAs include the Kargah Community Managed Conservation Area, the Danyor Game Reserve, the Jutial Community Controlled Hunting Area and the Sakwar Community Controlled Hunting Area. The Naltar Wildlife Sanctuary is located at least 40 km away from Gilgit, but a short write-up on this protected area and its ecological importance is given below.

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59. Rafique, M. 2002. Fish diversity and distribution in Indus River and its drainage system: Pakistan J. Zool., vol. 32 (4): 321-332 pp
60. Rafique, M. 2002. Fish fauna of Himalayas in Pakistan with comments on the origin and dispersal of its high Asian elements.
61. Dr. Amjad Tahir Virk, Dr. Kashif M. Sheikh and Abdul Hamid Marwat, 2 0 0 3. NASSD Background Paper: Biodiversity. IUCN Pakistan, Northern Areas Progamme, Gilgit. x+74 pp.
62. Dr. Amjad Tahir Virk, Dr. Kashif M. Sheikh and Abdul Hamid Marwat, 2 0 0 3. NASSD Background Paper: Biodiversity. IUCN Pakistan, Northern Areas Progamme, Gilgit. x+74 pp.
63. Ibid.

Kargah Community Managed Conservation Area

The Kargah Nullah is an important ecological feature in the area. Previously, the entire catchment of the Kargah Nullah was declared a wildlife sanctuary. Recently, however, it has been handed over to the community and has been declared a Community Managed Conservation Area[64]. The altitude of the area ranges from 1,515 m at the mouth of the Kargah Nullah to 4,242 m at its end. The average annual precipitation in the valley is 152 to 203 mm, most of which falls as snow during the winter months of December and January. June and July are the hottest months. Trees and shrubs found here include Fraxinus, Salix, Olea, Pistacia, Juniperus, Kail, Picea, Betula, Rosa, and Daphnes oleides. Ground cover consists of Artemisia, Stipa, Haloxylon, and other grass species.[65]

Large mammals found in the area include the Astore Markhor Capra falconeri, Musk Deer Moschus chrysogaster and Snow Leopard Panthera uncia, which are all listed as Endangered in the IUCN Red List 2013, and Ibex Capra ibex, which is listed as of Least Concern. The area's avifauna includes a variety of game birds, such as the Chukar Alectoris chukar, Snow Partridge Lerwa lerwa, Snowcock Tetraogallus himalayensis and Monal Pheasant Lophophorus impejanus.[66]

The Kargah Nullah is one of the best places for trout rearing in the GB and has two trout hatcheries. The Kargah Nullah, itself, has a very good trout population and serves as the best recreational fishing spot near Gilgit.[67] The area around the Kargah Nullah is mostly used as a picnic spot during hot summer days, in Gilgit, and the road leading to it is good. Community initiatives are underway to start a trophy-hunting programme for Astore Markhor Capra falconeri and Ibex Capra ibex that have reached harvestable size.

Danyor Game Reserve

The Danyor Game Reserve is located approximately 6 km northeast of Gilgit and covers 44,000 hectares (Virk and Sheikh 2003). It is a source of attraction for tourists and hunters and is accessible only by a bridle path. The topography is undulating and rugged. In some places there are steep, precipitous slopes that become gentler at their upper limits. The climate is dry temperate; the mean annual precipitation is 76 to 102 mm, most of which falls as snow during the months of November, December and January.[68]

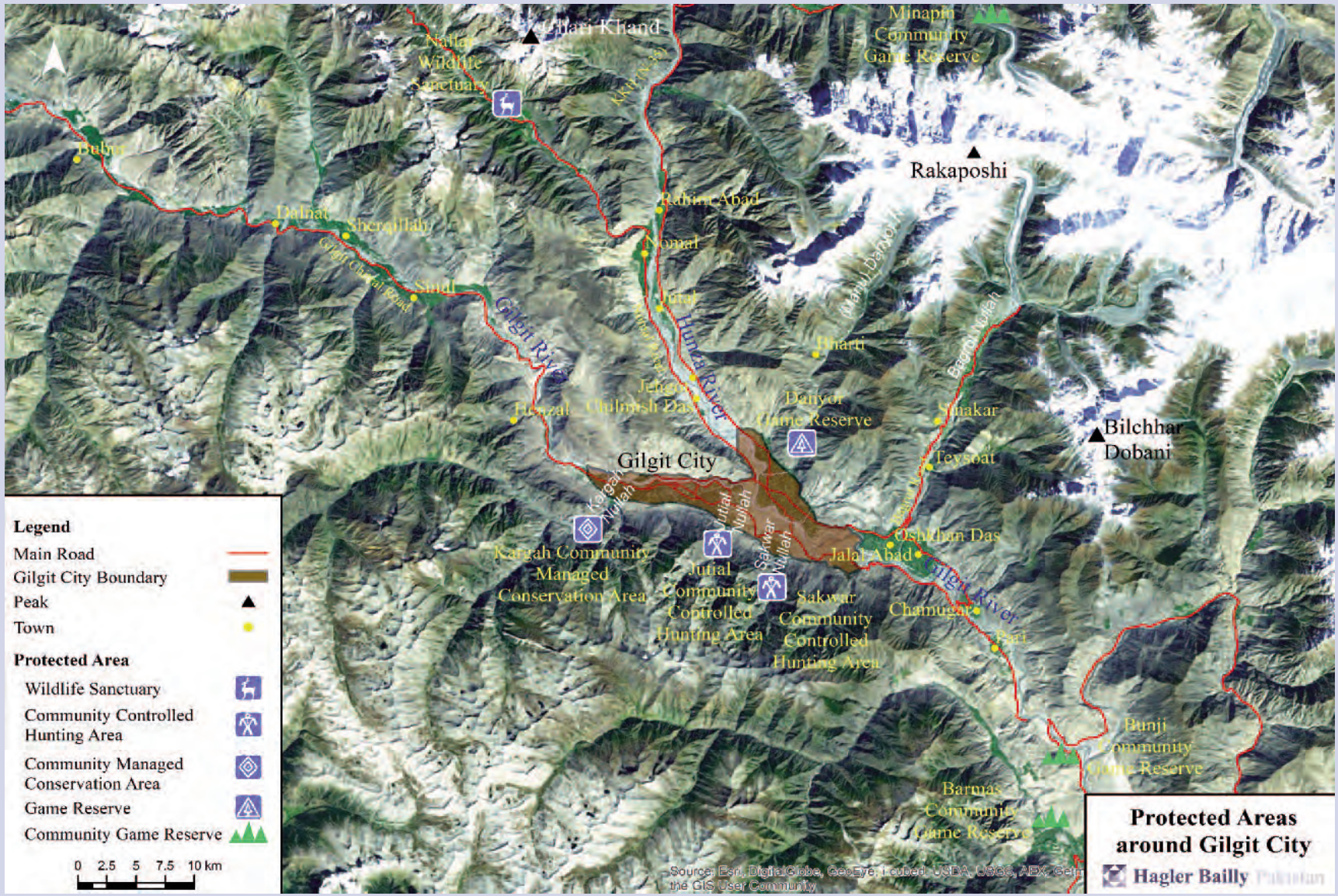
Trees and shrubs include Kail, Picea, Salix, Juniperus, Olea, Pistacia, Hippophae, Fraxinus, Rosa and Betula. Ground flora comprises Artemisia, Haloxylon, Stipa and other grasses. Large mammals in this game reserve include the Astore Markhor Capra falconeri[69], Urial Ovis vignei[70], Snow Leopard Panthera uncia[71], Ibex Capra ibex and Fox Vulpes vulpes[72]. Avifauna includes a variety of game birds, such as the Chukar Alectoris chukar, Snow Partridge Lerwa lerwa, Snowcock Tetraogallus himalayensis and some species of vulture[73].

Jutial Community Controlled Hunting Area

Located along the Jutial Nullah, this area has been allocated to the local communities for the conservation of its natural resources and for managing it as a Community Controlled Hunting Area. Trees and shrubs found here include Fraxinus, Salix, Olea, Pistacia, Juniperus, Kail, Picea, Betula, Rosa, and Daphnes oleides. Large mammals found in the area include the

64. Personal communication with Babar Khan, Manager WWF-Gilgit.
65. IUCN. 1990. IUCN directory of South Asian Protected Areas. Cambridge, UK: 294 pp.
66. BirdLife International (2013) Important Bird Areas factsheet: Kargah Wildlife Sanctuary. Downloaded from http://www.birdlife.org on 20/11/2013
67. IUCN. 1990. IUCN directory of South Asian Protected Areas. Cambridge, UK: 294 pp
68. IUCN. 1990. IUCN directory of South Asian Protected Areas. Cambridge, UK: 294 pp
69. Endangered in IUCN Red List
70. Vulnerable in IUCN Red List
71. Endangered in IUCN Red List
72. Both listed as Least Concern
73. IUCN. 1990. IUCN directory of South Asian Protected Areas. Cambridge, UK: 294 pp

Exhibit 2.10: Protected Areas around Gilgit



Astore Markhor Capra falconeri and Snow Leopard Panthera uncia, which are listed as Endangered in the IUCN Red List 2013, and the Himalayan Ibex Capra ibex. Avifauna includes a variety of game birds, such as the Chukar Alectoris chukar, Snow Partridge Lerwa lerwa, Snowcock Tetraogallus himalayensis and Monal Pheasant Lophophorus impejanus.[74]

Sakwar Community Controlled Hunting Area

The Sakwar Community Controlled Hunting Area is located along the Sakwar Nullah and is ecologically contiguous with the Jutial Community Controlled Hunting Area and the Kargah and Bermus Community Managed Conservation areas. This protected area is managed by the community as a controlled hunting area for large mammals, such as the Astore Markhor Capra falconeri and Himalayan Ibex Capra ibex.[75]

Naltar Wildlife Sanctuary

The Naltar Wildlife Sanctuary is located in Naltar, northwest of Gilgit. It covers an area of 273 km² of the Naltar Valley, to its juncture with the Hunza River, and is contiguous with the Pakora and Sherqila Game Reserves. This protected area is located more than 40 km from Gilgit, but it is discussed here due to its ecological importance.

The sanctuary includes the Naltar Lakes Complex, which lies at an elevation of 3,183 to 3,530 meters above sea level and comprises five small and medium-size lakes. All of these are fed by glacial melt in the form of springs and streams that originate from the immediate catchments.[76]

Important flora of the area include the Betula utilis, Salix tetrasperma, Pinus wallichiana, Juniperus macropoda, Celtis spp, Fraxinus xanthoxyloides, Populus ciliata, Picea smithiana, Rosa webbiana, Rebis alpestris, Taraxacum officinale, Fragaria vesca, Trifolium sp, Urtica diocia, Capparis spinosa, Coriandrum sativum and Hippophae rhmnoides.

The fauna includes the Himalayan Ibex Capra ibex sibirica, Astore Markhor Capra falconeri and Snow Leopard Panthera uncial that are listed as Endangered in the IUCN Red List 2013. Other mammals reported are the Common Red Fox Vulpes vulpes montana, Otter Lutra lutra[77], Musk Deer Moschus moschiferus[78], Common Wolf Canis lupus and Lynx Cat Felis lynx.[79]

Avifauna comprises the White Wagtail Motacilla alba, Brown Dipper Cinclus pallasii, Rock Bunting Emberiza cia, Blue Whistling Thrush Myophonus caeruleus, Black Billed Magpie Pica pica, Yellow Wagtail Motacilla flava, Large Billed Crow Corvus macrorhynchos, Chukar Alectois chukar, Hill Pigeon Columba rupestris, Snow Pigeon Columba leuconata, Great Tit Parus major, Golden Oriole Oriolus oriolus, Rock Bunting Emberiza cia, Laughing Thrush Garrulax lineatus, House Sparrow Passer domesticus, Golden Eagle Aquila chrysaetos, Lammergeier Gypaetus barbatus, Himalayan Snowcock Tetraogallus himalayensis and Eurasian Eagle Owl Bubo bubo. Common migratory water birds are the Northern Pigtail Anas acuta, Eurasian Teal Anas crecca, Northern Shoveler Anas clypeata and Grey Heron Andrea cinerea.[80]

2.2.7 Conclusions

Natural landscapes and habitats of conservation importance are located in the mountains towards the north and the south of Gilgit. The principle areas of conservation importance, around the city, include the Kargah Community Managed Conservation Area, the Danyor Game Reserve, and the Jutial and Sakwar Community Controlled Hunting Areas. The biodiversity of these areas is

74. Personal communication with Babar Khan, Manager WWF-Gilgit.
75. Personal communication with Babar Khan, Manager WWF-Gilgit.
76. Fact sheet on Naltar Lakes, 2008. Gilgit Conservation and Information Centre, WWF-Pakistan.
77. Near Threatened in IUCN Red List
78. Vulnerable in IUCN Red List
79. Fact sheet on Naltar Lakes, 2008. Gilgit Conservation and Information Centre, WWF-Pakistan
80. Fact sheet on Naltar Lakes, 2008. Gilgit Conservation and Information Centre, WWF-Pakistan

under increasing pressure due to rising human population and the need for more land to grow crops and more wood for fuel and housing.[81]

This section summarizes the threats to the biodiversity in Gilgit from existing and future developments in the city. Unmanaged and uncontrolled urban developments in and around the city and an increased influx of tourists are likely to exacerbate these threats.

- **Habitat loss:** Habitat loss is considered the leading cause of loss of the world's biodiversity. Most species need undisturbed habitat to find food, water, shelter and mates. Activities that are leading to habitat degradation and fragmentation include: cutting wood for fuel and firewood; commercial logging; land development; over-grazing; soil erosion; the construction of roads and unmanaged growth of urban areas. The forest habitats in and around the city are vulnerable to these impacts particularly in the Kargah, Naltar, and Danyor Valleys (Exhibit 2.10).

- **Decline in species of conservation importance due to habitat loss:** The degradation of forest habitat is bound to impact the faunal species that abound in the forests in the city. Species of conservation importance such as the endemic species and those included in the IUCN Red List are of special concern. These include the endemic reptiles and also large mammals, such as the Ibex Capra ibex, Markhor Capra falconeri (Endangered), Urial Ovis vignei (Vulnerable), Snow Leopard Panthera uncia (Endangered), and Common Leopard Panthera pardus (Near Threatened). No Endangered or Critically Endangered bird species has been reported from the city. Nevertheless, habitat loss and deforestation is likely to negatively impact the avifauna.

- **Species population decline due to illegal hunting:** Indiscriminate and illegal hunting for trophies, skin and meat is believed to be the major cause of population decline for many species of birds and animals. Mountain ungulates such as the Ibex Capra ibex, Astore Markhor Capra falconeri (Endangered), Urial Ovis vignei (Vulnerable) are particularly susceptible. Game birds such as the Chukar Alectoris chukar and waterfowl are hunted for meat, while pheasants are hunted for feathers. Similarly, falcons are trapped and sold for the falconry trade. Increased urbanization and an increased influx of tourists are both likely to increase hunting pressure.

- **Decline in abundance of fish resources:** Fish species, particularly the trout species found in the Gilgit and Hunza Rivers and in the nullahs of the city are important both from an ecological and socioeconomic standpoint. They provide food to local communities and also recreational and commercial fishing. Over exploitation of fish resources will ultimately lead to a decline in the abundance and diversity of fish species. It is important that pollution from Gilgit, in the form of sewage and solid waste, not be disposed of in the river or its catchment areas, as the decline in river-water quality is likely to negatively impact its flora and fauna, particularly its fish.

- **Loss of nature-tourism areas:** Gilgit attracts domestic and international tourists. Destruction of forests and decline in fish abundance will reduce the nature-tourism potential of the area. Forest areas outside the city and the green areas inside the city limits should be maintained and protected from encroachment.

- **Decline in trophy-hunting potential:** Trophy hunting is a win-win situation that provides a community an opportunity to earn money, while at the same time conserving an ecological resource (such as Markhor) and its habitat. A decline in habitat and associated loss of species abundance will reduce the trophy-hunting potential of these areas.

81. McNeely, J. A. 1993. Economic incentives for conserving biodiversity: Lessons for Africa. Ambio 22 (2-3): 144-150.

- **Ineffective management of protected area:** Areas designated as 'protected' are not managed in the real sense of the word and indiscriminate exploitation of their ecological resources continues. Government agencies, such as the Environmental Protection Agency (EPA) and the Forest, Wildlife and Environment Department of GB have limited capacities for the effective planning and management of various components of biodiversity. They lack the technical know-how and face financial constraints. However, NGOs such as the WWF-P and the WCS are active in the area and are involving local communities in implementing conservation initiatives. As the pressures associated with urbanization increase, capacities in these institutions will have to be built if they are to play a role in protecting ecologically important areas around the city in times to come.

2.3 Socioeconomic Environment of Gilgit

Information on the socioeconomic environment of Gilgit covers all the mozas in the city as shown in Exhibit 1.6.

2.3.1 Demography

According to the 1998 census[82] conducted across Pakistan, Gilgit's population at the time was 57,750 people.[83] This figure, however, did not include the moza of Danyor (which included Muhammadabad) and the moza of Sakwar (which included Minawar), both of which are within the Gilgit city-limits prescribed by the GDA for the Plan. Since this SEA is based on the GDA boundaries (Exhibit 1.6), the population figures for these regions, according to the 1998 census report, are presented separately in Exhibit 2.11. In 1998, the population growth rate of the city—excluding Danyor and Sakwar—was, approximately, 2.66%.[84] A 2011 UN Habitat report provides a projected figure for the same area as 92,365 people in 2018.[85]

Exhibit 2.11: Population of Danyor and Sakwar Regions in 1998[87]

Population of Danyor (including Muhammadabad) in 1998 (persons):	18,095
Population of Sakwar (including Minawar) in 1998 (persons):	4,553

Exhibit 2.12: Demography of Gilgit City in 1998[88]

Total Population of Gilgit District (persons):	243,324
Total Population of Gilgit City including Danyor and Sakwar (persons):	80,398
Population Growth Rate of Gilgit City (%):	2.66
Average Household Size in Gilgit City (persons/house):	8

Exhibit 2.13: Projected Demography of Gilgit City in 2018[89]

Total Population of Gilgit City excluding Danyor and Sakwar (persons):	92,365
Population Density in Gilgit City excluding Danyor and Sakwar (persons per sq km):	1743
Average Household Size in Gilgit City excluding Danyor and Sakwar (persons/house):	8

82. GoP conducted a population census in 1998, which is the fifth and latest nation-wide population survey in the country.
83. Professional Development Center North (PDCN), 2013, Population of GB, Aga Khan University, Institute of Educational Development (AKU-IED)
84. Pakistan Census Organization—Government of Pakistan (PCO-GoP). (1998). District Census Report of Gilgit. Islamabad: PCO, Statistics Division .
85. Karrar and Iqbal, 2011, Gilgit Report, .UN—Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
86. Ibid.
87. Professional Development Center North (PDCN), 2013, Population of GB, Aga Khan University, Institute of Educational Development (AKU-IED)
88. Ibid.
89. Karrar and Iqbal, 2011, Gilgit Report, .UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.

The average household size in Gilgit, in 2011—excluding Danyor and Sakwar—was eight persons.[86] Exhibit 2.12 summarizes the demography of Gilgit. Exhibit 2.13 lists the projected demographic figures for Gilgit for 2018.

2.3.2 Migration

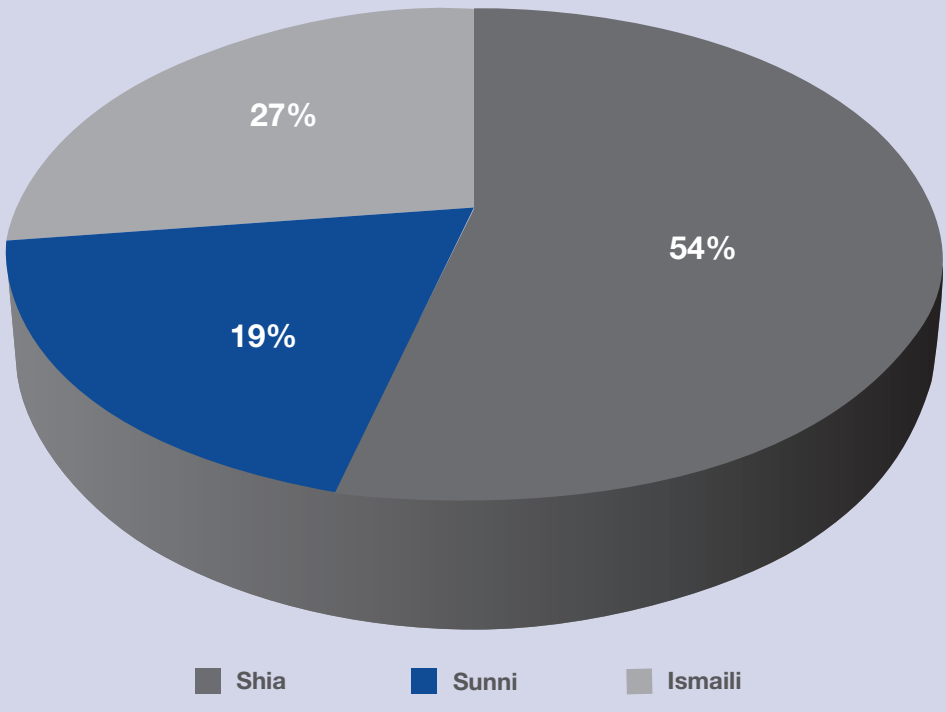
Gilgit has the highest rate of migration in GB.[90] Rural people and residents from the neighboring communities of Oshkandas, Nomal, Jutal and other suburban settlements migrate to Gilgit for its better education and health facilities, and its greater employment prospects. Most of the educated people in the province seek employment in the health and education sectors in Gilgit. Residents of rural Khyber Pakhtunkhwa (KPK) and Punjab migrate to Gilgit in search of business opportunities.[91]

Seasonal migration trends are also noted in Gilgit. The winter season sees the highest rural-to-urban migration because employment opportunities for rural people in winter sharply declines. Most of the young rural boys work in hotels and restaurants in Gilgit during winter. There are around 22 hotels and about 20 restaurants in the city.[92] Rural residents also migrate further south of Gilgit, during winter, to other parts of Pakistan in search of employment and livelihood opportunities.

2.3.3 Religion and Ethnicity

GB is a Muslim-majority province with a 2% non-Muslim minority. As shown in Exhibit 2.14, about 54% of the total population of Gilgit District is Shia; Ismailis constitute 27% of the population, whereas, the remaining 19% are Sunni.[93] Incidents of religious and ethnic violence, in the city, have risen over the last 10 years. From 1988 to 2010, 117 incidents of sectarian murders were registered.[94]

Exhibit 2.14: Sectarian Demography in Gilgit City



90. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
91. Ibid.
92. Ibid.
93. Karrar and Iqbal, 2011, Gilgit Report, .UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
94. Pakistan Institute of Legislative Development and Transparency (PILDAT). (2011). Sectarian Conflict in Gilgit Baltistan. Islamabad: PILDAT .

2.3.4 Economy

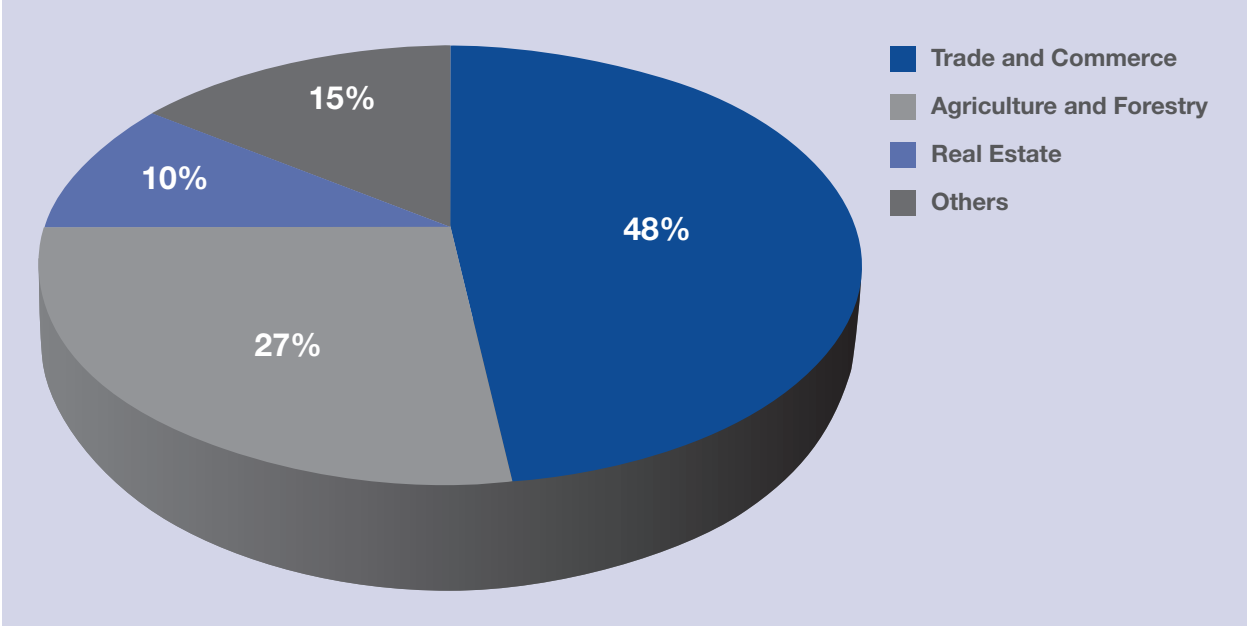
The average annual income of the people of Gilgit is around Rs. 30,000 per month.[95] The economy is largely driven by NGO donations and GoP funding.[96] The commercial and social-services sectors provide 45% of all livelihood opportunities in Gilgit and another 23% comes from agriculture.[97] After the opening of the Karakoram Highway (KKH), the increase in trade between China and Pakistan resulted in many of the city's inhabitants becoming directly or indirectly involved in border trade, hoteling and transport. Fishery, tourism, education, business, government and non-government services are main sources of revenue generation in the city.[98]

The total area of cultivated land in Gilgit is 22 km^2.[99] The total production of major crops, such as wheat, maize, barley, potato, vegetables and fruits,[100] for Gilgit District is about 63,000 metric tons.[101] However, due to inadequate marketing and packaging, considerable agricultural produce is wasted.[102] Exhibit 2.15 illustrates the proportion of the different sources of livelihood in Gilgit.

2.3.5 Thoroughfares and Modes of Transportation

The Karakoram Highway (KKH), constructed by Pakistan Army in 1966[104], is located approximately 10 km from Gilgit and connects it with other large towns in the region, such as Chilas, Dasu, Besham, Mansehra and Abbotabad. It also provides a connection with the federal capital in the south. On the Northern side, the KKH connects Gilgit to Hunza and Sust and extends to the Chinese cities of Tashkurgan, Upal and Kashgar, in Xinjiang province, as shown in Exhibit 2.16. Gilgit is the only large urban town within a

Exhibit 2.15: Sources of Livelihood in Gilgit[103]



95. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
96. The World Bank, Asian Development Bank, Government of Pakistan. (2010). Gilgit Baltistan Economic Report-Broadening the Transformation. WB, ADB, GoP.
97. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
98. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
99. The figure has been calculated using the Land Use Map for Gilgit in Exhibit 3.4.
100. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
101. Pakistan Census Organization-Government of Pakistan (PCO-GoP). (1998). District Census Report of Gilgit. Islamabad: PCO, Statistics Division.
102. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
103. Ibid.
104. The World Bank, Asian Development Bank, Government of Pakistan. (2010). Gilgit Baltistan Economic Report-Broadening the Transformation.

radius of 450 km, making it the trade hub of GB and a vital trade corridor between Pakistan and China.

Three main roads link the western part of Gilgit with the eastern part:

- River View Road
- University Road and
- Shaheed-e-Millat Road

Six bridges over the Gilgit River link the northern part of the city with the southern part. One of these bridges, the Gilgit Bridge, is a suspension bridge that spans 182 m and is only 2 m wide.[105] It is wide enough for one jeep to pass at a time and is located at the end of the traditional bazaar. The total length of all roads in the city is 224 km.[106]

The number of vehicles on the city's roads has increased with time, while the width of the roads has generally remained the same. Most roads are generally narrow and traffic obstructions are common during morning and afternoon hours, especially around offices and school areas.[107] In some areas, like Karimabad, the width of the road is between 25 and 40 ft,[108] which makes it inaccessible to emergency service vehicles, such as ambulances and fire engines.[109]

Exhibit 2.16 illustrates transport routes from Gilgit to major cities around it. Exhibit 2.17 provides a layout of the road network in Gilgit. Exhibit 2.18 illustrates the narrow alleyways that serve as thoroughfares in most residential areas of the city. Exhibit 2.19 provides information on the type and number of registered vehicles in Gilgit.

Exhibit 2.16: Map Showing Transport Routes of Gilgit City with Key Cities

105. Pakistan Urban Observatory. (2011). City Profile – Gilgit.
106. Observation made using Land Use Map in Exhibit 3.3
107. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
108. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
109. Ibid.

Exhibit 2.17: Thoroughfares in Gilgit City

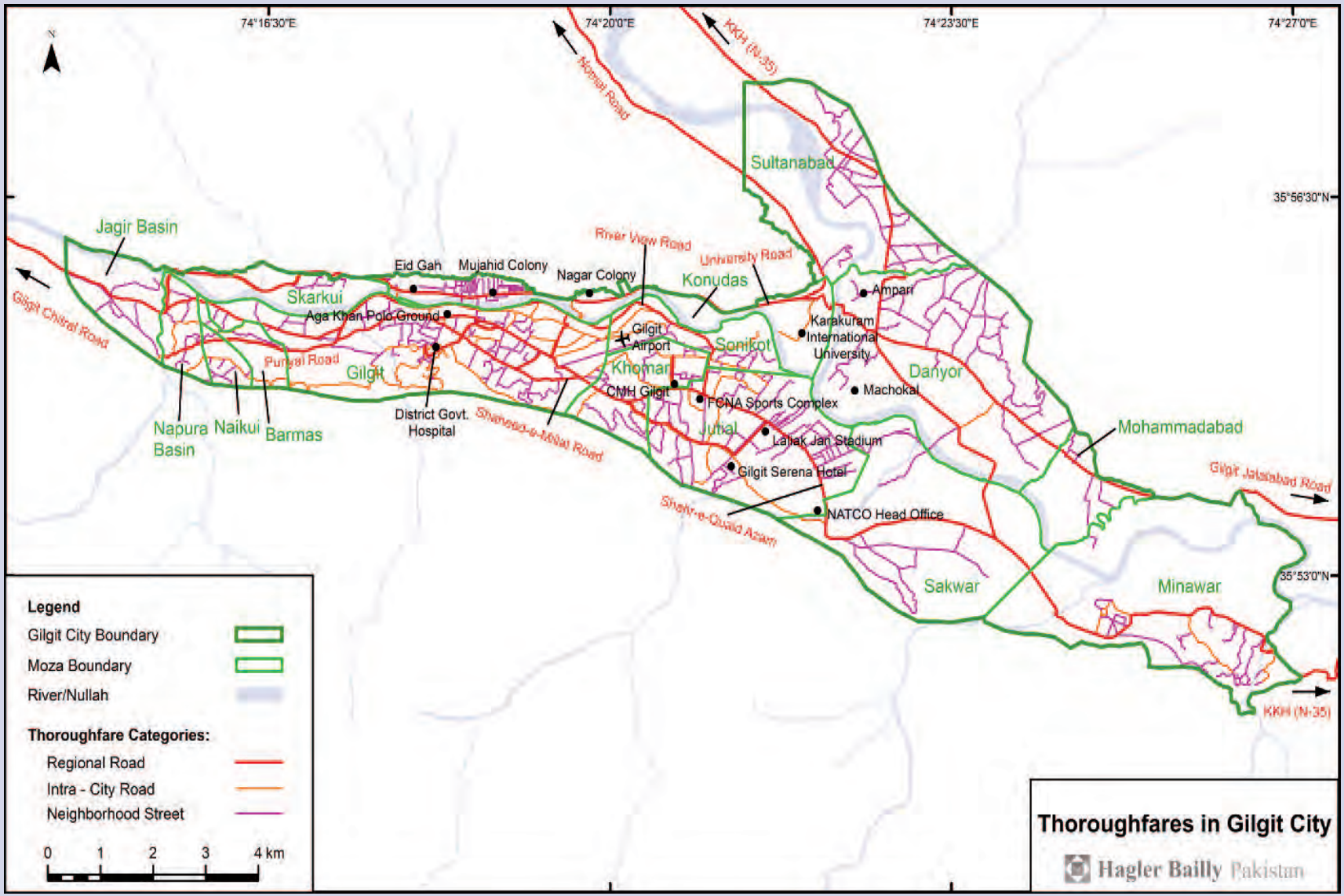
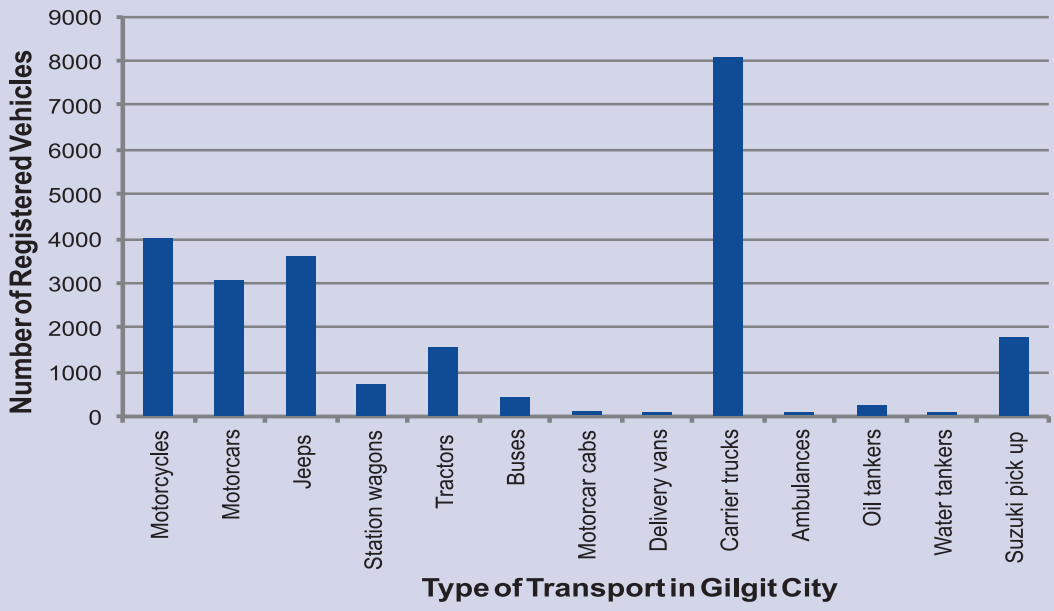


Exhibit 2.18: Narrow Alleyways in Gilgit City

Alleyways in Nagral

Alleyway in a residential area in Gilgit city

Exhibit 2.19: Type and Number of Registered Vehicles in Gilgit City[110]



110. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx

Exhibit 2.20: Photographs of Waste-Dump Sites in Gilgit

Dumpsite along Nomal Road

View of Dumpsite near Pump House, Mujahid Colony

2.3.6 Power and Gas Supply

Gilgit's energy demand is estimated to be 24 MW[111] or 1.25 KW per household.[112] GB is presently not connected to the national power grid of Pakistan and supplies electricity through hydropower. During summer, electricity generated from hydropower is 7 MW, which drops to 2.7 MW in winter.[113]

Urban power consumption doubles in winter, as the majority of the population in Gilgit relies on electricity for heating, cooking and other domestic facilities. During summer, energy consumption increases due to the use of refrigerators and air conditioners in domestic and commercial settings. One out of every five houses in Gilgit now owns a refrigerator.[114]

Due to the shortage of power, many households rely on fuel supplies especially for heating homes and workplaces during the city's harsh winter. Wood and timber from local forests is the main source of fuel, which has led to deforestation (please see Section 2.1.6 for more on deforestation in Gilgit).[115]

2.3.7 Waste Management

The municipal corporation (MC) operating in Gilgit is short of manpower and indispensable equipment. Due to a lack of financial resources, the existing infrastructure cannot be maintained, skilled professionals cannot be hired and the necessary procurements are hindered.[116]

Solid waste is collected by the MC, using two municipal trolleys, and is dumped at a site near Karakoram International University (KIU). In the commercial areas and nucleus of the city, the MC has provided dustbins. The Office of the Municipal Administration of Gilgit operates five dumpers and six dustbins in the areas of Gilgit, Jutial, Khomar and Sultanabad.[117] About 50% of the total waste generated in the city is either dumped or burned in the open air, while 14% is collected by the MC.[118]

According to an IUCNP survey conducted in 1998, the average per capita waste generation in Gilgit is around 0.4 kg per day.[119] Based on this figure, the total waste generated in the city is about 36 tons per day.

Through site visits, it was observed that households situated along water channels directly dispose garbage into them. Usually, waste is burned at dumpsites in Gilgit.[120] Photographs that show waste dumps lying in open space near roads and riverbanks are presented in Exhibit 2.20. Exhibit 2.21 shows the waste collection and disposal points in Gilgit.

Waste generated by commercial activity is more hazardous than other organic and inorganic effluents. Small- and medium-sized industries, such as automobile workshops, flour industries and dry fruit industries, are expanding in Gilgit. There are more than 20 service stations in Gilgit alone. Effluent from these commercial activities is discharged, without treatment, into nearby small water rills and ultimately into water channels. There is no proper arrangement to deal with the hazardous effluents generated by hospitals.[121]

111. This electricity demand is calculated on a per-household basis and does not take into account industrial and commercial demand.
112. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
113. Ibid.
114. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
115. Ibid.
116. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
117. Ibid.
118. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
119. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
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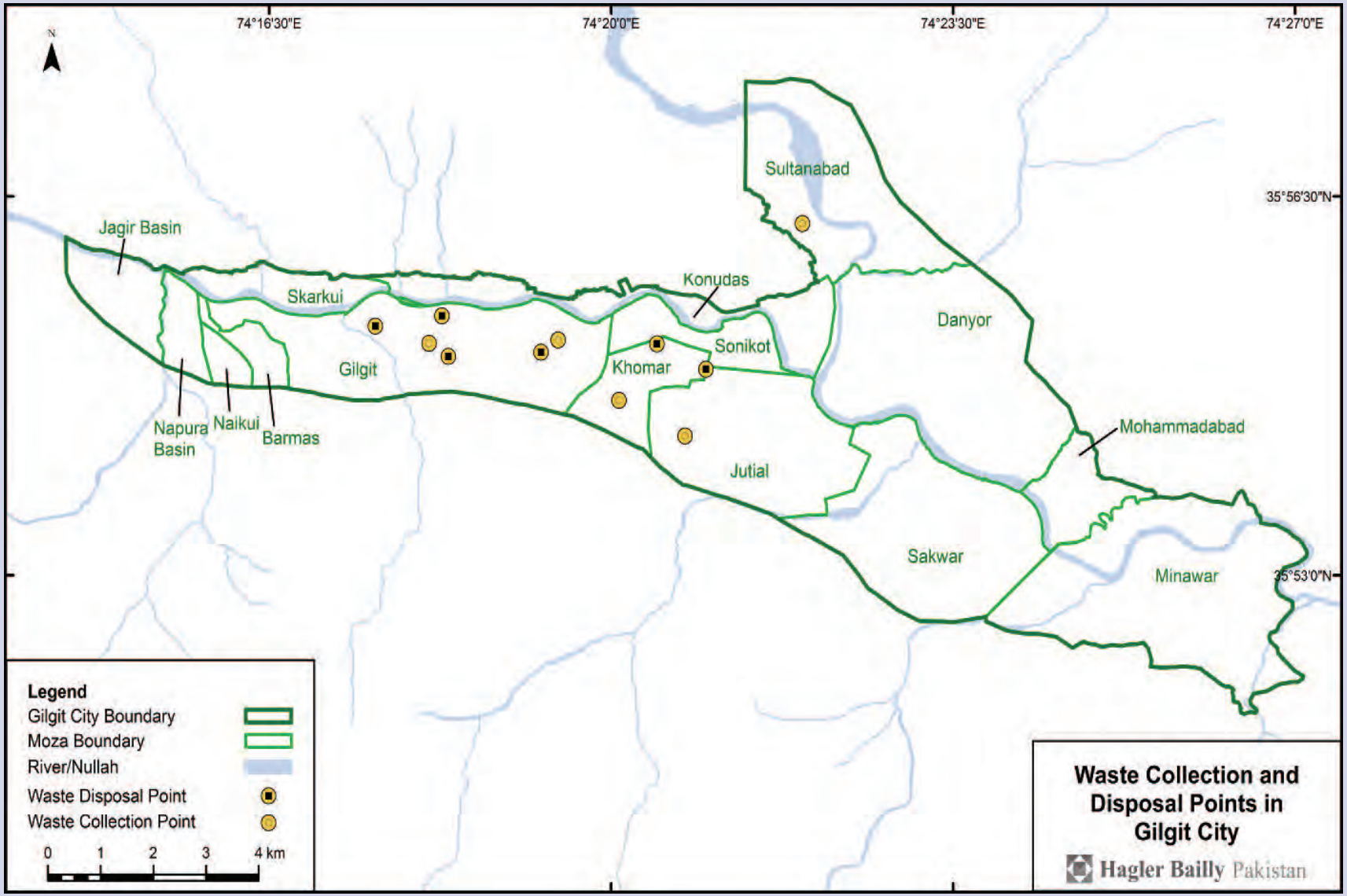
121. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.

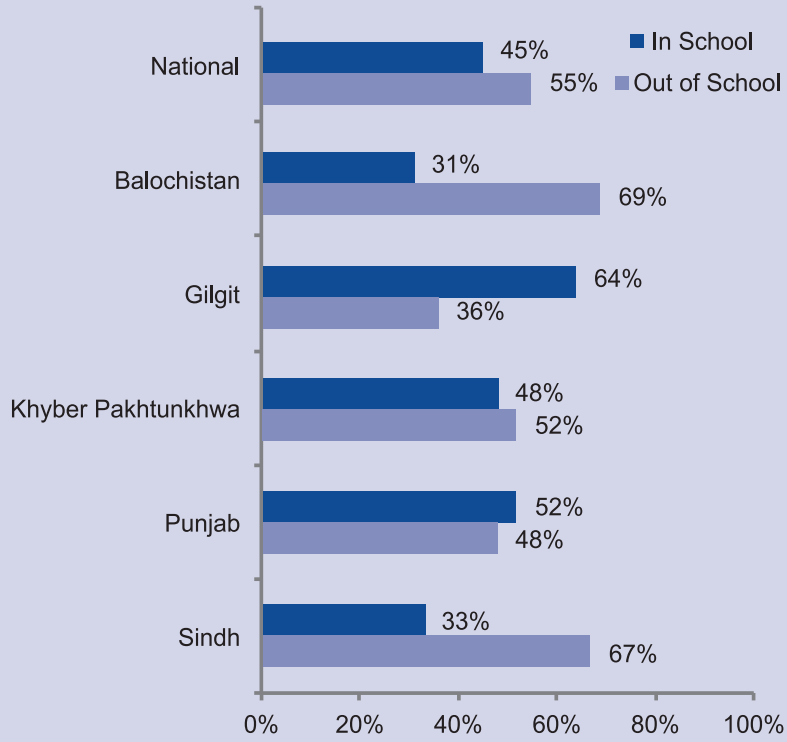
Exhibit 2.21: Waste-Collection and Disposal Points in Gilgit



2.3.8 Education Sector

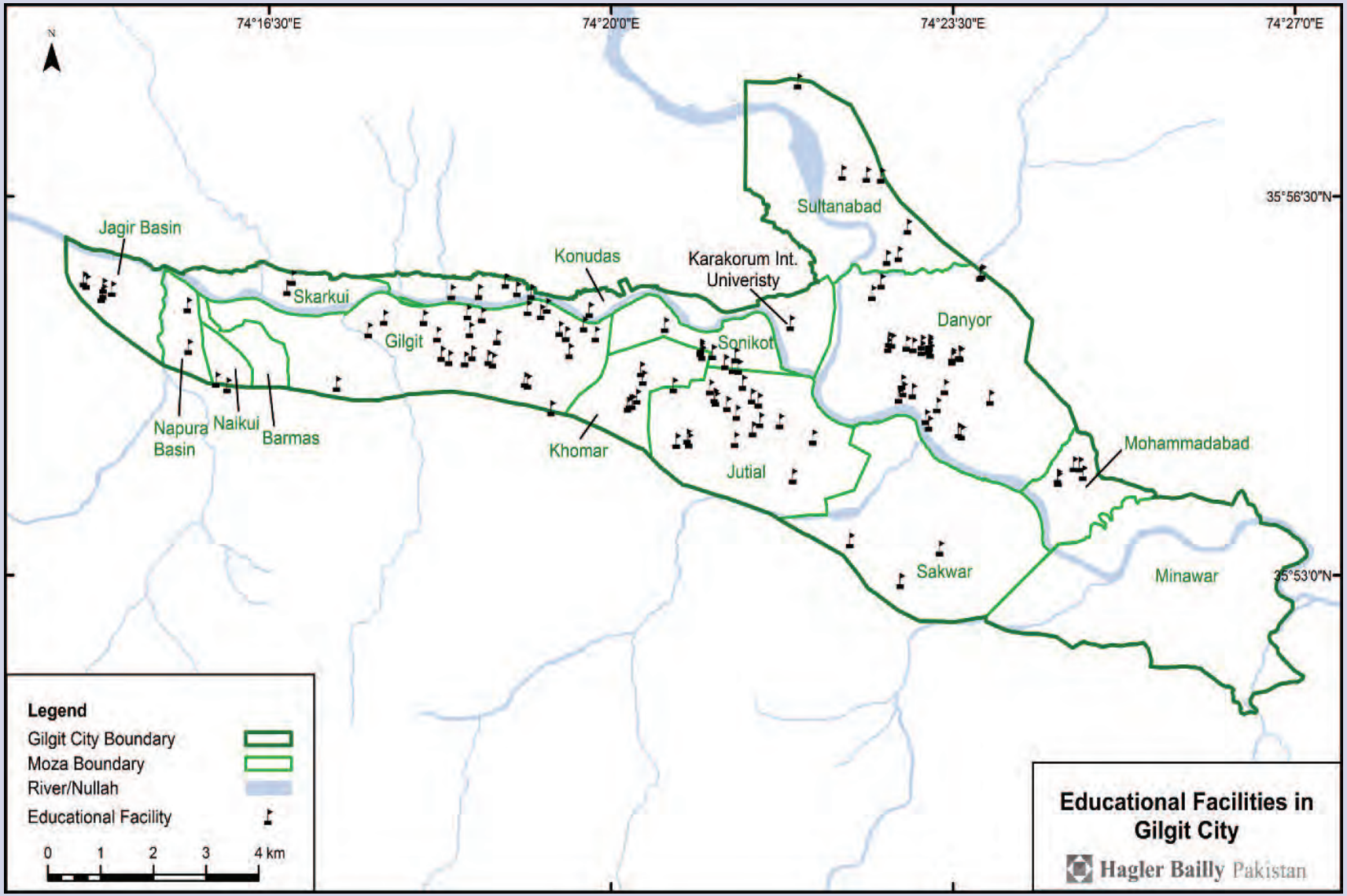
The literacy rate for the urban areas of Gilgit District was reported at 50% in 1998.[122] The enrollment ratio[123] for Gilgit, in 1998, was 62%.[124] There are more than 2000 schools, 14 colleges and one university in the district.[125] KIU currently enrolls 415 students every year. A comparison of Gilgit's early childhood education (ECE) enrollment figures for children aged 3 to 5 years ≈ with other provinces of Pakistan, for the year 2011, is shown in Exhibit 2.22. It can be clearly noted that Gilgit's enrollment ratio is even higher than that of Punjab. Exhibit 2.23 illustrates the distribution of educational institutions throughout the city.

Exhibit 2.22: Early Childhood Education (ECE) - National and Provincial Profiles[126]



122. PCO-GoP. (1998). District Census Report of Gilgit. Islamabad: Population Census Organization, Statistics Division.
123. Percentage of population going to school.
124. PCO-GoP. (1998). District Census Report of Gilgit. Islamabad: Population Census Organization, Statistics Division.
125. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
126. Ibid.

Exhibit 2.23: Educational Facilities in Gilgit City



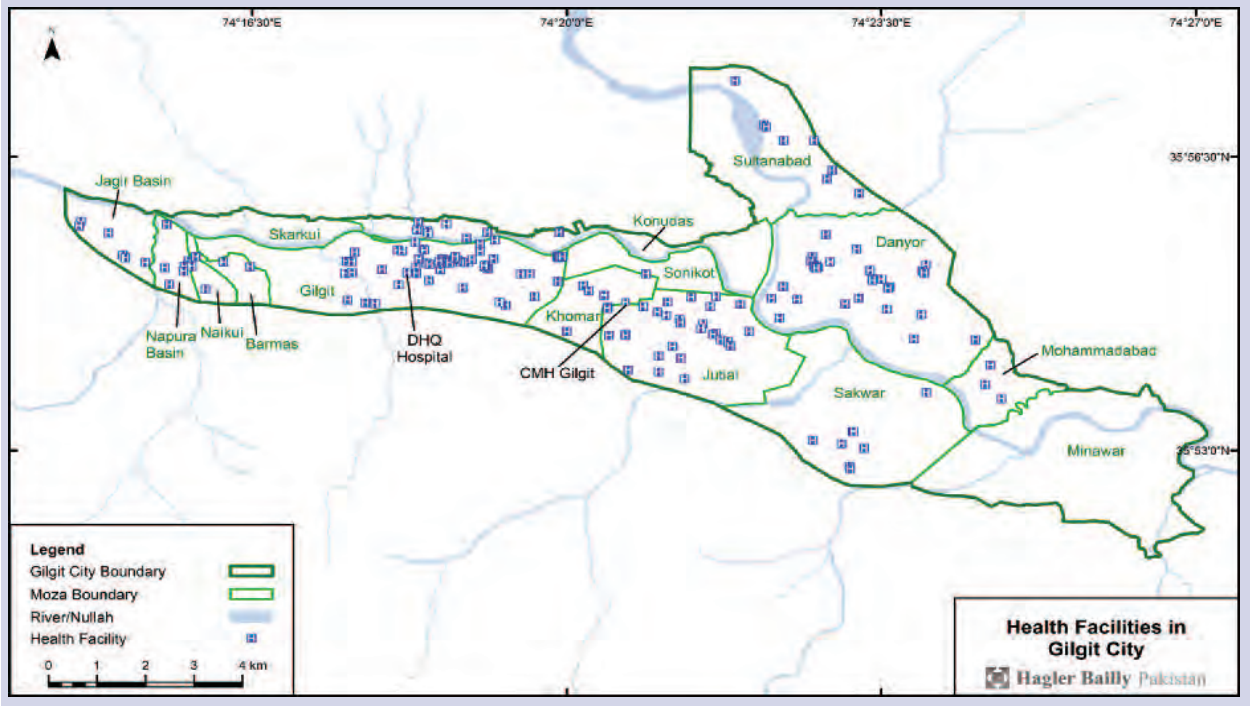
2.3.9 Health Facilities

There is one District Headquarter Hospital (DHQ), five hospitals and 22 dispensaries in Gilgit City. Basic level surgery facilities are present at the Civil Military Hospital (CMH) Gilgit and the DHQ.[127] The numerical strength of doctors and health specialists in the city is likely to be around 70 at present.[128] Female doctors account for less than 30% of the total number of doctors.[129]

During site visits, the Secretary of the Local Government of Gilgit-Baltistan informed the team of an increase in respiratory illnesses and skin allergies among women and children.[130] Although access to medical facilities has been made easier by the intervention of Government and Non-Government Organizations (NGOs), health expenses still pose a major financial burden on families in Gilgit. Residents of Oshkan Das, Nomal and other suburban settlements in the city also depend on Gilgit's health facilities.[131]

Location of health facilities in Gilgit is shown in the Exhibit 2.24. Note that regions of Danyor, Sultan Abad and Sakwar have no immediate hospital facilities nearby.

Exhibit 2.24: Spread of Health Facilities in Gilgit City



127. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
128. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
129. Ibid.
130. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
131. Ibid.

2.3.10 Tourism and Recreational Facilities

In Gilgit, there are two recreational parks. The Chinar Bagh covers an area of 8.5 acres and the City Park is located near the airport. Polo grounds in the city are used to hold polo matches and other traditional festivals of the area, which are a major source of tourist attraction. The Shandur Polo Festival in Gilgit attracts ordinary tourists and dignitaries from the world over.[132] The Armed Forces and local administration have their own recreational complexes, which are only for officials. The city also has three cinema halls with a combined seating capacity of 800.[133] Recreational spots in Gilgit are shown in Exhibit 2.25. Locals of Gilgit's suburban region also travel to Gilgit for recreational purposes.[134] [135]

Paragliding, trekking and mountaineering are the most widely practiced sports in the region. Almost all tourists headed for trekking and mountaineering in the Karakoram and Himalayas arrive at Gilgit first. Most local and international scientific expeditions to study glaciers and climate change also start from Gilgit.[136] Walking trails through forests with meadows and streams also attract many tourists and locals for picnics.[137] Major tourist attractions around Gilgit include Naltar Peak; Hunza Valley; the Fairy Meadows in Raikot; Shigar Town; Skardu City; Haramosh Peak in the Karakoram Range; Bagrot-Haramosh Valley; Deosai National Park; Astore Valley; Rama Lake; Juglot Town; Phunder Village; Yasin Valley and Kargah Valley. Another tourist attraction in Gilgit is the Kargah Buddha, which is carved into a cliff at the mouth of the valley. The Buddhist manuscripts found in Gilgit are among the oldest manuscripts in the world. They are significant in Buddhist studies and in the evolution of Asian and Sanskrit literature.

The number of tourists that visited Gilgit City in 2011 was around 37,000.[138] The lack of properly developed recreation and tourist spots along with meager physical and social infrastructure has negatively affected this industry. Ethnic and sectarian violence has also reduced the number of local and foreign tourists that visit the region.[139]

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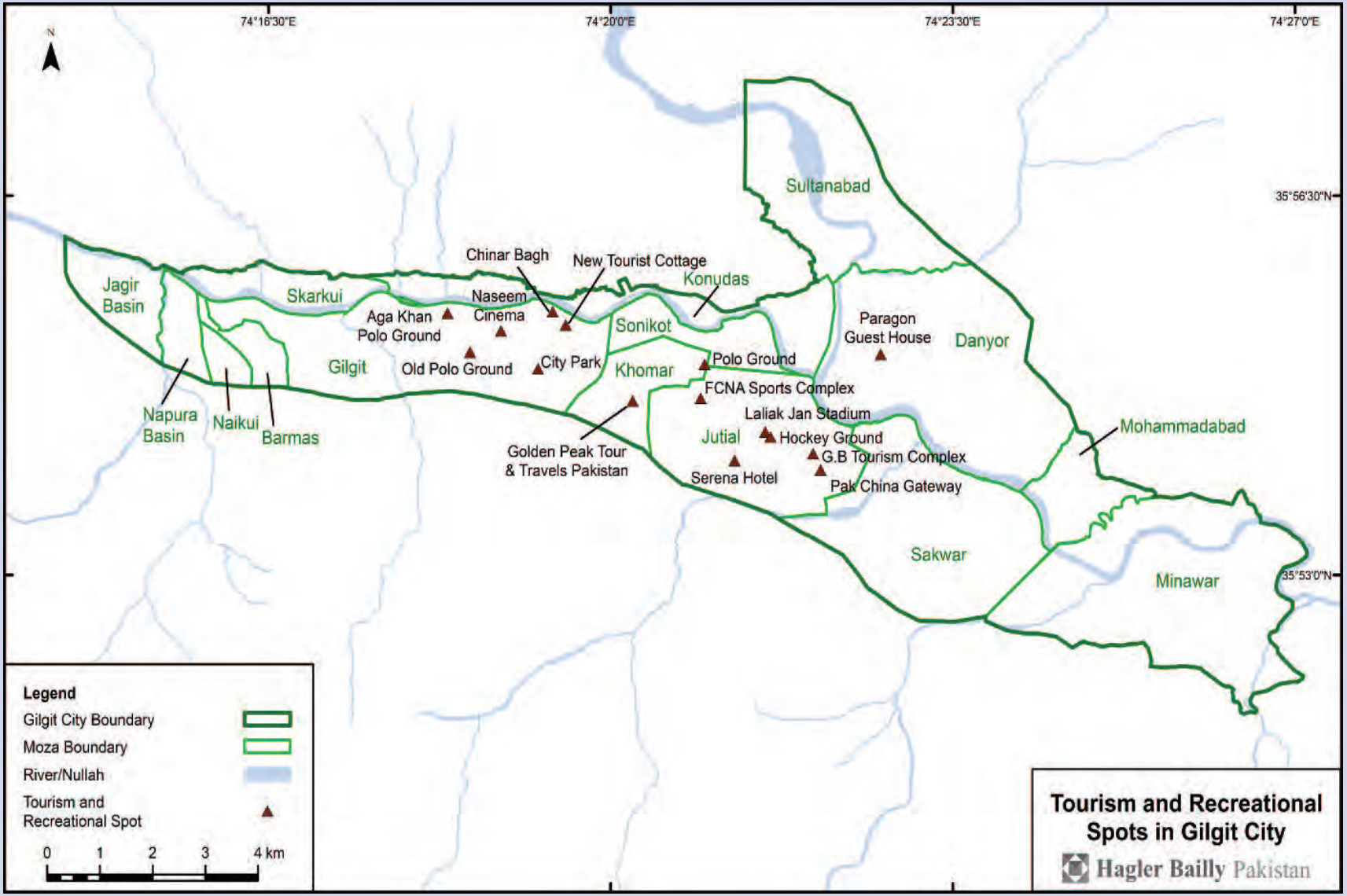
132. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
133. Ibid.
134. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of the Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
135. According to comments received from the GBEPA on 7th May 2014, there is also a Chinese Cemetery in Danyor which is considered an important heritage site for the city. The cemetery is the final resting place of Chinese workers and engineers who died during the construction of the Karakoram Highway (KKH) in Pakistan in the 1960s and 1970s.
136. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
137. Raza, H. (2003). Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
138. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
139. Pakistan Urban Observatory. (2011). City Profile - Gilgit. Retrieved November 20, 2013, from Urban UN-Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx

Exhibit 2.25: Recreational Spots in Gilgit



2.4 Environmental Values of Physical-Environment Features in Gilgit

Based on the physical and socioeconomic-environment features discussed in the previous sections, the Environmental Values (EVs) of the former are identified and discussed in the following sections under the following broad categories:

- Agricultural Fields and Grazing Areas,
- Forests,
- The Gilgit and Hunza Rivers and their Riverbanks,
- The Nullahs,
- Gilgit's Air Quality

The EVs highlight the importance of each one of these features to the overall functioning of the entire city.

A description of the EVs is followed by a discussion on the different barriers to realization, which are, at present, hindering the different environmental and socioeconomic features in the city from fulfilling their environmental function. For example, the nullahs of Gilgit may be unable to realize their EV of providing clean drinking water to the inhabitants due to their contamination from the uncontrolled dumping of waste.

Any future development in the city must address these barriers and enhance the EVs of all of the physical and socioeconomic-environmental features of the city. Any development that irreversibly harms the EVs will not be sustainable in the long run. On the other hand, preserving and enhancing the EVs will result in prosperity and an improved quality of life of the inhabitants of the city, who will then enjoy higher incomes, peace and stability.

Therefore, a discussion on the EVs and the barriers faced by each of the physical and socioeconomic environmental features in the city ends by recommending a few priority interventions. These interventions are the foundation on which the Conceptual Master Plan (CMP) is developed. While the interventions recommended in this section are brief, the CMP further develops them into detailed structural recommendations. The Financial Stability Plan (FSP) (Section 4) and the Institutional Framework (IF) (Section 5) develop the financial and institutional recommendations, in greater detail, in their respective sections.

2.4.1 Agricultural Fields and Grazing Areas

In Gilgit, agriculture accounts for 23% of total livelihood provision. According to Exhibit 1.6, approximately 22% of the total area in Gilgit, or 21.8 sq km, is covered by agricultural fields, trees and grazing areas.[140] These are primarily used for subsistence farming and are therefore small, fragmented and spread throughout the city. After fulfilling their own needs, the owners of these lands make their produce available to the local market. The size of the agricultural land and grazing areas in Danyor are larger compared to other similar landholdings in the rest of the city. Exhibit 2.27 and Exhibit 2.28 provides photographs of different agricultural fields and grazing areas in different parts of the city. Exhibit 2.29 provides a summary of the EVs, the barriers to realization and the priority interventions for agricultural fields and grazing areas in Gilgit.

140. Observation has been made using the Land Use Map shown in Exhibit 2.3

Exhibit 2.26: Agricultural Fields and Grazing Areas in Gilgit

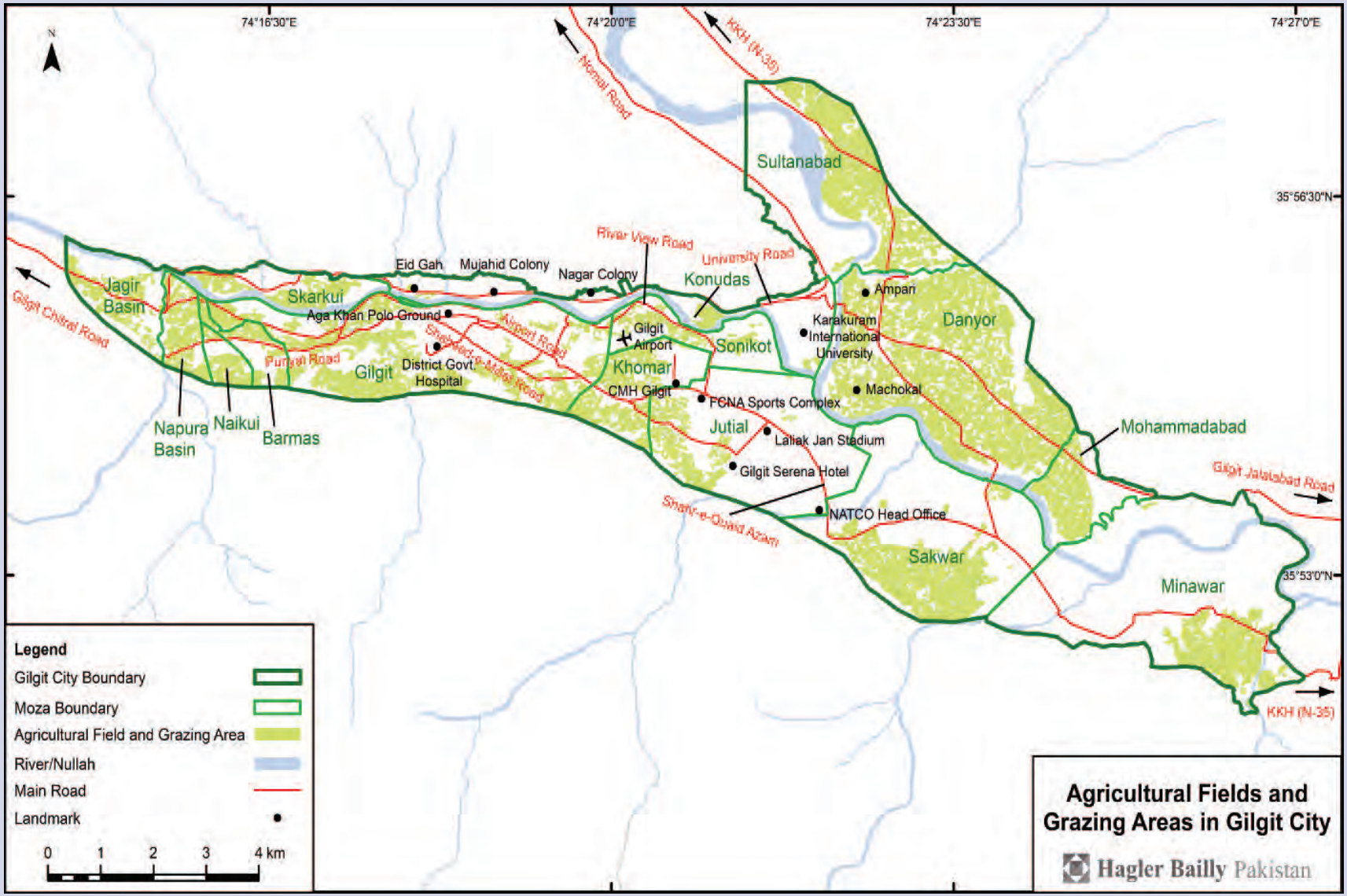


Exhibit 2.27: Photographs of Agricultural Fields and Grazing Areas in Different Parts of Gilgit in September

A view of the city from Barmas facing north.

A typical subsistence farm in Barmas with agricultural fields and livestock sheds adjacent to the landowner's residence.

A view of the city center from Barmas.

Grazing field in Barmas

Another view of the city center showing the trees.

A view of the city center from University Road, north of the Gilgit River.

Exhibit 2.28: Photographs of Agricultural Fields and Grazing Areas in different Parts of Gilgit in December

Grazing fields in Barmas.

Agricultural fields in Barmas.

Agricultural fields in Barmas.

A view of the city from Barmas facing northeast.

A view of the city from Barmas facing north.

Environmental Values of Agricultural and Grazing Areas

- **Subsistence Farming – A Strategic Asset**
  Gilgit is located in a remote area with limited access to markets across the country. The cost of importing goods, especially food products, to the city contributes to a sizable proportion of their price. Subsistence farming, which includes growing crops and rearing livestock, forms a vital source of survival for a large part of the inhabitants of the city. Surplus produce is sold to the local markets, which become a source of income for some of the households.

  In winter months, the production of subsistence agricultural products becomes almost negligible. Demand for food items from the markets peaks. This also leads to an increase in the price of these items. Income saved by the city's inhabitants during the summer months, by relying on home-grown fruits and vegetables, is used during winter. In this way, summer subsistence farming activities form a lifeline for the city's inhabitants and Gilgit's economy, both of which rely on local produce for six months of the year.

  The reduction of agricultural land and grazing areas, in the city, will result in a massive increase in the prices of basic food items there. This will adversely affect its inhabitants and lead to increasing unrest through rising crime rates, which will also result in an increase in the city's already intense ethnic tensions.

- **Commercial Agriculture and Export Opportunities**
  Food items that are not grown at home are obtained from the local market. In this way, commercial agriculture accounts for 22% of total livelihood provision of Gilgit's inhabitants.[141] Agricultural products in the area include vegetables, fruits, dry fruits and fodder. Food items unique to Gilgit's weather, such as apricots, peaches, mulberries, apples, honeydew melons, almonds and walnuts, are exported to other parts of Pakistan and Asia, forming a vital contribution to the local economy.[142]

- **Aesthetic Beauty and Source of Tourist Attraction**
  Other than the economic role agricultural fields and grazing areas play for the economy of the city, they also enhance the aesthetic beauty of the city, which is characteristic and unique to cities located in mountainous terrains. This uniqueness forms a large part of the pull for tourists who seek a reclusive and natural environment away from the hustle and bustle of their own towns and cities. Tourists and visitors bring with them a lot of capital that is injected into Gilgit's economy. Hotels, restaurants, tour guides, heritage and recreational centers, and other aspects of the city linked to the tourism sector earn a large part of their revenue from tourists.

Barriers to the Realization of Environmental Values

- **Encroachment**
  In recent years, the proportion of agricultural land has been decreasing due to encroachment by commercial and private sectors. Local farmers see better income potential by constructing a residential or commercial property on their agricultural land and generating revenue by renting it out. Since almost all of the agricultural land is privately owned, there is no GDA check on the conversion of agricultural land into non–agricultural uses. Therefore, land within the city and in the rural areas and villages outside it are being rapidly enveloped by commercial or residential areas.

- **Lack of Adequate Irrigation**
  Gilgit is an arid zone that requires large amounts of water for irrigating agricultural

141. Observation has been made using Land Use Map shown in Exhibit 2.3
142. http://www.brecorder.com/agriculture–a–allied/183:pakistan/1182473:gilgit–baltistan–fruits–horticulture–exports–could–fetch–billions/?date=2012–04–26

land. However, there is no adequate irrigation network that exists for this purpose. A poor infrastructure for water–supply in the city has left many households with limited or no supply of clean water. As a result, only agricultural activities close to the source of the nullahs on the mountain slopes and those located on or next to the riverbanks have adequate irrigation water. Agriculture areas between these can be expanded with adequate water–supply for irrigation.

- **Poor Agricultural-Sector Infrastructure**
  At present, there is a lack of facilities, such as a non-availability of cold storage for the short-term storage of fruit, and of export quality packaging material, quality control for grading, and facilities for washing and disinfection.[143] Due to inadequate marketing, packaging and modes of transporting goods to distant markets, a considerable amount of agricultural produce is wasted, as is the associated potential income for the city's economy.[144]

- **Introduction of Non-Native or Exotic Species**
  The use of exotic or non-native species is becoming common in agriculture in the city. There is a danger that, if uncontrolled and unchecked, invasive species might be introduced. These will upset the local ecosystems, and especially harm the soil or introduce pests that destroy the city's agricultural potential.

Priority Interventions

- **Regulating Land Use of Agricultural Fields and Grazing Areas**
  Subsistence farming in the city is a strategic asset that must be protected at all costs. As a policy, Gilgit's civil and political leadership must not allow a reduction in the amount of area used for agriculture. In fact, any future development must try to increase the amount of such areas.

  In any future development of the city, land currently being used for agriculture or grazing, whether subsistence or commercial, must not be allowed to be converted to another land use. For this purpose, the Gilgit Development Authority (GDA) will need to conduct a survey of the existing agricultural areas and clearly demarcate them. Land for residential or commercial development in other parts of the city must also be identified.

  The GDA could also work on providing incentives to subsistence farmers to continue growing crops for themselves and for the city. These incentives could include improving infrastructure related to the agricultural sector,

Exhibit 2.29: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Agricultural Fields and Grazing Areas in Gilgit

Environmental Feature	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Agricultural Fields and Grazing Areas	• Subsistence Farming – A Strategic Asset • Commercial Agriculture and Export Opportunities • Aesthetic Beauty and Source of Tourist Attraction	• Encroachment • Lack of Adequate Irrigation • Poor Agricultural-sector Infrastructure • Introduction of Non-native or Exotic Species	• Regulating Land Use of Agricultural Fields and Grazing Areas • Improving Agricultural-sector Infrastructure

143. http://www.brecorder.com/agriculture–a–allied/183:pakistan/1182473:gilgit–baltistan–fruits–horticulture–exports–could–fetch–billions/?date=2012–04–26
144. Karrar and Iqbal, 2011, Gilgit Report, UN–Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.

such as irrigation supplies, and helping farmers market their produce to other parts of the country.

- **Improving Agricultural-sector Infrastructure**
  In order to promote local produce to other parts of Pakistan and internationally, the GDA must invest in agricultural facilities that increase the amount of agricultural produce in the city, as well as its shelf life, especially for local fruits, and add to its value, such as by canning or tinning using preservatives.

  A system of irrigation will need to be developed for areas that are not close to the rivers or to the main sources of the nullahs on the mountain slopes. This will help increase the volume of agricultural produce in these areas and also the overall volume of agricultural produce for subsistence and commercial farming.

2.4.2 Forests

Trees are located throughout the city, usually on agricultural lands and grazing areas. In some parts, however, the tree density is higher. Here the trees provide the same function to the ecosystem as forests in terms of their role as a habitat for birds and terrestrial fauna. Exhibit 2.30 illustrates the locations of forests in Gilgit. These comprise approximately 3.8 sq km or 4% of the land area within the GDA boundary. The forests are characterized by fewer deciduous tree species, although coniferous species predominate. Forests also occur in the vicinity of the Jutial Nullah and on the mountain slopes facing the city. Typical tree species in these forests include Picea smithiana, Cedrus deodara and Pinus willichiana. Smaller shrubs include Quercus ilex and Junglus regia and scattered shrubs of Artimesia maritima, Ephedra intermedia, Indigofera gerardiana, Sambucus ebulus, Sorbaria tomentosa, and Plectranthus rugosus. Exhibit 2.32 provides a summary of the EVs, barriers to realization and priority interventions for forests in Gilgit.

Environmental Values of Forests

- **Habitat for Birds and Terrestrial Fauna**
  The forests surrounding Gilgit provide habitat for birds and terrestrial faunal. Large mammals such as the Snow Leopard Panthera uncia, Common Leopard Panthera pardus, Wolf Canis lupus, and Red Fox Vulpes vulpes have been reported in the hills surrounding the city.

  More than a hundred bird species have been reported in the city and its environs.[145] These include passage migrants, vagrant, resident, breeding and irregular visitors. Altitudinal migratory birds descend from higher altitudes during the winter months. Typical bird species found here include the Snow Partridge Lerwa lerwa, Chukar Alectoris chukar, Common Quail Coturnix coturnix, Common Hoopoe Upupa epops, Common Swift Apus apus, Rock Pigeon Columba livia and Common Kestrel Falco tinnunculus.

  By preserving the forests and, thus, the habitat for birds and fauna, Gilgit has the potential to become a recognized academic and tourist center for bird-watching and animal-sighting activities. Students and researchers in the field of zoology, ecology and other natural sciences will be attracted to Gilgit for the unique biodiversity the city has to offer.

- **Source of Timber for Fuel and Construction**
  Different varieties of trees in the forests are used either as a source of fuel or as a construction material. Varieties used for fuel are sold in the local market for Rs 650 to 700 (US$6 to 7) per maund[146] (or mun in the local dialect).[147]

  During the summer months, Gilgit's inhabitants are able to meet their demand for fuel by using liquefied petroleum gas (LPG)

145. Roberts, T. J. 1992. The Birds of Pakistan. Vols. 2, Oxford University Press, Karachi, Pakistan.
146. One maund is approximately equal to 40 kg. http://books.google.com.pk/books/about/Rice_Almanac.html?id=suZZiwyCEYMC&redir_esc=y
147. According to comments received from the GBEPA on 7th May 2014, there is no timber being supplied for fuel from within the city. The main sources of timber are the adjacent districts of Diamer and Hamamosh, a remote area within Gilgit District with thick forest.

Exhibit 2.30: Forests in Gilgit

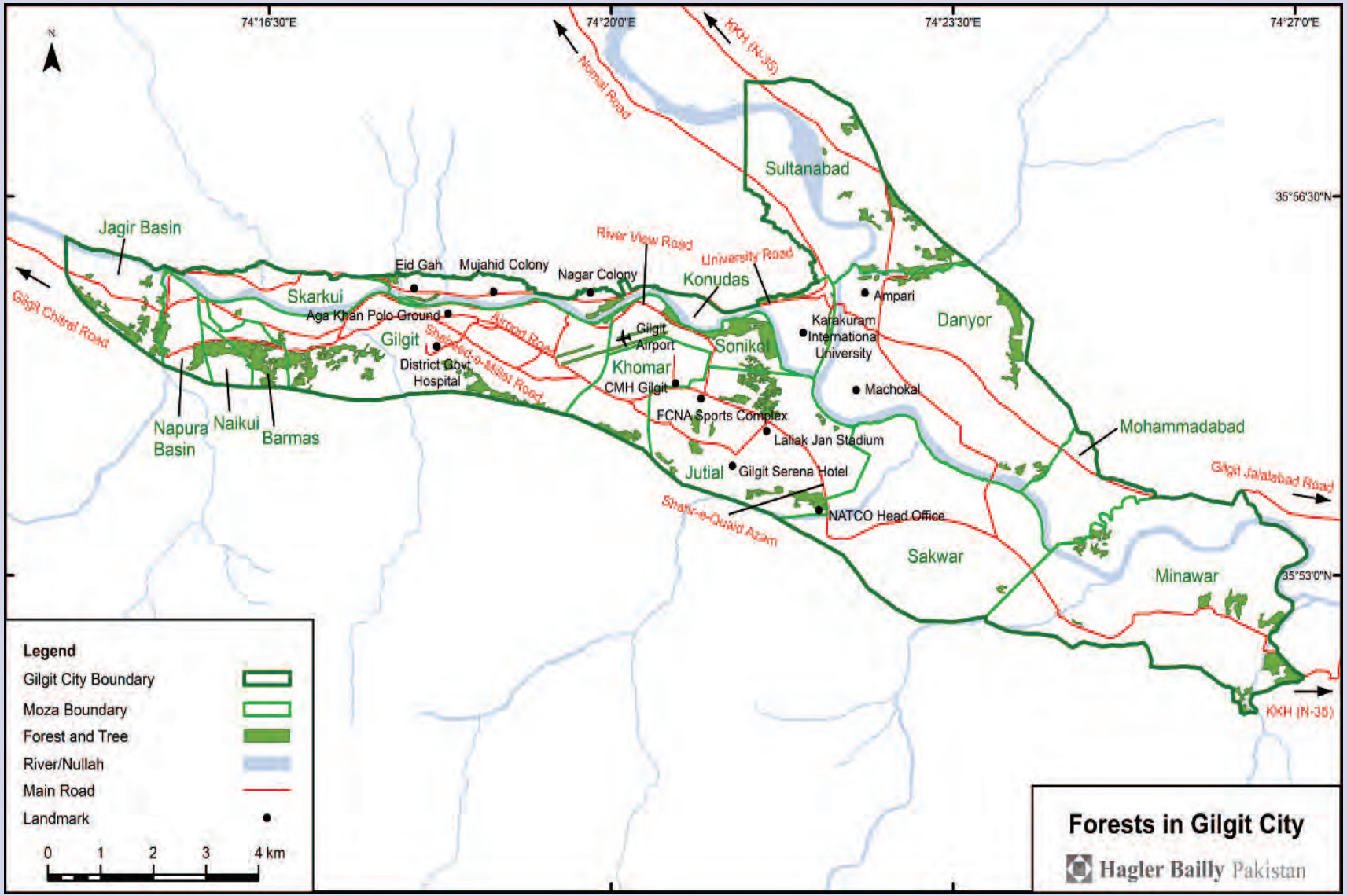


Exhibit 2.31: Photographs of Forests in Gilgit

Forest area in Skarkoi.

Forests next to the airport.

LPG cylinders available for purchase in a local shop.

Timber being used at a local restaurant to fire the oven.

tanks. An LPG tank weighing between 8 to 10 kg costs approximately Rs 1,800 to 2,350 (US$18 to 23) and is primarily used for cooking. During the winter, however, the increase in demand for LPG tanks results in price hikes and shortages. This results in an increase in the demand for timber, which is primarily used by the inhabitants for heating.

According to a shopkeeper in the timber market, interviewed by the SEA team in Gilgit, approximately 40 maunds, or 10 to 15 maunds per month, is sufficient for a household to purchase its winter supply of timber. Local timber is also one of the primary construction materials for housing in Gilgit.

If the trees in the city are neither preserved nor used in a sustainable way, the price of timber for winter heating will become unaffordable for the inhabitants of the city. This will result in an increase in the incidence of adverse health effects during winter months, which will, in turn, result in higher pressure on the local health facilities.

Unsustainable use of timber will result in the complete destruction of trees within the city. It will also cause a slow increase in the pressure on forests in other parts of GB. The further away these forests are, the higher the prices for timber will become.

- **Grazing Areas**
  The grass, shrubs and leaves in the forests make excellent grazing areas for livestock in Gilgit.

- **Prevent Flooding and Erosion**
  The forests around the rivers and nullahs in the city help prevent flooding and soil erosion. Forests on the mountain slopes help prevent landslides.

- **Aesthetic Beauty and Source of Tourist Attraction**
  Like agricultural fields and grazing areas, the forests in and around the city also enhance the aesthetic beauty of the city, which attracts tourists. Tourists and visitors bring with them a lot of capital, which they inject into Gilgit's economy. Hotels, restaurants, tour guides, heritage and recreational centers and other aspects of the city linked to the tourism sector earn a large part of their revenue from these tourists.

Barriers to Realization

- **Encroachment**
  In recent years, the number of trees and the size of forests have been decreasing due to commercial and private-sector encroachment. Trees are being cut down within the city and in the outlying villages and rural areas to make room for commercial or residential development.

Exhibit 2.32: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Forests in Gilgit

Environmental Feature	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Forests	• Habitat for Birds and Terrestrial Fauna • Source of Timber for Fuel and Construction • Grazing Areas • Prevent Flooding and Erosion • Aesthetic Beauty and Source of Tourist Attraction	• Encroachment • Deforestation • Stone Blasting and Excavation works	• Preserving Forest Areas • Developing Alternate Sources for Fuel Supply

- **Deforestation**
  Due to an increasing population in the city, the demand for timber for fuel and construction is also increasing. This demand is exacerbated in the winter months when the supply of LPG tanks in the city run short. To warm their homes during the winters, most of the inhabitants are dependent on wood from surrounding forests and this increases the rate of deforestation.

- **Stone Blasting and Excavation works**
  Stone blasting and excavation works in quarries on the mountain slopes facing the city also damage forests in those areas.

Priority Interventions

- **Preserving Forest Areas**
  As a policy for the GDA on sustainable tree planting and use, large-scale clearing of forests and trees for development inside the GDA boundaries should be allowed only if these trees are relocated elsewhere within the city. The GDA should conduct a survey to calculate the minimum number of trees required in the city for existing and future biodiversity services and socioeconomic uses of the inhabitants of the city. Any developments in the city must not cause a reduction in the required figures.

- **Sustainable Use of Trees**
  For ease of regulation, forested areas in the city should be clearly demarcated. Trees on the outskirts of the GDA boundary should also be included in the demarcation.

  The chopping of trees in the city must be regulated by the GDA. The GDA must also ensure that the quotas announced for the number of trees households can cut or that can be used for commercial purposes are respected. Heavy fines should be instituted for offenders.

  For any future developments in the city, such as road construction and forest clearing, permits should be required. These permits should indicate the maximum number of trees that can be cut down and should also state a new location within the city where new replacement trees will be planted.

- **Developing Alternate Sources for Fuel Supply**
  Alternative sources of fuel must be developed, especially during the winter. These include the provision of natural gas to the city or securing a supply of LPG gas cylinders that will last the entire winter.

2.4.3 Gilgit and Hunza Rivers and the Riverbanks

The Gilgit and Hunza Rivers and the key nullahs of Gilgit are shown in Exhibit 2.33. Photographs of the Gilgit and Hunza Rivers and their Riverbanks are shown in Exhibit 2.34. The Gilgit River flows through Gilgit from west to east. The Hunza River flows from the north and joins the Gilgit River at Duo Pani: the Gilgit–Hunza confluence near Karakorum International University (KIU). River flow is highest from July to September when snow melts in the mountains. Torrential rains result in landslides, heavy flooding and high turbidity in river waters. Irrigation is dependent on river water and glacial melts.[148] Exhibit 2.35 provides a summary of the EVs, barriers to realization and priority interventions of the Gilgit and Hunza Rivers and their riverbanks.

Environmental Values

- **Habitat for Riverine Ecology**
  The two rivers Gilgit and Hunza and the smaller nullahs contain both endemic and exotic fish species. The latter has a much higher diversity of aquatic fauna due to its lower turbidity.

  At least eight fish species are found in these bodies of water. Prominent among these are the Rainbow Trout Oncorhynchus mykiss and Brown Trout Salmo trutta, both of which are exotic fish species. The Brown Trout was introduced in Gilgit Agency during the early 1900s. Other trout species include the Kunar

148. Ibid.

Snow Trout Racoma labiata and Himalayan Snow Trout Schizothorax plagiostomus. Endemic fish species include the Chitral Loach Triplophysa choprai, Triplophysa loach, Triplophysa microps and Yasin Triplophysa yasinensis.

- **Habitat for Birds and Terrestrial Fauna and Flora**
  The rivers and their banks also play a critical role in habitat restoration, particularly for birds.

- **Source of Nutrition**
  Fish constitute a source of food protein and Vitamin A for many mountain communities, including the inhabitants of Gilgit. Most of the fish caught by local people is consumed within households, but it is also sometimes offered for sale and, thus, supplements their income.

- **Tourist Attraction and Recreational Value**
  The rivers that course through the center of Gilgit and their riverbanks possess a large potential for recreational development. Returning rivers and their banks to their natural state allows native species and natural ecosystems to recover. This, in turn, creates opportunities for increased recreational tourism, such as picnicking, fishing and rafting. Protecting the Gilgit and Hunza Rivers will provide inhabitants the opportunity to generate revenue from students studying in the KIU or from tourists visiting the city for fishing, camping and picnicking on the riverbanks, or white-water boating.

- **Aesthetic Importance**
  The wide and fast-flowing Gilgit and Hunza Rivers are a part of the scenic beauty of Gilgit. Riverfront properties and recreational areas, if adequately developed, will be unique to the city and a source of a lot of revenue. Offices, hotels and restaurants will compete for a place close to the river or facing it. By developing the area in a controlled fashion, the GDA will be able to charge higher rents or lease rates.

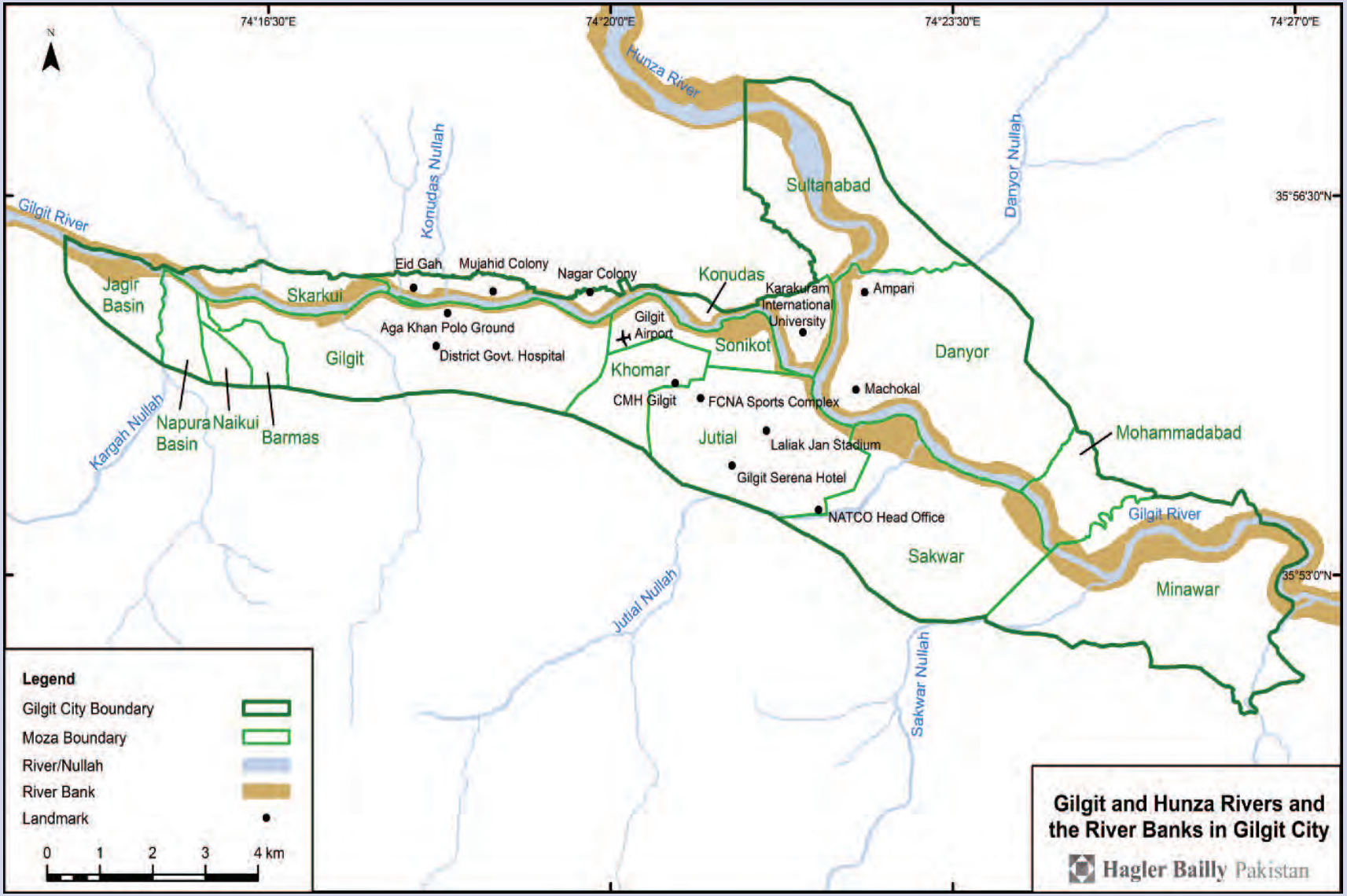
- **Drinking and Irrigation Water Supply**
  Presently, the nullahs are the primary source of drinking and irrigation water in the city. However, with an increasing population and a consequent higher demand for drinking water in the future, water from the rivers will be used by commercial and residential areas in the city.

- **Role of Riverbanks in Protection from Floods and Soil Erosion**
  The banks of the rivers absorb the energy of incoming water and thus have an extremely vital role to play in controlling soil erosion. Soil erosion results in bank instability thereby posing a risk to public safety. Residences and commercial buildings located on or close to the city's riverbanks may suffer property damage, economic disruption or risk injury or death if the riverbanks are not protected.

  The riverbanks also have the potential to protect the city from floods. Keeping the land along the riverbanks open and undeveloped allows the water to rise without threatening homes or lives. By leaving open spaces between the river and the residential and commercial areas, flood-protection barriers such as levees can be set back farther from the edge of the river, making them stronger, more practical, and more cost efficient. Fewer controlled developments in flood banks will reduce the human cost and government expense from flooding.

  The neglect and consequent reduction of riverbanks will cause river edges to shift closer to nearby buildings and developments and erode their foundations. Gradually, the river will grow wider, which will place huge pressures on the GDA to erect protective barriers between the river and the existing infrastructure. This will also result in a massive financial strain on the city economy.

Exhibit 2.33: The Gilgit and Hunza Rivers and the Riverbanks in Gilgit



Barriers to Realization of Environmental Values

- **Waste Disposal into the Rivers and on the Riverbanks**
  All wastewater in the city is currently either being disposed without treatment directly into the rivers or into soakage pits that overflow and contaminate the river. Due to the volume of river flow, the contaminants are diluted; in the future, however, the growing city will require the same water to fulfill its drinking-water demand. Therefore, not only does the deteriorating water quality affect the riverine ecology, it will also adversely harm human health.

- **Overfishing**
  Over-exploitation of fish in GB has reduced the population of many species to alarming levels. Fish fauna is also under threat from introduced species and from human activities, such as logging, the use of pesticides, road construction, and the diversion of water for irrigation.

- **Uncontrolled Development on Riverbanks**
  The riverbanks in the city face increasing pressure for development. New settlers from other parts of GB are settling in Gilgit and building residences on the riverbanks. These developments are adding to the existing commercial areas and residences already encroaching on the banks.

- **Sand and Gravel Mining**
  The riverbanks in the city are being extensively used for sand and gravel mining. Such activities are rapidly destroying the banks and bringing these rivers closer to the existing structures around them.

Priority Interventions

- **Waste Disposal Treatment and Management**
  Adequate wastewater treatment systems are needed, in the city, to treat effluents prior to their disposal into the rivers. Commercial activities and shops, such as car workshops, service stations and butcher shops, should be discouraged from locating close to the rivers. The GDA must regulate wastewater streams coming from households, industries, and hospitals and provide adequate treatment facilities for them.

  Solid waste disposal into the river should be banned and should incur fines. A solid-waste treatment facility, such as a landfill site, should be allocated outside the city boundary for this purpose.

- **Legislation Controlling Riverfront Development**
  Since uncontrolled riverfront development will place the entire city at risk, adequate policy measures and legal instruments should be put in place to regulate such development. If riverbank ownership is private, the GDA should try to purchase them. The only development allowed on the banks should be linked to the recreational and tourism sectors. Existing commercial and residential buildings should slowly be relocated elsewhere.

  There should be an immediate ban placed on sand and gravel mining along the riverbanks; this ban should include those mining activities already taking place. The GDA should identify areas outside the city where it can encourage and regulate these activities.

- **Establish River Parkways**
  The river and the riverbanks should be converted into recreational zones. These ‘parkways’ should be developed to improve the quality of life of the inhabitants of the city and to promote the diversification of Gilgit’s economy by enhancing the tourism sector. The parkways will offer recreational opportunities for jogging, biking, walking, school outings, camping and picnics. These will also provide habitat for dozens of native species and offer critical flood protection to the city.

Exhibit 2.34: Photographs of the Gilgit and Hunza Rivers and their Riverbanks

Riverbank on the Gilgit River near the city center.

Truck carrying gravel extracted from the riverbank.

Scenic view of the Gilgit River from Konudas.

Washing clothes on the bank of the Gilgit River.

A stream of untreated effluent from a drain flowing into the Gilgit River.

Sand and Gravel Mining on the riverbank at Sonikot.

A large waste dump in Konudas which falls into the river

New developments on the riverbank at the Jagir Basin.

New encroachments and developments on the riverbanks

An upcoming development on the riverbank.

Commercial buildings built on the riverbanks.

Waste dump on the edge of the Gilgit River.

Exhibit 2.35: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Gilgit and Hunza Rivers and the Riverbanks in Gilgit

Environmental Feature	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Gilgit and Hunza Rivers and the River Banks	• Habitat for Riverine Ecology • Habitat for Birds and Terrestrial Fauna and Flora • Source of Nutrition • Tourist Attraction and Recreational Value • Aesthetic Importance • Drinking and Irrigation Water Supply • Role of Riverbanks in Protection from Floods and Soil Erosion	• Waste Disposal into the Rivers and on the Riverbanks • Overfishing • Uncontrolled Development on Riverbanks • Sand and Gravel Mining	• Waste Disposal Treatment and Management • Legislation Controlling Riverfront Development • Establish River Parkways

2.4.4 Nullahs

The nullahs[149] around the city are Gilgit's primary sources of water supply and are recharged by glacial melt. These nullahs eventually flow into the Gilgit and Hunza Rivers. Key nullahs in and around the city are the Jutial, Konudas, Kargah and Danyor; the other nullahs are the Barnas and Sakwar. The Kargah and Jutial nullahs serve most of the irrigation and drinking water purposes of the city.[150] Exhibit 2.36 illustrates the main nullahs around Gilgit. Photographs of some of the Nullahs in Gilgit are shown in Exhibit 2.37. Exhibit 2.38 provides a summary of the EVs, the barriers to realization and the priority interventions for the nullahs in Gilgit.

Environmental Values of the Nullahs

- **Primary Source of Drinking and Irrigation Water**
  The nullahs, particularly the Jutial and Konudas Nullahs, are the primary sources of drinking water in the city. Water from the nullahs is also extensively used for irrigating agricultural land in the city.

- **Habitat for Riverine Ecology**
  Some of the nullahs contain endemic and exotic fish species. The Kargah Nullah is an important ecological feature in the area. Previously, the entire catchment of the Kargah Nullah was declared a wildlife sanctuary. Recently, however, it has been handed over to the community and has been declared a Community Managed Conservation Area.

  The Kargah Nullah is one of the best places for trout rearing in the GB. It has two trout hatcheries, and the Kargah Nullah, itself, has a very good trout population that serves as the best recreational fishing spot near Gilgit.[151]

- **Habitat for Birds and Terrestrial Fauna and Flora**
  The trees and shrubs found along the Kargah Nullah include Fraxinus, Salix, Olea, Pistacia, Juniperus, Kail, Picea, Betula, Rosa, and Daphnes oleides. Ground cover consists of Artemisia, Stipa, Haloxylon, and other grass species. Large mammals found in the area include the Astore Markhor Capra falconeri, Musk Deer Moschus chrysogaster and Snow Leopard Panthera uncia, which are listed as Endangered in the IUCN Red List 2013, and the Ibex Capra ibex, which is listed as of Least Concern.

149. A Nullah (pl. Nullahs) is a small and narrow watercourse/stream.
150. Pakistan Urban Observatory. 2011. City Profile – Gilgit. Retrieved November 20, 2013, from Urban UN–Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
151. IUCN. 1990. IUCN directory of South Asian Protected Areas. Cambridge, UK: 294 pp

The avifauna includes a variety of game birds, such as the Chukar Alectoris chukar, Snow Partridge Lerwa lerwa, Snowcock Tetraogallus himalayensis and Monal Pheasant Lophophorus impejanus.

The Sakwar Community Controlled Hunting Area is located along the Sakwar Nullah and is ecologically contiguous with the Jutial Community Controlled Hunting Area and the Kargah and Burmas Community Managed Conservation areas. This protected area is managed by the community as a controlled hunting area for large mammals such as the Astore Markhor Capra falconeri and Himalayan Ibex Capra ibex.

The area along the Jutial Nullah has been allocated to the local communities for the conservation of its natural resources and for managing it as a Community Controlled Hunting Area. The trees and shrubs found here include Fraxinus, Salix, Olea, Pistacia, Juniperus, Kail, Picea, Betula, Rosa, and Daphnes oleides.

- **Tourist Attraction and Recreational Value**
  The road leading to the Kargah Nullah is good and the bank of the nullah is mostly used as a picnic spot during the hot summer days in Gilgit. Community initiatives are underway to start a trophy-hunting program for the Astore Markhor Capra falconeri and Ibex Capra ibex that have reached harvestable size.

Barriers to Realization of Environmental Values

- **Customary Water Rights**
  The water in the nullahs is first stored in water tanks located at higher elevations along the nullahs. The water is, then, released downstream to different communities around the nullah, based on their customary water rights. Based on this system, communities that have been in the area for a long period of time are placed at an advantage over new communities, which normally do not have any water rights. This system is creating management problems for water distribution in the city that lead to conflicts among communities due to water shortages. Water from the Kargah Nullah is allotted on a rotating per-household basis of only 2 days a week.

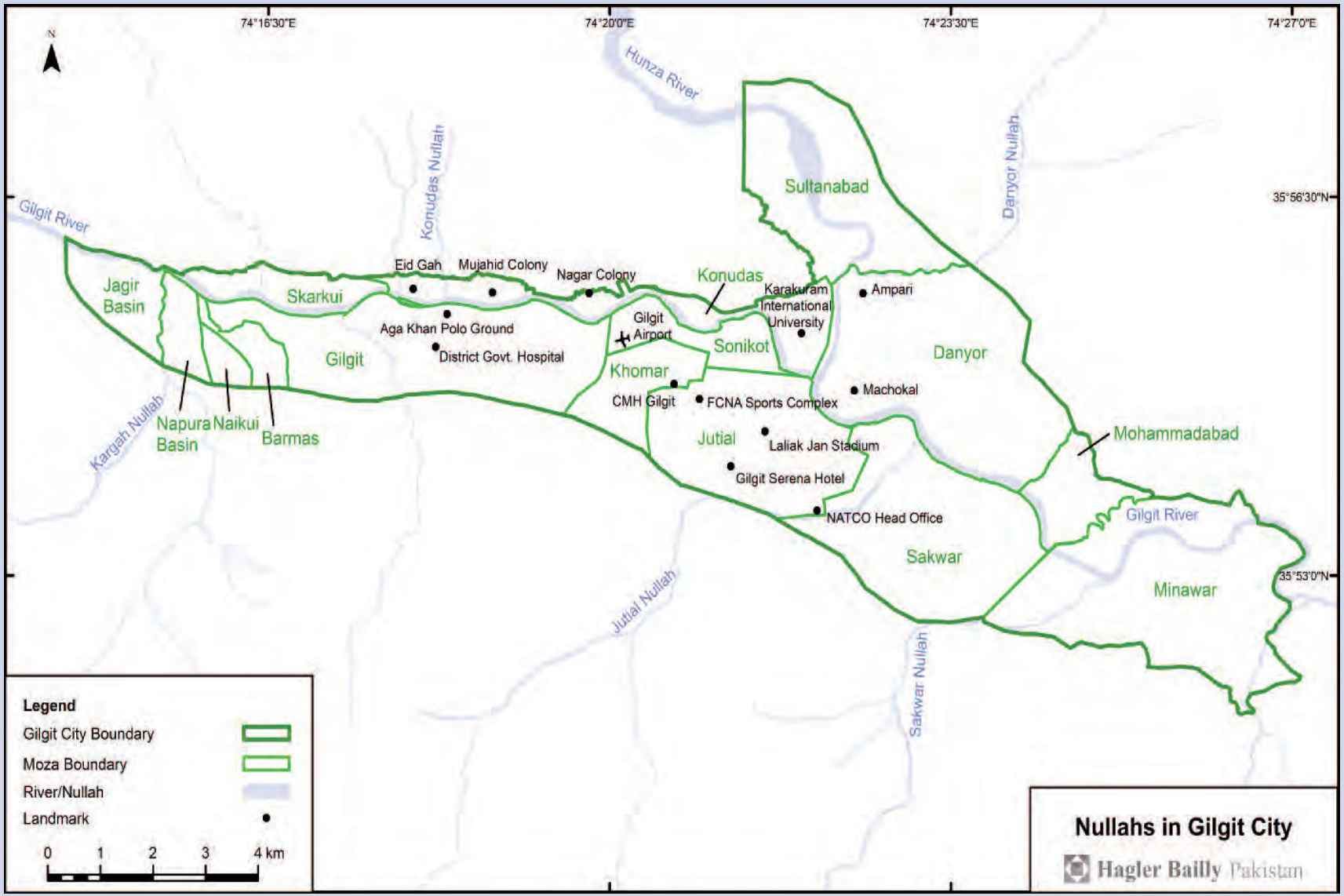
- **Dilapidated Water Distribution Infrastructure**
  Some of the existing water tanks and drinking-water supply complexes in the south of Gilgit were built in the late 1970s to meet the water demands of the time and are still in use by the current residents of the city.[152] The existing pipe water-distribution network, however, does not supply adequate pressure for the required amount of water. In some areas, the pipes are in a damaged condition due to rusting and in other areas, at higher altitudes in the city, the pipes are regularly damaged by the expansion of frozen water in the winter.[153]

  At present, the water storage and distribution capacity of the water supply complexes is inadequate and does not meet the city's existing water demand. Expansion of the existing system is problematic due to the lack of available space and a paucity of financial resources. An IUCN survey indicates that the present storage capacity of all water-supply complexes is about 15 times less than the actual demand.[154]

- **Waste Disposal into the Nullahs**
  The two main nullahs, the Jutial and the Konudas Nullahs, are the primary sources of water supply in the city, and are being contaminated by unchecked waste disposal by residents living close to them. The other nullahs are suffering from a similar fate. Considering the nullahs are the primary sources of drinking water for the city's inhabitants, their contamination will result in a high incidence of water-borne diseases there.

152. Ibid.
153. Raza, H. 2003. Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
154. Ibid.

Exhibit 2.36: Nullahs in Gilgit



According to data obtained from the District Headquarter Hospital in Gilgit, for the year 1999, more than 60% of reported illnesses were related to poor water and sanitation conditions. In a survey conducted, that same year, by the Water and Sanitation Extension Program (WASEP)[155], all five water complexes in Gilgit were found to be highly contaminated with fecal matter. Water in the channels was also found to be contaminated by activities such as washing clothes and utensils.

- **Development Pressure**
  Clusters of residential dwellings, known as mohallahs or khots in the local language, are situated near the watercourses, and new developments are also springing up close to the nullahs because they provide easy access to water. This development is not only leading to more pressure on the water resources of the city, it also blocks the area around the nullahs, which has the potential to be developed for recreational purposes for the inhabitants and also for tourists.

Priority Interventions

- **Revising Customary Water–Rights**
  The system of water distribution based on existing water rights is no longer sustainable in Gilgit. The increase in the population and the growth of the city has resulted in a greater demand for water, which cannot be regulated through traditional water-sharing methods. Local government should take ownership of the water-distribution system and bring the inhabitants of the city on board. The existing water-rights should be documented and revised, in a transparent manner, to make water distribution in the city fair and equitable for all of the city's inhabitants.

- **Improving the Water Distribution System and Introducing User Charges**
  The water-distribution system in the city should be equipped with a metering system that is visible to all. The daily volumes and timings of water distributed to different parts in the city should be documented and made public knowledge. This would help end a growing perception, in the city, of unfair water distribution.

  Gradually, user charges should also be introduced for the repair, maintenance and expansion of the water-distribution system.

  The existing water-filtration plants need to be expanded and new plants need to be built to ensure the treatment of water before distribution.

- **Recreational Parks**
  Land running along the nullahs should be developed into recreational zones with picnic spots, walking tracks and hiking trails. No construction other than for recreational development should be allowed here. The Kargah Nullah should be declared a recreational area, as rare animals, such as the Markhor, can be spotted there.

155. Ibid.

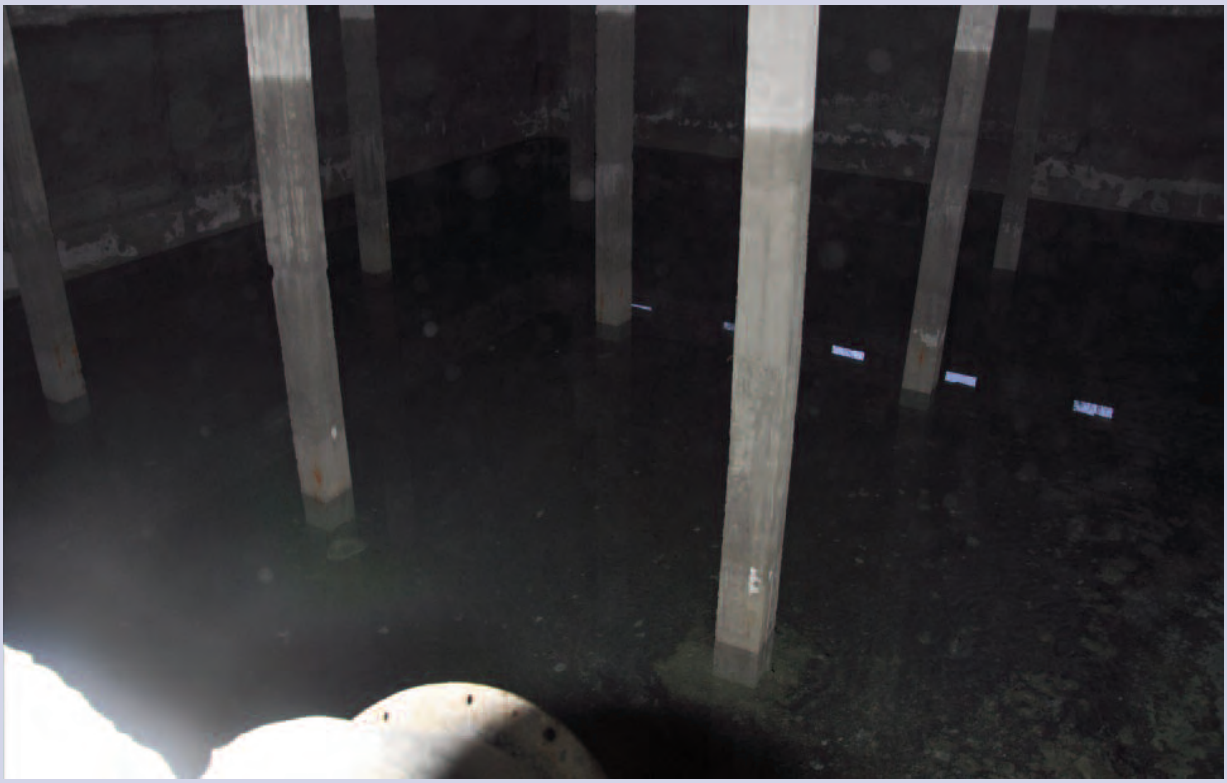
Exhibit 2.37: Photographs of some of the Nullahs in Gilgit

A scenic road along the Naupura Nullah, which flows into Kargah Nullah. The Kargah Buddha can also be spotted from here.

The Kargah Nullah.

An old footbridge over the Kargah Nullah

A water plant on the Jutial Nullah.



Water stored inside the water plant.

Danyor Nullah.

Exhibit 2.38: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Nullahs in Gilgit

Environmental Feature	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Nullahs	• Primary Source of Drinking and Irrigation Water • Habitat for Riverine Ecology • Habitat for Birds and Terrestrial Fauna and Flora • Tourist Attraction and Recreational Value	• Customary Water-Rights • Dilapidated Water Distribution Infrastructure • Waste Disposal into the Nullahs • Development Pressure	• Revising Customary Water-Rights • Improving the Water Distribution System and Introducing User Charges • Recreational Parks

2.4.5 Air Quality

The IUCN and the Space and Upper Atmosphere Research Commission (SUPARCO)[156] conducted an air quality survey, in Gilgit, in 1998.[157] According to the survey, the air quality in Gilgit is relatively better than the air quality of the main cities of Pakistan especially Islamabad, Lahore and Karachi. However, the survey also reported that burning waste in open air, excessive deforestation, and traffic pollution is leading to higher levels of carbon dioxide, carbon monoxide and sulfur oxides in the atmosphere. During a site visit by the HBP team, in September 2013, local women reported an increase in respiratory illnesses and skin allergies among children and pregnant women. Exhibit 2.39 shows photographs of Open-Air Waste Dumping and Burning in Konudas Exhibit 2.40 provides a summary of the Environmental Values (EVs), barriers to realization and priority interventions of the air quality in Gilgit.

Environmental Values of Clean Air

Clean air leads to improved health, saved lives, improved environmental conditions, and increased economic welfare.

- **Saves Expenditure on Health and Increases Economic Welfare**
  Cleaner air leads to better health and productivity. Air-pollution-related health problems, such as chronic bronchitis, acute bronchitis, acute myocardial infarction, asthma exacerbation, hospital admissions, lost school days, and lost workdays are avoided.

- **Improves Ecological Functions**
  The environmental effects of air pollution include damage to plants and long-term forest health, soil nutrient deterioration, and the accumulation of toxins in the food chain, including toxins in rivers and nullahs that result in harm to fish and other aquatic life.

- **Source of Tourist Attraction**
  Tourists who visit Gilgit look forward to its clean air. Poor air quality in the form of pollution-caused haze will destroy Gilgit's status as a tourist destination. Any parks, recreational areas and tourist developments in the city center will be rendered poor in quality due to dust, smoke and smog.

Barriers to Realization of Environmental Values

- **Open–Air Incineration of Waste**
  There is no solid-waste-management system in the city. Currently, the mechanism for handling waste in Gilgit is either to dump it in the river or to incinerate it through open-air burning on specific waste burning sites located on the riverbanks. About 50% of total waste generated in the city is dumped or

156. SUPARCO is Pakistan's national space agency mandated to conduct research and development in space science and space technology. It works towards developing indigenous capabilities in space technology and promoting space applications for the socioeconomic uplift of the country. www.suparco.gov.pk
157. Raza, H. 2003. Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.

burned in open air, while 14% is collected by the Municipal Corporation (MC).[158] Burning waste produces harmful fumes that pollute and reduce the air quality of Gilgit.

Burning waste in open air along with excessive deforestation and traffic pollution is leading to higher levels of carbon dioxide, carbon monoxide and sulfur oxides in the atmosphere. During a site visit by the HBP team, in September 2013, local women reported an increase in respiratory illnesses and skin allergies among children and pregnant women.

- **Rise in Traffic**
  There is no public transport system in the city, which means people are increasingly dependent on their private vehicles. The increasing number of vehicles is resulting in smog, particularly during rush hours. The city is also susceptible to air pollution from heavy vehicle traffic on the Karakoram Highway (KKH).

Priority Interventions

- **Banning Open-Air Waste Incineration**
  Open-air waste incineration within the boundaries of the city should be immediately banned. Strict fines should be enforced on offenders.

- **Enforcement of Air-Quality Standards**
  Strict air-quality standards must be enforced in the city. These standards should cover new plants and factories, in the city, which should be required to install modern pollution-control technology. The standards should also cover cars, motorcycles, trucks and other motorized vehicles used in the city.

Exhibit 2.39: Photographs of Open-Air Waste Dumping and Burning in Konudas

Smoke from open-air waste incineration in Konudas can be seen at a distance from Sonikot.

158. Karrar and Iqbal, 2011, Gilgit Report, UN–Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.

Massive open waste dump in Konudas seen from Sonikot.

The open waste dump in Konudas

The smoke forming a lingering layer across the city.

Smoke from Konudas spreading across the city.

Smoke from Konudas spreading across the city.

The open waste dump in Konudas.

Exhibit 2.40: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Air Quality in Gilgit

Environmental Feature	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Air Quality	• Saves Expenditure on Health and Increases Economic Welfare • Improves Ecological Functions • Source of Tourist Attraction	• Open-Air Incineration of Waste • Rise in Traffic	• Banning Open-Air Waste Incineration • Enforcement of Air-Quality Standards

2.5 Environmental Values of Socioeconomic-Environment Features

The Environmental Valuations (EVs), barriers to realization and priority interventions of each of the socioeconomic-environment features of the city are identified and discussed in the following sections under the following broad categories:

- Multiculturalism in the city,
- The city center,
- Thoroughfares in the city, and,
- Cultural heritage and recreational areas.

2.5.1 Multiculturalism in Gilgit

Gilgit-Baltistan (GB) is a Muslim majority province with a two percent non-Muslim minority. About 54% of the total population of Gilgit District is Shia, Ismailis constitute 27% of the population, and the remaining 19% are Sunni.[159] Incidents of religious and ethnic violence in Gilgit have witnessed a rise over the last 10 years. From 1988 to 2010, 117 incidents of sectarian murders have been registered.[160]

Gilgit has the highest rate of migration in GB.[161] Rural people and residents from the neighboring communities of Oshkandas, Nomal, Jutial and other suburban settlements migrate to Gilgit for its better education and health facilities, and greater employment prospects. Most of the educated people in the province seek employment in the health and education sectors in Gilgit. Residents of rural Khyber Pakhtunkhwa (KPK) and Punjab migrate to Gilgit in search of business opportunities.

Seasonal migration trends are also noted in Gilgit. The winter season sees the highest rural-to-urban migration because employment opportunities for rural people, during this time, decline sharply. Most of the young rural boys work in hotels and restaurants in Gilgit during winter. There are around 22 hotels and about 20 restaurants in the city.[162] Rural residents also migrate further south of Gilgit to other parts of Pakistan, during winter, in search of employment opportunities. Developing diverse business opportunities will ensure jobs even during the winter months. Exhibit 2.41 provides a summary of the EVs, barriers to realization and priority interventions of multiculturalism in Gilgit.

Environmental Values of Multiculturalism

- **Economic Growth from Peace and Stability** Sectarian harmony in the city will lead to peace. Peace and stability makes it easier to plan for the future development of the city by considering the most efficient and equitable distribution of resources. Such planning and development creates more jobs and generates economic growth for all of the city's inhabitants.

159. Karrar and Iqbal, 2011, Gilgit Report, UN–Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
160. Pakistan Institute of Legislative Development and Transparency (PILDAT). 2011. Sectarian Conflict in Gilgit Baltistan. Islamabad: PILDAT.
161. Raza, H. 2003. Northern Areas Strategy for Sustainable Development Background Paper: IUCN Pakistan, Northern Areas Programme, Gilgit. x+38 pp.
162. Ibid.

Harmony among the different communities in Gilgit will ensure that the largest possible proportion of its inhabitants is able to participate in its economic activities. This will help boost the local economy.

Tourists are deterred from visiting places that are known to be unsafe. Gilgit has already lost a lot of potential visitors due to the recent incidents of violence there and also due to the general security situation in the entire country. Promoting harmony among the communities will help make Gilgit a safe place for tourists from around the world to visit. The entire city will be able to reap from the revenue generated from this sector.

- **Center for Inter-Faith Harmony and Education**
  Gilgit can advertise itself to the rest of Pakistan and the world as a place of inter-faith and cultural harmony. The city can boast the fact that, in a short trip to the city, visitors will be able to interact with different faiths and cultures. Events that showcase the diversity of the cultures of GB can be in the form of festivals and exhibitions with the entire city getting involved. Gradually, Gilgit will be able to make a name for itself for academic reasons as well. Scholars and academics conducting research on religion or anthropology would be attracted to the city.

- **Becoming the 'Middleman' for Tourists**
  By showcasing itself as a one-stop destination for exploring all the diversity of cultures in the entire Gilgit-Baltistan (GB), Gilgit can become the first stop for all tourists planning to go further north. Gilgit can become the 'information center' for all tourists entering the province. Here, they will be able to find out about everything on offer in other parts of GB. Tour guides and operators from other parts of the region can open up their offices in Gilgit where they can sell their tours to tourists who may not have yet planned their entire trip.

  In this way, tourists planning to visit GB need not sign up with middlemen or hotels in Islamabad or other parts of Pakistan. They will be able to visit Gilgit and plan their trip from the city, which will offer a catalogue of different packages. In this way, the city will be able to cut out the 'middlemen' and generate extra revenue for itself.

Barriers to Realization

- **Unemployment**
  Although the economy of Gilgit has grown over the last few years, due to developments on the KKH, it has been unable to keep pace with its growing population. For this reason there is a lot of unemployment in the city, particularly among its youth. This drives up crime, which sometimes takes the form of sectarian acts of violence. Such acts create tension among the different communities in the city, which then begin seeking to live separately from each other.

- **Physical Segregation of Communities in the City**
  Due to the acts of violence, in the city, carried out along sectarian lines, different communities end up segregating themselves from others. This segregation has given rise to the 'no-go areas' that have sprung up across the city, where the inhabitants belonging to one sectarian or ethnic group will not be welcome in an area predominantly occupied by another group.

- **Un-Equitable and Non-Transparent Distribution of Resources**
  Due to such physical segregations among the different sects and ethnicities in the city, the equitable distribution of resources, such as water, becomes difficult. This leads to further tensions among the different communities. Adhering to the old traditions of water sharing, such as the customary "water-rights," means the city is unable to cope with its increasing population and rising segregation.

Exhibit 2.41: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Multiculturalism in Gilgit

Socioeconomic Environment Features	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Multiculturalism in Gilgit	• Economic Growth from Peace and Stability • Center for Inter-Faith Harmony and Education • Becoming the 'Middleman' for Tourists	• Unemployment • Physical Segregation of Communities in the City • Inequitable and Non-Transparent Distribution of Resources	• Promoting Mixed Communities through Shared Resources • Public Awareness Campaigns Highlighting Dividends of Community Harmony

Priority Interventions

- **Promoting Mixed Communities through Shared Resources**
  The government in Gilgit must provide incentives for communities to interact with one another around shared resources. For example, water-distribution tanks should be centrally located, and schools and colleges must be designed and located in central or shared areas. Similarly, recreational areas should also be designed in a way that brings the inhabitants of the city together.

- **Public Awareness Campaigns Highlighting Dividends of Community Harmony**
  The government, political parties, religious leaders, schools, and colleges must all get involved in a massive public awareness campaign to promote community harmony. The focus of these public awareness campaigns should be to highlight the negative impacts communal tensions have on all of the city's inhabitants and the benefits that are to be gained from harmony.

2.5.2 City Centre

The geography and topography of towns and cities located in valleys has a strong influence on the city layout. As such, there is normally always a city center that acts as a nucleus with the development of the rest of the city around it. In Gilgit, the intersection of Shaheed-e-Millat and Raja Bazaar Roads is taken as its center or nucleus (Exhibit 2.42 and Exhibit 2.43). This is the main commercial hub of the city. Shops sell kitchen goods, textiles, shoes, crockery, travel bags and souvenirs. Vendors with handcarts sell jewelry, textiles, bags and shoes and are sometimes seen on roadsides. The city center is also host to some administrative buildings, an airport, bus stands, historic settlements, open recreation areas and a polo ground. Exhibit 2.44 provides a summary of the Environmental Valuations (EVs), barriers to realization and priority interventions of the agricultural fields and grazing areas in Gilgit.

Environmental Values of the City Centre

- **Economic Engine of the City**
  The city center is Gilgit's commercial hub. Offices, shops, restaurants, hotels, and bazaars are all located here and generate a lot economic activity. The diversity of the entire city and, potentially, of all of Gilgit can be witnessed, here, in the form of different kitchen goods, textiles, shoes, crockery, travel bags and souvenirs. Vendors with handcarts selling jewelry, textiles, bags and shoes are sometimes seen on roadsides.

- **Tourism Central**
  The city centre has the potential of becoming the central attraction for tourists and visitors to the city. Youth hostels, restaurants, tour guides, and souvenir shops can be located here, where tourists can choose from a plethora of different activities.

  The city centre can also become a site for exhibitions, cultural parades and festivals,

highlighting the beauty and diversity of the entire province. The polo grounds in the city center have the potential to be the biggest tourist attraction, hosting exciting and thrilling polo matches for the audience.

The city centre is also home to the only three houses of worship in the entire city. Tourists can also be welcomed to each one of these for informative tours.

- **Place of Inter-Community Interaction**
  The economic activities of the city centre will also ensure all the communities interact with each other. This will promote inter-communal harmony.

Barriers to Realization of Environmental Value

- **Lack of Access to the City Centre**
  There is no public transport system in the city. Private Suzuki wagons operate as a substitute. Existing wagon stands in the city center are inadequate in facilitating transport from different parts of the city.

  An influx of private and official vehicles during rush hours causes traffic congestion in the city center. A line of vehicles is parked along the side of roads in the city center due to inadequate parking. This narrows the lanes available for other vehicles moving around the city.

  There are few existing footpaths in the city center and not all of them are pedestrian-friendly. There are no bicycle–friendly tracks or paths.

- **Sporadic and Uncontrolled Expansion**
  Sporadic and uncontrolled expansion of commercial areas and general stores in the city centre have resulted in haphazard structures. Government offices and commercial buildings seem to be mixed and the activities related to both conflict, creating further mismanagement of the city centre.

  Commercial plazas are five-to-six-storey buildings, but there is no provision for parking.

  Haphazard drainage in the city center results in water being blocked and also in high water tables in areas situated at the tail of the city, such as in Kashrot, Majni Mohallah, Amphrey and at the Airport. The water table creates problems for building and construction projects in these areas.

- **Civil Unrest**
  The city center becomes a place of protest and shuts down each time there are sectarian or political conflicts in the city.

Priority Interventions

- **Separate Municipal Management for the City Centre**
  For any future development in Gilgit, the city centre should be treated as a separate zone with its own building regulations and municipal management authority. The city centre municipality should comprise of elected representatives from all communities.

- **Planning and Design of City Centre Infrastructure**
  The city centre should be developed as a separate entity with an infrastructure specifically designed to cater to the functions a city centre is meant to fulfil. A system for drainage, sewerage, waste disposal and parking in the city center should be calculated based on the maximum potential.

- **Promote Public Transport and Bicycle Lanes into the City Centre**
  The narrow and windy roads in the city centre should be protected since they add to its aesthetic character. These should be turned into pedestrian and bicycle-only zones. Roads for use by vehicles should circumvent the city centre.

- **Banning Entry of Private Vehicles into the City Centre**
  Vehicle-free zones should be created in the city centre, where the entry of motorized vehicles is banned at certain times of the day and week.

Exhibit 2.42: Scenes from Gilgit City Center

The Raja Bazaar Road in the City Center with a Mosque at the end.

An open drain next to the footpath.

More open drains in the city center.

Vehicles parked on the side constricting the road.

Exhibit 2.43: Gilgit City Center

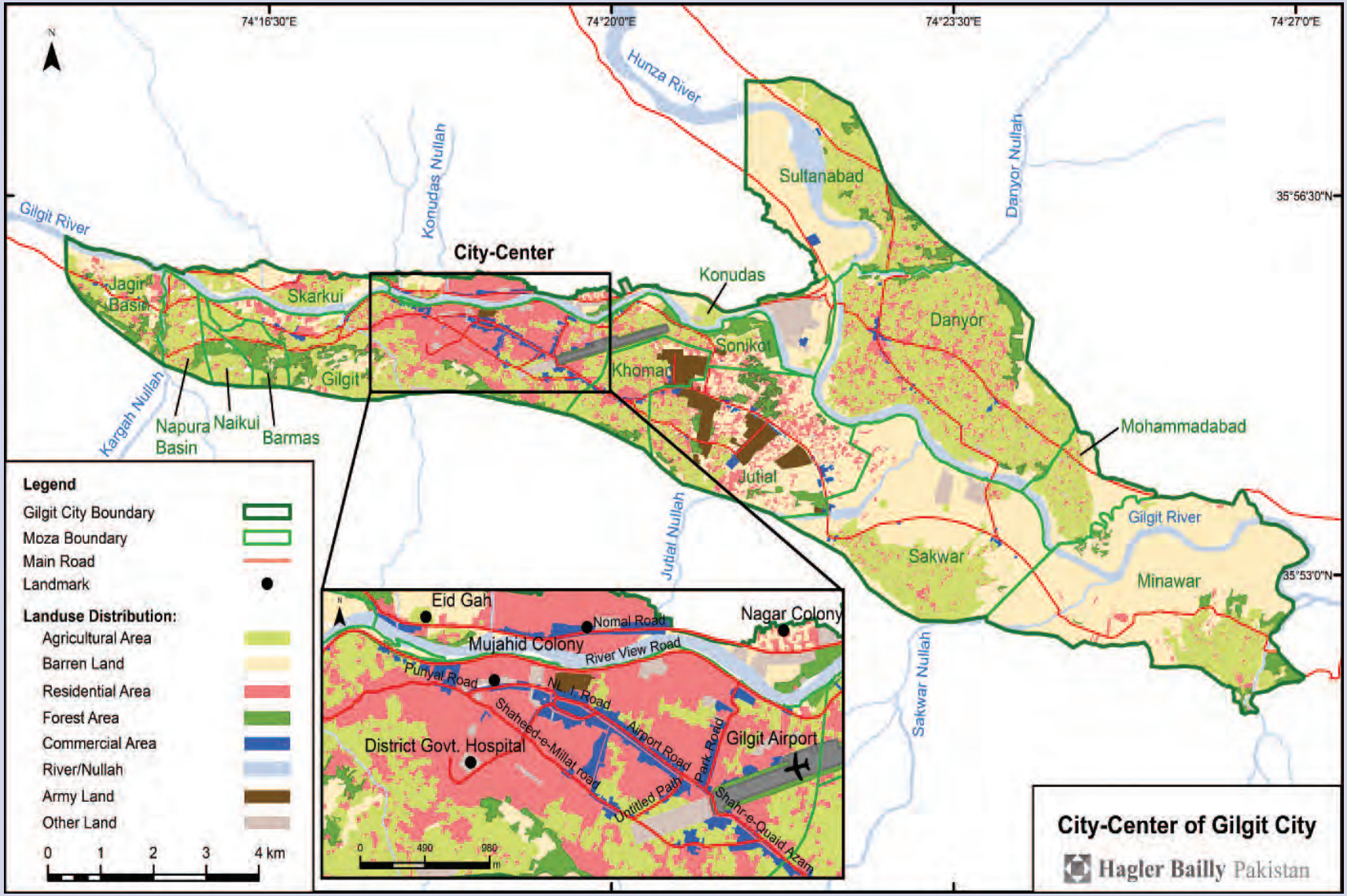


Exhibit 2.44: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Gilgit City Centre

Socioeconomic Environment Features	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
City Centre	• Economic Engine of the City • Tourism Central • Place of Inter-Community Interaction	• Lack of Access to the City Centre • Sporadic and Uncontrolled Expansion • Civil Unrest	• Separate Municipal Management for the City Centre • Planning and Design of City Centre Infrastructure • Promote Public Transport and Bicycle Lanes into the City Centre • Banning Entry of Private Vehicles into the City Centre

2.5.3 Thoroughfares

The Karakoram Highway (KKH), constructed by Pakistan Army in 1966[163], is located approximately 10 km from Gilgit and connects it with other large towns in the region, such as Chilas, Dasu, Besham, Mansehra, and Abbotabad. It also provides a connection with the federal capital in the south. On the northern side, KKH connects Gilgit to Hunza and Sust, and extends to the Chinese cities of Tashkurgan, Upal and Kashgar in the Xinjiang province. Gilgit is the only large urban town within a 450 km radius, making it the trade hub of Gilgit-Baltistan (GB) and a vital trade corridor between Pakistan and China.

Three main roads link the western part of Gilgit with the eastern part:

- River View Road
- University Road and
- Shaheed-e-Millat Road

Six bridges cross the Gilgit River and link the northern part of the city with the southern part. One of these bridges, the Gilgit Bridge, is a suspension bridge that spans 182 m and is only 2m wide.[164] This bridge is wide enough for one jeep to pass at a time and is located at the end of the traditional bazaar. The total length of all roads in the city is 224 km.[165]

The number of vehicles on the city's roads has increased with time, while the width of the roads has generally remained the same. Most roads are generally narrow and traffic obstructions are common during morning and afternoon hours, especially around offices and school areas.[166] In some areas, like Karimabad, the width of the road is between 25 and 40 ft[167], which makes it inaccessible to emergency-service vehicles, such as ambulances and fire engines.[168] Exhibit 2.45 illustrates the layout of Gilgit's road network. Exhibit 2.46 shows photographs of different thoroughfares in Gilgit. Exhibit 2.47 provides a summary of the EVs, barriers to realization and priority interventions of these thoroughfares.

163. The World Bank, Asian Development Bank, Government of Pakistan. 2010. Gilgit Baltistan Economic Report–Broadening the Transformation.
164. Pakistan Urban Observatory. 2011. City Profile – Gilgit.
165. Observation made using Land Use Map in Exhibit 2.3.
166. Stakeholder consultations and site visits conducted by HBP from 16 September to 18 September 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
167. Pakistan Urban Observatory. (2011). City Profile – Gilgit. Retrieved November 20, 2013, from Urban UN–Habitat: http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx
168. Ibid.

Exhibit 2.45: Thoroughfares in Gilgit

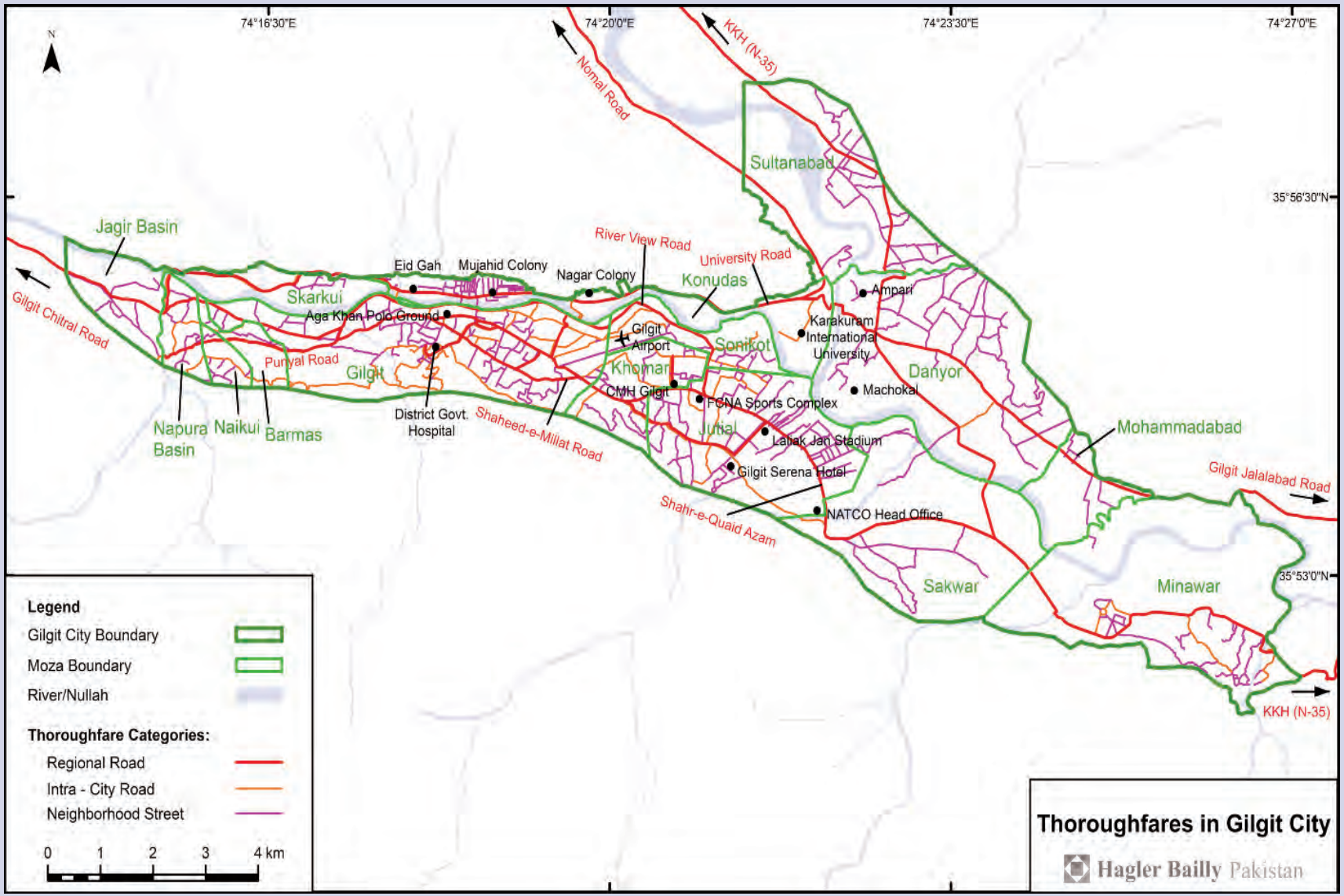


Exhibit 2.46: Photographs of different Thoroughfares in Gilgit

A neighbourhood street in Gilgit

University Road; a regional road with encroachment of shops on the sides.

More open drains in the city center.

A neighbourhood road connecting to an intra-city road.

An intra-city road in the city center.

A neighbourhood road.

An intra-city road leading towards Barmas.

Shaheed-e-Millat Road, a regional road.

The Karakoram Highway from Hunza towards Gilgit.

Environmental Values of Thoroughfares

- **Regional Connectivity**
  After the inauguration of the Karakoram Highway (KKH), the increase in trade between China and Pakistan resulted in many of the city's inhabitants becoming directly or indirectly involved in border trade, hoteling and transport. Better road connectivity can also make Gilgit accessible to these markets year-round, ensuring prices of food items remain stable throughout the year. Good roads also make the city accessible for tourists.

- **Aesthetic Value**
  The narrow and winding lanes throughout the city promote its aesthetic beauty. These lanes have the potential of being converted into bicycle tracks, providing the inhabitants easy access to all parts of the city. These can also become a mode of recreation for tourists and their families to venture across the city by bike.

Barriers to Realization of Environmental Values

- **Traffic Choke Points**
  An increase in private-vehicle ownership and the poor planning of thoroughfares have created choke points around the city center. Wider roads acting as bye-passes around the city centre are being encroached on by commercial activities that have sprung up right next to these roads. Residential houses on bye-passes have front entrances on these roads, which results in barriers to free traffic flow when vehicles enter or leave these residential properties.

- **Widening of Narrow Lanes**
  Instead of building wider roads around the city center, the narrow lanes going through it are being widened. This is having the effect of only letting more traffic flow through the city rather than easing congestion here. It also makes the city center less pedestrian-friendly.
  Sectarian Strife

When protests take place across the city, some of the major roads are blocked.

Priority Interventions

- **Regulating Road Levels in Different Parts of the City**
  Narrow roads in the city should be converted into pedestrian and bike-friendly thoroughfares. The use of these lanes by motorized vehicles should be discouraged.

These roads should be allowed to have commercial buildings situated right next to them.

Wider roads, on the other hand, should have a certain length of "right–of–way" on sides where no buildings may be erected or no commercial activities may be allowed to take place. These roads should be built in such a way as to divert traffic around the city center.

Exhibit 2.47: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Thoroughfares in Gilgit

Socioeconomic Environment Features	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Thoroughfares	• Regional Connectivity • Aesthetic Value	• Traffic Choke Points • Widening of Narrow Lanes • Sectarian Strife	• Regulating Road Levels in Different Parts of the City

2.5.4 Cultural Heritage and Parks

There are numerous sites around the city that are unique to the heritage of Gilgit. These include ancient artifacts, such as Buddhist scrolls and engravings, and old government buildings with their unique architecture. Together, these are the city's legacy, inherited from past generations, which should be maintained in the present and bestowed for the benefit of future generations of the city, of Pakistanis and the rest of the world. Gilgit also has a few parks, such as the Chinar Bagh, which covers an area of 8.5 acres and the City Park, which is located next to the airport. The polo grounds in the city are used to hold polo matches and other traditional festivals and have the potential of becoming a major source of tourist attraction in the region.

Exhibit 2.48 is a map that illustrates the locations of cultural and recreational sites in Gilgit. Photographs of some of these sites are shown in Exhibit 2.49. The Kargah Buddha is carved into a cliff at the mouth of the valley in Kargah, and the Buddhist manuscripts found in Gilgit are among the oldest manuscripts in the world and are significant in Buddhist studies and in the evolution of Asian and Sanskrit literature. Exhibit 2.50 provides a summary of the EVs, barriers to realization and priority interventions of Gilgit's cultural heritage and parks.

Environmental Values

- **Economic, Aesthetic, Historic, Educational, Scientific, Spiritual, Social and Recreational**

  Recreational and cultural areas in a city have a number of environmental values. In Gilgit, the recreational areas are not only important for the health and well-being of its inhabitants, they are also invaluable in promoting communal harmony there. Recreational parks across the city have the potential of offering unique experiences, such as rafting and fishing, which will help attract tourists.

  Gilgit's cultural heritage is unique in terms of the different time periods and diversity of cultures it represents. Gilgit hosts ancient Buddhist scrolls and carvings, which alone can be a source of attraction for Buddhists from around the world. Old British settlements built during the colonial period stand out for their architecture and are a part of the city's heritage. These, along with the cultural and religious diversity Gilgit can offer a visitor in one place, also have the potential to make it a center of anthropological scholarship.

Barriers to Realization of Environmental Values

- Deterioration of Old Buildings due to Non-maintenance
- Lack of Investment in Maintaining the Cultural Heritage of the City

Priority Interventions

- Legal Protection to all Buildings, Places and Structures in the City with Heritage Value
- Investment in Conservation Programs

Exhibit 2.48: Cultural Heritage and Recreational Spots in Gilgit

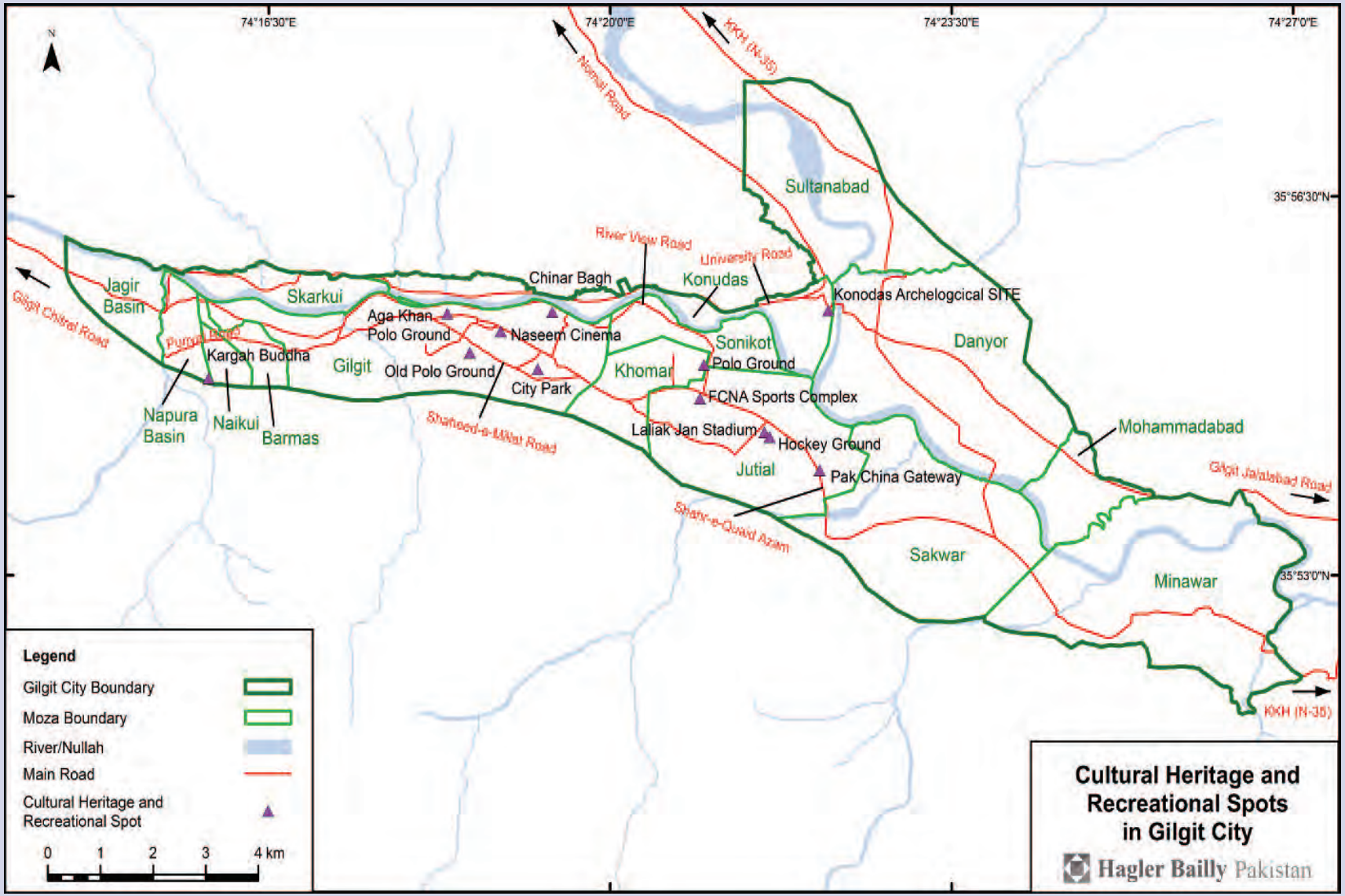


Exhibit 2.49: Photographs of the Recreational and Heritage Spots in the City

A polo ground at the city center.

Another view of the polo ground at the city center.

An old British cemetery in the city center.

The famous Kargah Buddha wall carving.

Exhibit 2.50: Summary of the Environmental Values, Barriers to Realization and Priority Interventions of Cultural Heritage and Parks in Gilgit

Socioeconomic Environment Features	*Environmental Value*	*Barriers to Realization*	*Priority Interventions*
Cultural Heritage and Parks	• Economic, Aesthetic, Historic, Educational, Scientific, Spiritual, Social and Recreational	• Deterioration of Old Buildings due to Non-maintenance • Lack of Investment in Maintaining the Cultural Heritage of the City	• Legal Protection to all Buildings, Places and Structures in the City with Heritage Value • Investment in Conversation Programmes

3. Conceptual Master Plan

The Conceptual Master Plan (CMP) developed in this section builds on the physical and structural—the town-planning—aspects of the priority interventions developed in Sections 2.4 and 2.5. It aims to provide the graphical demarcations and boundary allocations of the various features of Gilgit and suggests avenues and strategies for future growth. The CMP ensures that there is sufficient land to meet the long-term population and economic-growth needs of the city, while providing a high quality living environment for its inhabitants. It is designed to act as an outline for the future comprehensive Plan, which will be developed by the Gilgit Development Authority (GDA). It will cover the following aspects:

- Land-use strategies
- Traffic management
- Solid-waste infrastructure
- Urban economic and socio–cultural empowerment
- Adapting to climate change and
- Future expansion strategies.

3.1 Objective of the CMP

The objective of the CMP is to clarify the vision and direction for the future development of the city. The vision was established through a combination of stakeholder consultations and expert analyses of a team of town planners and environmental experts who conducted the pilot SEA study. Elaborating on that vision, the CMP aims to provide detailed recommendations to steer future development in the city along the following social, environmental and economic objectives:

Social

- To prepare Gilgit for its role as the center of administrative activity for all of Gilgit-Baltistan (GB).

- To develop Gilgit in a manner that brings positive change to the lives of its inhabitants.

- To recognize the religious, ethnic and socio-cultural diversity of the city's inhabitants and to develop it in a way that promotes social inclusion, harmony and the principles of equity in the distribution of all the resources the city has to offer.

Environment

- To prepare the city according to a climatically sustainable urban plan that anticipates the effects of climate change.
- To bring attention to the existing environmental features of the city that require redevelopment and upgrading. Moreover, to identify avenues for developing additional resources.
- To provide environment-friendly civic amenities that will facilitate opportunities for the protection and sustenance of the natural environment.

Economic

- To facilitate financial empowerment of the city by developing avenues for revenue generation.
- To develop the city in a manner that facilitates a sustainable rural economy through better regional transit connections.
- To prepare the city to fully benefit from the urban economic opportunities that would arise from the regional, national and global developments surrounding Gilgit.

3.2 Scope of the CMP

The scope of work for the CMP includes the following:

- Establishing the basis for planning, such as population growth rates and targets for economic and social development.
- Investigating existing or future boundaries planned for the city; identifying any restricted areas or existing cultural, touristic and religious buffer zones in place.
- Establishing the nature of the restrictions, if any, and identifying the regulatory regime governing zoning.
- Addressing management of waste water, including sewage, sewage treatment and recycling.
- Addressing the management of solid waste, including recycling and the location of landfills.
- Identifying the spatial coverage for the future Plan and recommending new boundaries and buffer zones, if required, based on the existing conditions and the future requirements for the expansion of the city .
- Identifying traffic corridors and addressing the integration of public transport and mass transit within the city.
- Investigating the existing water-supply sources and providing a strategy and infrastructure for the future distribution and management of the same.
- Investigating the existing power-supply infrastructure and distribution and providing recommendations for future expansion if required.
- Identifying sites of cultural value, nature conservation, and recreational importance that require protection and development.
- Identifying resettlement requirements, if any, and providing strategies for the same.
- Addressing the possibility of urban renewal in the oldest parts of the city.

3.3 Design Parameters for the CMP

The design parameters for the CMP are based on predicting the user requirements of the city by the year 2025. The future demand will be the fundamental impetus behind any future development. These parameters, therefore, become central in defining the final shape of the CMP.

The most important design parameter is the population. The CMP has been developed to consider the population projections for Gilgit up to the year 2025. This projection will have the greatest bearing on the outcomes of the CMP. Since the projections will be based on assumptions, three scenarios will be generated using ‘low’, ‘medium’ and ‘high’ growth rates (Section 3.5). All development aspects of the city, including future demand for transportation networks; sewerage systems; water supplies; education and health facilities will be based on these projections.

Other design parameters were selected based on expected developments that stem from Gilgit's new role as the capital city of Gilgit-Baltistan (GB). The demographic growth and population influx will come from civic administrators, commercial investors and migrants from other parts of GB and the rest of Pakistan who seek commercial and employment opportunities in local industries. A gradual increase in tourist activity in GB, over time, will also contribute to an increasing influx of tourists during the summer months. Based on these assumptions, the regional role and function of Gilgit, as a city, is expected to change in the following ways:

- Gilgit will replace Islamabad as a transit center for tourist-related activity in the mountainous north of Pakistan.
- It will become an economic headquarters of GB province.
- It will develop into a regional transit corridor connecting Pakistan with China.
- There will be a synergistic redistribution of rural and urban space within the city.
- Gilgit will become a hub for higher education within the GB region.

These changes will affect various aspects of the city, such as housing, transit systems, tourism, education, health and governance, which are some of the important design parameters for the CMP. Exhibit 3.1 lists all the design parameters and breaks them down into the environmental, social and economic aspects they are linked to.

Exhibit 3.1: Design Parameters for the Conceptual Strategic Master Plan

No	*Environment*	*Social*	*Economic*
1.	Pleasant living conditions	Integrated living environment	Providing services/facilities within walking distance
2.	Environment-friendly systems	Cohesive opportunity for inter-community linkage	Incorporation of local transport systems
3.	Conservationof indigenous flora and fauna	Community integration	Revenue generation through comprehensive land-use planning Local industry Mass production or Heavy industry Private (Small-scale community development)
4.	Community participation in decision-making processes	Communal spaces and settlements providing interaction	Promote local crafts through vocational training
5.	Strategies to protect endangered environment	Exposure to regional and International activities	Promote local and regional destinations
6.	Educational city to promote a cosmopolitan environment	Facilitate future hub of education (university city)	Facilitate hierarchical educational set up
7.	Facilitate traditional cultural activity with required spaces	Facilitate local culture through community development	Cultural activities as a source of revenue generation
8.	Improve quality of living through architectural guidelines	Basic health services infrastructure (clinics) and facilities at a regional scale.	Bank on local environment and climate
9.	Develop physical connections with other cities of GB	Gilgit as a transit center for GB	Promote Gilgit as a market town with national and international linkages
10.	Demarcate urban, peri-urban and peripheral boundary	Conserve natural beauty of the surroundings	Sustainable forests, drinking-water streams
11.	Environmental and construction bylaws	Public participation process institutionalized	Gilgit as an economic zone
12.	New focus on the Environment	Cohesive center for GB	Facilitate international economic ties

3.4 Methodology

The methodology used to prepare the CMP included the following activities:

- Literature review
- Forecasting
- Strategy plan evolution
- Evaluation of spatial growth options
- Identifying hurdles in the implementation of the Master Plan

These activities are explained in the following sections.

3.4.1 Literature Review

Data compiled during Phase 1 of the SEA was reviewed and the relevant data for the CMP was extracted and organized. Additional information was compiled from secondary resources on the latest population figures and growth trends for Gilgit so as to forecast the population of the city for the year 2025.

3.4.2 Forecasting

The latest population statistics on Gilgit date back to the 1998 national census, which is a decade and half old. To compensate for the lack of data, unofficial population figures for the population growth rate were used to forecast Gilgit's population for the year 2025. While forecasting, the following national and international developments that have affected Gilgit's population were taken into account:

- 2005 – Earthquake 8 October (see Section 2.1.7)
- 2009 – Self-autonomy (Gilgit-Baltistan Empowerment and Self-Governance Order 2009)
- 2010 – Attabad Lake formation (see Section 2.1.7)
- 2010 – National level floods (see Section 2.1.7)
- 2011/12 – Sectarian strife (see Section 2.3.3)

These events, along with the prospects of better employment, contributed to an increase in in-migration to Gilgit from Hunza and other parts of GB. In the future, Gilgit's recently acquired status as a provincial capital will result in increased development in the city, thereby attracting more people. Other national developments, such as the Kasghar–Gwadar Economic and Transit Corridor, future plans for railway lines and improved road infrastructure, will add to the population.

3.4.3 Strategy Plan Evolution

Various components of urban operations and amenities, such as transport and infrastructure requirements, were analyzed quantitatively, and intangible aspects, such as social and cultural norms, were analyzed qualitatively. Following the analyses, different development strategies were devised. Different combinations of the proposed development strategies were weighed and a workable balance identified. The balance forms the basis of the different spatial growth options for the city.

3.4.4 Evaluation of Spatial Growth Options

On the basis of the year 2025 population forecast and proposed development strategies for the city, different options for the utilization of the landmass of Gilgit were developed. These options were based on information from field surveys, topographical maps and existing infrastructure plans.

3.4.5 Identifying Hurdles in the Implementation of the Master Plan

At times, events and circumstances hinder the effective implementation of a master plan. In Pakistan, master planning exercises have not been successful for a variety of reasons. These reasons are also analyzed and included in the CMP exercise in order to benefit the end users of this report and to ensure the effective implementation of the CMP.

3.5 Design Population and Cohort Analysis

Population is the total number of people of all ages, living in a defined location at a particular point in time. According to the 1998 census of Pakistan, the country's total population was 146.5 million[169]. A

169. The fifth and latest nationwide survey by Government of Pakistan was conducted in 1998.Pakistan Census Organization–Government of Pakistan (PCO–GoP).(1998):PCO, Statistics Division

population projection is an estimated calculation of the number of people expected to inhabit a particular place at a future date, based on data on the current population size and the expected natural-growth trends. These trends include births, deaths, fertility rates, occurrences of calamities or natural hazards; political developments, and migration. Population projections are set on a "conditional" future. These projections are a useful tool for policy dialogue and programme planning. They help stakeholders plan for the near and distant future and identify potential issues for policy makers.

The population growth rate (PGR) is the increase in a region's population during a specified period of time, usually one year, expressed as a percentage of the population at the start of that period. It reflects the number of births and deaths during the period as well as in- and out-migration figures. According to a World Bank report, the annual PGR of Pakistan has risen from 1.7%, in 1998, to 3.7%, in 2012[170]. The PGR is not a static element and must be considered in detail. For the CMP, the conventional and direct method for population projection is used. In this method trends, patterns and assumptions are studied to determine high and low variables for the population projection.

For part of the report, the "cohort method" is used for a detailed study on specific future requirements of the city to the year 2025. The cohort analysis helps define options for broad geographical approaches for the expansion of the city and for future land-use designations, including major transportation corridors, for such purposes as commercial, business, education and leisure. Analyzing the different options leads to the selection of a consolidated spatial growth option for the city that will meet key development objectives, such as sustainable economic growth, city center regeneration, the provision of quality housing, infrastructure, the promotion of viable communities, enhanced bio-diversity and improved accessibility.

3.5.1 Existing Population Trend

The population statistics for this report are based on the 1998 national census. The number of people living in Gilgit, then, was 56,701[171]. However, this figure did not include the mozas of Danyor and Sakwar, which for this SEA are considered part of Gilgit. According to the 1998 census, the population for Danyor, which includes the moza of Muhammadabad, was 18,095 people, and the population of Sakwar, which includes the moza of Minawar, was 4,553[172]. The population projections were made based on the sum of these two figures and the 1998 figure for Gilgit, which together come to 79,349 people. In 1998, the population of the entire Gilgit District was 243,324[173]. The growth rate of Gilgit—excluding Danyor and Sakwar—was 2.66%. According to the Gilgit Master Plan of 1977, the population of the city that year was 23,556[174] with a PGR of 3.4%. Exhibit 3.2 provides a summary of the figures.

Exhibit 3.2: Population Count – Gilgit (1998 Census Data)

Area	*Population*
Gilgit District	243,324
Population of Gilgit without Danyor and Sakwar	56,701
Population of Danyor and Sakwar	22,648
Total	**79,349**
Average household size	8.1

170. World bank , "Population growth annual," http://data.worldbank.org/indicator/SP.POP.GROW (accessed November 27,2013)
171. Pakistan Census Organization–Government of Pakistan (PCO–GoP).(1998).District census report of Gilgit, Islamabad: PCO, Statistics Division
172. Professional Development Centre North (PDCN), 2013, Population of GB, Aga Khan University, Institute of Educational Development (AKU–IED)
173. Ibid
174. S. Qutub, Ayub : Gilgit Master Plan, (Pakistan Environmental Planning and Architectural Consultants, 1977)

According to the preliminary findings of a house-listing exercise in Gilgit District, conducted in 2011 by the Government of Pakistan[175], the population of Gilgit city stood at 261,440. The average growth rate of the entire district since 1998 was 4.4% and the total population of the district multiplied 4.6 times from 1998 to 2011. During this time, the average household size of Gilgit increased to 8.6. Exhibit 3.3 provides a summary of the statistics. Exhibit 3.4 provides a comparison of population growth rates for Gilgit District for selected years from 1981 to 2011.

Gilgit is the administrative and educational hub of the province and attracts a constant flow of immigrants from surrounding areas in Pakistan. The main factors contributing to the attraction are as follows:

- Economic – hope for better employment, better food, better shelter, and for families to have higher standards of living
- Social – better health care, better educational opportunities
- Political – freedom from persecution, safety
- Environmental – flooding, landslides, and natural calamities such as earthquakes

3.5.2 CMP Population Forecast for 2025

The population forecast for the city for the year 2025 was carried out in two parts. The time span covered in the forecast was split between the period from 1998 to 2013 and from 2014 to 2025. The former is the base-year projection while the latter is the future projection on which the CMP was developed.

The forecast was based on the population figures taken from the 1998 census—an official government resource—and a 10% margin of error was considered for the results. Since Danyor and Sakwar are predominantly rural areas, two separate PGRs were used for projecting the population of the city: one for all the mozas of Gilgit, excluding Danyor and Sakwar ('Gilgit-Urban'); and the other for the rural areas of Danyor and Sakwar ('Gilgit-Rural'), also within the GDA boundary. The total projected population for Gilgit in the CMP was the sum of the two forecasts.

Gilgit-Urban

As Gilgit is located within a valley, there is limited flat land available for growth. From 1998 to 2013, the urban areas of Gilgit expanded towards its

Exhibit 3.3: Population Growth 2011

Area	*Population*
Population Growth Rate of Gilgit District	4.44 %
Average Household Size	8.6

Exhibit 3.4: Growth Rates for Gilgit District from 1981 to 2011 for selected years

Year	*Growth Rate*
1972 – (Gilgit Master Plan 1977) – Gilgit City	3.40%
1981 – (National Census)	4.44%
1998 – (National Census) – Gilgit City	2.66%
2011 – (House Listing Data)	3.54%

175. Abdul Sattar Khan, "AJK, Fata, GB, capital population goes up many a time", The News International, April 08, 2012, Print Edition.

urban fringe and damaged the setting of the peri-urban areas,[176] eroding the clear demarcation of the boundary between the city and the adjoining rural areas. This has resulted in suburban land being converted to urban land. Controlling such growth in the future is addressed in the CMP. Keeping in mind the 3.4% PGR for the city, between 1972 and 1998, and the district PGR of 4.44%, from the 1998 census, a high PGR of 5% was assumed for the 1998 to 2013 base-year projections. Another reason for the high base-year PGR is that the findings of the 2011 house listing[177] have not yet been verified by a final report and do not account for forced migration as a result of natural calamities, such as the Attabad Lake incident, which took place in GB during the same period.

For the future population projection, it was predicted that Gilgit will experience an even higher growth rate between the years 2014 and 2025. This will be due to the establishment of the city as the region's educational, financial, industrial, tourist and trade hub. Therefore, a higher PGR of 6% was used for the 2014 to 2025 future projections for the city.

Gilgit-Rural

For the rural areas of Danyor and Sakwar, which fall under the GDA boundary, a lower PGR of 2.6% was used for the 1998 to 2013 base-year projections, which is the same value as the 1998 PGR for the entire city. This estimate is considered reasonable, considering the bulk of the growth during that period was in the urban and peri-urban areas of the city rather than in the rural areas.

For the 2014 to 2025 future projections, a relatively higher rate of 3% was applied, since the areas that consist mainly of agricultural, pastoral and riverside flood plains may experience suburban expansion, as previously discussed. Exhibit 3.5 lists the PGRs used for the base year and future projections for Gilgit's urban and rural areas.

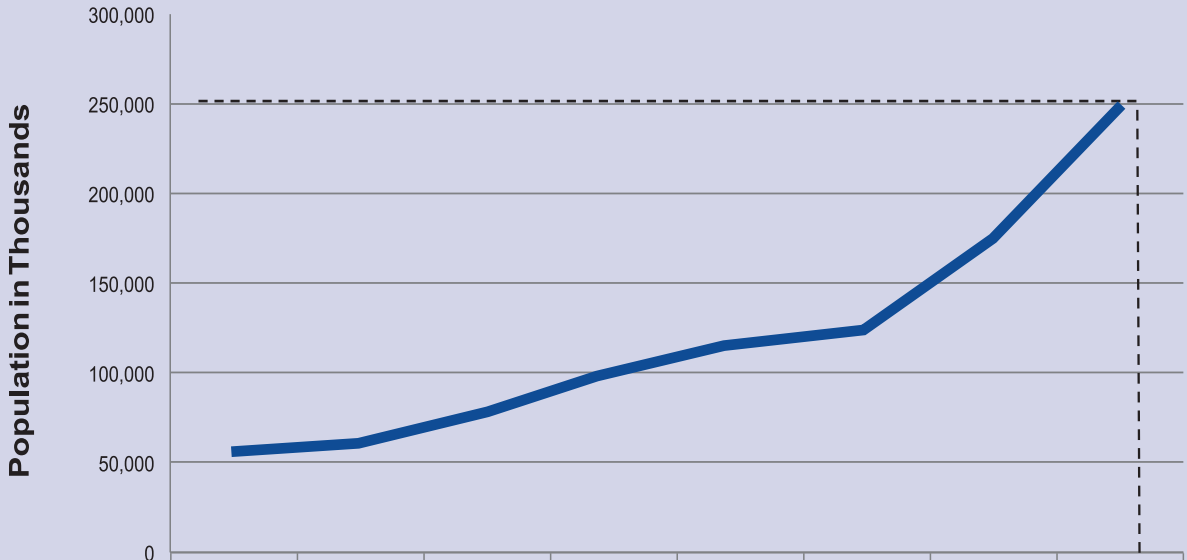
Based on these PGRs, Exhibit 3.6 and Exhibit 3.7 illustrate the base-year and future projected population figures for the urban and rural areas of the city. Exhibit 3.8 lists the projected population figures with a 10% margin of error. Thus, for the year 2025, all urban facilities and infrastructure, such as water supply, transportation, sewerage and electrical systems, offered in Gilgit would have to provide for a population of approximately 331,000 people.

Exhibit 3.5: Growth Rates for Base Year and Future Projections of Gilgit's Population

Area	Pop. Growth Rate
Gilgit–Urban	
Base-Year Projection 1998–2013	5.0 %
Future Projection 2014–2025	6.0 %
Gilgit–Rural (Danyor and Sakwar)	
Base-Year Projection 1998–2013	2.6 %
Future 2014–2025	3.0 %

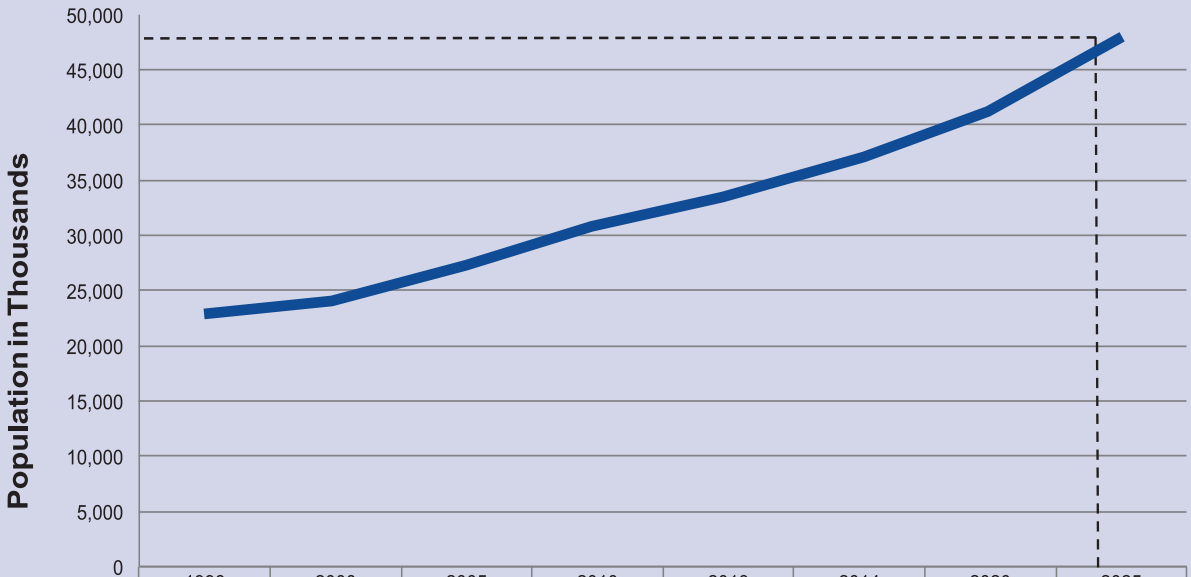
176. The areas immediately adjoining the city's urban areas and between these urban areas and the rural areas that provide a small buffer between the two.
177. Abdul Sattar Khan, "AJK, Fata, GB, capital population goes up many a time", The News International, April 08, 2012, Print Edition.

Exhibit 3.6: Population Projection of Gilgit-Rural (Danyor and Sakwar)



	1998	2000	2005	2010	2013	2014	2020	2025
Population	56,701	62,513	79,785	101,827	117,878	124,950	177,244	249,794

Exhibit 3.7: Population Projection for Gilgit-Urban



	1998	2000	2005	2010	2013	2014	2020	2025
Population	22,648	23,842	27,106	30,818	33,285	36,746	40,936	47,456

Exhibit 3.8: Projected Population 2025

Area	*Population*
Gilgit-Urban-2025	274,773
Gilgit-Rural (Danyor and Sakwar)-2025	55,951
Total	330,724

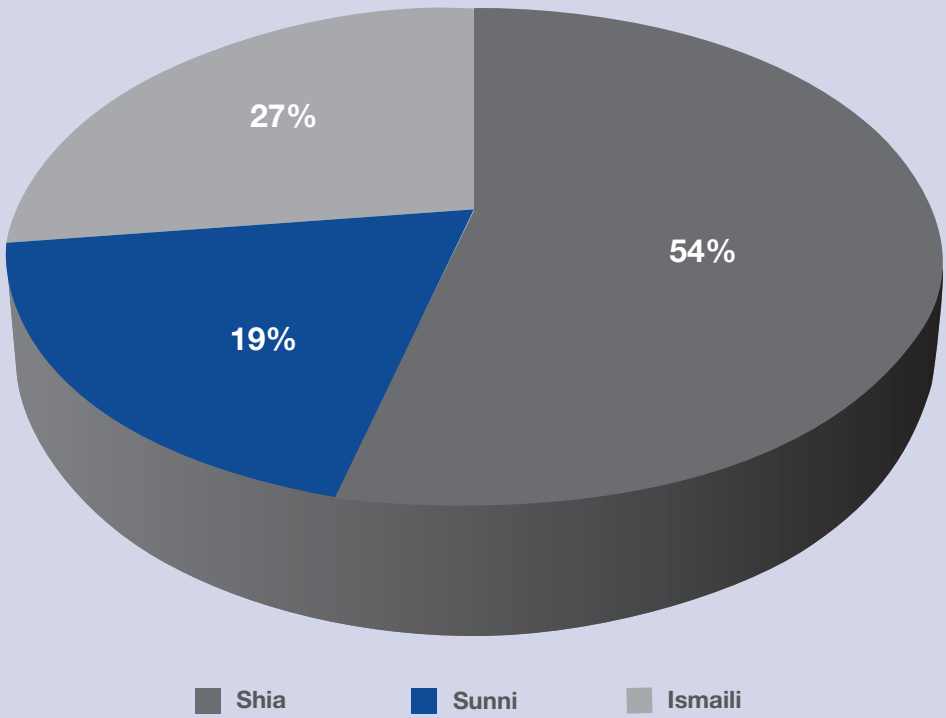
3.5.3 Population Trend Analysis – Cohort Analysis

A trend analysis of the population projections was undertaken using the Cohort Method. A cohort is a group of people who share a common characteristic over a certain period of time. An analysis of the same focuses on the activities and characteristics of one or a number of identified cohorts. It helps in identifying potential trends that will develop in a city as it grows to the projected figures, thereby allowing speculation of future needs and strategies. The cohort analysis carried out for the CMP was based primarily on the data gathered by a socioeconomic survey of the city in 2011 by the UN–Habitat.

Religion and Ethnicity

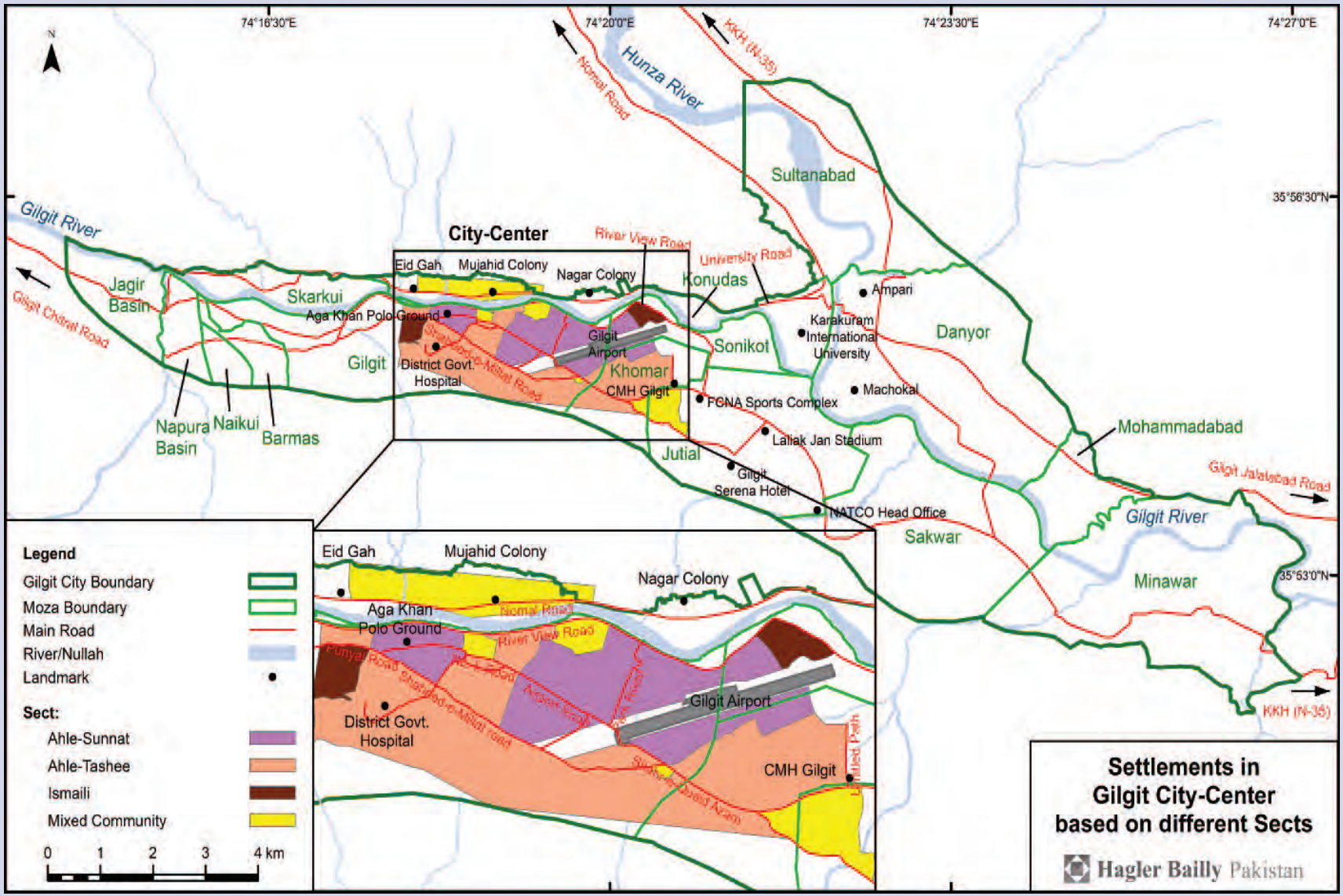
More than 97% of the population in Gilgit is Muslim and belongs mainly to the Shia, Sunni and Ismaili sects. As shown in Exhibit 3.9, 54% are Shia, 27% are Ismaili and 19% are Sunni[178]. All of these groups live in close proximity and there is constant ethnic tension among them. From 1998 to 2010, 117 incidents of sectarian violence that led to fatalities were registered.[179] These types of clashes affect the overall economy and tourism of the region and need resolution by design in the CMP. Exhibit 3.10 Illustrates the area occupied by the inhabitants according to their different sects. Different communities live in close proximity to each other and are often enveloped by sectarian conflicts. Strategies for the planned growth of the city recommended in the CMP consider the resolution of such conflicts and the promotion of community harmony. An example of such a strategy is the promotion of mixed communities complete with their mosques at defined distances from each other.

Exhibit 3.9: The Proportion of Inhabitants of Gilgit Belonging to Different Sects



178. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology,2011)
179. Sectarian Conflict in Gilgit Baltistan, Islamabad: PILDAT(Pakistan Institute of Legislative Development and Transparency, 2011)

Exhibit 3.10: Settlements in Gilgit City Center based on different Sects [180]



180. Ibid.

Age Groups

The UN-Habitat survey revealed that, in 2011, 43% of the population of Gilgit was between 16 and 30 years of age and 28% percent was under 16; 18% of the population was between 31 and 45 years of age, while 9% percent was between 46 and 60. Only 2% of the population was over 60 years of age.[181] Exhibit 3.11 summarizes the results.

Based on this information, two assumptions were made for the 2025 population projections for Gilgit. First, that within the next ten years there will be a high rate of dependents in society in the form of infants and elderly people. Therefore, adequate provisions would need to be directed towards these age groups in the CMP. Secondly, a large number of the population will fall within the reproductive age range. This implies a need for a greater focus on the provision of all levels of education, employment opportunities, vocational training and housing in the CMP.

Female-Male Ratio

According to the Gilgit Master Plan of 1977, the female-to-male ratio of the city, in 1972, was recorded as 1:1.13.[182] The same ratio was reported to be 1:1.05, in 2009, for the population between 15 and 64 years of age—the majority of the population.[183] In 2011, it was reported to be 1:1.12.[184] The one common feature among all of

Exhibit 3.11: Age Group

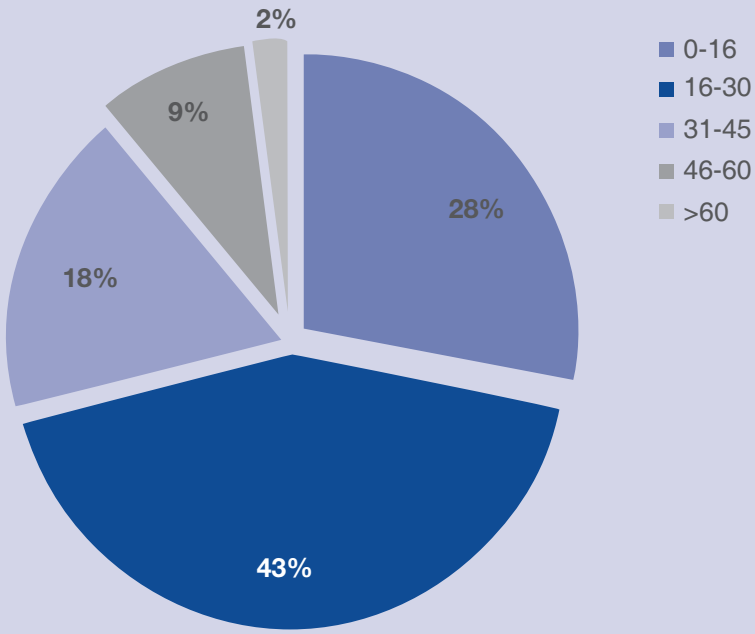


Exhibit 3.12: Gender Ratio in Gilgit City

Year	*Gender Ratio Female : Male*
1972	1:1.13
2009	1:1.05
2011	1:1.12

181. IUCN, 2011, Socioeconomic Household Survey of Gilgit City, International Union for Conservation of Nature Pakistan
182. S. Qutub, Ayub, Gilgit Master Plan,(Pakistan Environmental Planning and Architectural Consultants ,1977)
183. CIA,The World Fact Book, (Washington D.C, Potomac publishers, 2010), 418
184. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)

these ratios is that the number of males is slightly higher than that of females. This may be due to a higher number of births of a particular sex, a higher female mortality during the child bearing/infantile stage and a better census of males as compared to women in the same area due to the lack of exposure of the latter in a conservative society. However, the recurrent trend of a higher proportion of males was assumed for the population projected for 2025. Exhibit 3.12 summarizes the findings.

Built Environment

The total area of Gilgit is approximately 98 square kilometers (sq km) and the average household size in the city is approximately eight people. Among the structures in the city, 48% are load bearing and the rest are either made out of reinforced brick concrete or reinforced cement-and-concrete-frame structures.[185] Any future development in the city must provide for the fact that the area falls within an active earthquake zone.

The growth of settlements in the city does not seem to be guided by some plan. Many areas are clustered and congested. The majority of the housing is near the riverbanks, as they provide easy access to water and maximize natural-resource usage in different seasons. Exhibit 3.13 demarcates the planned and unplanned parts of the city. Exhibit 3.14 illustrates land use and marks out the residential areas of the city.

Among the residential plots in Gilgit, 33% are generally larger than 20 Marlas, and 15% of the plots are smaller than 7 Marlas.[186] Exhibit 3.15 illustrates the proportion of the different plot sizes in the city.

A trend that was noted in the development of the CMP was that houses on bigger plots had kitchen gardens where vegetables were grown and a few animals were kept for livestock. Such self-sustainability in the supply of vegetables, poultry and dairy products is considered vital for inhabitants of a city like Gilgit, and its preservation is, therefore, addressed in the CMP strategies.

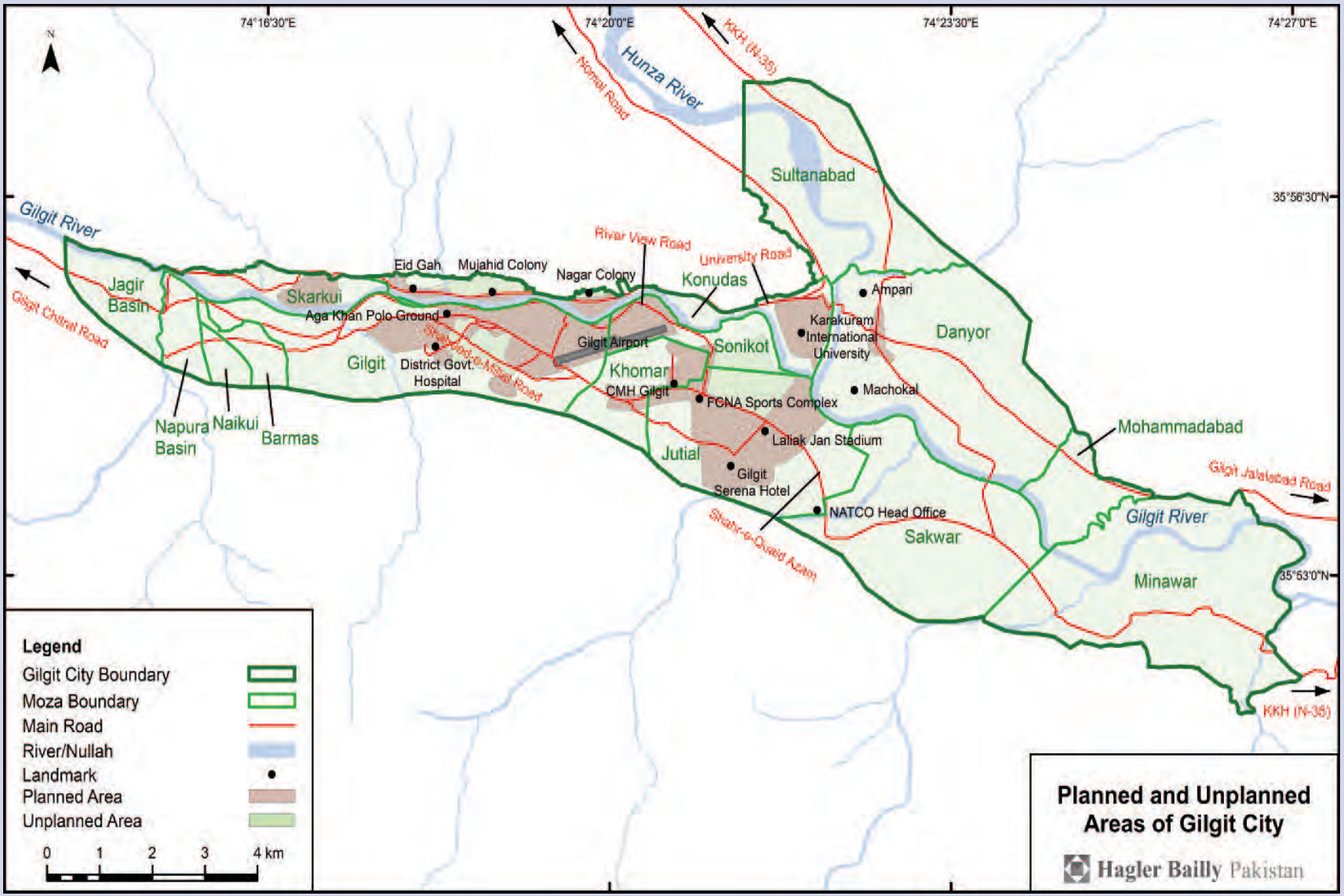
Employment and Literacy

The literacy rate in Gilgit is approximately 72% with almost equal literacy rates between males and females.[187] The unemployment rate in the city, at 45%, is quite high (Exhibit 3.16). One of the reasons may be due to a high dependence on livestock rearing and the maintenance of kitchen gardens, which are sufficient for the daily sustenance needs of the residents. The employed 45% percent work within Gilgit; 35% are employed in the city center and 4% work in other cities of Pakistan. Only 1% of the population is involved in agriculture within Gilgit. Women work primarily at home or in the agriculture sector. Exhibit 3.17 illustrates the sources of livelihood by percentage[188] and the monthly income of the inhabitants of the city.[189] At present, the city center is the center of employment. Once the GB High Court and Assembly become operational, the center of employment may shift towards the areas where these organizations are located.

The unemployment rate of 45% percent was provided for in the CMP by recommending strategies to boost existing avenues for employment and to generate new ones in the future. New jobs can be created by expanding the agricultural and forestry industries, for example, which will have a positive impact on the city's economy. The tourism and education industries are two massive avenues for job generation in the future and have been incorporated in the CMP.

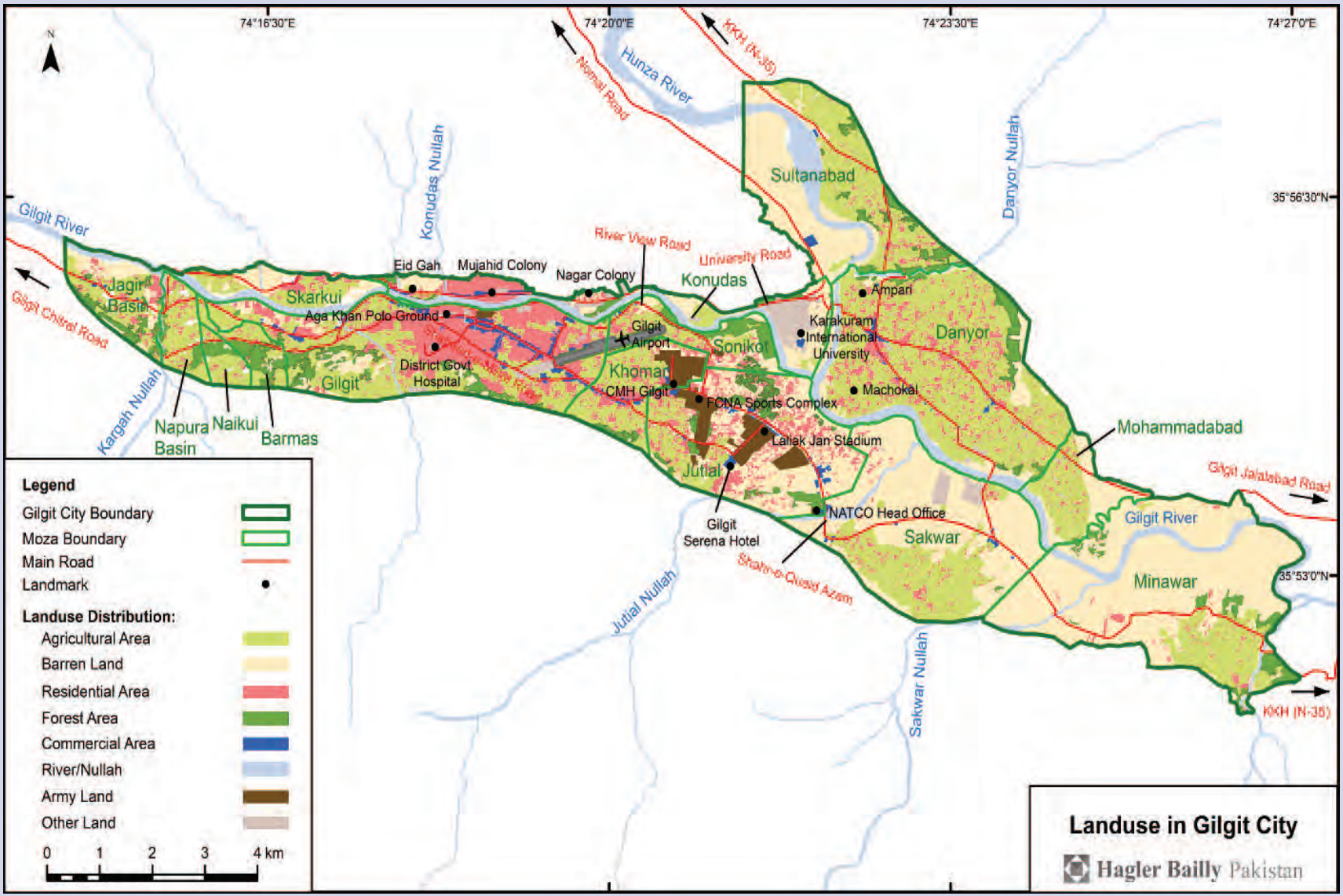
185. IUCN, 2011, Socioeconomic Household Survey of Gilgit City, International Union for Conservation of Nature Pakistan
186. IUCN, 2011, Socioeconomic Household Survey of Gilgit City, International Union for Conservation of Nature Pakistan
187. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)
188. Ibid.
189. Professional Development Centre North (PDCN), 2013, Population of GB, Aga Khan University, Institute of Educational Development (AKU–IED)

Exhibit 3.13: Planned and Unplanned Parts of Gilgit [190]



190. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)

Exhibit 3.14: Land Use in Gilgit [191]



191. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)

Exhibit 3.15: Residential House Sizes (in Marla) in Gilgit

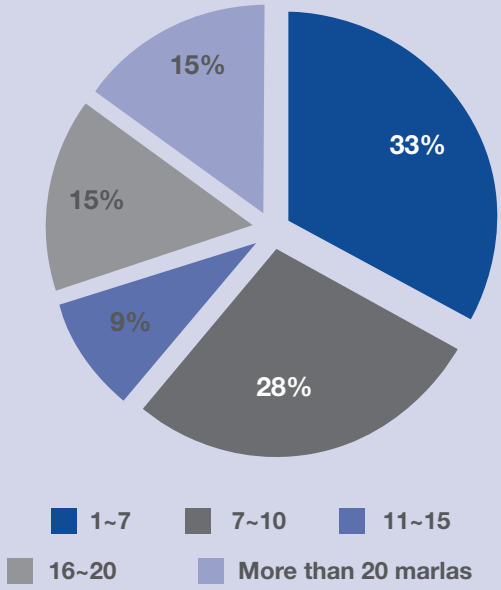


Exhibit 3.16: The Proportion of Employed and Unemployed in Gilgit

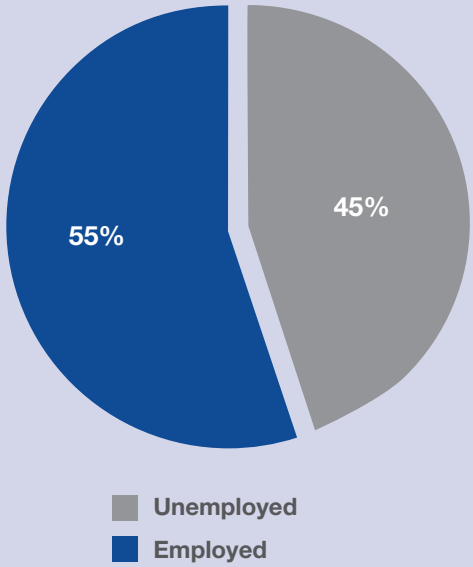
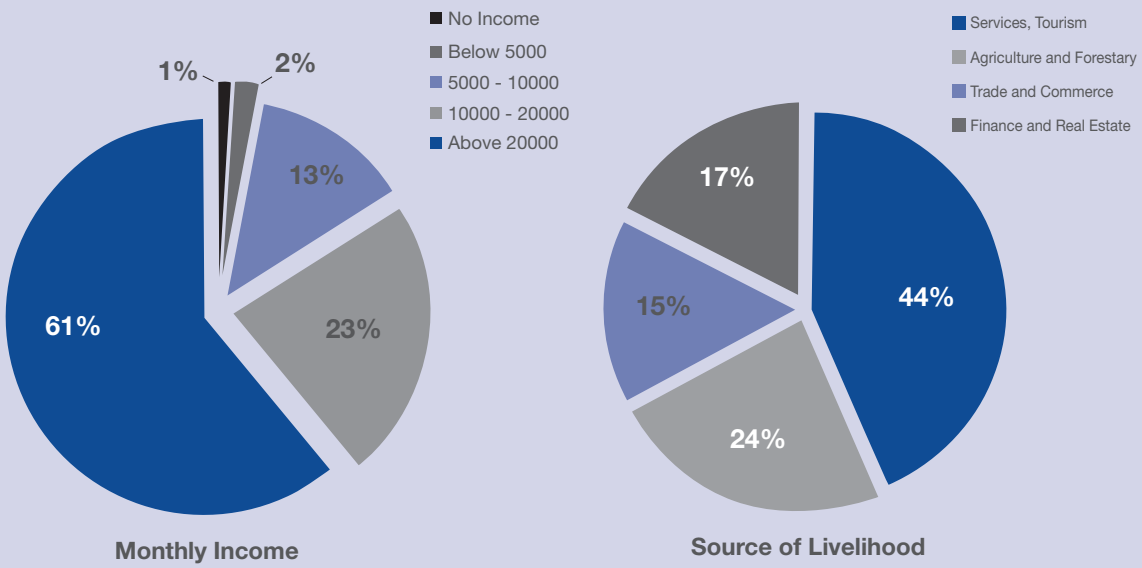


Exhibit 3.17: Levels of Income (in Rs) and Sources of Living in Gilgit



Household Units and Area Required

A projected number of household units in Gilgit for the year 2025 was based on:

- A family size of 8.1 people
- Total population of 331,000
- The assumption that there will be no homeless people or people without regular dwellings in the city

Exhibit 3.18 provides the total number of households in Gilgit, in 2025, based on the population projections. Exhibit 3.19 summarizes the total number of household units present in 1998 based on census data of the same year.

By subtracting the 1998 number of households from the projected number of households for the year 2025, the demand for additional housing units was estimated and made part of the design of the CMP.

To calculate the area needed to provide for additional housing units, it was assumed that future developments in the city will be comprised of multi-level apartments and small townhouses. Accordingly, the average residential plot size was assumed to be 5 Marlas, resulting in approximately 32 household units per acre.[192] With multi-level, mid-rise housing, as advised in the CMP, the approximate household units per acre can go to as high as 128. In hectares, this figure is 316 household units per hectare. Therefore, the amount of land needed for housing at the rate of 316 household units per Ha, for a total of 31,068 units, was calculated to be 98 Ha (0.98 sq km). Exhibit 3.20 summarizes the results.

Exhibit 3.18: Projected Household Units in Gilgit in 2025

Area	*Population*	*Household size*	*Number of Household Units*
Gilgit-Urban	274,773	8.1	33922.5
Gilgit-Rural (Danyor and Sakwar)	55,951	8.1	6907.5
Total	**~ 331,000**	**8.1**	**40,864**

Exhibit 3.19: 1998 Household Figures

Area	*Population*	*Household size*	*Number of Household Units*
Gilgit-Urban	56,701	8.1	7,000
Gilgit-Rural (Danyor and Sakwar)	22,648	8.1	2,796
Total	**~ 79,349**	**8.1**	**9,796**

Exhibit 3.20: Area and Number of Household Units Required for the 2025 CMP

Description	
1998– Number of Households	9,796 units
2025– Projected Number of Households	40,864 units
Total Households Required	**31,068 units**
Area required for 31,068 units (@ 316 units/Ha)	98 Ha

192. A hectare has 2.47 acres and 1 acre has 8 Kanals; each Kanal has approximately 20 Marlas.

Travel and Transport

A field survey of Gilgit revealed traffic congestion issues at the city center. The minimum width of roads for vehicular traffic in the city is 20 feet (ft), while the maximum width extends to approximately 35 ft, internal streets are normally used by pedestrians and the width can vary from 8 ft to 15 ft. There is no demarcation of pedestrian routes in the inner streets, but most of the main roads provide footpaths.

Public transport in the city includes carts, Suzuki wagons, and taxis that can be accessed from informal bus stands, locally termed as 'adda,' and usually located near commercial areas.

According to a survey carried out in the year 2000 by the Northern Area Traffic Office and Federal Statistics Office Gilgit, there were a total number of 24,002 registered vehicles in the city.[193] Among these, the majority were motorcycles and jeeps. The same trend was observed during a field visit conducted by the SEA team in 2013.

The total figure took into account non-custom vehicles with blue number plates. The count, however, did not include military vehicles nor did it take into account the increase in the number of vehicles during the tourist season. Exhibit 3.21 summarizes the results of the survey.

A 2011 IUCN survey focused on modes of travel in the city; Exhibit 3.22 summarizes the results. The primary mode of travel in the city is on foot, which accounts for 61% of the city's road users. This is followed by the use of public transport by 24% of the population. These two popular modes of transport were taken into account in the design of the CMP.

Exhibit 3.21: Registered Vehicles in Gilgit[194]

Type of vehicle	*Registered*	*On-Road*
Motorcycles/Scooters	4014	3986
Motorcars	3000	2974
Jeeps	3563	3552
Station Wagons	700	690
Tractors	1557	1487
Buses/Mini Buses	330	329
Motorcar/Cab	39	39
Delivery Van	54	50
Public Carrier Truck	7939	7917
Private Carrier Truck	47	47
Pick–up Datsun	767	762
Ambulance	12	12
Oil Tankers	179	172
Water Tanker	2	2
Suzuki Pickup	1799	1755
Grand Total	***24002***	***17774***

193. Northern Area Traffic Office & Federal Statistics Office Gilgit
194. Ibid

The CMP also took into account the fact that the number of private-vehicle owners in the city is expected to rise by 2025.

Gilgit has a small domestic airport within the city, which connects it to the rest of Pakistan. The KKH runs about 10 km off the city boundary, connecting Pakistan to China. Transport infrastructure and systems were, therefore, considered a vital part of the CMP, as they would enable the city to expand its existing provisions for 2025.

Educational Facilities

Gilgit has a large number of educational institutes and the literacy level is comparatively higher than the rest of the district.[195] The institutes of learning provide primary-to-post-secondary education levels. The Karakoram International University (KIU) at Duo Pani was established, in the city, in 2002, to address the need for undergraduate- and graduate-level programs in the region. Exhibit 3.23 lists the different education facilities available in the entire city district and the number of students enrolled between 2010 and 2011.

Exhibit 3.22: Modes of Travel in Gilgit

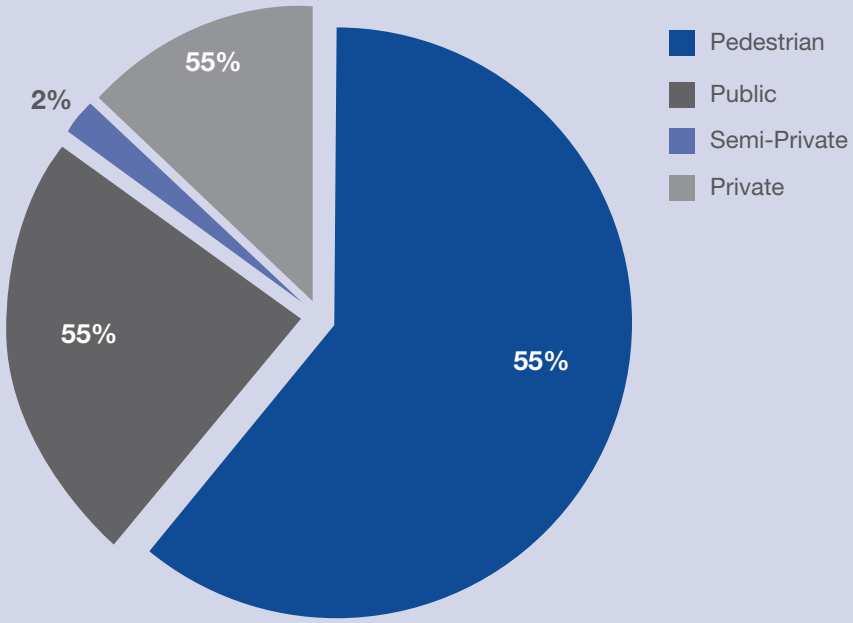


Exhibit 3.23: Education Facilities in Gilgit District in 2010–11

Facility	*Number*	*Enrollment*
Primary	1,496	149,690
Middle	318	32,901
High	187	11,082
Higher Secondary	6	161
Colleges	14	2,688
I.T Centers	4	207
Universities	1	414
Total	**2,026**	**197,143**

195. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)

In 2010, the dropout rate in the district at the primary level among boys and girls was 11% and 8% respectively. This was ascribed to poverty, migration of families and mismanagement of schools.[196]

Both the dropout rate and the enrollment statistics in the above exhibit were used to project future demand for schools in Gilgit. As discussed previously in this section, 28% of the total population of the city, in 2011, was younger than 16 years of age. It was assumed that this proportion would rise to become 30% of the population, in the future, as a result of better education and health facilities. This figure of 30% implies 99,300 people below 16 years of age, in Gilgit, in 2025, based on the projected population of 331,000.

By assuming 100% enrollment and a dropout rate of 15%, 84,405 out of the 99,300 students would progress to middle-year education. Out of these, 25% are expected to drop out, with 63,303 progressing to higher education. Exhibit 3.24 summarizes the results.

Comparing the projected enrollment figures for primary education in 2025 (99,300 people) with the primary enrollment figures for the entire district in 2011 (149,690 people), it is clear that the existing number of educational facilities in the city will not meet the future demand. The number of students gaining higher education will also increase, with additional pressure from students from adjoining areas.

Health Facilities

Gilgit is the center for medical facilities in the entire province. There are six hospitals, including one District Headquarter Hospital (DHQH)—the only government hospital in the city—and five civil hospitals, with a total count of 269 beds.[197] Exhibit 3.25 provides a breakdown of the health facilities available in the city.[198] There is no teaching hospital in Gilgit; the closest one is in Abbottabad, which is a 13-hour road journey away.

Exhibit 3.24: Projected Number of Students by Level of Education - 2025

Level of Education	*Enrollment*
Primary	99,300
Middle	84,405
Higher	63,303

Exhibit 3.25: Health Services in Gilgit– 2010–11

Service	*Number*
Hospitals	6
Basic Health Units	4
Dispensaries	22
Total Beds	269

Exhibit 3.26: Required Health Services by 2025

Description	*Number*
Existing Beds	269
Required for 331,000 People at the Ratio of 3 Beds/1000 People	993
Number of Beds to be Provided	724

196. "Gilgit Dropout rate", Dawn International, March 26,2010, Online Edition.
197. Dr. Naila Khalil , Background Paper Health and Environment, (IUCN Pakistan Programme Northern Areas Strategy for Sustainable Development , 2011).
198. Source: Health Department Northern Areas, June 1999.

In order to estimate the required number of health facilities, in Gilgit, in 2025, the CMP used the World Health Organization (WHO) standard for the provision of health care, which recommends 3 beds per 1000 people.[199] [200]

Using this standard, Exhibit 3.26 provides an estimate of the number of beds that will be required in the city in 2025. According to the table, this number is 724 beds and will be taken into account in the CMP.

Recreational Facilities

There are currently two public parks in Gilgit city: the Chinar Park and the City Park. There are also three polo grounds, which are also used for cultural and social activities. These grounds also double as playing areas for children.

There are three cinema halls with a total seating capacity of 800 people. Institutional and administrative areas have their own facilities, which are not open to the general public.[201]

The CMP was designed to keep in mind the need to develop additional recreational facilities for the general public. The development of riverfront areas as urban river parks for the general public is one avenue considered in the CMP.

3.5.4 Conclusion

In 2025, the projected population of Gilgit, including the areas of Danyor and Sakwar, is estimated to be 331,000. This estimate was based on the 1998 census and the natural growth trends of the city.

Using the 2025 population, a cohort analysis was undertaken, which considered future trends in age groups, female-male ratios, demand for homes, employment, education facilities and other important aspects of the city. The design of the CMP is based on the issues identified by the cohort analysis.

The issues identified were related to housing, health, education, transport, infrastructure and employment. Sectarian strife was also identified as an issue that would be addressed in the design of the CMP. The cohort analysis also identified avenues for job creation in the tourism industry. For housing, an additional 31,000 units is estimated for Gilgit in 2025, requiring approximately 98 hectares of land for development. Additional recreational, health and educational facilities will be required to match the needs of the future population. Gilgit will also require 724 additional hospital beds, along with clinics and dispensaries as aiding facilities.

Transport and travel services will need upgrading, and an infrastructure emphasis will be required for developing pedestrian-friendly roads and for promoting efficient public transport facilities. The regional role of the city will also significantly expand and will become a hub for trade, tourism and education. Regional connectivity in the form of major roads will also be required, thus connecting Gilgit with the rest of Pakistan and providing a gateway to China.

3.6 Development Strategies for the CMP

The issues identified in the cohort analysis, based on the projected population of Gilgit in 2025, will be addressed by the CMP through different development strategies. These strategies cover land use, transportation, sustainability, urban spatial growth, air quality and health, ethnicity, natural hazards, energy demand and the preservation of biodiversity. A combination of these different strategies will form the final recommendations of the CMP.

The land-use strategy will serve to demarcate different areas of Gilgit reserved for residential, commercial, institutional and recreational activities. Transportation strategies will look at easing traffic congestion in the city by allocating different types of roads and bridge networks for

199. Pakistan's hospital bed density in 2010 was 0.6 beds per 1,000 people. http://data.worldbank.org/indicator/SH.MED.BEDS.ZS
200. E–Health Magazine " Low bed-to-population ratio", http://ehealth.eletsonline.com/2011/09/india–with–low–hospital–bed–density–and–poor–doctor–patient–ratio–says–report/ (accessed December 28 2013)
201. Haider Raza,"NASSD Background Paper: Urban Environment", IUCN Pakistan, Northern Areas Progamme, 2003

pedestrians, cyclists, buses, cars, and heavy vehicles. Sustainability strategies will cater to the safe disposal of waste and its management in and around the city. Growth strategies include expansion scenarios and the preparation of preferred options for the future development of the city. Air quality and health strategies will provide for a healthy and safe environment for the future. An assessment of the city's vulnerability to natural hazards will facilitate in incorporating mitigation measures in the design of the CMP. The energy-demand strategy will help Gilgit provide for existing and future demand up to the year 2025.

The CMP will comprise of a combination of these strategies to provide a framework for the future development of the city.

3.6.1 Land-Use Strategy

The land-use strategy for the CMP classifies vacant land in the city according to the following criteria.

- **Land suitable and currently used for agriculture with full water rights (fertile land):** Future development in Gilgit must not change the agricultural use of this land (Exhibit 3.27 and Exhibit 3.28). These lands are vital to the economy of the city as they provide it with cheap, local vegetables for almost half a year. A large number of the inhabitants are also dependent on these lands for subsistence farming, which includes growing vegetables and rearing livestock.

- **Land suitable for livestock and grazing with some water rights:** Future development in Gilgit must keep this land as it is (Exhibit 3.27). Livestock rearing or grazing on this land must not be changed.

- **Barren land not suitable for cultivation:** This land may be utilized for housing and other urban development activities, such as the construction of roads, water channels and sewage drains.

- **Built up land; residential buildings or sheds:** This land may be utilized for housing and other urban development activities, such as the construction of roads, water channels and sewage drains.

- **Hazard-prone areas; riverbanks or landslide areas:** Development in these areas should be strictly avoided (Exhibit 3.29 and Exhibit 3.30).

According to the strategy, an inventory should be developed that categorizes and catalogues all vacant land in the city according to the above stated criteria. Land ownership of these areas should also be documented. All the information should be stored in the form of a data bank of land resources. It is vital for a successful future master plan of the city that this exercise be carried out before embarking on the exercise of preparing the comprehensive Master Plan for Gilgit.

The classification of land in Gilgit, according to the aforementioned criteria, should be enforced through legislation particularly to preserve the agricultural land available in the city. The agricultural areas in Danyor and Sultanabad are being rapidly encroached by the expanding urban areas of the city, particularly the developments around the N–35 transportation corridor. Danyor is a major supplier of fresh vegetables to Gilgit for almost seven months of the year, which helps keep prices of poultry and vegetables affordable for its inhabitants.

The development of residential buildings on fertile lands should be restricted by the introduction of some limits. The limits should ensure that a large part of a plot allotted on a residential area be used for subsistence farming and livestock rearing.

Government Housing

By 2025, Gilgit will be the center of administration for all of GB, which implies the need for housing for government employees. In order to establish

the future housing demand for the government sector, data from various government departments in GB will be required. Based on the data collected, land area for development will have to be allocated accordingly.

Currently, large government complexes, along with residential colonies, are all appearing near the junction of the KKH and Gilgit Road. Here, the land is not suited to agriculture and there do not appear to be any water rights pertaining to this area. This is consistent with the criteria established above for the development in the city on different types of vacant areas. Water requirements for new government developments at the junction can be met by pumping water from the nearby river.

The High Court and the GB Assembly are also being developed to the west of Gilgit Road (Exhibit 3.31). Here, too, the land is not suitable for cultivation, nor are there water rights pertaining to this area. This development is also consistent with the criteria established by the land-use strategy. These government developments in the area west of Gilgit Road and at the junction near the KKH are positive new development trends that do not disrupt vital existing land uses of the vacant areas in the city.

The development trend in this area of Gilgit will continue along the main roads towards the southeast of the city and into Sakwar. Such development, if not controlled and properly planned, has the potential of blocking access into the hinterland in Sakwar, thus depriving its inhabitants the opportunity to fully participate in the economic activities of the city. Such 'ribbon development' can be prevented by designing a road network, in the area, that promotes development away from the main transport corridors and further towards the interior areas. Interior approach roads need to be developed, at an early stage, complete with the provision of sewerage systems, water supply and electricity to promote development in vacant areas in Sakwar that are away from the main transport corridors.

Preferred Land-Use Strategy for Expansion in Gilgit

The strategy of choice for expansion in Gilgit provided by the CMP will be based on the following criteria:

- Only land not suitable for cultivation and not prone to natural hazards, such as floods or landslides, will be used for development.

- Such an area towards Sakwar is considered a viable option for development.

- A similar area between the KIU and Chilmas Das and further north along the same route is to be reserved for development related to the education needs of the city. At least 25% of the land should be used for student and faculty housing facilities and other commercial areas catering specifically to the needs of the students.

- A vacant, non-cultivable area close to the Hunza River (Exhibit 3.32) should be developed as an urban riverfront park. This will also generate economic opportunities in the form of restaurants, picnic spots and fishing areas.

3.6.2 Transportation Strategy

The transportation strategies discussed in this section will look at the existing transit corridors in the city and propose an urban form for the future of Gilgit that is compact and pedestrian-friendly. The strategy will also consider the vehicular movement of goods, with pertinent locations for inter- and intra-city transport terminals and bus links consistent with the land-use approach discussed in the previous section. A hierarchy of roads will also be established with potential road-widening schemes.

Three major roads in Gilgit give order and hierarchy to the city's existing transportation network. The preferred transportation strategy for the CMP will build on these existing patterns. The development of residential and commercial areas around the transport corridors will also be considered.

Exhibit 3.27: Agricultural Land and Grazing Areas in Gilgit

Agricultural fields in Barmas

Grazing field in Barmas

Exhibit 3.28: Good Agricultural Land Opposite Skarkui on the Gilgit–Chitral Road

Exhibit 3.29: Construction on a Riverbank

Exhibit 3.30: Landslide hazard area next to Skarkui showing houses constructed on landslide area.

Exhibit 3.31: Under Construction - Gilgit Baltistan Assembly Building on a Barren Peri-Urban Site.

Exhibit 3.32: View towards Hunza River showing Vacant, Non-cultivable Area

Surface Transport – Vehicular

Before recommending a strategy, it is vital to address the existing state of the transportation corridors in the city, particularly the transportation nodes— the inter- and intra-regional bus stops. At the junction of the KKH—a major regional transportation corridor—with Jalalabad Road in Danyor, there are three bus and Suzuki addas, which take passengers arriving at Gilgit from the south to:

- Gilgit city center,
- Hunza or
- Oshkhan Das.

At present, there are no rest facilities in the city, on either side of the KKH, that match the standards of the vehicle-stop areas, filling stations, repair shops, mosques, food shops and toilets available on the sides of the major motorways in the rest of Pakistan. Establishing hospitality facilities for overnight travelers around the junction is vital, considering its proximity to the KIU and the city's location as a regional transportation hub. The population of students will increase with time and with the addition of new departments in the university. Other educational institutions of higher learning are also located around Nomal Road and the Hunza River close to the junction.

The connection of the addas or bus stands to Nomal Road will have to be considerably enhanced, keeping in view the population to 2025, which is estimated to stand at 331,000. Any development around the junction, however, should be strictly controlled by clearly defining the land area available for use for this purpose. This will prevent future encroachments in the area. Land should, therefore, be allocated for the development of this junction as soon as possible. The area around the junction can also be developed to accommodate food-processing plants and warehouses for storing agricultural produce.

There is another general bus stand on the Shahrah-e-Quaid-e-Azam, which will also assume greater importance and will generate traffic once the Civil Secretariat is established on vacant land next to it. There is considerable vacant land to the rear of this bus terminal.

Both bus stands—at the junction of the KKH with Jalabad Road and the one at the Shahrah-e-Quaid-e-Azam— will assume greater traffic flow with the expansion of Gilgit to the east and the increase in the student population of the KIU. The area in Sultanabad will be further given over to educational institutions with student residences and those for faculty members and other staff members. In order to accommodate them, the educational institutions may develop three- or four-storey earthquake-resistant buildings. This would result in compact development and allow for housing densities of more than 1000 people/acre. Such compact development will allow a well–planned, affordable and viable public transport system to be developed.

The major constraint of compact and focused development around the KIU is that, in times of trouble, potential protestors in the student body will be able to block Nomal Road to traffic.
The Gizer-Yaseen Bus Stand within the city center, at the junction of Chitral and Shaheed-e-Millat Roads, will primarily serve as a hub for travelers to Chitral and Gizer. It requires space for expansion to accommodate at least 3 buses and 5 wagons, simultaneously along with rest, and ticketing facilities. Traffic in the area will need to be properly managed, as will adequate parking facilities for buses and wagons not in use.

New Bypasses

If bypass corridors are made to the north of the Gilgit River (the 'Northern Bypass') or, if the Nomal Road is widened and connected to Chitral Road in the northwest of the city, it will also be able to successfully serve as a bypass. Connecting this Chitral–Nomal Road Junction with a future Southern Bypass will effectively form a transportation loop around Gilgit, allowing regional traffic to transit through the city without going through its city center.

This will reduce pressure on the inner-city roads, which in turn will reduce pollution and congestion. The Northern Bypass, when developed, will also help mitigate land erosion and landslides, in that area, through adequate construction.

Constructing the Southern Bypass may require removal of some forest cover and the conversion of existing agricultural areas in the old part of the city in Barmas and Napura in the southwest. If, after an environmental impact assessment, the Southern Bypass is developed, the forest cover and cultivable area removed must be replaced in the same quantity somewhere else within the city. The replacement should be prepared before the development of the bypass.

Congestion in the city center from inter-city traffic will require amelioration through additional measures such as:

- New underpasses or large roundabouts, and
- Managing and rerouting traffic using one-way streets.

Distributing Regional and Inter-city Traffic

Another option for easing traffic congestion in the city center is by dividing the existing Suzuki and wagon stands to accommodate either regional traffic or the inter-city traffic, but not both. A dedicated regional bus stand can be developed close to the GB High Court with connections to inter-city bus stops. Dropping passengers from the regional stop to different locations in the city would reduce the pressure of regional traffic on the city center.

Pedestrians

Gilgit, and particularly the city center, must be made pedestrian-friendly. At present, there is an absence of adequately designed footpaths in the city center. New pedestrian routes and pavements will need to be added and made a feature there. This is particularly important considering that the future rise in population density may require that movement of vehicles through the city center to be disallowed altogether.

Air Transport Services

Air travel facilities in GB can be expanded by developing a network of small airfields for light aircraft around the province, with Gilgit and Skardu as the operational hubs. The Gilgit Airport can be developed to assume this expanded role by adding all-weather instrumentation, extending the runway and adding parking bays for smaller aircraft and helicopters. Such expansion will enhance the tourist potential of the entire province.

The Shaheed-e-Millat Road, at the end of the runway of the Gilgit Airport, may require re-routing away from the airport premises. This will allow the runway to be extended for larger aircrafts, but will result in the closure of the City Park. Therefore, any runway extensions must only take place after the relocation of the park.

Preferred Transportation strategy

Taking into account the above discussions, the preferred transportation strategy for the city is as follows:

- Two bypasses should be developed to divert regional traffic around the city center. The Northern Bypass should be developed along the base of the mountains to the north of the city; the Southern Bypass should be developed towards the south of Gilgit River.

- Encroachments along Nomal Road to the north should be cleared so that the road can be developed as a Gilgit bypass.

- The hinterland in Sakwar should be made accessible by developing a road network that avoids the ribbon development along Gilgit Road towards its junction with the KKH and the GB Secretariat.

- Congestion nodes in the city should be given proper lane alignment for better traffic management. The junction of Serena Hotel Road and that of Share-e-Quaid Azam should be engineered into a proper transportation junction with bylaws that account for future

demand. Some land around it should be kept clear to allow for the design of road junctions.

- Inter-city traffic should be managed with one-way routes and parking spaces.
- Roads along the main Nullahs should be properly defined and maintained.
- Parking areas and bus stops should be defined.

3.6.3 Energy Strategy

The principal forms of energy consumed in GB are firewood, electricity, kerosene oil, liquefied petroleum gas (LPG), diesel oil and batteries. Firewood, which includes sticks and bushes, is used for cooking and heating. Electricity and kerosene oil is used for illumination and diesel is used by a small number of industrial units where there is no electrification.[202]

Present Power Demand

The present power demands of GB are mainly met by small hydel power stations that range from 50 kW to 4,000 kW, according to the local demand and the allocation of funds. There are 184 hydel stations and 18 diesel-based thermal power stations in operation in GB, which provide a total of 50 MW to the province (see Exhibit 3.33).

Exhibit 3.33: Existing and Under Construction Power Stations

Region	*Existing Power Stations*				*Under Construction Power Stations (Hydel)*	
	No. of Stations		*Capacity (kW)*		*No. of Stations*	*Capacity (kW)*
	Hydel	*Diesel*	*Hydel*	*Diesel*		
Chilas	78	–	5,820	–	–	–
Astore	8	–	3,010	–	–	–
Gilgit	14	8	11,000	4,400	2	4,160
Hunza	13	1	6,940	200	1	400
Ishkoman	3	–	2,660	–	–	–
Yasin	1	–	1,000	–	–	–
Skardu	10	4	6,120	1,200	2	1,200
Shyok	7	1	4,000	200	1	1,500
Haramosh	5	–	2,220	–	1	500
Kharmong	7	–	1,880	–	–	–
Khunjerab	2	–	985	–	1	100
Ghizer	4	–	660	–	–	–
Gultari	2	–	110	–	–	–
Total	**154**	**14**	**44,000**	**6,000**	**8**	**7,800**

(Source: gtz:WAPDA Survey 1992–93 (updated))

202. Suleman Wali Khan and Muhammad Fiaz Joyia, Northern Areas Strategy for Sustainable Development, Background Paper on Energy, IUCN Pakistan Programme (Karachi: Rosette Printers, 2003)

Power Supply and Transmission System

GB's power supply system is not connected to Pakistan's National Grid primarily due to its remote location. This arrangement is likely to continue unless a major power station is constructed in Gilgit. The existing electric power generation, transmission and distribution system is being operated and maintained by the Northern Areas Public Works Department (NAPWD). The current installed capacity of 50 MW consists of 154 hydel and 14 thermal powers stations. The power generated from small hydels and limited thermal power stations are transmitted over short distances through 11 kV transmission lines and distributed for domestic, commercial and industrial use. Gilgit, being the major commercial city of GB, is fed from a number of hydels and thermal power stations through 11 kV lines/feeders. Each feeder is independently supplied by a group of hydel power plants.

Future Power Needs

The demand for electric power in the whole area, particularly in major cities like Gilgit and Skardu, is growing rapidly, while the present power generation is inadequate to meet the needs of the area. There appears to be a great shortage of power in this region, as the supply of electricity is generally uncertain and, in most cases, available only for a restricted period. In Gilgit, it is estimated that only 50% of the households are presently receiving power. In other towns and villages, the coverage of electrification is even less. Nevertheless, efforts are being made to meet demand.

The demand for electricity will increase further, particularly in Gilgit, which has become the new capital of the entire province. Commercial activities are increasing and new commercial centers are opening. If trade with the Central Asian Republic and China increases, commercial activities will expand further in this region. With these developments, the numbers of medium- and small-scale industries will also increase. The most prominent sectors that will require considerable power are the tourism and hospitality industries. The number of foreign and local tourists visiting GB is substantial and it is expected that a greater number of them will be visiting this region in the future.[203]

3.6.4 Strategy for Recreation Parks and Riverfront Development:

City Parks and Polo Grounds

At present, the extension area for the airport runway is home to the City Park. With the expansion of the airport runway in that direction, the park's use will change. Any plans of changing the park to a runway should first include the relocation of the existing park to somewhere within or near the city center before the new runway is developed.

Another large and open space in the city center is the polo ground. Its existing use, however, seems to be unregulated and it is used primarily by children for playing football. The grounds have a gated entrance and brick walls that completely surround them. Also, there are hardly any trees and no green areas around it. On one side, there are shops, and a heavy build-up of residential areas exists on the other. This, along with other polo grounds in the city, can be developed as urban parks at the city scale.

Riverfront Development

The riverfront in Gilgit, at present, has not been developed, but has the potential to serve as a major recreational space in the city. The riverfront also needs to be protected, as it is an environmentally important feature. Riverfronts along the Hunza and Gilgit Rivers should be zoned and development that damages the riverfront in these areas should be immediately ceased.

203. Suleman Wali Khan and Muhammad Fiaz Joyia, Northern Areas Strategy for Sustainable Development, Background Paper on Energy, IUCN Pakistan Programme (Karachi: Rosette Printers, 2003)

Due to the lack of public awareness about the environmental importance of the riverfront, the following activities are rapidly causing damage:

- Sand is being taken from the riverbed. (See Exhibit 3.34).
- Houses and abetment walls are being constructed on the riverbed.
- Contaminated water from the nullahs and raw sewage is entering the river.
- Solid waste dumped on the riverbanks and leachates from waste dumps flow into the river.

Legislation is required in the city to define land ownership on riverbanks and to define the right-of-way (ROW) of the river where no development will be allowed. Further, the riverfront should be treated as communal property and not as the property of some individuals. The latter may affect the river in a manner that contributes to the scouring of the riverbed. Besides adversely affecting the riverine ecosystem, scouring also damages the foundations of bridges, leading to their eventual collapse (Picture 3.6). All land on the riverfront, particularly the riverbed and riverbanks, should be purchased by the government and not allowed to be sold for private or commercial purposes. The riverfronts are a natural resource that should be enjoyed by all of Gilgit's inhabitants. Waste dumping into the rivers should be banned and the sewage flowing into the river should be treated before disposal.

3.6.5 Water Supply in the City

Gilgit is rich in fresh-water resources, however mismanagement has led to water shortages in different parts of the city. The primary sources are the Gilgit and Hunza Rivers and the streams or nullahs, the latter which flow down into the city from the mountain slopes.[204] These nullahs have reduced flow in winter and a number of communities have priority use of the water through traditional water rights. The water in the

Exhibit 3.34: Urban Park Development: sand being taken from riverbeds.

204. Gilgit-Baltistan Environmental Protection Agency, Water and Wastewater Quality Survey in seven urban centers of Gilgit Baltistan, 2013

nullahs are contaminated and are filtered in the water-filtration plants in the city. Only the Danyor Nullah has uncontaminated water and should, therefore, be protected from pollutants and animals. The Danyor Nullah will be under threat from the development of the KIU and other education institutions in the vicinity.

The drinking-water supply complexes in Gilgit city are as follows:

- Burmas Water Supply Complex, Majini Mohalla
- Jutial, Water Lift System, Sonikot
- Jutial, Lift Water Supply Complex, Zulfiqar Colony
- Danyor Chikas Water Supply Complex, Choke Area
- Gilgit Filtration Plants: APSC Filtration Plant and DHQH Filtration Plant.

The volume of water consumed by residents in the developed world is more than 50 gallons/person/day. However, considering the

Exhibit 3.35: Infrastructure Requirement (Based on 35 Gallons per Day) (Water Supply and Solid Waste)

Description	*Year 2014*	*Year 2025*
Water supply in cities	5.6M gallons/day	11.5M gallons/day
Solid waste	2.2M gallons/day	13.2M gallons/day

Exhibit 3.36: Infrastructure Requirement (Based on 50 Gallons per Day) (Water Supply and Solid Waste)

Description	*Year 2014*	*Year 2025*
Water supply in cities	8.0M gallons/day	16.5M gallons/day
Solid waste	3.1M gallons/day	19.0M gallons/day

Exhibit 3.37: Water Works (Tanks in Jutial Area)

lifestyles of the inhabitants of Gilgit and the average household size of 8.1 people, the water supply estimations in this section will consider a volume of 35 gallons/person/day being used in GIlgit. Accordingly,

- 35 gallons/person/day x 8.1 = 284 gallons/household/day.
- Industries and hospitality establishments add another 15% to this figure.
- Seasonal variations (summers and winters) may increase or decrease the load/day.
- According to the population projections, the number of households in Gilgit in the year 2014 = 161,696/8.1 = 19,962.
- And in the year 2025, the number of households will have increased to 330,724/8.1 = 40,830.

Based on the above projected household figures, the water supply required for the city in 2014 and 2025 using both the 35-gallon-per-day and 50-gallon-per-day standards are shown in Exhibit 3.35 and Exhibit 3.36 respectively. If projections are based on 50 gallons/person/day, 16.5M gallons in total, or 35 gallons/person, are required per day and 11.5M gallons/day will be required by the city in 2025. This cannot be met by the flow in the nullahs alone and will, therefore, require water to be pumped from the Gilgit and Hunza Rivers.

Design Criteria

The existing piped delivery systems in urban settlements in Gilgit do not match the current domestic and non-domestic water demands. For instance, the five complexes that currently supply drinking water to Gilgit were designed in late 1970s based on the population demand of the time. The existing systems were designed on the criterion of 67 liters (18 gallons) per capita per day, which is eleven times less than the same criterion for Islamabad, three times less than Quetta's and two times less than Peshawar's. It is worth mentioning that since 1998, the Water Sanitation Extension Programme of the Aga Khan Planning and Building Services (AKPBS) is designing rural water supply systems in GB on the design criterion of 70 liters (18.5 gallons) per capita per day. Exhibit 3.38 and Exhibit 3.39 list the water supply demand required for Gilgit in the next decade based on the current growth rate.[205]

According to the Bureau of Indian Standards (BIS) 1172:1993, reaffirmed in 1998 (Indian standard code for water requirement):

- For communities with a population of 20,000 to 100,000 – 39.6 gallons per person per day are consumed.
- For communities with a population of over 100,000 – 52.8 gallons per person per day are consumed.

In the BIS 1172, a breakdown of the water demand for both categories is provided. For the 2025 population projection for Gilgit, the breakdown of the 52.8 gallons is used and is as follows:

- Bathing: 14.5 gallons/person/day
- Toilet flushing: 7.92 gallons/person/day
- Washing of clothes: 5.28 gallons/household/day
- Washing the house: 2.64 gallons/household/day
- Washing utensils: 2.64 gallons/household/day
- Cooking: 1.32 gallons/household/day
- Drinking: 1.32 gallons/person/day

According to the Water Supply and Sanitation Collaborative Council (WSSCC),[206] the planning guidelines for minimum water quantities for institutions and other uses are as follows:

205. Haider Raza, Northern Areas Strategy for Sustainable Development, Background Paper on Urban Environment, IUCN Pakistan Programme (Karachi: Rosette Printers, 2003)
206. WSSCC has built its reputation, with a 20-year credible track record, as a major global organization with extensive experience in water, sanitation and hygiene issues at the community, national and international level. Its institutional home is the United Nations under the UNOPS (UN Office for Project Services). http://www.wsscc.org/

Exhibit 3.38: Water Requirement Standards (Public Spaces)

Description	*Water Consumption (in gallons)*
Health Centers and Hospitals	1.32 gallons/outpatient 10.5–15.8 gallons/in-patient/day Additional quantities for laundry equipment, flushing toilets, etc.
Schools	0.79 gallons/pupil/day for drinking and hand washing (use for toilets not included).
Mosques	0.528–1.32 gallons/person/day for washing and drinking.
Public Toilets	0.26–0.52 gallons/user/day for hand washing 0.52–2.11 gallons/cubicle/day for toilet cleaning
All Flushing Toilets	5.28–10.56 gallons/user/day for conventional flushing toilets connected to a sewer 0.79–1.32 gallons/user/day for pour-flush toilets.
Small–scale Irrigation	3–6mm/m2/day, but can vary considerably.

Exhibit 3.39: Public Space Facility Requirement (Time Based)

Description	*Short Term*	*Long Term*
Market areas	• 1 toilet to 50 stalls	• 1 toilet to 20 stalls
Hospitals/Medical Centers	• 1 toilet to 20 beds or 50 out-patients	• 1 toilet to 10 beds or 20 out-patients
Feeding Centers	• 1 toilet to 50 adults 1 toilet to 20 children	• 1 toilet to 20 adults 1 toilet to 10 children
Reception/Transit Centers	• 1 toilet per 50 people 3:1 female-to-male	
Schools	• 1 toilet to 30 girls 1 toilet to 60 boys	• 1 toilet to 30 girls 1 toilet to 60 boys
Offices		• 1 toilet to 20 staff

There are primarily two major types of water resources available in Gilgit.

- The Gilgit and Hunza Rivers, and
- The streams or nullahs flowing down from the mountains.

All the major nullahs in Gilgit are connected to water-storage tanks from which the water is channeled into 12-inch diameter metal pipes with valves (See Exhibit 3.40). Water from these pipes is first supplied to the residents and their agricultural lands that possess traditional rights over the water, after which it is supplied to other areas. The water tanks do not have any gauges or measurement systems, nor do they have any chlorination or sand-bed filtration or aeration systems. The general hygiene and protection of these works from animals, domestic or wild, have not been taken into consideration.

Communities without traditional water rights are supplied with this water grudgingly. Such communities often prefer getting water from the river rather than relying on upstream communities, with water rights, to share.

At present, there is a system of mobile water bowsers in the city, which are pulled by tractors and charge approximately Rs 1000/trip for each bowser to deliver water from the river to different households (Exhibit 3.41). These tractors consume fuel and increase congestion on the roads. This method of water supply is expensive and employed mostly by those with no other option for water supply or by commercial entities that require larger quantities.

Strategy and Recommendations

In the future, the main source of drinking water in Gilgit will be the Gilgit and Hunza Rivers. It is, therefore, important to protect the water quality of these resources from pollution. Once more industries are developed in the city, the demand for water will rise further. In order to prevent pollution from these industries, treatment of waste prior to disposal into the river would need to become part of the law in Gilgit. The same

Exhibit 3.40: Valves from the Water-storage Tanks

condition should be imposed for all the bus stands in the city, mechanic shops, car-washing facilities and other such commercial enterprises that dispose effluents into the rivers.

The protection of these nullahs can be facilitated by constructing raised, green embankments and small lagoons on the sides and by planting trees, shrubs and grass. While protecting the nullahs, these additions will also turn them into green recreational corridors, which will also protect the biodiversity of the area.

The following strategies related to drinking-water supply in the city are recommended:

- Landfill sites for solid waste to be moved away from the riverbanks.
- Legislation against the dumping of solid waste into the rivers and nullahs to be enacted.
- Nullahs should be turned into recreational spots. The Danyor Nullah should be afforded particular attention so as to preserve its present uncontaminated state.
- New storage tanks should be constructed or the capacity of existing storage tanks should be increased. All of the storage tanks should be equipped with water meters, which help make water distribution a transparent and equitable process. Such meters will also allow user charges for the water to be implemented.
- User charges should be introduced and should replace the traditional water rights.
- Water aeration and bed filtration systems should be developed for the water tanks. Sand bed filtration systems can even be introduced on the sides of the existing nullahs, where water can be diverted, filtered and released back into the nullah.
- Large pipes should be installed along the main roads, in the city, to distribute water to a larger population.

Exhibit 3.41: Mobile Water Bowsers in Gilgit

3.6.6 Solid-Waste Management

Municipal solid waste (MSW) consists of all the waste generally associated with residential areas, such as domestic waste, plastics, paper bags, glass pieces and paints. According to a survey conducted by the IUCN, in 2011, the average MSW generated in Gilgit was around 70 to 80 tons per day. According to the same report, it was estimated that, in 1998, the city generated MSW at a rate of 0.4 kg of waste per person per day.[207]

The state of the existing MSW disposal system, in the city, can be gauged from the following observations during a field visit in December 2013:

- There are only 3 to 4 tractor trolleys for waste collection and disposal in the entire city.
- There are no compactor trucks available.
- The major dumping sites in the city are in the north, on University Road and close to the river. These dumping sites are open, uncontrolled and are a major source of pollution of the river.
- The solid waste, in these dumps, is set alight and the smoke spreads throughout the city. This is a major source of air pollution.
- Chilmas Das, a recent dump site outside the city limits near the Nomal Road towards Chitral, is too far away and, therefore, hardly any waste is dumped there. Very little garbage was seen dumped at this site. It is also an open and uncontrolled dumping site.

Preferred Waste Disposal Strategy

According to the population projections in Section 3.5:

- The total population of Gilgit, including Danyor and Sakwar, in 2014, will be 161,696.
- The total population of Gilgit, including Danyor and Sakwar, in 2025, will be 330,724.

Therefore,

- In 2014, the projected MSW Generation in the city is expected to be = 60–70 tons/day[208]
- By 2025, this is projected to rise to MSW Generation (in tons) = 132

Taking account of future MSW projections for the entire city and the abysmal existing state of its MSW disposal system, it is recommended that at least two compactor trucks be immediately purchased. These trucks simultaneously collect and compact waste, which immediately reduces the size of the disposal sites required. Waste bins that complement the mechanical lifting-and-compaction operation of the compactor trucks should be introduced for residences and businesses throughout the city.

A comprehensive solid-waste management strategy needs to be devised and implemented by the Gilgit municipality. The strategy can look into developing collection points at different places in the city from which waste is collected by compactor trucks and disposed of at a landfill site outside the city limits.

Exhibit 3.42: Municipal Solid Waste Generation (1998)

District	*Urban Area*	*Population*	*MSW Generation (in tons @ 0.4 kg/person/day)*
Gilgit	Gilgit City	56,701	23

207. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology,2011)13
208. This figure is also consistent with the approximate number revealed to us by the GBEPA officials in a meeting with them on 15th December, 2013, according to which it is currently between 50–60 tons/day.

During an SEA team field visit to Gilgit in December 2013, the Gilgit-Baltistan Environmental Protection Agency (GBEPA) informed the team of ongoing feasibility studies on a "Pyrolysis and Gasification Plant" for the city. Such a plant converts waste into a stable supply of electricity by using the heat generated during waste incineration to generate steam. This plant will greatly benefit the MSW management system of the city. The existing practice of burning waste in an open and uncontrolled fashion must be immediately stopped or taken outside the city limits. Plastics are also being burnt. This is dangerous to health and known to be the major cause of respiratory diseases, particularly among children.

Exhibit 3.43: Area Where Solid-waste-disposal Tractors are Parked

Exhibit 3.44: Nomal Road Side Walls Changing Route of River Streams

Legislation preventing the open dumping and burning of waste in the city should be enacted and strictly enforced. Hospital waste must also be similarly regulated, ensuring it is separated from other waste and disposed of only after treatment. The municipal authority must look into separate incinerators particularly designed to deal with hospital waste from the city.
Waste recycling must be encouraged that will further contribute to the reduction of waste generated in the city. Recycling activities form a major source of income for the poorer segment of the society. However, the supply of adequate protective equipment and clothing must be ensured to protect the health of the municipal workers.

The open and unregulated dumping and burning of waste on the University Road close to the Gilgit River requires immediate regulation to prevent waste from falling into the river and fumes from spreading throughout the city. This dumping site will eventually have to be moved. Initially, the relatively new dumping site at Chilmas Das may be a suitable alternative; however, this too will have to be moved, as the land close to the site is owned by Karakoram International University (KIU) and slated for future expansion.
With the growth of the city, there will be an increase in businesses dealing with tourism and hospitality. Medium- and small-scale industries will grow; fruit and vegetable markets will expand. These will contribute towards a growing share of industrial waste produced by the city. Apart from the need for adequate legislation and equipment, the municipal authorities in Gilgit that deal with waste disposal will also have to invest in capacity-building measures in order to be up to the task of effective waste management in the future. Local communities should also be involved in the management of waste disposal in the city and should be encouraged to take up the role through local government mechanisms.

3.6.7 Educational Facilities

Gilgit has a high literacy rate (72%). There are a number of educational institutions that range from small tuition centers to large schools and the KIU University. According to a World Bank Economic Report on GB (2010–11), the net primary school enrolment in GB that year was 51%, the net middle-school enrollment was 17%, and only 14% were enrolled at the inter-mediate (pre-university) level. These dropout rates are very high and undesirable. The KIU has been recently established to address the need for graduate and undergraduate programs for the region. Exhibit 3.46 and Exhibit 3.47 provide a summary of the education-sector statistics in the entire province.

Exhibit 3.45: Mehnaz Fatima School. The Mehnaz Fatima School for children has an enrollment of 450 students

Exhibit 3.46: Educational Statistics Gilgit–Baltistan [209]

	Literacy Rate		
Year	*Male*	*Female*	*Both*
1981	24%	3%	15%
1998	53%	22%	33%
2008 (Projected)	57%	27%	43%

Teacher-Student Ratio

Level	*Institutions*	*Teaching Staff*	*Enrollment*	*Teacher-Student Ratio*
Govt. Schools	1672	5870	151508	1:26
Govt. Colleges	15	251	6233	1:25
Total	1687	6121	157741	1:26

District-Wise Comparison (Government Vs Private)

District	*Government*		*Private*	
	Institutions	*Enrollment*	*Institutions*	*Enrollment*
Gilgit	345	43188	160	21070
% age Govt. Vs Private	76%	68%	24%	32%

Exhibit 3.47: Existing Educational Statistics

Education Facilities	*Number of Schools*				*Enrollment*			*Teachers*		
	Male	Female	Co.Edu	Total	Male	Female	Total	Male	Female	Total
Primary	427	201	868	1496	88456	64234	149690	1507	726	2233
Middle	136	70	112	318	21288	11613	32901	791	245	1036
High	111	34	42	187	7890	3192	11082	1323	350	1673
Higher Sec. Schools	3	1	2	6	114	47	161	37	15	52
Colleges	10	1	–	14	2115	573	2688	237	61	298
IT Centers	2	2	–	4	120	87	207	9	5	14
University	–	–	1	1	285	129	414	44	7	51

209. GB Social Welfare Organization, "Statistics Regarding the Education Sector of Gilgit–Baltistan", Government of GB, http://www.geogilgit.org/edu_stats.php (accessed December 18, 2013)

The student-to-teacher ratio in the entire province is quite high. This immediately highlights the dearth of schools in the region for the burgeoning population. The same trend resonates in Gilgit. There are a number of good quality primary- and secondary-level government and private schools in the city. On the other hand, the pre-university, or intermediate level of education in the city, is quite poor.

Keeping in mind the population projection of the city for 2025, at least three intermediate-level educational institutions need to be developed with a capacity of 1,200 students each. The three institutions, together, will cater to 2,400 boys and 1,200 girls.

Due to a high rate of unemployment in the city and a high dropout rate at school, vocational centers complete with boarding and lodging facilities will be required in the city. These vocational centers will be based on creating skilled personnel in the following fields:

- Woodworking
- Welding and turbine repair
- Metal works
- Electrical repair works of products
- Cooking
- Building construction and supervision
- Installation and repair of solar power and the production of small units
- Free-range poultry farming, organic farming
- Hospitality industry

With an eye to the future, Gilgit will need a skilled labor force with the requisite education to fully utilize the benefits of its regional role.

Polytechnical and vocational institutes will ensure the preparation of the work force to meet the needs of the future. Suitable land available in the city for this purpose is next to the existing Polytechnical school in Chilmas Das. At least two vocational institutes will be required for the year 2025—one for boys and the other for girls.

3.6.8 Industries

Other than the tourism, adventure sports and hospitality industries, the following sectors are also expected to grow in the city:

- Storage of warehouses for goods to and from China
- Fruit processing industry
- Packaging and printing industry for fruit containers
- Stationery and clothing industry linked to the education sector.
- Insulation and building material for paving, water proofing, compact, roof and wall insulation.
- Cement industry
- Wooden weaving, thread and the carpet industry
- Local handicrafts
- Gemstone industry and training centers for said

A designated industrial zone needs to be developed in the city to allow for a controlled expansion of local industries. Suitable barren land between 5 Ha to 15 Ha close to the KKH (N–35) should be allocated for this purpose. The industrial zone should be equipped with adequate infrastructure comprising roads, electricity, and water supply and sewerage systems.

3.6.9 Health Facilities

As discussed in Section 3.5.3, an additional 724 beds will be required in Gilgit in 2025.

In order to accommodate this demand, a number of smaller health facilities will need to be developed around the city where patients can be treated without requiring hospitalization. This will reduce the pressure on the number of hospital beds in the city. For severe cases, a 250-bed teaching hospital should be developed to provide the additional beds required. This hospital can be established either in Chilmas Das or at Sakwar. The major sponsors for such a hospital will be the Aga Khan Medical Services or the GB government. The former has already run a number

of health projects successfully around GB. The teaching hospital will also serve as a medical institute, where students from all over GB will be imparted medical qualifications without being required to go to other major cities in Pakistan.

3.6.10 Conclusion

The previous sections discussed the preferred strategies for the development of various aspects of Gilgit for the year 2025. The implementation of all the different strategies will have to be executed in such a way that other aspects of development in the city are not adversely impacted. The right balance, however, will be governed by the physical space available in the city for growth. In the next section, various urban spatial options that attempt to find that balance are discussed.

3.7 Urban Spatial Options

It is pertinent to chalk out suitable options for growth in Gilgit that enable the effective implementation of the recommended strategies presented in the previous section. These options will guide the expansion of Gilgit and will be based on the population projections established in Section 3.5. The projections anticipate and provide for the city's requirements up to the year 2025.

The growth of a city is dependent on the adequate provision of housing, infrastructure, accessibility and sustainability—economic and otherwise. The options developed in this section accommodate these factors. The choice between one option and another is dependent on the nature of the "candidate sites" available for growth in Gilgit. These sites will enable the development of the preferred strategies discussed in Section 3.6 and will eventually help form a consolidated overall spatial plan for development.

The selection of the candidate sites will take into account issues such as flood risk, water logging, open space provision, job opportunity, land availability, urban capacity, urban renewal and infrastructure development. Areas requiring protection, such as high-value biodiversity and conservation areas, will also be identified and possible mitigation measures for flood risk and landslide zones will also be considered in the assessment of the sites. The candidate sites considered in this report include areas not only within the city limits but also areas adjacent to it.

A consolidated strategy will be required to meet the competing priorities of development and environmental preservation. Adequate infrastructure must be capable of serving new development areas. These include efficient transportation routes and services, education provision, community facilities and utilities. In other words, any development option must also consider economic viability, and the delivery of development must be integral to the selection of a preferred spatial option. The consolidated spatial option will form the foundation of the CMP and will ensure the realization of the city's wider objectives that relate to socioeconomic growth, sustaining communities and enhancing environments.

In order to arrive at the consolidated approach for development, four spatial options for the expansion of Gilgit will be discussed in this section. Two of these options are largely based on development within the built-up areas or "brownfields" of the city; the other two are based on a sustainable expansion of the urban area of the city using "greenfield" sites outside the city limits. Each option aims to fully utilize existing brownfield sites and to regenerate key urban areas within Gilgit, particularly in the city center.

In the context of the CMP, greenfields are agricultural or grazing areas in the city or barren land with no existing development on it. Brownfield sites, on the other hand, are areas or land with some form of infrastructure on them, such as houses or roads. Development that converts the entire city into a brownfield site is not considered an economic or environmentally sustainable option. Greenfields spread throughout the city will be considered an integral requirement of any development option chosen for the city. The spatial options discussed in this section do not define the precise boundaries for development nor do they provide exact new land-use prescriptions. The options will define the broad geographical approaches that can be

utilized for development in the city. These options will allow for an analysis of the possible strategic balances for development, which will lead to a consolidated urban spatial strategy, which is the 'preferred option.' The growth options are also intended to introduce concepts for urban growth expansion to the stakeholders in Gilgit and to stimulate debate among them in the selection of appropriate strategies for the future comprehensive Master Plan. Since a large area of land in the city belongs to the army, it should also be involved in the development process. Exhibit 3.48 illustrates a map of the city that shows various options for expansion.

3.7.1 Option One – Spread Approach – Limited Peripheral Growth

This option is based on maximizing the use of suitable brownfield sites in Gilgit-urban. It will be supported by allocating new greenfield sites at the edges of the urban settlements. This option does not consider any development in Gilgit-rural.

Brownfield development is the predominant feature of this option and the existing services of such areas in the city for recreation, leisure and commerce will be enhanced. This strategy will be the most environmentally benign and non-evasive option for the development of the city. However, this will lead to the densification of the urban areas. The main advantage of such densification will be the easy provision of viable and sustainable utilities and public transport systems.

3.7.2 Option Two – Spread Approach – Extensive Peripheral Growth

As with Option One, this option is also based on maximizing the use of suitable brownfield sites within the urban areas of the city, with the support of new greenfield sites at the edges of the urban settlements.

The main point of departure, however, is that it also considers expansion in Gilgit-rural: the rural mozas of Danyor, Sakwar, Minawar and Muhammadabad. The expansion into the rural areas will primarily be used for new housing units as well as religious spaces, recreational areas, health and education facilities.

A key advantage to consider, with this option, will be the employment-generating activities from the development of the new housing areas. Another aspect will be the impact of new housing units on the sectarian makeup of the city, and particularly the effect they will have on the tension and conflict among the different communities living within the city.

Development in the rural areas will have a detrimental effect on the environment, particularly through the conversion of agricultural land. Such development can also impact the landscape, biodiversity and areas of conservation on the city limits. This option will, therefore, require strong legislation and administrative measures for guiding development in an environmentally sustainable manner.

3.7.3 Option Three – Sustainable Urban Expansion

Option Three will consider areas for expansion in brownfield sites, both, within and outside the Gilgit city limits. The scale of the expansion areas is generally more than 10 ha. Development in these areas will be based on the 2025 population projections and address all aspects related to improving the quality of life and meeting the economic objectives of the city at the same time. Along with the 10 ha sites, smaller sites will also be considered across the city.

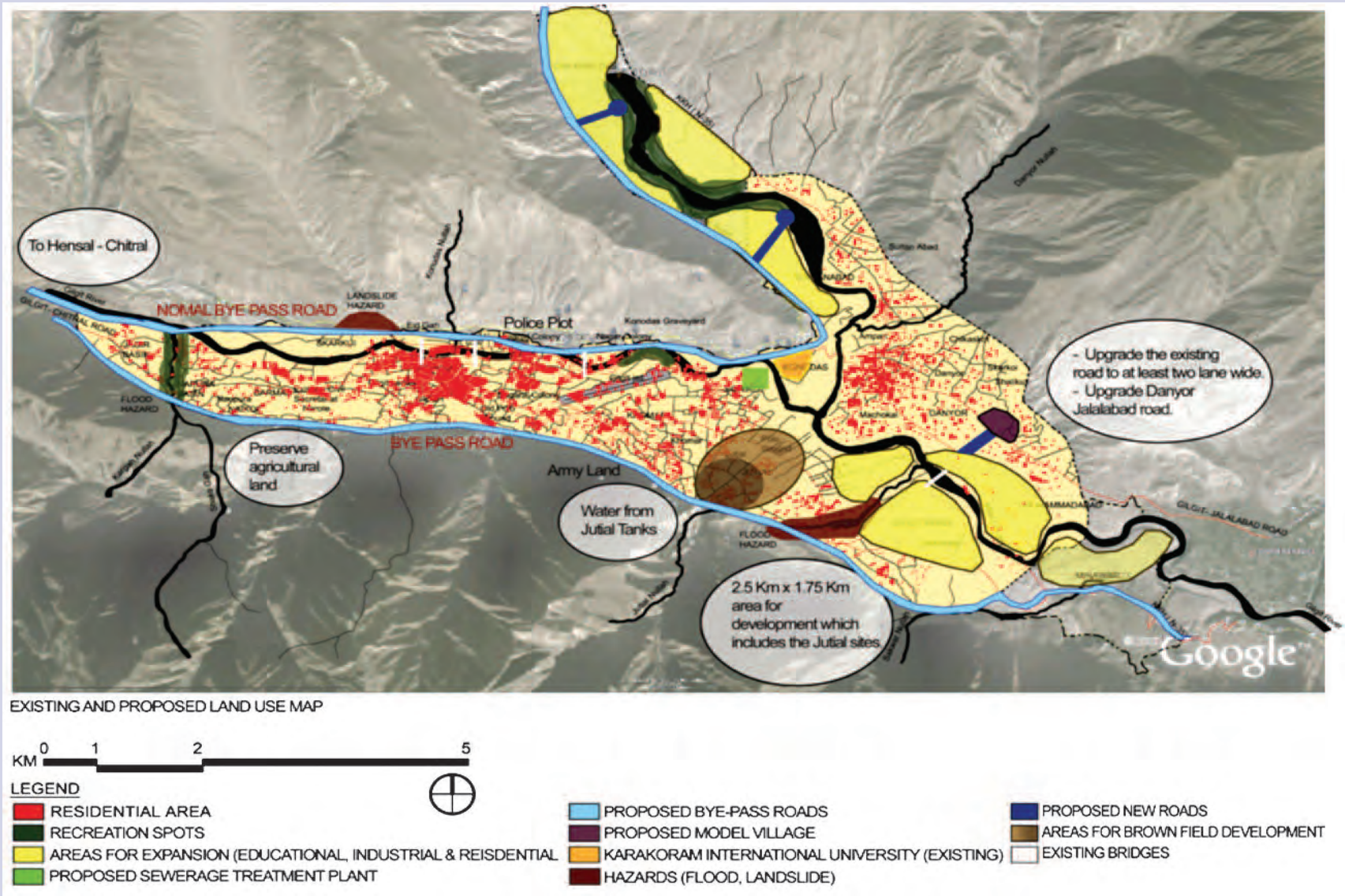
The selection of the development areas will be governed by the existing land use of a particular area and the existing infrastructure around it. Areas where the two complement each other provide greater opportunities for economically viable development.

While the areas of expansion may provide opportunities for mixed-use developments, they will largely be dominated by one major type of land-use activity, such as either residential or recreational activities.

3.7.4 Option Four – Mixed Use for Major Development Areas

Option Four also considers development on brownfield sites within and outside the city limits. However, it also considers expansion options

Exhibit 3.48: Proposed Strategic Concept Plan of Gilgit



using one or more of the greenfield sites outside Gilgit. Such an expansion is effectively the creation of a new town or settlement along with a wide range of uses and infrastructure services. The scale of the greenfield area required will be in excess of 100 Ha. Development in this area will create employment, retail outlets, recreation facilities and provisions for health and education.

For this option to be effective, considerable investments will have to go towards infrastructure. Implementation of this option will involve the loss of significant areas of greenfield, which raises the concern of the potential loss of green spaces and amenity areas. A development strategy of this nature will be required to address and enhance the existing biodiversity and environmental features of the city. Exhibit 3.49 summarizes the strengths and constraints of the four options.

3.7.5 Preferred Option – Option Four

Option Four is the preferred option for the consolidated spatial urban plan for Gilgit. It will form the basis of the final shape of the CMP in the next section. It provides a combination of the development of expansion sites outside the city and the densification of urban areas within it. It aims to preserve existing greenfield areas in the city.

The implementation of Option Four will have to look towards building avenues for economic growth that accommodate a target population of 330,724, in the city, in 2025, and a seasonal influx of tourists in addition to this figure. Demand for housing, land and water supply will also need to be provided for. The direction for growth of the city will need to be established so that land can be acquired at an early date. This will curb land speculation by developers. Road networks and transportation corridors will be established, along with sewerage and water networks. The issue of customary water rights in the city will also be addressed.

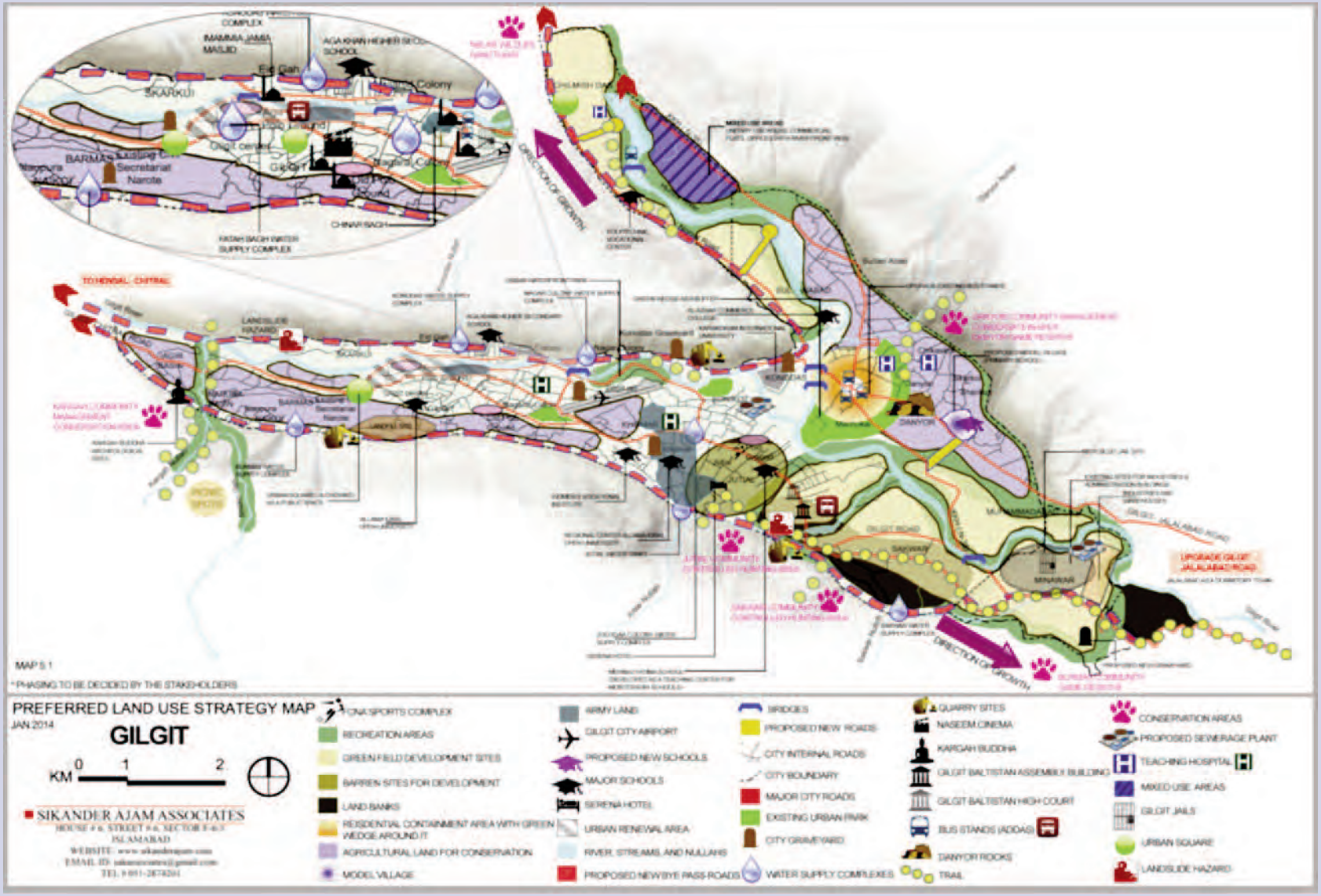
Pursuing this option will also include looking into generating sources of revenue through tourism and through user charges on utilities provided by municipal services in the city. A model tourist village can be developed to protect and enhance the environment of the city. A viable urban transportation system for the inhabitants also needs to be in place by then.

A substantial area totaling at least 200 ha of brownfield within and outside the city limits will be required to develop income-generation schemes, industries and warehouses, and schools (Exhibit 3.48). Existing barren sites towards Chilmas Das and Sakwar would be used as the expansion

Exhibit 3.49: Matrix Analysis of Spatial Options

Options	*Strengths*	*Constraints*
Option One: Limited Peripheral Growth	• Use of existing resources and facilities • Compact city plan • Pedestrian access to all facilities • City facilities are being used including infrastructure.	• Land to be made available • Barren land only within city limits • Increased pressure on the existing city center
Option Two: Extreme Peripheral Growth	• City facilities are being used including infrastructure. • Pressure on city center reduced	• Availability of barren land within city limits.
Option Three: Sustainable urban expansion	• Compact planning, but some additional facilities will have to be provided	• Land availability
Option Four: Mixed Use of Major Development Areas	• Has both brownfield and greenfield sites, leading to flexible options	• Availability of a large tract of barren land, in close proximity to Gilgit, that has good links to the city

Exhibit 3.50: Preferred Land-Use and Strategy Plan for Gilgit 2025



areas outside the city. Development in Sakwar will blend into the peripheral development of Jutial. In the process of development, the water issues of Jutial will also be resolved.

3.8 Preferred Land-Use and Development Strategy for Gilgit 2025

In the previous section, Option Four was selected as the preferred urban spatial strategy for development in Gilgit. This section provides detailed recommendations for growth and development, in the city, based on the preferred strategy. Future work on any comprehensive master-planning exercise for the city is expected to build on the preferred land-use and strategy plan for Gilgit elaborated in this section.
The preferred land use and strategy plan for Gilgit, illustrated by Exhibit 3.50 and Exhibit 3.51 on a map of the city, is dynamic and adaptable to both the current and future needs of the city's residents and administration. In order to develop the city in the future, according to the preferred strategy, some of the existing undesirable land-use practices must be immediately stopped. Gilgit has a tendency to follow a linear, ribbon development pattern, which will leave the land behind the developed areas locked and inaccessible.

The topography of Gilgit also provides additional constraints. The city is located in a valley and has two entry and two exit points. In the past, these four points have suffered directly and indirectly from natural disasters. To the north are mountains prone to landslides, and towards the east, west and south, seasonal streams or nullahs have a tendency to occasionally flood during heavy rains. The Mujahid Colony is one example of an existing residential area, on the base of the northern mountains, comprising people from very low socioeconomic backgrounds. This colony, and similar areas exposed to natural hazards, must be accounted for in the future development of the city. Exhibit 3.52 indicates existing hazard zones within Gilgit.

Gilgit has two major rivers and several natural nullahs that can adequately provide drinking water for the population. Due consideration must be granted towards regulating the use of the nullahs to reduce the high level of pollutants in them. Several treatment plants are located across the city (Exhibit 3.53). These must be developed in an integrated manner, as recommended in the preferred strategies for development in Gilgit (Exhibit 3.50).

The preferred land-use and development plan for Gilgit, going into 2025, places health and education as a priority for the CMP. The existing infrastructure for health and education can be seen in Exhibit 3.54. The existing mismanagement of development in the city and the abysmal condition of the municipal services has resulted in deteriorating health of the inhabitants. The incidence of water-borne diseases and respiratory illnesses are high. Existing medical services in the city are not sufficient to provide for population growth within the next 10 years. As far as literacy is concerned, Gilgit has one of the highest literacy levels within Pakistan. This is a precedent that needs to be maintained in the future. The expansion of Gilgit on both its axis provides the necessary space to develop educational and medical facilities.

Exhibit 3.50 provides a detailed illustration of the preferred land-use strategies for development in different parts of the city. It puts forth the future growth directions and other development options. The following sections explain in detail the development in different parts of the city. In order to implement the preferred strategies, strong legal and institutional frameworks will be required, along with a sound financial sustainability plan. These are discussed in Sections 4 and 5 respectively. At present, Gilgit faces environmental degradation. And if not checked now, it will end up like most metropolitan centers of Pakistan with major issues that range from loss of administrative control on government land leading to encroachments, to infrastructure dilapidation, land-use violations and civic insecurity. The city is also a potential hub for the tourism industry and if properly tapped will provide locals with a vital source of income.

Exhibit 3.51: Preferred Growth-Areas Plan for Gilgit 2025

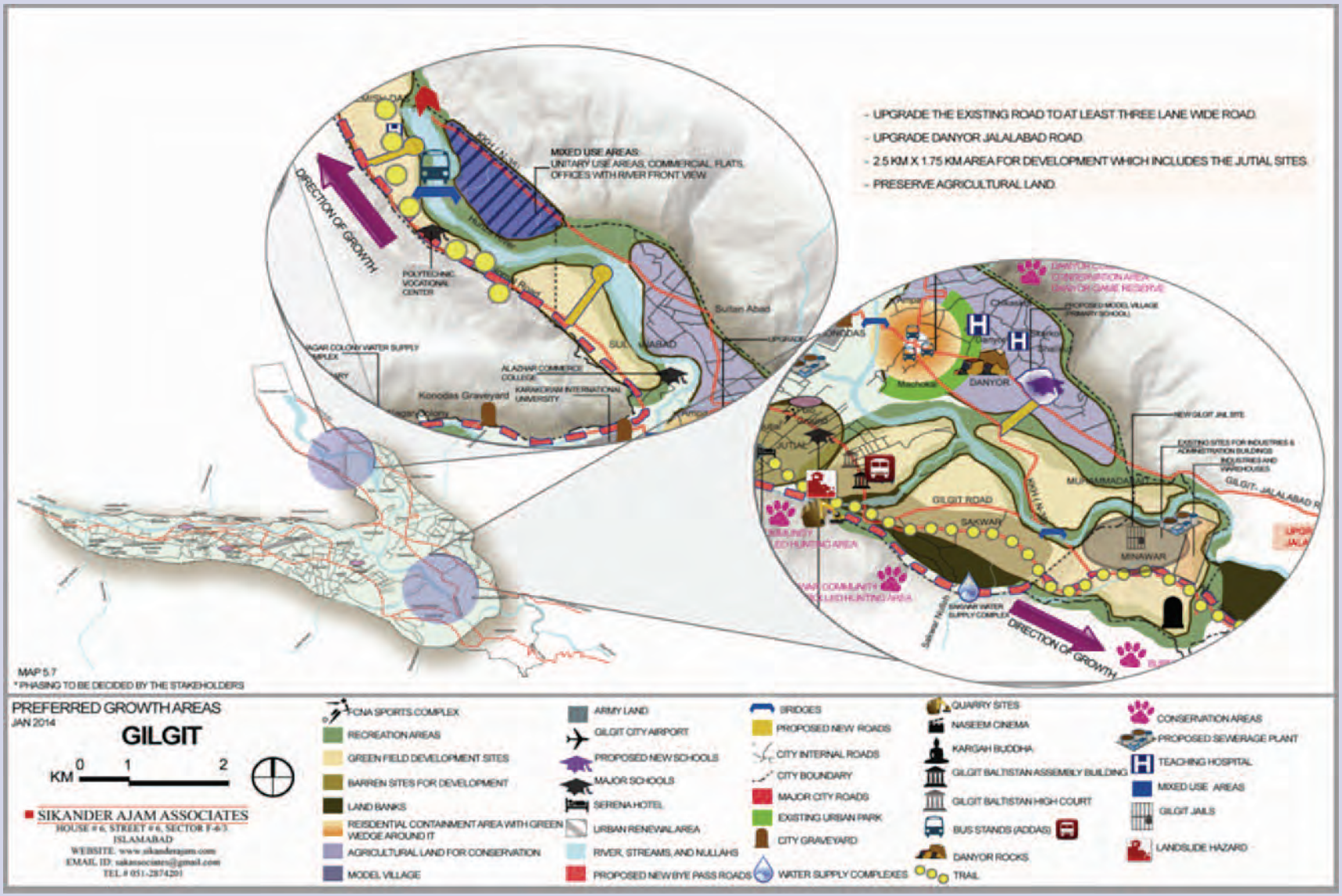


Exhibit 3.52: Potential Hazard Zones within Gilgit

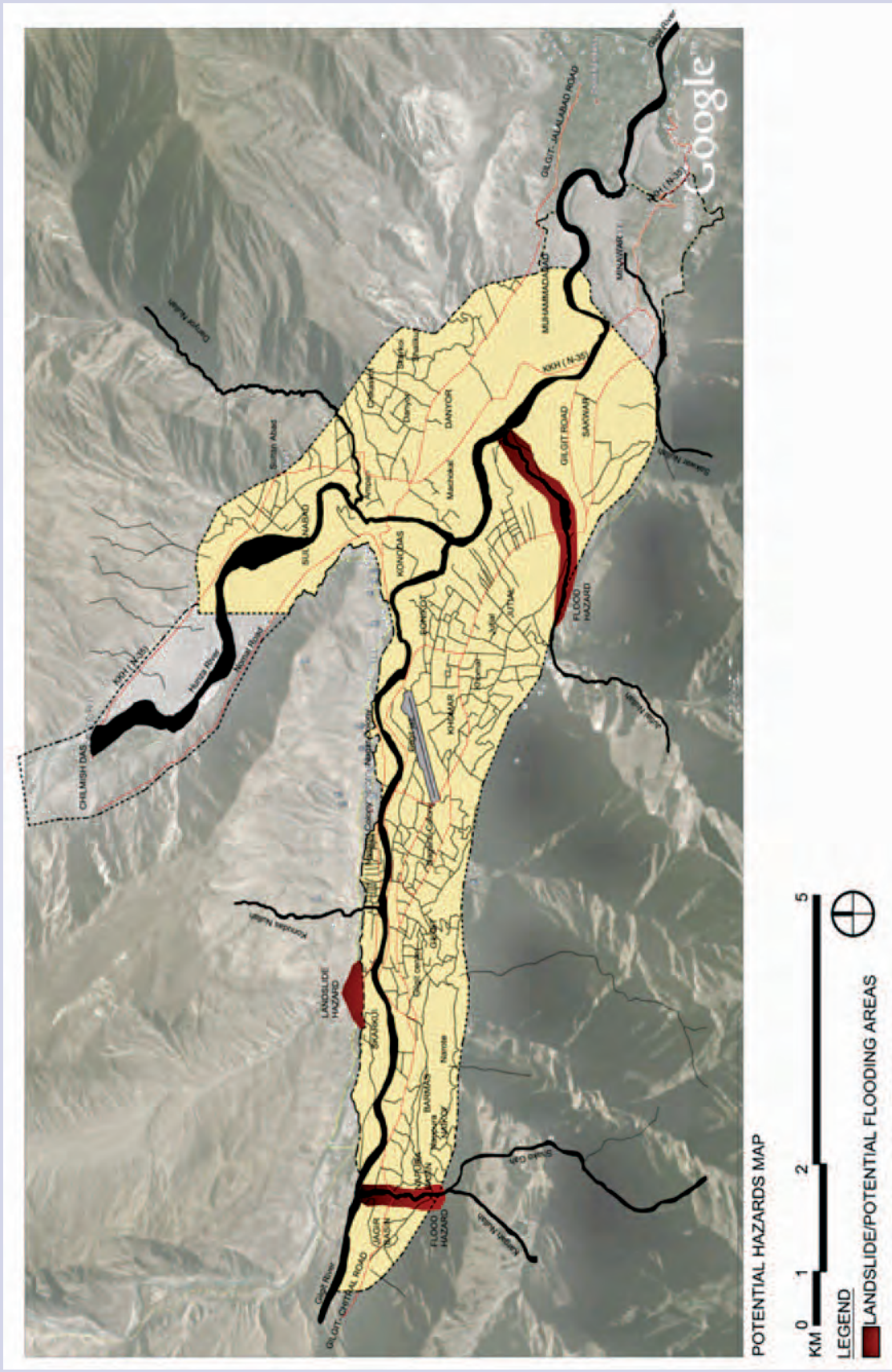


Exhibit 3.53: Existing Water Supply Complexes within Gilgit

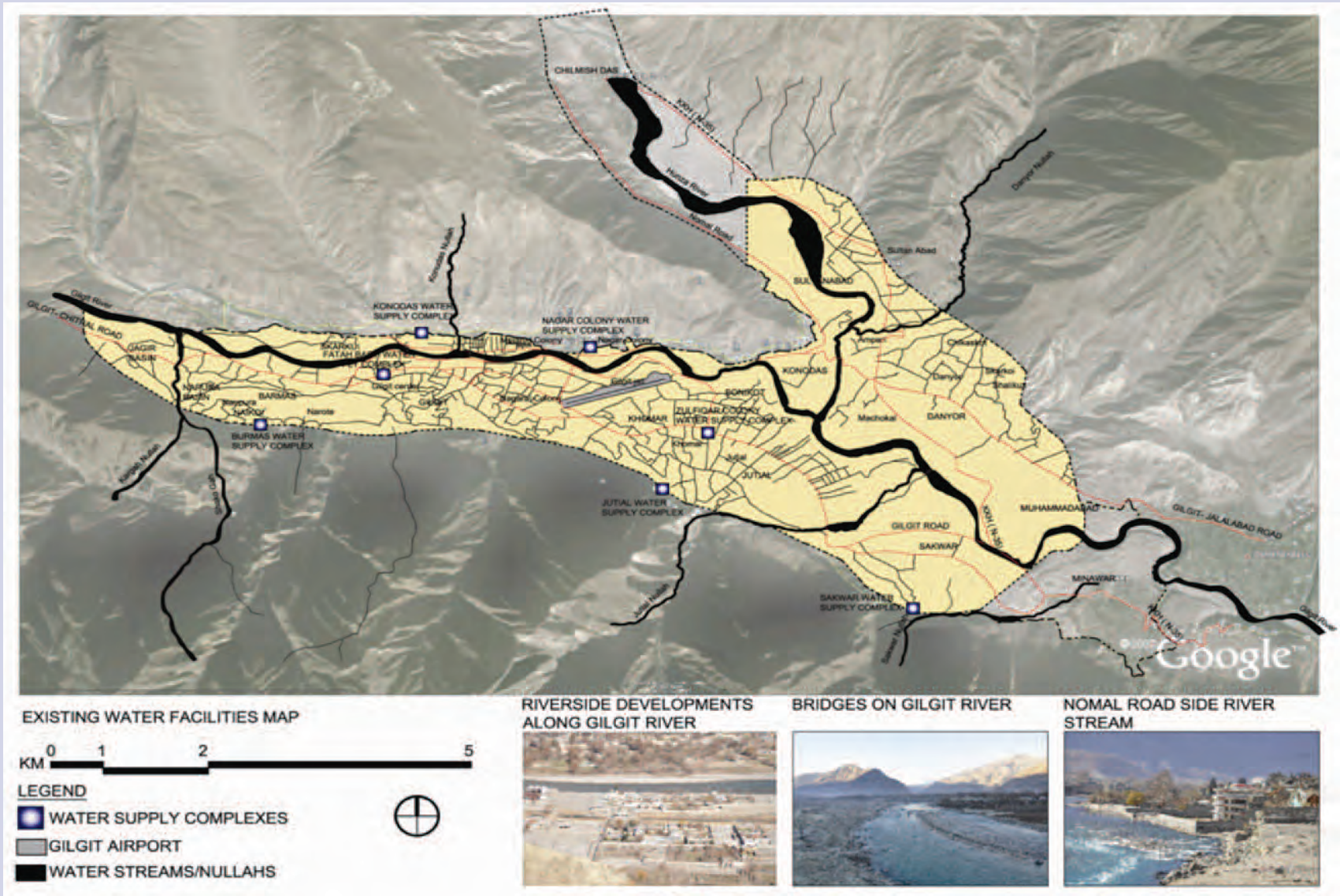


Exhibit 3.54: Existing Health and Educational Facilities within Gilgit

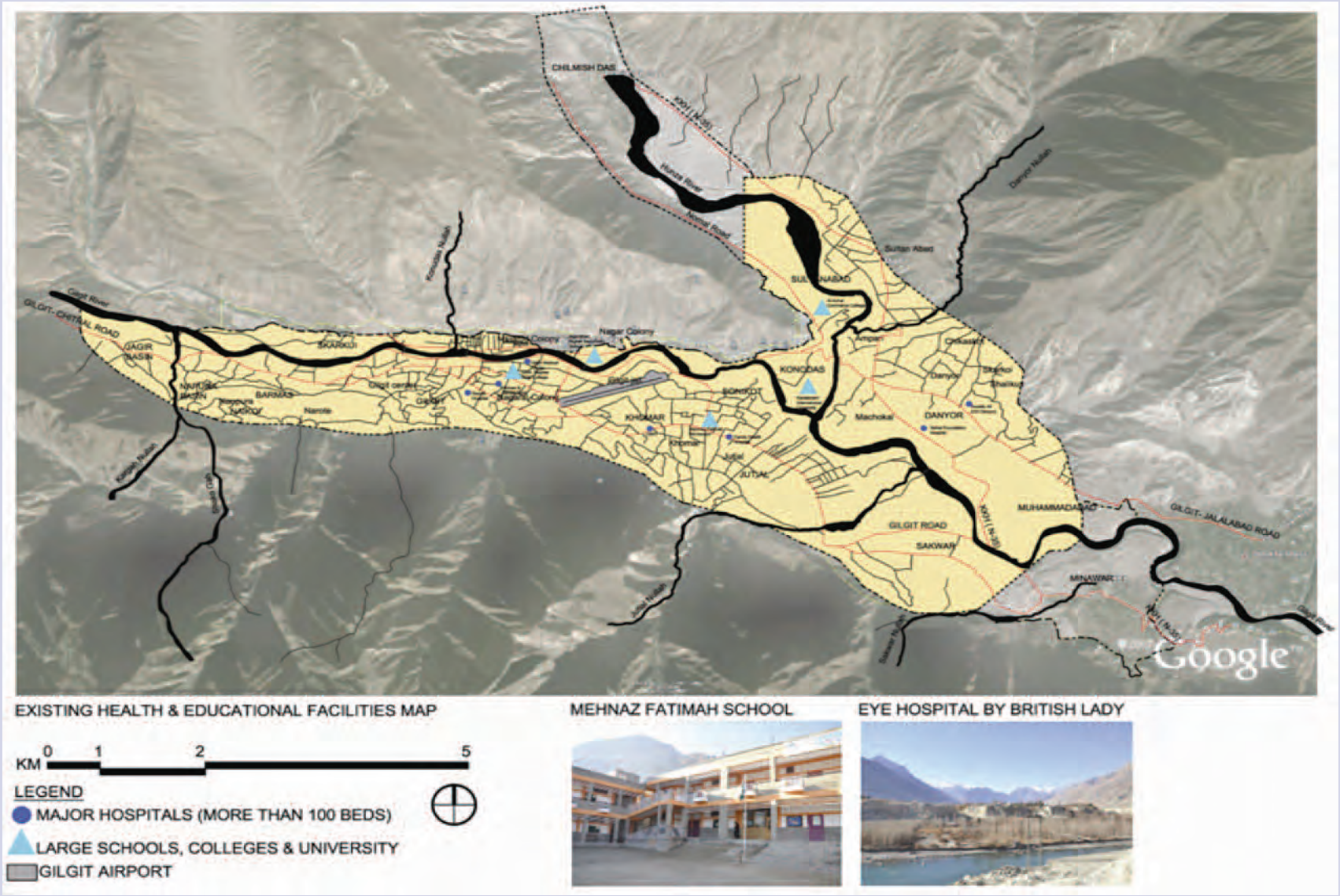


Exhibit 3.55: Conceptual Master Plan 2025 Recommendations

Strategy	*Recommendation*
Land-use Zoning and Strategy	• Expansion of plan towards Sakwar on barren land • Urban infill on barren land close to Gilgit. Peripheral growth • Extensive peripheral growth
Transportation Plan	• Development of two bypass roads • Upgrading the main roads • Removal of encroachment along the main transport corridors for ease of traffic flow
Urban Transport	• Improve urban transportation facilities and routes.
Education	• Provision of the following • 2 boys' schools + colleges • 1 girls' school + college • Vocational institute • Boys' institute located in Chilmas Das • Girls' institute to be located within the city area • Teaching hospital and nursing school
Health	• Upgrading of the District Hospital to a resourceful start • Teaching hospital to be setup • Upgrading of the existing eye hospital
Housing	• Establishment of a new housing/residential sector self-contained • Housing colony for government employees
Recommendation/Tourism	• Establishment of playing fields • Football field/stadium/swimming pool
Tourism	• Development of the model village, for tourists, with regional architecture typology • Walking tracks/cycle tracks connecting various sites • Development of trails along the Nullah, bird-watching sites • Developing picnic spots along the riverfront and Kargah Nullah, Kargah Buddha, Danyor stones and the Taj Mogul monument
Bio Diversity Sites	• Intensify Bio-diversity sites along the conservation areas. Visit to animal sanctuary vantage points
Industry	• Establishment of warehousing, packaging and packing plants for fruit preservation • Traditional Industry and its further value-added items
Riverfront Development	• Riverfront to be developed as a strategic asset to be enjoyed by all
Water Supply	• Water to be seen as a serene reserve to be supplied to all • Community has first right • Other communities on payment for water rights

Strategy	Recommendation
Sewerage	• Establishment of zonal sewerage-treatment plants. Disposal of treated effluents • User charges to be introduced
Legislation	• Legislation for riverfront development • Classification of agricultural land within the urban area
Financial Aspect	• Payment of user charges
Urban Agriculture	• Funds generated from new development • Water-supply charges to communities • Urban agriculture to be developed and that will compete with other land usages Model units to be made • Pilot project shall be set up for the farmers to learn from new modes of urban agriculture, to be made operational, that cross over applications between agriculture, sports, tourism, and leisure, and shall be part of any strategy

Exhibit 3.56: Benefits of the preferred Scenario

Parameter	Benefits
Brownfield Sites on Periphery	• The use of brownfield sites only is not recommended as a holistic approach; both greenfields and brownfields are to be included • Compact city centre for pedestrian use
Barren Sites Peri-urban Areas	• Barren sites are advocated for development, thereby saving agricultural areas • Sustained urban growth through site identification and assessment
Urban Agriculture	• Improving the sustainability and economic condition of small urban agricultural land holdings: Bringing it at par with other land usages • Integration of the local customs and traditional diet within the future Master Plan • Social integrity to be conserved; protection and continuance of the existing practice of urban farming
Growth Directions	• Two growth directions instead of one. Flexibility in the plan; more amenities and opportunities • Spread approach instead of ribbon growth along roads • Access to limited lands and those areas serving as potential land banks
Urban Renewal Area	• Opportunities for urban-renewal sites identified • With action plan areas, greater economic opportunities • Proposing a city-center square
Regional Bypass Transit Corridor	• Unimpeded traffic flow through transport corridors without negatively impacting Gilgit city • Regional dry port potential around main highway
Present Trends	• Following existing growth trends towards Sakwar
Economic Opportunities	• Are enhanced with greater sustainability • Provision of employment opportunities through trade and service sector upgrading • Industrial zone proposed

Parameter	*Benefits*
Reduce Ethnic Tension	• Enhanced and distributed civic activities • Smaller mosques
Institutionalization	• Legislations governing land resource • Increase in tax net through formalization of space and activity
Transport	• Inclusive strategy • Facilitate environment-friendly strategy
Connectivity	• Multiple entry and exit points into the city • Provision of air, surface linkage with the rest of the country • Inter-city connectivity through looped transit corridors
Recreational Facility	• Revenue-generating, self-sufficient activity • Social space provision • Adapted use of existing, underutilized recreational spaces
Biodiversity	• Provision of new spaces for local flora and fauna to flourish • Protection and preservation of existing species through legislative measures • Preservation of natural habitat • Controlled development within biodiversity-sensitive zones
Regional and Indigenous Architecture	• Preservation of the indigenous building form through the model-village concept • Legislative support for the local building craft
Human Resource	• Opportunities for both vocational and mainstream education • Local craftspersons to be trained in entrepreneurship
Community Empowerment	• Stakeholder participation in all decision making. • Citizen ownership of the city
Financial Self-sufficiency	• City to generate its own revenues through services provided
Regional Icon	• In terms of service and infrastructure provision • Architectural articulation to be formalized through legislation • Strong administrative support for development initiatives • Centre for trade and industry (formation of regional chamber of commerce)
Bio–diversity	• Provision of new spaces for local flora and fauna to flourish • Protection and preservation of existing species through legislative measures • Preservation of natural habitat • Controlled development within bio-diversity-sensitive zones

Areas of urban agriculture are to be saved and further developed so that they can compete with other land usages; land is to be rearranged in terms of co-operative farms with access to markets. Thus, the challenge for the CMP is to find out how new modes and types of peri-urban agriculture can be invented, implemented and accepted by the stakeholders and a more sustainable agriculture can be conceived and applied, through a multilayered agricultural strategy that will anchor urban agriculture as an important objective in the urban and regional Master Plan of Gilgit city. The following are general recommendations for sustained urban farming in Gilgit:

- Bio-farming and greenhouse farming.
- Diversification of marketing.
- Contracts negotiating co-operative ownership of land and produce.
- Reusing wastewater as an agricultural input.

All of the above are important elements of any viable urban agriculture strategy, including farming cooperatives and the rearranging of land in terms of its use.

3.8.1 Land values

Before any work on the comprehensive master plan is conducted, one of the very first tasks, for the government authorities in the city, is to complete a land-evaluation exercise of the key sites in the city.

Some of the key sites will be where future development of the following facilities will take place:

- Gymnasiums
- Parks
- Riverfront areas for restaurants
- Commercial zones
- Water tourism
- Other recreational areas

3.8.2 Candidate sites for consideration

Exhibit 3.57 provides an illustration of Gilgit's administrative boundaries, or Mozas. In formulating the preferred option for development in the city, different brownfield and greenfield sites were identified as candidate sites in and outside the city. Based on the area of these sites, they are split into "Strategic Sites," which are over 75 ha, and "Non-Strategic Sites," which are under 10 Ha. These sites will be discussed in detail in the following sections.

For the future detailed Master Plan of the city, a two-phased screening process for the selection of candidate sites is strongly recommended. Stage I of the selection process will involve engineering and technical assessments of potential sites. The assessment process must consider potential hazards and threats to development on the candidate sites. Stage II will provide all relevant stakeholders, in the development of the city, an opportunity to participate in the final selection process. Considering the army owns large tracts of brownfield land in the city, it must also be involved in the site-selection process.

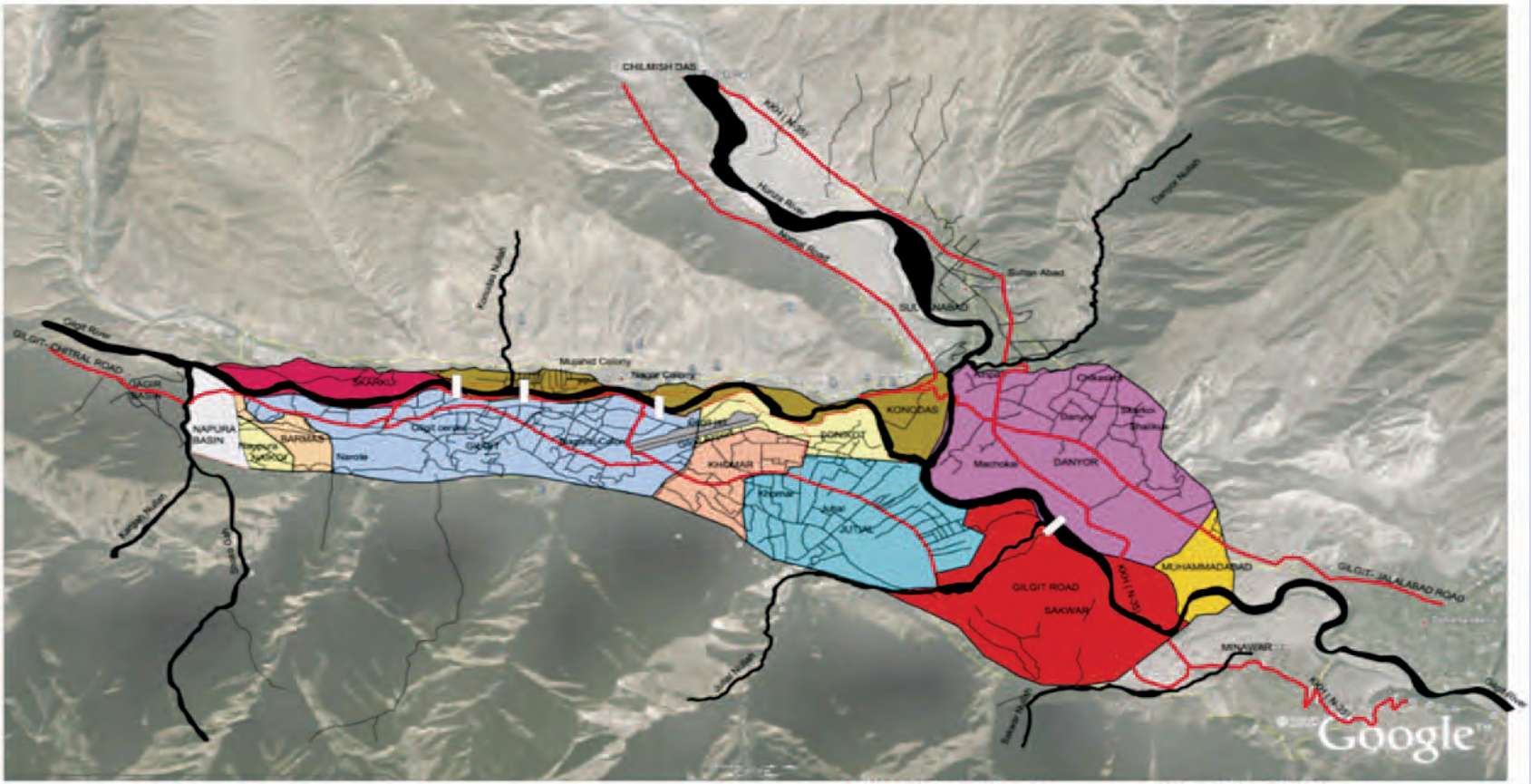
Brownfield Sites

Over time, Gilgit has developed linearly along the northern and southern banks of the Gilgit River. The major brownfield sites in the city are on the southern bank and include the city center—first developed by the British during the colonial era—the airport, Jutial, and the inter-city bus terminal area.

Some of the constraints involved in utilizing this land for development will be:

- The propensity of sectarian clashes in the area
- Limited space for future expansion due to single-lane road width
- Open and green spaces hidden behind high walls and commercial outlets
- Agricultural land

Exhibit 3.57: Gilgit Existing Mozas/Administrative Boundaries



EXISTINGMOZAS/ADMINISTRATIVE BOUNDARIES MAP

KM 0 1 2 5

LEGEND

- DANYOR
- MUHAMMADABAD
- SAKWAR
- KONODAS
- JUTIAL
- SONIKOT
- KHOMAR
- GILGIT
- SKARKUI
- NAIKOI
- BARMAS
- NAPURA BASIN
- MAIN ROADS - (PRIMARY)
- BRIDGES

BARREN LAND AT JUTIAL

BROWN FIELD LANDS

The city center consists of mixed-use development and comprises commercial, residential, recreational and religious facilities. The inhabitants dwelling in the brownfield area in the city center predominantly belong to the Shia community. There are significant parcels of agricultural land, in this brownfield area, that are used for subsistence farming. Most amenities are also located close by.

There is a considerable amount of greenfield area near the airport, particularly south of the runway. Any future development in this area must, first, be approved for suitability to airport operations by the concerned aviation authorities. The City Park is also currently located at the end of the runway. If the runway is extended, the City Park must be relocated somewhere close to the city center and the Shaheed-e-Millat Road will have to be rerouted around the extension.

The green plains around the airport are very fertile and should be developed into a source of agricultural produce for subsistence farming for the residents. A large amount of empty area in the same direction is owned by the army. These lands should be incorporated into the development plans of the city through coordination with the army.

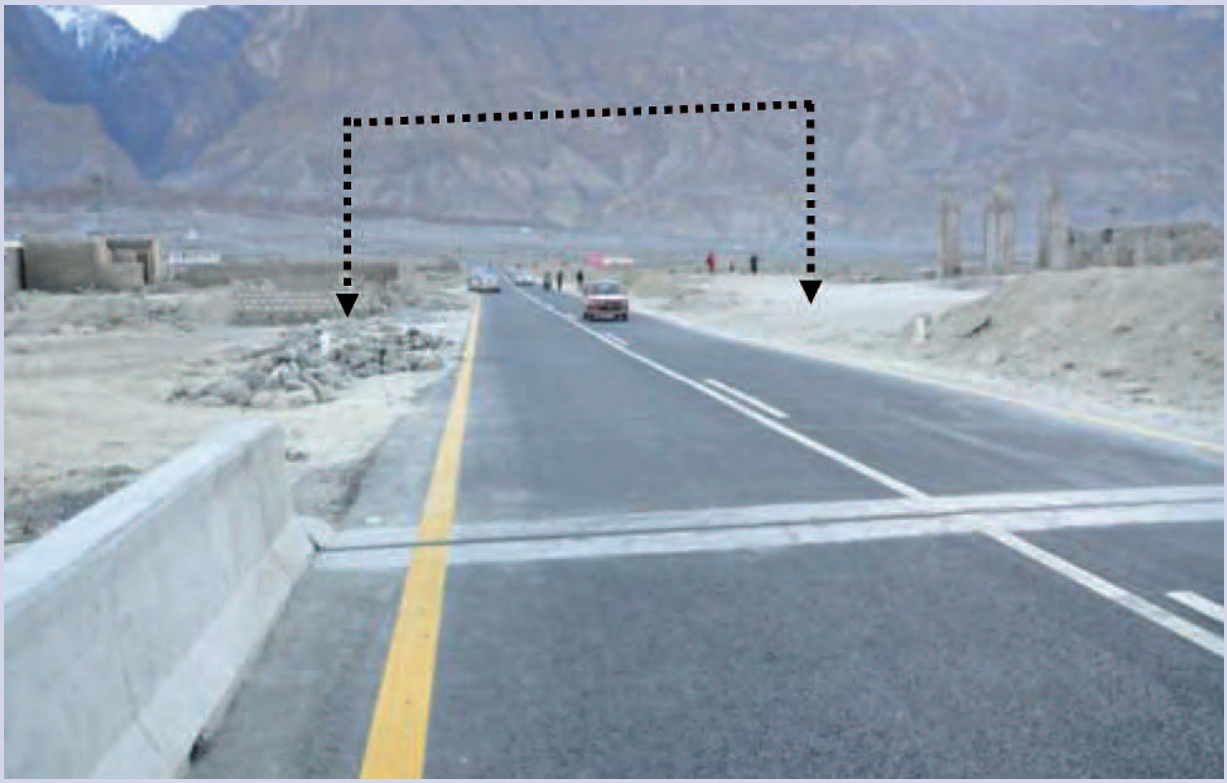
A mix of communities inhabits the areas of Jutial and Kaunas, in Gilgit.[210] While there are no sectarian conflicts here, there is trouble between the communities on the issue of water rights.

Exhibit 3.58: Greenfield Land in Barmas

210. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology, 2011)

Exhibit 3.59: Barren Land in and around old Jutial Nullah

Exhibit 3.60: Road coming from KKH (right-of-way is 40 feet wide) showing markers



Other constraints in some of the areas towards the south of the city, close to the nullahs or mountain slopes, are from natural hazards. Some of the residential areas in Jutial, close to the Jutial Nullah, are at risk of being exposed to floods from the nullah.[211] Development in such areas needs substantial remedial measures in terms of landslide and flood protection.

Brownfield sites on the northern bank of the Gilgit River include the area on the Kaunas Plateau, Mujahid Colony, the city courts, the Eid Gah and the KIU. There are some constraints in utilizing these sites for development. Solid waste is currently being dumped and burnt in an open dumping site close to the KIU on the University Road. The area on the northern bank close to the mountain slopes is also prone to landslides.[212]

An existing sewerage-development plan has been designed by the Public Works Department (PWD) in the area, however, construction work has not yet started. Choosing this area for brownfield development, therefore, provides the opportunity of modifying the existing plan to provide for larger developments. The provision of water and electrical utilities can also be made a part of the sewerage plan. A treatment plant can also be added to the plan to treat waste from the new developments in the area before it is disposed into the Gilgit River.

Development in some of the brownfield sites, particularly along the Nomal Road, will require the construction of new roads to make these areas accessible. The government will also be required to acquire the land for development and to ensure there are no community claims over it.

Greenfield Areas – Danyor and Sultanabad

Exhibit 3.62 lists the area of land available for greenfield development in the various Mozas. Danyor and Sultanabad are prime greenfield areas with agricultural fields that form a vital part of the

Exhibit 3.61: Photograph showing Danyor in Autumn

211. UN sustainable urbanization report
212. Karrar and Iqbal, Gilgit Report, (UN– Habitat & Department of Architecture and Planning, NED University of Engineering and Technology,2011)

agrarian economy of the city. These areas are a source of vegetables, for Gilgit, for at least six months of the year. The Danyor Nullah supplies both areas water for drinking and irrigation. Water can also be pumped up from the Gilgit River, which flows nearby.

These areas are close to the KKH, Nomal Road, and the Gilgit–Chitral Road. If strict development controls are not exercised, regarding site development and building construction, these areas would be under great risk of either becoming prey to urban sprawl or to speculative development. Heavy traffic on the KKH will effectively cut both Danyor and Sultanabad into two parts. In order to protect these areas, the section of the KKH that passes through or close to Danyor and Sultanabad should be rerouted. If that is not possible, remedial policies will have to be formulated.

The part of Danyor to the west of the KKH can be utilized for mixed use, while protecting the eastern bank of the Gilgit River. This area should be marked as a conservation area and the forest cover in it should be preserved. If this site is left vacant, it will be difficult to control urban sprawl into it.

The new provincial secretariat of GB is being constructed close to the inter-city bus terminal near Jutial. This 2 km-by-15 km strip of land will, therefore, see a lot of associated development take place around it. This area is barren and does not have any cultivated land or significant water rights. Thus, this area is a prime greenfield and the total area available for development here is about 3000 kanals. The area next to the GB secretariat and the road may be planned to include an open space for communal activities such as a town hall. The establishment of the secretariat will also lead to accelerated, haphazard development leading to urban sprawl, in this part of the city, if adequate planning is not undertaken.

Exhibit 3.62: Area available for Greenfield development in various Mozas [213]

Area / Moza	*Area in Kanals*
Jutial	500/1000
Khomar	100
Nagral	200
Amphary	200
Naikoi	500
Barmus	1000
Nupura	1500
Basin	Near River 2000
Chilmas Das	3000
Sakwar	3000/4000
Minawar	3000/4000

213. The above information was taken from Mr. Arif Hussain Zameer from the GDA and the site has been visited on ground as well. For the CMP study, the above mentioned available land use will have to be confirmed, on the ground, through acquisition of prime data from the site.

Exhibit 3.63: Boys playing on barren land at Naikoi, a Peri-Urban Site

Exhibit 3.64: Danyor area from Jutial showing barren land and fertile Danyor Valley

3.8.3 Sakwar – Greenfield

To the east of the Jutial Nullah, and between the Gilgit River and Sakwar Nullah, is the Moza of Sakwar. The population densities are not very high here as, in the past, the nullah has flooded the area. Sakwar has a high potential of serving as a greenfield site.

Sakwar is located at the tail end of the Shahrah-e-Quaid-e-Azam Road, which leads to the city center and Raja Bazaar and is one of the main commercial roads of Gilgit. The road also goes through the army land, in the city, thus splitting it into two large parts. Any expansion of the road into three or four lanes will, therefore, require approval from the army.

The Shahrah-e-Quaid-e-Azam Road is one of the major roads in the city and it should be widened to four lanes with proper medians, bylanes and bus stops up to the point where it currently connects to the KKH. A T-junction should eventually be designed where the two roads connect. Until then, a large roundabout at the location will suffice.

The development around the road should be mixed use and include warehouses or light engineering industry with housing and some commercial areas. Mitigation measures for natural hazards, such as flooding, must be incorporated here and land-ownership disputes between the government and the locals must be resolved. Most of this land is currently barren and suitable for development.

It is also recommended that the Moza boundary for Sakwar be extended towards the Sakwar Nullah. In that way, more land will be available for development, thereby taking pressure off Danyor, which is a prime agricultural area vital to the economy of the city.

Exhibit 3.65: Sakwar barren sites greenfield area.

3.8.4 Muhammadabad – Greenfield

The Moza of Muhammadabad is to the east of Danyor and has the Jallalabad road passing along its northern boundary. This greenfield site has good agricultural land and should be developed as a future land bank. The GDA can purchase this land in anticipation of a future rise in land prices due to surrounding development.

The boundaries of Muhammadabad should be extended towards Oshkhan Das, along the Gilgit River, and legislation should be passed to protect vegetation and biodiversity there against development and encroachment. Adequate safeguards will be required for controlling developments, particularly along the Jallalabad Road.

3.8.5 Urban renewal of the City Center – Brownfield

While there is no official demarcation of the area referred to as the city center in this report, to locals, it is the area where the Raja Bazaar is located. There are two major mosques in close vicinity here and a polo ground between them (Exhibit 3.66).

The city center is prone to waterlogging, and there is an urgent need for a proper sewerage system to be developed here. There is a web of disorganized overhead wires that run across the city center and which are not only a visual nuisance but a source of danger to pedestrians. These need to be properly routed through underground channels.

Exhibit 3.66: Raja Bazaar area behind which is the polo ground

Façade treatment and urban-design guidelines should be formulated for development in the city center based on the following factors:

- Height of buildings
- Façade material
- Roof and walls insulation
- Fenestration size of openings and its treatment
- Building lines and the articulation of façade guidelines
- Car parking, garages with plans for revenue generation
- Upgrading of narrow streets, sidewalks, pavements, car parking and services
- Controlling waterlogging in the area (here the municipal utilities have completely broken down in terms of sewerage and garbage)
- Chinar trees to be protected.

The polo ground and the area around it should be opened up and the surrounding area developed as a city park. The Gora Kabaristan (Cemetery) should be recognized as a site of cultural heritage and renovated and properly maintained. Three water channels run through the city-center called the Upper Khul, Lower Khul and Sardar Khul. These flow from the Kargah Nullah and supply drinking water to the city-center. The renewal and maintenance of these channels should form an integral part of urban renewal strategies.

If modern urban principles of development are followed in earnest, Gilgit's city center will become a vibrant place for tourists, hotels, shopping and restaurants. Visitors staying at different hotels in the city will travel to the city center to enjoy the culture, activities and food. The city center will, therefore, become the biggest economic engine for the entire city. This opportunity must be seized by the community and the city center must be renovated along modern urban-design strategies.

Exhibit 3.67: Waterlogged area outside Raja Bazaar

3.8.6 Recreational Parks

Major new city parks and smaller recreational areas should be developed next to the riverbanks close to the city center and the nullahs around the city. The parks should be accessible by public transport and should be designed to blend in with and enhance the local landscape.

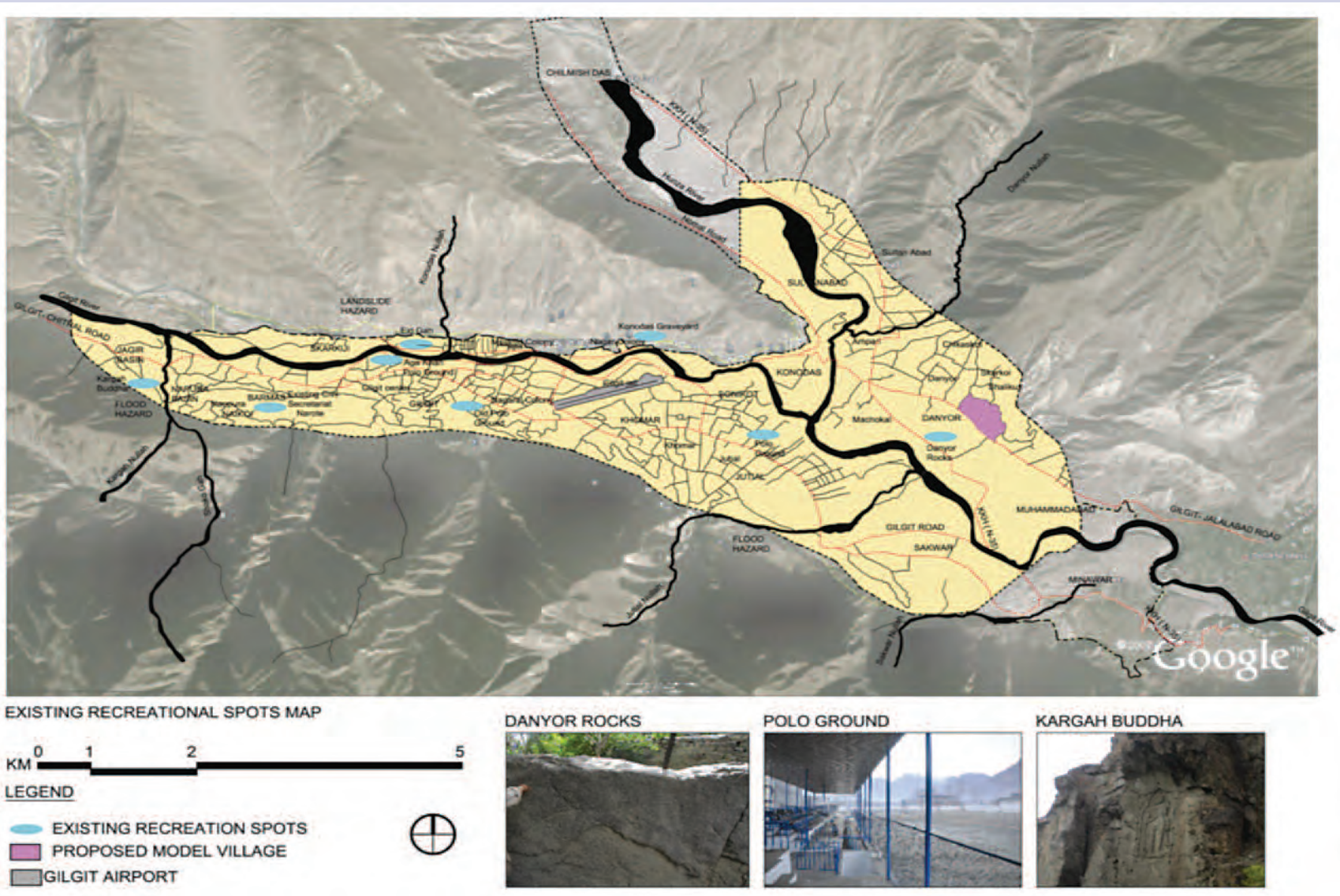
Exhibit 3.69 indicates the existing recreational spots in and around Gilgit. It also marks the locations of known tourist spots in the city such as the Danyor Rocks in Danyor Valley, the polo grounds—both existing and new ones— and hiking attractions. Gilgit also has a vast range of archeological sites, such as the Kargah Buddha and a museum housing ancient Buddhist manuscripts.

A recreational circuit should be developed that connects all the existing recreational facilities and tourist sites in the city. The circuit should be based on easy access of all the locations on the circuit via public transport, walking trails and biking tracks. The circuit should also be linked to the major commercial and residential areas of the city. It should also ensure that the disabled are accorded an equal opportunity to enjoy the recreational facilities the city has to offer.

Such a circuit will guarantee all inhabitants equal participation in the economy of the city. It will also ensure revenue generation from tourism is spread throughout the city.

Exhibit 3.68: Dilapidated condition of buildings: No character, no preservation evident with overhead lines, no Chinar trees.

Exhibit 3.69: Existing Recreational Areas / Spots – Danyor Rocks images taken from http://www.flickr.com/photos/edanial/10381270363/



EXISTING RECREATIONAL SPOTS MAP

KM 0 1 2 5

LEGEND

- EXISTING RECREATION SPOTS
- PROPOSED MODEL VILLAGE
- GILGIT AIRPORT

DANYOR ROCKS

POLO GROUND

KARGAH BUDDHA

3.8.7 Bicycle Trails

As Gilgit is mostly flat and not more than 17 km long, a network of bicycle trails should be developed throughout the city. The network can be a mix of dedicated bicycle tracks and bike lanes on the roads. Not only will this accommodate the inhabitants of the city, especially in the summer, it will also be a massive source of tourist activity across different parts of the city. Exhibit 3.70 shows the Scenic Bike Trails in Barmas.

3.8.8 Tourist Attractions

The tourism industry is expected to grow in the future and has the potential to become a major sector of Gilgit's economy. To ensure the city can reap maximum benefits from its tourism potential, particularly in the summer months, all development in the city must preserve all of Gilgit's features that are a source of attraction for tourists. New development in the city must also ensure Gilgit can maximize the benefit of being the first stop for visitors travelling further up the province of GB. Tourism within the summer months will play an important role in Gilgit's future prosperity.

The following sites in Gilgit need to be developed as major tourist attractions.

- Kargah Buddha (Exhibit 3.71), 3 Stupas and archeological sites in the city.
- Taj Moghul Monument.
- Rocks with ancient inscriptions at Danyor found on private land.
- Development of hiking and walking trails towards the tourist attractions mentioned above.
- Bird watching – sanctuaries to be developed along the nullahs with grass, shrubs and tree cover from where birds can be seen and heard.

Exhibit 3.70: Potential for scenic bike trails in Barmas

- Visits to biodiversity and conservation areas.
- Development of a public square in front of the polo ground in the city center (Exhibit 3.72).
- A tourist village in the city.

A large tourist village should be developed around Danyor. The main objective of the village will be to preserve the agricultural fields and green areas in that part of the city. The village will be readily assimilated into the landscape. It shall provide demonstrable environmental, social and economic benefits that outweigh any harm caused to the area in which it is located. And it is to be accessible by public transport from the regional and national transport corridor. Easy accessibility will be a prime concern for the location of the model village. It will enhance local building skills and the provision of restaurants will contribute to the sustainability of Danyor. Bed and breakfast motels can also be developed, here, in the same architectural style as the local villages.

3.8.9 Minerals and Quarries

Gilgit has a diverse geology with a large range of minerals and aggregates that includes sand and gravel, limestone, sandstone, granite and igneous rocks. Stone and sand mining quarries are visible at the riverbanks and the slopes of the mountains surrounding the city.

It is, therefore, important that a geological classification is conducted, which identifies the different parts of the city prone to quarrying and mining activities. Doing so will allow the GDA to carefully control where such activities can be carried out and restrict others that may potentially adversely affect the environmental features and development plans of the city.

Exhibit 3.71: Kargah Buddha to be conserved as a tourist attraction

3.9 Avenues for Revenue Generation in Gilgit

In order to make future developments in the city financially viable, avenues for revenue generation need to be designed and developed for the relevant government departments. One of the primary sources of revenue will be in the form of "user charges" for various services the city administration provides to the inhabitants. Some of the services for which user charges can be collected are as follows:

- Charges for water delivered directly to houses or to a central point in a residential neighborhood
- Charges for sewerage disposal, which includes its collection and treatment
- Charges for solid-waste disposal and its treatment
- Road-user charges on some parts of the road network in the city such as:
  - Parking charges
  - Toll tax on bridges
  - City-center congestion charges

Revenue can also be generated, by the GDA, by selling newly developed commercial areas in the city. The revenue collected from selling these commercial areas can, then, be invested in developing residential areas. Residential units can be sold at suitable premiums on the actual cost.

The user charges will be transferred directly to the residents. The capacity and willingness to pay must, first, be determined before any rates for the charges are fixed.

The existing municipal services in the city are in a dilapidated state. One of the primary reasons for this is the lack of available funds. User charges are essential in tackling some of the major existing problems, in the city, that are related to sewerage and waste disposal. Safe collection, treatment and disposal of sewerage will reduce the incidence of child mortality and overall health expenditures. Similarly, the provision of clean drinking water, at various points in the city, all pumped directly to the residents, will massively contribute to a reduction in diseases such as cholera and hepatitis. This will further help reduce the load on the city's existing medical facilities.

Exhibit 3.72: Area to be opened up as an urban square in front of polo ground

Solid-waste collection and disposal is another important municipal service that can be improved by collecting user charges for domestic and commercial producers of solid waste. A special solid-waste treatment facility must be set up for hospital waste.

User charges for road use will be recovered through vehicle registration charges and some tolls collected on specifically designed expressways. To control inner city congestion, the owners of private cars may be asked to pay congestion charges. Residents of the city center, however, will be exempt from this fee.

Since development in the greenfield areas will be new, part or all of the land and infrastructure charges can be included in their selling price. Maintenance charges can be implemented for the upkeep of the developed areas and have different rates for residential, commercial and institutional uses. Even recreational parks and public toilets can charge a nominal user charge for upkeep.

Initially, the implementation of user and maintenance charges may be met with opposition. However, as improvements in municipal services becomes visible to all, a gradual, phased-in implementation of user charges, in the city, will be more accepted. All communities and stakeholders must be consulted throughout the phase-wise implementation of the user charges. The financial sustainability plan (FSP) for the future development of Gilgit will be discussed in greater detail in Section 4.

3.10 Legislative and Institutional Framework Guidelines

The following guidelines will need to be developed for legislation:

- Legislation for acquiring private land
- Legislation to protect right-of-way of the river and nullahs
- Legislation to bar nuisance and non-conforming land use
- Legislation to protect right-of-way of roads from encroachments
- Legislation for acquiring land banks for future development
- Legislation for maintaining agricultural areas in the city and to curtail encroachments on it

Such legislation will clearly lay out the community consultative process in terms of land acquisition. Legislation regarding water rights shall also be stated so that excess water is not wasted but used efficiently. The legislation on the distribution of water has to be particularly clear and unambiguous, as this is an issue of conflict among users.

Legislation regarding the development of urban farming will aim to curtail the conversion of agriculture land to other purposes.

The right-of-way of the rivers and the nullahs needs to be defined and reserved for use by all. Legislation regarding the use of riverbank material should aim to protect the banks from soil erosion. Mining of gravel and other aggregates from the riverbanks needs to be strictly controlled. The institutional framework required for the development of Gilgit will be discussed in greater detail in Section 5.

3.11 Implementing the Conceptual Master Plan

A master plan is a tool to guide and manage the growth of cities in a planned manner. It has its origin in the English Town and Country Planning Act of 1947. While it has long been discarded in the United Kingdom, the master-planning approach is still being followed in many developing countries, including Pakistan.[214] Unfortunately, master plans prepared for several major cities of Pakistan, in the past, have not been implemented effectively.

214. Rizwan Hameed and Obaidullah Nadeem, Challenges of Implementing Urban Master Plans: The Lahore Experience, International Journal of Human and Social Sciences 1:1 2006

Master plans are successfully implemented when they represent a vision that brings together the concerns of different interest groups and when their recommendations create a groundswell of community and political support. Good master plans are flexible and involve the community and other stakeholders from the outset, giving the plan a legitimate base and a better chance of coming to fruition. Master plans can build visibility and credibility for a nonprofit group and can help target projects and raise money. They become promotional documents for the development of an area.

The CMP for Gilgit is robust, helps raise awareness and provides for economic opportunities while promoting environmental sustainability. It does not advocate the development of only the brownfield option but a mix of both approaches. It is designed to provide for an increase in the future population of the city and to utilize the population bulge as a work force for the development of the city.

The CMP advocates for developing barren sites, whether greenfield or brownfield. It goes with the existing trend of development east of Gilgit. It promotes development of brownfield sites in Jutial Moza, which is adjacent to Sakwar. The development of a model tourist village in Danyor and the opening up of recreational parks along the Gilgit River as well as residential, education and institutions along the Chilmas Das area next to Hunza River are seen as important areas of development, besides the opening up of the transportation corridor to bypass Gilgit. The recreational and tourist potential of Gilgit is enormous and it needs to be tapped. The enhanced development of urban agriculture to compete with other land usage shall be seen as an important factor that leads to sustainability.

As part of the outcome of this SEA, a set of draft Terms of Reference (ToRs) were also prepared with the aim of assisting the GDA in developing their own ToRs for engaging consultants for the development of the future Plan. These can be found in Appendix A.

3.11.1 Potential Risk

Ethnic strife and civic turmoil pose the most potential risk for the implementation of the CMP. Furthermore, if the financial and the legal framework is not in place, then it will go the way of the Pakistan Environmental Planning and Architectural Consultants Ltd. (PEPAC) 1977 plan, which did not take these factors into consideration. The use of the water rights of various communities will have to be respected and a system for its distribution needs to be ensured. Agricultural land within the city shall not be converted into commercial buildings, especially in the Danyor and Sultanabad area. Ribbon development along the main roads, which curtails access to the hinterland, will also have to be addressed. The question of large tracts of army land within the city, and its development, will have to be discussed with the current authorities in regard to its future zoning and land use. Land speculation, if not curtailed at an early date, can also play havoc with the master plan. This has to be addressed now by establishing land banks.

3.11.2 Unsuccessful Master Plan Examples of Pakistan:

In Pakistan, master planning exercises have largely not been successful due to a variety of reasons, which include a lack of political will and governance, legislation, or inadequate administrative and financial planning. Land acquisition is still a chronic problem for the implementation of master plans, with a major role played by land developers.

Faisalabad

The urban development report by Mr. Murtaza Haider states that there are “numerous low-income communities, which are home to blue-collar labor that lack proper water supply and sanitation in Faisalabad.” Moreover, the size and density of communities has increased, over time, and the lack of adequate municipal services has persisted.

The lack of sanitation has resulted in streets filled with sewage and other waste. Poor sanitary

conditions have resulted in higher incidences of disease. Women and children suffer the most because they spend the most time in the unhygienic environment. The community relies on donkey carts to supply water to the households. [215]

Karachi

A critical issue in land management is the extremely high percentage of government ownership. Nearly 90% of the Karachi's land is publicly owned. The problem has arisen where public sector institutions could not respond to or respond inappropriately to the needs and development trends of the population they serve. The government simply does not have the capacity to effectively meet people's demand for residential and commercial land. The supply of land and the available stock of commercial and residential land in the market have not been sufficient. As a result, land prices have been pushed up and out of the reach of the average homeowner and small business operator. [216] The expansion of the informal economy – the spread of slums and squatter colonies— are also contributing factors.

Lahore

The master planning practice in Lahore has only partially achieved the objectives of planned development. Key impediments identified relate to excessive delays in plan preparation and the approval process, a weak institutional set up, a lack of coordination among government departments, inadequate financial resources, legal lacunas, a lack of dissemination of plans and, above all, a lack of political will.

3.11.3 Potential within Gilgit City

Urban development areas for local action plans will be identified, such as the Raja Bazaar areas. It's upgrading will be seen as an important feature of the Gilgit city development, i.e. as an urban renewal exercise, and will include the following:

- Preparation and timely implementation of the CMP
- Involvement of the stakeholders at every point of the planning process
- Ambitious strategies formed to curtail existing problems faced by city residents and to provide for the future needs of the city
- Preparation of suitable land classification, land usage, and land development policies and approaches
- Community- and gender-sensitive policies to be implemented
- Conservation and preservation of valuable lands in terms of environment protection
- Adequate provisions for the existing residents and future requirements based on appropriate population projections
- Envisioning Gilgit City as a future model city for the country
- The tourist potential, including adventure tourism and cultural tourism, shall aim to serve as an educational and health hub of the region.
- Development of urban agriculture to compete with other land usages
- Access to established conservation and tourist-developed areas in terms of roads or walking trails

3.11.4 Constraints

The following constraints will have to be surmounted before establishing a master-plan exercise.

- Current data and its availability
- Inadvertent growth and rapid urbanization during the projected period

215. http://www.regionomics.com/INDUS/Pak_chapter_ADB.pdf (date accessed 20 December, 2013).
216. Published in The Express Tribune, September 23rd, 2013.

- Natural disasters and non-availability of mitigation measures for their aftermath
- Sectarian clashes that are unabated
- Limited availability of resources to curb the solid-waste and municipal-waste - management failure of municipal services

Water-rights issues and its equitable generation

- Traffic management in existing areas and resolving confusion at various nodes and junctions
- Land speculation can damage the master-plan process from the very beginning.
- Intensive training mechanisms have to be evolved to make urban agriculture competitive with other land uses
- Establishment of farm co-operatives and the rearranging of urban agriculture land

Prime data will be required for the Master Plan and area development schemes. Action areas will need to be developed. Waterlogging, which is a prime concern for the existing urban areas, will have to be properly addressed, particularly in the Raja Bazaar area. Thus, it will be necessary to acquire prime data for housing demand and traffic forecasting before launching the major master-planning exercise.

4. Financial Sustainability Plan

This section introduces the need and importance of developing a financial sustainability plan (FSP) as part of future development in Gilgit. Government organizations in Gilgit, including the Gilgit Development Authority (GDA), the Gilgit Municipal Corporation (MC) and the Water and Sanitation Authority (WASA) are the institutional bodies engaged in maintaining the basic utilities of the city, such as water supply, sewage management, solid-waste management and infrastructure management. This FSP provides guidelines to implement the recommendations of the Conceptual Master Plan (CMP) proposed in Section 3.9. The Financial Sustainability Plan (FSP) will calculate the approximate capital and operational costs of the provision of basic utilities in Gilgit and will recommend avenues for revenue generation based on the preferred growth strategy outlined in the CMP.

4.1 Objectives

The objectives behind developing the FSP are as follows:

- To introduce the concept of financial sustainability as part of the master planning process of the town
- To explore budgetary and funding options available to Gilgit
- To identify potential capital and operational costs for the provision of water supply, sewerage-system management, solid-waste collection and disposal, and road infrastructure upgrading and management using secondary sources and standards.
- To provide general recommendations for possible revenue-generation methods to fund the maintenance of the above-mentioned utilities.

4.2 Scope

The scope of the FSP is limited to cost estimations, using guidelines from the World Bank and the UNO, for the maintenance and operation of basic utilities in Gilgit. It will also explore and recommend opportunities to finance these from revenues generated within the city. The cost estimation was carried out only for the provision of water supply, sewerage-system management, solid-waste collection and disposal, and road-infrastructure upgrading and management. A detailed FSP that covers the cost of all the services in Gilgit

should be prepared as part of the future detailed Master Plan.

4.3 Methodology

The process of developing the FSP involves the following steps:

- Funding and grant options, such as private investments, donations, government grants and revenue generation for Gilgit were identified.
- The concepts of capital and operating budget were introduced in the context of financial planning on a town level.
- Using suggested cost parameters and standards from secondary sources, as the World Bank and the UNO, approximate capital and operational costs for the provision of water supply, sewerage system management, solid-waste collection and disposal, road-infrastructure upgrading and management were estimated.
- Using the projected population and household figures for 2025, for Gilgit, approximate per-household costs of the above mentioned utilities were estimated.
- Strategies for potential revenue generation against the cost of each utility were recommended.

4.4 Funding

In Gilgit, there are typically three major sources of funding. The major contribution comes from provincial and federal government grants. Another portion of the funding comes from the private sector. This involves institutions that invest in the city for different reasons. These institutions include non-governmental organizations (NGOs) that operate in Gilgit for humanitarian reasons. Currently, a few NGOs, such as the International Union for the Conservation of Nature (IUCN), the World Wildlife Fund (WWF) and the Aga Khan Development Network (AKDN), funded by different donors, are engaged in capacity-building activities in Gilgit. Another portion of this funding involves private investors who have interests in Gilgit due to the business potential in the city. Mainly, they involve developers who invest in the city and develop stand-alone housing schemes with their own infrastructure for the provision of basic facilities such as water, power, gas and roads.

The third source of the city's funding is the revenue-generation schemes that local authorities introduce within the limits of their respective jurisdictions. Such schemes involve property taxes, utility taxes, road toll charges, parking charges and other miscellaneous fees.

4.4.1 Government Grants

The redistribution of centrally collected revenues is often insufficient for the operation of cities in Pakistan. Transfers from the national government to city maintenance authorities include grants; local share of taxes, which in some cases come from provincial authorities; and earmarked funds for specific projects. Transfers from the central to the local level are usually insufficient, and cities in Pakistan tend to rely on these transfers to bridge the gap between their own revenue-generating capacity and local expenditures. Ideally, central transfers should be made available to municipalities in time to allow them to prepare their budgets. In many developing countries, including Pakistan, this is unfortunately not the case. Central transfers fluctuate from year to year; this forces cities to make ad hoc revisions to their budgets during the fiscal year.

Under the Public Sector Development Programme (PSDP), the Annual Plan Coordination Committee (APCC), in Pakistan, is responsible for organizing an annual meeting wherein the secretaries of the ministries and divisions of all the provinces submit their respective ministry's proposals for the Annual Development Budget allocation. The total development outlay of Gilgit-Baltistan (GB), for every fiscal year, is divided in two parts: block allocation for the Gilgit–Baltistan Annual Development Program (ADP), and the remaining amount is allocated for the on–going projects,

such as the ADP 2013–2014 for water and power. The federal government increased the development budget (block allocation) by 19.3% in the 2013–2014 budget compared to the development budget of 2012–2013.[217] The ADP 2013–14 was formulated within the policy framework of the present government and included poverty alleviation, ensured good governance, the generation of employment and improvements in the quality of social services. Exhibit 4.1 illustrates the procedure behind the formulation of the ADP.

The Annual Plan 2013–2014, for Gilgit, emphasized the agriculture sector and improvements to indicators of education and health through specific interventions for ensuring quality service delivery. In pursuance of the new development approach, the plan further focused on software development and information and communication technology. Conceiving rapid growth, the government placed an emphasis on urban development, youth affairs, tourism development and public-private partnership initiatives.

4.4.2 Costs

The effective functioning of the city requires a smooth inflow of funds for the maintenance of the services provided to its dwellers. There are two major costs involved in managing a city: capital costs and operational costs. Generally, the capital costs of a city are much higher than operational costs. Different institutional bodies in a city have different functions. The following bodies in Gilgit are responsible for the day-to-day maintenance of services:

- Water and Sanitation Authority (WASA)– Responsible for water distribution and maintenance of the sewerage system in Gilgit

- Gilgit Development Authority (GDA)– Responsible for development operations in Gilgit

Exhibit 4.1: Annual Development Programme Procedure [218]

217. Planning and Development Department Government of GB, Annual Development Plan, June 2013.
218. World Bank (2003) Process of Federal Budget in Pakistan.

- Municipality Committee (MC)– Responsible for maintaining the streets of Gilgit, which involves solid-waste collection and disposal

Operating budget

The operating budget covers spending on services, such as daily water supply, sewage treatment, solid-waste collection and disposal, and road maintenance. Examples of these daily services include:

- Providing drinking water to all citizens
- Disposing of sewage for all citizens
- Ensuring a smooth transportation network during all seasons throughout the year
- Collecting recyclables and waste at residential and commercial properties, parks and civic buildings
- Keeping the city safe by maintaining a police force and fire-fighting units
- Providing programmes and services at city facilities, such as swimming pools, arenas and cultural centers

Capital budget

The capital budget deals with creating and maintaining the city's infrastructure. Road repair, bridge upgrades and replacement of water mains are all capital expenditures. The capital budget also includes the expansion and creation of new infrastructure, such as fire stations, transit exchanges, bicycle paths and ball fields. Capital investments are funded from government grants and also from the revenues collected by the city authorities.

4.5 Water

This section estimates the annual capital and operational costs for water supply and sewage treatment in Gilgit. To calculate annual costs, the CMP's projected 2025 population of Gilgit was used along with the World Bank's recommended per-person water needs. For per-household costs, the CMP's projected number of households in 2025 was used. This section also recommends fundraising strategies that can be adopted by the relevant authority, WASA, to fund the costs of water supply and sewage management in Gilgit.

4.5.1 Water Supply

During the stakeholder consultations, water supply in the city of Gilgit was identified as one of the major problems the people of Gilgit face. The key problem behind water issues was the traditional water rights that exist in Gilgit. People of different areas claim their rights on the different nullahs of Gilgit. This creates problems for the authorities in terms of fairly distributing water to the people of the city.

Another major identified problem behind the issue of water rights was the non-willingness to pay in Gilgit.[219] The people of Gilgit have traditionally defined water rights and they are not willing to pay for the water they have rights on. It is very important that they understand that extracting water from the nullahs and supplying it to their houses involves a cost, and it is critical that they pay for this delivery cost to ensure an uninterrupted supply of water. The team of Hagler Bailly Pakistan (HBP), in Gilgit during stakeholder consultations, learned that the culture of payment for water was completely non-existent in the city. Non-availability of funds to the authorities for providing clean drinking water adds to the issues of water supply.

The cost of supplying water consists of fixed costs (capital costs and personnel costs) and variable costs that depend on the amount of water consumed (mainly energy and chemicals). The fixed-cost estimates for Gilgit's water supply, given in the Gilgit City Sewerage Plan, published in 2006, is 1,065 million rupees.[220]

The calculations for the presented operational costs are from global standards used by the World Bank and the UNO. These were carried out

219. Hagler Bailly Pakistan, Stakeholder Consultations in Gilgit, 2013.
220. NAPWD Gilgit, Sanitary Sewerage System for Municipal Area Gilgit Town Final Feasibility Report, 2006.

to estimate the expected expenses to facilitate the basic operations of water supply and sewerage maintenance of a city. The operational cost of supplying water and treating sewage in urban areas in developed countries is about US$1 to 2 per cubic meter, depending on local costs and local water consumption levels.[221] These costs are lower in developing countries. Throughout the world, only part of these costs is billed to consumers, the remainder being financed through direct or indirect subsidies from local, regional or national governments.

Provision of clean drinking water is very important in Gilgit, considering the high concentration of e coli and other harmful substances in the nullah waters of Gilgit. Currently, only the Danyor Nullah has a lower concentration of e coli.[222] Globally, diarrhea is the leading cause of illness and death, and 88% of diarrheal deaths are due to a lack of access to sanitation facilities, together with an inadequate availability of water for hygiene and unsafe drinking water. The provision of improved sanitation and safe drinking water could reduce diarrheal diseases by nearly 90%. In Sub-Saharan Africa, treating diarrhea consumes 12% of the health budget.[223]

The UN suggests that each person needs 20 to 50 liters of water a day to ensure their basic needs for drinking, cooking and cleaning.[224] In the year 2025, the population of Gilgit is expected to be 330,724, as projected in the CMP (Section 3.5). This results in a water demand of approximately 9,921,720 liters per day and a cost of 9,921 dollars per day, using a cost-of-supply estimate of $1 per cubic meter.[225] This corresponds to an annual cost of approximately PKR 394,732,630 (39 million rupees) for the provision of domestic water only. This cost does not account for water needs for irrigation purposes, which add significantly to the water demands of a city.

4.5.2 Sewage

On average, a city generates 50 liters of sewage per person per day.[226] As approximately 70% of sewage is lost and does not make it to the treatment plant, approximately 15 liters of sewage per person per day has to be treated in the treatment plant. Using Gilgit's projected population of 330,724, by 2025, the daily sewage generated is expected to be 4,960,860 liters. This corresponds to an annual sewage-treatment cost of approximately PKR 197,367,815 (19.7 million rupees). This results in a total annual cost of water supply and sewage management of 58.7 million rupees. These figures give an idea of the costs of maintaining Gilgit's sustainable water supply and the treatment of sewage generated.

4.5.3 Recommendations

The significant costs of the water supply to the city of Gilgit need to be balanced by a robust financial recovery plan for the sustainability of the city. Approximately 40,864 households are expected by 2025 in Gilgit, as projected in the CMP (Section 3.5.3). If the annual operational costs of water supply and sewage treatment (58.7 million rupees) are considered, this leads to an annual contribution of 1436 rupees per household. In addition to this, the capital cost of 1065 million rupees accounts for a further per household contribution of 26,062 rupees. This figure is just an estimate and the detailed Master Plan must incorporate primary data collection and a detailed analysis for planning the finances of Gilgit. A comprehensive study of the financial planning of Gilgit will predict the costs of water supply and sewage management with precision and accuracy.

Further measures will have to be planned for the long-term sustainability of the water-supply system of Gilgit. These measures can involve the metering of water to ensure fair pricing and commercial users, such as hotels, charged at high

221. The World Bank, Water Electricity and the Poor– Who benefits from subsidies?, 2011.
222. Environmental Protection Agency Gilgit Baltistan, Water and wastewater quality survey in seven urban centers of Gilgit Baltistan, 2013.
223. Water Supply and Sanitation Collaborative Council (WSCC), Water Hygiene, 2013.
224. UNESCO, World Water Assessment Program: World Water Development Report (2013).
226. The World Bank, Water Electricity and the Poor– Who benefits from subsidies?, 2011.
227. Ibid.

premium rates. Initially, fixed water charges can be introduced, but the long-term goal, after 5 to 10 years, should be water metering, which will ensure fairness to the users. The water infrastructure should be planned for metering purposes so that a switch from fixed charges to use-based charges can be smooth. People with water rights should not be allowed to use water for free. As the delivery of water from the river and nullahs requires high capital and operating costs, these costs should be recovered from the people and they should be charged for the delivery of water to their houses. As for hotel owners, as the people using the water in hotels are not from Gilgit, they do not have any right on the local water according to traditional laws. Therefore, the hotels should be charged a premium for the use and delivery of water.

4.6 Solid-Waste Management

The Municipal Committee (MC) of Gilgit is responsible for overall solid-waste management. This includes the selection and adoption of appropriate technical and local solutions for waste collection, transfer, recycling and disposal. It is evident that the operation of an efficient solid-waste management system requires organizational capacity and the ability to achieve cooperation among all interested parties, including communities, private enterprises and municipal authorities.

The solid-waste assessment study, carried out in 2012, reveals that 73 metric tons of solid waste is generated per day from domestic interventions, which include 76% organic and 24% inorganic waste.[227] Domestic solid waste is a major human-induced hazard.

For all municipal solid waste emanating from business establishments, such as stores, markets, office buildings, restaurants, shopping centers, and entertainment centers, commercial solid waste can be divided into ordinary and special solid waste. In commercial waste, contents are similar in all cities and contain around 69% inorganic and 31% organic waste.[228] Special waste includes cement kiln dust, mining waste, oil and gas drilling mud and oil production brines, phosphate-rock-mining beneficiation and processing waste, uranium waste, and utility waste (i.e., fossil-fuel combustion waste).[229] This waste mostly comprises commercial and industrial waste. This waste can further be categorized as waste generated from workshops, hospitals and medical facilities, slaughter waste, animal dung, dead animals, construction and demolition, chemical processing factories, and mechanical and electrical products. The major part of the special waste generated is treated as hazardous waste and needs special attention in regards to generation, collection and treatment.

Industrial waste comprises around 1.7% of the total special waste generated.[230] Seventy percent of the industrial waste generated is used for burning purposes. This is a very common trend of the area where people even burn toxic and hazardous waste. The main reason behind burning this waste is to counter the cold in winter, which is always below freezing.

Gilgit generates approximately 163 metric tons of domestic and commercial waste. Around 35 to 40% of the total generated waste is handled by the municipal corporation.[231] This solid waste is transferred manually into tractor trolleys and dumper trucks and is ultimately disposed of in the form of open dumping at Chilmas Das, a municipal committee designated site.
Street sweeping and solid-waste collection account for the top two expenditure items in terms of solid-waste management. This includes the salaries of the staff, fuel for vehicles, repair

227. Shehzad Shigri, 2012, Report on Solid Waste Quantities and Characteristics in Seven Urban Centers of Gilgit Baltistan, Environmental Protection Agency–GB, Gilgit.
228. Ibid.
229. World Bank," What a waste – Solid waste management in Asia" Urban and Local Government Working Papers, The International Bank for Reconstruction and Development. THE WORLD BANK, 1818 H Street, N.W. Washington, D.C. 20433, U.S.A, 1999.
230. Shehzad Shigri, 2012, Report on Solid Waste Quantities and Characteristics in Seven Urban Centers of Gilgit Baltistan, Environmental Protection Agency–GB, Gilgit.
231. Ibid.

and maintenance, and the purchase of new equipment and vehicles. According to the Gilgit Municipal committee, the total annual expenses incurred on solid-waste management in the city are PKR 29,640,000 for the 73 tonnes of waste generated each day.[232]

4.6.1 Recommendations

Section 3.6.6 of the CMP contains population and waste-production projections for the year 2025. According to these projections, it is expected that, in Gilgit by 2025, approximately 132 tonnes/day of solid waste will be generated. Based on the present annual cost of PKR 296,640,000 for 73 tonnes of waste generated per day[233], for the projected 132 tonnes of waste per day, an annual cost of PKR 536,389,920 (53.6 million rupees) is expected. These figures are for illustration purposes only and the Comprehensive Master Plan must involve relevant primary data collection and accurate calculations of these numbers. Section 3.6.6 recommends at least two compactor trucks be bought for Gilgit. An online global trading website recommends the cost of a compactor truck is approximately USD 5000, equivalent to a total of approximately one million rupees for two trucks.

The total cost of solid-waste management is expected to be 54.6 million rupees. It is recommended that the Federal Government of Pakistan or the Provincial Government of Gilgit-Baltistan should fund these costs through the annual development budget. The funds collected as income tax and sales tax by the government should be spent on managing the daily solid-waste collection and management for Gilgit. The MC can work with the GDA and take a share from the property-tax collections across the city. Currently, a mechanism of property tax does not exist in the city, which is generally a major source of revenue generation of city development authorities across Pakistan, such as the Capital Development Authority (CDA) and the Karachi Development Authority (KDA). The future detailed Master Plan must involve strategies for revenue generation and policy recommendations to fund the costs of solid-waste collection and disposal.

4.7 Development of housing schemes and roads

Presently in Gilgit, unplanned and uncontrolled construction has been in practice since 1947. Though there is no clear distinction between residential and commercial areas, the size of residential plots is from 10 marlas to 2 kanals, albeit a small fraction of the population has constructed households on 3 to 5 kanals.[234] This unplanned construction in urban areas has led to a haphazard growth and expansion that resulted in irregular shapes of plots, narrow streets and a lack of infrastructure facilities to accommodate the needs of the growing population. The streets are narrow and are only used by pedestrians. And in some areas it is quite difficult to address the basic public infrastructure needs of the urban population, such as sewerage, drainage, the provision of electricity and easy access to rescue services in case of emergencies. The residential dwellings have a lesser degree of plot coverage. In Gilgit, 51% of the dwellings have covered an area of up to 25% of their plots and as many as 84% of the dwellings have a site coverage of up to 50%.[235]

Gilgit has metal and un–metal roads of approximately 70 kilometers, consisting of radial roads, distributary links and access roads.[236] Encroachment on the right-of-way is common, especially in the central business areas. The haphazard on-street parking by various modes of transport is also very common. The loading and unloading activities both by heavy and light transport can be easily seen. The number of vehicles plying the roads is increasing with the passage of time, while the roads' widths remain same and the effective carriageway widths on

232. Ibid.
233. Ibid.
234. Haider Raza, 2003, NASSD Background Paper: Urban Environment, IUCN Pakistan, Northern Areas Program, Gilgit. x+38 pp.
235. Ibid.
236. Ibid.

certain road sections are unable to meet the present-day requirements.

The road and intersection geometry is poor. On-street parking and roadside encroachments are common and these have largely reduced the roads' capacities. Motor workshops, transport terminals and other compatible uses are spread all over Gilgit and are generating/attracting a great number of trips within the busy areas, creating congestion, noise and other environmental pollution. A lack of planned and properly organized public transport systems in the town, i.e. movement of buses and wagons on the narrow street networks, is creating frequent bottlenecks and thus hindering the flow of traffic. In addition, there is a lack of traffic control devices, such as traffic signals, traffic signs, and road markings, and their absence is a constraint on maintaining the smooth flow of traffic. Recently, government, with the assistance of the army, has completed operations against encroachments and has widened the roads. But in most cases, road alignments that increased the risk to users was not taken into account.

4.7.1 Recommendations

According to the CMP (Section 3.5.3), the number of Gilgit households projected for 2025 is about 31,000, requiring roughly 98 hectares of land for expansion. The nature of housing development to accommodate the increased number of households will be multi-level mid-rise buildings, with all other amenities within easy access.

As mentioned earlier, Gilgit has approximately 70 kilometers of roads, spread like a web all over the city. The World Bank estimates an average cost of 31,000 USD per km for the rehabilitation of a road.[237] Using this number, the total cost of repairing all of Gilgit's roads is equivalent to approximately PKR 236,530,000. These figures have a high amount of uncertainty associated with them due to the unavailability of any primary data. The detailed Master Plan must contain a detailed collection of primary data and the calculation of the development costs must be accurate. The detailed financial sustainability plan should involve an analysis of the different funding options and predict strategies for the way forward. The road repair and maintenance work is expected to be funded by the government. But, the maintenance of these roads should be the responsibility of the GDA. To fund the maintenance of road networks, the GDA can introduce revenue-generation schemes, such as parking charges, toll taxes on bridges and congestion charges for access to the inner city, as recommended in the CMP Section 3.10.

For the estimated 98 hectares of housing-area development, private-housing schemes should be encouraged in the city. Such schemes should be closely monitored by the GDA for compliance with Gilgit's regulations. Schemes such as the Defense Housing Authority, Bahria Town and the Saima Housing Scheme have proven successful all over Pakistan. In such schemes, the investors are responsible for the development of the housing schemes, for selling the houses, for constructing adequate infrastructure, and for providing basic facilities like gas, electricity and water. Development of large housing schemes and the provision of utilities will be expensive for the GDA. These types of developments are prone to mismanagement and are expected to eventually fail. Private investment in housing schemes will ensure their efficient construction and operation.

For monitoring private investors in Gilgit, the GDA should enforce the following:

- Impose taxes on late construction of houses after the final approval of housing schemes. For example, a penalty should be such that 10,000 per marla value of the construction project per year be charged in the event of a missed construction deadline.

- Ensure the timely provision of infrastructure services, especially in private-housing schemes, to encourage plot owners to build their houses as early as possible.

237. Rodrigo Archondo–Callao, 2000, Roads Works Costs per Km, The World Bank, http://www.worldbank.org/transport/roads/c&m_docs/kmcosts.pdf

- It is recommended to have strict control on the prices of building material. Further, the government may provide subsidized building material to ensure timely completion of houses.

- There should be a pre-defined building period for the construction of houses. Hence, strict enforcement of this building period is required after a person receives an allotment letter and possession of land.

- Plot speculation may be discouraged so as to have proper control on plot ownership by property owners. There may be restrictions on the purchase of more than one plot within a housing scheme.

5. Institutional Framework for Implementing the CMP

This section presents a proposed framework for the roles and responsibilities of the institutions in Gilgit tasked with the development of the city. The government organizations in Gilgit addressed in this section include the Gilgit Development Authority (GDA); the Gilgit Municipal Corporation (MC); the Gilgit-Baltistan Environmental Protection Agency (GBEPA); and the Forest, Wildlife and Environment Department. (Please see Appendix D for Institutional and Stakeholder Mapping). The framework provides general guidelines to enable these institutions to effectively implement the recommendations of the CMP proposed in Section 3. The guidelines address the recommendations of the CMP related to the following:

- Water rights, distribution and quality
- Land-use zoning and development
- Buildings and infrastructure development
- Roads, public streets and traffic management
- Encroachment control
- Drainage network
- Solid-waste management and
- Protection of forests and protected areas (PAs)

5.1 Objectives

The objectives behind developing the institutional framework are as follows:

- To identify the existing system of legal instruments in Gilgit that define the roles and responsibilities of institutions dealing with issues related to the development of the city.

- To identify the relevant institutions in Gilgit that can play a vital role in the effective implementation of the recommendations of the CMP.

- To identify potential hurdles the relevant institutions may face in effectively implementing the recommendations.

- To provide general guidelines for enhancing these institutions' roles and responsibilities, where required, to enable them to effectively implement the recommendations of the CMP and formulate comprehensive future bylaws for the relevant Gilgit institutions.

5.2 Scope

The scope of the institutional framework is limited to the government institutions operating in Gilgit and does not extend to the NGOs. These government institutions include the following:

- The Gilgit Development Authority (GDA);
- The Gilgit Municipal Committee (MC);
- The Forest, Wildlife and Environment Department; and
- The Gilgit-Baltistan Environment Protection Agency (GBEPA)

The issues identified in the CMP in Section 3.9 form the scope of the issues discussed in this section and include water rights and distribution, land-use zoning and development, building and construction works, road and traffic issues, encroachment on riverbanks and roadsides, municipal and industrial drainage, solid-waste management, deforestation and protected areas (PAs).

Recommendations or guidelines for concerned institutions are provided for each issue. Due to the scope of this pilot SEA, the framework is restricted to providing basic guidelines for future bylaws (rather than the bylaws themselves) for the relevant institutions to deal with the identified issues.

Existing laws used as the basis for the institutional framework include the following:

- Northern Areas Local Government Order 1979
- Gilgit-Baltistan Development of Cities Act 2012
- The Land Acquisition Act 1894
- Canal and Drainage Act 1873
- The Forest Act 1927
- Northern Areas Wildlife Preservation Act 1975
- Customary Laws in the Northern Areas

This section will not accommodate the introduction of any new legal instruments or legal amendments, introduced after 2012, in the laws listed above.

5.3 Methodology

Ideally, the process of formulating the institutional framework should have been based on a gap analysis between the existing roles and responsibilities of the relevant institutions in Gilgit and those required for the effective implementation of the recommendations of the CMP. However, the methodology was revised since the GDA is currently engaged in the process of formulating bylaws, and information was unavailable on the Gilgit Municipal Committee (MC) bylaws and its hierarchy.

The following steps were involved in the revised methodology:

- Based on the recommendations of the CMP, fields of concern were identified. They include water, land use, infrastructure, roads, drainage, waste, encroachment and deforestation.[238]
- Existing general laws, including acts, orders, rules and regulations passed by the Government of Pakistan (GoP) and the Government of Gilgit-Baltistan (GoGB), applicable in Gilgit-Baltistan (GB), in the context of the identified fields of concern, were extracted.[239] [240] [241] A list of these laws is mentioned in Section 1.2. They define the responsibility of the GDA, the Gilgit MC, the GBEPA and the Forest Wildlife and Environment Department mentioned in this section.

238. A 'field of concern' is an area of socio–economic or environmental concern as identified by the CMP. For instance one of the fields of concern mentioned in this section is 'water rights and quality.'
239. Abdul Basit, 2011, Muhammad. The Gilgit – Baltistan Laws. Lahore: Federal Law House.
240. Government of Pakistan, Ministry of Kashmir Affairs and Northern Areas. "Gilgit–Baltistan (Empowerment and Self–Governance) Order, 2009." http://www.gilgitbaltistan.gov.pk/. September 9, 2009. http://www.gilgitbaltistan.gov.pk/index.php?option=com_content&view=article&id=65&Itemid=110 (accessed January 29, 2014).
241. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.

- The following information was collected for each field of concern:
  - Legal empowerment of the institution: This defined the legal instruments that empower a specific institution to take a given responsibility in their fields of concern.
  - Responsible institution: This identified the existing institution responsible for the given task and the recommended institution if, for any reason, the current institution is unable to execute its specified responsibility.[242]
  - Concerns: These highlighted different issues for each field of concern.
- Recommendations for the institutions based on legislative guidelines identified in the CMP Section 3.9 were proposed. These recommendations provided for the capacity building of responsible institutions, the implementation of existing laws, guidelines for the enactment of new laws and specific suggestions for the relevant institutions to overcome the identified issues in each field of concern.

5.4 The Framework

The CMP identifies that, presently, Gilgit faces issues of water management, land-use zoning, infrastructure development, encroachment control, waste management, drainage network and deforestation. With the future population growth of the city, these issues are likely to aggravate if necessary measures by the relevant institutions are not taken to address them. The GDA and the MC play a focal role in the development of the city, and their responsibilities in addressing the aforementioned issues should be clearly defined so as to achieve effective implementation of the CMP recommendations.

5.4.1 Water Rights and Quality

Gilgit's sources of water supply include springs, dug wells, nullahs and river water.[243] Jutial Nullah, Danyor Nullah and Kargah Nullah are the three main sources of water currently used by the city. Glacial melt is the primary source of water supply to the nullahs. The flow in these nullahs is dependent on the annual snowfall and the temperature of the area. Besides piped water from five drinking-water supply complexes, individuals and communities have installed water motors and lifts along the banks of both the Hunza and Gilgit Rivers to fulfill their water requirements.[244] Water bowsers are also used for water delivery in some areas. Residents of Zulfiqarabad, Sonikot and a few colonies in Jutial use these water bowsers.

Responsible Institution

The Canal and Drainage Act 1873 is applicable in GB. The law entitles the GB government to use and control water from all rivers and streams flowing in natural channels and from all lakes and other natural bodies of still water. The government may prohibit obstructions and order their removal if they appear to be causing injury to land, public health or public convenience.

According to the Northern Areas Local Government Order 1979, Schedule V, Section B, Article 8, Clause 1, the MC should provide water sufficient for public and private purposes. Under this order, installation of any well, pump or other water source is subject to obtaining permission from the MC. Water-quality control is also given to the MC under the same order.[245]

On the other hand, customary laws define the right of an individual to the water from nullahs. Old settlements, which have paid Malia[246] before the 1970's, have a full right over the water, whereas the new settlements may take the

242. Initially, only the existing responsible institution was included in the discussion. However, collection of sufficient information regarding the responsible institutions for each field of concern revealed that, in some cases, the responsibility was either given to an irrelevant institution or was given to two institutions at a time. For example, responsibility of water supply was given to the GDA, encroachment control, to the MC, and roads were the responsibility of the Works Department. Consequently, the methodology was upgraded to define the proposed institution responsible for that field of concern.
243. Raza, Haider. 2003, Northern Areas Strategy for Sustainable Development. Background Paper, Gilgit: IUCN Pakistan Northern Areas Programme, x+38 pp.
244. Ibid.
245. Abdul Basit, 2011, Muhammad. The Gilgit – Baltistan Laws. Lahore: Federal Law House.
246. A tax charged by the native ruler before the 1970's either on the amount of water granted or the amount of land one owned.

excess water only with the consent of the residents of the old settlements.[247] Water stewards are appointed by the Numberdar[248] and the Jirga[249], which ensure the fair distribution of water set by the Jirga.[250]

The Gilgit-Baltistan Development of Cities Act, 2012 designates the responsibility of water supply to the GDA, but the current capacity and structure of the GDA seems inadequate to execute this responsibility.[251] According to natives of Gilgit, the Water and Sanitation Authority (WASA) provides water to the city. However, no information was found regarding any legal instrument empowering this particular organization to do the same. Therefore, the MC, which is empowered by the Northern Areas Local Government Order 1979, was identified as the responsible authority for the provision of water to the city.

Concerns

Water Scarcity

The residents of the old settlements are reluctant to share water with new settlements. For instance, Zulfiqarabad colony, a relatively new settlement in the city, faces a serious water shortage especially in water-scarce seasons. The water-storage and distribution capacity of the current water-supply complexes is inadequate in meeting the city's existing water demand. A survey conducted by the IUCN indicates that the present storage capacity of all water-supply complexes is around 15 times less than the actual demand.[252]

Water Quality

Poor water quality is another major problem in the city. In a survey conducted by the Water and Sanitation Extension Program (WASEP), in 1999, all five water complexes in Gilgit were found to be highly contaminated with fecal matter. Water in the channels was also found to be contaminated by activities such as washing clothes and utensils.[253] The dumping of municipal waste into nullahs and rivers by residents living upstream deteriorates the water quality.[254] All the wastewater is currently either being disposed in the river or in soakage pits, which both lead to the contamination of ground water and river water.

Recommendations

Recommendations concerning the definition of customary water rights, water scarcity, quality and user charges for the municipal water supply system are proposed as follows:

Defining New Rights for Water Use

- Water usage in the city can be categorized into three main types: commercial, industrial and residential. The customary rights of water should be limited to domestic use and to public institutions, such as schools, hospitals, government buildings, and for agricultural purposes. Commercial and industrial sectors should not be given these rights.

Fixing Limits on Customary Water Rights

- With the consent of the old settlements, the MC should set a fixed quantity of water that communities with customary water rights can use. If such communities require a quantity of water greater than the one specified to them under their customary rights, they should take the fixed amount and pay for any amount they use in excess of it.

- All the residents claiming customary water rights should be registered. After validation of their claims, a database of these residents should be developed and maintained by the MC. This will help preclude false claims of customary rights in future.

247. Bilal, Asad, Dr. 2003, Huma Haque, and Patricia Moore. Customary Laws Governing Natural Resource Management in the Northern Areas. IUCN Law Programme, xiii+67 pp.
248. The 'Numberdar' (also known as 'Lumbardar' or 'Tarangpa') is a local term used to designate the village headman in different parts of GB.
249. A 'jirga' is a body of notable persons in a village or area specially constituted to resolve a specific conflict. A jirga might be composed of the Numberdar and representatives from both parties in a dispute, with some village notables as middlemen.
250. Bilal, Asad, Dr. Huma Haque, and Patricia Moore. 2003, Customary Laws Governing Natural Resource Management in the Northern Areas. IUCN Law Programme, xiii+67 pp.
251. According to comments received from the GBEPA on 7th May 2014, at present, the Public Health Engineering (PHE) department is looking after the supply of drinking water in the city. The MC is responsible for solid waste management in the Gilgit, however, there is no agency looking after sewerage management at present. And, the supply and management of electricity falls under the ambit of the water and power department.
252. Raza, Haider. 2003, Northern Areas Strategy for Sustainable Development. Background Paper, Gilgit: IUCN Pakistan Northern Areas Programme, x+38 pp.
253. Ibid.
254. Ibid.

River Supply Control

- Ultimate control of river water should rest with the MC. Any person willing to extract water from the river should seek permission from the MC and pay a fee for the volume of water extracted. This should be applicable to the installation of motors and pumps for the water extraction as well as to the water taken by supply tankers. Customary water rights should not be exploited to extract water from the Hunza and Gilgit Rivers.

Division of River and Nullah Water Supply

- Dealing effectively with water scarcity requires that local water resources are harnessed, conserved and used in an optimum manner. The MC should use the Gilgit and Hunza Rivers to fill the water paucity faced by the city. An efficient way of doing this would be to give the water from the nullahs to the people residing in the higher elevations and to compensate the lower areas with river water. The Gilgit River has a greater flow and a lesser turbidity than the Hunza River, making it more suitable for extracting water.

- Expansion Works of Water Supply Infrastructure

- The MC should enhance the storage capacity of the current water-supply complexes or new complexes should be constructed to ensure maximum storage.

- The efficiency of the current distribution system should be increased by proper maintenance to avoid leakage and waste. The MC should construct new distribution systems where necessary.

Equitable Distribution

- The MC should ensure unbiased distribution of drinking water. The lack of transparency in distribution is resulting in massive distrust among the different communities that share the same water.[255]

- To avoid any uncertainty regarding the availability of water, the MC should provide users with water time tables. Distribution should be strictly based on the water requirements of specific areas, regardless of race, language or religion.

Improving Water Quality Control and Supply of Safe Drinking Water

- Water-treatment plants should be installed to ensure the provision of safe drinking water to the entire city.

- To ensure the provision of safe drinking water, the MC should implement and follow the National Standards for Drinking Water Quality (NSDWQ) in the city.

- Frequent quality checks on drinking-water sources should be organized to ensure public health safety.

- A law should be passed by the GBLA or the existing laws should be implemented in upstream areas to ensure protection of both the Hunza and Gilgit Rivers from pollution.

- The use of drinking water for irrigation and other purposes should be prohibited.

- Licenses should be issued to private water-supply authorities, only after quality checks.

Introducing a Water Tariff

- The MC should provide safe drinking water to the citizens and should charge for the supply in order to recover costs. The MC should apply charges in a way that protects the customary rights of people. This can be done in several ways, including exempting natives with rights from the basic water charge (a charge for the maintenance of pipes only should be collected), providing a specified volume of water without any charge (charge to be applied if the person uses more than the specified exempted volume of water).

255. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.

5.4.2 Land-Use Zoning and Development

Most of the land in Gilgit is privately owned.[256] The Gilgit Master Plan of 1977 divides the city into seven zones as follows:[257]

- Town Nucleus (intersection of Shaheed-e-Millat Road and Raja Bazaar Road)
- Transition Zone
- Konudas Plateau
- Gujardas
- Danyor Plain (mostly agricultural land)
- Jutial
- Basin

Based on the GIS Maps of the city, provided by the GDA, there is presently 37% agricultural land, 16% residential land, 3% commercial land and 17% vacant land in Gilgit. Average residential plot sizes vary from 10 marlas (250 m2) to two kanals (1,010 m2).[258]

Only two percent of the total agricultural land in Gilgit is arable. In recent years, the proportion of agricultural land has been decreasing due to encroachment by the commercial and private sectors.[259] The trend of the local population is shifting from agricultural activities towards commercial businesses as a means of livelihood.[260]

Responsible Institution

Under the Gilgit-Baltistan Development of Cities Act 2012, economical and effective utilization of land and to evolve policies and programs relating to the improvement of the housing environment is the responsibility of the GDA.

The Land Acquisition Act 1894 is applicable in GB. Under this law, public land may be acquired by the State for a public purpose, meaning hereby for the use of the public or people at large or for a company. The Act also enables the following:

- The acquisition of land needed for public purposes and for companies and;
- Determination of the amount of compensation to be paid on account of such acquisition.

The Gilgit-Baltistan Development of Cities Act 2012, therefore, extends power to the GDA to acquire land under The Land Acquisition Act 1894 and to develop zones in Gilgit, according to the Master Plan.

In other cities of Pakistan, such as Islamabad, Lahore and Karachi, land-use zoning and plot bifurcation responsibilities have been assigned to the respective development authorities. Therefore, the GDA seems to be the most capable and well-suited institution (in terms of legal authority) to address this issue.

Concerns

Zoning

To avoid uncontrolled expansion and maintain Gilgit's identity, there is a need for the proper demarcation of city boundaries and the zoning of existing land use. Land-use zoning can help in preserving property values that might decline if someone initiates an undesirable business in the middle of a residential neighborhood. Also, comprehensive, forward-thinking zoning enables a city to grow sustainably in the future.

Islamabad offers a good example of well-planned zoning. The federal capital was conceived as an administrative city and a cultural center and planned as a dynapolis or a dynamic city. Its amenities run in the direction of its expansion and its planning provides for dynamic and parallel development of several functions. All the various elements of the city are knitted together in a way that any change will deform its structure.[261]

256. Pakistan Urban Observatory. 2011 "City Profile – Gilgit." urban.unhabitat.org.. http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx (accessed January 24, 2014).
257. Pakistan Environmental Planning and Architectural Consultants Limited Gilgit Master Plan, 1977.
258. Pakistan Urban Observatory. 2011."City Profile – Gilgit." urban.unhabitat.org. http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx (accessed January 24, 2014).
259. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
260. Ibid.
261. Qasim, Muhammad. "Islamabad master plan: Know Thy City – I." The Express Tribune, January 13, 2014: 1.

Preservation of Agricultural Land

In recent years, the proportion of agricultural land has been decreasing due to encroachment by commercial and private sectors.[262] Residents are converting agricultural land into commercial areas and plots on rent. In Gilgit, agriculture accounts for 23% of total livelihood provision. The conservation of agricultural land and greenfield sites are of prime importance as they are a source of sustainable livelihood for the city.

As an example, in Islamabad, agro-farming, conservation and recreation projects are allowed in subzones C and D of Zone IV. These subzones comprise 60% or 45,000 acres of the total area of Zone IV, which spans 70,000 acres. Commercial activity astride defined major roads is permissible only at selected locations. This was to support the original plan to keep the area predominantly green.[263]

Recommendations

Keeping in mind the existing issues regarding land use, recommendations are being provided for plot size, plot coverage, brownfield sites and development of the city center.

Defining Plot Size and Coverage

- The land use in Gilgit can be classified into agricultural, residential, commercial and industrial areas. It is recommended that the GDA should define separate zones for each of these areas and delineate plot sizes in the zones.

- Commercial plots should be allowed coverage of 75% of the plot size marked by the GDA, the remaining 25% should be demarcated for parking area, garage or lawn.

- Residential plots with agricultural areas should be allowed 25% to 30% coverage depending on the plot size. This will help preserve agricultural land in the city in the longer run.

Regulating Bifurcation of Plots

- Plot sizes should be defined by GDA bylaws and plot coverage on each plot should be based on this definition of plots. This implies that any future plot bifurcation should not redefine plot coverage.

- Minimum plot size should be set by the GDA and bifurcation of a plot below this size should be prohibited.

Strategy for Brownfield Site Land Use

- As mentioned in the CMP Section 3.8, fertile land and grazing areas with some water rights should not be used for housing colonies. Instead, barren land and built-up residential areas should be used for establishing housing colonies.

- Land prone to natural hazards, such as floods or landslides, should be avoided for any construction or agricultural activity.

- Urban infill on barren land close to or in the periphery of Gilgit is recommended.

Developing the City Center as a Commercial Zone

- The city center may be marked as a commercial zone with no residential or industrial dwellings. Bylaws for the development of this zone should keenly focus on the promotion of tourism and recreation in the city.

5.4.3 Buildings

The total number of residential buildings in the city, based on an average household size of eight persons, is approximately 11,546.[264] Commercial buildings include hotels, restaurants, plazas, retail stores, slaughter-houses, vehicle workshops and other privately owned businesses.

Responsible Institution

Under the Local Government Order 1979 Schedule V, Section I, Article 26, building

262. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
263. Qasim, Muhammad. January 13, 2014 "Islamabad master plan: Know Thy City – I." The Express Tribune,: 1.
264. Pakistan Urban Observatory 2011. "City Profile – Gilgit." urban.unhabitat.org. http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx (accessed January 24, 2014).

construction can commence by the permission of the MC, after the relevant fees levied by the MC are paid and after the building plan is approved. The MC can also declare any work, addition or alteration exempt from this section of the bylaws.[265]

Under the Gilgit-Baltistan Development of Cities Act 2012, the GDA is responsible for the establishment, maintenance and periodic revision of planning controls and building regulations for the area (Gilgit).

Prior to the formation of the GDA, in 2012, the responsibility of applying building laws and regulations in Gilgit was designated to the Gilgit MC. However, based on the Gilgit-Baltistan Development of Cities Act 2012 and the pattern followed by the Capital Development Authority (CDA) and the Lahore Development Authority (LDA), building regulation and planning control responsibilities should be delegated to the GDA.[266]

Concerns

Building Design and Construction Material

In Gilgit, 60% of the houses are semi-pukka[267], 35% are pukka, while the remaining 5% are kuchha. Residences are usually constructed using earth, wood and soil stones. The houses are built using poor construction standards, making them prone to natural hazards. Cement and bricks are now being used in new developments around the city.[268]

Building Specifications

Three percent of the population of Gilgit lives in two-storey buildings. Presently, building[269] construction specifications are not defined by the GDA or the MC. The specifications are important because, in the absence of these, constructors may establish any type and size of building without being held accountable. In Gilgit, visual obstructions are a sensitive issue due to the valley topography of the city. This further strengthens the need for building specification codes to regulate construction in the city.

Recommendations

Institutional recommendations for the GDA's bylaws concerning building specifications, the preservation and promotion of traditional infrastructure and disaster resilience of constructed structures are as follows:

Bylaws needed for Defining Building Specifications

- GDA bylaws are needed for the floor-area ratios (FAR). Ground coverage, sizes, heights, number of storeys, stair towers, type and development of buildings, distance between adjacent plots, parking area, lawns and other relevant factors.

- Building plans for residential and commercial buildings should be defined by the GDA and made available to the people.

CDA Building Bylaws as an Example for the GDA

- The GDA could use the Capital Development Authority (CDA) building bylaws as a guide for defining building specifications for Gilgit.

- However, while formulating these bylaws, care should be taken to address factors such as air pollution (by adjusting chimney-stack height), visual impact of buildings (by adjusting building heights) and the nature of construction material used.

Preservation and Promotion of Cultural Heritage through City Infrastructure

- In order to preserve the cultural heritage of the city, it is essential that local architecture be incentivized by the institutional body concerned with the application of building bylaws.

265. Abdul Basit, Muhammad. 2011, The Gilgit – Baltistan Laws. Lahore: Federal Law House.
266. In Islamabad, the CDA formulates and implements bylaws regarding land-use zoning and building regulations. In Lahore, the Lahore Development Authority (LDA) performs these services for Lahore.
267. There are three general classes of housing in Pakistan: pukka houses, built of substantial materials such as stone, brick, cement, concrete, or timber; katchi or kuchha ["ramshackle"] houses, constructed of less-durable material (e.g., mud, bamboo, reeds, or thatch); and semi-pukka houses, which are a mix of the two. "Housing." Encyclopedia Britannica Online. Encyclopedia Britannica, n.d. Web. 20 Jan. 2014. <http://www.britannica.com/EBchecked/topic/438805/Pakistan/276147/Housing>.
268. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
269. Pakistan Urban Observatory. "City Profile – Gilgit." urban.unhabitat.org. 2011. http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx (accessed January 24, 2014).

- Material available in the construction area and/or its vicinity should be used for construction purposes.

- Construction of infrastructures and buildings on cultural patterns should be encouraged through the provision of incentives to contractors.

Buildings to be Disaster Resilient

- In accordance with the provisions of the GoP (extended to the GoGB) regarding building laws, all construction works should provide for disaster preparedness and hazard resilience.

5.4.4 Roads, Public Streets and Traffic Congestion

There has been a drastic increase in the number of vehicles with inflow of non-custom paid (NCP) vehicles into Gilgit, due to which there is considerable load on the current network of roads. Gilgit, being the only urban area within a 450 km radius, is considered the business hub of GB. Therefore, people from other areas of GB travel there for employment, trade, education and healthcare services. As they use public and private vehicles, this results in an increase in the number of vehicles, thereby restricting traffic flow. Proper management of these external vehicles may decrease the load on internal roads, making the flow of traffic smooth.

Responsible Institution

According to the Northern Areas Local Government Order 1979, Schedule V, Section J, Article 29, the MC should provide and maintain such public streets and other means of public communications as may be necessary. The Order also entitles the MC to prepare and execute a Road Maintenance and Development Program, which should form part of the budget.[270]

The Gilgit-Baltistan Development of Cities Act, 2012 entities the GDA to initiate and maintain a continuous process of comprehensive development and planning for Gilgit. The planning regarding roads and streets should be the responsibility of the GDA. Since this organization is nascent and is in the process of development, its only present responsibility should be the planning of roads, while the execution of these plans and the maintenance work regarding roads and streets should be delegated to the MC.

Concerns

Traffic Congestion

An absence of proper parking areas, roadside encroachment, lack of traffic signals, an absence of continuous up-grading and road development, and the poor law-and-order situation has exacerbated the traffic congestion situation in the city. The Madina Market, Makkah Market, the NLI Market, Garibagh Market, Nasreen Film Hall Chowk, Jamia Masjid, Jamat Khana Bazaar and a few chocks in Danyor face serious traffic congestion in rush hours.

Road Maintenance

Many roads in Gilgit City are broken and potholes can be observed in almost all of them. The main avenue from Choongi to Gilgit City, Park Link Road, Domiyal Link Road, River View Road, Zulfiqarababad Link Road, Shaheed-e-Millat Road, Hospital Road and most of the roads in Danyor require the MC's immediate attention. Broken roads cause a public nuisance and hamper the smooth flow of the traffic. A lack of financial resources is considered the biggest hurdle in road maintenance.

Emissions from Vehicles

Gilgit's present air quality has been recognized as an environmental value in Section 2.1.5 of this report. Gilgit has a fragile environment and any increase in the concentration of pollutants in the air may cause serious problems for the natives. No recent air-quality monitoring survey has been conducted in the city, but a previous study done by the IUCN and the Space and Upper Atmosphere Research Commission (SUPARCO)[271] shows that the air quality in Gilgit City is better than the air quality of the main cities of Pakistan,

270. Abdul Basit, Muhammad. 2011, The Gilgit – Baltistan Laws. Lahore: Federal Law House.

271. SUPARCO is Pakistan's national space agency mandated to conduct research and development in space science and space technology. It works towards developing indigenous capabilities in space technology and promoting space applications for the socioeconomic uplift of the country. www.suparco.gov.pk

especially Islamabad, Lahore and Karachi. The air quality of the city is an asset for the natives and also for the tourists, which necessitates its preservation.

Recommendations

The following recommendations regarding the construction, maintenance and categorization of roads and bye-passes, vehicular emissions and toll taxes are suggested:

Constructing and Maintaining the Roads

- As mentioned in the CMP Section 3.8.5, the GDA should keep streets in the city center and other commercial areas narrow, to encourage pedestrians and cyclists, while discouraging haphazard parking on the roadsides.

- Rules and regulations should be made to secure the streets and roads from alteration by people. Any alteration prior to any permission from the GDA should be penalized.

- The MC should ensure periodic and emergency maintenance of all the roads. A reporting system or an inspection system should be developed to investigate the roads requiring attention from the MC so that no pothol may go unnoticed.

- Considering the fragile environment of Gilgit, the MC should convert the unpaved roads into paved ones, which will minimize the amount of dust in the air and will preserve the existing air quality.

Categorizing Roads Based on Class of Vehicles Allowed to Pass

- Roads should be properly categorized depending on their allowed access. In commercial areas and the city center, roads should be reserved for pedestrians and cyclists.

- Trucks and other heavy vehicles should not be allowed access to residential areas. Certain bypasses should only be open for traffic other than cyclists and pedestrians.

- The GDA bylaws should be formulated to minimize the passage of heavy traffic through the internal roads of the city, and a specific time should be allocated for such movement, if this is possible.

Constructing City Bypasses

- Traffic load on the internal roads of the city should be minimized by constructing city bypasses. Vehicles going to other parts of GB, including Hunza and Ghizer, should be given specific routes so as to minimize the number of vehicles on the internal roads. New bypasses should be constructed or the MC should specify current roads for this external traffic.

Collecting Toll Taxes

- Toll taxes should be collected on main roads to generate money for their maintenance. Permanent residents of that specific area should be exempted from paying this tax. Potential roads and areas where toll taxes can be collected include the KKH, University Road, the NLI market and other commercial areas, Punial Road and all the bridges that connect the different areas of Gilgit to one another. More information on toll taxation in Gilgit can be found in Section 4.

Controlling Vehicular Emissions

- The GBEPA, which reports to the Forest, Wildlife and Environment Department, should ensure the enforcement of National Environmental Quality Standards (NEQS) regarding vehicular emissions. Vehicular emissions should be subject to monitoring and inspection by the GBEPA.

Issuing Vehicle Fitness Certificates

- A vehicle fitness certificate should be issued to any vehicle only after a comprehensive assessment of its emissions. This is important because of the construction of a business corridor[272] between Kashghar and Gawadar. More commercial vehicles will pass

272. The trade corridor between Kashghar and Gwadar will pass through GB and will provide Chinese traders a road link to deliver their goods to the international markets through the Gwadar Port.

through the area, causing an increase in air pollution.

Prohibiting Roadside Encroachment

- Front entrances to residential areas on main roads should be prohibited, as when a vehicle enters or leaves a house, it hinders traffic flow.

- Installation of moveable or immovable structures on the roadside should be outlawed by the GDA.

Installing Traffic Signals on Main Chocks

- Presently, there are only two traffic signals in the entire city.[273] Traffic signals should be installed to ensure managed flow of traffic.

5.4.5 Encroachment

Encroachment on the riverbank and nullah sides can be observed in almost all parts of the city and is due to the absence of proper right-of-ways (RoW) to rivers and nullahs. Roadside encroachment can be observed in specific areas, such as the Jamat Khana Bazaar, the Raja Bazaar and on the KKH in Danyor. Supply-side shortages in terms of legitimate spaces for residential, commercial and institutional use may cause this encroachment. Serious steps should be taken to provide the required space for each.

Responsible Institutions

Northern Areas Local Government Order 1979, Schedule V, Section J, Article 30, prohibits movable or immovable encroachment by any person on an open space or land vested in or managed, maintained or controlled by an MC, or over or under a street, road, graveyard, within the municipal limits or a drain, except under a license granted by the MC and to the extent permitted by such a license.[274] Under the same law, the MC may remove the aforementioned encroachment with such force as may be necessary. Any person aggrieved by notice issued under this law may, within seven days of the serving of the notice, appeal to such authority as may be appointed by the Government in this behalf whose decision should be final. No compensation should be given to the encroacher.

According to the Gilgit-Baltistan Development of Cities Act, 2012, after the preparation of the development plan, the GDA should ensure compliance with it. This act assigns responsibility of controlling encroachment to the GDA. However, to efficiently address this dynamic issue in the city, it is proposed that the GDA may accept the assistance of the MC to ensure compliance. Involvement of the MC is beneficial because its members are elected by the public and would efficiently resolve any public grievance or potential disputes due to the removal of an encroachment. The GDA may seek the assistance of the GB police in implementing the laws related to encroachment.

Concerns

Although the GoGB has comprehensive laws regarding encroachment applicable in Gilgit, serious encroachment along the riverbanks, nullahs and open areas can be observed. Encroachment in public streets in the city center is causing serious issues. The following types of encroachment can be observed in the city:

Land Encroachment

Since most of the land is privately owned, the owners protect their property boundaries. However, disputes regarding these boundaries are common in Gilgit. Nomads (Jalawan in local language) live in Kuchhi Abadis on riverbanks in a few areas of Basin and Kargah.[275] Most of the riverside encroachment is caused by migrants from different villages of GB and Kohistan.[276]

Roadside Encroachment

Establishment of illegal roadside cabins and stalls, disobedience of right-of-way (RoW) of roads and haphazard parking in the city is causing this type of encroachment. The residential houses

273. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
274. Abdul Basit, 2011, Muhammad. The Gilgit – Baltistan Laws. Lahore: Federal Law House.
275. Ibid.
276. Ibid.

along the main roads with front entrances facing the road worsen the issue. Roadside dumping of solid waste is also hindering the smooth flow of traffic.

Riverbank and Nullah-side Encroachment
Installation of water pumps on the Gilgit and Hunza Rivers, excavation of pebble, crush and stones from riverbanks, erection of structures that cause a hindrance to the flow of rivers and temporary settlements can be included in the riverbank encroachment. These encroachments are not merely deteriorating the quality of river water but are also causing erosion of the banks.

Recommendations
Recommendations regarding the RoW of roadsides and riverbanks and work permits in these areas are provided as follows:
Defining Boundaries of Plots
- The GDA should define proper boundaries of plots as described in the CMP.

Preparing a Digital Database of Land
- Complete land-ownership records should be developed and maintained on a GIS-based database.

Resolving Land Disputes Using a Digital Database
- A digital database should be maintained to avoid future boundary conflicts. Presently, land disputes take considerable time to resolve. Efforts should be made, by the concerned institution, to resolve land disputes in a minimum time frame.

Defining the RoW of Riverbanks, Nullahs and Roads
- As suggested in the CMP recommendations Section 3.8, RoWs should be defined for roads, rivers and nullahs. The RoW for roads can be defined using good engineering practices, while the RoW on riverbanks can be defined as the area to the breadth of at least 10 meters from the ordinary waterline in the wet season (or as deemed fit by the relevant institution). The RoW of the nullahs can be similarly defined.

Enacting Bylaws for Proper Implementation
- The GDA bylaws should be enacted to ensure obedience of the aforementioned RoWs of roads, rivers and nullahs. The GDA should take the responsibility of implementing all these bylaws and should take the help of the GB police, if and where required.

- Disobedience of the RoWs and boundaries for roads, rivers and nullahs, declared by the GDA, should be treated as a serious crime and penalties should be clearly mentioned in the bylaws.

Prohibiting Roadside Encroachment
- Roadside cabins and stalls in the municipality should be prohibited, or a distinct area where these stalls may operate should be identified.

- Gilgit traffic police should outlaw roadside parking. Proper parking signage that designates “no parking” areas should be installed, where necessary.

- Roadside dumping of solid waste should be strongly prohibited.

Issuing Construction Permits
- No construction activity, without prior approval of the GDA, should be allowed within the RoWs. The erection of any structure causing hindrance to the flow of rivers and/or nullahs should not be allowed in any case.

Providing Legitimate Spaces for all Sectors[277]
- Supply-side shortages in terms of residential, commercial and institutional use may cause this encroachment. Serious steps should be taken to provide the required space for each.

Converting Riverbanks and Nullahsides into Recreational Areas
- As suggested in the CMP recommendations, riverbank and nullah RoWs should be used as recreational spots for the public.

277. Residential, commercial and institutional

Providing Access to the Riverbanks

- Access or exit ways to the riversides should be provided only after permission from the GDA. Materials such as sand crush and stones should not be transported through these ways. The preference should be to keep the number of these ways to a minimum.

Limiting Activities on Riverbanks

- Sand mining in terms of excavation of pebbles and sand on riverbanks should be forbidden.

- Installation of pumps on riverbanks without GDA sanction should be prohibited

- Controlled and sustainable fishing should be done only with GDA sanction.

5.4.6 Drainage

The Northern Areas Public Works Department (NAPWD) has constructed a network of roadside sanitary drains for Gilgit. The Frontier Works Organization (FWO) has also constructed similar drains along the KKH.[278] The kuchha and pukka household drains in mohallas and residential colonies are constructed on a self-help basis.

Responsible Institution

Under the Local Government Order 1979, Schedule V, Section C, Article 9, it is the responsibility of the MC to provide adequate drainage systems in the city. The Order allows residents to empty their private drains into public drains with the prior permission of the MC, while the MC has the power to inspect and regulate private drains and, by notice, require the owner of any building, land or an industrial concern within the Municipality to construct appropriate drains within the building or land or the street adjoining such building or land. Article 10 of the same order grants authority to the MC to require commercial and industrial entities to prepare and implement adequate drainage schemes in their locality.

This Gilgit-Baltistan Development of Cities Act 2012 delegates the power of developing, operating and maintaining the drainage system to the GDA. However, considering the heavy responsibilities of land-use zoning, development and planning already delegated to the GDA, drainage network construction, operation and maintenance may be assigned to the MC as stated by the Gilgit-Baltistan Local Government Order 1979. The existing laws are capable of addressing drainage concerns in the city.

Concerns

Type and Capacity of Drains

The drains constructed by Northern Area Public Works Department (NAPWD) and the Frontier Works Organization (FWO) are primarily designed for the collection of storm water and are not meant for municipal grey water. Existing drains along roadsides do not have the capacity to adequately capture larger volumes of storm water during the rainy seasons. Due to an inadequate capacity of the constructed drains, instances of drain blockages in the city were noted during HBP's site visit.[279]

Water Pollution

Locals use drainage water for irrigation. The excess is released in an untreated state into the Gilgit and Hunza Rivers.[280]

High Water Tables

Poor drainage in Gilgit is resulting in high water tables in Kashrot, Majni Mohallah, Amphrey and the Airport. The water table is creating problems for building and construction projects in these areas.[281]

Recommendations

Recommendations for maintaining and operating municipal, industrial and commercial drainage networks in Gilgit are as follows:

278. Pakistan Urban Observatory. "City Profile – Gilgit." urban.unhabitat.org. 2011. http://urban.unhabitat.org.pk/Region/GilgitBaltistan/Gilgit.aspx (accessed January 24, 2014).
279. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
280. Ibid.
281. Raza, Haider. 2003, Northern Areas Strategy for Sustainable Development. Background Paper, Gilgit: IUCN Pakistan Northern Areas Programme, x+38 pp.

Hospital and Industrial Waste as a Separate Waste Entity

- Before dumping into public drains or the river water, hospital, industrial and commercial drainage should be treated separately and regulated by the MC.

Industries to Develop Drainage Plan for their Area of Operation

- It is recommended that industries operating in the city should develop drainage plans for their area of operations, get approval from the relevant institution and implement the plan in that area.

The MC to Upgrade Existing Municipal Drains

- The existing drains may be upgraded by the MC along with the construction of newer drains in areas where required, as part of the municipal-drainage network for the city.

- Municipal drains should be capable of handling storm water.

Use of Municipal Drainage Water

- Municipal drainage water may be used for irrigation purposes.

- The MC should treat/dilute the drainage water before introducing it to the river water.

- Drainage water should not be introduced to the nullahs, as they are the primary source of drinking water.

Maintenance of Municipal Drains

- Bylaws are needed for the maintenance of the drainage network.

- Legislation against dumping solid waste into drainage networks is needed in Gilgit.

5.4.7 Waste

According to an IUCNP survey conducted in 1998, the average per capita waste generation in Gilgit is around 0.4 kg per day.[282] Based on this figure, the total waste generated in the city is about 36 tons per day.

Through site visits, it was observed that households situated along water channels directly dispose of garbage into these channels. Usually waste is burned at dumpsites in Gilgit.[283]

Responsible Institution

Under the Local Government Order 1979 Schedule V, Section A, Article 3, responsibility for the collection and disposal of refuse rests with the MC. The MC is duty bound to provide dustbins or receptacles at suitable places and in proper and convenient locations in streets or other public places. All the refuse removed and collected by the MC through these dustbins is the property of the MC.[284]

Under Schedule V, Section A, Article 2 of the same Order, the MC has the authority to issue notice to owners/occupiers of any building to clean the building to the satisfaction of the MC or to make repairs as may be specified in the notice. Under the Gilgit-Baltistan Development of Cities Act 2012, the responsibility for sewerage, drainage, solid-waste disposal and related matters is assigned to the GDA. Presently however, the MC is handling sewerage and solid-waste disposal in Gilgit.

It is recommended that the responsibility for sewerage and solid-waste management in Gilgit should remain with the MC, as is the present situation. Assigning this responsibility to the GDA may result in burdening the nascent institution beyond its present working capacity and may not yield effective results.

Concerns

Solid-Waste Management

The Office of the Municipal Administration of Gilgit operates five dumpers and six dustbins in the city.[285] Solid waste is collected from these

282. Raza, Haider. 2003, Northern Areas Strategy for Sustainable Development. Background Paper, Gilgit: IUCN Pakistan Northern Areas Programme, x+38 pp.
283. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
284. Abdul Basit, Muhammad. 2011, The Gilgit – Baltistan Laws. Lahore: Federal Law House.
285. Ibid.

dustbins by the MC using two municipal trolleys and dumped at a site near the KIU. The MC does not own any waste compactor trucks. About 50% of the total waste generated in the city is dumped or burned in open air and 14% is collected by the MC.[286]

The MC operating in Gilgit is short of manpower and indispensable equipment. Due to lack of financial resources, existing infrastructure cannot be maintained, skilled professionals cannot be hired and the necessary procurements are hindered.[287]

The present waste-dumping site is located in Chilmas Das, with the KIU in close proximity of it. Unregulated dumping of waste into Gilgit River, near Nomal Road, is one major cause of water pollution in Gilgit.

Air Pollution and Health Hazards

Open-air burning and the dumping of waste is being practiced along Nomal Road near the KIU. Dumping sites are close to the river on the north side – fire due to burning of waste is one of the major causes of air and water pollution in Gilgit. The burning of waste is also a major cause of respiratory diseases, particularly among children, due to the plastic content in the waste (more information on the environmental values of clean air in the city can be found in Section 2.1.5).

Special Waste

Effluent from service stations in Gilgit is discharged, without treatment, into nearby small water rills and ultimately to water channels. There is no proper arrangement to deal with hazardous effluents generated by hospitals.[288]

Recommendations

Recommendations for managing the waste situation in Gilgit, including the prohibition of open-air dumping, the burning of waste, collection routes and timings, special and hazardous waste, the recycling of waste, the capacity of the existing MC and service charges for the waste management system are as follows:

Prohibition of Open-Air Burning/Dumping of Waste

- MC bylaws should prohibit open-air burning and dumping of waste into rivers, nullahs or on roadsides and declare penalties for violators.

- All waste collected in the city for one day should be disposed of in a single dumpsite identified by the MC.

Provision of Waste Receptacles

- The MC should provide covered dustbins in recreational areas, parking areas and residential streets.

Defining Waste-Collection Routes and Timings

- Waste-collection routes and timings should be identified by the MC so that collection trolleys may collect municipal waste and dispose of it at recommended sites.

- As Sabzi Mandies are usually outside municipal limits, regulations should be passed for waste-collection timing, routes, fees and disposal.

- Central waste-collection systems in the mozas should be implemented, so the MC trolleys may conveniently pick up municipal waste from specified collection points.

Special/Hazardous Waste Management

- Bylaws are needed for the definition of on-site treatment and the disposal of special/hazardous waste.

- If on-site treatment is not practiced, hospital waste or waste from smaller clinics should be carefully regulated, separated and then disposed of.

- Prior inspection of hospital waste and its disposal should be one of the priorities of the MC. Completely sealed hospital-waste incinerators should be made a legal requirement for hospitals operating in Gilgit.

286. Karrar and Iqbal, 2011, Gilgit Report, UN–Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
287. Raza, Haider. 2003, Northern Areas Strategy for Sustainable Development. Background Paper, Gilgit: IUCN Pakistan Northern Areas Programme, x+38 pp.
288. Ibid.

Recycling of Waste to be Promoted

- Recycling of waste, which forms a source of income for the poorer segment of the society, should be encouraged, and the health of the workers should be protected with suitable protective measures.

Operating Capacity of MC to be Upgraded

- The structure and working capacity of the MC needs to be upgraded in order to make the waste-management plan and legislations effective.

- Service Charges: Users should be charged, through taxation, for the waste-collection and disposal services being provided to them.

5.4.8 Deforestation and Uncontrolled Grazing

Only 6% of the total land area in Gilgit is covered with forests.[289] Most of the trees are privately owned and are controlled by individuals, making them vulnerable.[290] These trees may be chopped whenever the owner needs wood or money. Greenfield sites in Gilgit identified in the CMP are valuable assets for the city and should be protected from any damage. They provide fresh air to the city and sequester carbon dioxide (CO2).

Responsible Institution

The Forest, Wildlife and Environment Department is responsible for implementing the following legal instruments in GB.

- Several provisions of The Forest Act 1927 are applicable in GB. The Act protects forest areas, regulates forest produce, provides for the creation of various classes of forest and allows provincial governments to reserve state-owned forest land, assume control of privately owned forest land, and declare any government-owned forest land to be a protected area (PA). The law prohibits grazing, hunting, quarrying, clearing for cultivation, removing forest produce, and felling or lopping trees and branches in reserved or protected areas.
- Northern Areas Wildlife Preservation Act 1975 provides for the establishment of national parks, wildlife reserves and wildlife sanctuaries; the constitution of a Northern Areas Wildlife Board; and the issuing of hunting licenses and certificates of lawful possession of forests. It regulates hunting, prohibits the use of inhumane methods and imposes certain other limitations, such as time of day, season and area in which hunting is permitted.

Natives categorize forests in GB into awami (people's property) forests, artificial forests and government-owned forests. The categorization is based on the type of ownership mentioned by the respondents. The first type is owned by the communities, the second one is mostly owned by individuals and the final type by the government. Government has banned tree cutting in a few reserved forests.[291]

Under the Forest Act 1927, the responsibility of managing forests rests with the Forest, Wildlife and Environment Department. This framework proposes that the complete control of all public forests should rest with this department, while the private forests in the city should be subjected to monitoring by the same.

Concerns

Wood is an important source of fuel, especially during the extreme weather of winter. Cutting wood for fuel is the main cause of deforestation. Residents of Gilgit usually cut trees for personal use, however, a few types of wood and timber are a source of income. Wood sold in the winter months fetches a good price for the seller. There are three main issues regarding the current situation of forests in Gilgit city:

- Continuous deforestation
- Scant vegetation cover
- Privately owned trees

289. Information is taken from land use map for Gilgit (HBP's Phase 1 Report, Exhibit 3.3) developed by GDA.
290. Stakeholder consultations and site visits conducted by HBP in September 2013 and December 2013. This was to take the key stakeholders in Gilgit City on board with the SEA of Gilgit City Master Plan and to obtain information from them about the city. The stakeholders involved government officials, secretaries, ministers and representatives of NGOs active in Gilgit City.
291. Bilal, Asad, Dr. Huma Haque, and Patricia Moore. 2003, Customary Laws Governing Natural Resource Management in the Northern Areas. IUCN Law Programme, xiii+67 pp.

Uncontrolled grazing on slopes and hillsides will cause habitat loss, soil erosion, flooding and landslides. With the increase in population and the expansion of the city, destructive grazing will become common. More people will use the public slopes and hills to graze their livestock, causing uncontrolled grazing.

Recommendations

In order to prevent deforestation and habitat destruction of the biodiversity in Gilgit, the following set of recommendations are being proposed:

Encouraging Local Farmers for Afforestation

- The planting of new trees, shrubs and other kinds of suitable vegetation in the city should be ensured. Local farmers should be given incentives to plant a maximum number of trees in their land, except for on the land used for cultivating crops and vegetables. The local government should provide native species of plants to avoid the introduction of invasive species in the city or a proper procedure should be followed before introducing any external species of plants.

Planting Trees on Riverbanks and Nullah Sides

- Riverbanks and nullah sides seem viable options for tree planting.

Developing Road Verges

- Road verges can also be developed along the main roads.

Protecting Slopes and Hillsides

- The slopes and hillsides vulnerable to floods, landslides and erosion should be identified and controlled grazing be ensured. These areas should not only include the public forests and wildlife areas, managed by the Forest, Wildlife and Environment Department, but also the privately owned areas identified as vulnerable to destructive grazing.

Issuing Tree-Cutting Permits

- Where trees are approved to be cut, the minimum replacement ratio is two new trees for each tree cut, but this may be greater depending on the arborist's recommendations. This should be also applicable to privately owned trees.

- Stop-work orders, delays in construction, replacement-tree requirements, or fines should be implicated if trees are damaged or cut without proper sanction from the Forest, Wildlife and Environment Department.

Controlling and Monitoring Destructive Grazing

- The Forest, Wildlife and Environment Department should conduct a proper survey to identify slopes and hillsides vulnerable to deforestation or destructive grazing.

- Areas identified by the Forest Department as vulnerable to destructive grazing should be monitored and only sustainable grazing should be allowed in such areas.

Banning Transport of Wood from the City

- Transport of wood from Gilgit to other areas without proper sanction of the Forest, Wildlife and Environment Department should be banned.

5.4.9 Protected Areas

Several PAs have been created over the last 25 years in GB. However, many of these do not have effective management systems. The responsibility for managing these lies with the Forest, Wildlife and Environment Department of GB. NGOs working on conserving the ecological resources and community-uplift schemes include the World Wide Fund for Nature (WWF–P), the International Union for Conservation of Nature (IUCN–P), the Snow Leopard Foundation and the Wildlife Conservation Society (WCS).

The PAs in the Study Area include the Kargah Community Managed Conservation Area, Danyor Game Reserve, Jutial Community Controlled Hunting Area and Sakwar Community Controlled Hunting Area. The Naltar Wildlife Sanctuary is located at least 40 km away from Gilgit. Previously, the entire catchment of the Kargah Nullah was declared a wildlife sanctuary.

However, recently, it has been handed over to the community and has been declared a Community Managed Conservation Area.[292]

Responsible Institution

The Forest, Wildlife and Environment Department of the GoP is the institution responsible for PA management in Gilgit.

Under existing laws, wildlife sanctuaries provide greater protection than national parks. Game reserves afford no protection to the habitat and only regulate hunting.[293] The Forest Act 1927 prohibits grazing, hunting, quarrying, clearing for the purpose of cultivation, removing forest produce, and felling or lopping trees and branches in reserved or protected areas.
It is recommended that the Forest, Wildlife and Environment Department should continue managing PAs in and around Gilgit.

Concerns

PA Boundaries and Classification

The boundaries of PAs in Gilgit are vague and not clearly defined. There is a need for proper definition of PAs and their classification based on biodiversity, habitat and their ecological importance.

PA Management

The biodiversity of the PAs is under increasing pressure due to the rising human population and the need for more land to grow crops and more wood for fuel and housing.[294] Commercial and residential encroachment of the PAs has been noted, in Gilgit, in recent years.

Recommendations

Recommendations for developing bylaws for PA management in Gilgit are as follows:

Clearly Defined PA Boundaries

While developing the Plan for Gilgit, it is important that the Forest, Wildlife and Environment Department clearly specify the boundaries of the PAs in order to prevent any encroachments of city limits into these areas.

- Fencing of PAs may be done by the Forest, Wildlife and Environment Department in order to stop encroachment.

Bylaws for PA Management

- Regulations should be made to prohibit any construction activity in the designated PAs.

- A database of present biodiversity, endangered species and reproduction rates should be maintained by the Forest, Wildlife and Environment Department so that controlled hunting and trophy hunting may be sustained in Community Controlled Hunting Areas. The Department should regularly monitor these areas and accept the help of the Gilgit Police Department in order to regulate encroachment or illegal hunting in these areas.
- Consultations should be done with the tourism department to set rules and regulations regarding tourism activities in the PAs

5.5 Summary of the Discussion

The discussion of the institutional framework is summarized in Exhibit 5.1.

292. Personal communication with Babar Khan, Manager WWF–Gilgit.
293. Ibid.
294. McNeely, J. A. 1993, "Economic Incentives for conserving biodiversity: Lessons for Africa." Ambio 22 (2–3) 144–150.

Exhibit 5.1: Proposed Institutional Framework for Gilgit

Field of Concern	*Responsible Institution*	*Legal Empowerment of Institution*	*Issues*	*Recommendations*
Water	• Current: MC • Proposed: MC	• Canal and Drainage Act 1873 • Northern Areas Local Government Order 1979, Schedule V, Section B, Article 8, Clause 1 • Customary laws of GB	• Water Scarcity • Water Quality	• Defining New Rights for Water Use • Fixing Limits on Customary Water Rights • River Supply Control • Division of River and Nullah Water Supply • Equitable Distribution • Improving Water Quality Control and Supply of Safe Drinking Water • Introducing Water Tariff
Land	• Current: GDA • Proposed: GDA	• Gilgit-Baltistan Development of Cities Act, 2012 • The Land Acquisition Act of 1894	• Zoning • Preservation of Agricultural Land	• Defining Plot Size and Coverage • Regulating Bifurcation of Plots • Strategy for Brownfield Sites Land Use
Buildings	• Current: MC • Proposed: GDA	• Local Government Order 1979 Schedule V, Section I, Article 26 • Gilgit-Baltistan Development of Cities Act 2012	• Design and Construction • Material Building Specifications	• Bylaws Needed for Defining Building Specifications • CDA Building Bylaws as an Example for GDA • Preservation and Promotion of Cultural Heritage through City Infrastructure • Buildings to be Disaster Resilient
Roads, Public Streets and Traffic Congestion	• Current: Works Department • Proposed: GDA and MC	• Northern Areas Local Government Order 1979, Schedule V, Section J, Article 29 • Gilgit-Baltistan Development of Cities Act, 2012	• Traffic Congestion • Road Maintenance • Emissions from Vehicles	• Constructing and Maintaining City Roads • Categorizing Roads Based on Type of Vehicles Using the Road • Constructing City Bye-passes • Collecting Toll Taxes • Controlling Vehicular Emissions • Issuing Vehicle Fitness Certificate • Prohibiting Roadside Encroachment • Installing Traffic Signals on Main Chocks
Encroachment	• Current: MC • Proposed: GDA	• Northern Areas Local Government Order 1979, Schedule V, Section J, Article 30. • Gilgit-Baltistan Development of Cities Act, 2012	• Land Encroachment • Roadside Encroachment • Riverbank and Nullah Encroachment	• Defining Plot Boundaries • Preparing Digital Database of Land-Ownership Records • Resolving Land Disputes using Digital Database • Defining RoWs of Riverbanks, Nullahs and Roads

Field of Concern	*Responsible Institution*	*Legal Empowerment of Institution*	*Issues*	*Recommendations*
				• Prohibiting Roadside Encroachment • Issuing Construction Permits for all Construction Activities • Providing Legitimate Spaces for Residential, Commercial and Industrial Sectors • Converting Riverbank and Nullah side RoWs into Recreational Areas • Controlled Access to the Riverbanks • Limiting Activities on Riverbanks
Drainage	• Current: MC • Proposed: MC	• Local Government Order 1979, Schedule V, Section C, Article 9 • Gilgit-Baltistan Development of Cities Act 2012	• Water Pollution • High Water Tables	• Hospital and Industrial Waste as a Separate Waste Entity • Industries to Develop Drainage Plan for their Area of Operation • The MC to Upgrade Existing Municipal Drains • Use of Municipal Drainage Water • Maintenance of Municipal Drains
Waste	• Current: MC • Proposed: MC	• Local Government Order 1979 Schedule V, Section A, Article 3 • Local Government Order 1979, Schedule V, Section A, Article 2 • Gilgit-Baltistan Development of Cities Act 2012	• Solid-Waste Management • Special Waste • Air Pollution and Health Problems	• Prohibition of Open-Air Burning/Dumping of Waste • Provision of Waste Receptacles • Defining Waste-Collection Routes and Timings • Special/Hazardous Waste Management • Recycling of Waste to be promoted • Operating Capacity of MC to be upgraded
Deforestation, Protected Areas Management Grazing and Illegal Hunting	• Current: Forest, Wildlife and Environment Department • Proposed: Forest, Wildlife and Environment Department	• The Forest Act (1927) • Northern Areas Wildlife Preservation Act (1975)	• Continuous Deforestation • Scant vegetation Cover • Privately Owned Trees	• Encouraging Local Farmers for Afforestation • Planting Trees on Riverbanks and Nullah Sides • Developing Road Verges • Protecting Slopes and Hillsides • Issuing Tree-Cutting Permits • Controlling and Monitoring Destructive Grazing • Banning Transport of Wood from the City • Defining Boundaries of Protected Areas • Regulations for Protected Area Management

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Appendix A: Terms of Reference – Gilgit Phase II

A.1 Terms of Reference

A.1.1 Introduction

The Government of Gilgit Baltistan and Gilgit Development Authority (GDA) intends to develop detailed ToR for Gilgit City (limits) Master Plan, and wishes to appoint an interdisciplinary team of specialist consultants led by a Town Planner registered with Pakistan Council of Architects and Town Planners. The master plan will be prepared in partnership with the GDA and other stakeholders. It will provide for justification for decision making, guided growth of the promotion, implementation and timing of all master plan initiatives in the town center, and its periphery unless superseded. Gilgit-Baltistan means the areas comprising districts of Astore, Diamer, Ghanche, Ghizer, Gilgit, Hunza-Nagar, Skardu and such other districts as may be created from time to time (Refer to the enclosed CMP in Annexure 1).

In Pakistan, large master planning exercises have not been successful due to a variety of reasons, some due to lack of political will, legislation or simply an inadequate administrative and financial system which has not been put in place, as well as bad governance. Land acquisition is still a chronic problem in implementation of master plans with a major role played by land developers.[1] For successful launching and implementation exercise, all the above factors will have to be catered for.

A.2 Recipient

The detailed Master Plan is proposed by the governance and development authorities for the development of Gilgit city and to cater for its future requirements up to year 2025.

A.3 Objectives

A.3.1 General

The General Deliverables of the Master Plan Development Study are outlined here:
The principles of Sustainable Development will form the foundation for new development, within Gilgit city, and its periphery. These principles include but are not limited to:

- Development for Social Progress
- Development for Ecological Balance
- Development for Economic Growth
- Development of Tourism

The Gilgit City Master Plan (GCMP) vision for the future, understanding of current conditions, and future needs would be incorporated into a detailed land use planning exercise, with future options of spatial growth highlighted including developing strategies for Urban Renewal.
There is a need to develop an implementation strategy for the (GCMP). This will require identification of and capacity building within a lead agency, and detailed guidelines for sustainable land use.

There is a need to improve the capacity of government which shall undertake and implement detailed land use planning in Gilgit.
The Government of Gilgit Baltistan should encourage and facilitate, new developments in Gilgit within the limits of the environment while maximizing the benefits desired.

A.4 Specific

It is imperative that the sampling techniques are furnished at the start of all studies. In continuance to the general objectives, specifics of the exercise are delineated below:
Collection of Data: In depth data collection of Environment, Cultural, Social, and Economic context of the study area, and its analysis and synthesis.

Contextual Impacts: Determining Regional context, location and setting of the Master Plan area, and impact of regional events on the study

1. Hagler Bailley; David Annandale: Pilot SEA of Master Plan for Gilgit City, Conceptual Master Plan, 2014.

area, including transportation corridors.

Master Plan Options: Preparation of different master plan options through selection of candidate sites to be carried out resulting in the implementation of a final selection by the stakeholders.

Settlement pattern Options (spatial): Spatial growth options will define the broad geographical approach and the overall concept of growth. Existing barren sites towards the Chilmas Das and Sakwar to be used as the expansion areas outside the city. (Refer to the enclosed CMP in Annexure 2), with a schedule of available sites and areas.

Town Promotion: The promotion of Gilgit as a town that is committed to learning and enterprise as an evolving and continuous process. Educational Importance: The presence of (Karokaram International University) in the city with its own redevelopment and growth plans as a testament to such a commitment.

Environmental Benefits & Tourism: The improvement of the Environment and general air quality to attract visitors creating a high quality, clean and safe environment with lively and striking public spaces, especially along the river front areas. This is aimed at increasing tourism in the region. Improvement of environment along the archeological and conservation areas will also be focused upon. Recreation should be seen as an important factor to be addressed. Conservation of cultural heritage shall also be focused upon.

River Front Development: Recommendation for river front areas to have detailed polices including income generating schemes, protection of river front areas and strict adherence to no dumping of waste in the river or Nullahs as they are the primary source of water supply.

Income Generation: Income generation guidelines for the population, especially through urban agriculture and tourism. Strategies of income generation for municipality will also be formulated.

Urban Renewal and Regeneration: urban renewal to be seen as an income generation exercise spread over; tourism, housing, culture and environment. Stress on urban renewal will reinforce the idea of creating a town identity and promotion of recreation. Not more than three areas shall be selected for urban and local development plans.

For urban renewal areas, guidelines for aesthetics i.e. building lines, façade development, fenestration design and materials will be developed for the local urban development plans.

Traffic Management: The improvement of access and movement to and within the town center to make the town more user friendly through road and air infrastructure improvements, improved car parking, developing user friendly transportation nodes and encouraging alternative modes such as cycling, walking and public transport, with links to the regional transport system.

Solid waste disposal sites: Policies to be developed for allocation of waste disposal sites and new landfill areas, hospital waste sites and its management.

Model Village: Development of the Image of Marketing of the Town Center and proposed model village as a focal point for its rich rural hinterland for the local residents as well as visitors, national as well as international. It should be developed as an income generative model, whether through promoting regional arts and crafts or bed and breakfast facilities. Location and size determination of model village based upon prime survey data, including the activities to be located such as vocational training centers with retail outlets, bed and breakfast motels for income generation.

Regeneration: A hierarchy of regeneration priorities with short, medium, and long-term actions and timelines should be developed into an

Action Plan for the next 10-15 years. Regeneration through enhanced urban agriculture polices, and methods including any rearrangement of urban agricultural land.

Availability of adequate Resources: Determining availability of scarce resources and its distribution.

Growth options: Including population projections, flow of labor and population. Conducting sample surveys of householders and some estimates of population through collection of prime data. 5% collection of data for population and 5% collection of data for households.

Housing Demand: Estimating housing demand for the year 2025 which includes natural population growth and that of government departments as well as expansion plans of the education and health sectors, based on population estimates.

Zoning and Physical Infrastructure: Physical Planning and land use, developing zoning policies, especially the concept of mixed zoning or unified zoning. Policies and location strategies regarding the following, both regarding Gilgit and as a regional Hub.

Seismic Zone: Prepare comments on the NESPAK report on seismic zoning of Gilgit Baltistan.

Health Surveys: Prime surveys to be conducted of complete health facilities with total number of beds of present as well as projections of future number of beds and facilities, which will be supported by the estimated population. Sustainability: Promotion of sustainability of the prepared Master Plan

Industry: Designated industrial zone to be developed within the city limits to allow for controlled expansion of local industries. Barren land of around 15 Ha is to be dedicated for the storage of warehouses, development of fruit processing industry, packaging, stationery, clothing, cement, handicrafts industries among others.

Institutional Framework: Urban Agriculture and its policies including land management and consolidation. Identification of institutions responsible for development and implementation of the master plan;

Financial and implementation mechanism: For implementation of the Master Plan till 2025, such as raising revenues, concept of user charges to generate funds.

Ethnic Strife: Mechanisms for reducing sectarian violence between various ethnic groups.

Priorities should be identified, using a range of measures including Availability, Impact, Size, Time-span, Enhancement, etc. Appropriate implementation agencies should be identified, at various times, including the responsibilities of the various line departments, i.e. power generation and distribution, sewerage, water supply, and solid waste disposal; this list is not exhaustive.

The recommendations produced should be ambitious, yet realistic, sustainable and capable of being delivered. Where the appointed consultants' recommendations would require the department to acquire land and property, whether by agreement or compulsorily, the extent of and justification for the acquisition will need to be shown.

A.5 Methodology

Regarding preparation of detailed Master Plan there will be literature review of previous studies with synthesis and conclusions drawn including giving special reference to the recent studies conducted by Hagler Bailey in early 2014, which will be reviewed in greater detail and commented upon. For example comments and recommendations on Hagler Bailey's Phase – II report and environmental framework on conceptual master plan, policy and institutional

plan and financial sustainability plan shall be prepared.

A background analysis of Pilot Strategic Environmental Assessment of the master plans for Gilgit city and the Phase-II Conceptual Master Plan report shall be consulted simultaneously resulting in a synthesis for the third Phase. This synthesis would require reorganization of existing information, reshuffling it and giving it a new interpretation to existing approaches. Sample surveys of the master plan area as outlined in the objectives will be carried out leading to comments on strategies and collection of prime surveys to substantiate a realistic basis for the following strategies:

- Strategy for management of air quality and water quality: Development of Water supply and distribution networks.
- Strategy for management of solid waste: Determination and calculation of the amount of solid waste and its disposal, location of landfills.
- Strategy for management of traffic and noise: Public transport and mass transit systems development through a traffic demand modeling program.
- Strategy for sewerage management: Development of Sewerage treatment and recycling treatment of grey water, comment on the existing sewerage plan for Gilgit city.
- Strategy for nature conservation and recreation: Model Village proposal, promotion of fisheries (Trout) in the various nullahs such as the Kargah and conservation of cultural heritage and conservation areas.
- Strategy for Power Distribution: Calculation of the power distribution
- Urban renewal: aerial development plans for various zones to be prepared, called development zones.
- Strategy for development of brownfield and green field sites for urban expansion.

Current policies, legislation and rules: Relevant to master planning and identification of gaps, recommendations for amendments and additional legislation; Policy and institutional development plan; current role under legislation and rules and expected role for preparation and implementation of the master plan; review of the capacity of the institutions with reference to the requirements of the master plan; and recommendations for capacity enhancement and institutional development.

Formulation of Legislations: regarding: environmental issues land management, urban agriculture and land re-appropriation issues, approval of building plans (area wise development), land acquisition, urban renewal needs, and implementation of plan, planning commissions for residential, commercial, institutional and health care.

Financial Sustainability Plan: under the governance responsibilities for the preparation of a detailed Master Plan includes preparation of preliminary budget estimates for infrastructure development, training, capacity building and operation of the infrastructure and municipal services in the city including determining the extent of municipal jurisdiction, determination of the extent to which the government will rely on internal and external resources for investment and operation, formulating proposals for revenue generation through charging the users for services provided, preparing recommendations for policy, rules and regulations for imposition of user fees and revenue collection, and giving recommendations for management of revenue collection and utilization in particular to; consider the interaction between statutory consultees such as the Highways Agency, Environment Agency and the planning development and other stakeholders. In addition to that, to identify ways to make it operate effectively and efficiently; classify areas where there is scope for reducing administrative burdens, for example through

further reduction of or streamlining in information requirements or extending the use of planning, consistent with efficient application of development controls and delivery of sustainable development.[2]

It is imperative that the issues highlighted be addressed and mitigated at every stage as is evident from the past that regulations for large master plans have failed because these issues were not dealt with.

A.6 Deliverables

Stages: The report deliverables shall comprise of the following stages:
Collection of prime data and in depth study of previous studies whereby the review should: (the consultant should specify in his methodology the collection of prime data).

- Identify the key policy objectives that the planning system is required to deliver now and in the future;
- Assess existing institutional delivery arrangements, noting areas of good practice and areas in need of improvement;
- Propose options for the future delivery of the planning system, including plan making and development management services. This should include consideration of what should be delivered where in the institutional hierarchy and may include suggesting new institutional arrangements.
- Comments on the prime data collected in the form of a synthesis;

A.7 Data compilation and report writing.

Inception Report: A brief report to be prepared of not more than fifteen (15) pages and submitted in ten (10) days and which incorporates the first stakeholder – consultant meeting observations, and vision of the Master Plan objectives.

Draft Report: Preparation of a Draft report of no more than two hundred (200) pages (with maximum of 30 pages of Maps, Plans and Diagrams) will be provided within two to three weeks after conclusive studies are done. The second stakeholder – consultant meeting observations are incorporated at this stage. The draft report submission by the consultant will consist of four (04) hard copies. The maps will be in addition to the 200 page report.

Finalized Report: Preparation of a finalized report after incorporation of all the comments with various policy options and strategies formulated for growth of the city with plan period of 2025. Third stakeholder – consultant meeting concludes at this stage.

The finalized report submission by the consultant shall comprise of One Soft Copy of the Report (CD) and five (05) hard copies (A-4 size) of the report.

Note: Bibliography: All the reports produced shall constitute of a bibliography of all references that shall be used in the SEA report.

A.8 Coordination

The project shall require coordination of all involved authorities', departments; stakeholders; clients with the Master Plan consultant. The consultant shall be provided with timely updates, responses and comments from all involved. Coordinator shall be appointed by the GDA and should preferably be a town planner.

A.9 Responsibilities:

- Of the Coordinator (appointed by the GDA) to arrange for meetings with various government departments and provide transport.
- Of GDA to provide office space for the Master Planning Consultants, Vehicular transportation within the city for assistance in surveys and collection of data.

2. Killian Petty Review, Planning Applications: A faster and more responsive system – Final Report, 2008.

A.10 6.2 Stakeholder meetings:

There shall be a minimum of three key stakeholders – consultant meetings to discuss progress, comment and revision of work at each stage, which shall be coordinated by the GDA.

- Meeting 1 – At the start of the project and before the inception report stage; this meeting shall focus on and address the evaluation of candidate sites as suggested by Hagler Baileys' Phase – II report.
- Meeting 2 – At the Draft Report Stage;
- Meeting 3 – At the Final Report Stage.

A.11 Timeframe

The maximum time duration of all the deliverables till the finalized report would be ten (10) months. This does not include time for approvals and stakeholder meetings.

A.12 Background

Gilgit-Baltistan known formerly as the Northern Areas of Pakistan shares its borders with two of Pakistan's regional neighbors: China to the east and northeast and Afghanistan to the north. According to the 1998 census had a population of 56, 7012 (excluding Danyor and Sakwar) individuals. Gilgit consists of the following Mozas (Administrative boundaries): Danyor, Muhammadabad, Sakwar, Konodas, Jutial, Sonikot, Khomar, Skarkui, Naikoi, Barmas, and Napura Basin. Gilgit is the capital city of the province of Gilgit-Baltistan. It is the administrative and commercial center of Gilgit-Baltistan and constitutes 30% of the province[3]. Situated in the Karakoram mountain foothills, the valley terminates at the intersection of two rivers, Gilgit and Hunza River. This junction is known as Duo Pani (Map 1).

Recent administrative and socio-political changes will lead towards considerable land-use changes due to migration and growing land speculation within the urban precinct and periphery. It is therefore necessary to develop a conceptual and later a comprehensive master plan to support and sustain the urban development pattern of the region.

Gilgit city is one of the two major hubs for all mountaineering expeditions in Gilgit–Baltistan. Almost all tourists headed for treks in Karakoram or Himalaya Ranges arrive at Gilgit first. Gilgit lies about 10 kilometers (6.2 mi) off the Karakoram Highway (KKH). The Karakoram Highway connects it to Chilas, Dasu, Besham, Mansehra, Abbottabad and Islamabad in the south. In the north it is connected to Hunza and Sust in the Northern Areas and to the Chinese cities of Tashkurgan, Upal and Kashgar in Xinjiang. Other than trekking, Gilgit is also home to many archeological sites such as the Kargah Buddha and the ancient manuscripts and is relatively close to the following tourist attractions: Naltar Valley with Naltar, Fairy Meadow in Raikot, Shigar town, Yasin and Kargah Valley.

The Gilgit Development Authority department thus has strategic responsibility for urban regeneration and spatial options for growth of Gilgit city. According to the Development Cities Act, 2012[4], GDA is also responsible for preparation, implementation and enforcement of schemes for environmental, improvements, housing, urban renewal including slums improvement and redevelopment, solid waste disposal, transportation and traffic, health and education facilities and preservation of objects or places of historical, archeological, scientific, cultural and recreational importance.

3. Government of Gilgit Baltistan, accessed 20 Dec 2013, http://www.gilgitbaltistan.gov.pk/
4. Hagler Bailley; David Annandale: Establishing the Context, Pilot Strategic Environmental Assessment of the Master Plan for Gilgit City, 2013.

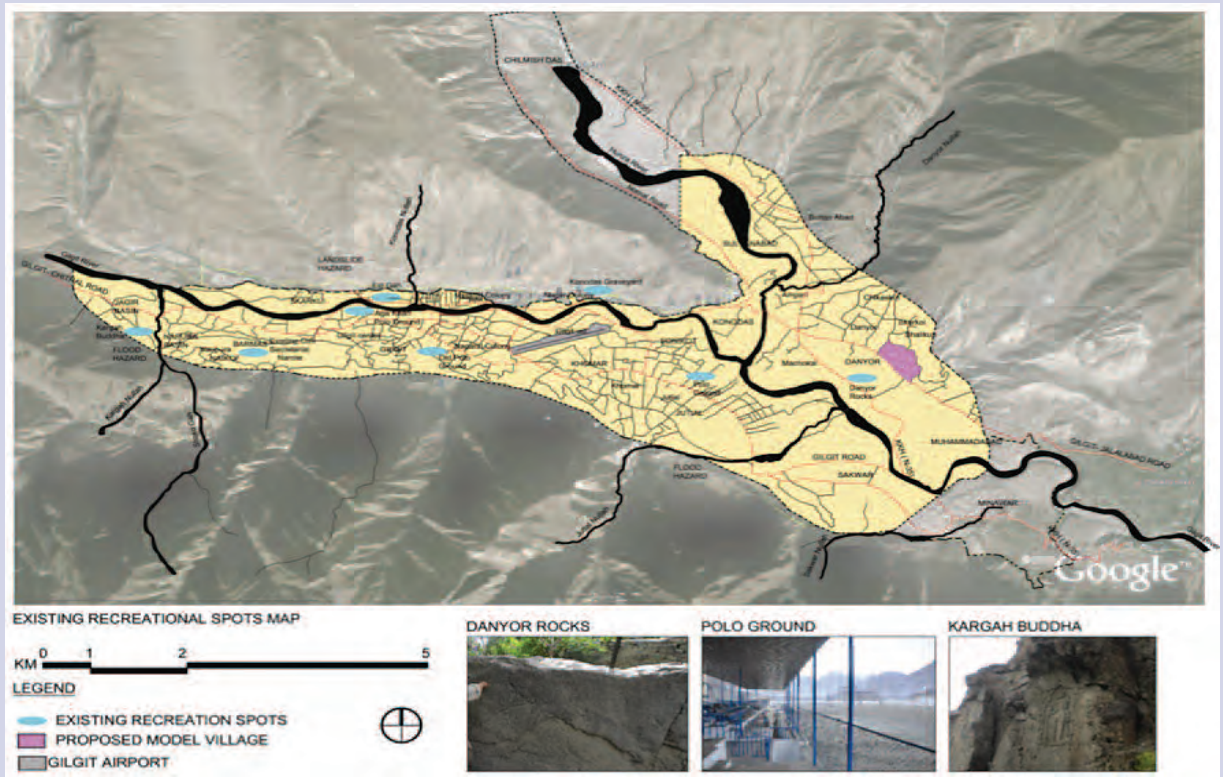
Exhibit A.1: Duo Pani, Intersection of Hunza and Gilgit River

Exhibit A.2: Good Agricultural Land Opposite Skarkui showing Gilgit Chitral Road

Kargah Buddha to be conserved as a tourist attraction

Sakwar barren sites greenfield area

Suitable riverside developments with abattoir along Gilgit River.



A.13 Annexure 1

A.14 Annexure 2

A.15 Team Composition

Personnel Description	*Man Hours (Months)*
Team Leader (MSc. In Town Planning, foreign university)	8
*Urban Designer (MSc. In Town Planning / local or foreign)	6
Junior Town Planner (local)	4
Sociologist	3
Economist	2
Transport Planner: MSc in transport planning, foreign qualified.	4
MEP Engineer/ Infrastructure specialist (3 separate persons)	4
Tourism & Environmental Conservation Hotel Management	2
Archeologist (Artifacts preservation)	2
Urban Landscape Architect (foreign qualified)	2
Demographer / Urban Geographer	5
Environmental Specialist: Foreign Qualified.	3
GIS/MIS expert	6
Legal Specialist (Legislation Specialist): land acquisition & municipal bylaws.	7
Financial Specialist	3
Governance specialist	4
Research Analyst (3 persons): for data compilation & report writing.	6
Economist/Research Analyst	5
Urban Land Use Planner	8
Agriculturist Specialist: specialist in urban growth	6
Sustainability Expert: to give an overview of the process & its linkages. Should be an urban planner or architect.	6

**Could be an architect with a Masters or PHD in relevant focus area.*

Appendix B: Stakeholder Consultation

Pilot Strategic Environmental Assessment Master Plan for Gilgit City

National Impact Assessment Programme (NIAP)

International Union for Conservation of Nature (IUCN)

Report on Pilot SEA Stakeholder Consultation Meetings in Gilgit City

Date: 16th – 18th September, 2013

Stakeholders Consulted (See **Annexure D** for a complete list of participants): Gilgit Baltistan Government Departments: Chief Secretary, Secretary Local Government, Secretary Environment, Secretary Finance/Planning and Development, Secretary Industries and Mining, Gilgit Baltistan Council, Environmental Protection Agency, Deputy Secretary (Staff)
Other Institutions: Water and Sanitation Extension Program (WASEP), Building and Construction Extension Program (BACEP), World Wildlife Fund (WWF)

Other Individuals: Local farmer, Local Town planner/GIS Expert

Conducted by: Mr Vaqar Zakaria, Managing Director Hagler Bailly Pakistan

Recorded by: Mr Hussain Ali, Environmental Engineer Hagler Bailly Pakistan
Ms Khadija Amir, Consultations Expert Hagler Bailly Pakistan

Summary
A series of stakeholder consultations were conducted in Gilgit City as part of the planning phase for the execution of a pilot Strategic Environmental Assessment (SEA) of Gilgit City Master Plan between the 16th and 18th of September 2013. The consultations were led by Mr Vaqar Zakaria, Managing Director Hagler Bailly Pakistan and involved meetings with key stakeholders in the government and private sector in Gilgit Baltistan.

This report begins by providing an outline of the original scope of work that was proposed for carrying out the SEA study. It then states the issues and concerns raised; and the expectations that were shared by the stakeholders during the consultations. The last part of the report incorporates these expectations with the initial scope of work of the SEA and recommends a new way forward for the pilot study.

Introduction to the SEA of Gilgit Master Plan

The Government of Pakistan (GoP) and International Union for Conservation of Nature (IUCN) are jointly implementing the National Impact Assessment Programme (NIAP) that aims to contribute to sustainable development in Pakistan through strengthening the Environmental Impact Assessment (EIA) process and introducing Strategic Environmental Assessment (SEA) in national development planning.

The Government of Gilgit-Baltistan (GoGB) wishes to improve the infrastructure and living standards of its major towns, based on the principles of modern urban planning. To implement this vision, the GoGB has recently established the Gilgit Development Authority (GDA). GoGB is participating in the NIAP program to develop a Strategic Environment Assessment (SEA) of the Gilgit Master Plan. The primary objective of the Master Plan being prepared by GDA is to bring positive changes in the quality of life of Gilgit's

inhabitants by properly planning available human and physical resources, and anticipating future growth and planning for the same. The Master Plan will also focus on estimating future population, planning of utility services, education, health, infrastructure development, tourism, disaster management, solid waste management, housing and employment. Once approved and notified, the Master Plan will serve as the basis for future urban development of Gilgit city.

Hagler Bailly Pakistan Pvt. Ltd (HBP) is preparing the SEA in association with an international consultant, Dr. David Annandale, and International Union for Conservation of Nature (IUCN). The implementation partners of the Programme include Pakistan Environmental Protection Agency (PakEPA); the Environment Wing (EW) of the Ministry of Climate Change (MoCC), and the Gilgit Development Authority (GDA) under the Planning Commission of Pakistan (PC). Additionally, the Netherlands Commission for Environmental Assessment (NCEA) has an advisory role in the Project and provides technical advice.

Proposed Work Plan

The SEA of Gilgit Master Plan study will be a systematic and iterative process which will identify and report on the extent to which the implementation of the Master Plan will achieve a balance of environmental, social, and economic objectives.

This SEA of Gilgit Master Plan will consist of three main phases which will be carried out along the following timelines shown in Exhibit 1.

The detailed breakdown of each phase along with the planned activities within each phase is listed in Appendix B.1.

Phase 1 of the SEA will comprise an analytical component which will analyze key environmental and social problems in the existing Gilgit city based on secondary information. The focus in this phase will be on current maps and layouts of towns in Gilgit; and a comparison with all previous urban and town development plans for the region. The initial desk study will involve obtaining information about various aspects of social and environmental indicators from 1960s to date. All of the historical and latest data available on health, agriculture, irrigation, population, economy and tourism, among others, will be compiled to gauge the success and failure of previous development plans in the region and help identify their strengths and weaknesses.

Phase 2 of the SEA will involve preparation of draft plans with proposed zoning plans for the city. This will be followed by further consultation meetings with the stakeholders. The preparation of draft plans will involve refining options of various plans, predicting their impacts and developing strategies to mitigate their adverse effects. The draft plans will then be presented to the stakeholders in a workshop to record their feedback.

The last phase of the project will involve producing a set of recommendations for institutional reforms and financial sustainability for the implementation of the CMP. This phase will also involve further consultations with the

Exhibit 1: Proposed Timelines for the Three Phases of the SEA Study

Phase 1: Setting the context and objectives; and establishing baselines.	20/09/2013-12/11/2013
Phase 2: Preparing the Conceptual Master Plan	21/10/2013-06/01/2014
Phase 3: Recommendations for implementing the conceptual master plan	27/11/2013-07/02/2014

stakeholders to keep them informed and to ensure that the Master Plan as it is developed in its full detail will be acceptable to all the stakeholders.

The participatory component of the SEA includes sensitization meetings with the Gilgit Development Authority (GDA), and one-on-one meetings with important stakeholders – some of which have already been conducted – throughout the course of the SEA study. Initial stakeholder workshops, a sectoral stakeholder workshop, and a final consultation workshop are planned as an integral part of the SEA.

Stakeholder Consultations

Stakeholders are groups and individuals that are affected by or can affect the outcome of a project. Stakeholder engagement is a broad, inclusive and continuous process between a company and its stakeholders. It encompasses a range of coherent activities and approaches, spanning the entire life cycle of a project from planning to implementation. The objective of conducting stakeholder consultations during the SEA process is to inform all the stakeholders about the Project; record and take into account their opinions, suggestions and concerns; and, gain the confidence of the Project stakeholders regarding the methodology, results, quality and depth of the study. This is achieved by informing the stakeholders in a timely manner about the proposed project and its potential consequences on the environment and by encouraging their feedback. The SEA will attempt to provide a platform for dialogue and interaction between policy makers, planners, stakeholders, and civil society at large on environmental priorities and on how these priorities could be affected by the implementation of the Master Plan.

A stakeholder scoping workshop was organized by IUCN on the 9th of July, 2013, in Gilgit to present the objectives, process and outcomes of a typical SEA. The workshop also involved presentations by IUCN on the background of the project, the source of funding and how the Master Plan of Gilgit city would be prepared. Feedback from the participants of the meeting was also obtained. The detailed outcomes of the workshop and the list of attendees are given in Appendix B.2.

Following the stakeholder scoping workshop, institutional stakeholder consultations were conducted by the HBP team, accompanied by representatives from GDA, Environmental Protection Agency of Gilgit-Baltistan (GBEPA) and IUCN; in Gilgit from the 16th to the 18th of September, 2013. During the course of three days, HBP's team consulted different stakeholders that were present during the scoping meeting held in July 2013, to follow up and record their views and concerns and incorporate them in the preparation of the Master Plan. As the environmental aspects of a city are related to a diverse range of functions, operations, layout and composition of the city, it was critical that as wide a range of relevant stakeholders be consulted and their concerns taken into account in the planning stage of the SEA so that an acceptable CMP for Gilgit city is prepared keeping in view the requirements of the residents of the city. These consultations were to make sure that an engineer's Master Plan is avoided so that the actual issues faced by the Gilgit city are addressed in a way that the inhabitants of the city find easy to embrace.

The following stakeholders were consulted by the HBP team:

- Shehzad Shigri, Director, EPA-GB
- Owais Muzaffar, Secretary Finance/Planning and Development, GB
- Liaquat Ali, Deputy Secretary (Staff), GB
- Mohammad Younus Dhaga, Chief Secretary, GB
- Javed Ahmed, Head, Aga Khan Planning and Building Service: WASEP

- Abdul Qayyum, Secretary Local Government, GB
- Babar Khan, Head, World Wildlife Fund (WWF)
- Masood Khan, Town planner/GIS Expert, Aga Khan Planning and Building Services (AKPBS)
- Mohammad Jameel, Deputy Speaker, GB
- Amjad Hussain, Member GB Council
- Jawed Ahmed, Advocate, GB
- Fida Hussain, Deputy Director, Building and Construction Extension Programme (BACEP)
- Khadim Hussain Saleem, Secretary Environment, GB
- Rai Hasnain Ali, Secretary Industries and Mining, GB

Due to time constraints, some stakeholders such as Force Command Northern Areas (FCNA), representatives of traders, the Chamber of Commerce and Industry, religious leaders, and other community leaders were not consulted. These stakeholders will be consulted during Phase II when draft recommendations for the CMP are ready.

Stakeholder Concerns

During the course of the three days, numerous concerns were raised by the stakeholders with regards to the development of the Master Plan. The concerns raised can be classified under the following categories:

- Long term vision
- Zoning and land use
- Infrastructure development
- Environmental enhancement
- Institutional strengthening
- Financial sustainability

These are discussed in detail below.

Long-term vision

The stakeholders, during the consultation meetings, expressed their long-term vision of Gilgit city. One of the basic requirements highlighted for the future was access to basic utilities and services for the inhabitants of the entire city. The basic services mentioned included electricity, clean water supply, drainage systems, solid waste collection, telephone networks and gas connections.

On a regional level, the stakeholders envisage the city as a trade hub in the future between China and Pakistan. Currently, all trade between China and Pakistan is routed through Gilgit City which makes it an important gateway for trade exchanges from China and Central Asia with Pakistan. The stakeholders believed that the development of Gilgit City will attract foreign visitors and investors in the future, especially once the Kashgar–Gwadar trade route becomes functional. According to them this requires the development of the city on international standards with state of the art facilities, designated industrial zones, and adequate infrastructure such as well-connected road networks.

With provincial autonomy now granted to Gilgit Baltistan with Gilgit City as the capital, the stakeholders emphasized the importance of the city as focal point for growth and development in the entire region. Gilgit City will also be the center for all Government-related activities in the future; therefore, its development should take into account the resulting expansion of the city with areas designated for government buildings such as secretariats, courts, the Provincial Assembly and other miscellaneous civil offices.

Gilgit City is surrounded by mountains with a fresh water river flowing through the city. It also houses forests that are wildlife habitats. The stakeholders demanded that adequate attention be given towards the conservation of wildlife, flora, fauna, and provision of features that will

encourage tourism. As a result of uncontrolled expansion of the existing city, a lot of green areas in the adjoining areas have been cleared for buildings and plazas leading to loss of wildlife habitat. These activities threaten rare animals like the Markhor, which is an asset not just for GB but for Pakistan as well. Another key feature is agricultural land and houses located at short distances from the city which add beauty to the landscape and the profile of the city. Stakeholders were concerned that the land in Gilgit was privately owned therefore, it is critical to control development of adjoining areas to maintain the city's green landscape. This will protect the environment and promote tourism in the area which has declined substantially over the years.

Zoning and Land Use

Stakeholders expressed the need for developing different zones and pre-defined land use policies for Gilgit City. One of the key concerns raised with regards to the demarcation of Gilgit City was that there are many rural areas and villages around the city which are being enveloped by the constantly expanding city. In order for the city to maintain its individual profile, it is important to maintain a buffer between the city and surrounding villages to avoid blending the rural areas with the former. Stakeholders advised that city boundaries should be defined in the Master Plan and all the demarcations and zoning should be done within those boundaries to avoid merging with the rural areas.

Different stakeholders expressed development of different zones in the city which included the following:

- Commercial areas
- Government buildings
- Heavy urban zones
- Suburban zones
- Recreational zones
- Nature conservation areas
- Agricultural zones
- Industrial zones
- Urban renewal sites
- Landfill sites

A clear definition of these zones is critical so that the function of each can be preserved and a balance maintained. Uncontrolled development has a drawback of unequal growth in the city and its surroundings. It is expected that the Master Plan will make sure that the development within the city is balanced and confined to the respective zones.

Infrastructure Development

Most of the issues raised at the consultation meetings were associated with the current and future infrastructure of the city. The stakeholders complained about the current state of infrastructure and utilities provided in the city.

Roads

Traffic blockages and issues related to congestion are particularly common during the morning and late-afternoon peak hours particularly near schools. This is mainly due to poor road designs made by 'patwaris'[1] who lacked adequate engineering knowledge for road network design. Narrow roads make it difficult for two way traffic to pass smoothly, therefore, wide and well-constructed roads were required. It was also highlighted that some houses are only accessible by very narrow alleyways which are extremely difficult for relief vehicles and fire engines to access in case of emergencies.

By-Passes

The deteriorating situation of the city's bypasses due to a lack of regulated development was also highlighted. Encroachment and increase in commercial activities on the bypasses was resulting in blockages. Most of the residential houses on bypasses have front entrance which results in barriers to free traffic flow when vehicles enter or leave a house. The stakeholders recommended that the Master Plan should have new bypasses with effective control measures to provide high speed, congestion-free access across the city.

1. Patwaris- Refers to village accountant responsible for demarcation, survey and documentation of land.

Water Supply and Drainage

There is abundant water in the city from the river but due to the lack of adequate infrastructure for water supply, many households have limited or no supply of clean water. Gilgit is an arid zone which requires large amounts of water for irrigating agricultural land yet there is no adequate network which exists for this purpose. All the wastewater is currently either being disposed in the river or in soakage pits leading to the contamination of ground water and the river. Due to the volume of river flow, the contaminants are diluted; however, in the future the growing city will generate large amounts of waste leading to an alarming increase in the contamination levels in river water. Adequate wastewater treatment systems are needed for the city for handling wastewater streams from households, industries, hospitals and other similar sources.

Power Supply

Regular power outages in the city indicate a shortage of power supply to Gilgit. With the future population and industrial growth of the city, the need for an increased supply of power to the city becomes vital. Gilgit is expected to be the engine for economic growth in the province of Gilgit Baltistan and to serve as a trade transit from China and Central Asia to Pakistan. Therefore, a constant and stable power supply is crucial for the city.

Gas Supply

The supply of gas is an issue in the city due to its dependency on forest wood for fuel purposes. The temperatures in the city drop significantly during winters therefore gas is required for heating houses and water. Most of the houses are dependent on wood from surrounding forests for these purposes which is causing deforestation in the area. Alternate fuel supply such as gas should be provided to the city.

Landfill

There is no solid waste management system in the city. Currently the mechanism for handling waste in Gilgit is either dumping in the river or open air burning on specific waste burning sites which are located on the banks of the rivers. Burning of waste produces harmful fumes which are polluting the air quality of Gilgit City. Significant amounts of unburned waste also drain in the rivers from the burning sites. This issue requires serious attention and it is very important that the Master Plan involves adequate solid waste collection and management system to ensure an environmental friendly mechanism for dumping the waste in dedicated landfills. This will not only make lives of locals easier, but protect the environment from being polluted.

Industrial Areas

With a vision of the city to act as the industrial hub of Gilgit Baltistan, stakeholders stressed that dedicated industrial zones should to be demarcated in the city. This will ensure controlled expansion of industries. Provision of dedicated industrial zones in the Master Plan will aid demarcation of high standards for heavy traffic flow. It will also help in provision of adequate power and gas supply lines to bridge the gap between demand and supply in future. The industrial zones should be located at a distance from the residential areas to avoid disruption of lives due to movement of heavy vehicles, noise, release of harmful gases and movement of excess personnel.

Environmental Enhancement

Gilgit City is surrounded by mountains, forests and green areas which are habitat to a variety of wildlife especially the Astor Markhor. A fresh water river flows through the city and adds to the aesthetic value of the city. Stakeholders highlighted the importance of conservation of these wildlife species and suggested that the areas such as Jutial, Barnas, Sakwar and Kargah should be declared as recreational areas. Another key environmental feature is the river which flows through the city having both ecological and aesthetic importance. It is important to take measures that will conserve the river ecology. It is therefore necessary to ensure the river is not polluted by activities on the river banks. Use of

exotic species is gradually becoming common in agriculture, such practices should be controlled and the use of exotic species should be regulated.

Institutional Strengthening

A Master Plan for Gilgit City was developed during the 1970s which could not be implemented owing to absence of executing institutions. Stakeholders feared the same will happen to the new Master Plan if there is are no institution responsible for implementation. It is important that the relevant body, GDA has adequate legislative powers, support and resources from the Government to ensure implementation of the Master Plan. The municipalities also require sufficient resources to function efficiently and independently. The Master Plan should provide layout for a strategy to strengthen and enhance these institutions.

Furthermore, regulatory institutions such as the Environmental Protection Agency and other private sector service providers should have powers and resources to make sure that the Master Plan is implemented.

Financial Sustainability

Many systems and institutions had failed in Gilgit due to lack of financial support. The current system is mostly surviving on donations from foreign NGOs and funds from the Federal Government. A financial sustainability strategy for Gilgit City is required so the current systems can work according to their function. Revenue generation is also important for capacity enhancement of different government institutions so that they can work according to the recommendations of the Master Plan. The stakeholders also pointed out that the Master Plan should have a financial sustainability plan so that the institutions can enforce the Master Plan on adequate standards.

In Gilgit, people expect to avail themselves of all services without having to pay for them, so an internal revenue generation plan through taxation and user pays principle was important. Lack of funds posed a potential threat to the survival of the systems that a typical Master Plan will recommend, so it was critical that fund raising schemes, current budgetary constraints and projected revenues are taken into account when developing the Master Plan.

Other Concerns

The Chief Secretary GB mentioned that it is important for the Master Plan to be completed by March 2013 so that it can be incorporated in the next Annual Development Budget (ADB). Also, Secretary Finance GB requested a follow-up meeting to discuss further on the SEA project.

Recommendations for Way Forward

Recommendations presented in this section have been formulated on the basis of the following considerations:

- Comments provided by the stakeholders summarized in Appendix B.3, and

- Delay in engagement of a town planning firm to undertake the development of the Master Plan for Gilgit City.

As described in the Terms of Reference for the SEA exercise, ideally the process of development of a Master Plan should have been initiated prior to the initiation of the SEA. The SEA process would have then been integrated with the development of the Master Plan and contributed to the incorporation of environmental considerations to it through all stages of its development. As a compromise, and recognizing that the commitment of government funds for preparation of the Master Plan are not likely to be available until July of 2014, the following approach to the SEA is proposed with new activities detailed in Appendix B.2, with the same timelines as stated in Exhibit 1.

The SEA process will produce the following final products:

1. An Environmental Framework,
2. A Conceptual Master Plan (CMP),
3. A Policy And Institutional Development Plan,
4. A Financial Sustainability Plan.

The above products will provide a foundation for the development of a detailed Master Plan by the government later next year. These products respond to the concerns raised by the stakeholders, and primarily address the sustainability of the Master Plan. In the absence of the environmental, institutional, and financial frameworks, the Master Plan will remain a paper document with little possibility of making a serious contribution to the future development of the city in a sustainable manner. The Environmental Framework, the Policy and Institutional Development Plan, and the Financial Sustainability Plan are the essential elements of an SEA for a master plan of a city. The CMP is an additional product which will fill the gap created by the delay in the engagement of master planning consultants and experts by the GDA. The CMP will provide a basic level of detail for the Master Plan itself and the context for development of other plans listed above. HBP therefore envisages a more intensive input from a town planning expert for the SEA compared to that anticipated earlier when it was assumed that the preparation of the Master Plan would already be underway.

All the SEA products listed above can be directly incorporated into the detailed Master Plan that will be prepared later by the GDA, and will provide a head start to it. The SEA team can remain engaged with the Master Plan process later next year if resources and schedule permit. Principle components of the suggested outputs for the SEA are outlined below.

1. Environmental Framework for the Master Plan

- Identification of environmental and social values and resources, and cultural context
- Principles of environmental sustainability to be followed in the development of the Master Plan
- Overview of traditional rights and issues arising out of traditional rights
- Broad classification of land use zones
- Strategy for management of air quality and water quality
- Strategy for management of solid waste
- Strategy for management of traffic and noise
- Strategy for nature conservation and recreation
- Strategy for conservation of cultural heritage
- Public participation and grievance redressal

2. Conceptual Master Plan

- Basis for planning such as population growth rates and targets for economic and social development
- Investigation of existing boundaries planned for the master city, any no-go areas, or existing cultural, touristic, religious buffers in place
- Basic restrictions and regulatory requirements for the zones
- Strategy and infrastructure for management of waste water including sewerage, sewage treatment, and recycling
- Spatial coverage of the Master Plan including recommended boundaries and recommended buffer zones in lieu of SEA study
- Broad layout of the zones taking into account baseline conditions and future requirements for expansion of the city
- Classification and layout of traffic corridors and integration of public transport and mass transit
- Sources of water supply (Phase 1), and strategy and infrastructure for distribution and management

- Strategy and infrastructure for management of solid waste including recycling and location of landfills
- Infrastructure for power supply and distribution
- Protection and development of sites of cultural, nature conservation, and recreational importance
- Identification of resettlement requirements if any and strategy for resettlement
- Urban renewal in the old city

3. Policy and Institutional Development Plan

- Current policies, legislation, and rules relevant to Master Planning and identification of gaps
- Identification of institutions responsible for development and implementation of the Master Plan
- Current role under legislation and rules, and expected role for preparation and implementation of the Master Plan
- Review of the capacity of the institutions with reference to the requirements of the Master Plan
- Recommendations for amendments and additional legislation
- Recommendations for capacity enhancement and institutional development

4. Financial Sustainability Plan

- Preparation of preliminary budget estimates for infrastructure development, training, capacity building, and operation of the infrastructure and services in the city
- Determination of the extent to which the government will rely on internal and external resources for investment and operation
- Proposals for revenue generation through charging the users for services provided
- Recommendations for policy, rules, and regulations for imposition of user fees and revenue collection
- Recommendations for management of revenue collection and utilization

B.1 Detailed Work Plan

Phase 1: Setting the context and objectives, establishing the baseline and deciding on the scope
Activity 1: Institutional Analysis and Stakeholder Mapping
Identification of current policies, legislation, and rules relevant to Master Planning and identification of gaps
Identification of institutions responsible for development and implementation of the Master Plan
Identification of institutional values (i.e. stated mission, objectives, legal responsibilities) with regards to Environmental, Social, Available Resources, Cultural
Collect data on other relevant plans, programs, and sustainability objectives
Documenting the roles of different non-government organizations of relevance to the development and implementation of the Master Plan
Research on traditional rights and issues arising out of traditional rights
Developing a stakeholder map of all relevant institutions (government, private, NGOs) to the development and implementation of Master Plan
Develop public participation strategy
Activity 2: Mapping baseline GB City geographical limits, buffer zones, development plans, etc.
The history of the development of the existing city and salient features of its layout and organization
Landscape information (existing city boundaries and buffer information)
Identifying infrastructure for management of waste water including sewerage, sewage treatment, and recycling
Accessing P&DD GIS base maps for Gilgit
Activity 3: Collecting baseline information of the existing city (ecological, social, economic, etc.) and Identification of environmental and social values and resources, and cultural context
Ecological baseline information and compiling issues related to the existing city
Social baseline information and compiling issues related to the existing city
Economic baseline information and compiling issues related to the existing city
Identifying basis for planning such as population growth rates and targets for economic and social development
Environmental baseline information (Traffic, Noise, Waste Management, Drainage, Water Supply, Air Quality etc.) and related issues of the existing city

Phase 2 Activities: Conceptual Master Plan
Activity 1: Predicting future of existing city keeping existing issues and socioeconomic growth indicators in mind and identifying 'danger zones'
Predicting future issues that may arise from the existing management of waste water including sewerage, sewage treatment, and recycling
Predicting future issues that may arise from the existing management of solid waste including recycling and location of landfills
Predicting future issues that may arise from the existing management of air quality and water quality
Predicting future issues that may arise from the existing management of solid waste
Predicting future issues that may arise from the existing management of traffic and noise
Predicting future issues that may arise from the existing management of nature conservation and recreation
Predicting future issues that may arise from the existing management of conservation of cultural heritage
Activity 2: Strategizing Management of Existing Issues
Strategy and infrastructure for management of waste water including sewerage, sewage treatment, and recycling
Strategy and infrastructure for management of solid waste including recycling and location of landfills
Strategy for management of air quality and water quality
Strategy for management of solid waste
Strategy for management of traffic and noise
Strategy for nature conservation and recreation
Strategy for conservation of cultural heritage
Identification of resettlement requirements if any and strategy for resettlement
Mitigating adverse effects and maximizing beneficial effects
Activity 3: Recommendations for Future Development of City and a Conceptual Master Plan
Principles of environmental sustainability to be followed in the development of the Master Plan
Protection and development of sites of cultural, nature conservation, and recreational importance
Broad classification of land use zones
Spatial coverage of the Master Plan including recommended boundaries and recommended buffer zones in lieu of SEA study
Infrastructure for power supply and distribution
Predicting the effects of the chosen options
Public participation and addressing grievances

Phase 3 Activities: Informing and Influencing Decision-making
Preparation of preliminary budget estimates for infrastructure development, training, capacity building, and operation of the infrastructure and services in the city
Proposals for revenue management and generation through charging the users for services provided
Determination of the extent to which the government will rely on internal and external resources for investment and operation
Recommendations for institutional reform
Recommendations for capacity enhancement and institutional development
Recommendations for policy, rules, and regulations for imposition of user fees and revenue collection
Recommendations for amendments and additional legislation
Consultation

B.2 Scoping Workshop

B.2.1 Workshop Minutes

SEA of Gilgit City Master Plan

Scoping Meeting-9th July 2013

Minutes of the Meeting

****A complete list of participants can be found in Appendix E****

Agenda Item 1: Inauguration

- The meeting commenced with the recitation of the Holy Quran followed by a welcome address by **Mr. Haider Raza (EIA Expert- Gilgit Baltistan)**. He thanked the participants, the team from IUCN and Dr. David Annandale for making the trip to Gilgit-Baltistan and conducting this pilot program.

- **Mr. Shahzad Hasan Shigri (Director EPA- Gilgit Baltistan)** gave welcome remarks on behalf of the GB-EPA. He explained the context and background and need for this pilot program in GB and said that unlike EIA, SEA is newer concept in Pakistan and is being introduced from curricula to regulatory to policy. He explained to the audience that Dr. Annandale will brief us about the SEA process and give us a proposed roadmap for development of the Gilgit city masterplan; incorporating the environmental concerns in the best way.

- **Mr. Ahmad Saeed (Project Manager, NIAP)** gave an overview of the NIAP with a special focus on the objectives and deliverables as part of this program. He identified where the SEA pilot for GB Land use would fits into the larger context of the program.

- Finally, the participants introduced themselves one by one before Dr. David Annandale introduced himself.

Mr. Ahmad Saeed's presentation can be found in Appendix A

Agenda Item 2: Purpose of the Workshop and the Approach

Please refer to Dr. David Annandale's presentation in Appendix B

- **Dr David Annandale** introduced himself and gave a brief background of his impact assessment experience(specifically SEAs). He explained the purpose of the workshop as having two major objectives: The morning session would give an introduction to SEA and bring in some views from around the world. The afternoon session would focus specifically on the GB Land Use Master Plan SEA. He said that this is not just a presentation, but is also a consultation, and requested the audience to give their feedback.

- **Dr David Annandale** kicked off the day by defining the difference between an EIA and an SEA. He clarified that EIA has been around for 40 years around the world whereas SEA is a newer concept and is applied to plans, programmes and policies (PPPs) and not to on-ground projects. He explained that the idea is to incorporate environmental thinking into the development of PPPs, such as transport plans, energy policies, or national socio-economic development strategies.

- He continued that SEA has been developing over the last 15 years in different parts of the world. It is at different stages of development in different countries. The SEA Directive from the EU has resulted in the development of SEA regulation in EU member countries, while the countries in Asia have been experimenting with SEA mostly on a voluntary basis. There have been significant developments in SEA regulation and practice in many parts of Asia. China and Vietnam stand out.

- **Dr. David Annandale's** slides explained the analytical and participatory approaches to SEA. He showed how SEA is more flexible than an EIA- which is done in a formulaic fashion. SEA can be designed to fit the circumstances of a country, budget and timing. He explained this by putting SEA in the context of the AJK Hydropower pilot SEA.

- **Dr. David Annandale** continued by saying that Pakistan is lagging behind other developing countries in SEA development. However, through NIAP, a lot of progress has been made.

- **Dr. David Annadale** confirmed that the introductory material (from the morning session) is not available in hard copy form and will be sent to all the participants later in soft copy format by the NIAP program coordination team.

- Dr. David Annandale explained the key entry points for SEAs through case studies focused on Vietnam, Lao, Cambodia, Ghana and Mexico. And then he related these international examples to Pakistan's case and specifically to the case of Gilgit City.

- Some of the questions asked during this part of the presentation were as follows:
    - One of the participants asked whether SEA is a regulatory tool which is used by donors, or is there more to it. **Dr. Annandale** responded that there are significant benefits for SEA which are not immediately clear. It is an efficiency tool that is a way to make more efficient economic decisions. EIA is focused on individual projects but cannot work with cumulative impacts. For example, EIAs undertaken individually on each of the 30-40 small hydro projects currently planned for AJK would not help us to understand their combined cumulative impact. However, when an SEA is carried out for the 30-40 projects together, there might be a range of impacts which EIA will not help pick up.

- **Dr David Annandale** kicked off the day by defining the difference between an EIA and an SEA. He clarified that EIA has been around for 40 years around the world whereas SEA is a newer concept and is applied to plans, programmes and policies (PPPs) and not to on-ground projects. He explained that the idea is to incorporate environmental thinking into the development of PPPs, such as transport plans, energy policies, or national socio-economic development strategies.

- He continued that SEA has been developing over the last 15 years in different parts of the world. It is at different stages of development in different countries. The SEA Directive from the EU has resulted in the development of SEA regulation in EU member countries, while the countries in Asia have been experimenting with SEA mostly on a voluntary basis. There have been significant developments in SEA regulation and practice in many parts of Asia. China and Vietnam stand out.

- **Dr. David Annandale's** slides explained the analytical and participatory approaches to SEA. He showed how SEA is more flexible than an EIA- which is done in a formulaic fashion. SEA can be designed to fit the circumstances of a country, budget and timing. He explained this by putting SEA in the context of the AJK Hydropower pilot SEA.

- **Dr. David Annandale** continued by saying that Pakistan is lagging behind other developing countries in SEA development. However, through NIAP, a lot of progress has been made.

- **Dr. David Annadale** confirmed that the introductory material (from the morning session) is not available in hard copy form and will be sent to all the participants later in soft copy format by the NIAP program coordination team.

- Dr. David Annandale explained the key entry points for SEAs through case studies focused on Vietnam, Lao, Cambodia, Ghana and Mexico. And then he related these international examples to Pakistan's case and specifically to the case of Gilgit City.

- Some of the questions asked during this part of the presentation were as follows:
    - One of the participants asked whether SEA is a regulatory tool which is used by donors, or is there more to it. **Dr. Annandale** responded that there are significant benefits for SEA which are not immediately clear. It is an efficiency tool that is a way to make more efficient economic decisions. EIA is focused on individual projects but cannot work with cumulative impacts. For example, EIAs undertaken individually on each of the 30-40 small hydro projects currently planned for AJK would not help us to understand their combined cumulative impact. However, when an SEA is carried out for the 30-40 projects together, there might be a range of impacts which EIA will not help pick up.

Agenda Item 3: Deciding on the Structure of the GB SEA Work

- The afternoon session focused on a possible method for structuring the Gilgit Masterplan SEA work, and on a proposed Terms of Reference (ToR) for the exercize.
- Dr Annandale presented the proposed approach in detail, and it can be read in Appendix

ToR for the SEA Pilot

After a brief recap, **Dr. Annandale** shared the draft ToR for the SEA pilot and asked the participants to brainstorm and comment on it. **The draft ToR can be found at Appendix D.** The responses were collected individually and archived separately. Some of the main points that were extracted from this discussion were:

- In addition to state laws, an institutional analysis of the customary laws and practices, land tenure, water rights etc.
- Referring to phase 1 activity 2, the audience member pointed out some other variable documents that can be used e.g. WB economic report on GB, a study conducted by NASSD and the old 1970s master plan.
- In phase 3, there was a feedback comment that the term 'urban utilities' can be narrowed down a bit more
- The conditions can be divided into two: internal factors (e.g. population growth) while external factors such as trade and budget deficit. These might be more pressing due to mega projects coming in the future.

Closing remarks/ Wrap-up

- **Dr. Annandale** closed the session by saying that he is very happy with the progress of the day and considers it a useful start. He said that the national consultants will be hired very soon and the audience feedback on the TORs will be incorporated into the TORs designed for the national consultants. He said that he hoped they would come to GB approximately 5 times between now and the end of the year. He said that he himself will come back end September/early October. And then in December. He said that he will be directing the national consultants, even if he is not physically present.
- **Mr. Shahzad Shigri** thanked IUCN and all the participants who gave their very valuable input and feedback. He said that It is a new initiative in GB and there was no such concept before. He said that it is a great opportunity for the peple of GB and the people are grateful for the guidance from Dr. Annandale.
- **DG Punjab** said that it was a great honor and pleasure to be part of this occasion and said that this is the step in the right direction. He mentioned that the steering committee had initially approved this pilot for Punjab. However, on the insistence of the GB government and as a goodwill gesture, the Punjab government agreed to have the pilot in GB. He said he was pleased to be part of this as a focal person from the Punjab government.

B.2.2 Attendees List of Scoping Workshop

No.	Name	Designation	Organization	Contact	Email	Signature
1.	Shehzad Shigri	Director	EPA	03003689340	Shigri_shehzad@yahoo.com	
2.	Shahbaz Nadeem	DC Gilgit	Dist. Admin	03336107415		
3.	Muhammad Saleem	Programme Manager, Special projects	AKRSP	03455566224		
4.	Qasam Ali Shah	Senior PM, AKPBSP	AKPBSP	03469751662		
5.	Shoail Hussain	Editor (Blog) Parbot Caption	Media (Parbot Caption)	03555606548		
6.	Samar Abbas Qazafi	Editor GEO GB, PID Glt	PID	03455068337	qazafimedia@gmail.com	
7.	Khadim Hussain	AD GBEPA	GBEPA	03462532944	hussain.gebpa@yahoo.com	
8.	Rehmat Ali	Conservation Coordinator	WWF-PAK Gilgit-Baltistan		rehmatwwf@yahoo.com	
9.	Javed Akhtar	Deputy Director	Department of Agrivulture GB		javedakhtar20@yahoo.com	
10.	Mubashir Hussain	Water Management Officer	GB-EPA		hussain.wmo@gmail.com	
11.	Syed Jawar Hussain	Scientific Officer	GB-EPA		sjh_env@yahoo.com	
12.	Muanwar Hussain	AD	GB-EPA		mosvi.naepa@yahoo.com	
13.	Iram Sifat	Student/internee	GB_EPA		Mari.ini@hotmail.com	
14.	Shahzad hussain	Reporter	K.P.W		Shahzadh14@gmail.com	
15	A.R. Bukhari		INP			
16.	Masood Azam	Research Officer	P&OD/GDA		masoodazam@gmail.com	
17.	Javed Iqbal	Chief Officer	Municipal Committee	03555101577		
18.	Muhammad Nazir Khan	Deputy Chief	P&D Deptt. GB		Nazirkhandc@yahoo.com	
19.	Ghulam Murtaza	Superintending Engineer	Water & Power Dept. GB		dinalmurtaza@yahoo.com	
20.	Faisal Usman	Director Admin	Gilgit-Dev Authority	0355555131	faysalosman@gmail.com	
21.	Mehmood Ghaznavi	DFO	GDA	GDA	mehmoodghaznavi@hotmail.com	
22.	Arif Hussain	Director GDA	Gilgit development Authority	03469550988	Arifzameer_12@yahoo.com	
23.	Hamza	Consultant	IUCN			
24.	Sh cfarooq Hameed	DG EPA payable	Govt. of GB	03004334563	farooqhsh@gmail.com	
25.	Asadullah Faiz	Secretary (P&D) GB	Govt. of GB		Asullullahfaiz2000@hotmail.com	
26.	Sajid Ali	Internee EPA	EPA	03555111281		
27.	Mahmood Alam	RG	P&D		malampk@gmail.com	
28.	Nazakat Ali	PTV, Daily K2 reporter	PTV News	03445404499	nazakatglt@yahoo.com	
29.	M. Muzaffar	Deputy Chief	P&D Dept.	03469237125		
30.	Nasir Hussain	Assistant	GB, EPA	03555117750		
31.	Ismat Abbas	Internee	GB, EPA		Abbas.ismat@gmail.com	
32.	Tariq Hussain Shah	President	Gilgit Union of Journalists		guilgit@gmail.com	
33.	Manzar Shiqri	Samma OSR	Saama TV		manzarshiqri@gmail.com	
34.	Haider Raza	EIA Expert	GB, EPA	922016		
35.	Miraj Alam	Scientific Officer	Agriculture	03464521346		
36.	Sir Syed	Agriculture Officer	Agriculture			
37.	Azfar Ansari		IUCN	03452004148		
38.	Ahmed Saeed	Project Manager	IUCN	03452004208		
39.	Hamza Butt	Consultant	NIAP	03004003443		

B.3 Log of Meetings

B.3.1 Meeting: EPA-GB

Stakeholder:	Environmental Protection Agency GB (EPA-GB)
Date:	September 16, 2013
Time:	12:40 pm
Meeting Venue:	EPA Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- Inconsistency in tasks shared with HBP and GDA by IUCN.
- As per HBP's understanding of the Terms of Reference, it was expected that HBP will carry out the SEA on the environmental aspects and zoning would be done by identifying the key issues faced in Gilgit.
- AH expected that a Master Plan in complete engineering detail would be developed by HBP.
- Following discussion with Ahmed Saeed it was clarified that HBP is responsible for SEA and zoning for the Master Plan which will act as a framework for a detailed Master Plan.
- SS: Most of the land in Gilgit is owned privately. Regulating the development and implementing the Master Plan will be challenging owing to private ownership.
- FU: How will HBP integrate the existing sewerage plan and will it affect the timelines as the sewerage plan is ready and is expected to be implemented soon. VZ clarified that HBP will incorporate the sewerage plan into the Master Plan and the sewerage plan can be implemented parallel to the development of the Master Plan.

B.3.2 Meeting: Secretary Finance/P&D GB

Stakeholder:	Secretary Finance/Planning and Development GB
Date:	September 16, 2013
Time:	1.45 pm
Meeting Venue:	Secretary Finance Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Owais Muzaffar (OM), Secretary Finance/P&D-GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	VZ briefed the participants about the purpose of the meeting. A copy of Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- SS briefed the participants about the NIAP program, funding sources, objectives and how the pilot project was selected for GB by FU and Study Area.
- OM supported the efforts and requested all the information related to the SEA and Master Plan. He also requested a follow-up meeting.

B.3.3 Meeting: Deputy Secretary (Staff) GB

Stakeholder:	Deputy Secretary (Staff) GB
Date:	September 16, 2013
Time:	2.45 pm
Meeting Venue:	Deputy Secretary office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Liaquat Ali (LA), Deputy Secretary (Staff)-GB Jameel Ahmed (JA), Deputy Speaker-GB Yaqoob Shah (YS), MNA-GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- JA: A sewerage plan has been developed and is being finalized for implementation. What are the timelines for completion of the Master Plan. The implantation of the sewerage plan will be delayed due to the time required for the Master Plan.

- VZ: The sewerage plan can be implemented as planned in parallel to the preparation of the Master Plan. The existing sewerage plan will be taken into consideration and will be duly incorporated in the Master Plan.

B.3.4 Meeting: Chief Secretary GB

Stakeholder:	Chief Secretary GB
Date:	September 16, 2013
Time:	3.00 pm
Meeting Venue:	Chief Secretary Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB
	Arif Hussain (AH), Director Gilgit Development Authority
	Faisal Usmani (FU), Deputy Director Gilgit Development Authority
	Haider Raza (HR), GB-Representative IUCN
	Mohammad Yunus Dagha (MYD), Chief Secretary-GB
	Liaquat Ali (LA), Deputy Secretary (Staff)-GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP
	Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic
	Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- SS briefed the attendees on the objective of the meeting and background of the Project
- VZ briefed the attendees on the update of SEA and HBP's role. He explained the timelines for the completion of the SEA and Master Plan
- MYD enquired about how the detailed plan would be designed. AH explained that IUCN will be requested to recruit specialized town planners for this purpose
- MYD fully supported and endorsed the SEA project and proposed completion of the Master Plan before March 2014 for inclusion in the next ADP, if the project is delayed, the implementation will then be delayed until the next ADP in 2015.

B.3.5 Informal Discussion: Local Farmer

Stakeholder:	Local farmer
Date:	September 16, 2013
Time:	4.00 pm
Meeting Venue:	EPA Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Local farmer (LF)
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- AH raised the following issues
  - Kargah Nullah water is allotted to households on rota system, 2 days a week per house only
  - It is difficult to control the development of private lands. Institutional strengthening of GDA and legislative support will play an important role in regulating the development of the city.
  - Congestion on the bypasses needs to be considered in the Master Plan.
- VZ explained that the development on bypasses needs to be regulated, no shops should be allowed, and minimum 30 feet distance should be left for parking.
- SS: The encroachment on slopes should be controlled strictly to conserve the landscape of the city
- LF intends to construct a plaza on his agricultural land in future and earn by renting out houses to provide shelter for his family.
- LF grows most of the vegetable used at home on own land; due to shortage of growth in winters, vegetables are bought from the market.

B.3.6 Meeting: Aga Khan Planning and Building Service (WASEP)

Stakeholder:	Water and Sanitation Extension Programme (WASEP)
Date:	September 17, 2013
Time:	10.35 am
Meeting Venue:	WASEP Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Syed Munawwar Hussain (MH), Assistant Director EPA-GB, EIA Enforcement) Javed Ahmed (JA), Head WASEP Saleem Khan (SK). Programme Manager WASEP Masood Khan (MK), Town planner/GIS Expert WASEP Esaar Khan (EK), Water Quality Analyst WASEP Shakila Bibi (SB), Senior Field Engineer WASEP
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- HR introduced the project and VZ explained the objectives and outcomes of the Master Plan
- VZ explained that engineering consultants will be taken on board within 6-8 months to develop the detailed engineering Master Plan
- JA raised the following issues:
  - People in Gilgit are migrating from rural areas, and they are not satisfied with the provision of facilities from municipality, they prefer traditional communal models.
  - Institutions can be strengthened but there will be political pressure which cannot be ignored.
  - Road network is critical and should be given due consideration in the plan. Roads need to be broadened because passage of two-way traffic is difficult on the current road network. The existing roads were irregularly designed by local people and patwaris so they are not efficient and engineered designing needs to be carried out.
  - Plazas are constructed with five to six stories but no provision for parking is provided.

- There is no public transport system in the city. Only private Suzukis are operating in the city as public transport. People would prefer buses in the city if they are of good quality, punctual and well connected.

- Water rights are not defined. The government needs to engage local communities and determine water rights.

- Wastewater is normally sent to soakage pits which results in contamination of ground and river water.

- Waste from industries and hospital located at the banks of the river is dumped into the river. There is no control on industries on river banks.

- Every new change receives resistance so the Master Plan is also expected to receive resistances from:
  1. Communities
  2. Religious leaders
  3. Politicians
  4. Community leaders
  5. Local people

- MK raised the following issues:
  - Gilgit city Master Plan was developed in 1970s but was never implemented due to lack of legislative provisions. The new Master Plan should be supported by a legal framework and institutions like GDA should be strengthened to be able to implement the new Master Plan.

  - Some streets in Gilgit are five to six feet wide and it is difficult for vehicles to access these areas in emergencies like fire engine or ambulance.

  - Zoning should be carried out in Khumar which is a semi urban area.

  - Agriculture waste should be controlled and green area should be conserved.

  - There was a need for implementing Land Acquisition Act for widening roads.

  - Strict requirement for EIA's should be imposed in the city for all development projects.

B.3.7 Meeting: Secretary Local Government GB

Stakeholder:	Secretary Local Government-GB
Date:	September 17, 2013
Time:	1.00 pm
Meeting Venue:	Secretary Local Government Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Faisal Usmani (FU), Deputy Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Syed Munawwar Hussain (MH), Assistant Director EPA-GB, EIA Enforcement Abdul Qayyum (AQ), Secretary Local Government GB Sheraz Nadeem (SN), Superintendent, GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- VZ introduced the project and explained the importance of revenue generation for financial sustainability

- AQ raised the following issues:
  - Drainage and sewerage in the city is a major problem and a plan is needed for proper design of these utilities.
  - No property tax in being collected which can serve as means for finance for the department.
  - Currently all the waste is discarded into the river.
  - The municipal committee headed by a Chairman and a Vice Chairman have not been elected yet.
  - Proper solid waste disposal system has to be designed. Unhygienic practices have led to incidence of many diseases like blood cancer in Gilgit.
  - People want good services but there is no willingness to pay for these services owing to poverty.
  - Leakages in water supply pipes caused contamination of water. This requires adequate maintenance of pipe systems.

B.3.8 Meeting: World Wildlife Fund (WWF)

Stakeholder:	World Wildlife Fund (WWF)
Date:	September 17, 2013
Time:	4.50 pm
Meeting Venue:	WWF office
Attended by:	Babar Khan (BK), Head WWF-GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- VZ briefed the participants about the purpose of the meeting.

- BK raised the following issues and concerns:
  - Gilgit city is surrounded by mountains, forests and green areas which are habitat to a variety of wildlife especially the Astor Markhor. It is important to conserve the habitat for wildlife species. These wildlife habitat areas should remain intact and the Master Plan must make sure that the city does not expand to these habitats.
  - Jutial, Barnas, Sakwar and Kargah can be used for recreational purposes and some of these areas can provide wildlife sighting.
  - The Gilgit River flows through the city and has both ecological and aesthetic importance. It is important to take measures that will conserve the river ecology. It is therefore necessary to ensure the river is not polluted by activities on the river banks.
  - Use of exotic species is gradually becoming common in agriculture, such practices should be controlled and the use of exotic species should be regulated.
  - Hazard risk assessment for river flooding should be conducted as part of the SEA/Master Plan development.

B.3.9 Meeting: Masood Khan Town Planner/GIS Expert (AKPBS)

Stakeholder:	Aga Khan Planning and Building Services (AKPBS)
Date:	September 17, 2013
Time:	5.45 pm
Meeting Venue:	WASEP Office
Attended by:	Masood Khan (MK), Town planner/GIS Expert (AKPBS)
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- MK raised the following issues:
  - Town planning graduates from Gilgit city with an understanding of the local needs should be taken on board in preparation of the Master Plan.
  - Small streets in the city make passage of vehicles difficult. VZ responded that small streets add to the beauty and profile of the city, so they should be protected and given a better aesthetic look.
  - Open drains along the streets attract flies and insects, resulting in spread of diseases.
  - There are sectarian differences in the city. It was difficult for people to relocate due to religious and cultural preferences.
  - Alternate routes should be provided to reduce congestion.
  - Unwanted traffic could be avoided by imposing toll taxes in the city center.
  - It is important to conserve the mazaars as they are an asset to the city.
  - Traffic Impact Assessment (TIA) should made mandatory as part of approval for any project.

B.3.10 Meeting: Lawmakers GB

Stakeholder:	Lawmakers GB
Date:	September 17, 2013
Time:	9.45 pm
Meeting Venue:	Serena Hotel
Attended by:	Arif Hussain (AH), Director Gilgit Development Authority Jameel Ahmed (JA), Deputy Speaker GB Amjad Hussain (AM), Advocate/Member GB Council Javed Ahmed (JV), Advocate GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- VZ briefed the participants about the purpose of the meeting

- AM raised following concerns and issues:
  - Keeping in view the potential of trade and tourism, the existing infrastructure does not suffice the needs and requires further enhancement.
  - A plan for the Gilgit city was developed previously which was not implemented. It is important that this Master Plan is taken to the next level that is implementation.
  - Currently the city has expanded in one direction only, this has to be made uniform.
  - Community water rights have not been documented which gives rise to disputes. There is need to regulate the water rights.
  - Development on the river banks must be regulated.
  - GDA and other government institutions should be strengthened.
  - Encroachment is common in the city which needs to be regulated.

- AH suggested allowing one-way traffic only on the roads that are subjected to blockage due to excessive traffic for example the airport road.

B.3.11 Meeting: Building and Construction Extension Programme (BACEP)

Stakeholder:	Building and Construction Extension Programme (BACEP)
Date:	September 18, 2013
Time:	10.35 am
Meeting Venue:	BACEP Office
Attended by:	Arif Hussain (AH), Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Fida Hussain (FH), Deputy Director, BACEP Masood Khan (MK), Town planner/GIS Expert, AKPBS
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- FH explained the structure of AKDN which has 3 sub branches, WASIP, BACIP and Construction Risk Management

- FH raised the following concerns:
  - GDA does not own land in Gilgit like CDA, so revenue generation for this body is difficult.
  - There are no-go areas in the city and people in one area will not relocate to another due to sectarian issues.
  - Some areas also have severe flooding problems. If roads are widened then dislocation of people should be taken into account.
  - Poor infrastructure and open wires leads to electrocution of kids and livestock. Roads have to be widened for access to emergency vehicles like firefighting engines
  - Key requirements of the citizens are basic facilities like electricity, water, gas, telephone. VZ assured that these facilities will be included in the Master Plan however, the facilities will be provided with a service cost to ensure sustainability.
  - Increased tectonic activity in Kashmir region, Gilgit is now in high risk area prone to tectonic activity. Gilgit is now in 3+ Richter scale and Chitral is 4.

B.3.12 Meeting: Secretary Environment GB

Stakeholder:	Secretary Environment GB
Date:	September 18, 2013
Time:	11.50 am
Meeting Venue:	WASEP Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Arif Hussain (AH), Director Gilgit Development Authority Haider Raza (HR), GB-Representative IUCN Khadim Hussain Saleem (KH), Secretary Environment GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- SS and VZ introduced the project background, objectives and the expected outcomes

- Following issues were raised by KH:
  - The commercial areas in the city have to be confined and the general stores have to be regulated. Zoning in the city is important, one way streets should be made to manage the traffic efficiently.
  - Open disposal of waste should be controlled and seepage of waste water in the ground should be discouraged.
  - Workshops and service stations on Shaheed-e-Millat road which exceed the requirement compared to the number of vehicles in the city should be discouraged. The workshops contaminate the water streams with grease and other waste particles.
  - Butcher shops on roads should be made to avoid waste disposal into streams.
  - Deforestation for fuel wood and agricultural purposes has to be controlled. There is a need for the clear demarcation of forested areas so that cutting wood can be controlled.
  - Kargah Nullah can be declared as a recreational area, as rare animals like Markhor can be seen there
  - River was the most vulnerable natural source in the city. Due to its turbulence, the harmful effects of waste disposal are diluted but still the waste dumping should be controlled.
  - River View road has a lot of potential so it should be adequately developed. The Master Plan should also provide recreational areas and parks for the city for the entertainment of tourists and people coming here from adjoining villages for work purposes.

- SS raised concern that the Kargah and Jutial are water sources which are being encroached and have to be protected.

B.3.13 Meeting: Secretary Industries and Mining GB

Stakeholder:	Secretary Industries and Mining GB
Date:	September 18, 2013
Time:	12.45 pm
Meeting Venue:	WASEP Office
Attended by:	Shahzad Shigri (SS), Director EPA-GB Haider Raza (HR), GB-Representative IUCN Rai Hasnain Ali (RHA), Secretary Industries and Mining GB Fareed Ahmed (FA), Deputy Secretary Industries and Mining GB
Conducted by:	Vaqar Zakaria (VZ), Managing Director HBP
Recorded by:	Khadija Amir (KA), Consultation Expert, HBP Hussain Ali (HA), Environmental Engineer HBP
Language:	Urdu and English
Preamble:	Background Information Document (English) on Strategic Environmental Assessment of Gilgit City Master Plan

Concerns/Discussion:

- SS introduced the project and gave the background. He enquired if there was any planned industrial area or any other projects in the pipeline which need to be considered for the Master Plan.
- RHA suggested that crush machines are eroding the mountains so there should be a check on them and they should be regulated.
- RHA suggested incorporating current industrial zones in the Master Plan.

B.4 Photographs of Stakeholder Meetings

Meeting with Secretary Finance/P&D GB

Meeting with EPA-GB

Meeting with Chief Secretary GB

Informal Discussion with Local Farmer

Meeting with WASEP

Meeting with WASEP

Meeting with Secretary Local Government GB

Meeting with Secretary Local Government GB

Meeting with Masood Khan (AKPBS)

Meeting with Lawmakers GB

Meeting with Lawmakers GB

Meeting with BACEP

Meeting with Secretary Environment GB

Meeting with Secretary Industries and Mining GB

Appendix C: Species in Gilgit City

Exhibit C.1: Mammals Species Reported from Study Area

No	*Scientific Name*	*Common Name*	*Family*	*IUCN Status*
1.	Crocidura pullata	Kashmir White-toothed Shrew	Soricidae	Data Deficient
2.	Rhinolophus macrotis	Big-eared Horseshoe Bat	Rhinolophidae	Least Concern
3.	Eptesicus serotinus	Common Serotine	Vespertilionidae	Least Concern
4.	Pipistrellus pipistrellus	Common Pipistrelle	Vespertilionidae	Least Concern
5.	Barbastella leucomelas	Asian Barbastelle	Vespertilionidae	Least Concern
6.	Otonycteris hemprichii	Hemprich's Long-eared Bat	Vespertilionidae	Least Concern
7.	Canis lupus	Wolf	Canidae	Least Concern
8.	Vulpes vulpes	Red Fox	Canidae	Least Concern
9.	Martes foina	Stone Marten	Mustelidae	Least Concern
10.	Lutra lutra	Eurasian Otter	Mustelidae	Near Threatened
11.	Caracal caracal	Caracal	Felidae	Least Concern
12.	Prionailurus bengalensis	Leopard Cat	Felidae	Least Concern
13.	Panthera pardus	Common Leopard	Felidae	Near Threatened
14.	Panthera uncia	Snow Leopard	Felidae	Endangered
15.	Lepus capensis	Cape Hare	Leporidae	Least Concern
16.	Ocotona	Royle's Pika	Ochotonidae	Least Concern
17.	Eoglaucomys fimbriatus	Small Kashmir Flying Squirrel	Sciuridae	Least Concern
18.	Eupetaurus cinereus	Woolly Flying Squirrel	Sciuridae	Endangered
19.	Apodemus rusiges	Kashmir Field Mouse	Muridae	Least Concern
20.	Rattus turkestanicus	Turkestan Rat	Muridae	Least Concern
21.	Mus musculus	House Mouse	Muridae	Least Concern
22.	Cricetulus migratorius	Grey Hamster	Cricetidae	Least Concern
23.	Alticola roylei	Royle's Mountain Vole	Cricetidae	Near Threatened

Exhibit C.2: Bird Species reported from Study Area

No	Scientific Name	Common Name	Family	IUCN Status
1.	Lerwa lerwa	Snow Patridge	Phasaenidae	Least Concern
2.	Alectoris chukar	Chukar	Phasaenidae	Least Concern
3.	Coturnix coturnix	Common Quail	Phasaenidae	Least Concern
4.	Jynx torquilla	Eurasian Wryneck	Picidae	Least Concern
5.	Dendrocopos himalayensis	Himalyan Woodpecker	Picidae	Least Concern
6.	Picus squamatus	Scaly Billed Woodpecker	Picidae	Least Concern
7.	Upupa epops	Common Hoopoe	Upupidae	Least Concern
8.	Coracias garrulus	European Roller	Coraciidae	Near Threatened
9.	Alcedo atthis	Common Kingfisher	Coraciidae	Least Concern
10.	Merops persicus	Blue Cheeked Bee Eater	Meropidae	Least Concern
11.	Merops apiaster	European Bee Eater	Meropidae	Least Concern
12.	Cuculus canorus	Eurasian Cuckoo	Meropidae	Least Concern
13.	Apus apus	Common Swift	Meropidae	Least Concern
14.	Apus affinis	House Swift	Meropidae	Least Concern
15.	Otus brucei	Pallid Scops Owl	Strigidae	Least Concern
16.	Otus scops	Eurasian Scops Owl	Strigidae	Least Concern
17.	Bubo bubo	Eurasian Eagle Owl	Strigidae	Least Concern
18.	Caprimulgus europaeus	Eurasian Nightjar	Strigidae	Least Concern
19.	Columba livia	Rock Pigeon	Columbidae	Least Concern
20.	Columba rupestris	Hill Pigeon	Columbidae	Least Concern
21.	Streptopelia turtur	European Turtle Dove	Columbidae	Least Concern
22.	Milvus migrans	Black Kite	Accipitridae	Least Concern
23.	Gyps himalayensis	Himalyan Griffon	Accipitridae	Least Concern
24.	Accipier nisus	Eurasian Sparrow Hawk	Accipitridae	Least Concern
25.	Aquila chrysaetos	Golden Eagle	Accipitridae	Least Concern
26.	Falco tinnunculus	Common Kestrel	Falconidae	Least Concern
27.	Lanius collurio	Red Backed Shrike	Laniidae	Least Concern
28.	Lanius isabellinus	Rufous Tailed Shrike	Laniidae	Least Concern
29.	Lanius schach	Long Tailed Shrike	Laniidae	Least Concern
30.	Lanius meridionalis	Southern Grey Shrike	Laniidae	Least Concern
31.	Pica pica	Black Billed Magpie	Corvidae	Least Concern
32.	Pyrrhocorax pyrrhocorax	Red Billed Chough	Corvidae	Least Concern
33.	Pyrrhocorax graculus	Yellow Billed Chough	Corvidae	Least Concern
34.	Corvus monedula	Eurasian Jackdaw	Corvidae	Least Concern
35.	Corvus macrorhynchos	Large Billed Crow	Corvidae	Least Concern

No	Scientific Name	Common Name	Family	IUCN Status
36.	Corvus corax	Common Raven	Corvidae	Least Concern
37.	Oriolus oriolus	Eurasian Golden Oriole	Oriolidae	Least Concern
38.	Pericrocotus ethologus	Long Tailed Minivet	Campephagidae	Least Concern
39.	Terpsiphone paradisi	Asian Paradise Flycatcher	Monarchidae	Least Concern
40.	Cinclus cinclus	White Throated Dipper	Cinclidae	Least Concern
41.	Cinclus pallasii	Brown Dipper	Cinclidae	Least Concern
42.	Monticola saxatilis	Rufous Tailed Rock Thrush	Muscicapidae	Least Concern
43.	Monticola cinclorhynchus	Blue Caped Rock Thrush	Muscicapidae	Least Concern
44.	Monticola solitarius	Blue Rock Thrush	Muscicapidae	Least Concern
45.	Ficedula superciliaris	Ultramarin Flycatcher	Muscicapidae	Least Concern
46.	Luscinia pectoralis	White Tailed Ruby Throat	Muscicapidae	Least Concern
47.	Luscinia brunnea	Indian Blue Robin	Muscicapidae	Least Concern
48.	Phoenicurus phoenicurus	Common Redstart	Muscicapidae	Least Concern
49.	Chaimarrornis leucocephalus	White Caped Water Redstart	Muscicapidae	Least Concern
50.	Rhyacornis fuliginosa	Plumbeous Water Redstart	Muscicapidae	Least Concern
51.	Hodgsonius phoenicuroides	White Billed Redstart	Muscicapidae	Least Concern
52.	Enicurus scouleri	Little Forktail	Muscicapidae	Least Concern
53.	Saxicola torquatus	Common Stone Chat	Muscicapidae	Least Concern
54.	Saxicola caprata	Pied Bushchat	Muscicapidae	Least Concern
55.	Oenanthe albonigra	Hume's Wheatear	Muscicapidae	Least Concern
56.	Oenanthe oenanthe	Northern Wheatear	Muscicapidae	Least Concern
57.	Oenanthe picata	Variable Wheatear	Muscicapidae	Least Concern
58.	Oenanthe pleschanka	Pied Wheatear	Muscicapidae	Least Concern
59.	Oenanthe xanthoprymna	Rufous Tailed Wheatear	Muscicapidae	Least Concern
60.	Oenanthe isabellina	Isabelline Wheatear	Muscicapidae	Least Concern
61.	Acridotheres tristis	Common Myna	Sturnidae	Least Concern
62.	Myophonus caeruleus	Blue Whistling Thrush	Turdidae	Least Concern
63.	Turdus merula	Eurasian Black Bird	Turdidae	Least Concern
64.	Turdus rubrocanus	Chestnut Thrush	Turdidae	Least Concern
65.	Turdus ruficollis	Dark Throated Thrush	Turdidae	Least Concern
66.	Sitta leucopsis	White Cheeked Nuthatch	Sittidae	Least Concern
67.	Tichodroma muraria	Wallcreeper	Sittidae	Least Concern
68.	Certhia familiaris	Eurasian Tree Creeper	Certhiidae	Least Concern
69.	Certhia himalayana	Bar tailed Tree Creeper	Certhiidae	Least Concern
70.	Troglodytes hiemalis	Winter Wren	Certhiidae	Least Concern

No	Scientific Name	Common Name	Family	IUCN Status
71.	Cephalopyrus flammiceps	Fire Caped Tit	Remizidae	Least Concern
72.	Periparus rufonuchalis	Rufous Naped Tit	Paridae	Least Concern
73.	Parus melanolophus	Spot Winged Tit	Paridae	Least Concern
74.	Parus major	Great Tit	Paridae	Least Concern
75.	Aegithalos leucogenys	White Cheeked Tit	Aegithalidae	Least Concern
76.	Leptopoecile sophiae	White Browed Tit Warbler	Aegithalidae	Least Concern
77.	Riparia diluta	Pale Martin	Hirundinidae	Least Concern
78.	Ptyonoprogne rupestris	Eurasian Crag Martin	Hirundinidae	Least Concern
79.	Delichon urbicum	Northern House Martin	Hirundinidae	Least Concern
80.	Delichon dasypus	Asian House Martin	Hirundinidae	Least Concern
81.	Sylvia communis	Greater White Throat	Sylviidae	Least Concern
82.	Sylvia curruca	Lesser White Throat	Sylviidae	Least Concern
83.	Acrocephalus concinens	Blunt Winged Warbler	Sylviidae	Least Concern
84.	Acrocephalus dometorum	Blyth's Reed Warbler	Sylviidae	Least Concern
85.	Phylloscopus collybita	Common Chiffchaff	Sylviidae	Least Concern
86.	Phylloscopus sindianus	Mountain Chiffchaff	Sylviidae	Least Concern
87.	Phylloscopus affinis	Tickel's Leaf Warbler	Sylviidae	Least Concern
88.	Acrocephalus orinus	Large Billed Warbler	Sylviidae	Least Concern
89.	Garrulax lineatus	Streaked Laughing Thrush	Timaliidae	Least Concern
90.	Garrulax variegatus	Variegated Laughing Thrush	Timaliidae	Least Concern
91.	Melanocorypha bimaculata	Bimaculated Lark	Alaudidae	Least Concern
92.	Calandrella brachydactyla	Greater Short Toad Lark	Alaudidae	Least Concern
93.	Alauda arvensis	Eurasian Skylark	Alaudidae	Least Concern
94.	Alauda gulgula	Oriental Skylark	Alaudidae	Least Concern
95.	Passer domesticus	House Sparrow	Passeridae	Least Concern
96.	Petronia petronia	Rock Sparrow	Passeridae	Least Concern
97.	Motacilla alba	White Wagtail	Motacillidae	Least Concern
98.	Motacilla citreola	Citrine Wagtail	Motacillidae	Least Concern
99.	Motacilla flava	Yellow Wagtail	Motacillidae	Least Concern
100.	Motacilla cinerea	Grey Wagtail	Motacillidae	Least Concern
101.	Anthus trivialis	Tree Pipit	Motacillidae	Least Concern
102.	Anthus roseatus	Rosy Pipit	Motacillidae	Least Concern
103.	Anthus cervinus	Red Throated Pipit	Motacillidae	Least Concern
104.	Anthus spinoletta	Water Pipit	Motacillidae	Least Concern
105.	Prunella collaris	Alpine Accentor	Prunellidae	Least Concern

No	Scientific Name	Common Name	Family	IUCN Status
106.	Prunella rubeculoides	Robin Accentor	Prunellidae	Least Concern
107.	Leucosticte nemoricola	Plain Mountain Finch	Fringillidae	Least Concern
108.	Leucosticte brandti	Brandt's Mountain Finch	Fringillidae	Least Concern
109.	Fringilla coelebs	Chaff Finch	Fringillidae	Least Concern
110.	Carduelis flavirostris	Twite	Fringillidae	Least Concern
111.	Rhodopechys sanguinea	Crimson Winged Finch	Fringillidae	Least Concern
112.	Rhodopechys githaginea	Trumpeter Finch	Fringillidae	Least Concern
113.	Rhodopechys mongolicus	Mongolian Finch	Fringillidae	Least Concern
114.	Carpodacus erythrinus	Common Rose Finch	Fringillidae	Least Concern
115.	Carpodacus thura	White Browed Finch	Fringillidae	Least Concern
116.	Carpodacus rhodochlamys	Red Mantled Rose Finch	Fringillidae	Least Concern
117.	Carpodacus rubicilla	Great Rose Finch	Fringillidae	Least Concern
118.	Emberiza leucocephalos	Pine Bunting	Emberizidae	Least Concern
119.	Emberiza cia	Rock Bunting	Emberizidae	Least Concern
120.	Emberiza buchanani	Grey Necked Bunting	Emberizidae	Least Concern
121.	Emberiza stewarti	White Caped Bunting	Emberizidae	Least Concern
122.	Rallus aquaticus	Water Rail	Rallidae	Least Concern
123.	Porzana parva	Little Crake	Rallidae	Least Concern
124.	Porzana pusilla	Baillon's Crake	Rallidae	Least Concern
125.	Gallinago solitaria	Solitary Snipe	Scolopacidae	Least Concern
126.	Gallinago gallinago	Common Snipe	Scolopacidae	Least Concern
127.	Numenius arquata	Eurasian Curlew	Scolopacidae	Least Concern
128.	Tringa erythropus	Spotted Redshank	Scolopacidae	Least Concern
129.	Tringa totanus	Common Redshank	Scolopacidae	Least Concern
130.	Tringa ochropus	Green Sandpiper	Scolopacidae	Least Concern
131.	Tringa glareola	Wood Sandpiper	Scolopacidae	Least Concern
132.	Actitis hypoleucos	Common Sandpiper	Scolopacidae	Least Concern
133.	Tachybaptus ruficollis	Little Greb	Podicipedidae	Least Concern
134.	Ardea cinerea	Grey Heron	Ardeidae	Least Concern
135.	Nycticorax nycticorax	Black Crowned Night Heron	Ardeidae	Least Concern

Exhibit C.3: Herpeto-fauna reported from Study Area

No	Species	Common Name	Family	IUCN Status	Endemism
Reptiles					
1	Altiphylax stoliczkai	Baltistan Gecko	Gekkonidae	Not Assessed	Endemic
2	Cyrtodactylus baturensis	Batura Bent-toed Gecko	Gekkonidae	Not Assessed	Endemic
3	Laudakia himalayensis	Himalayan Agama	Agamidae	Not Assessed	Endemic
4	Laudakia pakistania	Pakistan Agama	Agamidae	Not Assessed	Endemic
5	Laudakia tuberculata	Blue Rock Agama	Agamidae	Not Assessed	Not Endemic
6	Laudakia badakhshana	Badakhshan Rock Agama	Agamidae	Not Assessed	Not Endemic
7	Laudaki pakistanica khani	Khan's Rock Agama	Agamidae	Not Assessed	Endemic
8	Varanus bengalensis	Bengal Monitor	Varanidae	Least Concern	Not Endemic
Amphibians					
1	Bufo pseudoraddei baturae	Batura Toad	Bufonidae	Not assessed	Endemic
2	Bufo lastastii	Ladakh Toad	Bufonidae	Not assessed	Not endemic

Exhibit C.4: Fish species reported from the Study Area

No	Scientific Name	Common Name	Family/Sub family	Status/ Distribution
1	Oncorhynchus mykiss	Rainbow Trout	Salmonidae	Exotic
2	Salmo trutta	Brown Trout	Salmonidae	Exotic
3	Racoma labiata	Kunar Snow Trout	Cyprinidae/ Schizothoracinae	Wide
4	Schizothorax plagiostomus	Himalayan Snow Trout	Cyprinidae/ Schizothoracinae	Wide
5	Triplophysa choprai	Chitral Loach	Balitoridae/ Nemacheilinae	Endemic to Pakistan
6	Triplophysa microps	Leh Triplophysa Loach	Balitoridae/ Nemacheilinae	Endemic to Indus drainage
7	Triplophysa yasinensis	Yasin Triplophysa Loach	Balitoridae/ Nemacheilinae	Endemic to GB
8	Glyptosternum reticulatum	Turkestan Catfish	Sisoridae	Wide

Exhibit C.5: Vegetation Species reported from the Study Area

No	Common Name	Local Name	Urdu Name	Scientific Name
A–Trees				
1.	Willow	Chitee Biyoo	Baid	Salix alba
3.	Blue Pine	Cheer	Kail	Pinus wallichiana
4.	Pencil Cedar	Chilee	Sanobar	Juniprus macropoda
5.	Spruce	Kachul	–	Picea simithiana
6.	Ash	Kasonar	–	Fraxinus xanthoxyloides
7.	Poplar Species	Falchoo	Safida	Populus nigra & alba
8.	Walnut	Ashuo	Akhrot	Juglans regia
9.	Russian Olive	Gonaer	Ber	Elaeagnus angustifolea
10.	Mulberry	Marooch	Toot	Morus Alba & nigra
11.	Nettle Tree	Buyoo	–	Celtis tralis
12.	Fir	Rai	Partal	Abies pindrow
13.	Deodar	Diar	Deodar	Cedrus deodara
15.	Chinar	Boch	Chinar	Platanus orientalis
16.	Quercus	Bani	Oak	Quercus ilex
17.	Russian Olive	Gonaer	Ber	Elaegnus angustfolea
18.	Fig	Faak	Ingeer	Ficus religiosa
B–Fruit trees				
1.	Apricot	Joiee/joo	Khubani	Prunus armeniaca
2.	Cherry	Glass	Cherry	Prunus spp.
3.	Peach	Choknarr	Arddo	Pyrus persica
4.	Apple	Phlaa/baalt	Seab	Pyrus malus
5.	Plum	Gildaro	Aloobokhara	Prunus domestica
6.	Pear	Shugree	Nashpati	Pyrus communis
7.	Mulberry	Maroach/Biranch	Toot	Morus alba
8.	Walnut	Ashuo/Kakhayo	Akhrote	Juglans regia
C–Shrubs				
1.	Juniper Berries	Matharee	–	Juniperus communis
2.	Seabuckthorn	Borue	Sibukthon	Hippophae rhamnoides
3.	Goose Berry	Shomuloo	–	Ribes alpestres
4	Berberry	Ishkeen	–	Bereberis lycium
5	Tamarix	Hapackhokaoo	–	Maricaria gemanica
6	–	Byar	–	Podophyllium species
7	Tamarix	Hookro	–	Tamarix gallica
8	Wild Rose	Shingie	Ispand	Rosa webbiana

No	Common Name	Local Name	Urdu Name	Botanical Name
D–Herbs				
1.	Trifolium	Shaptal	Shaftal	Trifolium repens
2.	Dandelion	Ishkinache	-	Taraxacum officinale
3.	Wild Thyme	Tumoroo	-	Thymus serphyllum
4.	Berginia	Suspur	-	Berginia stracheyi
5.	Mullein	Jangli Tamakoo	-	Verbescum thapsus
6.	Wild Strawberry	Jangle Mawa	-	Fragaria vesca
7.	Ephedra	Soom	-	Epherdra intermedia
8.	Artemisia	Zhoon	-	Artemisia maritime
9.	Cumin Seed	Kamsal Zeera	-	Cumium cyminum

Appendix D: Institutional Analysis and Stakeholder Mapping

This section identifies all the institutions and stakeholders relevant to the development of the Plan in particular and of the city in general. Stakeholders include government departments, NGOs and civil society organizations. The level of influence and interest of different stakeholders is assessed and recommendations are provided on the mode and manner of engaging them in the Master Plan development process.

D.1 Administrative History of Gilgit-Baltistan

Gilgit was an important location on the Silk Route and saw the spread of Buddhism from South Asia to the rest of the continent. For centuries it was ruled by various rulers from different dynasties until the Gilgit Agency (GA) was formed by the British in 1877[1] GA acted as a political unit of British India and administered the northern half of the princely state of Jammu and Kashmir.

After the partition of the sub-continent in 1947, the name Gilgit Agency was adopted by Pakistan and eventually changed in 1970 when all the territories of present-day GB were renamed the Northern Areas (NA)[2] GA was administered from Islamabad, the federal capital of Pakistan, separately from the neighboring state of Azad Kashmir and the princely states of Hunza and Nagar. It bordered the Sinkiang region of China to the northeast, the Indian state of Jammu and Kashmir to the south, Baltistan to the east and North West Frontier Province[3] to the west.

Initially, GA was not absorbed into any of the provinces of Pakistan, but was ruled directly by political agents of the GoP. In 1963, Pakistan entered into a treaty with China to transfer part of the GA to China, the Trans-Karakoram Tract, with the proviso that the settlement was subject to the final solution of the Kashmir dispute.[4] Pakistan and India continue to dispute the sovereignty of the territories that had comprised the GA.
On 29 August 2009, the Gilgit Baltistan Empowerment and Self-Governance Order 2009 was passed by the Pakistani cabinet and later signed by the then president of Pakistan, Pervez Musharraf.[5] The order granted self-rule to the people of the former NA, now called GB, by creating, among other things, an elected legislative assembly.

D.2 Regulatory and Policy Framework for Town Planning in Gilgit

GB is administratively controlled by Pakistan and granted self-governance through the Gilgit Baltistan (Empowerment and Self-Governance) Order, 2009 passed by the Pakistan cabinet on August 29, 2009 and later signed by the President of Pakistan. The order granted self-rule to the people of GB by creating, among other things, an elected GB Legislative Assembly and GB Council.

D.2.1 Hierarchy of Legal Instruments

GB is governed by a combination of legal instruments including common law dating back to the British colonial administration of India; federal and provincial Pakistani statutes that have been extended to GB and legislation framed specifically for the province.

The hierarchy of laws in force is as follows:

- Selected provisions of the Constitution of the Islamic Republic of Pakistan 1973;
- Acts passed or adapted by the GB Council;
- Ordinances promulgated by the President extended to the GB or the Governor of GB;

1. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
2. Ibid.
3. The North West Frontier Province (NWFP) has now been renamed as Khyber Pakhtunkhwa (KPK).
4. Karrar and Iqbal, 2011, Gilgit Report, UN-Habitat & Department of Architecture and Planning, NED University of Engineering and Technology.
5. Ibid.

- Rules, regulations and orders issued by the National Assembly, or by federal ministries or departments extended to GB, GB departments, or framed by the Ministry of Kashmir Affairs and GB (KA&GB) specifically for the GB.

Constitution of the Islamic Republic of Pakistan 1973

According to the 1973 Constitution of Pakistan, GB is a part of the Federal Republic as a state which by 'accession or otherwise' is included in Pakistan.[6] Pakistan has acted as sovereign in GB, exercising an effective and continuous display of state authority generally recognized under international law (please see Section 2.1 for administrative history of GB).

Legislative Acts

The Gilgit Baltistan Legislative Assembly (GBLA) and Gilgit Baltistan Council (GBC) established under the Gilgit Baltistan (Empowerment and Self Governance) Order, 2009 have powers to make laws. The GBC has exclusive powers to make laws with respect to any matter that is included in the Council Legislative List whereas the Assembly has powers to make laws included in the Assembly Legislative List.[7] The GBC also has powers to adopt any amendment in the existing Laws or any new Law in force in Pakistan. For all matters not included in the Council or Assembly Legislative lists, the power to make laws lies with GoP.[8]

Ordinances

Ordinances are promulgated by the executive branch of the government; by the President when the National Assembly is not in session or by the Governor when a provincial assembly is not in session. Ordinances deal with matters not already covered by federal or provincial law and are generally promulgated when it is considered necessary to take immediate action. The President and provincial governors are awarded broad powers to assess such urgency. Ordinances have the same force and effect as an Act, but remain in force for a limited period of time: (four months in the case of Gilgit Baltistan Governors' ordinances as specified in the Gilgit Baltistan (Empowerment and Self Governance) Order, 2009). During this period, the President or provincial Governor may withdraw an ordinance, or it may be disapproved or modified by the relevant assembly. An ordinance lapses if the relevant assembly fails to adopt it within the specified period.[9]

Orders

Orders are issued by either the legislative or executive branch of government, in exercise of powers delegated under a statute. The status of an order depends on the delegated power under which it is issued. An order may deal with a broad range of substantive issues, as in the case of the NACLFO, or with a specific and limited situation as in the case of environmental protection orders that may be issued under the Pakistan Environmental Protection Act (PEPA) 1997, extended to the GB by the Environmental Protection (Adaptation and Enforcement) Order (EPO) 2002. Executive orders are issued by the government as a matter of administration, while statutory orders are issued by government departments in pursuance of acts and ordinances, prescribing their promulgation. Administrative orders are issued by an administrative authority in exercise of a delegated power to administer a particular issue.[10]

6. Article 1 (2) states that the territories of Pakistan shall comprise:-
   (a) the Provinces of Balochistan, the Khyber Pakthunkhwa, the Punjab and Sindh;
   (b) the Islamabad Capital Territory, hereinafter referred to as the Federal Capital;
   (c) Federally Administered Tribal Areas; and
   (d) such States and territories as are or may be included in Pakistan, whether by accession or otherwise.
7. The Gilgit Baltistan (Empowerment and Self Governance) Order, 2009
8. Environmental Law in Pakistan, Governing Natural Resources and the Processes and Institutions that Affect them: Northern Areas, Volume 1 (Description and Analysis), Part 6, IUCN. http://cmsdata.iucn.org/downloads/pk_elaw_na_review_vol1.pdf (Date Accessed: October 25, 2013)
9. Ibid
10. Ibid

Rules and Regulations

Rules and regulations are issued by the executive branch of government but are not independent legal instruments. Rather, they are framed under the authority conferred by an act or ordinance, and lay down working details for the enforcement and implementation of that particular legal instrument. Rules are the principles to which an action or procedure is intended to conform and are always framed in the exercise of powers delegated under a statute. Examples of statutory rules include the Gilgit Baltistan Rules of Business 2009, Gilgit Baltistan System of Financial Control and Budgeting Rules, 2009, and rules made under PEPA, which are automatically extended to the GB region by the EPO.[11]

Regulations, meanwhile, provide for specific measures that may be required to put into effect a law or ordinance. Regulations are also the instruments that federal and provincial governments use to govern the Federally Administered and Provincially Administered Tribal Areas, respectively.

Notifications

Rules, regulations or orders issued pursuant to a particular law must be officially notified in the federal or provincial gazette. Notifications are not a separate class of legal instruments but rather serve as mechanism by which the executive branch of government promulgates rules and regulations. In certain cases, notifications also serve as a means to communicate official actions taken to accomplish a particular and limited purpose, such as designating a protected area.[12]

D.2.2 Legal Instruments

Laws relevant to the master planning of Gilgit city are summarized below.

Environment

Since the promulgation of the 18th Amendment to the Constitution, responsibility for the development and implementation of environmental laws has been devolved to the Provinces. Each Province is currently drafting environmental assessment laws and regulations, based on "templates" developed by NIAP. In the meantime, GB still regulates environmental issues according to the Pakistan Environmental Protection Act 1997.

The Environmental Protection (Adaptation and Enforcement) Order (EPO) 2002 (KANA Order No. F.No. 10(S), 2002-NA.II dated 21 August 2002) extends the application of the Pakistan Environmental Protection Act (PEPA) 1997 to the whole of GB. Section 2 of the EPO states that all rules, regulations and orders issued under PEPA are also to apply to GB.

The PEPA provides for regulating development activities by two types of environmental assessments: Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA). EIAs are carried out for projects that have a potentially 'significant' environmental impact, and IEEs are conducted for relatively smaller projects with a relatively less significant impact. The term 'EIA' is defined in PEPA as "an environmental study comprising collecting data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as be prescribed".

Section 12(1) of PEPA requires that: "No proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an initial environmental examination (IEE) or, where the project is likely to cause an adverse environmental effect, an environmental impact assessment (EIA), and has obtained from the Provincial Agency approval in respect thereof." The Pakistan EPA has delegated the power of review and approval of

11. Ibid
12. Environmental Law in Pakistan, Governing Natural Resources and the Processes and Institutions that Affect them: Northern Areas, Volume 1 (Description and Analysis), Part 6, IUCN. http://cmsdata.iucn.org/downloads/pk_elaw_na_review_vol1.pdf (Date Accessed: October 25, 2013)

IEEs and EIAs to the provincial EPAs. The Gilgit Baltistan Environmental Protection Agency (GB-EPA) is responsible for the approval of the EIA and IEE of new developments undertaken in GB.

The Gilgit Baltistan Environmental Protection Agency, after review, may approve or require the EIA to be re-submitted after modifications as prescribed by the Agency, or may refuse the project as being contrary to the environmental objectives. Section 12(3) states that every review of an environmental impact assessment shall be carried out with public participation. PEPA requires the Agency to communicate its decision within a period of four months from the date the EIA has been filed for review [Section 12(4)].

The Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2000 provide the necessary details on the preparation, submission, and review of initial environmental examinations and environmental impact assessments. The Regulations categorize projects for IEE and EIA. Schedules I and II, attached to the Regulations list the projects that require IEE and EIA, respectively.

Forests and Wildlife[13]

- Throughout most of Pakistan, the management of forests and wasteland is the responsibility of the state. This, however, is not the case in the GB where over three quarters of the forest area is guzara land (wasteland, or land used for subsistence) owned by communities and managed under government supervision. The fragile ecosystem of the Gilgit Baltistan provides a rich habitat for a number of indigenous and migratory species. Under the Gilgit Baltistan Rules of Business, 2009 the management, conservation, regulation and use of forest and wildlife resources is the responsibility of the Forest, Wildlife and Environment Department headed by a secretary. Laws regulating matters related to the forests and wildlife of Gilgit Baltistan are summarized below.

- Forest Act 1927 – Various notifications issued over a period spanning several decades have extended the Forest Act 1927 to different parts of Gilgit Baltistan, however by 1991, the Forest Act had been extended to all parts (Office Memorandum No. LA-COMM-9(7)/91 dated 14 May 1991, item 54). There is no single legal instrument that extends the Forest Act 1927 to the entire Gilgit Baltistan region. The Forest Act 1927 is designed to protect forest areas and regulate forest produce. The Forest Act provides for the creation of various classes of forest and allows provincial governments to “reserve” state-owned forest land, assume control of privately owned forest land, and declare any government-owned forest land to be a protected area. The law prohibits grazing, hunting, quarrying, clearing for the purpose of cultivation, removing forest produce, and felling or lopping trees and branches in reserved or protected areas.

- Forest Act Amendment Order 1993 (KANA Order No. 26(8)/92- NA-I and LA-COMM-9(7)/92 dated 25 February 1993)a – This Amendment Order makes a number of procedural changes to the Forest Act 1927. It awards divisional forest officers and higher forest officials the powers of a magistrate (Section 2(a)). The 1993 Order also amends Sections 26, 33 and 42 of the 1927 Act, increasing punishments for forest offences.

- Northern Areas Forest Rules 1983 (KANA Notification No. D- 5(4)/81-VII dated 9 May 1983) – The Northern Areas Forest Rules 1983 apply to protected forests in Astore, Baltistan (Skardu and Ghanche) and Gilgit, regulating matters such as cutting trees, removing timber and forest produce, and clearing for cultivation.

- Northern Areas Cattle Trespass Act 1976 (Notification No. LA-RESNTF- 9(1)/76 dated 20 September 1976) - aims to control

13. Environmental Law in Pakistan, Governing Natural Resources and the Processes and Institutions that Affect them: Northern Areas, Volume 1 (Description and Analysis), Part 6, IUCN. http://cmsdata.iucn.org/downloads/pk_elaw_na_review_vol1.pdf (Date Accessed: October 25, 2013)

damage caused to land and facilities in both urban and rural environments. In rural areas, natural vegetation and cultivated land are protected from being damaged by grazing. The Act consolidates and amends the law relating to cattle trespass, providing protection against damage to private and public property, including privately cultivated land, plantations, drainage works, public roads and pleasure grounds.

- Northern Areas Wildlife Preservation Act 1975 – provides for the establishment of national parks, wildlife reserves and wildlife sanctuaries; the constitution of a Northern Areas Wildlife Board; and the issuing of hunting licenses and certificates of lawful possession. It regulates hunting, prohibits the use of inhumane methods and imposes certain other limitations, such as time of day, season and area in which hunting is permitted.

Fisheries[14]

Laws regulating the fisheries sector in the Gilgit Baltistan region deal with many issues related to the management and use of fish resources, particularly trout species which abound in the region and are amongst its most prized resources. These include:

- Northern Areas Fisheries Act 1975 (Notification No. REGHC.NTF-5/75 dated April 1975) – provides for the management and protection of some of the richest fisheries resources in the country. It aims to control indiscriminate exploitation and introduces a regulatory mechanism.

- Northern Areas Fisheries Rules 1975 (Notification No. REG-HC.NTF.6/75 dated 4 April 1975) – Issued under Section 23 of the Northern Areas Fisheries Act 1975, the Northern Areas Fisheries Rules 1975 deal with licenses, fishing gear and methods that may be used, as well as the size of fish that may be caught, and lists waters in which fishing is permitted. Erecting fixed engines, constructing weirs or dams and diverting water is prohibited.

Freshwater

Canal and Drainage Act 1873 – regulates matters related to irrigation, navigation and drainage, and was extended to GB. This Federal Act operates as a provincial law. All powers under the Act, including the power to make rules, have been delegated to the provinces. In the case of the Northern Areas, this authority is exercised by the Chief Minister, Deputy Chief Minister and Chief Secretary. The law entitles the provincial government to use and control water from all rivers and streams flowing in natural channels, and from all lakes and other natural bodies of still water. The provincial government may prohibit obstructions and order their removal if they appear to be causing injury to land, public health or public convenience.

Land Tenure

Legal instruments governing property rights in the GB include the Gilgit and Baltistan Right of Prior Purchase Act 1938, North-West Frontier Province Tenancy Act 1950 and Northern Areas Allotment of Government Land Rules 1975, as well as the Punjab Settlement Manual and Punjab Land Record Manual which are updated annually. Land Acquisition Act 1894 provides for the acquisition of land needed for public purposes and for Companies, and determines the amount of compensation to be made on account of such acquisition.[15]

Other laws enacted in GB are summarized below.

14. Environmental Law in Pakistan, Governing Natural Resources and the Processes and Institutions that Affect them: Northern Areas, Volume 1 (Description and Analysis), Part 6, IUCN. http://cmsdata.iucn.org/downloads/pk_elaw_na_review_vol1.pdf (Date Accessed: October 25, 2013)
15. Environmental Law in Pakistan, Governing Natural Resources and the Processes and Institutions that Affect them: Northern Areas, Volume 1 (Description and Analysis), Part 6, IUCN. http://cmsdata.iucn.org/downloads/pk_elaw_na_review_vol1.pdf (Date Accessed: October 25, 2013)

Urban and Rural Development

Northern Areas Town Area Committees Building Bylaws 1979 (Notification no. LA/Res-9(1)/79 dated 25 June 1979

Extractive and Non- Extractive Industry

Northern Areas Concession Rules 2003

Factories Act 1934 Adaptation of Laws Order 1981 (KANA Order no. NA-9 (2)/81 dated 10 December 1981)

Taxation

Northern Areas Council Legal Framework Order 1994 (KANA Order no.12 (34)/93-NA-1 dated 12 June 1994)

Transport

Motor Vehicle Ordinance 1965 (Cited in KANA Order no.NA-4(1)/80 dated 19 May 1982)

Tourism

Northern Areas Hotels and Restaurant Rules 1982 (KANA Notification No.G-14(100)/ 77 dated 4 July 1982)

Pakistan Hotels and Restaurant Act 1976

D.3 Institutions Involved in Master Planning in Gilgit

This section identifies the institutions that are currently involved, or may be involved in the future, in the development and implementation of the Plan. The identification of these institutions based on their current and future involvement with the plan is discussed in detail in Section 4.3.

D.3.1 Gilgit Development Authority

GDA has been established under Section 4 of the Gilgit Baltistan Development of Cities Act, 2012. The Act provides for the following:

- Establishment of a comprehensive system of planning and development in order to improve the quality of life of the cities in GB;
- Establishment of an integrated development approach and a continuing process of planning and development to ensure optimum utilization of resources,
- Economical and effective utilization of land and to evolve policies and programmes relating to improvement of the environment of housing,
- Industrial and trade development, traffic, transportation, health, education, water supply, sewerage, drainage, solid waste disposal and related matters.

GDA is be headed by a chairman and will consist of members. Following are the powers and functions of the GDA as prescribed by the Development of Cities Act, 2012:

- Initiate and maintain a continuous process of comprehensive development and planning for Gilgit with the objective of preparing a development plan;
- Periodically update such development plan and coordinate its implementation by the Authority or government Agencies within Gilgit;
- Develop operate and maintain water supply, sewerage and drainage system within Gilgit;
- Prepare Annual Development Programme for Gilgit, ensure compliance of the Annual Development Programme with priorities established in the development plan after its

preparation and evaluate performance under the Annual Development Programme at the end of each year;

- Establish, maintain and periodically revise as necessary, planning controls and building regulations for the area;
- Provide appropriate urban design and protect urban safety;
- Ensure compliance with development plan after its preparation;
- Prepare, implement and enforce schemes for environmental, improvements, housing, urban renewal including slums improvement and re-development, solid waste disposal, transportation and traffic, health and education facilities, and preservation of objects or places of historical, archaeological, scientific, cultural and recreational importance;
- Take any steps or adopt any measures for the face lifting beautification of the area;
- Acquire property, both movable and immovable;
- Sell, lease, exchange or otherwise dispose of any property vested in it;
- Undertake any works and incur any expenditure;
- Procure machinery instruments or any other material required by it;
- Enter into contracts;
- Case studies, surveys, experiments, technical researches or contribute towards the cost of any such studies, surveys, experiments or technical researches made by any other Agency;
- Issue interim development orders for the area for which a scheme is under preparation and restrict or regulate by general or special order, any change in the use of land and alteration in building structure and installation;
- Seek and obtain advice and assistance for the preparation of any scheme, or for the execution of any scheme from the Government agency or person and such agency or person shall give the advice and assistance sought by the Authority to the best of its ability, knowledge and judgment and the additional expenditure, if any, involved in giving such advice or assistance shall be borne by the Authority; and
- Establish an agency/agencies and entrust to it such powers and functions as it may deem fit with the approval of the Government

It is clearly stated in the Development Cities Act, 2012 that GDA shall prepare the master plan and phased master programmes for the development of any part or whole of the specified area of Gilgit District and all such plans and programmes prepared from time to time shall be submitted to the Government for approval. GDA may issue interim development orders for areas for which master plan is being contemplated or under preparation and restrict or prohibit by general or special order any change in the use of land and alteration in buildings, structures and installation.

D.3.2 Gilgit Baltistan Environmental Protection Agency

Environmental Protection Agency Gilgit Baltistan (EPA-GB) is primarily responsible for administering the provisions of the Pakistan Environmental Protection Act 1997 in Gilgit Baltistan. The EPA-GB reports to Forest, Wildlife and Environment Department. EPA-GB serves as GB's environmental policy-making and regulatory institution. Its role is to regulate, coordinate, monitor and enforce environmental laws in the region. The agency is expected to play a major role in environmental protection, as well as to be the central point in dealing with the management of GB's environment so that it benefits all the

citizens of region. The functions and responsibilities of the EPA-GB include the following:

- Enforcement of Pakistan Environmental Protection Act (PEPA) 1997;
- Enforcement of National Environmental Quality Standards (NEQS);
- Implementation of Self Monitoring & Reporting Tool (SMART);
- Environmental Impact Assessment (EIA);
- Advising and coordinating with the government, NGOs, etc. on preventive measures for abatement of pollution;
- Assisting local authorities and government departments to implement schemes for proper disposal of wastes to ensure compliance with NEQS;
- Enhancing awareness among the general public;
- Conducting research and studies on different environmental issues;
- Attending to public complaints on environmental issues; and,
- Carrying out any other task related to environment assigned by the government.

D.3.3 Planning and Development Department (P&DD)

P&DD is the principle institution responsible for approving various kind of development projects of all line departments. The functions of the P&DD have been described in the Gilgit Baltistan Rules of Business, 2009 which include:

- Preparing the annual development programme in coordination with all departments of the government.
- Monitoring the utilization of ADP funds.
- Approval of development schemes.
- Coordination training in economic development for all officers serving with the Gilgit Baltistan Government.
- Preparing five years and other provincial development plans.
- Service matters except those entrusted to Services and General Administration, Information and Cabinet Department.

D.3.4 Forest, Wildlife and Environment Department

The Forest, Wildlife and Environment Department is responsible for:

- Scientific Management of existing public forest estates to maximize production of wood minor forest produce and to create new forest resources.
- Promotion of social/farm forestry on private lands.
- Establishment of amenity forests and recreational parks.
- Tree plantations for strategic purposes in consultation with the National Sub-Committee on Defense Planting.
- Education of the public for tree planting and provision of technical and advisory services on matters of afforestation to the people and other Government Department.
- Regional research in various disciplines of forestry, wildlife, sericulture and fisheries.
- Implementation of various provisions of Forest Act and rules framed thereunder.
- Service matters except those entrusted to S& GAD Department.
- Management of Zoological gardens and promotion of wildlife.

- Prevention of poachers.
- Protection of wildlife by involving community organizations.
- Provision of facilities for trophy hunting in the community protected areas.
- Administration of laws relating to environmental protection.
- Preparation of environmental policy.
- Coordinate environmental policies and programme nationally.
- Provide information and education to the public on environmental matters.
- Identify the needs for legislation in the environmental field.

D.3.5 Works Department

The Works Department is mainly involved in construction of roads, buildings, construction of power supply stations (hydro power, thermal), for towns and rural areas. Functions of the Department are described below.

- Planning, Designing, Construction, Equipment, Maintenance and repairs of all Government Buildings, Residential and Non-Residential including Rest Houses, Circuit Houses.
- Evaluation, Fixation of Rent, Control, Management.
- Laying standards of specifications for various types of roads and bridges.
- Planning and designing roads and connected works for the department.
- Construction, maintenance, repairs and improvement of roads, bridges and culverts.
- Service matters except those entrusted to S&GAD Department.
- Purchase of stores and capital goods for the department.
- Development of integrated communication network for GB.

D.3.6 Local Bodies and Rural Development and Census Department

This department is the main player in rural development and its main areas of interventions include construction of schools, link-roads, irrigation channels, water storage tanks and provision of water supply and sanitation facilities to rural communities of GB. The department is responsible for:

- Matters relating to:
  - Local Councils.
  - Establishment and budget of local councils except grant-in-aid for hospitals and dispensaries.
  - Directorate of Local Government and Rural Development and their subordinate offices.
  - Local taxation and local rates.
- Registration of births, deaths and marriages by local councils.
- Development funds and development schemes pertaining to local councils.
- Grant in aid for local councils.
- All matters relating to local council services.
- Coordination of Census work.
- Rural Development Councils and Rural Development Programme.
- Purchase of stores and capital goods for the department.
- Service matter except those entrusted to the service, General Administration and Information Department.

D.3.7 Revenue, Usher[16] and Zakat,[17] Excise and Taxation and Cooperative Department

The functions and responsibilities of the department as described in the GB Rules of Business, 2009 are:

- Assessment and Collection of land revenue.
- Shamailat-e-deh-matters.[18]
- Revenue field staff, District and Divisional Establishment matters connected with their recruitment, training, pay allowances promotions, leave, posting and transfers.
- Compulsory acquisition of land, land acquisition act and rules made thereunder.
- Registration of deeds and documents including registration fees.
- Settlement and re-assessment.
- Transfer of property act.
- Stamps & Court Fees, Judicial & non-Judicial under Court Fees act.
- Boundary disputes.
- Matters relating to Divisional, District, Sub-Divisional and Tehsil Office Buildings etc. except actual constructions, maintenance and repairs.
- Execution of the policy laid down and decision taken by the Central and Provincial Councils.
- Supervision and guidance of local Tehsil and district Zakat Committees.
- Distribution of Zakat funds to local Zakat Committees, Deeni Madras and Welfare Institutions.
- Completion and collection of data regarding number of beneficiaries and the amount utilized.
- Arrangements for training of Chairman and Members of Zakat Committees and Officers associated with Zakat Work.
- Supervision and guidance of Local Tehsil and District Zakat Committees.
- Valuation of Usher.
- Cooperative Societies and Cooperative Banks.
- Cooperative Development Fund and Projects.

D.3.8 Water and Power Department

This department is responsible for development, generation, supply and distribution of power. The functions of the department are provided below:

- Administration of Electricity Act, 1910 and Electricity Rules, 1937.
- Administrative control and check on the work of electric officials and all technical matters including court case relating to the officials of electric offices.
- Electrical accidents in connection with generation, transmission distribution and use of electric energy.
- Standardization of specifications in respect of electric appliances, machinery and installations.
- Matters connected with distribution of power.
- Acquisition, revocation or amendment of licenses of electric supply undertaking and approval of loads.
- Matters connected with electricity duty under the West Pakistan Finance Act, 1964 and Rule thereunder.
- Service matters except those entrusted to S&GAD Department.

16. Usher is the obligatory charge (Zakat) on farm produce which is one-tenth for one kind of land and one-twentieth for others.
17. A term used in Islamic finance to refer to the obligation that an individual has to donate a certain proportion of wealth each year to charitable causes.
18. Public and private communal lands of a village

- Purchase of stores and capital goods for the department.
- Development of small & medium hydel stations.
- Development & maintenance of local transmission lines.

D.3.9 Finance Department

The Finance Department is responsible for the supervision and control of GB's finances. It prepares the Annual Budget, and formulates financial rules. Management of public funds and administration of Local Fund Audit Department and the Treasuries are its main responsibilities. Details of functions are given below.

- Management of Public funds i.e.
  - Supervision and control of Provincial finances.
  - Preparation of Provincial budget.
  - Preparation of supplementary estimates and demands of excess grants.
  - Ways and means.
- Public Accounts and Public Accounts Committee.
- Framing of financial rules for guidance of departments and supervision of maintenance of accounts.
- Grants, contributions, other allowances and honoraria, contingencies, recoveries from and payment to government department and cases relating to money matter generally, such as deflections, embezzlements and other losses.
- Banking.
- Communication of financial sanctions.
- Creation of new posts.
- Monitoring of receipts and expenditure.
- Local Audit Department.
- Treasuries and sub-treasuries

D.3.10 Tourism, Sports, Culture and Youth Department

Functions of the department are explained below.

- Promotion of tourism in GB.
- Development schemes pertaining to tourism.
- Arrangements of national events.
- Arrangement of Silk Route Festivals and other festivals in GB.
- Promotion of sports in GB
- Grant-in-aid to sports organization.
- Formulation of Sports policy.
- Promotion of Art, Culture and Literature.
- Conservation of historical monuments in GB
- Promotion of National integration and cultural activities and Organization of relevant seminars and symposia.
- Development of schemes pertaining to Art and Culture.
- Service matters except those entrusted to S&GAD.
- Purchase of stores and capital goods for the department.
- Coordination of activities of Youth Organizations.
- Arranging seminars/exhibitions etc, relating to such events as international youth year, National Youth Festivals, Sports e vents etc.
- Arranging inter-provincial and international visits by the youth delegations.

D.3.11 Mineral Development, Industries, Commerce and Labor Department

This department is responsible for promoting, planning and development of industries

contributing to employment generation and socioeconomic uplift of the region. The department is responsible for matters relating to:

- Geological surveys.
- Development of mineral resources and regulation of mines.
- Grant of prospecting licenses and mining leases.
- Planning and development of industries.
- Industrial research.
- Industrial control.
- Industrial exhibitions with the country.
- Survey of industries.
- Preparing plans in respect of industries to be established in the public sector.
- Workers colonies.
- Labor laws.

D.4 Stakeholder Identification and Mapping

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses.[19]

Section 4.2 of this report already discusses in detail the roles and responsibilities of institutions in the development and implementation of the Plan for Gilgit. In addition to the institutions discussed previously, this section will also focus on government and non-government institutions that may or may not be directly involved in development and implementation of the Plan but may possess some interest or may be able to exercise some influence in the process.

The process of identifying stakeholders is an integral part of the SEA as it will allow an analysis of the relationship between different stakeholders and GDA, GB-EPA and P&DD, while at the same time help develop a better understanding of other organizations with a role in developing and implementing the Plan.

D.4.1 Objective

The objective of the stakeholder analysis is to:

- Identify the major institutional stakeholders that have interest or have the ability to influence planning and development of the Plan.
- Assess the level of influence and interest of various institutional stakeholders to determine the significance of each stakeholder to the Plan.
- Provide recommendations on engaging the stakeholders in the development of the Plan.

D.4.2 Methodology

The following methodology was adopted for identification and analysis of potential stakeholders:

- An internet-based search was conducted to identify all the government departments, NGOs and civil society organizations from Gilgit which were considered relevant to the development of the Plan. A list of the institutional stakeholders is provided in Exhibit 4.1 with information on whether they belong to the private or public sector.
- A matrix was developed to measure the level of interest and influence of the stakeholders in the development of the Plan with the help of information available on the websites of these institutions and information collected during preliminary stakeholder consultations

19. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, 2007, International Finance Cooperation, PDF, http://www1.ifc.org/wps/wcm/connect/938f1a0048855805beacfe6a6515bb18/IFC_StakeholderEngagement.pdf?MOD=AJPERES (Date Accessed: June 7, 2013).

in Gilgit by the HBP team in September 2013. A set of questions were designed to gauge the level of interest and influence of the stakeholders based on their organizational objectives and legal mandate. Each question could only be answered with one of the following three numbers: 1, 0.5 or 0 corresponding to 'Yes'; 'Yes & No' or 'not enough information' and 'No' respectively based on available information. The scope of the questions was deliberately kept broad to accommodate the potentially diverse interests of the stakeholders in one or more of the plethora of different aspects of development of the Plan and their varying levels of influence on it.

- The questions designed to determine the level of interest are as follows:
  - Will this stakeholder be affected by the Gilgit Master Plan?
  - Does this stakeholder have any past, present or planned project or involvement in development of the Gilgit Master Plan?
  - Will this stakeholder promote/support the project, provided that they are involved?
  - Will this stakeholder obstruct/hinder the project if they are not involved?
  - Has this stakeholder not been involved up to now but should have been?
  - Do the stakeholder's goals and expectations either support or conflict with the development of the Gilgit Master Plan?
- The questions applied to determine the level of influence are as follows:
  - Does the stakeholder have a legal mandate for anything related to the Gilgit Master Plan?
  - Is this stakeholder directly responsible for decisions on issues important to the Gilgit Master Plan?
  - Can this stakeholder provide or withhold resources to affect the Gilgit Master Plan?
  - Does the stakeholder have the ability to mobilize civil society in pursuit of its objectives?

D.4.3 Level of Interest and Influence of the Stakeholders

The responses to the questions designed above were ascertained after extensive internet-based research on each of the stakeholders identified and have been presented in Exhibit D.1 and Exhibit D.2. The last column includes the final score for the level of influence and interest obtained based on the scoring criteria stated in Section D.3.2.

Exhibit D.3 presents the finals scores for stakeholder interest and influence together and provides a brief summary of the nature of the mandate, roles, responsibilities and objectives of the stakeholder which justifies their score.

Exhibit D.1: List of Identified Institutional Stakeholders in Gilgit

No	*Institutional Stakeholder*	*Abbreviation*	*Type*
1.	Office of Chief Secretary Gilgit Baltistan	CS	Government
2.	Local Government, Rural Development and Census Department	LGRD&CD	Governmen
3.	Gilgit Development Authority	GDA	Government
4.	Planning and Development Department	P&DD	Government
5.	Environmental Protection Agency	GB-EPA	Government
6.	Forest, Wildlife and Environment Department	FW&ED	Government
7.	Mineral Development, Industries, Commerce & Labour Department	MDIC&LD	Government
8.	Gilgit Baltistan Council	GBC	Government
9.	Works Department	WD	Government
10.	Law and Prosecution Department	L&PD	Government
11.	Food and Agriculture, Fisheries and Animal Husbandry Department	F&AFAHD	Government
12.	Finance Department	FD	Government
13.	Revenue, Usher and Zakat, Excise and Taxation and Cooperative Department	RUZET&CP	Government
14.	Education, Social Welfare and Women Development	ESW&WD	Government
15.	Home & Prisons Department	H&PD	Government
16.	Health and Population Welfare Department	H&PWD	Government
17.	Water and Power Department	W&PD	Government
18.	Tourism, Sports, Culture and Youth Department	TSC&YD	Government
19.	Water and Sanitation Extension Program	WASEP	NGO
20.	Building and Construction Extension Program	BACEP	NGO
21.	World Wildlife Fund	WWF	NGO
22.	Karakoram Agricultural Research Institute for the Northern Areas	KARINA	Academic
23.	Karakoram International University	KIU	Academic

Exhibit D.2: Assessing Stakeholders' Level of Interest

No	Stakeholder[20]	A - Has this stakeholder not been involved up to now in the formulation of the Gilgit master plan but should have been?	B - Will this stakeholder be affected by the Gilgit Master Plan?	C - Will this stakeholder promote/support the project, provided they are involved?	D - Will this stakeholder obstruct/hinder the project if they are not involved?	E - Do the stakeholder's goals and expectations either support or conflict with the Gilgit Master Plan?	F - Does this stakeholder have any past, present or planned project or involvement in Gilgit Master Plan?	Level of Interest (Max score 6)
1.	CS	No	Yes	Yes	Yes	Yes	No Information	**4.5**
2.	LGRD&CD	No	Yes	Yes	No information	Yes	No Information	**4**
3.	GDA	No	Yes	Yes	Yes	Yes	Yes	**5**
4.	P&DD	No	Yes	Yes	Yes	Yes	No Information	**4.5**
5.	GB-EPA	No	Yes	Yes	Yes	Yes	No Information	**4.5**
6.	FW&ED	No	Yes	Yes	No information	No	No Information	**3**
7.	MDIC&LD	No	Yes	Yes	No information	Yes	No Information	**4**
8.	GBC	No	Yes	Yes	Yes	No Information	No Information	**4**
9.	WD	No	Yes	Yes	No information	Yes	No Information	**4**
10.	L&PD	No	No	No information	No	No	No Information	**1**
11.	F&AFAHD	No	No information	No information	No	No Information	No Information	**2**
12.	FD	No	Yes	Yes	No information	No Information	No Information	**3.5**
13.	RUZET&CP	No	Yes	No information	No information	No Information	No Information	**3**
14.	ESW&WD	No	No	No information	No	No	No	**0.5**
15.	H&PD	No	No	No information	No information	No Information	No	**1.5**
16.	H&PWD	No	No	No information	No	No Information	No	**1**
17.	W&PD	No	Yes	Yes	No information	No Information	No Information	**3.5**
18.	TSC&YD	No	Yes	No information	No information	Yes	No Information	**3.5**
19.	WASEP	No	Yes	Yes	No information	Yes	Yes	**2.5**
20.	BACEP	No	Yes	Yes	No information	Yes	Yes	**2.5**
21.	WWF	No	Yes	Yes	No	Yes	No	**3**
22.	KARINA	No	No	No information	No information	No	No Information	**1.5**
23.	KIU	No	No	No information	No information	No	No Information	**1.5**

20. Full names available in Exhibit 4.1

Exhibit D.3: Assessing Stakeholders' Level of Influence

No	*Stakeholder*[20]	*G - Does the stakeholder have a legal mandate for anything related to Gilgit Master Plan?*	*H - Is this stakeholder directly responsible for decisions on issues important to Gilgit Master Plan?*	*I - Can this stakeholder provide or withhold resources to affect Gilgit Master Plan?*	*J - Does the stakeholder have the ability to mobilize civil society in pursuit of its objectives?*	*Level of Influence (Max score 4)*
1.	CS	Yes	Yes	Yes	No Information	**4.5**
2.	LGRD&CD	Yes	Yes	Yes	No Information	**4**
3.	GDA	Yes	Yes	Yes	No Information	**5**
4.	P&DD	Yes	Yes	Yes	No Information	**4.5**
5.	GB-EPA	Yes	Yes	Yes	Yes	**4.5**
6.	FW&ED	No Information	No	Yes	Yes	**3**
7.	MDIC&LD	Yes	No	Yes	No Information	**4**
8.	GBC	Yes	Yes	Yes	No Information	**4**
9.	WD	Yes	No	Yes	No Information	**4**
10.	L&PD	No	No	Yes	No	**1**
11.	F&AFAHD	No	No	No Information	No Information	**2**
12.	FD	No	Yes	Yes	No Information	**3.5**
13.	RUZET&CP	No	Yes	No Information	No Information	**3**
14.	ESW&WD	No	No	No Information	No	**0.5**
15.	H&PD	No	No	No Information	No Information	**1.5**
16.	H&PWD	No	No	No Information	No	**1**
17.	W&PD	No	Yes	No Information	No Information	**3.5**
18.	TSC&YD	No	No	No Information	No Information	**3.5**
19.	WASEP	No	No	Yes	No Information	**1.5**
20.	BACEP	No	No	Yes	No Information	**1.5**
21.	WWF	No	No	No Information	No Information	**3**
22.	KARINA	No	No	Yes	Yes	**1.5**
23.	KIU	No	No	Yes	Yes	**1.5**

Exhibit D.4: Level of Interest and Influence Scores along with Supporting Information

No	Stakeholder [21]	Level of Interest (Max score 6)	Level of Influence (Max score 4)	Supporting Information
1.	CS	**4.5**	**4.5**	The CS is in charge of the Services and General Administration Department and shall also be the Secretary to the Cabinet, heads the Secretaries Committee and coordinates with all departments.
2.	LGRD&CD	**4**	**4**	The department is the main player active in rural development, main areas of intervention include construction of schools, link-roads, irrigation channels, water storage tanks and provision of water supply and sanitation facilities to rural communities. The department is responsible for development funds and development schemes pertaining to local councils.
3.	GDA	**5**	**5**	GDA has the prime responsibility to initiate and maintain a continuous process of comprehensive development and planning for Gilgit with the objective of preparing a development plan. It is also responsible for preparing the master plan and phased master program for the development of any part or whole of the specified area of Gilgit District.
4.	P&DD	**4.5**	**4.5**	P&DD is the principle institution responsible approving various kind of development projects of all line departments.
5.	GB-EPA	**4.5**	**4.5**	GB-EPA is primarily responsible for administering the provisions of the Pakistan Environmental Protection Act 1997 in GB and safeguarding the environment and natural resources. GB-EPA is bound under the Act to regulate development through environmental assessments of all such development projects that may cause significant impacts to the environment.
6.	FW&ED	**3**	**3**	The department is responsible for the protection and promotion of natural resources in GB.
7.	MDIC&LD	**4**	**4**	The department is responsible for promoting, planning and developing industries contributing to employment generation and socioeconomic uplift of the region. Preparing plans in respect of industries to be established in the public sector.
8.	GBC	**4**	**4**	The GBC is empowered to make laws pertaining to matters specified in the Council Legislative List provided in the Gilgit Baltistan (Empowerment and Self-Governance) Order, 2009
9.	WD	**4**	**4**	The Works Department is mainly involved in construction of roads, buildings, construction of power supply stations (hydro power, thermal), for towns and rural areas.
10.	L&PD	**1**	**1**	Provide advice to department on all legal matters including interpretation of laws, rules and orders having the force of law.
11.	F&AFAHD	**2**	**2**	Department is responsible for administering laws and management of resources.
12.	FD	**3.5**	**3.5**	Finance Department responsible for the supervision and control of GB finances. It prepares the of Annual Budget.

21. Full names available in Exhibit 4.1

No	Stakeholder [21]	Level of Interest (Max score 6)	Level of Influence (Max score 4)	Supporting Information
13.	RUZET&CP	**3**	**3**	The department is responsible for matters relating to taxation, collection of land revenues, shamilat and deh, boundary disputes,
14.	ESW&WD	**0.5**	**0.5**	Responsible for promoting education and scientific research, professional and financial assistance to registered voluntary social welfare agencies, overall social and economic uplift of women and awareness rising.
15.	H&PD	**1.5**	**1.5**	Responsible for maintaining public Order and Internal Security. Enforce and maintain law and order.
16.	H&PWD	**1**	**1**	Improving health and providing for adequate facilities for the people GB.
17.	W&PD	**3.5**	**3.5**	Matters relating to power distribution.
18.	TSC&YD	**3.5**	**3.5**	Promote tourism, art, culture and literature.
19.	WASEP	**2.5**	**1.5**	Works towards provision of clean drinking water and hygienic sanitation facilities to prevent the high incidence of waterborne diseases in disadvantaged communities
20.	BACEP	**2.5**	**1.5**	Works towards improving housing and living conditions of rural and peri-urban communities with the mission “to promote measures that will enable the communities in GB to make sustainable improvements in their living conditions by providing solutions to their housing related problems, allowing them to optimize their investment in built environment related aspects and hence improve the quality of living environment, especially for women and children”
21.	WWF	**3**	**3**	WWF aims to conserve nature and ecological processes by: Preserving genetic, species, and ecosystem diversity, ensuring that the use of renewable natural resources is sustainable, both now and in the longer term, promoting action to reduce pollution and the wasteful exploitation and consumption of resources and energy
22.	KARINA	**1.5**	**1.5**	Provide support resources.
23.	KIU	**1.5**	**1.5**	Provide support and resources

21. Full names available in Exhibit 4.1

D.4.4 Mapping Stakeholder Influence and Interest in the Master Plan for Gilgit

The scores from stakeholder influence and interest analyses were mapped using a simple x-y grid with increasing levels of influence and interest away from the bottom-left corner of the grid. The x - and y – axis represent the possible scores in both categories with a score of '6' being the maximum possible score on the 'interest' axis and '4' for the axis representing 'influence'. By splitting the influence and interest axes down the middle, the grid was divided into four quadrants as shown in Exhibit D.5.

The top-right quadrant is the one with stakeholders deemed to be most influential and most interested or impacted by the Plan. Stakeholders falling into this quadrant are those that should be kept close in the development of the Plan due to their mandates and objectives as discussed in Section 4.3.3.

Stakeholders falling in the top-left quadrant are those with larger degrees of influence but little interest in - or with little impact from the Plan. These entities should be consulted and kept satisfied in the Gilgit Master Plan development process.

Stakeholders falling in the bottom-right quadrant are those with great interest in the Plan but hold almost no influence over it. These entities should be consulted and kept informed of the planning and development process.

The bottom-left corner contains all of the remaining stakeholders that were included in the stakeholder mapping exercise. These entities had almost no influence in affecting the Gilgit Master Plan and no interest in it either. These entities should be simply monitored for developing levels of interest in the Plan and for collection of data from them if pertinent to its development process.

Exhibit D.6 lists the different entities that fall under the four different categories with recommendations for engaging them in the development of the Plan. Recommendations for engaging the stakeholders range from actions that encourage coordination and involvement between these stakeholders and the institutions responsible for developing the Plan, to identifying the need for developing their capacities to improve the fulfillment of their mandate in the context of the Plan. The recommendations also include sharing information about the Plan with the public, keeping the latter informed especially about the possible environmental repercussions of the Plan.

Exhibit D.5 : Stakeholders of Gilgit Master Plan Mapped According to Interest and Influence

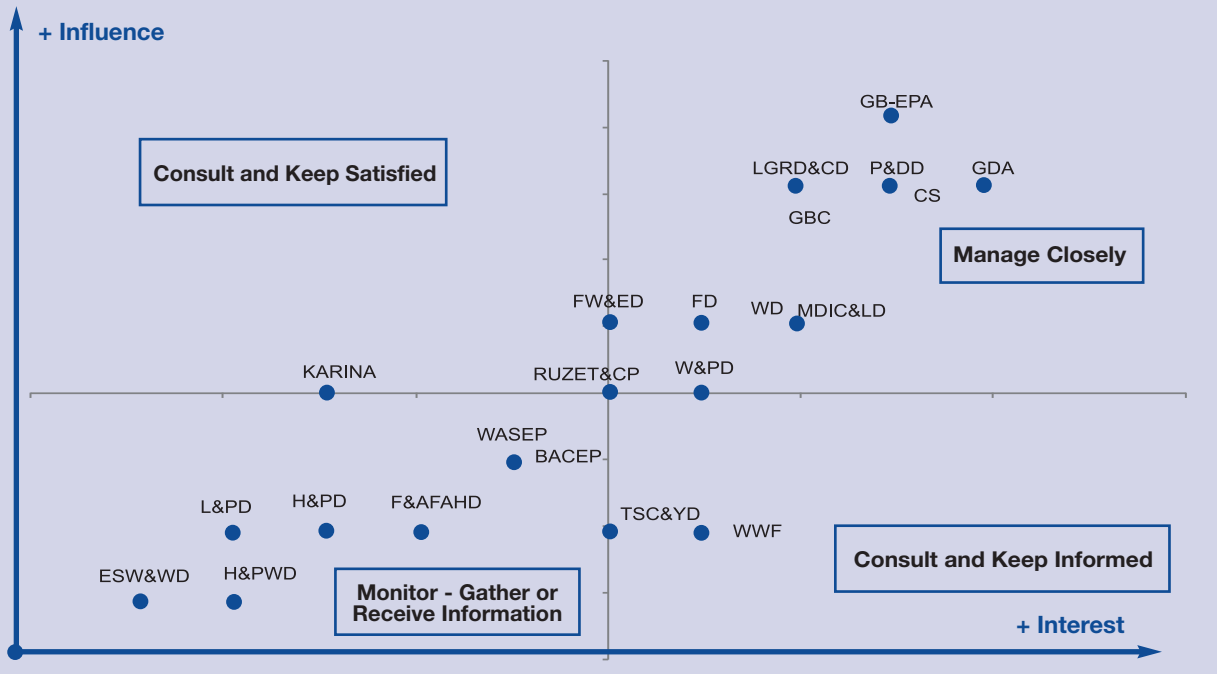


Exhibit D.6: Stakeholder Level of Engagement in Gilgit Master Plan

Stakeholder Engagement	*Stakeholder*	*Engaging Stakeholders in Gilgit Master Plan*
Manage Closely	GB-EPA P&DD CS GDA GBC FD WD MDIC&LD LGRD&CD	• Intense institutional coordination required between institutions developing Gilgit Master Plan and stakeholder. • Intense information sharing between institutions developing Gilgit Master Plan and stakeholder. • Stakeholder should have say in speed and priority of execution of plans. • Stakeholder capacity to meet its objectives and mandate with regards to Gilgit Master Plan should be strengthened and not bypassed. • Stakeholder must be intensely involved in monitoring and evaluating the development of Gilgit Master Plan. • Stakeholder should play an active role in keeping public informed about Gilgit Master Plan and its possible environmental repercussions.
Consult and Keep Satisfied	FW&ED	• Moderate institutional coordination required between institutions developing Gilgit Master Plan and stakeholder. • Moderate information sharing between institutions developing Gilgit Master Plan and stakeholder. • Stakeholder should be informed about speed and priority of execution of plans. • Stakeholder capacity to meet its objectives and mandate with regards to Gilgit Master Plan should be strengthened and not bypassed. • Stakeholder must be moderately involved in monitoring and evaluating the development of the Gilgit Master Plan. • Stakeholder should play some role in keeping public informed about Gilgit Master Plan and its possible environmental repercussions.
Consult and Keep Informed	WASEP BACEP WWF RUZET&CP TSC&YD W&PD	• Moderate institutional coordination required between institutions developing Gilgit Master Plan and stakeholder. • Moderate information sharing between institutions developing Gilgit Master Plan and stakeholder. • Stakeholder should be informed about speed and priority of execution of plans. • Stakeholder capacity to meet its objectives and mandate with regards to Gilgit Master Plan should be strengthened and not bypassed. • Stakeholder must be moderately involved in monitoring and evaluating the development of Gilgit Master Plan. • Stakeholder should play some role in keeping public informed about Gilgit Master Plan and its possible environmental repercussions.
Monitor – Gather or Receive Information	L&PD H&PD F&AFHAD AKRSP H&PWD ESW&WD	• No institutional coordination required between institutions developing Gilgit Master Plan and stakeholder. • Minimal information sharing between institutions developing Gilgit Master Plan and stakeholder. • Stakeholder should be encouraged to play some role in keeping public informed about Gilgit Master Plan and its possible environmental repercussions.

D.4.5 Public Participation and Grievance Redress

There is no formal grievance redress mechanism in GB. People usually contact the government officials with their issues and request that their issues be resolved. This is mainly reported by the LGRD&CD. EPA-GB also entertains such complaints and issues. The development process of the Plan must involve the public in order to be successful in achieving its desired objectives of improving the quality of life of the inhabitants of Gilgit. Existing systems of public participation and grievance redress are, however, inadequate in doing so. Therefore, the development process of the Plan must ensure, at its center, a public participation and grievance redress mechanism which allows inhabitants of the city a means to participate in the development of their city and have their voices and concerns heard by the relevant departments.

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