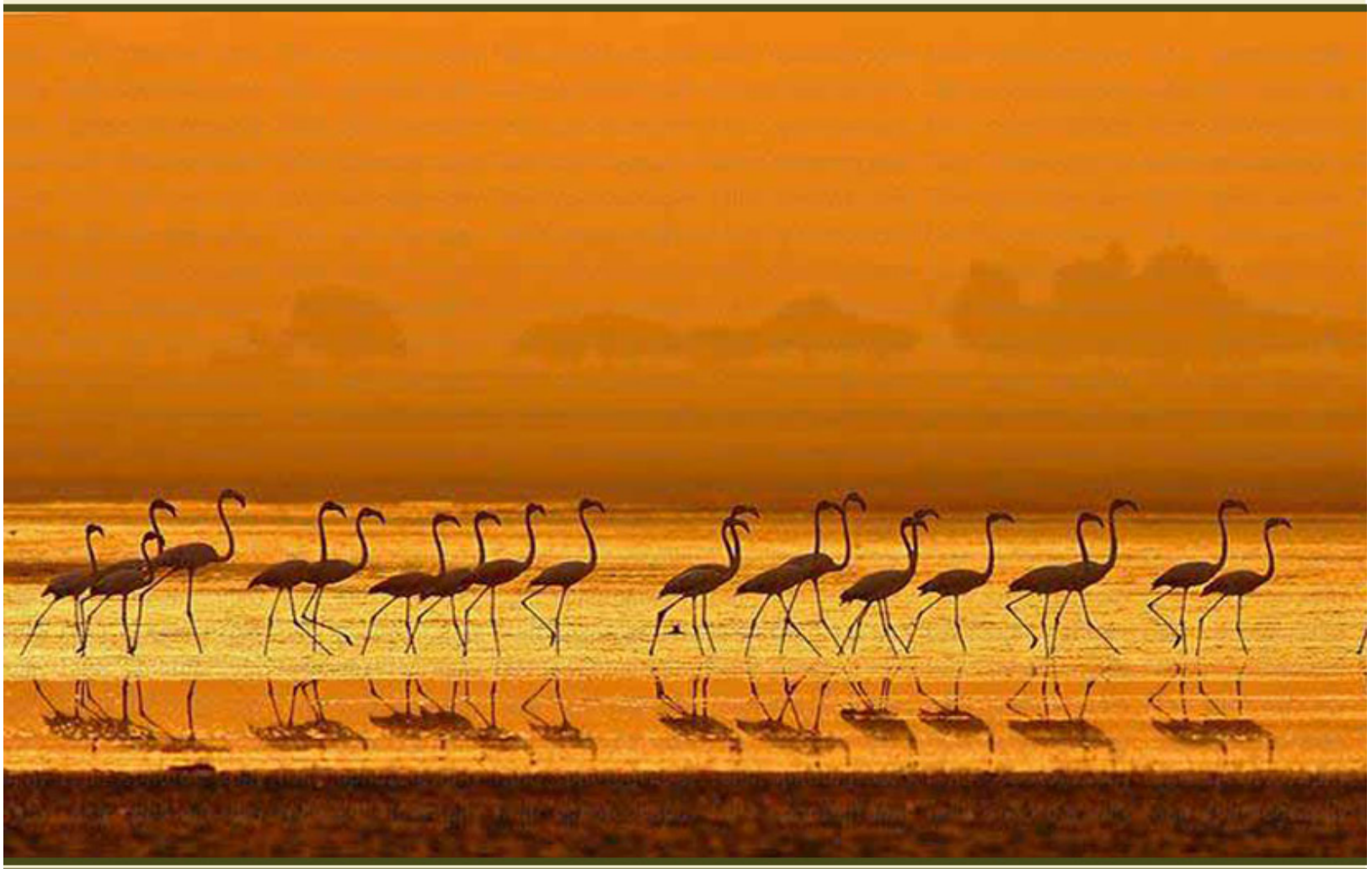
# SOON VALLEY ECO-TOURISM MASTER PLAN 2040

## SITUATIONAL ANALYSIS REPORT



APRIL, 2016



# SOON VALLEY ECO-TOURISM MASTER PLAN 2040

Situational Analysis Report

April, 2016

Urban Sector Planning & Management Services Unit

503-Shaheen Complex, Edgerton Road, Lahore, Pakistan

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## List of Acronyms

| | |
|---|---|
| ADP | Annual Development Program |
| ATM | Automated Teller Machine |
| BHU | Basic Health Unit |
| BOD | Biochemical Oxygen Demand |
| COD | Chemical Oxygen Demand |
| DG | District Government |
| DMPP | Disaster Mitigation and Preparedness Program |
| EIA | Environmental Impact Assessment |
| EPA | Environmental Protection Agency |
| ETM | Elapsed Time Meter |
| GIS | Geographic Information System |
| GoPb. | Government of the Punjab |
| ICS | Integrated Consulting Services |
| LPG | Liquefied Petroleum Gas |
| MSL | Mean Sea Level |
| MTDF | Medium Term Development Framework |
| MC | Municipal Committee |
| NADRA | National Database and Registration Authority |
| NESPAK | National Engineering Services Pakistan |
| NEP | National Environment Policy |
| NTP | National Tourism Policy |
| NGO | Non-Governmental Organization |
| NTFP | Non Timber Forest Products |
| PNCS | Pakistan National Conservation Strategy, 1992 |
| PPAF | Pakistan Poverty Alleviation Fund |
| PTCL | Pakistan Telecommunication Company |
| PPAF | Pakistan Poverty Alleviation Fund |
| PRS | Poverty Reduction Strategy |
| PLGA 2013 | Punjab Local Government Act 2013 |

| | |
|---|---|
| PLGO | Punjab Local Government Ordinance 2001 |
| PWA | Punjab Wildlife Act 1974 |
| R & D | Research & Development |
| RHC | Rural Health Center |
| SVDP | Soon Valley Development Program |
| TDCP | Tourism Development Corporation of Punjab |
| TMA | Tehsil Municipal Administration |
| TTCI | Travel & Tourism Competitiveness Index |
| UWC | Uchhali Wetlands Complex |
| UC | Union Council |
| USGS | United States Geological Survey |
| WWF | World Wide Fund for Nature |

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# Executive Summary

Soon Valley, situated in the north-west of Khushab district of Punjab, is renowned for beautiful lakes, waterfalls, jungles, natural pools and ponds. Valley provides a unique sanctuary to a host of migratory birds in the winter. The land itself is environmentally sensitive and is among the ecologically pristine areas of the country that are rapidly shrinking due to human intervention. Soon Valley Eco-Tourism Master Plan is a policy initiative taken by the Government of Punjab through the Tourism Development Corporation of Punjab (TDCP). The Urban Unit, through its concerted efforts, has provided technical assistance for the project and has played an active role in preparing the Soon Valley Eco-Tourism Master Plan 2040. The District Government Khushab would be ultimate beneficiary in plan implementation in collaboration with TDCP. The project aims to assist District Government Khushab to develop and conserve the Soon Valley as an eco-sustainable niche' as well as a vibrant tourist destination.

This document is one of the submission of the Consultants deliverables. This document overtly expounds the project methodology, various data needs and how the sectoral analysis were performed linking tourism, environment and urban growth in the Soon Valley. The report is built on the pattern described below:

- The first part of this report gives an introduction and background of the study, plan vision, rationale and objectives of the study to be achieved. This section describes in detail the project methodology for conducting field surveys what output the Consultants are expected to have after the study analysis. This chapter also explains the team management, data requirements, data treatment and deliverables. It gives a brief infographic account of the Valley encompassing demography, social, physical and environment aspects of the project area. Precisely, it takes into account of physical resources, administrative context, population dynamics, and international significance in terms of wetland and multiple tourism avenues it provides.
- Further, the report entails a brief account of previous initiatives and intervention, findings, proposals and outputs and finally lessons learnt from these interventions. This section also focuses on the tourism development potential and its existing policy & management scenario at national, provincial and the local levels keeping in view the institutional settings as well. After a thorough review of environmental and tourism policies and regulations of Pakistan, the role of concerned departments in tourism policy implementation including development, marketing, and promotion has been discussed in detail. In-addition, the previous planning and development interventions carried out, within the project area, by different organizations have been summarized in the later sections of the chapter. The report further explains the comprehensive study area profile based on primary and secondary data and discusses in detail the prevailing state of social & physical infrastructure, population growth, livelihood

pattern, income level, land use characteristics, role of Naushera Town as a development node and transportation system etc. of the project area. This section accounts the problems and issues being faced by the local residents and tourists alike. The environmental profile including description of biological resources, flora, fauna, water quality and significance of various tourist sites is discussed comprehensively.

- The last section of the report focuses on analyzing the existing situation of all the sectors including social and physical infrastructure, land use, transportation, environment and tourism to evaluate settlements footprints and spatio-temporal growth patterns, land suitability analysis, environmental sensitivity analysis, development policies and their repercussion in environment-tourism and development nexus. This section also summarizes the challenges and opportunities and analyze the Soon Valley in its regional and local context. Existing economic base, tourism potential analysis, identification of environmentally sensitive areas and disaster risk assessment has been discussed in detail. Moreover, SWOT Analysis of every sector has been performed to assess the strengths, weaknesses, opportunities and threats of that sector. This analysis confirmed that valley did not follow any intelligent pattern for land use growth, had overall moderately low density, lacking basic amenities, sense of place, neglected immense tourism potential and challenges of deteriorating environmental quality.

This analytical document will pave the way forward towards formulating substantial proposals in next volume of the Study which will precisely identify the pertinent sites suitable for various developments in future with respect environment, land use growth and tourism.

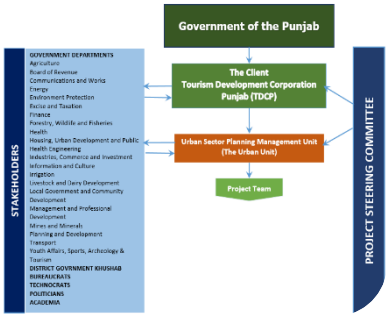
CHAPTER 1

# Introduction






- *Tourism Development Corporation of Punjab (TDCP) aims to promote and develop Tourism Industry in Pakistan*
- *To promote Soon Valley as an Eco-Tourist destination, the Punjab government has taken several initiatives. Project Titled 'Development of Eco-Tourism in Soon Valley'.*
- *It has been approved and initiated under Annual Development Program (ADP), which hopefully would be completed within 18 months.*




*The Proponents: Advocating Eco-Tourism Project in the Soon Valley*

# Chapter 1: Introduction

This chapter entails the need to prepare Eco-Tourism Master Plan of Soon Valley. It discusses the vision, objectives and rationale to develop Soon Valley as an eco-tourist destination. Moreover, it explains the approach and strength of the consultant team to achieve the desired objectives focusing on how Eco-tourism master will reshape and boost up the economy by promoting tourism development in the area.

## 1.1. Project Introduction

Soon Valley Eco-Tourism Master Plan is a policy initiative taken by the Government of Punjab through the Tourism Development Corporation of Punjab (TDCP). The Urban Unit, through its concerted efforts, has provided technical assistance for the project and has played an active role in preparing the Soon Valley Master Plan.

The Eco-Tourism Master Plan for the Soon Valley envisages the Valley to be conserved as an eco-sustainable niche' as well as a vibrant tourist destination. Following this, the Master Plan reviews development to be in harmony with the environment and socio-economic characteristics of the area.

Till date, there has been no pragmatic tourism planning done for the Soon Valley. No such holistic approach has been adopted with respect to developing the site, services and conserving the environment. Seeing the great significance the site holds with relevance to Tourism, the Government of Punjab envisioned a long-term development policy framework for the area. Thus, a Master Plan was required for sustainable tourism development, management and monitoring of the area.

The project includes the preparation of master plan embedding the principles of environmental sustainability and best practices of eco-tourism worldwide. It also includes analysis of existing institutional framework, inventory of land use, assessment of environment, infrastructure and

tourism facilities. It further focuses on formulating policies for urban development and identification of projects that are helpful for promoting sustainable eco-tourism in the Soon Valley.

The development & management of the natural resources upon which tourism is expected to capitalize, will lead to cultural integrity, offsetting ecological pressures, enriching biological diversity & boosting local livelihood opportunities in the Soon Valley.

## 1.2. Vision Statement

The Vision for a master plan, is generally defined as a broad statement of aspirations, ambitions, thoughts and future development priorities expressed, shared and envisaged jointly by the local communities and development partners. It is also defined as a lead planning statement to further set out a clear sequential, holistic and integrated course of actions to achieve all defined objectives through a coordinated and collaborative approach. The vision building process broadly includes defining the vision building objectives, identifying stakeholders, theme building, query development, stakeholder engagement, consultation, compilation, analysis and finally framing the vision statement to further setout planning objective.

The visioning process adopted for the Soon Valley Eco-tourism Master Plan 2040 takes into account the recommendations from and aspirations of all cross-sections of society as well as institutional stakeholders to build a Shared Vision. The process helped out the Consultants subsequently, to develop a consensus "Vision Statement" that will enable the plan to be implemented successfully leading through a collaborative approach and community stewardship.

The following "Vision Statement" was evolved through a collaborative consultative process, which eventually guided the Consultants to frame plan specific objectives;

- *Vision defines the lead planning statement that defines a clear and holistic course of actions to be achieved.*
- *The visioning process adopted for Soon Valley Eco Tourism Master Plan takes into account aspirations of all institutional stakeholders towards a shared vision.*
- *The Master Plan 2040 for the Valley envisions a sustainable development for envisaging an attractive tourist destination.*

*"Soon Valley Eco-Tourism Master Plan 2040 envisions to develop the Valley as a most desirable and sustainable tourist destination through a collaborative planning and development process. The Plan also envisages to help boost the local economy by capitalizing on local culture, heritage and nature based tourism while still conserving its ecological capital."*




*Envisaging a Sustainable Eco-Tourism Plan for the Soon Valley*

- *Soon Valley with its fascinating beauty & attractive tourist spots possess a huge potential for its conservation & promotion of tourism*
- *The wetlands of dynamic touristic capacity can play a significant role in ecological, economical, hydrological and social standards*
- *Government has passed laws which declare land within 500 meters of the lakes & closed to residential & commercial activity as environmentally-sensitive*
- *Preservation of the local species of flora and fauna and migratory birds is also a high priority concern of the Government.*

## 1.3. Plan Objectives

Sustainable use of the natural tourism spots is important not only for the environment, but also for the local and regional economy. The ultimate goal of developing environmentally sensitive areas should, therefore, be made to ensure the sustainable use of resources, and protection of natural environment, which is essential for the well-being and socio economic development of local communities. Considering this, the project aims to:

- Develop a shared strategic vision for the sustainable social, economic, cultural, environment and tourism development of the valley, and translation of the vision into tangible action plans.
- Strategize local tourism development initiatives while integrating the Ramsar Convention's wetlands conservation guidelines into local development perspective viz.-a-viz.
- Enhance the environmental conservation and management of the Valley by mainstreaming environmental sustainability into all local development related policies/regulations, and strengthening institutional arrangements to achieve the same.

## 1.4. Rationale

The project area contains major wetlands of dynamic touristic capacity. These wetlands play a significant role in hydrological, ecological, economic and social standards. Effective management of wetlands is an important component of the environment as they are vital habitats for flora and fauna which are inclusive of endangered groups & species. Wetlands also supports an enhanced level of biological diversity and productivity, preserve regional and local regimes of hydrology, eliminate pollutants, stores rain

and flood waters and upkeep human values and activities. The Wetlands of Pakistan have a high worldwide significance because of the supported diversified species which require measures of responsibility for their ecological conservation. The Eco-Tourism Master Plan will inevitably promote the tourism and will ensure flourished economy with preserved cultural and ecological assets.

Out of 225 Wetlands hosted by Pakistan, 19 have been declared as Ramsar sites of international importance. Under the Ramsar Criteria 2, 4, 5 and 6, the Uchhali Wetlands Complex has been acknowledged as a Ramsar Site since 1996. Uchhali Wetlands Complex include three lakes namely (i) Uchhali Lake; (ii) Khabekki Lake; and (iii) Jahlar Lake. Among these, Khabekki Lake was registered as a Ramsar Site in year 1976. In May 1990, Monitoring mission of Ramsar endorsed to enlist all the three wetlands as a group. This group is an important wintering site for the ferruginous duck, white-headed duck, flamingoes and graylag goose.

The Government of Pakistan has attempted to integrate and preserve environment and culture in its long-term planning documents through the Poverty Reduction Strategy Paper as well as the 10th five year Development Plan (2010-15). According to which the cultural preservation is the prime focus of tourist development and ecological preservation. This will trickle down the socio-economic profits to the community and stakeholders of the local area, serving the prime concern of meeting socio-economic goal.

- *The Ramsar Convention on Wetlands is an intergovernmental treaty signed on February 02, 1971 in the Iranian city of Ramsar, as a first modern global intergovernmental treaty on the conservation & sustainable use of natural resources*
- ***19 sites** are enlisted as Ramsar sites of Pakistan including Khabekki, Uchhali & Jhalar lakes in Soon Valley*
- *The Government of Punjab notified Uchhali Lake as a Game Reserve & Wildlife Sanctuary*
- *Khabekki Lake was declared as Wildlife Sanctuary to conserve the globally significant & unique biodiversity, especially the endemic Punjab Urial & other endangered waterfowls & significant migratory birds.*



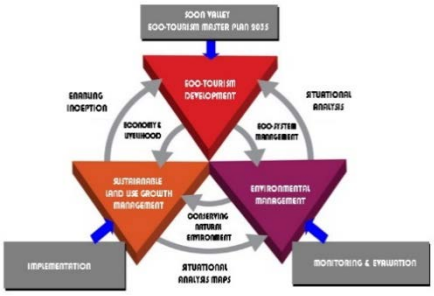

*The Master Plan envisions a sustainable environment catering the socio-economic and cultural concerns*

## 1.5. Team Organization

The Urban Unit has engaged the services of the specialists who have the right experience of working in similar type of projects embedding tourism, environment and urban development. Following are the technical expertise assigned for this project:

- Urban Planning & Design Expert
- Environmental Planning Expert
- Tourism Planning Expert
- Infrastructure Development Expert

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*Soon Valley Master Plan 2040: Outcome Delivery Framework*

Transportation Expert
- Ecologist
- GIS Expert
- GIS Analysts
- Research Analyst (Urban Planning)
- Research Associates (Urban Planning)
- Field Enumerators
- Support Logistic Staff

## 1.6. Deliverables

This report is a part of the two deliverables as committed in the inception report which are:

1. Situational Analysis Report: Describing existing situation featuring sectors including Infrastructure, Environment, Land Use growth and Tourism
2. Situational Analysis Maps: Guiding maps describing existing situations of the area which ultimately help in proposing future strategies

## 1.7. Master Planning Process




*The Eco-Tourism Master Plan aims to seek through the indicated aspects.*

Master plan is defined as "a tool to manage and guide through the future growth of human settlements in an organized and planned manner". The terms Development Plan, Master Plan and Structure Plan, to some extent, are being used synonymously. All these have the same spirit of guiding the future developments in common. The preparation of master plan is one of the main components of the development/land use planning process. Master planning process is aimed at:

- Defining some clearly stated objectives
- Anticipating the development needs of the area
- Studying / reviewing previous policy interventions, their implementation and outcomes
- Identifying /studying social, economic, environmental, tourism and physical structure of the area
- Identifying relevant development issues

- Identifying areas which are suitable/unsuitable for different types of development
- Bringing stakeholders and public on board to create an acceptable policy framework at large
- Making proposals for the way in which the area should develop over time
- Establishing long term as well as short term policies and strategies to guide through future development
- Particularizing long term strategies down to short term actions and plans to remediate emergent issues
- Devising implementation mechanism / strategies
- Feedback and evaluation

- *The Master Plan provides a framework to develop and promote eco-tourism in the Soon Valley*
- *Analyzing existing situation of various sectors, relevant development issues, coordinated support for the provision of infrastructure and capacity building initiatives that are conducive to the supply of quality eco-tourism products and services*
- *To avoid adverse and negative impacts, all stakeholders should be aware of the parallel need of a cautious and considered approach in promoting the sector.*

## 1.8. Methodology

A comprehensive methodology is adopted for the effective execution of project. The flow diagram shown in the figure given below is an overview to the methodology adopted, following which is the explanation to each step.




*Figure 1: Project Methodology*

- *A comprehensives methodology has also been formulated for the project area.*
- *It is comprised of 10 major steps which are well integrated and forms the fundamental basis for taking up the project.*
- *Every step is aimed at touching all its attributed aspects and discusses all in detail.*
- *Hence, a defined pathway is to be followed for the effective implementation of the project.*




*The formulated methodology is a key towards achieving the defined Vision 2014, for the Soon Valley Eco-Tourism Master Plan*

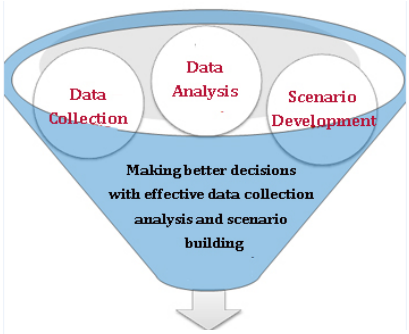
### 1.8.1. Project Planning & Initiation

Project planning and initiation involves critical factors to ensure successful completion and implementation of project. This stage brings together key, foundational documents to define the project; business concurrence for the project; project sponsorship; and on-going project governance. Project Initiation, by performing several critical steps, ensures a successful project start-up and gives a solid head start to achieve the desired project objectives. Not performing these critical steps virtually assures project failure.

### 1.8.2. Visioning

This phase highlights the vision/scope approved milestone, indicating team and agreement on the purpose and direction of the project. It completes tasks and creates deliverables to meet the goal of this phase to create a high-level view of the project's goals, constraints, and solution

### 1.8.3. Data Collection




*The master plan aims at having comprehensive data collection, effective analysis and thoughtful building up of scenarios for harnessing reliability in design*

Data collection is a systematic approach to gathering information from a variety of sources to get a complete and accurate picture of an area of interest. There are two forms of data collection i) primary ii) secondary. The primary data is the data collected in the field i.e. via interview, observation, action research, case studies, life histories, questionnaires, ethnographic research and longitudinal studies while secondary sources are data that already exists in previous research, official statistics, mass media products, diaries, letters, government reports, web information, historical data and information. All such data helps to analyze the existing scenarios and suggesting the future recommendations for the project area.

### 1.8.4. Data Analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, in different business, science, and social science domains. The analytic phase is closely aligned with the empirical phase. After data are collected, the data is prepared for analysis. In this phase, patterns and relationships in the data are identified and the research question is answered through the synthesis of numerical and/or narrative data.

- *Project initiation ensures a successful project start up and desired efficacy.*
- *A well-structured vision is defined, in the light of which all steps are taken up.*
- *Data collection is another fundamental aspect of the methodology which is integral in carrying out the project.*
- *With comprehensive data collection, analysis is performed on the basis of which further results are deduced.*
- *Seeing the analysis results scenario building is taken up which is an effective decision making step.*

### 1.8.5. Scenario Development

A scenario is a "story" illustrating visions of possible future or aspects of possible future. It is perhaps the most emblematic foresight or future studies method. Scenarios are not predictions about the future but rather similar to simulations of some possible futures. They are used both as an exploratory method or a tool for decision-making, mainly to highlight the discontinuities from the present and to reveal the choices available and their potential consequences.

Scenarios can help concerned officials to think in a disciplined way about the future when making public policy decisions. The method helps the decision-maker to consider the range of plausible futures, to articulate preferred visions of the future, to use what is learned during the scenario development process in the formal decision-making process to foster exceptional leadership. It also helps to stimulate creativity and to break from the conventional obsession with present and short-term problems

- *Policy development is foremost to be done for managing the decision making process.*
- *In the light of formulated policies, sector wise action plans are devised which articulate the key responsible areas.*
- *The implementation phase is where visions and plans become reality and is an indication of the successful completion of the project.*
- *No project can be sustained in the absence of proper monitoring and evaluation. It is very much necessary to have a regularized setup for the sustenance of the project.*

### 1.8.6. Policy Development

The decision process by which individuals, groups or institutions establish policies pertaining to plans, programs or procedures. It is an activity of developing policy generally involves research, analysis, consultation and synthesis of information to produce recommendations. It should also involve an evaluation of options against a set of criteria used to assess each option.

### 1.8.7. Developing Sectoral Action Plans

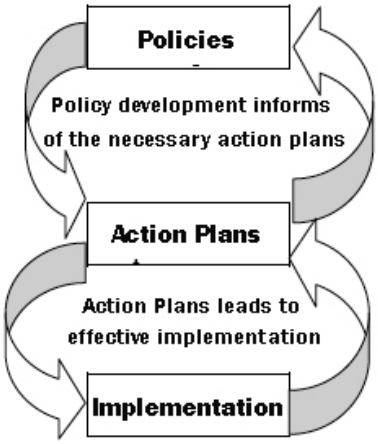
The action plan consolidates decisions regarding the type and level of action into a working document. With increasing frequency, an action plan, or at least a "blueprint" for action, is initiated. The action plans serves as a solid foundation upon which to base a plan for action, which articulates WHO will do WHAT by WHEN, with WHAT RESOURCES. It is widely accepted that the action plans must lead to action for success.

### 1.8.8. Implementation

Project implementation (or project execution) is the phase where *visions* and plans become reality. It refers to the final process of moving the solution from development status to production status. There is no single way to implement any project. It depends on the characteristics of the project and the solution. As the successful implementation leads to the successful completion of the project.

### 1.8.9. Monitoring & Evaluation

A Monitoring and Evaluation (M&E) Plan is a guide as to what you should evaluate, what information you need, and who you are evaluating for. The plan outlines the key evaluation questions and the detailed monitoring questions that help answer the evaluation questions. This allows you to identify the information needed to collect, and how you can collect it




*Policy development plays an integral role in good decision making which then results into structured action plans aiming towards effective implementation*

Depending on the detail of the M&E plan, you can identify the people responsible for different tasks, as well as timelines. The plan should be able to be picked up by anyone involved in the project at any time and be clear as to what is happening in terms of monitoring and evaluation.

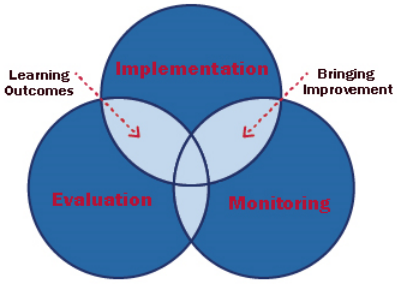



*Identifying the deficiencies and learning outcomes with a regularized monitoring & evaluation framework*

## 1.8.10. Proposals and Recommendations

Keeping in view the sectoral action plans and policy development, the proposals are highlighted which depict the future picture of the project area. These proposals are based on the evaluation of existing scenarios and short term action plans. The following aspects have been taken into account while proposing the future plans for Soon Valley master plan.

- Sustainable land use growth management
- Eco-tourism development
- Environmental management
- Economy & livelihood




*Concluding the project and guiding ahead with appealing proposals*

- *Recommendations and proposals have also been made a part of the project which cover the areas in different aspects including: Sustainable land use growth management, Eco-tourism development, Environment management, Economy and livelihood*
- *Thus, the defined methodology is a framework that explains the steps for effective execution of the project.*

CHAPTER 2

# Valley at a Glance



# Chapter 2: Valley at a Glance

This chapter gives a brief overview of demography, social, physical and environment aspects of the project area. Precisely, it takes into account the physical resources, administrative context, population dynamics, and international significance in terms of wetland & multiple tourism avenues it provides.

- *The Salt Range lies between the valleys of the Indus and Jhelum rivers in the Punjab province of Pakistan*
- *The range has a length of about 175 km and its highest point is Sakesar which is approximately 1,600 m*
- *Soon Valley is located on the western side of this range.*

## 2.1. The Project Study Area

The western edge of the salt range forms a semi-loop called the "Soon Valley". Soon Valley is situated in the center of the Punjab Province and lies to the northwest side of the Khushab District. The Valley starts from Padhrar village and ends at Sakesar which is the highest peak of the Salt Range. The Valley is 56 km long with an average width of 14 km. It covers a total land area of 960 sq. km and is about 361 km away from Islamabad.[1]

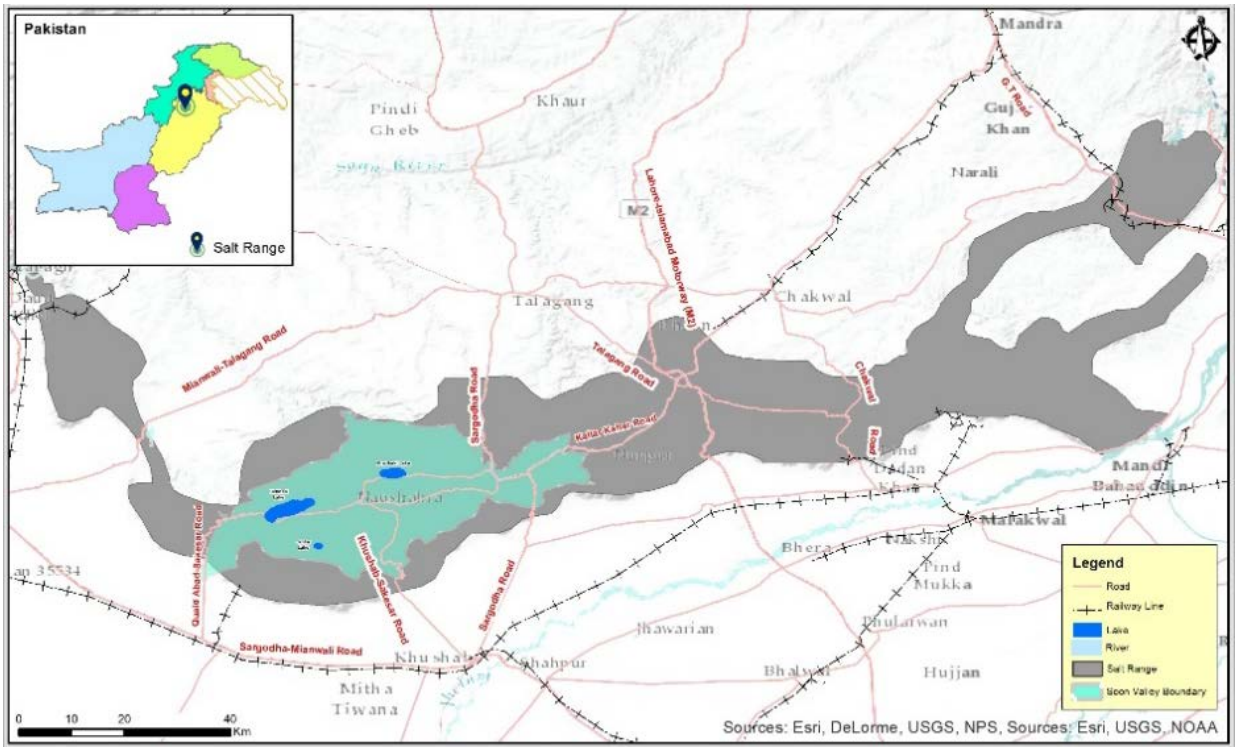



*Figure 2: Location Map of Soon Valley*
*Source: The Urban Unit, 2016*

[1] Kafeel Et.al, 2007

## 2.2. Administrative Context

The project area is divided into six Union Councils and one Municipal Committee which includes Khabekki, Anga, Uchhali, Kufri, Khura and Mardwal. Naushera, which is the Municipal Committee has been devised by the District Government Khushab. Important towns in the valley are Pail-Piran, Naushahra, Chitta, Sabhral, Khoora, Nowshera, Kufri, Anga, Ugalisharif, Mardwal, Dhadhar, Uchhali and Bagh Shams-ud-Din.

- *There is only one Municipal Committee i.e. Naushera*
- *There are six Union Councils: Khabekki, Anga, Uchhali, Kufri, Khura and Mardwal*
- *All form the whole Project Area, the Soon Valley*

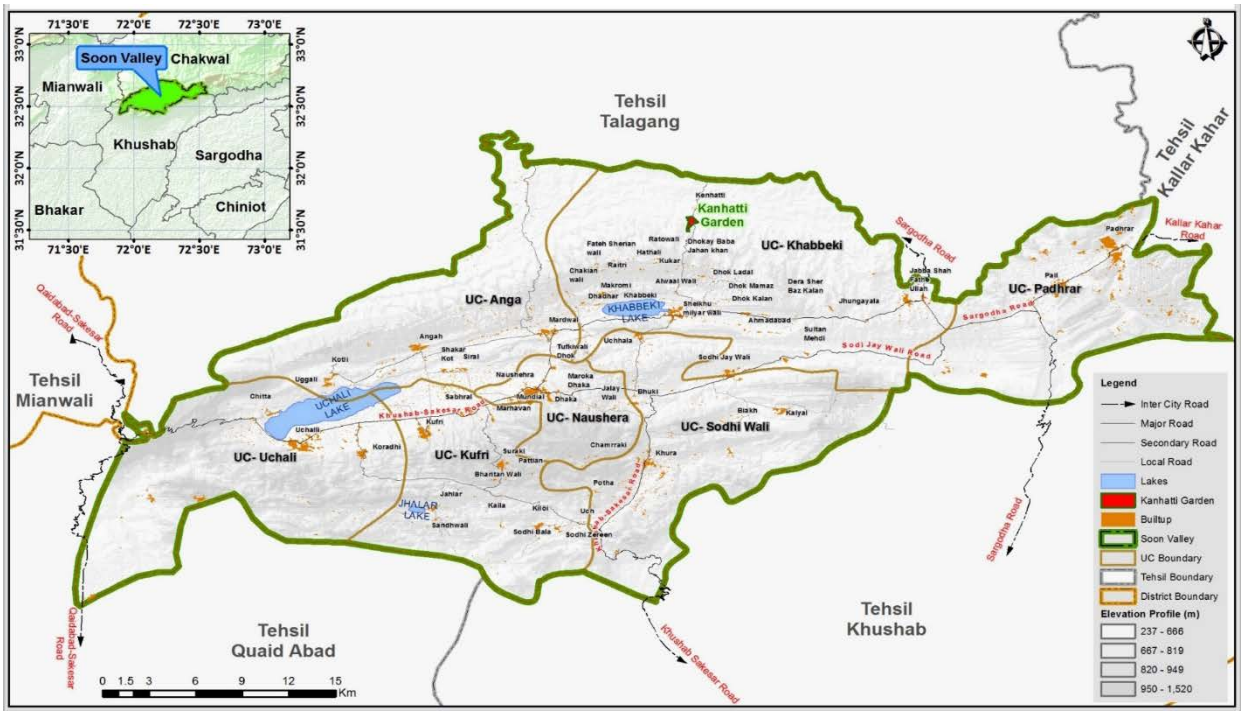



*Figure 4: Map showing the administrative boundaries of Soon Valley*
*Source: The Urban Unit, 2016*

## 2.3. Local Climate and Variability

According to Koppen classification system the project area is influenced by the local steppe climate. In Naushera, there is little rainfall throughout the year. The climate of this region is classified as BSh (Hot-Semi Arid). Here the temperature averages 21.0 °C while the average annual rainfall is 460 mm.

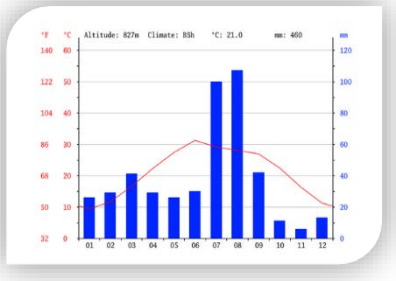
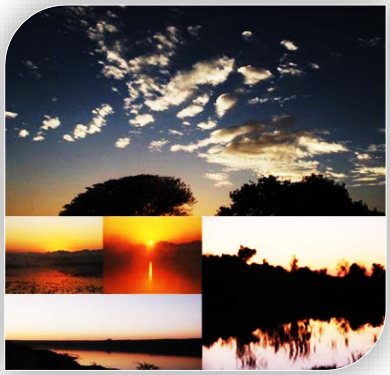



*Figure 3: Prevailing Climatic Variations in the Valley*
*Source: Climate-data.org*

- *The temperature of Soon Valley is mild to pleasant in the summer and cold in winters*
- *The region is heavenly in all seasons, especially when the monsoon clouds engulf the valley and a chill breeze races down Sakesar to welcome wandering tourists*

Winters accompany frost whereas hot dray winds and long droughts prevails in the area. The temperature rises to 46°C during the months of May and June. However, with the commencement of monsoon rains, the temperature falls as low as 26°C. The, average temperature generally ranges from 0.5°C in the month of January to a maximum of 36°C in the month of June.

The annual rainfall varies from 300mm to 800mm while the relative humidity ranges from 22%-85%. November, having a 6mm of rainfall is considered to be the driest months in the Valley. With an average of 107 mm, the most precipitation falls in August.



*The climatic variations bring in captivating views that catch many eyes*




*Seasonal Variation in Soon Valley*



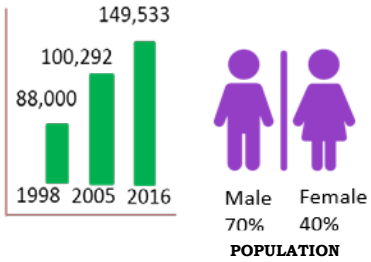
*The main tribe Awan, has got ancient reputation that got settled in the Valley with the coming of Qutab Shah.*

## 2.4. Tribes and Caste

The main tribe of the area is the Awan of ancient repute. This tribe came in this area with Qutab Shah and settled in the Soon valley.

## 2.5. Socio Cultural Environment

The administrative village size ranges from 500 to over 1200 households which includes small settlements within the revenue boundary of the village. The household size, however, is normal at 7 persons (1998 Census). The current household size in majority of the settlements ranges from 7.5 to 8.9.




*A significant increase is observed in the overall population of the Soon Valley with low living standard which results into unfavorable effects on the economic development*

*Source: Field Studies, the Urban Unit 2015-16*

## 2.6. Population Dynamics

According to 1998 census, the population of Soon Valley is around 88,000 people.[2] This population rose to 100,292 people in the year 2005 at an annual growth rate of 1.88% from 1998-2005. The projected population till the year 2016 is amounted to 149,533 people.

## 2.7. Livelihood Context

Agriculture, livestock, and mining are the main professions of the people. Approximately 80% of the population is dependent on agriculture. Moreover, people depend on forests for fulfilling their domestic needs like cooking, water boiling and space heating. Therefore, cutting of trees is a common practice adopted by the locals as there is no gas supply in the area. Besides, Forest Fires have also led to deforestation in the area. Many factors have led to deforestation in the area, including forest fires and cutting of trees.[3]

- *There are around 62 villages within the project area*
- *Each administrative village size ranges from 500 to 1,200 households*
- *The estimated population (2016) of this Valley is around 149,533*
- *People are mainly involved in agriculture, livestock and mining professions for their livelihood purposes*
- *Deforestation phenomenon is also observed as people use the wood for their domestic use*
- *Overall literacy rate is around 72%.*

## 2.8. Literacy

Availability of educational facilities over time has increased the overall literacy rate to 72 percent. Presently, each village has about four primary schools for boys and girls. The access to public sector secondary school facilities for the residents are both affordable and within reach. Out of the total literate

[2] The District Census Report of Khushab, 1998

[3] http://www.pakistanwetlands.org/reports/Oct-Dec%202011,Newsletter,updated.pdf



*The alluvial soil and rich rock deposits favor the cultivation of different kinds of fruits and vegetables in the Valley*

- *Soil is silt and compacted clay in character and inclined to be dry which supports different types of fruits and vegetables.*
- *The valley is enriched with a unique landscape comprising of mountains, hills and mineral resources*
- *Common rock types are sand stone (which is laminated by white/cream, dark red or purple, brown color) and limestone*
- *No major natural hazards have been witnessed during the recent past.*

sample size, one fourth had attained primary education (up till 7 years schooling) while 27% of them belonged to the under matric class (8-9 years of schooling). However, a substantial proportion of literates i.e. 40% had passed matriculation and intermediate level of education.

## 2.9. Soil

The alluvial and fertile soil in the valley is rich in clay and has moderate porosity and permeability which makes it good for vegetation. Not only seasonal but off seasonal vegetation is also grown here.[4]

## 2.10. Geology and Topography

The distinctive geological patterns of Soon Valley i.e. mountains, hills and mineral resources is responsible for providing it a unique landscape. Meta-sedimentary rocks i.e. Marble, lime stones, quartize, sandstones, phyllites, etc. are in abundance.

Sand stone and limestone are the common rock types of this region.[5] Most of the soil is heavily salt infested, as the water from brine springs deposits salts on the soil, all along its route.[6] Most of the soil present in valleys between Range Mountains is water-eroded soil. Soil lying between the Salt Range and River Jhelum is heavily saline due to run off water during rainy season and most of the areas are rich in salinity.[7]

## 2.11. Natural Hazards

No major natural hazard or calamity i.e. earthquake, flood or cyclone was witnessed in project area since last several years except the earthquake of October 2005 and the drought which spelled for five years (during 1997-2002). Some events of land sliding have been observed along the Khushab-Sargodha

[4] EIA, Report of Soon Valley Development Project prepared by Urban Unit in March, 2015

[5] Chaudhary, M. I., A. S. Mumtaz and M. A. Khan. 2001. Leaf epidermal anatomy of medicinal grasses of Islamabad, Attock and Mirpur (Azad Kashmir). Pak. J. Biol. Sci. 4 (12): 1466 -1469.

[6] Qadir, M., A. D. Noble, J. D. Oster, S. Schubert and A. Ghafoor. 2005. Driving forces for sodium removal during phytoremidation of calcarious sodic soils. Soil use Manag., 21: 173 –180.

[7] ibid.

Road. Moreover, due to poor drainage and improper water flow, the area experiences the phenomenon of flash flooding as a result the soil erosion occurs which ultimately affect its fertility.

## 2.12. Physical Infrastructure

People obtain water through municipal supply, boring, streams and hand pumps. Moreover, the quality of water is also unsuitable for drinking. The underground water gets mixed with the sewerage which contaminates the drinking water. Soon Valley lacks infrastructure facilities for managing waste. Due to absence of a proper waste disposal system, people throw garbage into streams & other water channels.

Though, both open and close drainage systems exist in the area, no proper waste disposal technique has been taken up. However, one of the trends that has been observed is the construction of non-concrete sand holes which are 20 ft. in height and 10 ft. in width.



*The poor sewerage and solid waste management is a deterrent to the area. The resulting pollution causes the quality of water to deteriorate and adversely effects the environment.*

*Source: Field Studies, the Urban Unit 2015-16*

## 2.13. Road Network

The total length of the road network in Soon Valley is about 297.48 km. The road network provides approaches to all main villages and lakes of the project area but majority of these roads are not usable in all seasons. The length of major roads is around 128.03 km, while secondary and local roads comprise a length of 81.93 and 87.50 km respectively.

- *The area has poor solid waste management and sanitation facilities.*
- *The total length of the road network in Soon Valley is about 297.48 km. Most of these roads are not usable in all seasons.*
- *The access roads to a number of tourist sites are not in good condition which become slippery in rainy season.*

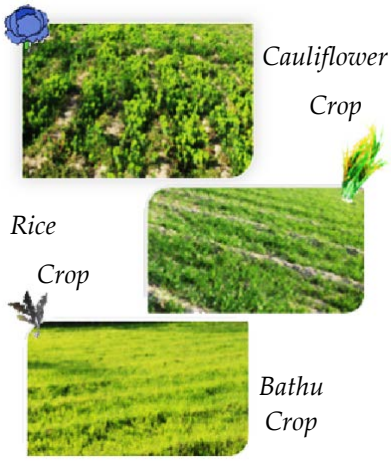
## 2.14. Agriculture

People in the Soon Valley largely depend on agriculture and livestock as their means of livelihood. The locals of the villages especially near Uchhali and Khabekki lakes greatly rely on such activities for their living. According to the representative of a local NGO, an average of 77% of cash crop i.e. wheat, cauliflower, potato and onions are grown on agriculture land present around these lakes to achieve high yields.



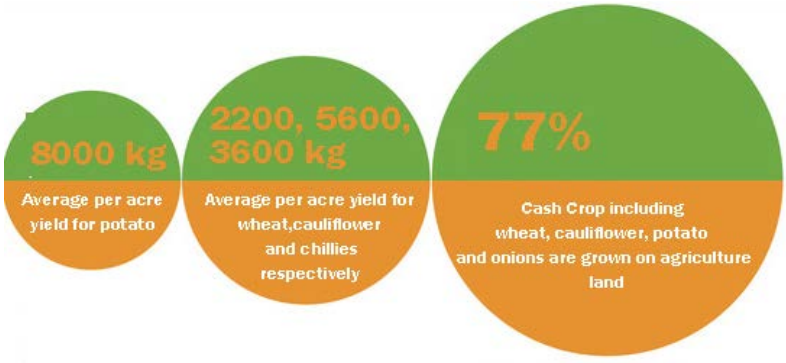
*Local people are largely agriculture dependent. Around 77% of each cash crops are grown on agriculture land around lakes of this region.*

*Source: Field Studies, the Urban Unit, 2015-16*




*The cool temperature and the rich organic soil in the Valley greatly favors the cultivation of cauliflower, rice and bathu crop. These serve as essential food crops, bringing livelihood to the people.*

The average per acre yield of these crops is 2200 kg for wheat, 5600 kg for cauliflower and 3000 kg for chillies. However, during the recent past, two species of potatoes have been introduced in this area and now their average per acre yield is 8000 kg. Villagers of these areas are also involved in the commercial cultivation of off-season vegetables and crops that include cultivating oranges in summer season as well.




*Agricultural statistics for few of the major cash crops grown in the Valley*

*Source: The Urban Unit, 2015-16*

Commonly grown cash crops around these lakes are described below:

*Table 1: Commonly Grown Cash Crops in Soon Valley*

| **Common name** | **Scientific name** |
|---|---|
| Wheat | *Triticum aestivum* |
| Potato | *Solanum tuberosum* |
| Cauliflower | *Brassica oleracea* |
| Rice | *Oryza sativa* |
| Corn | *Zea mays* |
| Lentil | *Lens culinaris* |
| Saag | *Spinacia oleracea* |
| Jute | *Corchorus olitorius* |
| Sorghum | *Sorghum bicolor* |
| Barley | *Hordeum vulgare L.* |
| Mung bean | *Vigna radiata* |
| White grains | *Cicer arietinum* |
| Black grains | *Vigna unguiculata* |
| Sugar cane | *Saccharum officinarum* |
| Onion | *Allium cepa* |
| Chillies | *Capsicum annuam* |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

The detailed description of fruits, vegetables and crops of Soon Valley are summarized in the table given below:



*Table 2: Details of Fruits, Vegetables and Crops in Soon Valley*

| List of fruits | List of vegetables | List of crops |
|---|---|---|
| Grapes | Potato | Wheat |
| Apricots | Cauliflower | Rice |
| Plums | Saag | Corn |
| Pomegranate | Onion | Jute |
| Peach | Cabbage | Sorghum |
| Guava | Bathu | Pulses |
| Apple | Chulai | Legumes |
| Olive | | White grains |
| Almond | | Black grain |
| Wild dates | | Sugar cane |
| Orange | | |
| Figs | | |
| Mango | | |
| Banana | | |
| Persimmon | | |
| Jamun | | |
| Mulberry | | |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

## 2.15. Significant Tourism and Places of Interest

The Soon Valley is famous for its scenic views, biodiversity, and ecological significance, and nature's habitat. Prominently, the Valley hosts the large wetland regions of international importance, enlisted as Ramsar sites under Ramsar convention 1971. The major places of interest in the project area are summarized in the following section.



*Khabekki Lake presents a very enticing view to the visitors. The enchanting & the cool lake breeze makes it an attractive tourist spot*

*Source: Field Studies, the Urban Unit 2015-16*

### Khabekki Lake

Khabekki Lake is brackish saline, stretching one kilometer wide and two kilometers in length. Khabekki is also the name of a neighboring village. The lake comprises an area of about 283 ha in the Salt Range with shallow brackish water. It is situated around 10 km north-east of Naushera village and 38 km northwest of Khushab District.

## Jahlar Lake



*The spherical shape of Jahlar Lake surrounded by a sloppy terrain adds to the scenic beauty, catching the eyes of many*

*Source: Field Studies, the Urban Unit 2015-16*

The lake has an area of about 17 ha in the Salt Range with its geographical extent lying between 32°29' N latitude and 72°07' E longitude. It is located at an elevation of 819 m above MSL. Jhalar lake is situated around 10 km south-east of Uchhali lake and 10 km south-west of Naushera village. Its area under water is approximately 59.89 ha.

## Uchhali Lake



*A cross over pathway at Uchhali Lake portrays an amazing picturesque making the lake the center of attraction for many*

*Source: Field Studies, the Urban Unit 2015-16*

Uchhali is also brackish saline lake. However, it offers an attractive scenery. It is the largest lake with an area of about 943 ha. It is situated 13 km west of Naushera and 42 km northwest of Khushab District in the Punjab Province, and is surrounded by agricultural lands. Uchhali Lake is notified as a Game Reserve[8] vide section 18[9] of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, vide Notification No. SOFT (EXT) XII-8/86, dated 09-07-1995, w.e.f. 09-07-1996.

Other areas of historical significance are as follows:

i. Kanhatti Gardens
ii. Akrand Fort
iii. Anga (An Important Village
iv. Baba Sultan Mehdi Barbar and Waterfall
v. Daip Shareef
vi. Kachiyan Wala Faqir
vii. Maai Wali Dheri
viii. Naushehra Rest House
ix. Neela Whann
x. Nursing Phowaar
xi. Sodhi Rest Hous
xii. The Old Classical Naushera

[8] **Game reserves** are large areas of land where wild animals live safely or are hunted in a controlled way for sport

[9] No hunting and shooting of a wild animal shall be allowed in the Game Reserve, except under a special permit, which may specify the maximum number of game animal that may be killed or captured, the area and duration for which such permit shall be valid:

a. Provided that the number of occasions on which hunting and shooting may be allowed shall not exceed two in a year

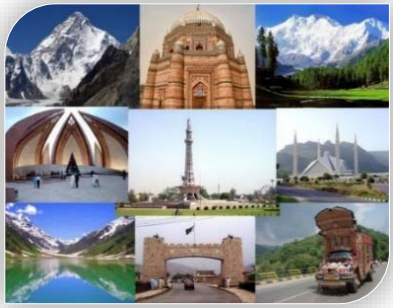
xiii. The ruins of Rat Rirri
xiv. Tulajha Fort
xv. Tulhaath Fort
xvi. Phulwari Rest House
xvii. Punj Peer
xviii. Ambh Shar

CHAPTER 3

# Enabling Environment: Policy, Institutions & Development Initiatives



# Chapter 3: Enabling Environment: Policy, Institutions & Development Initiatives



*Pakistan is home to a number of tourist attraction sites of which Soon Valley is one. The need of the hour is to preserve and uplift the status of these*

The chapter focuses on the tourism development potential and its existing policy & management scenario at national, provincial and the local levels keeping in view the institutional settings as well. After a thorough review of environmental and tourism policies and regulations of Pakistan, the role of concerned departments in tourism policy implementation including development, marketing, and promotion has been discussed in detail. In-addition, the previous planning and development interventions carried out, within the project area, by different organizations have been summarized in the later sections of the chapter.

## 3.1. Tourism in Pakistan

Economic contribution of tourism in the national economy is a widely recognized factor, along with undeniable contribution in the development of market-oriented economy. Tourism is directly linked with the cultural, economic and intellectual potential of a country and the current international tourism development shows that it is one of the most profitable and rapidly developing industries in the world. Pakistan with an increasing rate of tourists' reception around the world shows an indicator of growing national economy.

- *Tourism Development Corporation of Punjab (TDCP) aims to promote and develop Tourism Industry in Pakistan*
- *To promote Soon Valley as an Eco-Tourist destination, the Punjab government has taken several initiatives. Project Titled 'Development of Eco-Tourism in Soon Valley'.*
- *It has been approved and initiated under Annual Development Program (ADP), which hopefully would be completed within 18 months.*

### 3.1.1. National Tourism Setting

Globally, Pakistan is ranked very low for tourism economy. Out of global tourism income of $ 514 billion, the share of South Asia is $ 5.4 billion including Pakistan's share of only $ 135 million i.e. 0.03 per cent of global and 2 per cent of South Asian share. Out of the total tourists arrivals in the world estimated at 694 million per year, Pakistan receives only 0.5 million tourists annually, a very low figure. The tourist reception is even lower amongst South Asian countries.

According to the World Economic Forum's Travel & Tourism

Competitiveness Index (TTCI) 2013, Pakistan was ranked 122 out of 141 but this ranking further dropped to 125 in year 2015 as per TTCI 2015. With respect to the international tourists' arrivals, Pakistan has been in a fluctuating situation. During the past few years, the number of international tourists have dropped dramatically, especially after 2011.

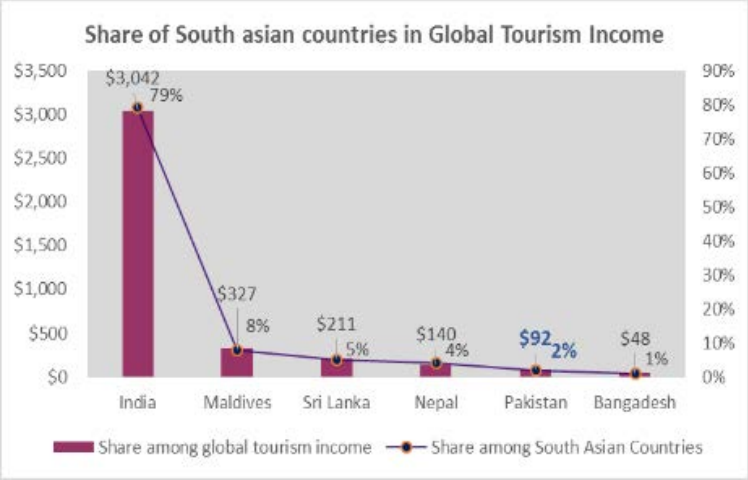



*Figure 6: The Regional Competitiveness of Pakistan among Tourism economy of South Asian Countries*

*Source: The Travel & Tourism Competitiveness Report 2015*

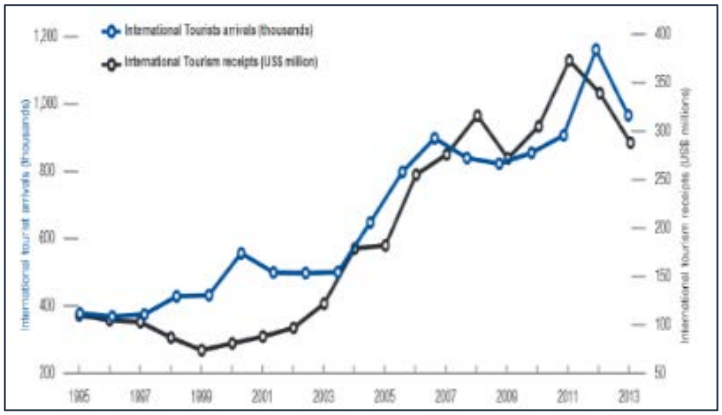



*Figure 5: International Tourists Statistics in Pakistan*

*Source: Travel & Tourism Competitiveness Report, 2015*

Prior to 18th Constitutional Amendment, Tourism as a sector was managed by the Federal Ministry of Tourism, which was responsible for formulating policies, development, marketing and promotion of foreign and domestic tourism along with the coordination and regulation of all those involved in

*The 10th National Five Year Plan (Medium Term Development Framework, 2005-10)*

- *Focused on promotion of domestic, cultural, religious and regional tourism for the generation of employment, reduction of poverty, and increase in foreign exchange earnings.*
- *It also revealed that tourist arrivals and receipts were expected to grow at 10 percent and 20 percent annually respectively to reach 850,000 arrivals and $500 million receipts by 2009-10*
- *Pakistan achieved the target of tourist arrivals in the country as a total of 854,905 however, tourism receipts couldn't be achieved as it counted as 240.6 million in year 2010.*

tourism. The Ministry of Tourism was responsible to look after the entire public sector interventions including formulation of policies, trainings and research; overseeing the legal and regulatory framework. However, after the 18th Constitutional Amendment, tourism is a devolved function of provinces and federal areas. The following departments exist at National/Federal level to promote tourism industry in Pakistan:

- Department of Tourist Service
- Pakistan Tourism Development Corporation (PTDC)
- Malam Jabba Resort (Swat)
- Pakistan Institute of Tourism and Hotel Management (PITHM)




*Figure 7: Travel & Tourism Competitiveness Index*

*Source: Travel & Tourism Competitiveness Report, 2015*

The above mentioned departments render their services at the national level for the development, promotion and marketing of the tourism services at the national level. However, they do not interfere in the provincial jurisdictions of Tourism Development Corporations at provincial levels.

## 3.2. Laws and Regulations for Tourism

Tourism is a cross-cutting theme; thus it cannot be dealt in exclusivity. It is therefore pertinent here to highlight that some other sectors such as environment, has direct correlation with the tourism sector. Pakistan has following laws and guidelines regarding environmental management and conservation of biodiversity and wetlands at the national level which enables tourism development in the country.

### 3.2.1. Provincial Tourism Setting

The four provinces of Pakistan along with the federal capital territory and tribal areas present a good picture in terms of tourism. As every province has a number of tourist sites in terms of natural and historic importance and possesses immense significance for the promotion of tourism industry. Likewise, Punjab also comprises areas which are highly significant for boosting up economy through tourism in the country. The need of the hour is to develop efficient

infrastructure and services that could cater the demand of growing tourism industry in order to see it flourish

With the establishment of Ministry for Tourism at national level, every province was given the charge of promoting tourism by setting up separate tourism departments. These departments are listed below:

*Table 3: Provincial Tourism Departments*

| Province | Concerned Department |
|---|---|
| Punjab | Tourism Development Corporation of Punjab (TDCP) |
| Sindh | Culture Tourism and Antiquities Department |
| Khyber Pakhtunkhwa | Department of Tourism |
| Balochistan | Secretary of Culture, Tourism & Archive |
| Gilgit Baltistan | Tourism, Sports, Culture and Youth Department |
| Azad Jammu & Kashmir | Department of Tourism |

*Source: Pakistan Tourism Development Cooperation, 2016*

However, with the devolution of federal Ministry of Tourism under the 18th amendment, the provinces are responsible to manage the tourism sector under their jurisdiction. The Tourism Development Corporation of Punjab Limited (TDCP) is a Public Limited Company owned by the Government of Punjab and is mandated for the tourism development in the Province. Its main objectives is to promote and develop Tourism Industry in Pakistan. TDCP runs several resorts and motels throughout Punjab and the Transport Wing of TDCP provides comfortable transport system to different tourist destinations in Punjab as well as Northern Areas and NWFP on regular and seasonal basis.

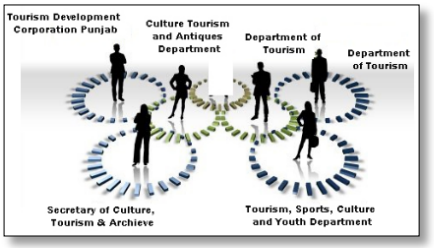
In-addition to the regulations at national level, there are few policies formulated at the provincial level. Punjab doesn't have any tourism policy at the provincial level and same is the case for other constituencies. The given table depicts the

*Why Pakistan is far behind the other Asian countries with respect to Travel & Tourism Competitiveness?*

- *Weak travel and tourism infrastructure provided by the concerned departments*
- *Low branding and marketing effectiveness*
- *Negligence of Government towards the travel and tourism industry.*

*Provincial Tourism Departments*

- *The National Ministry of Tourism paved way towards the development of 6 tourism departments in all provinces and Azad Jammu & Kashmir*
- *At both national & provincial level, only few regulations and policies exist.*
- *These are not well managed and implemented which is why the tourism sector remains on a decline.*




*The six national tourism development departments work in collaboration with other departments for a better envisioned future*



*The Soon Valley offers beautiful scenic views, but there is a need to develop sustainable infrastructure in order to preserve the natural landscape and scenic beauty*

*Source: Field Studies, the Urban Unit 2015-16*

- *Soon Valley is the second important hill station after Murree.*
- *It provides immense scenic beauty and offers a multitude of biodiversity.*
- *It is home to a number of wetlands which serve as a unique sanctuary for migratory birds.*
- *Despite, there is high potential of tourism in the area, the valley still remains neglected of development.*
- *There is absence of nicely managed recreational places.*
- *The valley lacks in infrastructure that facilitates tourists.*
- *There is, thus, a need to upgrade the area for keeping intact the spirit of high tourism.*
- *Steps are needed for developing the area for making tourism industry flourish.*

details of regulations/act regarding environmental management and conservation of biodiversity and wetlands in Punjab which enables tourism development in this Province.

*Table 4: Laws/Regulation Related to Environment in Punjab*

| Regulation / Laws | Brief Description |
|---|---|
| Punjab Environmental Protection Act 1997 (Amended 2012) | Provides the framework for implementation of the Pakistan National Conservation Strategy, establishment of Provincial Sustainable Development Funds, protection and conservation of species, conservation of renewable resources, and establishment of Environmental Tribunals, appointment of Environmental Magistrates, Initial Environmental Examination and Environmental Impact Assessment |
| The Punjab Wild Life (Protection, Preservation, Conservation and Management) Act, 1974 (Amended 2007) | This act is a hub of all the details for protection, preservation, conservation and management of wild life in all districts of Punjab province. |

### 3.2.2. Local Setting - Tourism in Soon Valley

Soon Valley is one of the most beautiful valleys of Pakistan. The Valley is the second important hill station after Murree in the province of Punjab and provides a unique sanctuary and is a host of migratory birds in winters. Soon valley is blessed with ancient civilization existed around 500 B.C. The ancient samples of natural resources, such as rocks, which date back to 50 million years are present in this valley. The fertile farms offer visitors with a unique experience of extraordinary landscape.

Even though all the places of Soon valley are ideal picnic spots to enjoy exotic experience. However, there is a lack of proper infrastructure available to enjoy these recreational spaces within the project area. The buildings of archeological importance are also not being taken care of. The development

and management of these resources if catered full, have the potential to lead to socio-economic benefits to the local community while maintaining cultural integrity, essential ecological processes, and biological diversity and life support systems. This responsibility lies with the concerned departments which are engaged in planning and development of this area.

- *Tourism Development Corporation of Punjab is mainly responsible for uplifting the local tourism industry, also in the Soon Valley.*
- *It works on the objective of preserving local culture & environmental sustainability*
- *Tehsil Municipal Administration is responsible for developing the municipal services infrastructure in the area.*
- *Environment Protection Department is responsible for protecting, conserving, rehabilitating and improving the environment in the area.*
- *Other than these, there are a number of other line departments which play a fundamental role in the development of tourism in the area.*

### 3.2.3. Tourism Promotion & Development

Tourism is mainly supervised, managed and monitored by Tourism Development Corporation of Punjab (TDCP), which is actively involved in the promotion and uplifting of local tourism industry with an objective of preserving local culture and ensuring environmental sustainability in Soon Valley and its surrounding region.

### 3.2.4. Land Use Control and Development

The Tehsil Municipal Administration, Khushab is the main civic body that looks after the municipal services provided within the urban area. Currently, TMA Khushab is mandated for the execution of land use conversion applications and comprehensive planning of the area through proper planning exercises including the preparation of master plans and respective subject plans through Punjab Local Government Ordinance, 2001 (PLGO 2001) and after 2013 under the Punjab Local Government Act, 2013 (PLGA 2013).

### 3.2.5. Environmental Management

Environment Protection Department (EPD), Punjab is responsible for the protection, conservation, rehabilitation and improvement of the environment; the prevention and control of pollution in this area.

*Environmental Protection Department responsible for protection, conservation, rehabilitation and improvement of environment*

The other sectoral, regional and local departments responsible to carry out planning and development work are summarized in table below:




*All stakeholders are need to be taken on board for effective execution of the project*

- *A number of functions are performed by the other line departments.*
- *Moreover, there are stakeholders whose participation and consultation is to hold a great significance in the development project.*
- *Besides local administration and municipal departments, several sub-offices also exist those which facilitate the kind of tourist development in the area.*
- *The development of tourist sector is a collaborative task which is not possible without public participation.*
- *Thus, public including the visitors (tourists) have also been consulted.*
- *Their views have also been brought into consideration.*

**Government of Punjab (GoPb.)**

**Functions**

- Provides funds for the development of different departments like health, energy etc.
- Provides aid/assistance in case of any disaster
- Reviews the performance of different departments

**District Government Khushab (DGK)**

**Functions**

- Approves master plans, zoning plans and land use plans
- Classification, reclassification of land, environment control, urban design and urban renewal
- Review of implementation of rules and regulations of land use, zoning, environment, roads, traffic, tax and public utilities
- Approval of schemes along river
- Co-ordination of the group activities of offices for coherent planning, synergistic development
- Exercises general supervision over programs, projects, services, and activities of the District Administration;
- Coordinates flow of information required by the government for performance of its functions under the Local Government Ordinance/Act;
- Acts as Principal Accounting Officer of the District Government and be responsible to the Public Accounts Committee of the Provincial Assembly;
- Calls for information and reports from local governments in the district as required by the Provincial Government or District Government through the Tehsil Municipal Officer

**Tehsil Municipal Administration (TMA)-Khushab**

**Functions**

- Preparation of spatial plan including land use plans, zoning plans, zoning plans and master plans

- Prepares plans in collaboration with Zila and union councils
- Controls over land use, land subdivision, land development and zoning by public and private sector for any purpose
- Exercises control over land use, land subdivision, land development and zoning by public and private sector for any purpose
- Compilation of information provided by Union Councils

**Union Councils (UCs)**

**Functions**

- Collection and maintenance of statistical information for socio-economic surveys
- Consolidation of ward and neighborhood development needs and to prioritize these into union-wide development proposals
- Identifying deficiencies in delivery of services and making recommendations to TMA

**Other Provincial Departments**

Besides local administrative and municipal departments, there exist sub-offices of provincial government departments to function to facilitate the local administration.

## 3.3. Previous Planning & Development Initiatives in Soon Valley

This section covers the previous development and planning activities carried out within the Soon Valley.

### 3.3.1. Soon Valley Development Program (SVDP) Initiatives

Pakistan Poverty Alleviation Fund (PPAF) entered into a partnership with the Soon Valley Development Program (SVDP) to help the poor and disadvantaged rural communities during 2005-08. It was envisaged that the benefits of PPAF interventions will accrue directly to poor

through: (a) income generation opportunities; (b) improved community physical infrastructure in the underserved areas; and (c) greater economic integration of women.

As part of its overall operations, the PPAF was required to develop a benchmark for its intervention areas, the outreach of Partner Organization and an impact assessment baseline for community infrastructure and capacity building activities. PPAF's Evaluation, Research and Development Unit (ERD) in collaboration with Social Mobilization Unit of SVDP conducted a baseline for the program in September 2006. This baseline was specially conducted to assess the social and economic impact of proposed pipe irrigation systems on the life of rural communities in the valley ERD Unit also conducted an impact assessment survey of the same sample villages in six UCs of the Valley in December 2008 to access the impact of pipe irrigation systems on the resident's quality of life.

To combat water shortage and facilitate an economic utilization of available groundwater resources, the farmers' cooperatives identified the introduction of pipe irrigation system as their first development priority. Therefore, SVDP introduced a pipe irrigation system in the Valley sponsored by PPAF with a grant of Rs.9.86 million. The construction of pipe irrigation systems was carried out in mid – 2003 and by the end of 2008, SVDP had completed construction of 152 pipe irrigation schemes in 30 villages. Table given below is a summary of sub-projects implemented during 2003-08.

Implementation of a majority of these interventions was completed by the end of the year 2008-09. The SVDP during 2003-08 completed 152 pipe irrigation schemes in 30 villages in the entire Valley.

- *Soon Valley presents one good case where an agriculturally productive area with huge tracts of land dependent on rainwater was hit by a prolong drought condition, and the local people worked together for an innovative solution.*
- *With the efforts of Soon Valley Development Program (SVDP) a citizen/community preparatory imperative was taken up for effective irrigation system.*
- *It aimed at installing underground PVC pipes for taking water to different fields even at a height of 30 feet*
- *The community-department coordination further strengthened when SVDP, in collaboration with the Pakistan Poverty Alleviation Fund (PPAF), started organizing small farmers into organizations.*

*Table 5: Number of Sub-Projects Implemented in Soon Valley*

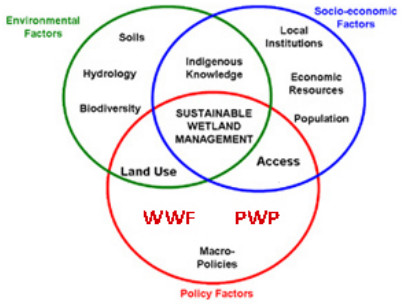
| *Interventions* | *Pre-DMPP* | *DMPP-1* | *DMPP-2* | *Total* |
|---|---|---|---|---|
| *Pipe Irrigation Schemes* | 34 | 56 | 62 | 152 |
| *Water Ponds* | 1 | 14 | 45 | 60 |
| *Drinking Water Schemes* | - | 10 | 0 | 10 |
| *Delay Action Dams* | - | 5 | 0 | 5 |
| *Check Dams* | 15 | 21 | 21 | 57 |
| *Natural Resource Management* | - | 0 | 10 | 10 |
| *Contour Walls (in rft)* | - | - | 11,000 | - |
| *Plantation/seeding-local species* | - | 15,000 | 6,000 | 21,000 |

*Source: Drought Mitigation Preparedness Program by PPAF*

## Results and Impacts

- Significant increase in land under cultivation
- Cropping intensity and diversity increased and cropping patterns changed in favor of crops
- Dramatic increase in the value of agricultural land and lease rentals
- Increased in agricultural income due to favorable market prices.
- Beneficiary households experienced a practical elimination of water conveyance losses, and substantially high time, labor, and cost savings.
- The provision of pipe irrigation has eliminated the need for women to perform the menial task of water channel cleaning
- Improved female literacy and health indicators
- Substantial improvement in decrease of infant mortality, better health hygiene & sanitation status and household literacy
- Decreased levels of carbon emissions and reduced dependence on firewood.
- Social mobility and community cooperation played an important role in the purchase of agriculture inputs and marketing of agriculture produce to international corporates at competitively negotiated rates/prices

- *PVC pressure pipe irrigation was given greater priority in this partnership and from the year 2003 to 2010 PPAF granted Rs90 million for this intervention, whereas farming communities invested Rs.27 million in cash and kind.*
- *A total of 2,200 turbines of small farmers were covered and total 2.3 million feet of PVC pipe were laid on 9,600 acres of land.*
- *Today, 80% of the land in the valley has PVC pipes installed which have been made possible only by the concerted efforts of the small farmers.*
- *This great initiative has boosted the overall economy of the area, bringing a considerable reduction in the maintenance cost and decreasing the irrigation cost by 40%*




*Soon Valley is a home to many wetlands. Their sustainable wetland management is the need of hour. With collaborative efforts, the wetland areas are thus preserved*

- *Uchhali Wetlands Complex is a complex of three wetlands which is notified as a Ramsar Site, located in District Khushab.*
- *The World Wide Fund for Nature Pakistan (WWF – P) in collaboration with partner organizations took up initiatives for protecting the wetlands.*
- *Interventions by WWF included management interventions, ecological interventions and social interventions.*
- *All these interventions aimed at preserving the status of wetlands and making the overall environment sustainable harnessing a good living*
- *It also aimed at preserving the flora and fauna species.*

- The expenditure on food seems to have decreased (from 70% to 50% of total monthly expenditure) after the implementation of the programs.
- Significant benefits of the programs to communities in terms of infrastructure development, access to technology, conflict resolution, and personal empowerment.

### 3.3.2. Wetlands Management Plan for Uchhali Wetlands Complex

Uchhali Wetlands Complex is a complex of three wetlands which is notified as a Ramsar Site, located in District Khushab. To safeguard and protect these precious wetlands, the World Wide Fund for Nature Pakistan (WWF – P) in consultation with other partner organizations in the year 2000 undertook wetlands initiatives, which resulted in the form of an inception of the Pakistan Wetlands Program (PWP) in 2005. The World Wildlife Foundation (WWF) completed the work on the management of this wetland complex which consisted of a brief introduction to the area, details of Bio-physical and Social Environment of the region, potential issues and threats faced by the wetlands, overall management vision for the Complex, strategic interventions and the implementation and monitoring mechanism that not only defines the priority of any intervention but also the stakeholders involved in its implementation.

### 3.3.3. Interventions by WWF

**Management Interventions**

- Improving stakeholders coordination at the provincial and site level
- Improving law enforcement in the area
- Strengthening knowledge, skills and technical capacity of the field staff
- Enhancing protection of the resources through additional field staff
- Generating funds for sustainable management of wetlands

**Ecological Interventions**

- Setting up of physical, chemical and socio-ecological bench marks
- Regular monitoring of major wildlife species
- Improving watch and ward mechanism to provide protection
- Protecting watersheds
- Conserving Protected Forests
- Conserving rangelands in the catchment areas
- Promoting indigenous fish fauna in the Complex
- Notifying no activity zone during migratory season in the Complex
- Removing invasive and non-native species in and around the round the Complex
- Preventing pollution from entering into the lake
- Securing water for wetlands
- Protecting wildlife corridors and biodiversity hotspots from unplanned destruction of Minerals and Ores

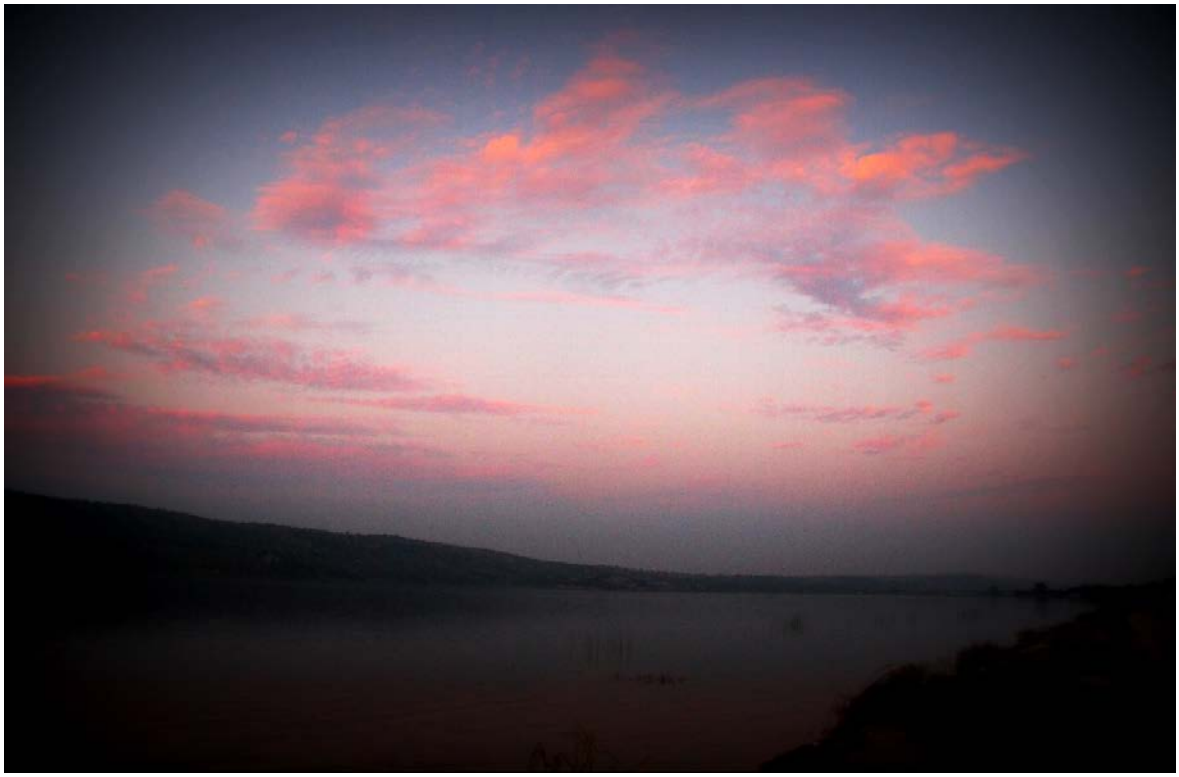
**Social Interventions**

- Empowering and mobilizing local communities for effective decision making
- Improving livelihood opportunities and alleviating poverty
- Promoting efficient and sustainable sources of energy
- Lobbying for enhanced government investment in the region

- *It is incumbent upon the authorities to preserve tourism in the Soon Valley.*
- *The migratory birds and rare species of flora and fauna also need to be preserved.*
- *The status of wetlands is to be well catered and steps to be taken for making the tourism industry flourish*

CHAPTER 4

# Study Area Profile



# Chapter 4: Study Area Profile

This chapter gives a comprehensive understanding of existing situation of Soon Valley based on primary data and interviews with stakeholders. It discusses in detail prevailing state of social & physical infrastructure, population growth, livelihood pattern, income level, land use characteristics, role of Naushera Town and transportation system etc. of the project area. The environmental profile of biological resources, flora, fauna, water quality and significance of various tourist sites is discussed comprehensively.

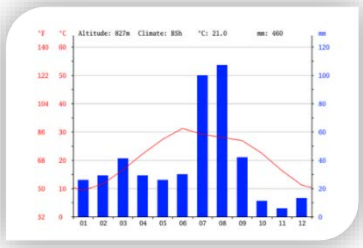


*Figure 8: Climatic Profile for the Soon Valley*
*Source: Climate-data.org*

- *The climate of the area is sub-tropical continental.*
- *January is the coldest month, while June is the hottest month.*
- *The absolute mean monthly temperature in the valley ranges from 1°C to 46°C.*
- *The area is also rich in meta sedimentary rocks which include marble, limestone, sandstones, phyllites and quartize.*



*Figure 9: Rich Deposits of Rocks & Minerals in Soon Valley*
*Source: Survey Conducted by the EIA Team, the Urban Unit, 2015*

## 4.1. Local Climate System and Variability

The climate of the project area is characterized as sub-humid with hot to moderate summer and severe winter. The thirty-year average precipitation was 853 mm within the project area. People usually experience hot dry winds and long period of drought in summers whereas winters are accompanied by frost. The frost is usually observed in nearby high altitudes such as Mount Sakesar. Ideally, during the month of May and June, temperature of this area rises up to 46°C. Then as the monsoon rains commence, the temperature falls as low as 26°C. However, average minimum temperature generally ranges from 0.5°C in the month of January to a maximum of 36°C. Annual rainfall varies 300mm to 800mm and relative humidity from 22%-85%.

## 4.2. Geology

The distinctive geological patterns of Soon valley i.e. mountains, hills and mineral resources are responsible for providing it a unique landscape setting. Meta-sedimentary rocks i.e. marble, lime stones, quartize, sandstones, phyllites etc. are in abundance. Sand stone and limestone are the common rock types of this region[10]. The sand stone is laminated by white or cream, dark red or purple brown

[10] Chaudhary, M. I., A. S. Mumtaz and M. A. Khan. 2001. Leaf epidermal anatomy of medicinal grasses of Islamabad, Attock and Mirpur (Azad Kashmir). Pak. J. Biol. Sci. 4 (12): 1466 -1469.

colors. Most of the soil is heavily salt infested, as the water from brine springs deposits salts on the soil, all along its route. Most of the soil present in valleys between Range Mountains is water-eroded soil. Soil lying between the Salt Range and river Jhelum is heavily saline due to run off water during rainy season and most of the areas are rich in salinity.

## 4.3. Demographic Profile

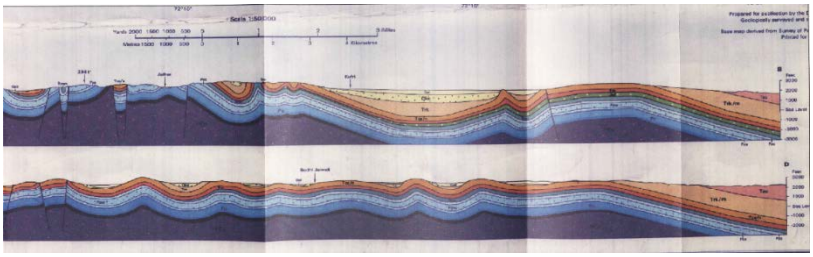


*Figure 10: Geological Cross-Section of Kufri & Sodhi Jay Wali (Soon Valley)*
*Source: DMPP, Soon Valley Project 2005*

The main tribe of the area is the Awan of ancient repute. This tribe came in this area with Qutub Shah and settled in the Soon valley. In the valley, Awan's are known by their clans. In old time the head of clan in each village was known as Raees, and the head of a tribe was known as Raees-Azam. In the project vicinity, 100% of the population is Muslim whereas no other minority religions exist in the area. Punjabi is the dominant language spoken in the project area but 95%of population speaks in Saraiki-Influenced Punjabi accent. Urdu is also understood by many people in the project area. Being as a tribe of Arabs origin, the local people follow Islamic traditions and typically Punjabi culture. Both men and women wear traditional dresses i.e., men wear Shalwar & Qameez and women wear Shalwar & Qameez along with Dubatta.

Traditionally the marriages are arranged according to the Islamic traditions and wedding ceremony usually takes place at the mosques. Most of the festivals i.e., Urs, Mela celebrated in project area are "religious" and they are associated with the agriculture. Urs of Hazrat Ilyas (R.A) is celebrated in Chitta village every year in which peoples of different villages

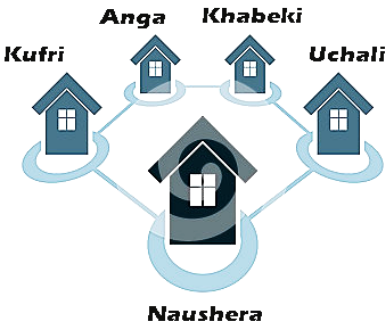
- *Soon Valley has been a home to many tribes.*
- *Awan, the dominant tribe in the valley is also the most ancient one.*
- *The tribes formulated clans, the head of which was called Rees while that of the tribe was entitles as Raees e Azam*
- *The valley not only attracts a number of tourists because of its scenic beauty, but the holding of several religious festivals and games also add in to the bulk of visitors.*

come along with their cattles as a religious affiliation. Moreover, different game shows are also organized there. Joint family system is common in this area. People of this area eat typical cereal crops like wheat and rice.

### 4.3.1. Major Settlements & Villages

Naushera is declared as Municipal Committee (MC) as per the Punjab Local Government Act, 2013. There are six Union Councils (Khabekki, Anga, Uchhali, Kufri, Khura and Mardwal). These six UCs and one MC form the whole Project Area, the Soon Valley.

With respect to area, the Naushera (MC) is smallest of all other Union Councils of the project area but on the other hand, it constitutes major settlements such as Mundial, Dhaka, Maroka Dhaka, Jalay Wali, Chamrraki and Naushera Town. There are around 50 main villages and settlements within the whole project area. The detailed UC-wise description of the settlements is summarized in the following figure.




*Major settlements in the Valley, with Naushera being the only Municipal Committee. Others being the Union Councils having villages*




*The largest number of villages are found in Khabekki and the least being in Uchhali*

| UNION COUNCILS | AREA (Acres) | NO. OF VILLAGES / SETTLEMENTS | NAMES OF VILLAGES / SETTLEMENTS |
|---|---|---|---|
| Uchali | 21,093 | 3 | Koradhi, Uchali and Chitta |
| Anga | 12,531 | 6 | Uggali, Kotli, Shakar Kot, Siral, Mardwal and Anga |
| Kufri | 23,816 | 10 | Jahlar, Sandhwali, Sodhi Bala, Sodhi Zereen, Kiloi, Kaila, Bharitan Wali, Suraki, Pattian and Kufri |
| Khabeki | 59,720 | 20 | Kanhatti, Fateh Sherian wali, Chakkian Wali, Ratowali Hathali, Raitri, Maromi, Dhadhar, Sheiku Milyar wali, Ahmadabad, Jungayala, Dera Sher Baz Kalan, Dhok Kalan, Dhok Mamaz, Dhok Ladal, Alwal Wali, Kukar, Jahan Khan, Dhokay Baba, Jahan Khan, Fethe Ullah and Khabekki |
| Khura / Sodi Wali | 36,228 | 8 | Khura, Biakh, Kalyal, Potha, Bhuki, Uchhala, Sodhi Jay Wali |

*Figure 11: UC-wise Area and Villages/Settlements in Soon Valley*

*Source: The Urban Unit, 2016*

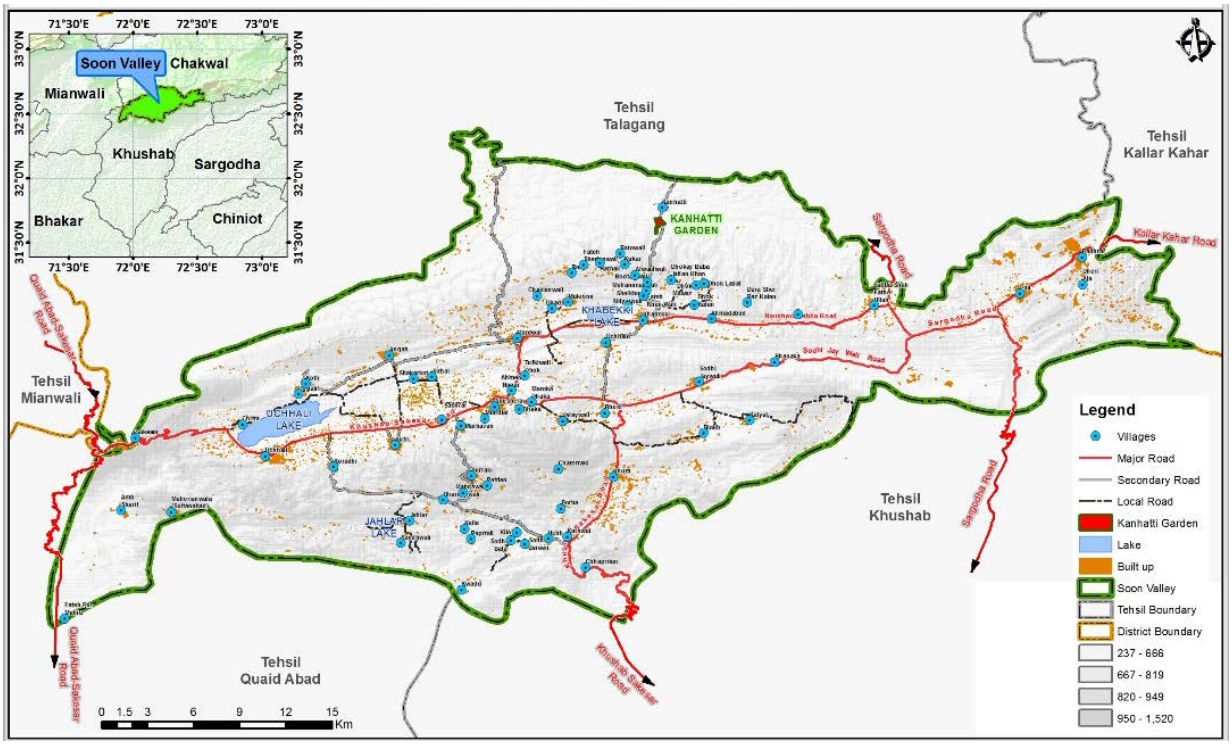



*Figure 12: Locations of Major Villages/Settlements in Soon Valley*

*Source: The Urban Unit, 2016*

Naushera is the main town of Soon Valley and is considered as the heart of Soon Valley. All major businesses and commercial activities are carried out in this town. As per field surveys, there are around 5,000 registered voters in Naushera Town. In 1998, the population of Naushera Municipal Committee (MC) was 14,639 having a growth rate of 2.46% (1998 census). The current projected population of this MC is around 22,670.

Likewise Naushera, the population in Soon Valley has observed increase from 88,014 to 123,096 over the period of 18 years (1998-2016). The population for each union council has been projected using the growth rates using the statistical record of population estimations collected through survey conducted by District Government Khushab in year 2005. The population projected till year 2035 accounts for 175,362.

- *Situated in the heart of Soon Valley lies Naushera which is surrounded by high hills, beautiful lakes, jungles & ponds.*
- *Naushera is the only Municipal Committee whereas Khabekki, Anga, Uchhali, Kufri and Mardwal make the six Union Councils.*
- *The major settlements are located in Naushera and a total of 50 villages lie in the whole project area.*

*Table 6: Population Dynamics of Soon Valley*

| Union Councils | Population (Years wise) | | | | |
|---|---|---|---|---|---|
| | Total Population | | Growth Rate (%) | Projected Population | |
| | 1998 | 2005 | | 2016 | 2035 |
| Uchhali | 14105 | 15298 | 1.17 | 17386 | 21686 |
| Anga | 14523 | 16888 | 2.18 | 21409 | 32252 |
| Kufri | 14154 | 16914 | 2.58 | 22384 | 36318 |
| Naushera | 14639 | 17352 | 2.46 | 22670 | 35973 |
| Khura | 15404 | 16983 | 1.40 | 19789 | 25772 |
| Khabekki | 15189 | 16857 | 1.50 | 19931 | 26447 |
| Soon Valley | **88,014** | **100,292** | **120,825** | **123,096** | **175,362** |

*Source: Projected by Urban Unit Team Based on the Previous Report & Data*

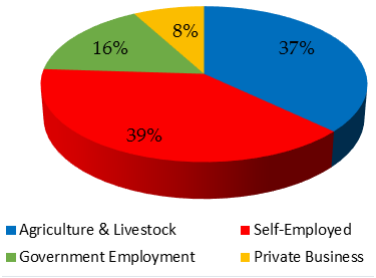



*Figure 13: Type of Occupation of Residents of Soon Valley*

*Source: Field Studies, the Urban Unit 2015-16*




*Figure 14: Residents' Main Source of Income*

*Source: Field Studies, the Urban Unit 2015-16*

### 4.3.2. Livelihood Context

The livelihood patterns holds key importance in analyzing the existing scenario and for recommending future planning proposals. Keeping in view of this importance, the residents of Soon Valley were inquired about their livelihood patterns. Analyses reveal that majority (39%) of the people are self-employed or daily workers/laborers and they travel to nearby towns and cities (Naushera, Khushab, Jauharabad, Pail etc.) for work. Another major chunk i.e. 37% of the respondents are associated with agricultural & livestock activities while 16% and 8% of the respondents are involved in government employment and private business respectively.

The majority of income is coming from agriculture while 32% of it is associated with other activities including daily wages/laboring. Livestock and small business support 14% and 22% of the respondents' income respectively.

### 4.3.3. Income Level

43% of the households have income ranging from 10,001-15,000 and 35% of the households have monthly income ranging from 5,001-10,000. During the field survey, it was also observed that income level of households of Naushera, Khabekki, and Uchhali was high than other settlements of the Soon Valley.

*Table 7: Income Level of Household*

| Rupees per month | Percentage of Households (%) |
|---|---|
| Less than 5000 | 15 |
| Between 5,001-10,000 | 20 |
| Between 10,001-15,000 | 43 |
| Between 15,001-20,000 | 9 |
| Between 20,001-25,000 | 4 |
| Greater than 25,000 | 9 |
| **Total** | **100** |

*Source: Field Studies, the Urban Unit Team, 2015-16*

- *A large number of people in the valley are mostly self-employed and daily workers.*
- *However, agricultural and livestock activities are also found in the area that generates income for the people.*
- *The monthly income ranges from 10,000 to 15,000.*
- *As a consequence of less employment opportunities, the area experiences around 49.5% of the dependency ratio*

### 4.3.4. Age Structure and Work Status

It has been observed that Infant and Juvenile ( less than or equal to 17) population is about 32% of total population, younger age group (18-45) is 40%, the middle age population (45-60) shares 11% of the population. The two groups combined constitute the entire workforce of the valley at 51%.

### 4.3.5. Dependency Ratio

There are very less employment opportunities for all sections of the community. So this area experiences huge dependency ratios i.e. overall 49.5%. The following table shows the dependency ratios for each Union Councils of project area.

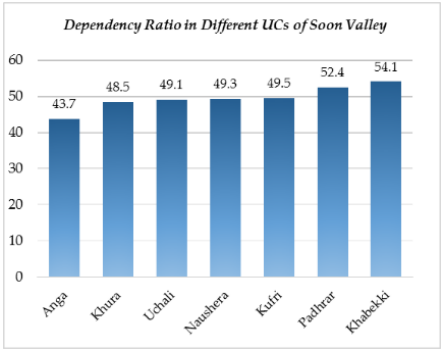



*Figure 15: Dependency Ratio in Different UCs of Soon Valley for Year 2016*

*Source: Field Studies, the Urban Unit Team, 2015-16*





*Pictures compare the pacca house in Kufri Village and a katcha house in Uchhali. The plain brick structure in paka gives it stability and a better outlook, whereas the mud built katcha house is relatively unstable and disaster prone.*
*Source: Field Studies, the Urban Unit Team, 2015-16*

### 4.3.6. Housing Infrastructure

The data from field surveys carried out by the Urban Unit reveals that 72% of the houses are Pakka, 18% are semi-pacca and 10% are Kacha. The majority of the kacha houses are present in small settlements. It was found that on the average 3-4 rooms are present in a house. Household size in majority of the settlements ranges from 7.5 to 8.9.

## 4.4. Land Use Profile

Land use profile explains the relationship of human activities and spatial uses which is essential for better urban planning. Land use is generally concerned with the sizes; proportion and distribution of different prevailing land uses in an urban setting and it constitute an information base for devising policy regarding land use development promotions, restrictions, growth corridors, exploring physical growth opportunities and constraints as well. Its purpose is to state existing situation, which have emerged because of past development that have taken place in the area.

- *Land use pattern of Soon Valley indicates that a large (40.98%) percentage of the area comprises of sparse forest and bushes.*
- *The area is predominantly covered by dense forests and agriculture.*
- *The built area/bare soil and water attributes to a very smaller percentage i.e. 1.98 & 0.94 respectively*

### 4.4.1. Land Cover Classification of Soon Valley

Considering the land a scarce resource, it is critical to understand how land and other resources are used within a given area before recommendations can be developed relative to future land uses. Therefore, information and statistics relevant to land uses in profiling an area provides crucial information for policy and plan making. The Soon Valley is famous for its scenic views, biodiversity and ecological significance, and nature's own habitat. Land use pattern of Soon Valley indicates that 40.98% consists of sparse forest and bushes, 29.30% forest, 26.80% agriculture, only 1.98% and 0.94% comprises of other land uses like Built Up area and water.

*Table 8: Pacca House in Kufri Village, Soon Valley*

| Land Use | Area (Sq. Km) | % Age |
|---|---|---|
| Agriculture | 257 | 26.80 |
| Dense forest | 281 | 29.30 |
| Sparse forest and bushes | 393 | 40.98 |
| Water | 9 | 0.94 |
| Other (built up/bare soil/shadow) | 10 | 1.98 |

*Source: Field Studies, the Urban Unit, 2015-16*

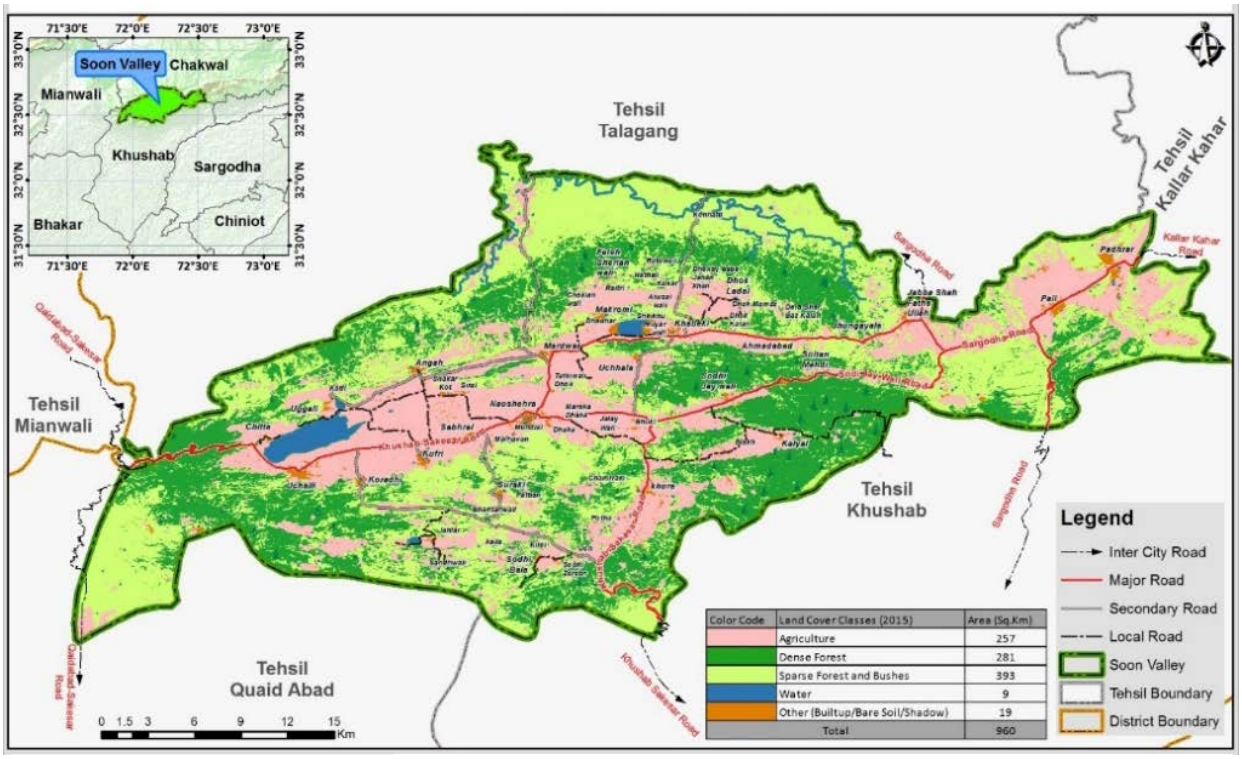



*Figure 16: Land Cover Classification of Soon Valley*
*Source: The Urban Unit, 2016*

## 4.4.2. Composition

Field surveys of Soon Valley reveal that study area comprises of low-density settlements and 90% of the settlements are single storey. Residential structures dominate and commercial uses are found only along major roads. In Naushera, which is the major settlement in Soon Valley, most of the built up is occupied by single storey residential buildings meanwhile commercial, public and hospitality buildings are found along Khushab-Sakesar Road, Eid Gah Road and Main Bazar Road.

- *Soon Valley mainly comprises of low density settlements with single storey character.*
- *Commercial and public buildings are located along main roads including Khushab Sakesar Road, Eid Gah Road and Main Bazar Road*

- *67% of the buildings in Naushera, Sodhi, Kufri, Uchhali and Angah are more than 30 years old.*
- *The overall condition of buildings is also not satisfactory and do not meet the minimal engineering standards.*
- *Pre-dominantly single storey buildings exist whereas, in Naushera there are few buildings that exceed up to 4-5.*
- *The area lacks in overall urban design and there is a need to uplift this.*

*Table 9: Condition of Buildings in Soon Valley*

| ***Condition*** | ***%Age*** |
|---|---|
| *Excellent* | 17 |
| *Good* | 63 |
| *Fair* | 14 |
| *Dilapidated* | 6 |

*Source: Extracted by the Consultant on the Basis of Field Study, 2016*

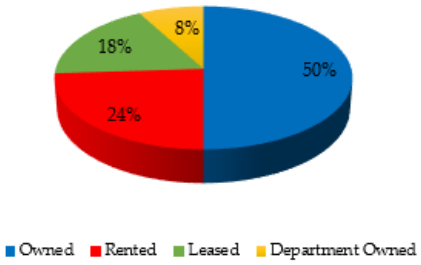



*Figure 17: Nature of Ownership in Soon Valley*
*Source: Extracted by the Consultant on the Basis of Field Study, 2016*

Along the roads mentioned above, majority of the commercial buildings are single storey and some of buildings are double storey. Some restaurants and hotels around Khushab-Sakesar road are 3-4 storeys well. Shops mostly comprise of grocery and general stores and rest of the commercial use include restaurants, hotels and other buildings.

It is observed that there is a severe shortage of hospitality services in Soon Valley. Hospitality services are only found along Khushab-Sakesar Road in Naushera. Moreover, quality of these hotels is also not up to the mark.

### 4.4.3. Age of Buildings

Age of buildings provides significant information about the existing physical condition of the area and helps in tracing back the time of development of the area.

Results of Surveys of different areas like Naushera, Sodhi, Kufri, Uchhali and Angah show that that more than 67% of the buildings in Soon Valley are 30 years old, 23% of the buildings are 15 years old and 10% of the buildings are 5-10 years old.

### 4.4.4. Condition of Buildings

Most of the buildings in Soon Valley are in good condition but they do not meet the engineering standards of construction.

### 4.4.5. Number of Stories/Height

In Soon Valley, 71% of the buildings are single storey, 10%-15% are double storey, 4%-5% three storey and 2%-3% are above 3 storey. In Naushera Main Bazar and Khushab-Sakesar Road, few buildings of 4-5 storey are observed.

### 4.4.6. Ownership Pattern

Constructed buildings in Soon Valley are owned by people living there. Open land in Soon Valley is owned by Forest Department.

### 4.4.7. Facade/Urban Design Value

Façade and urban design play an integral role in defining the overall morphology of an area. Soon Valley lack in this aspect and there is a dire need to bring improvement to this for enhancing the urban design value. The valley is also deficit in street furniture, public infrastructure, kiosks, building facades which if incorporated can attract a number of tourists to the area. There is also a need to strengthen the architectural value for harnessing a better living.

### 4.4.8. Utilities Installed

Utilities include electricity, water supply, telephone (Landlines & mobile Communication), internet (wireless & wired) and Sui gas which vary from area to area in Soon Valley. In the entire Soon Valley, there is no provision of Sui Gas and people use alternate sources for meeting their daily needs. Mostly, people use wood for cooking purposes. In some areas like Kufri and Angah, people have installed bio gas plants and fulfill their needs. Majority of the population has installed water boring in their houses, as public water supply schemes are not functional and up to the mark. Moreover, some of the people have installed hand pumps as well. Waste generated by different activities is disposed openly in the streets and roads and no solid waste collection facility is present there. Internet services are only present in Naushera, Khabekki and Uchhali.

### 4.4.9. Quality of Hospitality Service

Most of the tourists are not satisfied with quality of service being provided there. Firstly, there is severe shortage of Restaurant, Hotel and other such facilities for the visitors. Only Naushera City has such restaurants, quality of these services is not satisfying. Moreover, transport services are present to visit only Uchhali Lake and Khabekki Lake and visitors have to manage on their own to visit other places like lakes, gardens, shrines, waterfalls etc.

- *There is unavailability of Sui Gas in the entire Soon Valley and people rely on alternate sources such as wood for meeting the desired purpose.*
- *Solid Waste Management is also poor in the area and heaps of solid waste are found openly on roads and streets.*



*Only in Naushera, relatively better hospitality services exist. Mahria Restaurant & hotel is one such example that is home to a number of visitors.*

*Source: Field Studies, the Urban Unit 2015-16*

- *Because of poor hospitality services and potential of great leisure & recreation, TDCP aims at developing Uchhali, Khabekki lakes and Kanhatti Gardens as an attractive tourist spot.*



*Figure 18: Narrow streets in the main Naushera City indicate the living condition and quality of environment.*

*Source: Field Studies, the Urban Unit 2015-16*

### 4.4.10. Leisure & Recreation

In any urban structure, there are two type of open spaces; natural open spaces and planned open spaces. Soon Valley is extravagantly surrounded by a whole vista of natural open spaces covering almost 80% of landscape. Planned open / recreational sites are a rare in Soon Valley. Recently, efforts have been made Tourism Development Corporation Punjab (TDCP) to provide planned recreational sites in Uchhali Lake, Khabekki Lake and Kanhatti Garden. However, there is dire need to provide and improve planned recreational spaces in different areas of Soon Valley.

### 4.4.11. Health/Safety Aspects

In Soon Valley, health and safety condition of habitable structures is poor. Structures are not built in the way to handle disasters. Structures are generally not climate resistant / thermally insulated in wind chills, so places energy efficiency on stress. Heating in extreme winters is another issue because there is no Sui Gas and majority of people rely on wood. Moreover, health facilities are lacking necessary human resource, infrastructure to support public in case of any damage.

- *Naushera has recently been declared a Tehsil and now holds a population of 22,650 and a total area of about 42 square km.*
- *Despite the central commercial area for the whole of Soon valley, Naushera lacks proper solid waste management system and sewerage system which makes the city very unhygienic and the roads congested.*

### 4.4.12. Land Use Profile of Naushera Town

- Naushera has been recently declared as tehsil in Soon Valley. It is a major settlement and commercial hub in Soon Valley. Current population of Naushera is estimated to be 22,670 and its area is 41.95 square kilometer.
- It is center of commercial activities in the entire Soon Valley and people from all over the Soon Valley come to Naushera for various purposed like education, health, business etc.
- Occupation of majority of people of Naushera is agriculture, labor and some of the people are involved in commerce as well.
- Like other areas of Soon Valley, there is no system for solid waste management system, sanitation, sewerage and drainage system in Naushera. People dump the waste in streets and fields, drains are open resulting in very

unhygienic condition in the city.

- Most of the people use boring water system. Water table depth is 200-250 feet. Water supply schemes are providing water for only 1 hour in a day. Few people use water tank as well.
- Most of the road and streets in the Naushera are very congested and in deteriorated conditions that is mainly due to open dumping of waste materials in the streets and sewer coming out of open drains.
- The settlement structure of Naushera shows that most of the city is residential with single storey structures but commercial activity is also found along some corridor. It is observed that Khushab-Sakesar road, Eid Gah Road and Main Bazar Road are main commercial corridors in the city.
- The condition of buildings are relatively good as compared to other areas of Soon Valley. Mostly, age of the building is 20-30 years
- Monthly household income ranges from 12k to 16k. Majority of the population are unable to save money from such low income.
- Wood collected from nearby forests is used for cooking purposed while some of the shopkeepers also use cylinders.
- Mode of transport within the city is cycle and chingchi. Buses are also present that connect Naushera with Lahore, Rawalpindi and Khushab. Schedule of these buses is as follows:



*Figure 21: Open drains on the main Naushera road further deteriorates the condition and overall environment.*

*Source: Field Studies, the Urban Unit 2015-16*

- *Accessibility to the area is limited in terms of transportation modes that are available.*
- *There are few buses that can commute people to and from Rawalpindi and even fewer are there to take people to/from Lahore.*

*Table 10: Schedule of Buses Operating in Naushera*

| Route | No of Buses/Day | Start Time | End Time |
|---|---|---|---|
| Naushera to Rawalpindi | 15 buses | 6:30 am | 5:00 pm. |
| Naushera to Lahore | 3 buses | 7:30 am | 2:45 pm |
| Naushera to Khushab | buses are available after every half hour | 4:00 am | 6:30 pm |

*Source: Extracted by the Consultant on the Basis of Field Surveys, 2016*

- *For local travelling the predominant mode is Chingchis.*
- *The condition of health facility is also grave as 50% of the staff seats remain vacant.*
- *Similarly the education sector shows no more promising situation as there are few schools to serve the population.*

- For visiting tourist sites, no public transport is available and private cars are hired.
- Chingchi travel from Naushera to Y-Cross, Sodhi, Uchala, Mustafaabad, Khabekki, Sabhral, Kufri, Shakar Kot and are available from 6 am-6 pm
- No male doctor is present except Medical Superintendent (MS) and hospital lacks some important machinery for trauma and anesthesia patients. According to the Medical Superintendent (MS) of Tehsil Headquarter Hospital Naushera, 50% of the seats are vacant. Major diseases are typhoid, malaria, skin diseases and infection.
- There are 8 primary schools (4 each for males and females), 1 high school (male) and 5 higher secondary schools for males and 2 higher secondary schools for females are present in Naushera City. Some Private schools that include Punjab College, Allied School, Leaders School, Dar-e-Arqam are also present.

Land Use map for Naushera is shown ahead. It highlights the land use breakup percentages for the existing different land uses.

*Table 11: Land Use Statistics of Naushera Tehsil*

| Class | %Age |
|---|---|
| Residential | 8.4% |
| Commercial | 1.7% |
| Public | 0.4% |
| Commercial | 1.7% |
| Agriculture | 44.7% |

*Source: The Urban Unit 2015-16*

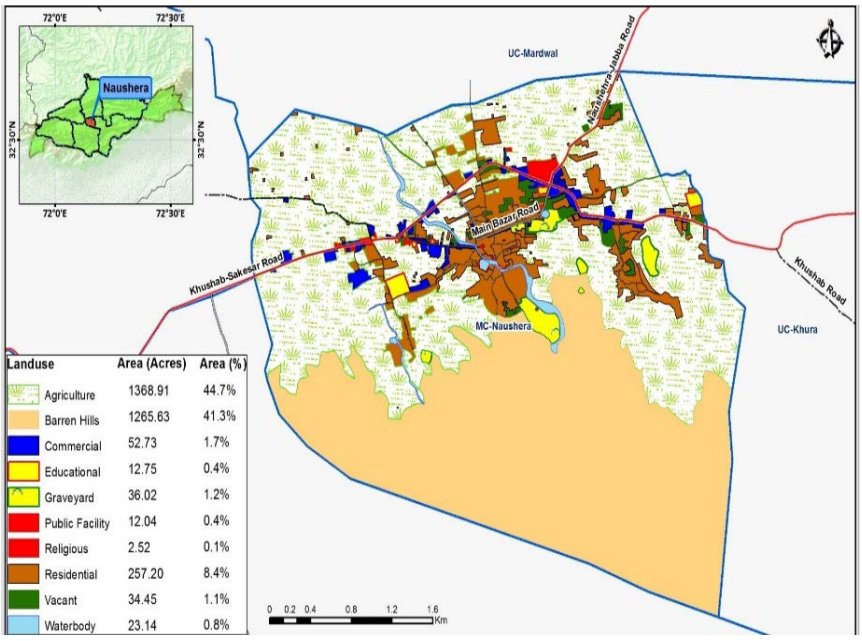



*Figure 22: Land Use Map for Naushera*

*Source: The Urban Unit, 2016*

## 4.5. Water: Sources, Storage & Delivery

Water sources in Soon Valley are very limited. Municipal water tanks, personal water borings, hand pumps and streams are the major sources of water. It emerged that the ground water is the prime source for the residents but the depth of water table is considerably very low. The settlements near to the water channels, ponds or lakes receive a relatively high water level as compared to other settlements. These settlements include; Jahlar, Uchhali and Khabekki where lakes are present. The following table summarizes the depth of water table in different villages of Soon Valley:



*Figure 23: Municipal Water Tank in Naushera takes stored water to the residents via piping system.*

*Source: Field Studies, the Urban Unit, 2016*

*Table 12: Depth of Water Table in Different Settlements of Soon Valley*

| *Sr. No.* | *Villages* | *Water Table Depth* |
|---|---|---|
| *1.* | Kufri | 150-200 ft. |
| *2.* | Jahlar | 130-150 ft. |
| *3.* | Anga | 250-300 ft. |
| *4.* | Sodhi Wali | 250-300 ft. |
| *5.* | Uchhali | 130-150 ft. |
| *6.* | Khabekki | 150-170 ft. |
| *7.* | Padhrar | 250-300 ft. |
| *8.* | Naushera | 200-230 ft. |

*Source: Field Survey Carried out by Urban Unit Team, 2015-16*

- *Scarce water sources are there including municipal water tanks, water borings, and hand pumps.*
- *Ground water being the prime source makes the water table significantly low.*
- *The water is pumped from tube wells & is stored in municipal water tanks & supplied via pipes*
- *The mixing of drainage & drinking water results into a poor quality.*

### i) Municipal Water Tanks

During the recent past, the number of tube wells were installed by the Government in major settlements such as: Kufri, Uchhali, Anga, Khabekki, Naushera, Padhrar and Sodhi. The water is pumped from these tube wells and stored in municipal water tanks and then supplied to the residents via pipelines. The field surveys expose that residents are totally unsatisfied with such municipal water scheme as the quantity and quality of water supplied is not up to the mark. The quantity of water supplied from these water tanks ranges from only half an hour to a maximum of an hour/day which seems inefficient. In addition to water shortage, quality of supplied water especially from municipal water tanks is



*Figure 24: Because of poor condition of the pipes, the Municipal water gets mixed with the drainage water pipes resulting to a poor quality*

*Source: Field Studies, the Urban Unit, 2016*

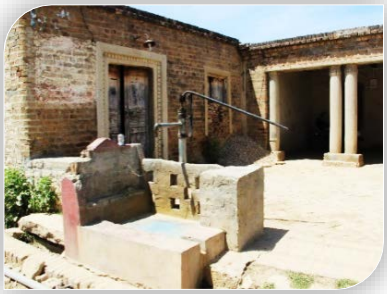


*Figure 25: People in the valley also make use of the hand pumps. The picture shows one such source of water in Sodhi Village*

*Source: Field Survey, the Urban Unit, 2016*



*Figure 26: The areas nearby lakes obtain water from the streams channel system. Water Pipelines Connected to Streams near Jahlar Village, is shown*

*Source: Field Survey, the Urban Unit, 2016*

another common complaint lodged by the residents. Sewerage water mixes with the supplied water due to poor and damaged water pipelines. At some location e.g. in Naushera main bazar, the water pipelines pass through the solid waste which enhances the mixing of sewage and drainage water with the drinking water. Moreover the quality of ground water received via personal borings and hand pumps is found to be satisfactory.

**ii) Water Boring**

The field studies reveal that due to lack of water supply from the municipal water tanks, people have managed boring at their homes. This water boring is very expensive as it costs PKR 120,000 approximately. Therefore, sharing of this boring facility is very common in the area i.e. people use to share this facility with neighbors which help them to avail this facility at an economical rate.

**iii) Hand Pumps**

The usage of hand pumps are also observed during the surveys. People with low economic backgrounds use these communal hand pumps for their domestic usage. These hand pumps are observed in Sodhi Jay Wali, Uchhali and at some locations of Kufri Village.

**iv) Streams**

People living close to the water channel, such as in Kufri, use the stream water coming from the mountains. Similarly, people living close to Jahlar Village, Chambal Mandar and Sodhi obtain water from streams and waterfalls for their daily use. Proper pipelines connecting water from streams to the settlements were also observed during the field survey.

### 4.5.1. Consumption

Water consumption pattern varies from house to house. For example; in Uchhali, water consumption per household is around 15 gallons per day for domestic usage and in some villages, where water table depth is high, consumption pattern is low i.e. around 10-12 gallons per household per day.

### 4.5.2. Water Quality

The water of Soon Valley is alkaline in nature and slightly above the permissible limits defined as per NEQS (i.e. 6-9) due to the dissolution of various salt content (i.e. carbonates, bicarbonates etc.) in both lakes. However, it is observed that pH of these lakes is not as much high that it becomes lethal to aquatic biodiversity. That's why both lakes support few fish species like Talabia, sundali, rahu etc. The drinking water obtained by hand pumps or motor pumps is in permissible limits of WHO and Pak-NEQs.11

However physiochemical analysis, microbiological analysis (i.e. Total Coliform and E.coli) depicted that drinking water quality of ground water sources of Ucchali, Chitta, Ugali, Khabeki, Uchala, Kotli villages is not in compliance with WHO and Pak-NEQs.

### 4.5.3. Water Tariff

Government formulated the local committee to collect the monthly charges for the municipal water schemes from the natives. During the field survey, it was highlighted by the residents that the monthly charges for these water schemes is considerably very high i.e. ranges from PKR 600 to 2,500 monthly, which is unaffordable for the residents especially the low income groups. Therefore, majority of people are now shifting from such water facility to personal water borings.

*Table 13: Source of Fresh Water*

| Source | %Age |
|---|---|
| Municipal Water Schemes | 9 |
| Water Boring | 68 |
| Hand Pumps | 16 |
| Streams | 4 |
| Others | 3 |

*Source: Extracted by the Consultants on the basis of Field Study*

- *The presence of salt content in the lakes make the water alkaline in nature.*
- *The drinking water from hand pumps or motor pumps is in permissible limits of WHO and Pak-NEQs.*
- *Tele communication as part of the physical infrastructure is also not there in the whole area.*
- *PTCL and landline service is only found present in Naushera and Khabekki*

## 4.6. Infrastructure Profile

### 4.6.1. Physical Infrastructure

#### 4.6.1.1. Water Supply System

As most of the water tanks and other schemes installed by government are not functional. So, majority of the residents use boring water and hand pumps for fulfilling their water demands. For example, in Sodhi, Uchhali, Kufri and Angah,

[11] Survey conducted by EIA Team of Urban Unit, 2015



*Figure 27: Communication Towers at Naushera provides ease to the people of this major settlement.*

*Source: Field Studies by the Urban Unit, 2015-16*



*Figure 28: Communication Towers at Uchhali are also room to many mobile networking operators.*

*Source: Field Studies, the Urban Unit 2015-16*

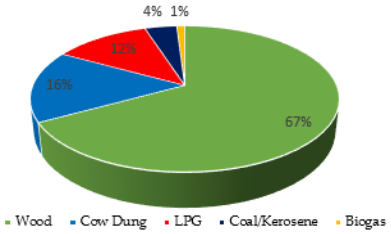



*Figure 29: Main Source of Energy for Cooking*



*Figure 30: Bio-gas Plant at Anga Village producing gas for domestic use*
*Source: Field Studies, the Urban Unit Team, 2016*

majority of the people obtain water through boring and hand pumps. The usage of municipal water schemes is very limited and is found at fewer places. Moreover, these water pipes pass through solid waste and drains that pollutes the quality of water resulting in spread of water borne diseases in the area.

#### 4.6.1.2. Tele-Communication

Only Naushera and Khabekki have telecommunication services of PTCL landline and rest of the Soon Valley is devoid of this infrastructure. Mobile communication towers of various service providers such as Jazz, Telenor, Ufone are also installed at various places in Naushera, Kufri, Jahlar, Uchhali, Sodhi etc.

#### 4.6.1.3. Sui Gas

There is no provision of Gas in entire Soon Valley. So, most of heating / culinary use dependence is on firewood, cow-dung and LPG, but LPG being expensive and in short supply in not a preferred choice of users (as it is primarily used for commercial purposes). The usage of biogas is very limited, as some biogas plants were found at some settlements nears Anga and Kufri. This huge dependence on wood, has increased stress on forests and air quality to a considerable extent.

#### 4.6.1.4. Electricity

Except few locations such as; Dhadhar Village and some other small settlements or dera in outskirts of Khabekki and Anga, the majority of the households are benefiting from electricity within the project area. Electricity situation is similar to the other areas of Punjab.

#### 4.6.1.5. Sanitation, Sewerage and Drainage Facilities

Sewage and drainage disposal is being observed as a major problem within the project area. Existing sewerage system in Soon valley is a combination of both closed and open drainage system. The majority of the area is not equipped with proper sewage pipelines. So, people dispose their waste water off in open and leaving it to be mixed in streams / springs thus

affecting their quality to harmful extents and further making it less worthy to the population in downstream areas. Run-off / rainwater is being drained over surfaces (both manmade and natural) and ultimately leads to the natural routes and again mixed up with sewage water.

#### 4.6.1.6. Solid Waste Management

Solid waste management system is absent in Soon Valley and people dump the waste openly in the fields, open plots and streets. Open dumping and burning of waste is a common practice. Almost all settlements experience such practice which not only hampers the beauty of the area with respect to tourism but also a source of spread of harmful diseases.



*Figure 31: Open Drains clogged with openly dumped solid waste in Kufri*

*Source: Field Studies, the Urban Unit, 2015-16*

### 4.6.2. Social Infrastructure

#### 4.6.2.1. Education

The data from field surveys reveals that the rate of primary level education is higher for females as compared to males, while in higher education the share of females is lower than their male counterparts. Overall level of educational attainment of population living in the valley is higher than the corresponding level nationwide as depicted in the table given below.

*Table 14: Literacy Rate (2016) in Soon Valley*

| *Overall (%)* | *Male (%)* | *Female (%)* |
|---|---|---|
| 72 | 50 | 28 |

*Source: Field Surveys Carried Out by Urban Unit Team, 2015-16*

However the educational facilities for girls is limited to middle level only. Furthermore, for gaining higher education people mostly go to other cities or gain education from private institutes.




*Figure 32: A View of a Government & and one of the very few Private Schools in Naushera, Soon Valley*

*Source: Field Studies, the Urban Unit, 2016*

*Table 18: Education Facilities in Soon Valley*

| Education Institutions | Gender | | | Total |
|---|---|---|---|---|
| | Male | Female | Co-Education | |
| High Secondary School | 5 | 2 | 0 | 1 |
| High School | 14 | 7 | 0 | 21 |
| Middle School | 11 | 7 | 0 | 18 |
| Primary School | 75 | 57 | 1 | 133 |
| Total | 105 | 73 | 1 | 174 |

*Source: Extracted by the Consultants on the basis of Field Studies*

*Table 15: Educational Facilities in Soon Valley*

| UC | High Secondary School | High School | Middle School | Primary School |
|---|---|---|---|---|
| Padhrar | 0 | 4 | 1 | 26 |
| Khabekki | 0 | 3 | 4 | 25 |
| Sodhi Wali | 0 | 3 | 3 | 18 |
| Naushera | 7 | 0 | 0 | 13 |
| Angah | 0 | 4 | 3 | 18 |
| Uchhali | 0 | 2 | 4 | 11 |
| Kufri | 0 | 5 | 3 | 22 |

*Source: Extracted by the Consultants on the basis of Field Studies*

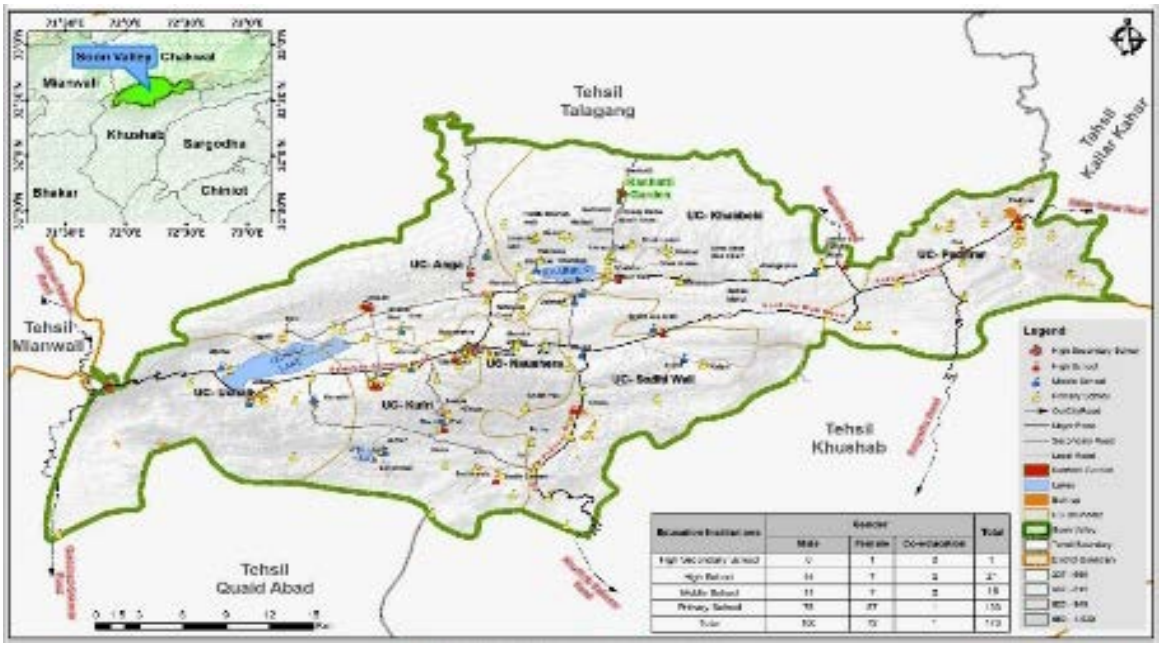



*Figure 34: Map of Educational Facilities in Soon Valley*
*Source: The Urban Unit, 2016*

### 4.6.2.2. Health

Currently, there exists only one Rural Health Center (RHC) in Khabekki and Padhrar along with small dispensaries and private clinics whereas only one private dispensary is present in Ugali but no single dispensary in Chitta village. Most of the villagers have to go to the private dispensaries in nearby towns like Naushera and Jauhrabad. Tehsil Headquarter Hospital Naushera lacks required infrastructure, as there is no male doctor in the hospital and trauma center and anesthesia center is not present. Moreover, there are 50 seats vacant for doctors and only 35 seats are filled. It is found that health facilities available in the above-mentioned villages are not adequate. In most of the BHUs, there is no lady doctor and severe problem is faced by the people in emergency. It is evident from the information collected that hospitals, rural health centers and women health centers are rare within the project area. Many of the people have suffered from diarrhea, hepatitis and other hygiene related complaints. Health facilities are shown in the adjacent table:

- *With the upgradation of Naushera to a tehsil, there are hopes that the social infrastructure will soon follow.*
- *Some improvements have been observed in this regard with an increase in the number of public schools, banks and other such facilities.*

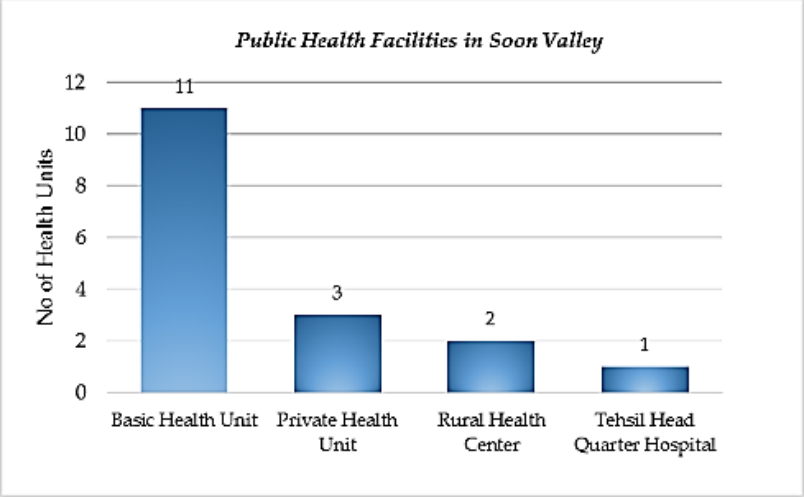



*Figure 35: Public Health Facilities in Soon Valley*

*Source: The Urban Unit, 2016*

*Table 20: Health Facilities in Soon Valley*

| Facilities | Health Unit |
|---|---|
| Basic Health Unit | 11 |
| Private Health Unit | 3 |
| Rural Health Center | 2 |
| Tehsil Head Quarter Hospital | 1 |
| Total | 17 |

*Source: Extracted by the Consultants on the basis of Field Studies, 2016*



*Figure 36: Views of the largest medical facility in the area, the Tehsil Headquarter Hospital, in Naushera*

*Source: Field Survey Conducted by Urban Unit Team, 2016*

*Table 21: Health Facilities in Tehsil & Union Councils of Soon Valley*

| *UC* | *Basic Health Unit* | *Private Health Unit* | *Rural Health Center* | *Tehsil Head Quarter Hospital* |
|---|---|---|---|---|
| *Padhrar* | 0 | 0 | 1 | 0 |
| *Khabbeki* | 1 | 0 | 1 | 0 |
| *Sodhi Wali* | 4 | 0 | 0 | 0 |
| *Naushera* | 0 | 2 | 0 | 1 |
| *Angah* | 1 | 0 | 0 | 0 |
| *Uchhali* | 3 | 1 | 0 | 0 |
| *Kufri* | 2 | 0 | 0 | 0 |
| *Total* | 11 | 3 | 2 | 1 |

*Source: Extracted by the Consultants on the basis of Field Studies*

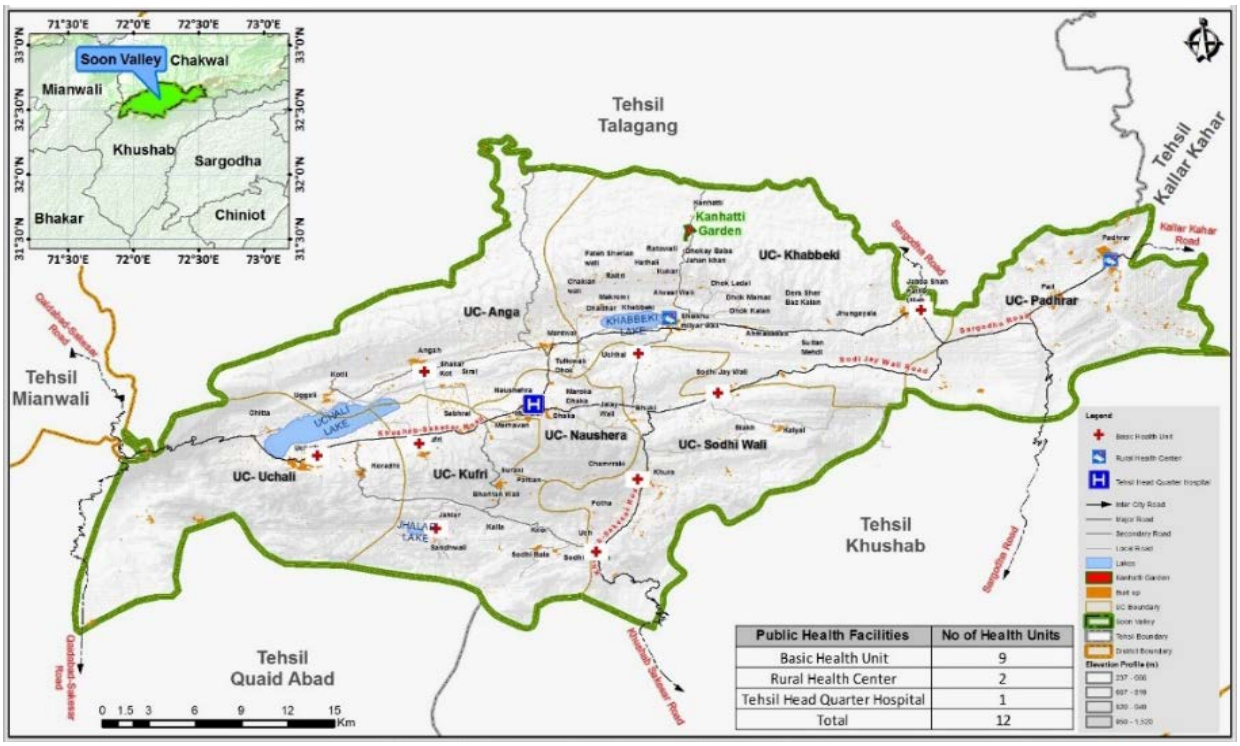



*Figure 37: Map of Health Facilities in Soon Valley*
*Source: The Urban Unit, 2016*

### 4.6.2.3. Public Offices

As Naushera is upgraded to Tehsil level so a number of public offices have been established which include NADRA, public sector banks, post offices, hospitals and public sector educational buildings etc.

| | | |
|---|---|---|
| Deputy District Education Office, Tehsil Naushera | Daftar Mahare Asmaar | Sub divisional office Telephone |
| Deputy District Education Office, Tehsil Naushera | Ombudsman (Muhtasib) Punjab, Tehsil Office Naushera | Office Patwar Circle, Mardwal |
| Arazi Record Center, Tehsil Naushera | Soon Valley Development Program, Branch Office Tehsil Naushera | Nadra office, Naushera |
| Naushera (Khushab) Post Office | Angah Post Office | Mardwal Post Office |
| Ugali Post Office | Dhadhar Post Office | Khabekki Post Office |
| Sodhi Post Office | Uchhali Post Office | Surraki Post Office |
| Kufri Post Office | Jahlar Post Office | Khura Post Office |
| Padhrar Post Office | Pail Post Office | |

*List of Public Offices in Naushera Tehsil*

- *There are a number of private banks present in the area.*
- *But once again most of these banks are located in Naushera while the rest of the Tehsil remains with only a limited options.*

### 4.6.2.4. Banks, ATMs and Financial Institutions

Public and private sector banks are present in Naushera and Uchhali. These include Habib Bank Limited, Muslim Commercial Bank, National Bank of Pakistan, United Bank Limited, etc. The complete list of banks is given as:

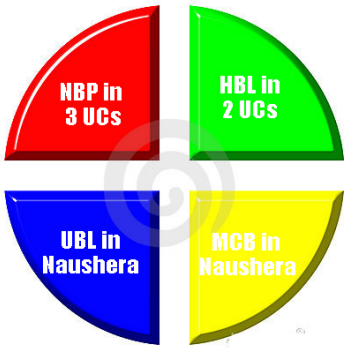



*Table 22: List of Banks in Soon Valley*

| *Bank* | *Branch* | *UC* |
|---|---|---|
| *NBP* | Pail Branch | Padhrar |
| | Khabbaki Branch | Khabbaki |
| | Naushera Branch | Naushera |
| *HBL* | Anga Branch | Anga |
| | Uchhali | Uchhali |
| | Naushera Branch | Naushera |
| *MCB* | Mardwal Chowk Naushera | Naushera |
| *UBL* | Naushera Branch | Naushera |

***Source: Extracted by the Consultant on the Basis of Primary & Secondary Data***

*Table 23: Length of Road Network in Soon Valley*

| Roads | Length Km |
|---|---|
| Major Road | 128.03 |
| Secondary Road | 81.93 |
| Local Road | 87.50 |
| **Total Length** | **297.48** |

*Source: Extracted by the Consultants on the basis of Primary & Secondary Data*

## 4.7. Transportation & Connectivity

Poor transportation infrastructure has been one of the major issue of Soon Valley causing accidents on regular basis. During rainy seasons, movement becomes very difficult for the people. Right of ways are narrow making it difficult for traffic to pass smoothly in peak hours.

### 4.7.1. Road Network

The total length of the road network in Soon Valley is about 297.48 km. Most of these roads are not usable in all seasons. The road network provides approaches to all main villages and lakes of the project area. The detailed description of the road network is given below:

The major inter-city roads connecting Soon Valley includes: Khushab-Sakesar Road, Sargodha Road, Kalar Kahar Road and Quaidabad-Sakesar Road

The roads have been further categorized as: Major, Secondary and Local Roads which are shown in the map given below

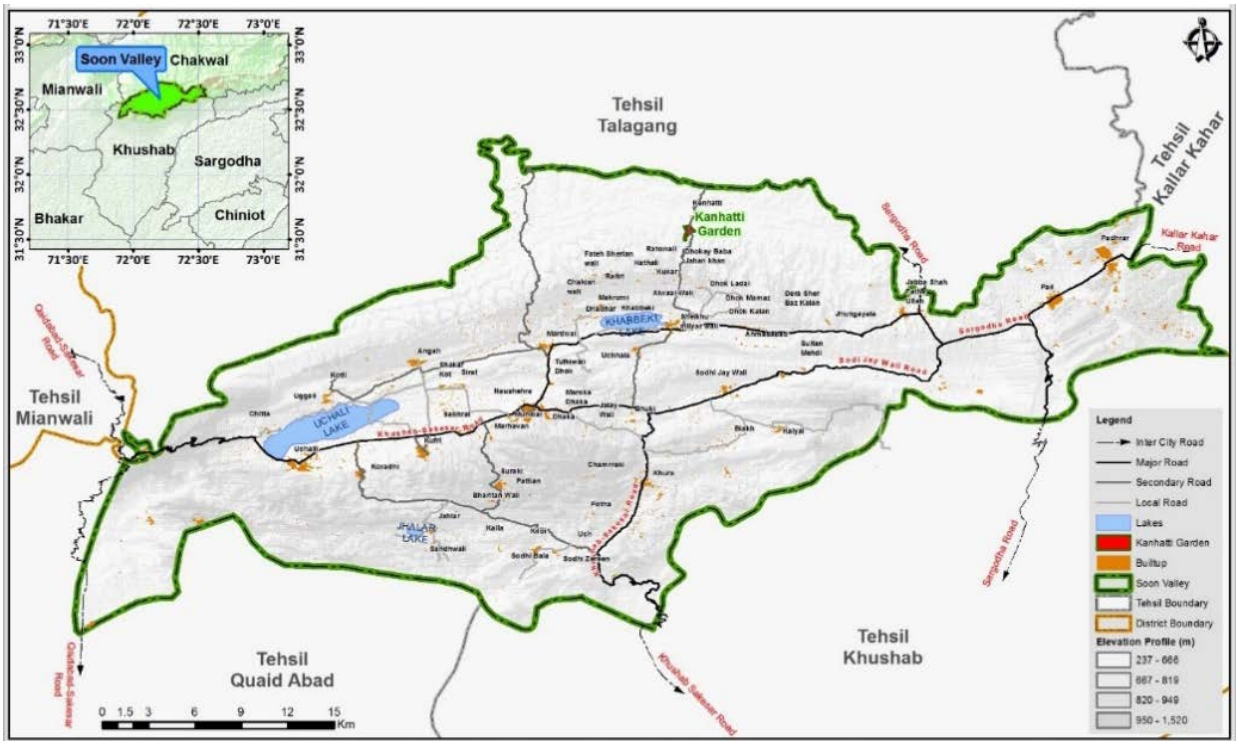



*Figure 38: Existing Road Network in Soon Valley*
*Source: The Urban Unit, 2015-16*

The majority of the roads within the Soon Valley are in poor condition and lie under the category of pack track as depicted in the map given below. Even though the major road such as Khushab-Sakesar Road, Sodhi Jay Wali Road etc. are metaled but are in very poor condition.

The following map shows the existing road network map with respect to condition.




*Figure 39: Deteriorated Road Condition in Soon Valley*

*Source: Field Survey, Urban Unit, 2016*

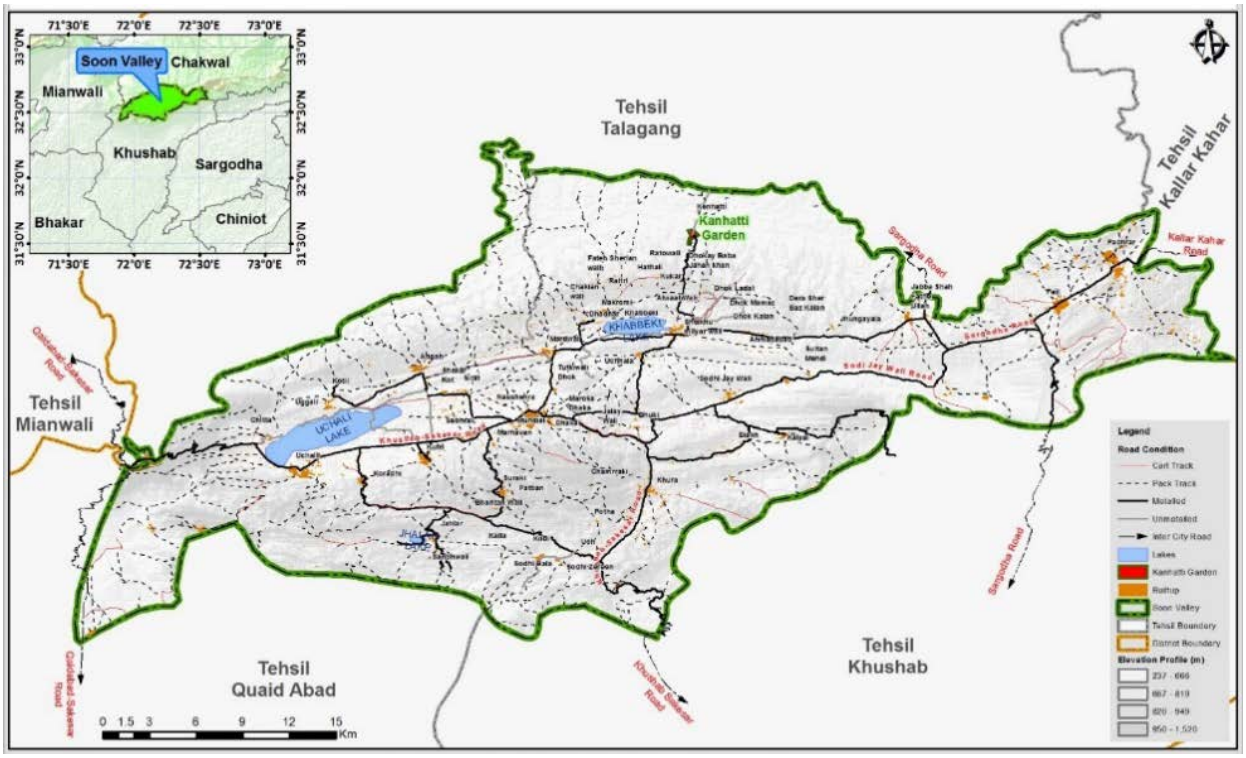



*Figure 40: Existing Road Network by Condition*

*Source: The Urban Unit, 2015-16*

## 4.7.2. Composition of Traffic

Traffic mostly consists of rickshaws, bicycles, Tongas, and vans. People mostly use these vehicles for most of their commuting. Such modes of traveling do not offer a decent transport, hindering the quality of life.



*Figure 41: Mixed mobility patterns & Modes in Naushera*

*Source: Field Studies, the Urban Unit 2015-16*

## 4.7.3. Pedestrian Support

Footpaths are considered as pedestrian islands which are found missing or in poor condition in the area. The footpaths which exist are mostly encroached upon by shops and



*Figure 42: A shabby Bus Stop near Sodhi Village, Soon Valley*

*Source: Field Studies, the Urban Unit Team, 2016*



*Figure 43: An extremely neglected Bus Stop near Kufri Village, Soon Valley*

*Source: Field Studies, the Urban Unit Team, 2016*

- *Due to lack of proper signage, direction finding in the rural settlements become almost impossible.*
- *There is no special provision for direction and vehicle availability for the tourist sites.*
- *The meagre bus facility that is available is unreliable.*

hawkers. This creates difficulty for pedestrian movement.

### 4.7.4. Traffic Management

Punjab Highway Patrolling Post is located on Pail Chowk, which manages all the traffic. Besides, there are no traffic wardens especially assigned for controlling the traffic in Soon Valley. Signage are provided along the main roads only. When you move along small settlements like Ugala, Banaka, Kalyal Sharif etc. it becomes very difficult to identify the right direction.

### 4.7.5. Bus Stops and Terminals

Bus stops are provided at various points like Uchhali, Sodhi, Kalyal Sharif, Ugala, Uchala but these bus stops are in crumbling situation.

### 4.7.6. Transportation Related Problems in Soon Valley

Fragile transportation system of Soon Valley is causing many problems for its residents. Firstly, most of the roads are in clumsy condition and inadequate provision of transport adds the dilemma. Chingchi travel from Naushera to Y-Cross, Sodhi, Uchala, Mustafaabad, Khabekki, Sabhral, Kufri, Shakar Kot. Chingchis are available from 6 am-6 pm.

During field studies by The Urban Unit, following roads were identified which were in poor condition.

1. Sodhi to Naushera
2. Naushera to Khushab Road
3. Naushera to Sakesar Road
4. Naushera to Jahlar Road
5. Links road to Kufri, Anga, Uchala and other settlements.

Timing and fares of the buses are causing problem to the travelers, as no bus service was available after 6 p.m. For visiting tourist sites, no public transport is available and private cars are hired.

## 4.8. Agriculture

Locals living in Soon Valley are dependent largely on agriculture and it is considered as the main source of livelihood. Field studies suggest that an average of 77% of cash crop i.e. wheat, cauliflower, potato and onions are grown on agriculture land around these lakes in order to achieve high yields. The average per acre yield for these crops is 2200 kg for wheat, 5600 kg for Cauliflower and 3000 kg for chillies. It is also found that the villagers of these areas are also involved in commercial cultivation of off-season vegetable and crops i.e. cultivation of oranges in summer season as well. Commonly grown cash crops around these lakes are described below:

- *The main occupation of the inhabitants of Soon Valley is agriculture.*
- *77% of the cash crop grown in the region is cultivated in the rich soil around the lakes.*
- *The major cash crops are wheat, potato and rice.*
- *Other than this many pulses are also grown in the valley.*
- *To diversify the income source, the cultivators of Soon Valley have also taken up farming of off-season vegetables.*
- *These vegetables tend to get more value in the nearby markets.*

*Table 24: List of Cash Crops Grown in Soon Valley*

| Common Name | Scientific Name |
|---|---|
| Wheat | Triticum aestivum |
| Potato | Solanum tuberosum |
| Cauliflower | Brassica oleracea |
| Rice | Oryza sativa |
| Corn | Zea mays |
| Lentil | Lens culinaris |
| Saag | Spinacia oleracea |
| Jute | Corchorus olitorius |
| Sorghum | Sorghum bicolor |
| Barley | Hordeum vulgare L. |
| Mung Bean | Vigna radiata |
| White Grains | Cicer arietinum |
| Black Grains | Vigna unguiculata |
| Sugar Cane | Saccharum officinarum |
| Onion | Allium cepa |
| Chillies | Capsicum annuam |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March, 2015*



*Figure 44: A Commercial Level Honey Production Site near Khura Village*

*Source: Field Survey, The Urban Unit, 2015-16*



*Figure 45: A Distant View of a Stone Crushing Unit near Sodhi*

*Source: Field Studies, the Urban Unit 2015-16*



*Figure 46: A Large Poultry Farm near Jahlar Village*

*Source: Field Studies, the Urban Unit 2015-16*

### Industrial Profile

Industry plays a vital role in the economy of every region, and brings prosperity in the life of local people. In soon valley, source of income of mostly people is agriculture and daily wagers. During field surveys, following industries are found:

- Poultry farms near Sodhi, Angah, Jahlar and Kufri
- Stone crushing Industry near Sodhi, Chanbal and Kalyal Sharif
- Coal Mining Industry near Kalyal Sharif
- Honey industries near Khura and Jahlar

## 4.10. Environmental Profile

### 4.10.1. Biological Resources

Biological resources represent one of Soon Valley's most abundant natural resources. Biological resources including flora and fauna are a major resource for the area because they represent the livelihood basis for a large portion of the population. These resources also provide Soon Valley with its tourist-attracting character. Soon Valley and its adjoining areas have retained rich floral diversity of the low lying sub-tropical forests, and different plant species have evolved drought and salinity tolerance.[12]

#### 4.10.1.1. Flora

On the hilly side of Soon Valley dense growths of grasses, shrubs, herbs, weeds and trees like Shisham, Dharek and Keekar etc. are present. The detailed description of floral species are summarized in the following table:

[12] Akram, N. A., M. Shahbaz and M. Ashraf. 2008. Nutrient acquisition in differentially adapted population of Cynodon dactylon (L.) Pers. and Cenchrus ciliaris L. under drought stress. Pak. J. Bot., 40 (4): 1433-1440.

*Table 25: List of floral species present at Project Site*

| Sr. No. | Floral Species in Uchhali Lake | Floral Species in Khabbeki Lake | Floral Species in Kanhati Garden |
|---|---|---|---|
| 1. | Phulai | Phulai | Schumach |
| 2. | Shisham | Shisham | Apple |
| 3. | Kikar | Kahu | Olive |
| 4. | Safeda | Toot | Mango |
| 5. | Dhrek | Safeda | Dates |
| 6. | Ber | Dhrek | Banana |
| 7. | Aksan | Anjeer | Anjeer |
| 8. | Kahu | Ber | Orange |
| 9. | Pomegrant | Sarsoo | Plumb |
| 10. | | | Pomegrant |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*

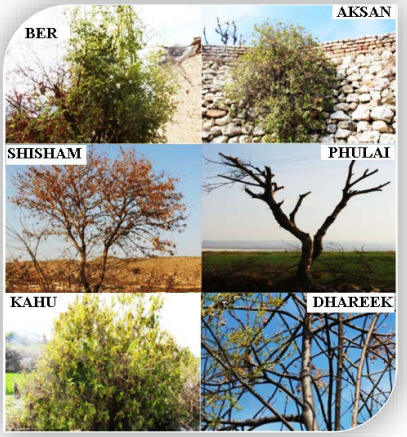



*Figure 47: Diverse Floral Species of Soon Valley*

*Source: Field Survey Conducted by EIA Team of Urban Unit in 2015*

Various habitats for the development of plant communities and grasses form dominant vegetation over extensive area and show great adoptability for life under very diverse ecological conditions. The table summarizes the details of grasses, herbs and shrubs at the project site.

*Table 26: List of grasses, herbs and shrubs present at project site*

| *Sr. No.* | *Location* | *Grasses* | *Herbs* | *Shrubs* |
|---|---|---|---|---|
| *1.* | Uchhali Lake | Brachiaria ramosa | Conyza bonariensis | Suaeda fruticosa |
| *2.* | | Cynodon dactylon | Solanum nigrum | ---------- |
| *3.* | | Suaeda fruticosa | ---------- | ---------- |
| *4.* | | Echinochloa colonum | ---------- | ---------- |
| *1.* | Khabbeki Lake | Cynodon dactylon | Parthenium hysterophorus | Suaeda fruticosa |
| *2.* | | Desmostachya bipinnata | Conyza bonariensis | ---------- |
| *3.* | | Brachiaria ramosa | Xanthium strumarium | ---------- |

- *The valley provides a variety of ecological conditions for the growth of Flora.*
- *This diversity produces a unique setting for each of the lakes.*
- *This provides a huge potential for development as a tourist spot as the plants, birds and animals will be a great attraction for animal and nature lovers.*
- *There is a great variety of herbs, shrubs and grasses are found in Soon valley.*

| | | | | |
|---|---|---|---|---|
| 4. | | *Echinochloa colonum* | ---------- | ---------- |
| 5. | | Dichanthium annulatum | ---------- | ---------- |
| 6. | | Setari apumila | ---------- | ---------- |
| 1. | Kanhatti Garden | Saccharum spontaneum | Solanum nigrum | Suaeda fruticosa |
| 2. | | Chrysopog onserrulatus | Avena sterilis | Bromus pectinatus |
| 3. | | Cynodon dactylon | Dicliptera bublenroides | Chrysopogon serrulatus |
| 4. | | Phalaris minor | Pupalia lappacea | ---------- |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*

- *Many of these herbs and shrubs have medicinal importance.*
- *This makes it even more important that an eco-tourist project be implemented in the area as uncontrolled growth and development could result in the loss of these valuable plan species.*

#### 4.10.1.2. Forests of Soon Valley

- *A number of forests are present in the Valley and fortunately there exist some provisions for its conservation.*
- *Hayatul Mir Forest is the largest of all with an area of 1646.55 hectares.*
- *These forests are mainly utilized by the residents to provide as animal grazing sites and fuel wood.*
- *For these uses grazing and fuel wood collection rights are being practiced by the inhabitants.*
- *Hayatul Mir Forest has some rights for mining as well.*

**a) Hayatul Mir (HM)**

The area of the forest is 1646.55 hectares. It is the only forest which has few compartments which are free of rights of any type of mining and quarrying in the area. It is surrounded by the following settlements: Kalial and Bayyakh towns in the north, Ararra in the east, Nalli in south and Khura in the west.[13]

**b) Khura West (KW)**

The area of the forest is 351.93 hectares. Grazing and fuel wood collection rights are being practiced in the entire forest. It is surrounded by the following settlements: Chamnakki in west, Potha, Khura in the east, Kund in the south and Uchhala and Bhukki in the north.

**c) Khura North (KN)**

The area of the forest is 186.71 hectares. It has common boundary with HM in the east. Grazing and fuel wood

[13] Khan, A. U., Ahmed, F., & Sharif, F. A. I. Z. A. (2013). Raipd ranking method for prioritizing restoration by evaluating humen influences on the status of serub forest: A case study. *Pak. J. Bot*, *53*(1), 11-16.

collection rights are being practiced in the entire forest. It is surrounded by the following settlements: Khura in west and Uchhala and Bhukki in the north with Bayyakh in the east.

### 4.10.1.3. Fauna

The project area supports a number of common birds and mammals' species including:

**Wood Pigeon:** The Wood Pigeon is a colony bird and is found at heights of not less than 4000' above mean sea level. The plumage of wood pigeon is generally similar to that of common Blue Rock. The only significant feature is its extra-long tail, which is unusual for the pigeon family. The bird is a swift flyer and the specially designed tail provides it excellent maneuverability. Its population is drastically decreasing, mostly because of loss of habitat. Moreover, very few people can differentiate it from the Common Blue Rock Pigeon.[14]

**Hedgehog:** Huge colonies of common Hedgehog inhabit the Sakesar top. The mammal is not very shy and often comes in close range of humans, as it feels no potential threat. In winters, the mammal goes into hibernation. The only factor responsible for its unnatural death is, vehicular traffic, on the road. The Sakesar peak can provide excellent opportunities for the study of hedgehogs.[15]

**Punjab Urial:** A few herds each comprising 10-15 Urials are present in the Soon Valley region. They are fighting a battle of survival against the local. Hunters (Shikarees), are distributed in almost all the villages of the valley, and possess a craze for hunting these magnificent animals, because of their delicious meat, trophy and for seeking thrills. Secondly, the Punjab Urial is affected by the loss of habitat, due to ever increasing numbers of coal and Salt mines along with human interference in the ecology of the Salt Range.[16]





*Cape Hare & Camel are also found in the Soon Valley, enhancing the beauty of the area*

*Source: Field Studies, the Urban Unit 2015-16*

- *Wood Pigeon is one of the birds that contribute to the beauty of the valley.*
- *Colonies of hedgehogs inhabit the area which is under threat as many of them are becoming victims of unnatural death due to vehicles.*
- *Leopards and Punjab Urials are fighting for their survival against the local hunters who fail to understand the importance of their existence.*

[14] Ahmad, Z. (2002). Conservation of Wild life and its habitat in Soan Valley.*Tiger Paper*, *29*(1), 12-16.

[15] ibid.

[16] ibid





*Donkeys and cows are also widely found in the area which are used for transportation and food purposes respectively*

- *Many animal species of the region add to the picturesque beauty of the Valley.*
- *Of these animals Red Fox, Palm Squirrel, Golden Jackel, Punjab Urial and Mangoose can prove to be attraction highlights of the Valley.*
- *Soon Valley provides for an unusual opportunity to see these wild animals in their natural habitats which are hardly touched by humans and is contrary to the option of zoos that Pakistanis normally have.*

**Leopard**: Salt Range supported a comfortable population of Leopards till mid of 20th century, there after it fell prey to the hunting instincts of men and loss of habitat.

The following table summarizes the details of all mammals present at the project site

*Table 27: Common and Scientific Name of Mammals in Soon Valley*

| Location | Common Name | Scientific Name |
|---|---|---|
| **Uchhali Lake** | Red fox | Vulpus vulpus |
| | Cap Hare | Lepus capensis |
| | Punjab Urial | Ovis vignei punjabiensis |
| | Wild Boar | Sus scrofa |
| | Chinkara | Gazella bennettii |
| | Mangoose | Herpestes edwardsi |
| | Porcupine | Hystricomorph, Hystricidae |
| | Camel | Camelus dromedarius |
| | Buffalo | Bubalus arnee |
| | Goat | Capra aegagrus hircus |
| **Khabekki Lake** | Cap Hare | Lepus capensis |
| | Wild Boar | Sus scrofa |
| | Mangoose | Herpestes edwardsi |
| | Red fox | Vulpus vulpus |
| | Chooha | Golunda ellioti |
| | Chumgadar | Scotophilus heathii |
| | Golden jackel | Canis aureus |
| | Camel | Camelus dromedarius |
| | Buffalo | Bubalus arnee |
| | Goat | Capra aegagrus hircus |
| **Kanhatti Garden** | Porcupine | Hystricomorph, Hystricidae |
| | Jungli Billi | Vivera indica |
| | Indian Hare Khargoash | Lepus nigricolis |
| | Red fox | Vulpus vulpus |
| | Cap Hare | Lepus capensis |
| | Palm squirrel | Funambulus pennantii |
| | Common Rat | Rattus rattus |
| | Common Yellow bellied Bat | Scotophilus heathii |
| | Small Indian civet | Vivera indica |

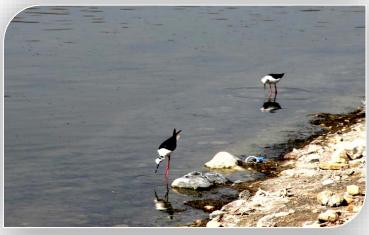
*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*

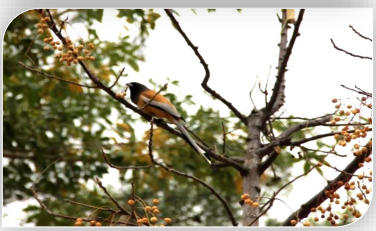
### 4.10.1.4. Avifauna/ Bird

Wide range of residents and migratory birds were observed during the visit i.e. Uchhali and Khabekki lake as well as Kanhatti garden. The local birds species present at project site is enlisted as:

| *Location* | *Common name* | *Scientific name* |
|---|---|---|
| *Uchhali lake* | Eagle Owl | *Bubo bubo* |
| | House Crow | *Corvuss plendens* |
| | House Sparrow | *Passer domesticus* |
| | Common Myna | *Acrido therestristis* |
| | Common Koel | *Eudynamys scolopacea* |
| | Ringed or Collard Dove | *Streptope liadecaocto* |
| | White-cheeked Bulbul | *Pycnonotus leucogenys* |
| | Coot | *Fulica atra* |
| | Grey Francolins | *Francolinus pondicerianus* |
| | Black Francolins | *Francolinus francolinus* |
| | Black shouldered kite | *Elanu scaeruleus* |
| | Little Brown Dove | *Streptopeli asenegalensis* |
| *Khabekki Lake* | House Sparrow | *Passer domesticus* |
| | House Crow | *Corvus splendens* |
| | Indian kite | *Milvus migrans* |
| | Red vented Bulbul | *Pycnonotus leucogenys* |
| | Streaked Long-tailed Warbler | *Prinia gracilis* |
| | Coot | *Fulica atra* |
| | Red eye dove | *Streptope liadecaocto* |
| | Wood pecker | *Picidae* |
| | Black shouldered kite | *Elanus caeruleus* |
| | Grey partridge | *Francolinus pondicerianus* |
| | Cuckoo | *Clamator jacobinus* |
| | Ducks | *Oxyura leucocephala* |
| | Hen | *Gillinula chloropus* |
| *Kanhatti Gardens* | House crow | *Corvus splenden* |
| | House sparrow | *Passer domesticus* |
| | Coot | *Fulica atra* |
| | Red-wattled Lapwing | *Hoplopterus indicus* |
| | Little Brown Dove | *Streptopelia senegalensis* |
| | Common Myna | *Acridothere stristis* |
| | Common Koel | *Eudynamys scolopacea* |
| | Indian Baya | *Ploceus philippinus* |
| | Purple sunbird | *Nectarinia asiatica* |
| | Pond Heron or Paddy Bird | *Ardeola grayii* |
| | Black shouldered kite | *Elanu scaeruleus* |
| | Desert Warbler | *Desert warbler* |

*Table 28: Common & Scientific Name of Avifauna Birds Soon Valley*
*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*





*Uchhali Lake is a home to a number of flamingos that migrate to the area and add beauty to the lake. Coot is another bird found in the area*
*Source: Field Studies, the Urban Unit 2015-16*





*Streaked long tail warbler and hawks are also two faun species that are found rare in the valley.*

*Source: Field Studies, the Urban Unit 2015-16*

#### 4.10.1.5. Migratory Bird Species

Both Uchhali and Khabekki Lake are the homes of Siberian migratory birds' species during winter season. The first arrival of the birds normally takes place between September to October and back migration starts during February to March. The migratory birds found at project site is enlisted in the following table:

- *Migratory Siberian birds make home at Uchhali and Khabekki during winters.*
- *The Flamingos, incorporated in the project logo, are the most attractive of these birds.*
- *The presence of these magnificent birds make this area an international bird watching spot from which the Soon valley regional and the country as a whole can generate beneficial results.*
- *The fact that these natural resources can cause monetary gains will enhance its preservation efforts.*

*Table 29: Details of Migratory Birds at Soon Valley*

| Sr. No. | Location | Common Name |
|---|---|---|
| 1. | Uchhali & Khabekki Lake | Black winged Stilt |
| 2. | | Common Swallow |
| 3. | | Brahminy Starling |
| 4. | | Coot |
| 5. | | White Headed Duck |
| 6. | | Grey Francolins |
| 7. | | Flamingos |
| 8. | | Steaked Long-tailed Warbler |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*

#### 4.10.1.6. Fishes/ Pisces

Present conditions of Uchhali lake water were not suitable for aquatic life due to presence of salt. However, few common fish species were observed in Uchhali Lake and few introduced fish species along with some common fish species observed in Khabekki Lake as described below:

*Table 30: Local and Introduced Fish Fauna in Soon Valley*

| Sr. No | Common Name | Scientific Name | Uchhali Lake | Khabekki Lake |
|---|---|---|---|---|
| **LOCAL FISH FAUNA** | | | | |
| **1.** | Dogra | Crossocheilus Iratius | + | + |
| **2.** | Sundali | Schistura punjabensis | - | + |
| **3.** | Pakistani Chilwa | Barilius pakistanicus | + | + |
| **INTRODUCED FISH FAUNA** | | | | |
| **1.** | Rohu | Labeo rohita | - | + |
| **2.** | Common Carp | Cyprinu scarpio | - | + |
| **3.** | Silver Carp | Hypophthalmichthys molitrix | - | + |
| **4.** | Grass Carp | Ctenopharyngodon idella | - | + |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March 2015*

- *The presence of salt content in the lakes make the water alkaline in nature which means that these lakes cannot support many of the aquatic animals.*
- *Simultaneously, this makes the resistant water animals that live in these lakes a more interesting feature of the lakes.*
- *The presence of nearby flora has enabled many reptiles/amphibians to flourish in the Valley.*
- *These species are hard to find and their search will add to the attraction provided at these sites.*

### 4.10.1.7. Reptiles & Amphibians

Amphibians and reptiles are important classes of animals among the vertebrates. Few reptiles and amphibians species were observed at the project site. The remaining species have been recorded through secondary data obtained through discussions with the local inhabitants and consulting the previous literature citations as shown in the table given below:

- *The table shows a long list of different reptiles / amphibians present in the region.*
- *This extensive list contains lizards, frogs and snakes of different kinds.*
- *Together the plants, birds, reptiles and mammals make a unique ecological system that needs to be preserved in its natural form to be used as an asset for the generations to come.*

*Table 31: Details of Reptiles and Amphibians present at Soon Valley*

| Sr. No. | Location | Common Name | Scientific Name | Class |
|---|---|---|---|---|
| 1 | Uchhali Lake | *Spiny-tailed groundlizard/ Sando* | *Uromastyx hardwickii* | Reptilia |
| 2 | | *Brilliant agama/Korr Kirili* | *Trapelus agilis agilis* | Repitilia |
| 3 | | *Long-tailed desert lacerta/Kirili* | *Mesalina watsonana* | Repitilia |
| 4 | | *Beaked thread snake* | *Leptotyphlops macrorhynchus* | Repitilia |
| 5 | | *Bull-frog/ Daddo* | *Hoplobatrachus Tigerinus* | Amphibia |
| 6 | | *Marbled Toad/ Daddo* | *Bufo stomaticus* | Amphibia |
| 1 | Khabekki Lake | *Spiny-tailed ground lizard/ Sando* | *Uromastyx hardwickii* | Repitilia |
| 2 | | *Sochurek's sawscaled vipor* | *Echis carinatus sochureki* | Repitilia |
| 3 | | *Brilliant agama/Korr Kirili* | *Trapelus agilis agilis* | Repitilia |
| 4 | | *Bull-frog/ Daddo* | *Hoplobatrachus Tigerinus* | Amphibia |
| 1 | Kanhatti Garden | *Indian garden lizard/ Sedar* | *Calotes v. versicolor* | Repitilia |
| 2 | | *Beaked thread snake* | *Leptotyphlops macrorhynchus* | Repitilia |
| 3 | | *Indian or common Krait/ Sangchoor* | *Bungarus c. caeruleus* | Repitilia |
| 4 | | *Bull-frog/Daddo* | *Hoplobatrachus tigerinus* | Amphibia |

*Source: Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March, 2015*

## 4.10.2. Physical Resources

### 4.10.2.1. Soil

Normally, soil is rich in fertility and alluvial which is rich in clay with moderate porosity and permeability good for vegetation. Not only seasonal but off seasonal vegetation is also grown here.[17]

- *The soil is alluvial being rich in clay and very fertile.*
- *The moderate porosity and good permeability makes it very suitable for cultivation of different crops.*
- *The region lacks a proper river system and only drainage watercourse is present.*
- *The main water bodies of the Valley are the beautiful lakes of Uchhali, Khabekki and Jahlar.*
- *There are a number of streams present that feed these lakes.*

### 4.10.2.2. Water

There is no river within the site, except the drainage watercourse that runs through the proposed area. Only lakes (Uchhali, Khabekki and Jahlar lakes) which naturally exist are present in the soon valley. These lakes are of prime importance as these wet lands are the winter sites of rare or vulnerable waterfowls, especially the white-headed duck.[18] The wells situated with a short distance of these lakes have sweet drinking water, showing that the saline water of lakes does not affect the underground water.[19] There are also streams in the area, which flow between the mountains, near Sodhi and Kanhati. The nearby areas are irrigated by this water.

The principal streams which traverse through this region includes: Kurrudi, Kaila, Athal, Gusa Wala, Saruli, Mannan wan, Dhrakkin, Sabhral, Gub, Jaba, Deep sharif, Kahchara, Sarhal and katora nullahs. These streams and nullahs flow from the south to north direction and mostly drop into the above mentioned lakes.[20]

### 4.10.2.3. Ground Water

Ground water is available in three types of aquifers in Soon Valley i.e. hard rock aquifer, aquifer under piedmont plain and aquifer in basins of the valleys. Due to vast variation in the composition of aquifers materials, the availability of

[17] Environmental Impact Assessment, Report of Soon Valley Development Project prepared by Urban Unit in March, 2015

[18] Nawazish, S., M. Hameed and S. Naurin. 2006. Leaf anatomical adaptations of Cenchrus ciliaris L. from the Salt Range, Pakistan against drought stress. Pak. J. Bot., 38 (5): 1723 –1730.

[19] Ahmad, A. 1964. Vegetation of the Salt Range. Pak. J. Forest. 25 (1): 36-64.

[20] Disaster Mitigation & Preparedness Plan Soon Valley Pilot Project, Prepared by NESPAK and ICS in October 2006

ground water reduces in hard aquifers along the foot hill to aquifers in the center of the valet. The water table and potential of tube wells also change accordingly.

Water table in the valley ranges from 120 ft. to about 300 ft. deep along the piedmont and shallow in the center of the valleys. The maximum depth to which aquifers have been explore in the area is 400 ft. by the public water supply tube wells.

- *Rainfall is the only source that feeds the water features of the Valley.*
- *The big depressed basins in the valley become accumulation sites for the water runoff caused by rainfall.*
- *The wetland system of Soon Valley is known as the Uchhali Wetland Complex and consists of: Uchhali, Khabekki and Jahlar lakes.*
- *The Uchhali Wetlands Complex was given the status of Ramsar Site in the year 1996.*

### 4.10.2.4. Surface Water

Rainfall is the only source creating runoff in the valley. No perennial and non-perennial surface water source enter or leave the Soon Valley. Several major nullahs bring flow towards the low lying areas. As there is no stream gauging station at any of the nullahs in the Project area, no stream flow record is available.

### 4.10.2.5. Drainage Basin Characteristics

The rainfall runoff flows towards the low-lying central part of the valley, which is studded with two extensive depressions. The direct runoff due to rainfall ultimately accumulates into these depression creating lakes namely Uchhali Lake (situated in the western part) and Khabekki Lake (in the eastern part of the region). Within the hill range in the south there also exits low-lying areas. The rainfall run off of the surrounding drainage area accumulates in a depression, forming a lake which is known as Jhalar Lake. The drainage area of Uchhali, Khabekki and Jhalar Lakes are: 209, 47 and 8 square kilometer respectively.

## 4.10.3. Wetlands of Soon Valley

The wetlands located in Soon Valley are known as the Uchhali Wetland Complex. It is the group of three independent wetlands namely, (i) Uchhali; (ii) Khabekki; and (iii) Jhalar. The Uchhali Wetlands Complex was declared as a Ramsar Site in year 1996. The catchment area of these lakes is almost 381 km whereas the surface area for water in these three lakes is 12.43 km2 (1243 ha).

### 4.10.3.1. Khabekki Lake

It is a lake having an area about 283 ha in the Salt Range with shallow brackish water. It is situated around 10 km north-east of Naushera village and 38 km northwest of Khushab District between 32°37' N latitude and 72°14' E longitude, at an elevation of 740 meters above MSL. The lake is filled by rainfall and various sporadic water streams rising in the adjacent hills. In recent years, the water level has increased by 30-60 cm, which has caused an increase in the size of the lake and decrease in its salinity.

Khabekki is notified as a Wildlife Sanctuary[21] vide section 16 of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, vide Notification No. SOFT (EXT) XII-1/89, dated 03-09-2004, w.e.f. 25-12-2002.



*Uchhali Lake serves as a wildlife sanctuary to the white headed ducks, who when migrate beautify the place*

*Source: Field Survey, the Urban Unit 2015-16*

- *The lakes are shallow with brackish water.*
- *The water level in the lakes has increased causing a decrease in salinity.*
- *Khabekki and Jahlar lakes are notified s wildlife sanctuaries while Uchhali as a Game Reserve.*

### 4.10.3.2. Jhalar Lake

It is a lake of area about 17 ha in the Salt Range with small brackish to saline water characteristics. It is situated around 10 km south-east of Uchhali lake and 10 km south-west of Naushera village, Khushab District, Punjab Province. Its geographical extent is between 32°29' N latitude and 72°07' E longitude at an elevation of 819 m above MSL. The run-off water from the adjacent hills of Salt Range fills this lake. Its depth ranges from 0.2 m to 6 m depending on the quantity of rainfall received.

Jhalar Lake is notified as a Wildlife Sanctuary vide section 16 of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, vide Notification No. SOFT (EXT)XII-2/93, dated 10-12-2004, w.e.f. 02-02-2003.



*The breathtaking views at Khabekki Lake attract the eyes of many*

*Source: Field Survey, the Urban Unit 2015-16*

### 4.10.3.3. Uchhali Lake

It is the largest lake with area about 943 ha, with brackish to saline water characteristics. It is situated 13 km west of Naushera and 42 km northwest of Khushab District, Punjab

[21] Ban on entering or residing, land cultivation, damaging vegetation, hunting or killing of animals within one-mile boundary, introducing exotic species and domestic animals and polluting water.



*Figure 48: Water samples collected from different locations of Soon Valley to assess water*

*Source: EIA Team, the Urban Unit 2015-16*

- *The surface water analysis of the Uchhali wetland complex was done during the summer season of 2015..*
- *The water samples have been tested against 21 parameters.*
- *The analysis revealed that the pH of the lakes was alkaline and slightly higher than permissible levels.*
- *This is increased pH is mainly due to the dissolving of salts into the lake water.*

Province, and surrounded by agricultural lands. Its geographical extent is between 32°33' N latitude and 72°01' E longitude. The lake is fed run-off from the surrounding hills of the Salt Range and a small spring, seepage from nearby irrigated land. The water level and salinity fluctuate according to local rainfall. The depth of the lake varies from 0.2 m to 6 m; and water is usually hyper-saline (41.5 ppt) with a pH of about 10.

Uchhali Lake is notified as a Game Reserve[22] vide section 18 of Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, vide Notification No. SOFT (EXT)XII-8/86, dated 09-07-1995, w.e.f 09-07-1996.

### 4.10.4. Water Quality

#### 4.10.4.1. Surface Water Analysis

Surface water samples from Soon Valley Complex (i.e. from Uchhali Lake, Khabekki Lake) were collected in summer season during 16-28th April, 2015. The sampling strategy was Grab sampling and total Nineteen (19) samples were collected out of which 13 samples were taken from Uchhali Lake and 6 samples were taken from Khabekki lakes. Out of 13 Uchhali lake samples, 6 were taken from the lake's edges while 7 were from center of Uchhali Lake. Whereas, in case of Khabekki lake, all 6 samples were taken from the lake's edges. Afterwards, the physiochemical analysis of these samples were conducted and total twenty one (21) concerned parameters which includes *(pH, TDS, TSS, Total hardness, BOD, COD, Chlorides, Carbonates, Bicarbonates, Sulphates, Calcium, Magnesium, Sodium, Potassium, Cadmium, Chromium, Copper, Lead, Arsenic, Zinc and Iron)* were analyzed. The results from these samples are summarized as:

- The **pH** of Uchhali and Khabekki lake water samples during study period lied between 8.7-9.7 and 8.75-9.1 respectively. The results revealed that **pH was alkaline in**

[22] No hunting, killing or capturing of animals provided certain conditions by the government

**nature and slightly above the permissible limits** defined by NEQS (i.e. 6-9) due to the dissolution of various salt content (i.e. carbonates, bicarbonates etc.) in both lakes. However, it was observed that pH of these lakes were not as much high that it becomes lethal to aquatic biodiversity. That's why both lakes support few fish species like Talabia, sundali, rahu etc. The obtained results of ***TDS*** (3045.05mg/L-63750mg/L for Uchhali Lake whereas 3094mg/L-3451.85mg/L for Khabekki lake), ***TSS*** (23mg/L-42mg/L for Uchhali Lake whereas 7.5mg/L-9.1mg/L for Khabekki lake) and ***Total Hardness*** (3950mg/L-8260mg/L for Uchhali Lake whereas 665mg/L-771mg/L for Khabekki lake) revealed that these **values were in high range as compared to PAK-EPA permissible limits**. High concentration of TDS in lake water was due to higher concentration of dissolved salts, natural movements of surface tides, high wind speed and surface runoff, however, low concentration of TSS was detected because the salts content present in the lakes were in dissolved form rather suspended. Moreover geological pattern of the area and weathering of sedimentary rocks were also major contributing factors in increasing TDS, TSS and Total Hardness of lake water and thus make these lakes bit turbid and deteriorate the lake's water quality.

- The obtained results of **BOD** (i.e. 2560mg/l-6640mg/l for Uchhali lake and 1086mg/l-1286mg/l for Khabekki lake) and **COD** (5280mg/l-10960mg/l for Uchhali lake and 2410mg/l-2610mg/l for Khabekki lake) were **high as compared to NEQs permissible limits** due to the presence of high algal growth which ultimately leads to eutrophication and reduces the Dissolved oxygen content at about 5-6 feet below the surface level. However, at the surface level of both lakes the measured DO values were up to the standard values prescribed by PAK-EPA because although abundant algal growth was observed there yet these algae were not dead (dead alga leads to hypoxia condition that results in

- *The hardness of the surface water was found to be significantly higher than allowed levels*
- *The analyzed water samples also showed alleviated levels of BOD and COD.*
- *The Do levels measured from the water samples of this wetland complex were within the permissible limits.*
- *The lower levels of DO are due to the continuous aeration of the water bodies that prevents the algae from dying.*

reduction of DO and bad odor) because of continuous aeration. As well as during the study period, dilutions in the lakes were observed due to the rainfall and high wind speed. However, generally the fluctuating trend of BOD and COD values were observed with varying seasonal pattern as well as migratory birds may also pose their influence on lake's surface water quality.

- The ***ionic composition*** of the lakes includes both cations and anions. The *cations* include **calcium** (10.8mg/L-55.2mg/L for Uchhali Lake whereas 8.12-9.7 for Khabekki lake), **magnesium** (989mg/L-2112mg/L for Uchhali lake whereas 158.4mg/L-182.7mg/L for Khabekki lake), **potassium** (142mg/L-374mg/L for Uchhali lake whereas 40.4mg/L-52.4mg/L for Khabekki lake) and **sodium** (8970mg/L-18575mg/L for Uchhali lake whereas 845mg/L-912.4mg/L for Khabekki lake). Moreover, the *anions* includes **sulphates** (9200mg/L-21658mg/L for Uchhali lake whereas 1410.5mg/L-1595mg/L for Khabekki lake), **carbonates** (45mg/L-101mg/L for Uchhali lake whereas 12.5mg/L-29.1mg/L for Khabekki lake), **bicarbonates** (340mg/L-703mg/L for Uchhali lake whereas 142.2mg/L-168.5mg/L for Khabekki lake) and **chlorides** (9123mg/L-19127mg/L for Uchhali lake whereas 227.5mg/L-286.8mg/L for Khabekki lake). All the detected ions dissolved in lakes water are essential to the health of aquatic biota. For example plants and fishes used calcium for proper functioning of their cells. Magnesium is used for photosynthetic activity by aquatic plants. Usually there are no permissible limits of these salts devised by PAK-EPA. However, these **salts were present in high concentration** due to fertile soil erosion, agricultural runoff, geological basin of the area, dilutions due to precipitation. Along with these factors, several other anthropogenic activities also posed their profound influences on lakes biochemistry and increases their nutrient and salts composition.

- *The salt content of the lakes consists of calcium, potassium, and sodium ions.*
- *The cationic composition is mainly of sulphates, carbonates, bicarbonates and chlorides.*
- *As there are no permissible limits for these salts in PAK-EPA, a general conclusion was drawn that these levels are considerably higher than anticipated.*
- *The main reason for these high salt concentration is soil erosion and agricultural runoff.*

The following tables shows the detailed description of these analysis carried out at Uchhali and Khabekki i.e. surface water quality analysis at Uchhali and Khabekki Lake while drinking water quality analysis in Uchhali and Khabekki Villages.

*Table 32: Surface Water Quality Analysis of Uchhali Lake*

| Parameters | NEQS Standards | Survey Results |
|---|---|---|
| PH | 06 to 09 | 9.21 |
| TDS | 3500 | 36127.20 |
| TSS | 200 | 27.60 |
| Total Hardness | | 4625.48 |
| BOD | 80 | 3800.08 |
| COD | 150 | 6348.62 |
| Chlorides | 1000 | 10539.97 |
| Carbonate | --- | 55.61 |
| Bicarbonate | --- | 391.23 |
| Sulfate | 600 | 11282.57 |
| Calcium | --- | 24.86 |
| Magnesium | --- | 1129.27 |
| Sodium | --- | 10093.35 |
| Potassium | --- | 195.24 |
| Cadmium | 0.1 | 0.00 |
| Chromium | 1 | 0.00 |
| Copper | 1 | 0.94 |
| Lead | 0.5 | 0.01 |
| Arsenic | 1 | 0.00 |
| Zinc | 5 | 1.33 |
| Iron | 8 | 1.43 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

- *The surface water quality analysis of Uchhali Lake reveal the pH equal to 9.21 when the NEQs standards read from 06 to 09.*
- *The presence of vast variety of chemicals in the water makes it unfit for drinking.*
- *For most of the chemicals the amount falls beyond the NEQs standards while there are few those fulfill the criteria.*

*Table 33: Surface Water Quality Analysis of Khabekki Lake*

| Parameters | Unit | NEQS | Survey Findings |
|---|---|---|---|
| **Color** | Objectionable/ Unobjectionable | | Objectionable |
| **Odor** | Objectionable/Unobjectionable | | Objectionable |
| **PH** | 06 to 09 | | 8.90 |
| **Temperature** | °C | 40 | 23.76 |
| **TDS** | mg/L | 3500 | 3225.57 |
| **TSS** | mg/L | 200 | 8.10 |
| **T. Hardness** | mg/L | --- | 719.57 |
| **BOD** | mg/L | 80 | 1222.33 |
| **COD** | mg/L | 150 | 2520.67 |
| **Chlorides** | mg/L | 1000 | 274.25 |
| **Carbonate** | mg/L | --- | 25.77 |
| **Bicarbonate** | mg/L | --- | 152.97 |
| **Sulfate** | mg/L | 600 | 1501.38 |
| **Calcium** | mg/L | --- | 8.80 |
| **Magnesium** | mg/L | --- | 170.53 |
| **Potassium** | mg/L | -- | 45.72 |
| **Cadmium** | Ppb | 0.1 | 0.00 |
| **Chromium** | mg/L | 1 | 0.00 |
| **Copper** | mg/L | 1 | 1.13 |
| **Lead** | mg/L | 0.5 | 0.00 |
| **Arsenic** | mg/L | 1 | 0.00 |
| **Zinc** | mg/L | 5 | 0.99 |
| **Iron** | mg/L | 8 | 0.71 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

- *The surface water quality analysis for Khabekki Lake reveal the pH value to be merely within the NEQs standards.*
- *The color of the water is also unfavorable and objectionable towards its usage.*
- *The color of water also turned out to be objectionable that hinders the good quality of water.*

*Table 34: Drinking Water Quality Analysis of Uchhali Village*

| Sr. # | Parameters | Unit | WHO* | Pak-NEQS* | Results |
|---|---|---|---|---|---|
| **1** | PH | --- | 6.5-8.5 | 6.5-8.5 | **7.89** |
| **2** | Taste | --- | Non-Objectionable/Acceptable | Non-Objectionable/Acceptable | **Acceptable** |
| **3** | Odor | | Non-Objectionable/ Acceptable | Non-Objectionable/ Acceptable | **Acceptable** |
| **4** | TDS | mg/L | <1000 | <1000 | **527.9** |
| **5** | Total Hardness as CaCO3 | mg/L | 100 | <500 | **235** |
| **6** | Chlorides | mg/L | 250 | <250 | **27.8** |
| **7** | Carbonate | mg/L | --- | --- | **BDL** |
| **8** | Bicarbonate | mg/L | 500 | --- | **326** |
| **9** | Sulfate | mg/L | 200 | --- | **45** |
| **10** | Calcium | mg/L | --- | --- | **62** |
| **11** | Magnesium | mg/L | --- | --- | **19.8** |
| **12** | Sodium | mg/L | 200 | --- | **8.95** |
| **13** | Potassium | mg/L | --- | --- | **3.85** |
| **14** | Cadmium | mg/L | 0.003 | 0.01 | **0.001** |
| **15** | Chromium | mg/L | <0.05 | 0.05 | **BDL** |
| **16** | Copper | mg/L | 2 | 2 | **0.68** |
| **17** | Lead | mg/L | 0.01 | <0.05 | **0.001** |
| **18** | Arsenic | mg/L | 0.01 | <0.05 | **BDL** |
| **19** | **Zinc** | **mg/L** | **3** | **5** | **1.2** |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

- *The drinking water quality analysis was also carried out in addition to the surface water for ensuring the hygiene.*
- *The results have been compared with the Pak NEQs and WHO standards for seeing the acceptability drinking quality.*
- *The water quality of Uchhali mainly came under the acceptable limits*

- *The drinking water quality analysis for Khabekki lake also came out to be under the acceptable levels*
- *Although, the pH falls under the defined limits of WHO and NEQs, there is still need to purify the alkaline nature water for safe drinking*
- *The water quality of Uchhali mainly came under the acceptable limits*

*Table 35: Drinking Water Quality Analysis in Khabekki Village*

| Sr. No. | Parameters | Unit | Who* | Pak-NEQs* | Results |
|---|---|---|---|---|---|
| **1** | PH | --- | 6.5-8.5 | 6.5-8.5 | **7.58** |
| **2** | Taste | --- | Non-Objectionable/ Acceptable | Non-Objectionable/ Acceptable | **ACCEPTABLE** |
| **3** | Odor | | Non-Objectionable/ Acceptable | Non-Objectionable/ Acceptable | **ACCEPTABLE** |
| **4** | TDS | mg/L | <1000 | <1000 | **476.5** |
| **5** | Total Hardness as CaCO3 | mg/L | 100 | <500 | **202** |
| **6** | Chlorides | mg/L | 250 | <250 | **26.5** |
| **7** | Carbonate | mg/L | --- | --- | **BDL** |
| **8** | Bicarbonate | mg/L | 500 | --- | **296.4** |
| **9** | Sulfate | mg/L | 200 | --- | **34.5** |
| **10** | Calcium | mg/L | --- | --- | **58.6** |
| **11** | Magnesium | mg/L | --- | --- | **13.5** |
| **12** | Sodium | mg/L | 200 | --- | **10.7** |
| **13** | Potassium | mg/L | --- | --- | **2.29** |
| **14** | Cadmium | mg/L | 0.003 | 0.01 | **BDL** |
| **15** | Chromium | mg/L | <0.05 | 0.05 | **BDL** |
| **16** | Copper | mg/L | 2 | 2 | **0.21** |
| **17** | Lead | mg/L | 0.01 | <0.05 | **BDL** |
| **18** | Arsenic | mg/L | 0.01 | <0.05 | **BDL** |
| **19** | Zinc | MG/L | 3.0 | 5.0 | **0.52** |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

### 4.10.5. Air Quality

Ambient air quality of Soon Valley Complex were measured in winter season at 14th February, 2015 by the Urban Unit Team. Total 03 sampling sites were selected and the air quality of these areas were monitored at regular interval of time i.e. after every 1 hour. Afterwards, seven physicochemical parameters (i.e. CO, NO, NO2, SOx, H2S, PM) were analyzed in these sampling sites. The obtained results shown below depicted that all the measured parameters were in permissible limits of **WHO** and **Pak-NEQs** and the air quality of the villages and the adjacent sides of lakes were observed healthy.

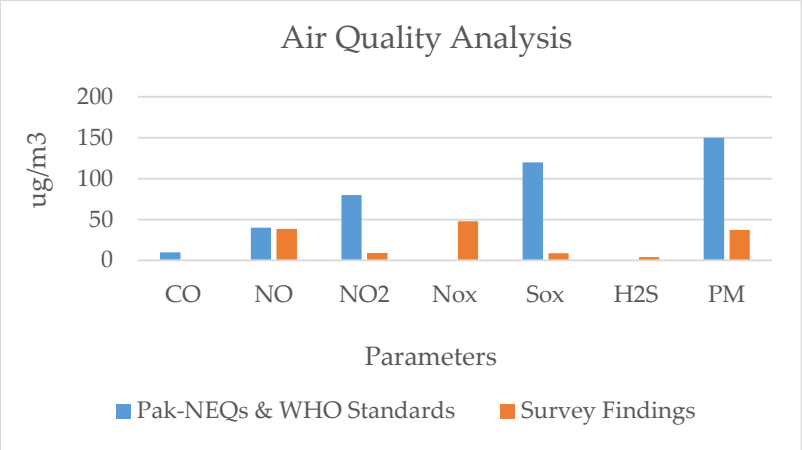



*Figure 49: Air Quality Analysis of Soon Valley*
*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

- *The air quality analysis in the Valley revealed that all measured parameters were in permissible limits of WHO and Pak-NEQs*
- *The survey results were studied in comparison with the WHO and NEQs*
- *Soil Quality Analysis was also carried out for 8 different sample site under 10 physiochemical parameters.*
- *The results revealed an alkaline pH with a high content of potassium.*

### 4.10.6. Soil Quality

To determine the quality of the soil, representative soil samples from Soon Valley Complex were collected in winter season during 15th February, 2015. The sampling strategy was Grab sampling and samples were collected from the nearby locations and alongside the lake banks from a depth ranging from 0.50 m to 1.00 m. Total 08 samples were taken from the study areas and Ten physicochemical parameters (i.e. pH, Texture, Organic matter, saturation, potassium, phosphorous, CaCO3, Sodium, Ca + Mg, Electrical conductivity) were analyzed. The obtained results depicted that all the measured parameters were in permissible limits of WHO and Pak-NEQs. The following table summarizes the results obtained from the 8 different sampling points.

*Table 36: Summary of Soil Characteristics within Soon Valley*

| Parameter | Value |
|---|---|
| pH | 8.09 |
| Electrical Conductivity (EC) | 16.50 |
| Organic matter | 0.65 |
| Saturation | 44.75 |
| Potassium | 389.13 |
| Phosphorus | 5.46 |
| CaCO3 | 9.24 |
| Sodium | 41.38 |
| Ca + Mg | 13.04 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

## 4.10.7. Noise Quality

- *Noise quality analysis was taken up for 06 monitoring points at project site*
- *Monitoring Instrument used is TENMARS TM-102.*
- *The results reveal a favorable condition as most of the areas do not have noise pollution beyond the permissible limits defined by NEQs.*
- *The six points chosen includes Chitta Village, Dhoke Janjwall, Dhoke Mir Abbs, Uchhali Village, Uchhali Lake Bank and Khabekki Lake area.*

Noise quality of Soon Valley Complex were measured during 14th Feb, 2015 by the EIA Team of Urban Unit. Total 06 monitoring points at project site were selected and their noise quality was monitored after regular intervals of times by using Monitoring Instrument: ***TENMARS TM-102.*** The obtained results reveal that the majority of project sites are free from noise pollution and the measured parameters are in permissible limits of Pak-NEQs. However, during the construction phase permissible noise levels can be temporarily exceeded due to the movement of equipment in the working zone of the project site. But with due implementation of effective noise abatement measures, it will be minimized. The following table shows the average noise level at six different location of Soon Valley.

*Table 37: Summary of Noise Quality at Six Different Location of Soon Valley*

| Location | Average Noise dB (A) | NEQS-Day Time Residential Area dB (A) |
|---|---|---|
| Chitta Village | 47.66 | 55 |
| Dhoke Janjwall | 40.18 | 55 |
| Dhoke Mir Abbas | 60.92 | 55 |
| Uchhali Village | 36.47 | 55 |
| Uchhali Lake Bank | 31.88 | 55 |
| Khabekki Lake | 40.07 | 55 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

## 4.11. Tourism Profile

The Soon Valley is famous for its scenic views, biodiversity and ecological significance, and nature's own habitat. Prominently, the valley hosts the large wetland regions of international significance, enlisted as Ramsar sites under Ramsar convention 1971. The major places of interest in the project area are summarized in the following section.

- *Soon Valley is known for its natural beauty, and is home to beautiful lakes, waterfalls and several places of interests*
- *It hosts the large wetland regions of international significance*

### 4.11.1. Places of Interest

The three main lakes of Uchhali Wetlands Complex are situated inside a cup shaped catchment area called the Soon Valley. These lakes are of prime importance and attractive places for the tourists. The catchment area of these three lakes i.e. Uchhali, Khabekki and Jahlar lakes is 381 km2 and the water surface area of these three lakes is 12.43 km2 (1243 ha)

**i) Khabekki Lake**

Khabekki Lake is also brackish saline, stretches one kilometer wide and two kilometers in length. Khabekki is also the name of a neighboring village. The lake comprises an area about 283 ha in the Salt Range with shallow brackish water. It is situated around 10 km north-east of Naushera village and 38 km northwest of Khushab District between 32°37' N latitude and 72°14' E longitude, at an elevation of 740 meters above MSL. The lake is filled by rainfall and various sporadic water streams rising in the adjacent hills. In recent years, the water level has increased by 30-60 cm, which has caused an increase in the size of the lake and decrease in its salinity. For tourists, boating facility is also available along with a small guesthouse, which is under construction. The lake and its adjacent green area provide a good scenery. These lakes attract thousands of migratory birds each year and are ideal haven for the bird watchers.





*The beautiful Khabekki Lake is a tourists. It is a protected habitat for a more than 45 migratory birds. The rare white headed duck migrates here in winters and the availability of fresh fish catch makes many to make their way here*

*Source: Field Studies, the Urban Unit 2015-16*

**ii)**



*Another spectacular and picturesque of the Valley is the Jhalar Lake that presents breathtaking views for the visitors. Like Khabekki this also is home to a number of migratory birds that come from Siberia and further adds up to the beauty of the lake.*

*Source: Field Studies, the Urban Unit 2015-16*





*Uchhali, the salt water lake in the valley presents a much captivating outlook. Lush green mountains are on the right side of the lake that increase its beauty. An unfinished metaled road bifurcates the lake into two, linking the opposite side village. The rehabilitation of this road is important to enhance the vision of tourists.*

*Source: Field Survey, the Urban Unit 2015-16*

**Jahlar Lake**

It is a lake of area about 17 ha in the Salt Range with geographical extent is between 32°29' N latitude and 72°07' E longitude at an elevation of 819 m above MSL. It is situated around 10 km south-east of Uchhali lake and 10 km south-west of Naushera village, Khushab District, Punjab Province. The lake is located near the Jahlar village and has been named after it. It has small brackish to saline water characteristics. The run-off water from the adjacent hills of Salt Range fills this lake. Its depth ranges from 0.2 m to 6 m depending on the quantity of rainfall received.

Jahlar is one of the most spectacular and beautiful lakes in the Soon Valley. Although it has stunning natural landscape with surrounding edges, it is still considered as one of the least visited lakes of the valley mainly because of its locality which is not easily accessible for the tourists. Its area under water is approximately 148 acres. In winter, birds from distant places migrate to this lake and in summer they make their return back to the native countries. This lake does not contain any facilities like boating or fishing unlike Uchhali or Khabeki Lake. There are two routes to this lake; one is from Kathwayi to Jahlar (while coming from Sargodha side) and the other is from Naushera to Surakki and then from there to Jahlar.

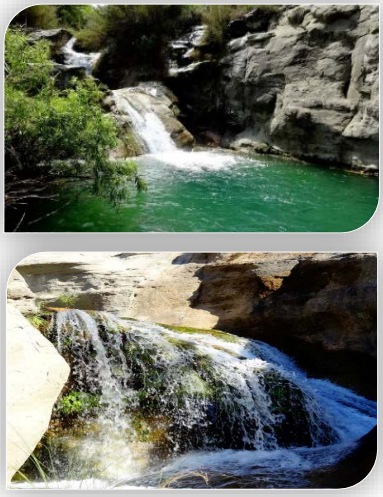
**iii) Uchhali Lake**

Uchhali is a brackish saline lake. However, it offers an attractive scenery. It is the largest lake with area about 943 ha, with brackish to saline water characteristics. It is situated 13 km west of Naushera and 42 km northwest of Khushab District, Punjab Province, and surrounded by agricultural lands. Its geographical extent is between 32°33' N latitude and 72°01' E longitude. The lake is fed run-off from the surrounding hills of the Salt Range and a small spring, seepage from nearby irrigated land. The water level and salinity fluctuate according to local rainfall. The depth of the lake varies from 0.2 m to 6 m; and water is usually hyper-saline (41.5 ppt) with a pH of about 10.

### iv) Kanhatti Garden

Home to stunningly beautiful waterfalls and marvellous views, Kanhatti Garden is a major tourist spot in Soon Valley. Kanhatti Garden is like a square, three sides are bounded by reserve forest (5,014 acres) while in North private lands of the Kanhatti settlement are located. Garden is home of the indigenous flora and fauna. More than 15 species of tall trees, 60 herbs, 20 shrubs and 15 types of grasses have been recorded from the garden. Kanhatti Garden is home to the largest birds' population in the Punjab Salt Range. Punjab Urial, Grey and Black partridges, golden orioles, woodpeckers while 6 different endemic fish species have been found in the garden water springs.

Kanhat rock is abundantly found in this area due to which the place is named as Kanhatti. Limestone and sandstone layers are present in the area where as red marl is also exposed at several places. The main mountain ridges of the area consist of the sand stone which are 120 million years old.



*Kanhatti Garden in the valley is bounded on three sides by a reserve forest. The waterfall at the garden adds up to the scenic beauty of the area. It is home to indigenous flora and fauna. The safe camping site here makes more tourist to come and visit the place*

### v) Akrand Fort

This fort was built by the men of Raja Tataar Khan in order to defend the areas of Soon and Pakhar. The fort is covered with thick and dense forest. Only one way leads to the fort which is along the way to Kanhatti garden. The fort had stables for horses, residential houses and weapon stores which have now turned into ruins. There is also a grave on the way to the fort which is supposed to be of Raja Tataar's. The fort is thought to be of immense historical as well as architectural value for the archaeologists, not to mention the marvellous scenery it holds within itself.



*Akrand Fort in the valley is a place of historical & architectural importance and holds appealing scenery within*

### vi) Angah

Angah is the village of the legendary poet of Urdu, Ahmed Nadeem Qasmi. It is famous for its cultural as well as scenic beauty.



*The stone brick structure of the Angah village is an important cultural site for tourist site*

**vii)** **Baba Sultan Mehdi Darbar and Waterfall**

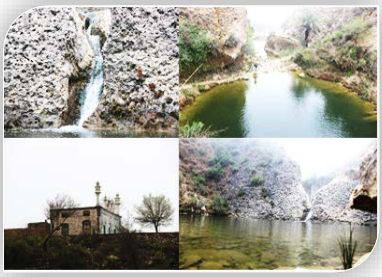


*Baba Sultan Mehdi Mazar is another important place of interest for visitors. People from all the world come here to see the mesmerizing waterfall and for praying*

The darbar of Baba Sultan Mehdi is one of the famous tourist spot in this region. Baba sultan mehdi fall is located near Jaba in soon valley district Khushab. It is a one of a wonder. It is in between two mountains where it was a chilla gah of Hazrat sultan mehdi. This water is very good cure for skin diseases. People from all over the world come to this place for their well wishes.

**viii) Daip Shareef**

The way to Daip Shareef goes from Kufri and Kuraddhi villages. Road almost goes near to the water springs from where one has to travel 1 kilometer by foot in order to reach the ponds. It is a mountainous *ziaarat gaah*. Water springs flow here in abundance. The water is absolutely clean, pure and sweet. People from all over the valley come here to pay their homage to this sacred place because of a saint Hazrat Siraaj Ud Din Naqshbandi (R.A.). It is a beautiful place where one can not only enjoy the spiritual peace but also the gorgeous scenic beauty because of a small waterfall, ponds and water springs.



*The clean, pure and sweet water from the springs and the embracing views in Daip Shareef are catchy to many eyes. It also has spiritual significance for visitors.*

**ix) Maai Wali Dheri**

Maai Wali dheri is the name given to a high cliff on which a saint Hazrat Bibi Peroz (R.A.) is buried. Apart from feeling the spiritual energy, one can have a panoramic view of Soon Valley because it is located at a great height.

**x) Neela Whan**

Neela Whan is a beautiful spring located near the village Sodhi Jay Waali in the valley that gives a beautiful insight to the tourism in that area.



*Scenic views from Neela Whan, the water spring leaves the visitors with beautiful memories of the area.*

*Source: Field Studies, the Urban Unit 2015-16*

**xi) Nursingh Phuwaar**

This is often mispronounced as nursing phuwaar. It is the name of a place in Soon Valley where one can find beautiful temples and lovely water springs. The temples still retain their original shape although rapidly deteriorating.

Regarding its history, there was a Hindu Nurshingh Daas who came to this place to pray. The drops of the water spring falls on an adjoining mountains and that is why how this place got the name of 'nurshingh phowaar'. In the past, in the month of beesakh, a besaakhi mela used to be celebrated at this place where 'Yaatrees' came from distant towns and villages. There is a beautiful waterfall, greenery at its best, mind blowing water springs and amazing archaeological as well as historical temples at this place. These days, this temple is under the department of Oqaaf. It is a pity and sheer callousness of our government that this temples has been turning into ruins since many years. No care has been given to this place, no funds are allocated and this precious historical site will be ruined. Need of the hour is to develop and protect this place.



*Nurshingh Phuwar is where one can find great temples and beautiful springs. The "besaakhi mela" brings in a number of Yatrees to the area. The lush greenery makes it an amazing tourist spot.*

**xii) Sodhi Rest House**

This rest house was constructed under the supervision of Captain Davis in British colonial period in the 18th century for officers of the British government who used to come here for visit and inspection. These days, any government or army official can stay here after getting permission from the officials of district government. This rest house still depicts the beautiful architecture of the British period. However, the officials of the district government should pay attention towards its maintenance and allocate funds for its repair and adding more rooms to it.



*The Sodhi Village Rest House depicts the beautiful architecture of British time, which was initially made for the British army officers. Nowadays, the building is used to house any visiting government or army official.*

**xiii) The ruins of Rat Rirri**

These ruins are located near Bhandar Chatha, Her Do Sodhi Wala. The ruins are scattered over quite a large area. Perhaps the archaeologists can guess or predict the era of this population. Contrary to the ruins of Akrand and tulhaath forts, these ruins comprise of small walls and they are in fairly bad shape. It might not be interesting for a majority of people out there but those who share an interest in archaeology will find it fascinating.



*The Ruins of Rat Rirri now consists of small walls and portrays an overall poor condition. However, the ruins are an element of fascination for the archeologists.*

*Source: Field Studies, the Urban Unit 2015-16*

**xiv)**



*Tulhart Fort, which was once a palace has been kept neglected for long. It has been mentioned in the archives of the British*



*Punj Peer is another ancient place located on a hill top and attracts many tourists*



*Ambh Sharif is another Hindu temple building that is of interest to several visitors. The temple refers to the Hindu Shahi Dynasty and has spiritual significance.*

**Tulhaath Fort**

Tulhaath fort is a place located near Her Do Sodhi Baala on Kathwayi-Jahlar road. One has to travel by foot for about 1 and a half kilometre. This was a palace and there were canals for water in it. It looked more like a fort to us just like the Tulaajha fort and Akrand fort. The reason is because it has not only a defensive wall but also built on a high mountain or cliff. According to locals, it dates back to the Stone Age. The stones used in the construction of this palace are of rectangular shape, lengthy and extremely heavy. There is a water spring flowing nearby and its name is 'gabh'. A defensive wall built to protect the palace is still present along with the rock used as the gate. Like all other places, this place has been utterly ignored by our administration and government in spite of the fact that this fort has been mentioned by the British in their archives before independence of Pakistan.

**xv) Punj Peer**

It is one of the most beautiful and attractive place in Soon Valley where shrines of five peers are present on top of the hill. One can easily enjoy the surrounding beauty of this valley from this peak.

**xvi) Ambh Sharif**

The ruins of a 10th century (AD) temple hark back to the heydays of the Hindu Shahi dynasty. The temple is one of a series of monastery-like complexes that include Malot, Ketas and Nandna that stud the Salt Range. The road to Amb is somewhat circuitous, as one has to first proceed to Quaidabad, about 45-km west of Khushab, thence north to Amb, over a 25km bone-jarring stretch that is best negotiated by a four-wheel drive vehicle.[23]

It is evident that there were number of such temples and historical buildings in the past but now there are only two buildings left and the rest have been destroyed.

[23] http://kaiser-footloose.blogspot.com/2010/11/off-beaten-track-nestled-in-hill.html

The following map summarises the location of tourist attraction sites at the Soon Valley which is home to a number of tourists.




*Figure 50: Map showing Tourist Attraction Sites in Soon Valley*

*Source: The Urban Unit, 2016*

## 4.11.2. Existing Tourism Management

During the last quarter century, environmental and cultural changes, market-based economics and over harvesting of plant species in Soon Valley have resulted in resource degradation, loss of biodiversity. Majority of the species are threatened by physical stresses and anthropogenic disturbances. The extensive uses are common threats to most of the plant species. They have narrow ecological amplitude and their unwise use has threatened their survival in the Salt Range. At present, there is little understanding for conservation or collection plan, and so this natural resource faces significant risk of depletion of biodiversity and the loss of indigenous and traditional medicinal knowledge.

- *Extensive resource and environment degradation has taken place in the area over the past quarter century.*
- *Eco-system in the valley has been on a verge of threat that needs to be preserved.*
- *There is a risk of biodiversity depletion, and extinction of various species.*
- *The need of the hour is to look through the potential resources of the area for the sake of preserving and developing them*



*Figure 52: Urban Unit team conducting consultative session with the residents of Khabekki*

*Source: Field Studies, the Urban Unit 2015-16*



*Figure 51: Urban Unit team conducting consultative session with the tourists at Uchhali Lake*

*Source: Field Studies, the Urban Unit 2015-16*

- *The public consultation at Uchhali, Khabekki & Kanhatti revealed low interest by the people in tourism industry.*
- *The reasons attributed to this are lack of investment, poor involvement & coordination.*
- *The area lacks in tourism facilities that result into poor tourist facilitation*

### 4.11.3. Public Consultation at Tourists Sites in Soon Valley

To understand the public interest in tourist sites of Soon Valley, various public consultation sessions were carried out at different tourist sites like Uchhali, Khabekki, and Kanhatti etc. Though some of these sites are internationally recognized, it is observed the percentage of population associated with tourism occupation was negligible. Reason for such low interest in tourism occupation is lack of investment and special attention by the administration towards the promotion and development of these sites. Given that tourism promotion interventions are made by the administration, people are ready to participate in these initiatives by any means. They are of the view that they should be involved while taking initiatives for development of these sites.

Considering the natural beauty of Soon Valley, it attracts many tourist as well. Tourists' perception about these sites are also undertaken. Tourist consultations revealed that this valley is highly under-rated in terms of publicity and investment, as a result majority of the people are unaware of the attractions of this beautiful valley. Tourists face many problems in terms of accommodation, restaurants, hotel, and transportation because no attention has been given by administration at this end. Considering these issues, tourists are unable to live there for more than 2-3 days. Tourists are of the view that there is a great scope for recreational opportunities like camping, cycling, trekking and rock climbing, chair lifts etc. They highlighted that the number of infrastructural facilities should be provided that could promote the tourism in this Valley. Those facilities include; canteens, restaurants, rest houses/hotels, proper sitting places (benches) on touristic sites, playing areas and proper signage/postage at different places for proper guidance and accessibility to different sites of this region.

## 4.12. Urban Security Profile

### 4.12.1. Physical Security (Law & Order/Terrorism)

Fortunately, Soon Valley has very low crime rate and people of the valley are peaceful. According to SHO Naushera, a few robbery/snatching cases are reported on monthly basis. According to SHO, few parts of the Soon Valley are under the control of Army as well that also ensures peace in the area.

### 4.12.2. Health Security

Though the people of Soon Valley are quite healthy and remained engaged in walking to perform their daily tasks. According to Medical Superintendent THQ Naushera, people are mostly suffering from typhoid, malaria and infections due to poor solid waste management and drainage system.

### 4.12.3. Food Security

Soil of Soon Valley is fertile and local people grow vegetables on their small farm landholdings to meet their daily needs. Not only seasonal but also off-seasonal crops are grown here. Most of fruits are not grown in Soon Valley and imported from Khushab.

### 4.12.4. Natural Hazards/Disasters Vulnerability

No major natural hazard or calamity i.e. earthquake, flood or cyclone was witnessed in project area since last several years except the earthquake of October 2005. The drought spells of 1997-2002 adversely affected the economic and social fabric of the Valley, since its' economy is heavily dependent on agriculture. Moreover, some events of land sliding were observed, during the field survey, along the Sargodha Road (connecting Soon Valley with Khushab).




- *People of the valley have been faced with security issues and poor physical safety measures prevail in the area.*
- *Poor solid waste management and unhygienic condition of the area have resulted out into serious health concerns.*
- *Due to high fertile soil in the Soon Valley, a number of crops are grown here.*
- *The Soon Valley is a disaster prone area and earthquakes, draught and land sliding have been witnessed here.*

CHAPTER 5

# Sectoral Analyses



- *Land Use & Land Cover Change Analysis is carried out to analyze the land use changes and pattern over the past 25 years.*
- *A change detection analysis is also performed for determining the nature, extent and rate of land cover change patterns.*
- *LANDSAT satellite images over a period of 3 years (1990, 2000 & 2015) have been used for the development of classification map*
- *Land Use classification is catered for the three mentioned years.*
- *All years are not of same season*

# Chapter 5: Sectoral Analyses

This chapter discusses the detailed analyses of all the sectors including social & physical infrastructure, land use, transportation, environment and tourism. Different analysis including Land & Land Cover Change Analysis, Environmental Sensitivity Analysis, Spatio-Temporal Analysis, Land Use Suitability Analysis, qualitative and quantitative analysis are performed to analyze the Soon Valley in regional context, existing population and growth trend, existing living condition, built environment and quality of settlements fabric. Land Suitability analysis is conducted to identify the pertinent sites suitable for various development in future. Existing economic base, tourism potential analysis, identification of environmentally sensitive areas and disaster risk assessment has been discussed in detail. Moreover, SWOT Analysis of every sector has been performed to assess the strengths, weaknesses, opportunities and threats of that sector

## 5.1. Land Use Analysis

Land use distribution of Soon Valley is identified in different periods (1990, 2000 and 2015). Land use distribution of Soon Valley explained the land use changes in built up, agriculture, forest, water bodies and other uses. For this, purpose land use and land cover change analysis is done which is explained as follows:



*Land Cover Change Analysis has been conducted to identify the changes in different periods*

### 5.1.1. Land use & Land Cover Change Analysis

Remote Sensing and GIS help in identifying the change so far occurred in Soon Valley for different land cover types over last 25-year time span. In order to formulate and exercise efficient Land management policies and practices, it is important to extract reliable land cover (LC) information. Mapping LC is now the standard way to monitor changes and in order to monitor land use change and development, a change detection analysis is performed to determine the nature; extent and rate of land cover change over time and space. The results quantify the land cover change patterns in the area and demonstrate the potential of multi-temporal satellite data to map and analyze changes in land cover in

spatio-temporal framework. Hence, to analyze and monitor the spatio-temporal land use and land cover change patterns within the Soon Valley, the multi-temporal satellite images from the period 1990-2015 were used.

### 5.1.1.1. Data Acquisition

LANDSAT satellite images at a time span of three different years (1990, 2000 & 2015) are used for the development of classification map. The images are selected considering the minimum cloud cover and shadow from the available images in United States Geological Survey (USGS) data archive.

Project area of Soon Valley is covered in two scenes for each instance (i.e. selected years), for same year each selected scene was tried to be of same season in 1990, 2000 & 2015. All years are not of same season as described in table below:

*Table 38: Satellite images For Land Cover classification*

| *Acquisition date* | | | ***Scene ID*** | | ***Resolution*** |
|---|---|---|---|---|---|
| *Year* | Month | Date | Path | Row | |
| *1990* | 2 | 19 | 150 | 037 | 30m |
| *1990* | 2 | 19 | 150 | 038 | 30m |
| *2000* | 5 | 5 | 150 | 037 | 30m |
| *2000* | 5 | 21 | 150 | 038 | 30m |
| *2015* | 4 | 13 | 150 | 037 | 15m |
| *2015* | 10 | 6 | 150 | 038 | 15m |

### 5.1.1.2. Land Cover Classification

A supervised classification is used to produce land cover classes. Algorithm used for classification is Maximum likelihood. The images of the study area are taken through three stages to generate land cover classes of the study area. These include: (1) feature extraction; (2) selection of training data (signatures); and (3) selection of suitable classification approach.

Five land cover classes including; Agriculture, Built up, Dense Forest, Sparse Forest and Bushes, Water body and other were identified and mapped. Other Class includes shadows, settlements and surrounding bare area of lakes. Water Class includes; wetlands, river, drain, and pond. The image classification was guided by reconnaissance information gathered from the field survey of the study area.



*For assessing the land cover, six classes have been defined*

- *Six land cover classifications were mapped including Agriculture, Built up, Dense Forest, Sparse Forest & Bushes, Water Body, Other (shadows, settlements).*
- *Water Class includes (wetlands, river, drain, and pond).*

## Land Cover Classification for Year 1990

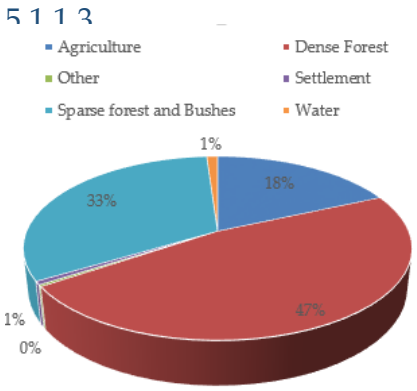



*Figure 53: Land Cover Classification (Showing Percentages of Different Land uses for Year 1990*

*Source: Extracted by the Consultant on the Basis of Field Study, 2016*

The supervised classification of the 1990 LANDSAT 5 TM image yielded the Land cover classes shown in Figure 2. These classes were calculated (based on the count of pixels) in sq.km and in percentages as well. As can be seen in figure given below, the land area of high-density forest cover is 453 sq.km, representing 47% of the total area. This is found in the Northern, Western and Southern part of the map with the high concentration in one of the protected areas. Similarly, Sparse Forest and Bushes covers the land area 312 sq.km (representing 32%) with scrub forest, grassland, bushes shrubs scattered around the North, South, East and the Western parts of the area with small patches within the dense forest.

Water area is 10 sq.km (1%). Other class and Agriculture land have respective land areas of 3 sq.km and 176 sq.km (18%). Moreover, it can be seen that built up area is 6 sq.km of the total area.

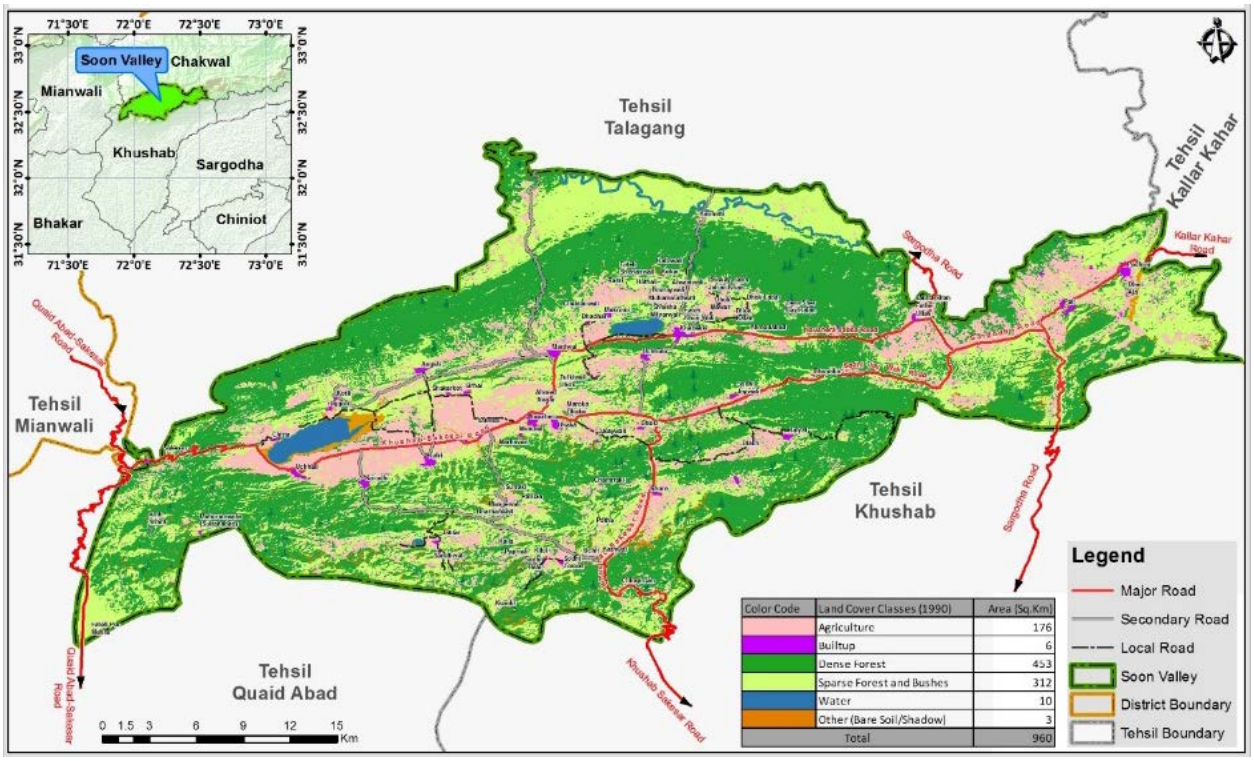



*Figure 54: Land Cover Classification for the Year 1990*

*Source: The Urban Unit, 2016*

### 5.1.1.4. Land Cover Classification for Year 2000

The supervised classification procedure applied to the 2000 Landsat 5 TM image yielded the Land cover map (shown in figure given below).

With the Dense forest class occupying the largest area coverage as compared to other land cover classes having 390 Sq.km which represents 41% (figure 3). Sparse forest and bushes covers an area of 308 sq.km (32%) which is scattered around the North, South, East and the Western parts of the area with some patches within the dense forest.

Other class occupies an area of 3 sq.km (0.31%) with soil and settlements mainly found in the surrounding of Wetlands and western edge of project area. Agriculture land having an area of 243 sq.km (25%) are concentrated along the entire scene, mainly around protected areas like Uchhali Lake and Khabekki Lake. Water class is having 9 sq.km (constituting 0.9%) while built-up covers 7 sq.km of the total area. The graphical representation of this distribution is shown in the graph given below.

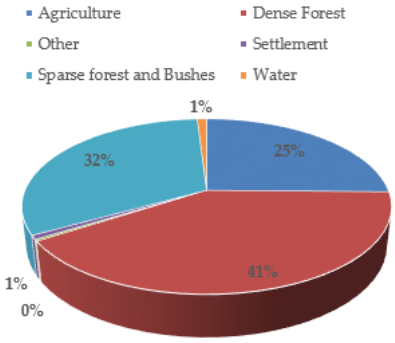



*Figure 55: Land Cover Classification (Showing Percentages of Different Land uses) for Year 2000*

*Table 39: Areas under Land Cover Classification (2000)*

| ***Classes*** | ***Areas(sq.km)*** |
|---|---|
| *Dense Forest* | 390 |
| *Sparse Forest & Bushes* | 308 |
| *Other* | 3 |
| *Agriculture* | 243 |
| *Water Body* | 9 |
| *Built Up* | 7 |

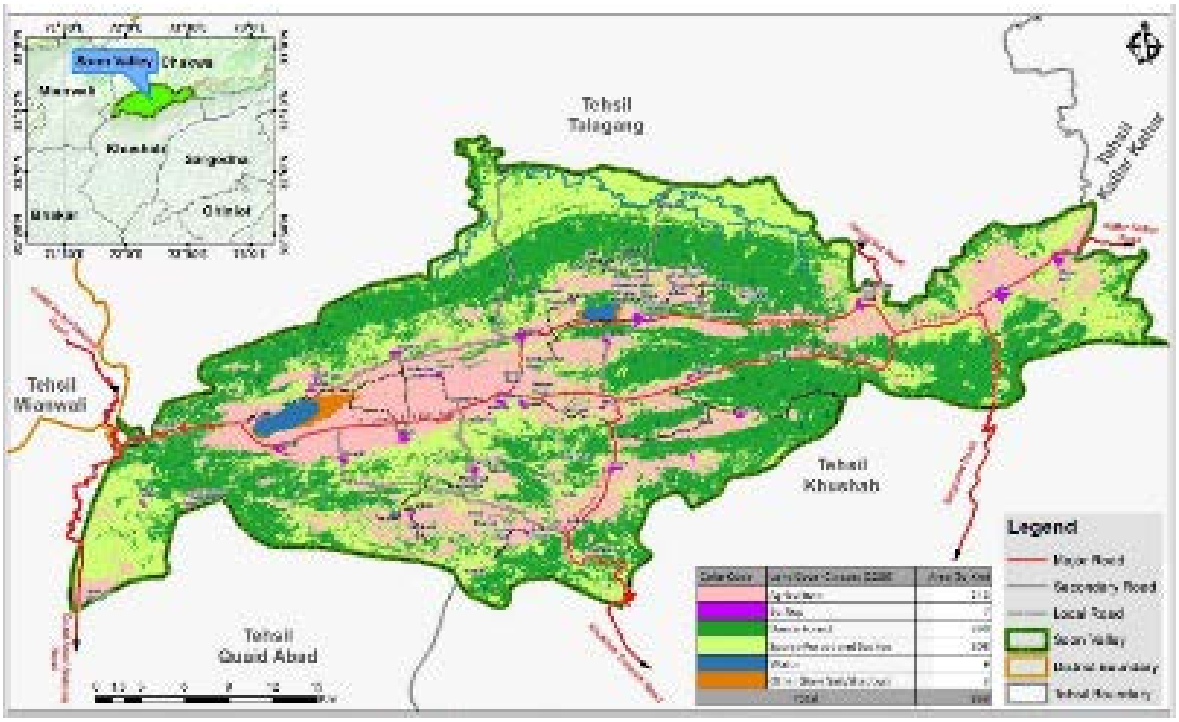



*Figure 56: Land Cover Classification for Year 2000*
*Source: The Urban Unit, 2016*

### 5.1.1.5. Land Cover Classification for Year 2015

The 2015 Landsat ETM+ after classification procedures yielded land cover map displayed in figure given below. It is evident from the graph given below that the land area of dense forest in 2015 is 281 sq. km (29%). Sparse forest and bushes covers an area of 393 sq.km (41%) and mainly around the Northern, Southern, Eastern and western parts. Other class has an area of 8 sq.km (0.8%).

Agriculture land having an area of 257 sq.km (27 %) is concentrated along the entire scene. As compared to previous years, the percentage of built up area is increased to 1.2% with an area of 11 sq. km. Water class, having 9 sq.km (0.9%) has the least area coverage and mainly concentrated within the lake area with very small amount of water in other areas.

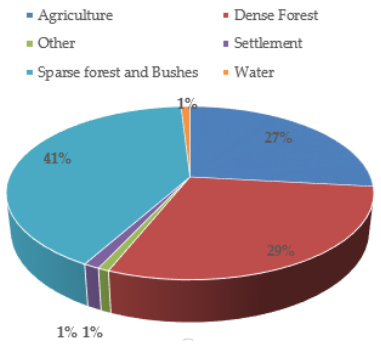



*Figure 57: Land Cover Classification (Showing Percentages of Different Land uses) for Year 2015*

*Source: Extracted by the Consultant on the Basis of Field Study, 2016*

*Table 40: Areas under Land Cover Classification (2015)*

| ***Classes*** | ***Areas(sq.km)*** |
|---|---|
| *Dense Forest* | 281 |
| *Sparse Forest & Bushes* | 393 |
| *Other* | 8 |
| *Agriculture* | 257 |
| *Water Body* | 9 |
| *Built Up* | 12 |

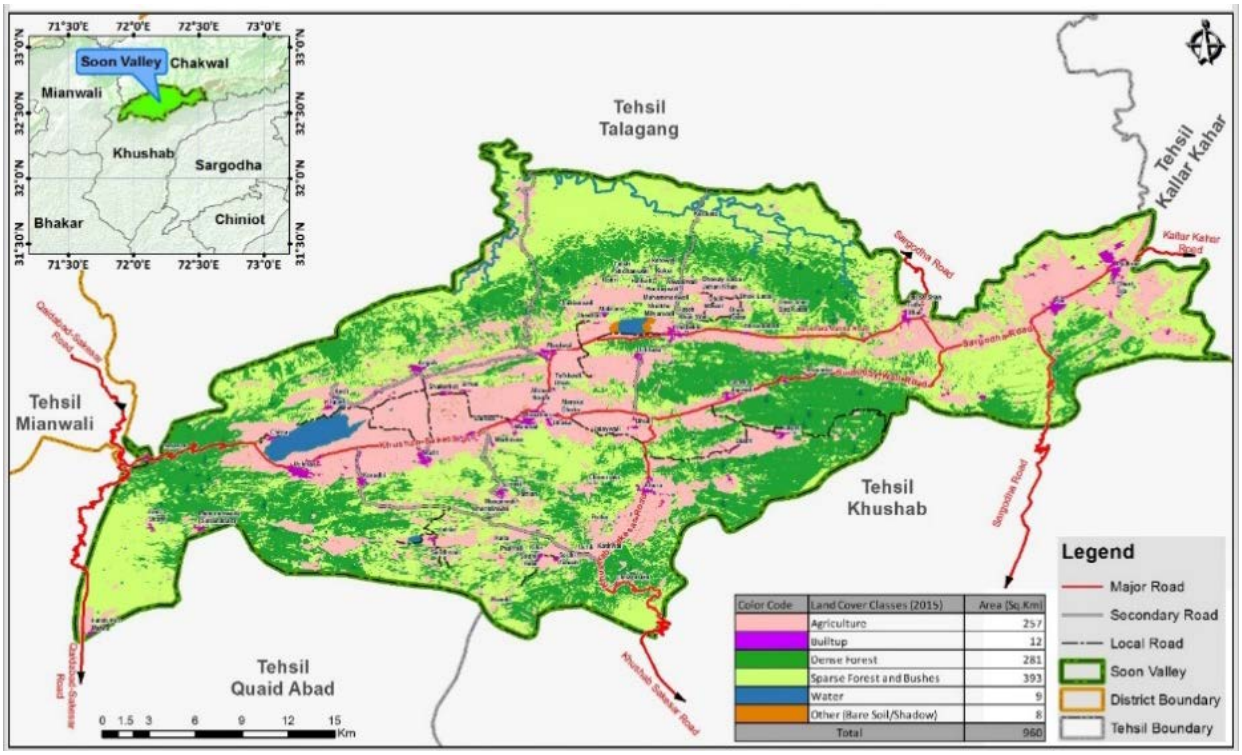



*Figure 58: Land Cover Classification for Year 2015*
*Source: The Urban Unit, 2016*

*Table 41: Land Use Cover Classification from 1990-2015*

| *Land Use* | *1990* | *2000* | *2005*[24] | *2015* |
|---|---|---|---|---|
| *Agriculture* | 176 Sq. Km | 243 Sq. Km | 155 Sq. Km | 257 Sq. Km |
| *Dense Forest* | 453 Sq. Km | 390 Sq. Km | 278 Sq. Km | 281 Sq. Km |
| *Other* | 3 Sq. Km | 3 Sq. Km | N/A* | 8 Sq. Km |
| *Built Up* | 6 Sq. Km | 7 Sq. Km | 7 Sq. Km | 12 Sq. Km |
| *Sparse forest and Bushes* | 312 Sq. Km | 308 Sq. Km | N/A* | 393 Sq. Km |
| *Water Bodies* | 10 Sq. Km | 9 Sq. Km | 4 Sq. Km | 9 Sq. Km |

*Source: Extracted by the Consultants on the basis of Primary and Secondary Data*

- *Sparse forests and bushes covering the most area was spread over 393 sq. km in the year 2015.*
- *Following this, dense forest is spread over an area of 281 sq. km in the same year.*
- *Agriculture being a slightly less is found spread over an area of 257 sq. km*

[24] Disaster Mitigation and Preparedness Plan Soon Valley Pilot Project, 2006

- *Overall, there is remarkable increase in the area of agriculture from 1990 to 2015*
- *Area of dense forest has decreased continuously from 1990-2015.*
- *Built up area has increased from 6 sq.km in 1990 to 12 sq.km in 2015*

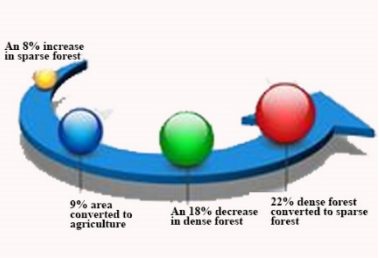



*Figure 59: Changes in land cover over time*

*Source: Extracted by the Consultant on the Basis of Field Study, 2016*

### 5.1.1.6. Land Cover Change Analysis in different periods (1990, 2000 and 2015)

Following chart shows varying trend in the area of agriculture land as it increased to 243 sq.km from 176 sq.km and then it decreased to 155 sq.km in 2005 and again increased to 257 sq.km in 2015. Decrease in area of agriculture land is mainly due to drought that occurred in 1999-2002. Areas of dense forest shows continued decreased from 453 sq.km to 281 sq.km that shows that cultivation has been done on the cost of forestland. Built up area shows an increase in area from 6 sq.km in 1990 to 12 sq.km in 2015 and areas of water bodies do not show sharp rise or fall in the area.

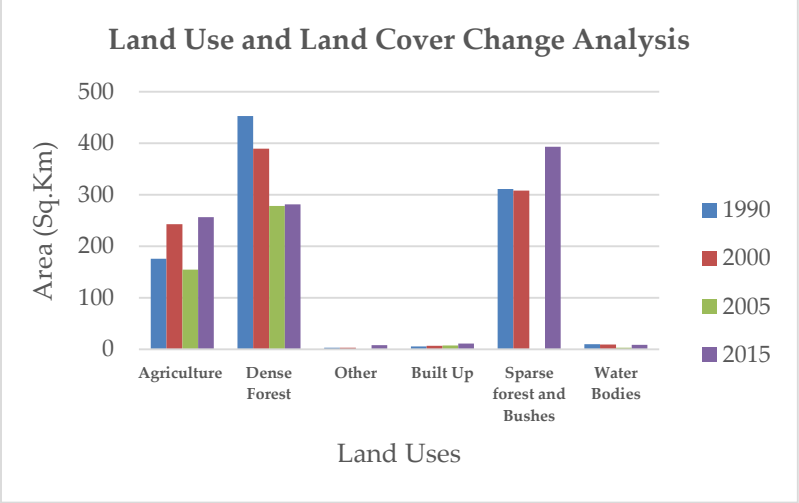



*Figure 60: Land use & Land Cover Change Analysis (1990, 2000, 2005 & 2015)*

*Source: Extracted by the Consultant on the basis of Field Studies, 2016*

According to our results, 18% area of dense forest is decreased and there is increase of 8% in land cover of sparse forest and Bushes. 22.8% of dense forest is converted into sparse forest and 9% area is converted into agriculture land.

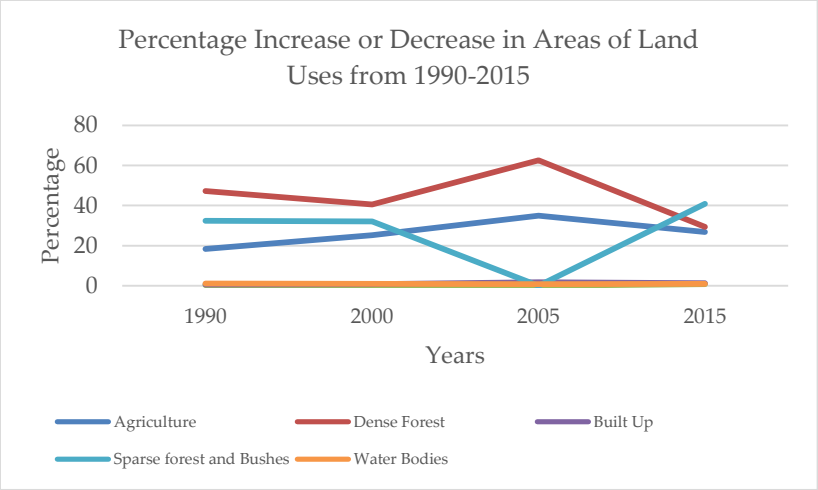



*Figure 61: Percentage Increase or Decrease in Land Use Classes*

*Source: Extracted by the Consultant on the basis of Field Studies, 2016*

- *18% of forest area has decreased*
- *Area of sparse forest and bushes has increased by8%.*
- *9% of dense forest is converted into agricultural l*
- *Built up area has increased from 6 sq.km in 1990 to 12 sq.km in 2015*

### 5.1.1.7. Spatio-Temporal Growth of Built Up Area (1993-2015)

Built-up area for 1993 is 6 sq.km area (which represents 0.5%) whereas, for year 2015, it covers area of 12 sq.km (which represents 1.5%) as depicted above mentioned chart. Built-ups are located mainly around the North, South, East and Western part of the study area. This shows that rate of development has been slow in Soon Valley.

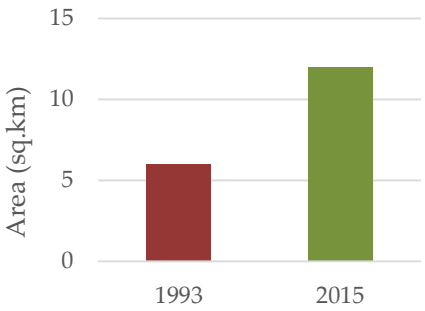



*Figure 62: Trend Analysis of Built Up Area within Soon Valley*

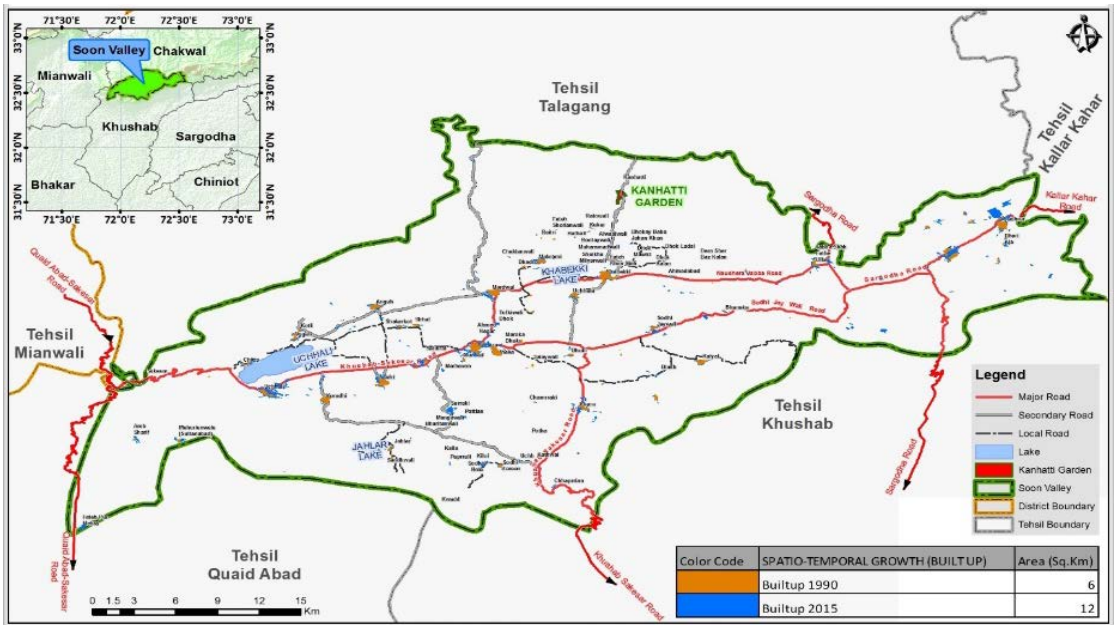
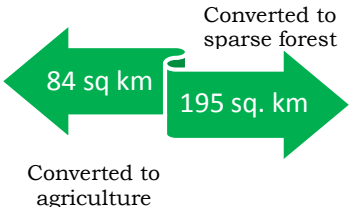



*Figure 63: Spatio-Temporal Growth of Built-up Area (1993-2015) within Soon Valley*

### 5.1.1.8. Land Cover Change Detection




Images of different dates are firstly classified and labelled individually. Image overlay tools were used in Arc Map to extract change detection of two classes i.e. dense forest and sparse forest /Bushes. Change detection is a process of identifying changes in the state of one land cover to another by observing images at different times as shown in figures given below

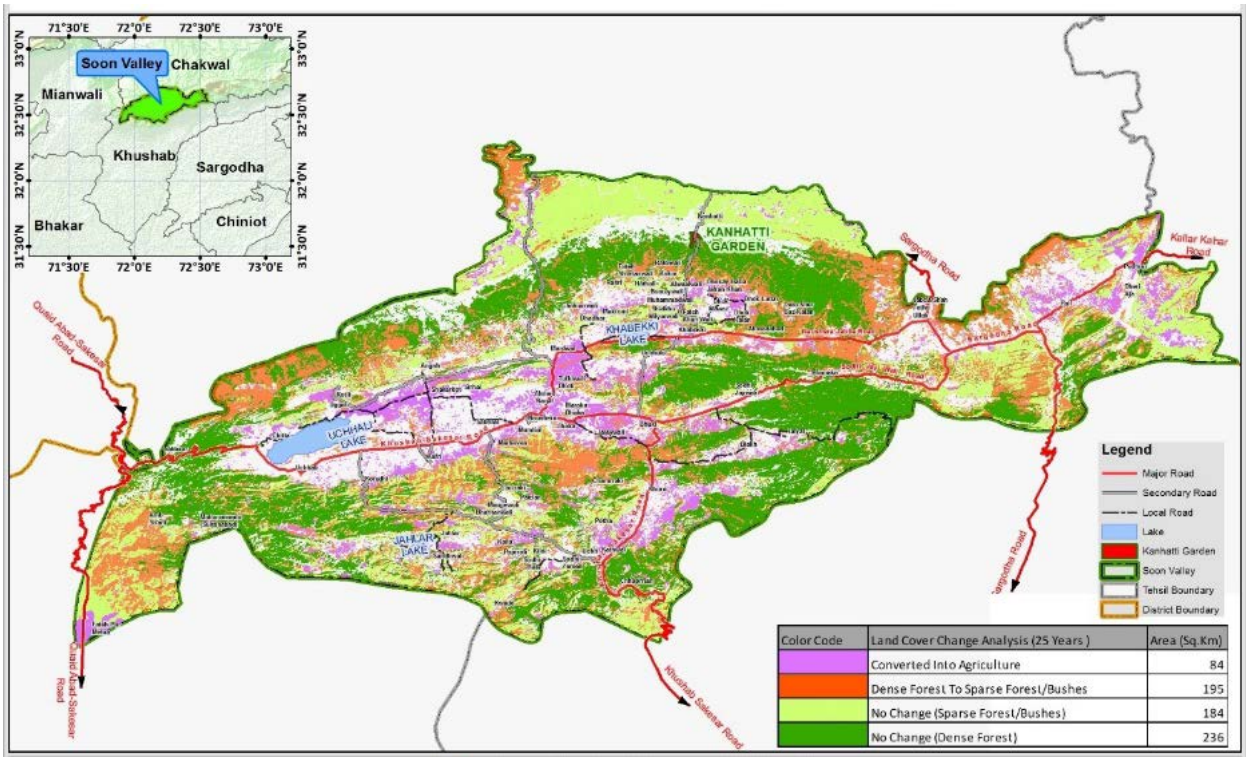



*Figure 64: Land Cover Change Detection*
*Source: The Urban Unit, 2016*

- *The results reveal a change of 84 sq. km of land to agriculture.*
- *However, a 195 sq. km change was observed from dense to sparse forest and bushes.*

This shows that 84 square kilometer of land is converted to agriculture and 195 square kilometer land is converted from dense forest to sparse forest and bushes. While there is no change observed in the land converted from sparse forest and bushes to other uses.

## 5.1.2. Major Issues and Challenges




*Overcoming the challenges & Issues*

Land cover and land use change analysis shows that Soon Valley is under exploited in terms of development. Development initiatives taken in the past are not enough to foster the economic growth of this Soon Valley. From 1990-1995, there is increase of 6% in built up area of Soon Valley that shows slow development in the area.

- Forest area of Soon Valley is under severe pressure due to increased agricultural activities. From 1990-2015, there is decrease in forest area from 453 sq.km to 281 sq.km.
- No urban planning intervention or environmental conservation plan has been undertaken or prepared in the past to foster and control the growth of Soon Valley as a result haphazard development has occurred in the Soon Valley.
- Spatial distribution of different land uses is not coherent and integrated thereby causing serious problems to the residents. For example, health and educational facilities are concentrated only along main roads thus people have to face accessibility issues.
- Employment opportunities are not diverse and pace of commercial development is very slow. Moreover, due to weak administrative control, major roads and streets in built up areas are suffering from encroachments.
- Naushera being a major settlement in Soon Valley is under pressure as most of the people move to Naushera for meeting their daily needs. Most of the infrastructure is confined to Naushera, which always attracts more development activities. Most of the infrastructure provided in the settlements is overburdened, improperly designed and worn out.
- Most of the development undertaken is violating the planning and engineering standards so probability of loss increases in case of earthquake or other calamity.
- Institutions responsible for smooth growth of project area not provided with necessary technical and financial

- *Accessibility issues due to incoherent spatial distribution of health, education and other facilities*
- *Employment opportunities are not diverse and people have to commute to other areas*
- *No urban planning intervention has been carried out resulting in haphazard development*
- *Lack of technical and financial resources allocation is hindering the smooth development of project area*
- *Pace of development activities is slow and confined to Naushera town only.*

- *Tourism and other historical sites are under immense pressure due to poor management of these sites.*
- *Lack of hospitality services in entire project area causes severe problems for tourists.*
- *Most of the structures are not following engineering and planning standards and thus are prone to disaster and hazards.*

resources and ultimately development is taking place without any control. Thus, capacity of administrative officials is also reducing.

- Immense tourism potential can greatly contribute towards revenue and employment generation but no such effort has been made to exploit the tourism potential of the area.
- Urban design of major settlement like Naushera, Uchhali etc. lacks place-making- setting that imparts a sense of place to an area is missing.
- Due to lack of landscape planning, the diversity of landscape is not maintained in the overall development hence there is a lot of room to contribute to environmentally viable urban design.
- There are many historical buildings in the Soon Valley like Forts, Shrines, Rest Houses etc. but they have been neglected badly. If managed properly, they can contribute much to the economy.
- Despite being a beautiful tourism avenue, the project areas generally lacks hospitality services. Visitors face many difficulties due to this as hospitality services are only located in Naushera Town.
- Some poor and low quality residential development is found in central area of Naushera, Uchhali, and Khabekki etc.

### 5.1.3. SWOT Analysis of Land Use




**Strengths**

- A considerable land resource of highly fertile soil
- Rich in natural tourism assets (lakes, waterfalls, gardens, streams, wetlands etc.)
- Overall environment is serene as soil, noise and air quality of the project area is within the permissible limits of Pak-NEQs and WHO
- Rich in mineral assets
- Low population growth, which can have an impact on the viability and vitality of services and businesses

**Weaknesses**

- No development plan has been prepared for planned growth of project area
- Haphazard growth has resulted into deteriorated fabric of settlements
- Institutions responsible for management of project area not provided with necessary technical and financial resources
- Continued decrease in the forest cover from 1990-2015
- Lack of industrial and commerce activities to spur economic growth as a result income level is low.
- Severe shortage of hospitality uses
- Lack of planned recreational spaces or parks
- Weak enforcement
- Incompatible land uses
- Deteriorated cultural and historical buildings like shrines, rest houses etc.

**Opportunities**

- As it is a less populated area, so optimum utilization of land resources can be ensured.
- Opportunity to exploit the immense tourism potential

**Threats**

- Soil erosion
- Soil degradation
- Decreasing forest area
- Loss of rare species of animal and plants
- Land use/cover change and natural habitats fragmentation
- Land sliding due to reduction in the forest area
- Flash floods due to poor management
- Deteriorated quality of life

- *No development plan has been prepared*
- *Lack of industrial and commercial development*
- *Non-allocation of financial resources*
- *Deteriorated tourist and historical sites*
- *Decreasing forest area*
- *Loss of rare species of animal and plants*



## 5.2. Environmental Analysis

- *The project area possess major wetlands of unique aesthetic value, eco-system and dependent migratory species.*
- *Such rich natural and biological diversity demands special attention to preserve, conserve and develop this area.*
- *Thus, environmental analysis has been carried out for Soon Valley which is actually a process to identify all the external and internal elements, which can affect the environmental quality.*



The project area contains major wetlands of unique aesthetic value, eco-system and dependent migratory species. These wetlands play a significant role in developing a typical hydrological, ecological, economic and social structure of the Valley. Effective wetlands management is the key component to sustain with local ecological environment, as they are significant in providing habitation for unique flora and fauna, inclusive of endangered groups, species and the humans in close commensalism with each other. It also supports an enhanced level of biological diversity and productivity, preserve regional and local regimes of hydrology, eliminates pollutants, stores rain, floodwaters, upkeep human values, and activities.

Thus, it demands special attention to preserve, conserve and develop this area. The state of the environment in an area can be best described by its water, soil, noise and air quality. Other possible indicators include the presence (or absence) of proper waste management, recreational parks and green areas, protected and environmental sensitive areas etc. In this section, environmental issues of Soon Valley are being analyzed by employing Environmental Sensitivity Analysis, Spatio-Temporal Analysis of existing lakes (Uchhali, Khabekki and Jahalar), air quality, surface water quality, drinking water quality, noise level and soil quality and human settlements.

### 5.2.1. Water Quality Analysis

- *To assess the water quality impacts, water resources in the impact area have been grouped into two classes' i.e. Surface water sources and Ground water sources in the deeper strata of the ground*

The water quality analyses are carried out by environment team of The Urban Unit in 2015 to determine the surface and ground water quality within Soon Valley. To assess the water quality impacts, water resources in the impact were grouped into two classes:

(i) Surface water sources i.e. lakes (Khabekki Lake + Uchhali Lake)

(ii) Ground water sources/aquifers in the deeper strata of the ground (Tube wells + Hand pumps)

The ground water quality analyses were conducted at number of villages such as: Uchhali Village, Makrromi Village, Dhadharr Village and Khabekki Village. While the surface water quality was analyzed at the Uchhali and Khabekki Lakes. The results of these analyses are summarized as:

- All the chemical parameters such as: pH, TDS, Total Hardness, Chlorides, Carbonate, Bicarbonate, Sulfate, Calcium, Magnesium, Sodium, Potassium, Cadmium, Chromium, Copper, Lead, Arsenic & Zinc, present within the ground water of the selected villages, are within the permissible limits as prescribed by World Health Organization (WHO) and Pak-National Environmental Quality (NEQ) standards.
- The taste and odor of the ground water at majority of the selected villages is also acceptable. In-addition, the microbiological parameters such as; total Coliform and E-Coli bacteria are also absent
- Likewise ground water, all the chemical parameters such as: pH, TDS, Total Hardness, BOD, COD, Chlorides, Carbonate, Bicarbonate, Sulfate, Calcium, Magnesium, Sodium, Potassium, Cadmium, Chromium, Copper, Lead, Arsenic, Zinc & Iron within the surface water at Uchhali and Khabekki Lakes are within the permissible limits as prescribed by Pak-NEQ's standards.

The water analyses carried out as a part of Drought Mitigation and Preparedness Program (DMPP) for Soon Valley Project in 2005 reveals that the quality of the ground water is up to the mark and all the parameters are within the permissible limits as prescribed by WHO and NEQs Standards. It emerged that the ground water quality of the region have remained consistent and acceptable over this time period (from 2005 to 2015).

In-addition to the water quality, the following issues have been observed, which are given below:




*The water quality analysis for the valley revealed the acceptable limits*

- *Ground water quality at selected villages & surface water quality analyses at Uchhali & Khabekki Lakes reveal that all the chemical & microbiological parameters are* ***within the permissible limits*** *as prescribed by Pak-NEQ's standards.*
- *In 2005, water quality analyzed by NESPAK (as a part of DMPP) also reveals the satisfactory condition of ground and surface.*

- *Valley experiences a continuous decline in water table depth which is an alarming situation*
- *Water table have decline to an average of 65 feet particularly due to severe drought (during 1997-2002) & extensive water boring for agriculture use*

- Rainfall is the only source creating runoff and recharge of the ground aquifer so this ground water is highly dependable on rainfall in this region. The extensive drought (during 1997-2002) dried up the ground aquifer. The effect of the drought disturbed the water balance in the entire valley and most tube-wells dried up. It also resulted in decline of water table depth.
- In 2005, the water table depth in Soon Valley ranges from 20 to 70 meters (65 ft. to 230 ft.) from the center of the valley to the piedmont as depicted in DMPP report**.** This water level have dropped to a certain extent i.e. from 65 ft. - 230 ft. in 2005 to 130 ft. - 300 ft. in 2015.

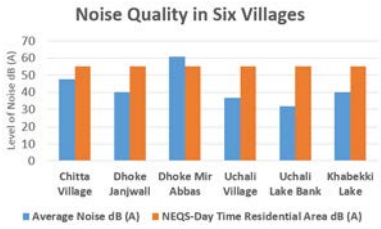



*Figure 65: Noise quality analysis was done for the six villages, with majority of tthe sites free of noise pollution*

- *Noise quality in Soon Valley Complex was measured during 14th Feb, 2015 by the EIA Team of the Urban Unit at six different points i.e. Chitta Village, Dhoke Janjwall, Dhoke Mir Abbas, Uchhali Village, Uchhali Lake Bank & Khabekki Lake.*
- *The noise quality analyses reveal that the average noise at selected located sites were within* ***the permissible limits*** *as prescribed by NEQ's-Day Time noise levels.*

### 5.2.2. Noise Quality Analysis

Noise quality in Soon Valley Complex was measured during 14th Feb, 2015 by the EIA Team of the Urban Unit. Total 06 monitoring points at project sites i.e. Chitta Village, Dhoke Janjwall, Dhoke Mir Abbas, Uchhali Village, Uchhali Lake Bank & Khabekki Lake were selected and their noise quality were monitored after regular intervals of times by using Monitoring Instrument: TENMARS TM-102. The obtained results reveal that the majority of project sites are free from noise pollution and the measured parameters are in permissible limits of Pak-NEQs. However, during the construction phase permissible noise levels can be temporarily exceeded due to the movement of equipment in the working zone of the project site. However, with due implementation of effective noise abatement measures, it will be minimized. The following table shows the average noise level at six different location of Soon Valley.

*Table 42: Summary of Noise Quality at Six Different Location of Soon Valley*

| *Location* | *Average Noise dB (A)* | *NEQS-Day Time Residential Area dB (A)* |
|---|---|---|
| *Chitta Village* | 47.66 | 55 |
| *Dhoke Janjwall* | 40.18 | 55 |
| *Dhoke Mir Abbas* | 60.92 | 55 |
| *Uchhali Village* | 36.47 | 55 |
| *Uchhali Lake Bank* | 31.88 | 55 |
| *Khabekki Lake* | 40.07 | 55 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

### 5.2.3. Air Quality Analysis

Ambient air quality of Soon Valley Complex were measured in winter season at 14th February, 2015 by the Urban Unit Team. Total 03 sampling sites were selected and the air quality of these areas were monitored at regular interval of time i.e. after every 1 hour. Afterwards, seven physicochemical parameters (i.e. CO, NO, NO2, SOx, H2S, PM) were analyzed in these sampling sites. The obtained results shown below

depicted that all the measured parameters were in permissible limits of **WHO** and **Pak-NEQs** and the air quality of the villages and the adjacent sides of lakes were observed healthy.



*Soothing air quality & Pleasant Weather in Soon Valley*

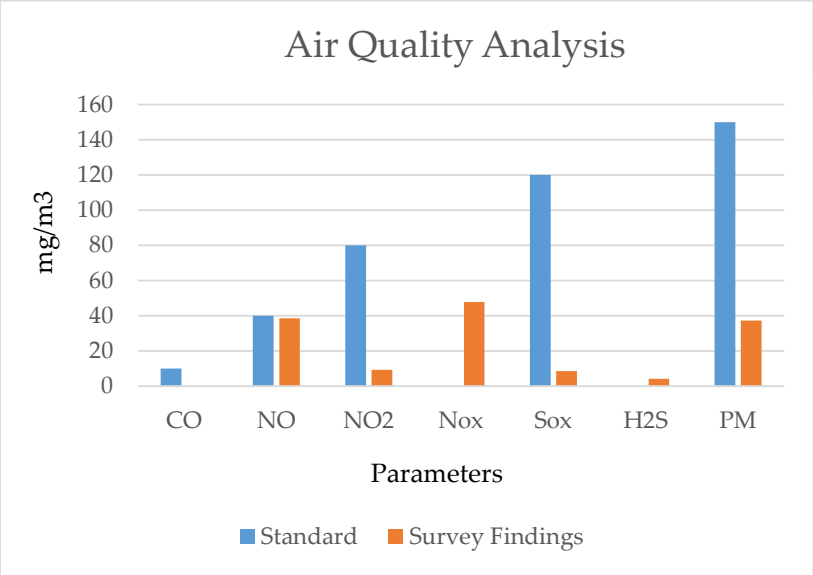



*Figure 66: Air Quality Analysis of Soon Valley*
*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

### 5.2.4. Soil Quality Analysis

To determine the quality of the soil, representative soil samples from Soon Valley Complex were collected in winter season on 15th February, 2015. The sampling strategy was Grab sampling and samples were collected from the nearby locations and alongside the lake banks from a depth ranging from 0.50 m to 1.00 m. Total 08 samples were taken from the study areas and Ten physicochemical parameters (i.e. pH, Texture, Organic matter, saturation, potassium, phosphorous, CaCO3, Sodium, Ca + Mg, Electrical conductivity) were analyzed. The obtained results depicted that all the measured parameters were in permissible limits of WHO and Pak-NEQs. The following table summarizes the results obtained from the 8 different sampling points.

- *Ambient air quality of Soon Valley Complex was measured in winter season at 14th February, 2015 by the Urban Unit Team.*
- *Total 03 sampling sites were selected and the air quality of these areas were monitored at regular interval of time i.e. after every 1 hour.*
- *The measured physicochemical parameters (i.e. CO, NO, NO2, SOx, H2S, PM) are in permissible limits of **WHO** and **Pak-NEQs.***

- *To analyze the soil quality, representative soil samples from Soon Valley Complex were collected in winter season on 15th February, 2015.*
- *Total 08 samples were taken from the study areas and 10 physicochemical parameters (i.e. pH, Texture, Organic matter, saturation, potassium, phosphorous, CaCO3, Sodium, Ca + Mg, Electrical conductivity) were analyzed.*
- *The measured parameters are in permissible limits of **WHO** and **Pak-NEQs.***

*Table 43: Summary of Soil Characteristics within Soon Valley*

| ***Parameter*** | ***Value*** |
|---|---|
| *pH* | 8.09 |
| *Electrical Conductivity (EC)* | 16.50 |
| *Organic matter* | 0.65 |
| *Saturation* | 44.75 |
| *Potassium* | 389.13 |
| *Phosphorus* | 5.46 |
| *CaCO3* | 9.24 |
| *Sodium* | 41.38 |
| *Ca + Mg* | 13.04 |

*Source: Survey Conducted by the EIA Team of Urban Unit, 2015*

### 5.2.5. Environmental Sensitivity Analysis

Environmental Sensitivity Analysis became one of the very important tools in ecology. Such analysis are widely used in finding the resource assessments, recreational planning, biodiversity conservation, Environmental Impact Assessments (EIA), Strategic Environmental Assessments (SEA) and many others areas. It is also an important tool of overall planning process for any region in environmental perspective. The main objectives of this analysis are:

- Mapping of ecological assets, strengths, weaknesses and threats in the area
- Mapping of ecological sensitivity throughout Soon Valley (Project Area)
- To enhance the environmental management of the Valley
- To develop a scientific methodology to prioritise areas for conservation and protection effort
- To encourage land uses and developments that maintain and enhance the natural habitat
- To acknowledge and conserve significant natural resources and features within Soon Valley

The study is based on the ecological indicators and their synthesis to identify ecologically significant and priority areas with in study area. For this purpose, spatial distribution of different aspects of ecological value for geographical targeting of conservation priority areas are identified. Then, a Geographic Information System (GIS) based overlay analysis of ecological parameters has been carried out. Indicators for Forest Cover, Agriculture Area, Vegetation Area (Sparse and Dense Density), Protected Areas, highly significant wetlands, Wildlife Species Habitat (birds, mammals, fish) and Built up are developed by using GIS and compiling the secondary data into spatial environment. Finally, buffer analyses are carried out along certain natural features at a pre-determined distance.

- *Environmental Sensitivity Analysis became one of the very important tools in ecology and is widely used in environmental studies.*
- *Different indicators such as; forests, protected areas, water bodies, settlements, agriculture, vegetation, & endemic species have been used to identify the ecologically significant and priority areas within study area.*

### 5.2.5.1. Indicators

The detailed description and mapping for indicators with certain classes is discussed as under:

**Forests**

The list of all forests within the project area are listed as:

1. Rakh ugali karang/rakh anga/rakh mardwal/rakh khabakki
2. Rakh huraddi
3. Chitta rf
4. Fatehpur rf
5. Rakh jabbi
6. Amb rf
7. Warchha rf
8. Sakesar rf
9. Amb sharif
10. Rakh Jahlar
11. Kattha rf
12. Khura south rf
13. Rakh sodhizairin
14. Paslian bhinaka rf
15. Dand unclassed forest



*Figure 67: A View of Forest near Mardwal Village, Soon Valley*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*




16. Rail rf
17. Rakh khura west rf
18. Kotukka (shinh dhakki) rf
19. Rakh surakki
20. Malot rf/ dawal uf/bhiot rf
21. Rakh khura north rf
22. Rakh mardwal
23. Hapar (sodhi) rf/ paslian (bhinaka) rf
24. Hinj rf/chinji rf
25. Mari rf
26. Kattha rf
27. Uchhalli rf

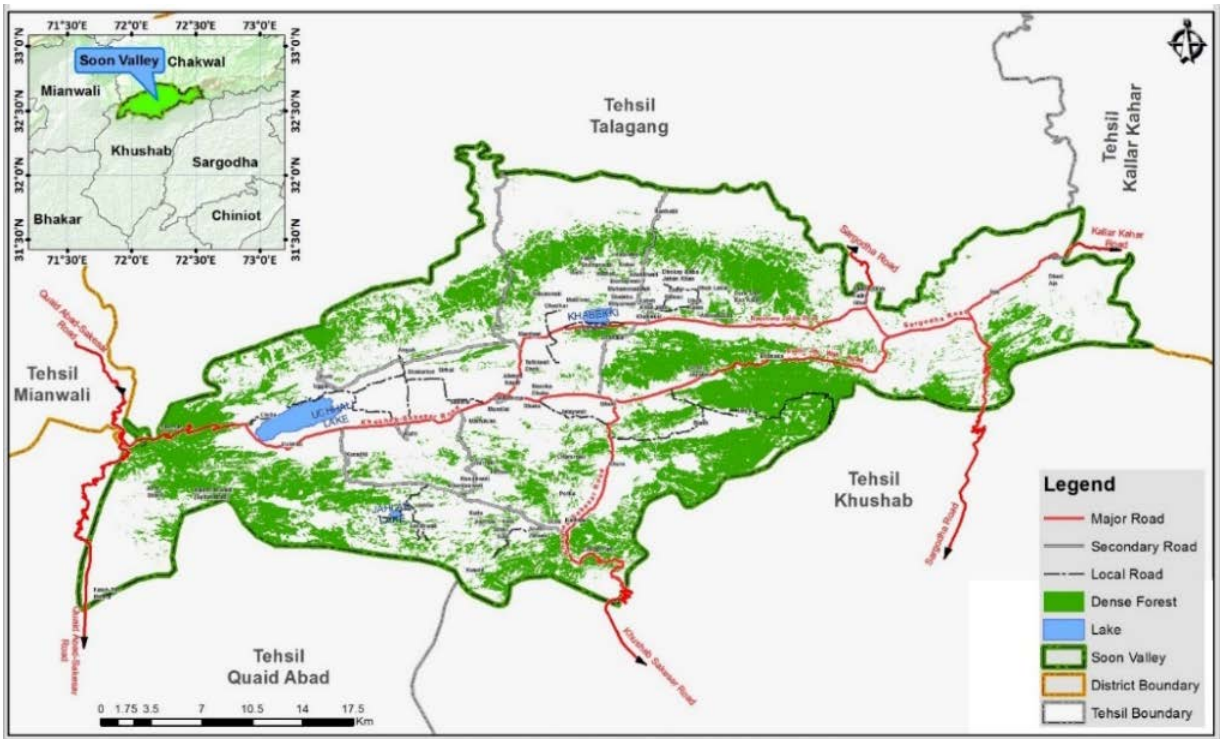



*Figure 68: Location of All Dense Forests within the Project Area*
*Source: Urban Unit, 2015*

## Protected Areas

As per analysis, there are 5 protected areas within the project area i.e. 4 Wildlife Sanctuaries, 1 Game Reserves. The following table shows the details of protected areas within the study area.

*Table 44: Details of Protected Areas within the Project Area*

| *Sr. #* | *Name* | *Class* |
|---|---|---|
| 1 | Jahlar Lake | Wildlife Sanctuary |
| 2 | Khabekki Lake | Wildlife Sanctuary |
| 3 | Sodhi | Wildlife Sanctuary |
| 4 | Uchhali Lake | Game Reserve |
| 5 | Chumbi surla | Wildlife Sanctuary |

*Source: IUCN, 2005; WWF–P, 2010*



*Figure 69: Khabekki Lake: A Home for Wildlife*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

These protected areas are seen within an applied 500m buffer in its surrounding which is shown in the following map.

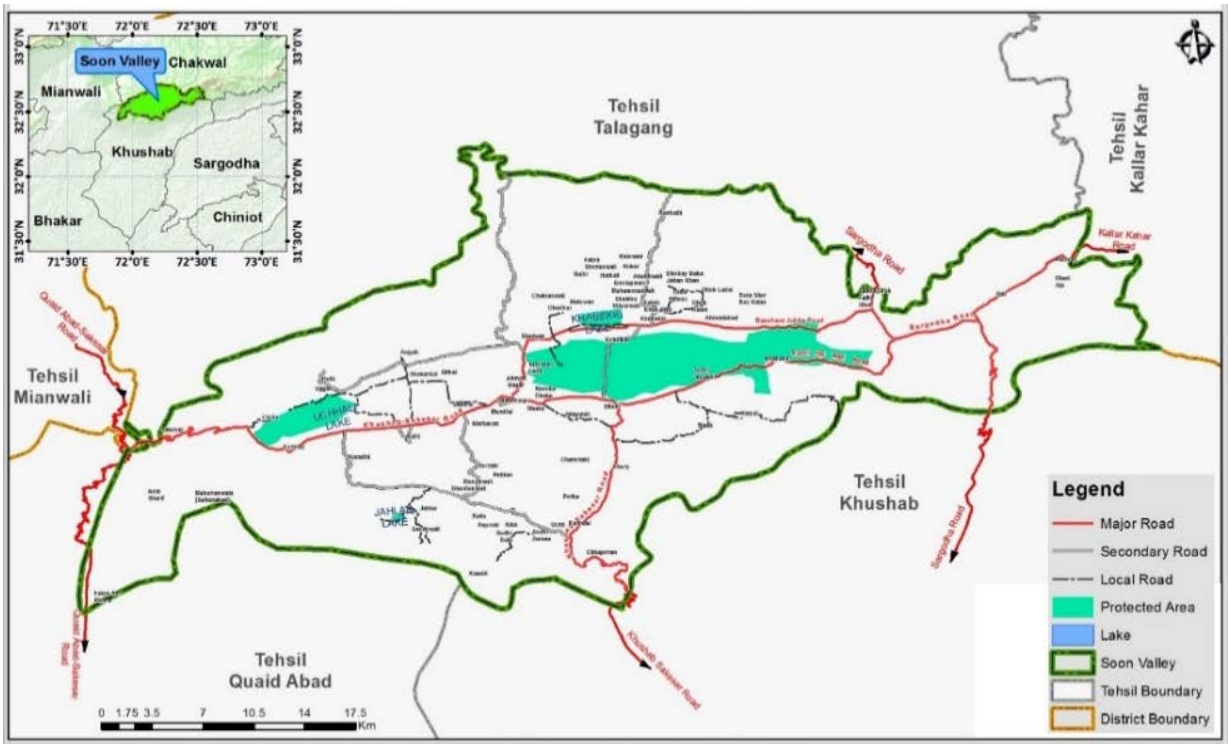



*Figure 70: Location of All Protected Areas within Soon Valley*

*Source: Urban Unit, 2015*

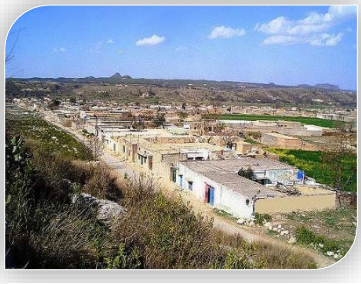


*Figure 71: View of Settlement near Mardwal Village, Soon Valley*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

## Water Bodies

The project area comprises a number of water bodies including lakes, ponds and river. There are total 3 lakes and 44 water ponds, within the study area. These three lakes are: Khabekki Lake, Uchhali Lake and Jahlar Lake. The location of all these water bodies within Soon Valley is shown in the following map.

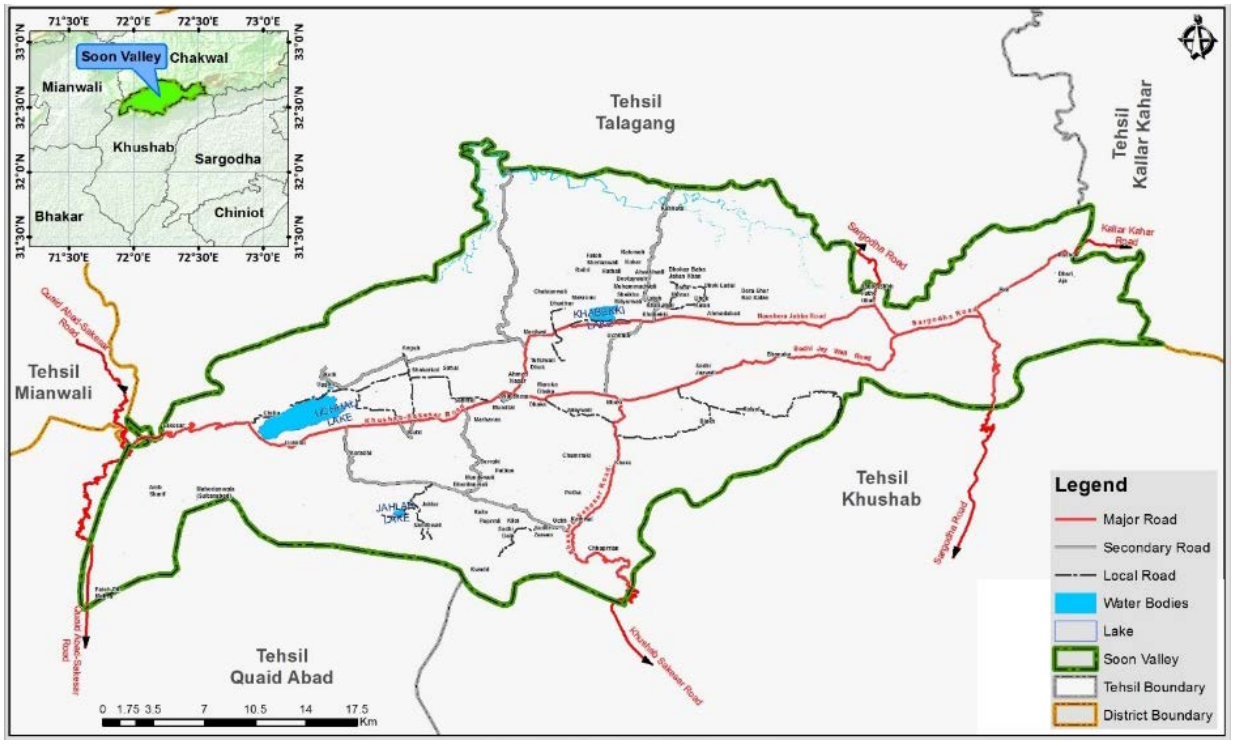



*Figure 72: Location of All Water Bodies within the Project Area*

*Source: Satellite Imagery (Google Earth), 2015*

- *Other than the protected areas and dense forest, water bodies and other settlements form a major part of the project area.*
- *Existing settlements are identified with the help of a 100 m demarcated buffer on the map.*

## Settlements

All the settlements within the project area are marked and buffer of 100 meter is applied in its surroundings as shown in the map given below.

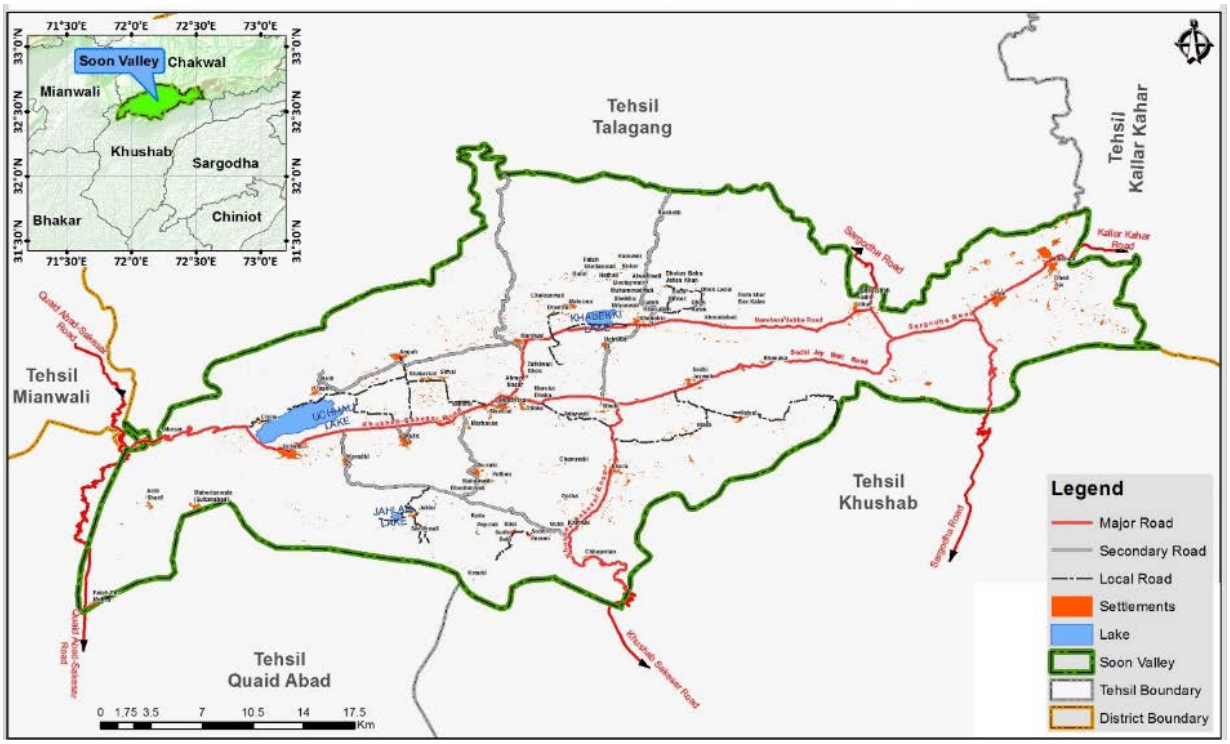



*Figure 73: Location of All Settlements with 100 m Buffer (in their surroundings) within the Project Area*
*Source: Urban Unit, 2016*

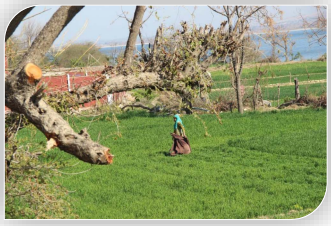


*Figure 74: A view of Agriculture Land in Soon Valley*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

## Agriculture

As the natives of this area are heavily dependent on the agricultural sector. The major portion of their monthly income comes from this sector. So keeping in view this important factor of livelihood, the Consultants studied the patterns of agriculture production and its spatial locations. In this regard, the GIS Database has been developed for the Soon Valley in which the extent of agricultural land is analyzed. The map given below shows the extent of this agricultural land within the Soon Valley. As depicted in the maps, the light pink color shows the agriculture land.

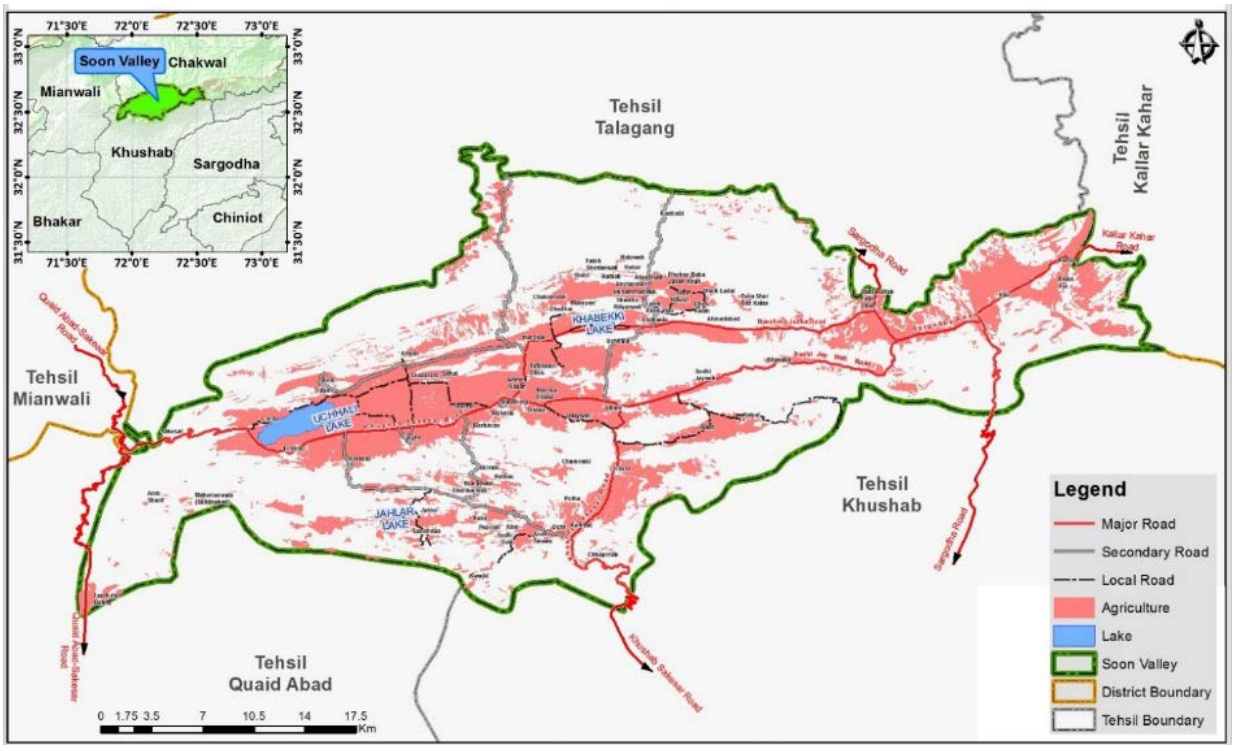



*Figure 75: Location of All Agricultural Lands within the Project Area*
*Source: Urban Unit, 2015*

## Vegetation

Likewise, agricultural analyses, the extent of vegetation land was also examined. The following map shows the locations of all vegetation that exists in the project area.

- *A vast area of agricultural land is found in the Soon Valley*
- *Due to high fertile soil, a number of crops are grown in the area.*
- *Other than the vast agricultural land, vegetation is largely spread over the entire area.*
- *There is a need to preserve the agriculture land and vegetation.*

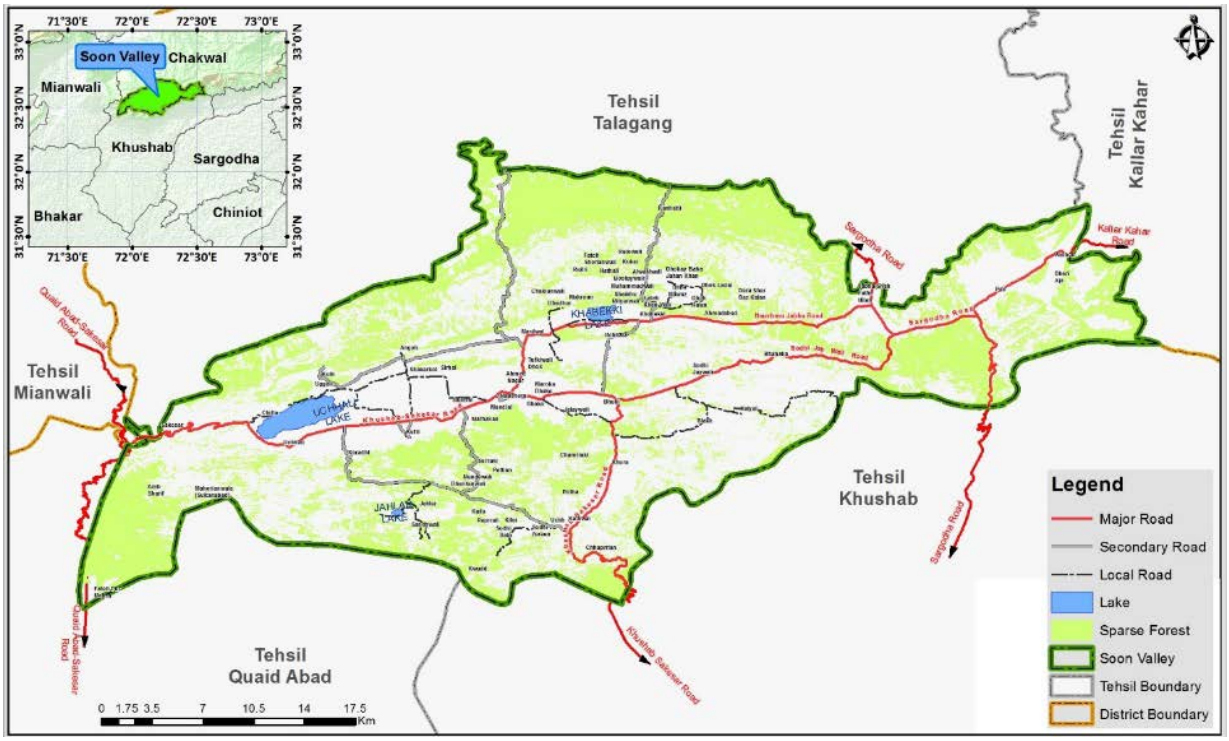



*Figure 76: Location of All Sparse Vegetation within the Project Area*
*Source: Urban Unit, 2015*



*Figure 77: Punjab Urials near Kalyal Village, Soon Valley*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

## Endemic Species

The lakes within the project area, especially Uchhali and Khabekki Lakes, provide a core habitat to several endemic species. However, they are also considered an ideal place for providing habitat of several endangered species of both flora and fauna as well. The location of these endemic species, especially Punjab Urial, have been identified and mapped accordingly. The buffer of 5 km have been applied along these locations as shown in the map given below.

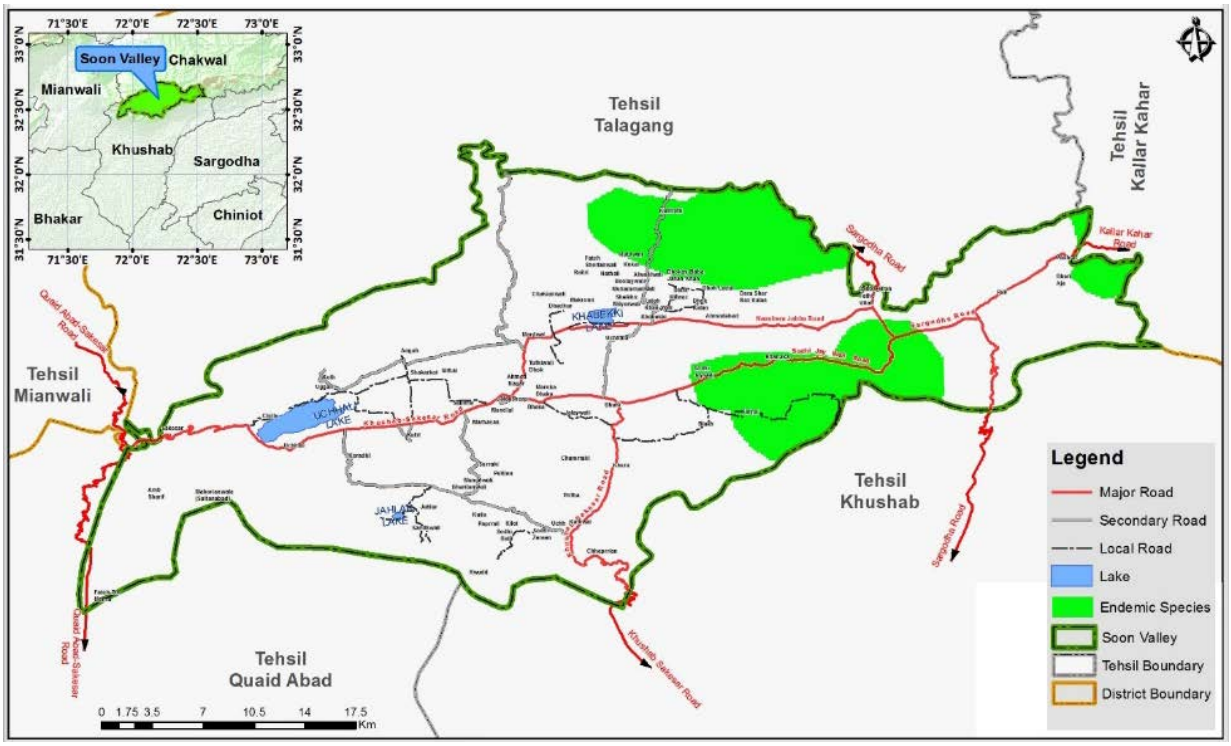



*Figure 78: Location of All Endemic Species within the Project Area*

*Source: Urban Unit, 2015*

### 5.2.5.2. Criteria for Ecological Sensitivity Analysis

The following criteria was applied for this analysis which is depicted in the table given below.

*Table 45: Criteria for Ecological Sensitivity Analysis*

| *Indicator* | *Buffer* | *Score* |
|---|---|---|
| State forest | - | 1 |
| Agriculture | - | .5 |
| Vegetation | - | .5 |
| Water Features | 50m | 2 |
| Protected Area | 500m | 1 |
| Endemic Species | 5km | 1 |




*Ecological Sensitivity Analysis was made under the enlisted six criteria*

Keeping in view the above-mentioned indicators and criteria, a comprehensive map for project area was produced. It helps to identify the specific locations for future development while taking into account the environmental sensitivity of the area

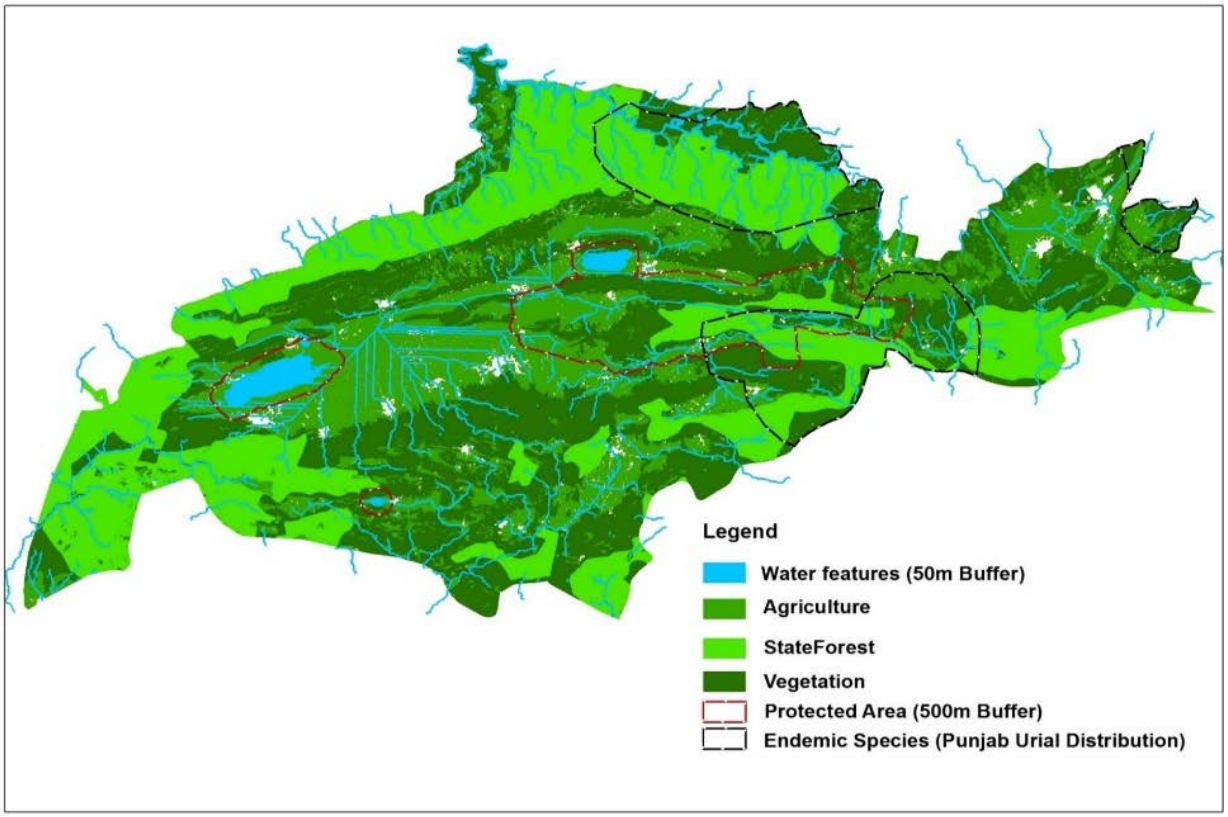



*Figure 79: Ecological Indicators and Criteria for Environmental Sensitivity Analysis of Project Area*

*Source: The Urban Unit, 2016*

- *Studying the ecology of the project area, it has been observed to comprise of several water bodies and green area.*
- *An ecological sensitivity has been generated on the basis of a defined criteria.*
- *The indicators chosen for such a kind of analysis include forest, vegetation, water bodies, protected areas and endemic species.*

- *The results of the analysis reveal that the least sensitive areas lie at the periphery and is shown in green,*
- *However, the most sensitive areas lie in the heart of the valley and are shown in red on the map.*

### 5.2.5.3. Results

Based on the indicators and criteria selected for the environmental sensitivity analysis, the locations of the highly sensitive and least sensitive regions were derived. The green color as shown in the map highlights that the particular area is least ecologically sensitive while the dark red color depicts the highly sensitive areas within the Soon Valley study area.

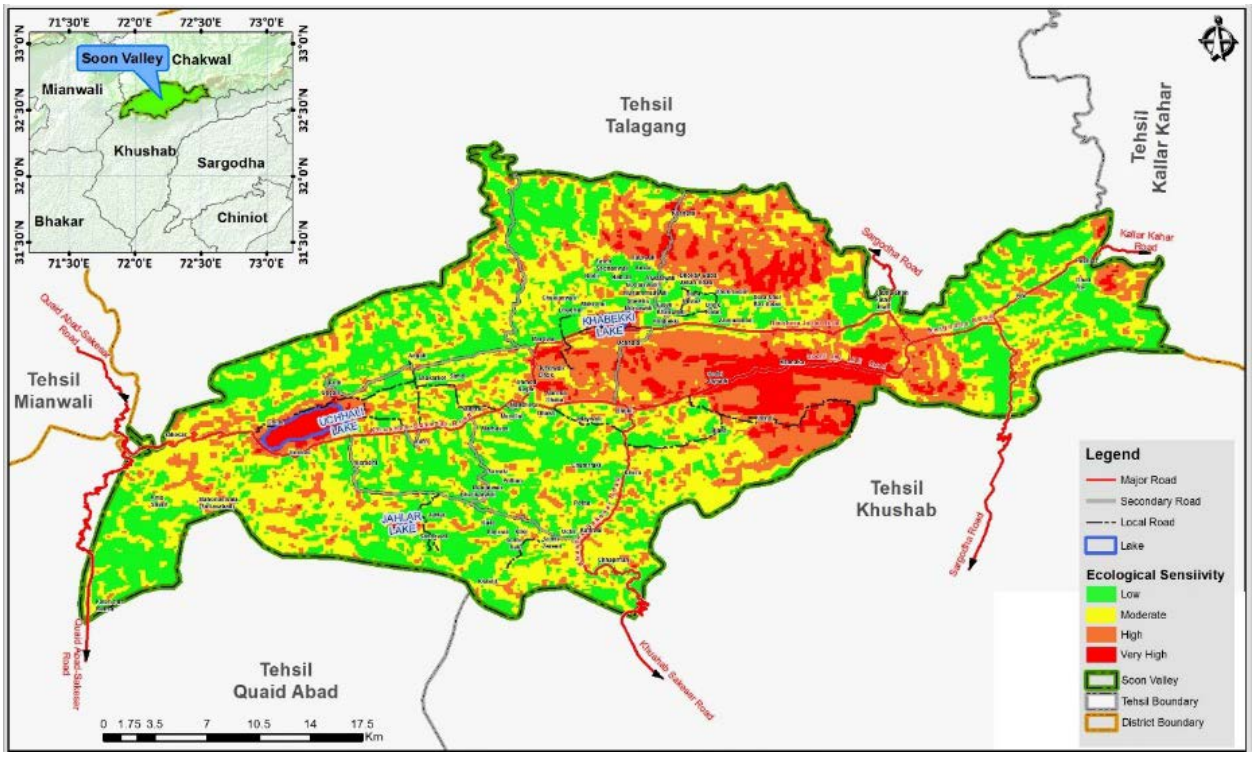
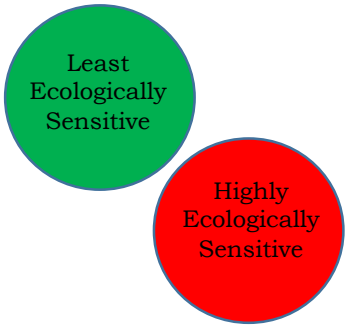



*Figure 80: Results of Environmental Sensitivity Analysis of Study Area*

*Source: The Urban Unit, 2016*




## 5.2.6. Temporal Analysis of Lakes in Soon Valley

The temporal analysis of all three lakes, within the project area, is carried out to analyze their extent during the past 45 years. The areas for the year 1971, 1988, 1990, 2000, 2005 and 2016 were calculated using GIS and Landsat Imageries. The analyses are given below:

## Jahlar Lake

Jahlar Lake is located in Jahlar Village, which is small settlement of the Kufri. It is the smallest lake as compared to Uchhali and Khabekki Lake. The following table shows the detailed description of the time series analysis of this Lake.

*Table 46: Spatio-Temporal Analysis of Jahlar Lake, Soon Valley*

| *Year* | *Area (Acres)* | *Satellite Data Source* |
|---|---|---|
| *1971* | 38 | Key hole |
| *1988* | 37 | KFA |
| *1990* | 52 | Landsat TM |
| *2000* | 30 | Landsat TM |
| *2005* | 21 | SPOT 5 |
| *2015* | 53 | Landsat ETM+ |

The analyses reveals that the Jahlar Lake experiences huge variations in its area during the year 1971 to 2015. In 1971, the size of the Lake was 38 acres which rose to 52 acres during the year 1990. The area experienced worst drought during 1997-2002, as a result the area of this Lake decreased to 30 acres in 2000 which further decreased to its lowest level (21 acres) in year 2005. However, the extensive rain recorded during the year 2010 and 2013, the area of this Lake rose to its maximum level as measured using Landsat ETM+ for the year 2015.

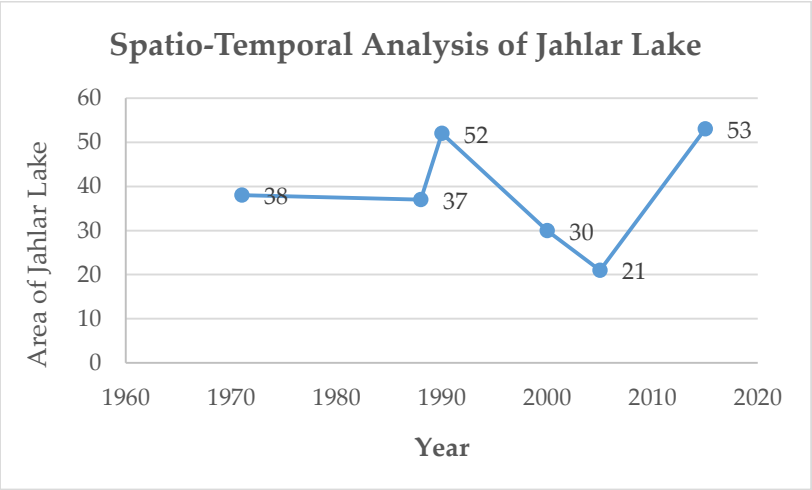



*Figure 82: Spatio-Temporal Analysis of Jahlar Lake*
*Source: The Urban Unit, 2015-16*



*Figure 81: A View of Jahlar Lake during the Winter Season, 2015*
*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

- *Jahlar Lake experiences huge variations in its area during the year 1971 to 2015.*
- *Soon Valley experienced worst drought during 1997-2002, as a result the area of Jahlar Lake decreased to 30 acres in 2000 which further decreased to its lowest level (21 acres) in year 2005.*
- *Moreover, the extensive rainfall during the year 2010 and 2013 have recovered the Lake area considerably*

- *Spatio-Temporal analysis was also taken up for Khabeki lake which is the second largest lake in the valley.*
- *Marked variation is observed in its area size from the year 1971-2015.*
- *Spatio-temporal analysis is helpful in determining the spatial characteristics over different time periods.*

This analysis is shown in the map given below:

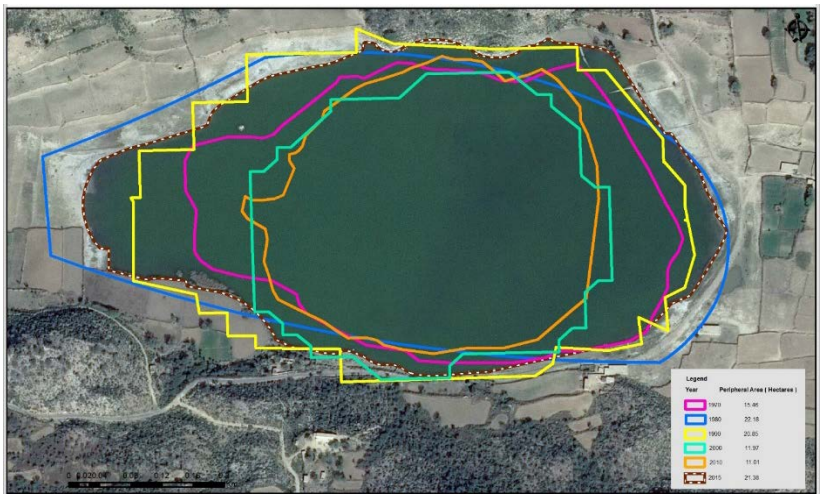


*Figure 83: Spatio-Temporal Analysis of Jahlar Lake, Soon Valley*
*Source: Extracted by the Consultants using Primary and Secondary Data*

## Khabekki Lake

Khabekki Lake is considered as the second biggest lake with respect to area. It is located near Khabekki village along Naushera-Jaba Road.

The following table shows the detailed description of the time series analysis of this Lake.



*Figure 84: A View of Khabekki Lake during the Winter Season, 2015*
*Source: Field Survey Conducted by the Urban Unit Team, 2016*

*Table 47: Change Detection in Area of Khabekki Lake*

| *Year* | *Area (Acres)* | *Satellite Data Source* |
|---|---|---|
| *1971* | 271 | Key hole |
| *1988* | 581 | KFA |
| *1990* | 537 | Landsat TM |
| *2000* | 408 | Landsat TM |
| *2005* | 30 | SPOT 5 |
| *2015* | 315 | Landsat ETM+ |

The analyses reveals that the Khabekki Lake experiences huge variations in its area during the year 1971 to 2015. In 1971, the size of the Lake was 271 acres which rose to 581 acres during the year 1998. The historic climate data of this region shows that the area experienced worst drought during 1997-2002, as a result the area of this Lake decreased to 408 acres in 2000 which further decreased to its lowest level (30 acres) in year 2005. However, the extensive rain recorded during the year 2010 and 2013, the area of this Lake have been recovered considerably and increased to 315 acres as measured using Landsat ETM+ for the year 2015.

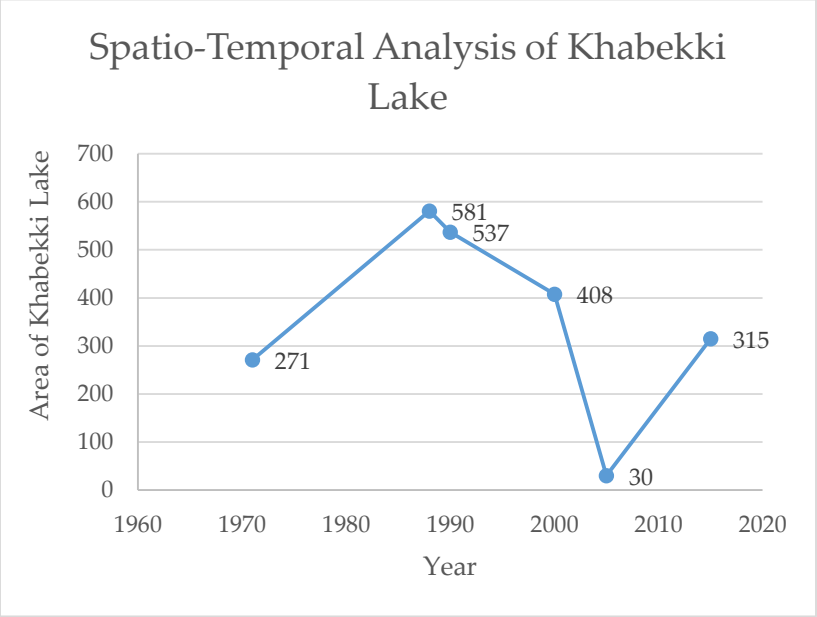
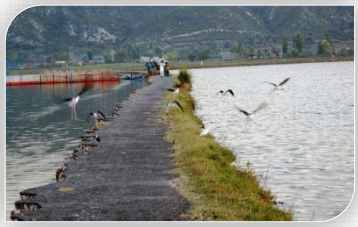



*Figure 85: Spatio-Temporal Analysis of Khabekki Lake*
*Source: Extracted by the Consultants using Primary and Secondary Data*

- *Khabekki Lake experiences huge variations in its area during the year 1971 to 2015.*
- *As per historic climate records, Soon Valley experienced worst drought during 1997-2002, as a result the area of Khabekki Lake decreased to 408 acres in 2000 which further decreased to its lowest level in year 2005.*
- *However, the extensive rainfall during the year 2010 and 2013 have recovered the Lake area considerably*



*The un-metalled pathway at Uchhali Lake connects the two areas on the opposite sides of the valley*

*Field Survey Conducted by the Urban Unit Team, 2016*

This analysis is shown in the map given below:

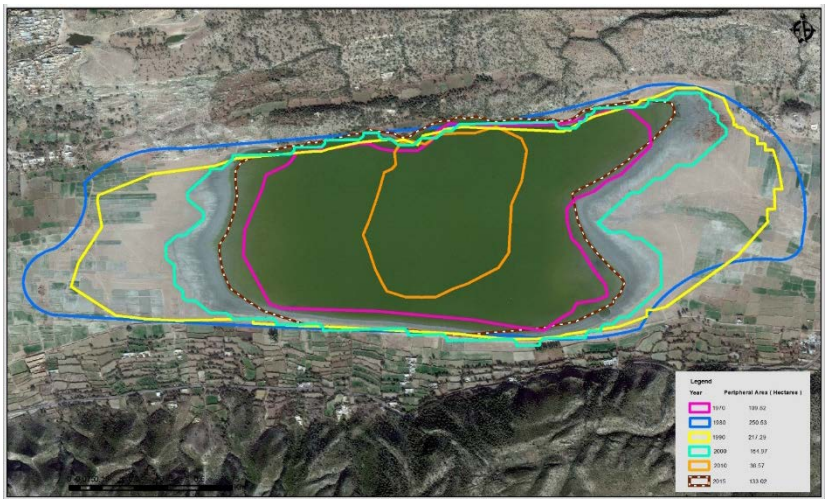


*Figure 86: Spatio-Temporal Analysis of Khabekki Lake*
*Source: Extracted by the Consultants using Primary and Secondary Data*



*Figure 87: A View of Uchhali Lake during the Winter Season*

*Field Survey Conducted by the Urban Unit Team, 2016*

## Uchhali Lake

It is the largest lake within the whole Soon Valley. It is situated 13 km west of Naushera and 42 km northwest of Khushab District, Punjab Province, and surrounded by agricultural lands. The lake is fed run-off from the surrounding hills of the Salt Range and a small spring, seepage from nearby irrigated land.

The following table shows the detailed description of the time series analysis of this Lake.

*Table 48: Change Detection in Area of Uchhali Lake*

| *Year* | *Area (Acres)* | *Satellite Data Source* |
|---|---|---|
| *1971* | 999 | Key hole |
| *1988* | 1724 | KFA |
| *1990* | 1647 | Landsat TM |
| *2000* | 1120 | Landsat TM |
| *2005* | 884 | SPOT 5 |
| *2015* | 1695 | Landsat ETM+ |

*Source: Extracted by the Consultants using Secondary Data*

The analyses reveal that the Uchhali Lake experiences huge variations in its area during the year 1971 to 2015. In 1971, the size of the Lake was 999 acres which rose to a maximum of 1724 acres during the year 1998. The historic climate data of this region shows that the area experienced worst drought during 1997-2002, as a result the area of this Lake decreased to 1120 acres in 2000 which further decreased to its lowest level (884 acres) in year 2005. However, the extensive rain recorded during the year 2010 and 2013, the area of this Lake have been recovered and increased to 1695 acres as measured using Landsat ETM+ for the year 2015.

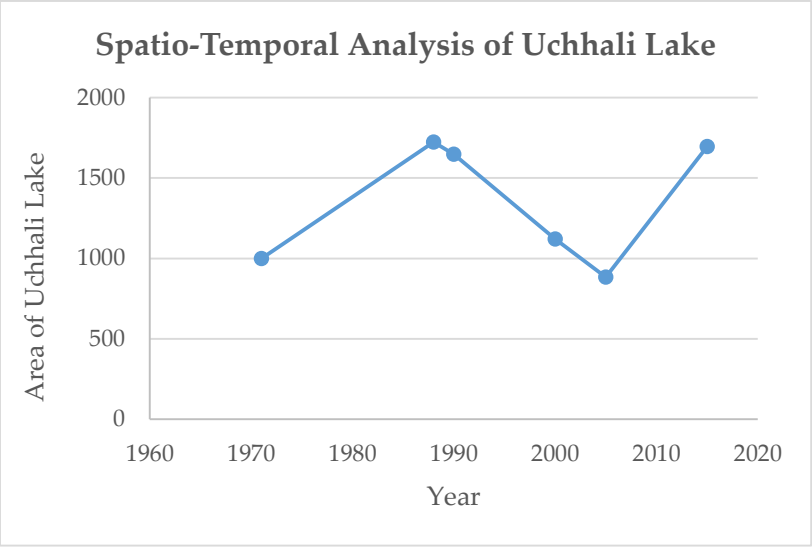



*Figure 88: Spatio-Temporal Analysis of Uchhali Lake*
*Source: Extracted by the Consultants using Secondary Data, 2016*

- *Likewise Jahlar & Khabekki Lakes, Uchhali Lake also experiences huge variations in its area during the year 1971 to 2015.*
- *The Lake area increased to a maximum level (1724 acres) in 1988.*
- *But due to the worst drought during 1997-2002, the area of Uchhali Lake decreased to 1120 acres in 2000 which further decreased to its lowest level (884 acres) in year 2005.*
- *However, the extensive rainfall during the year 2010 and 2013 have recovered the Lake area considerably*

This analysis is shown in the map given below:

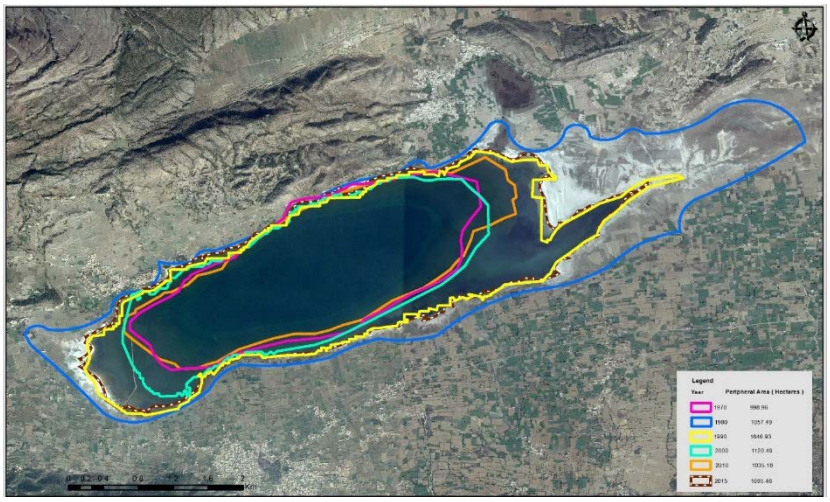


*Figure 89: Spatio-Temporal Analysis of Uchhali Lake*
*Source: Extracted by the Consultants using Secondary Data*

### 5.2.7. Environmental Analyses Findings

The major findings in this regard are summarized as:

- The pH of Uchhali and Khabekki lake water samples lies between 8.7-9.7 and 8.75-9.1 respectively. It reveals that pH is not as high that it becomes lethal to aquatic/water biodiversity. That's why both lakes support few fish species like Talabia, sundali, rahu etc.
- The obtained results of *TDS* values of the surface water of lakes are high as compared to PAK-EPA permissible limits (i.e. 3500mg/L for TDS and 200mg/L for TSS).
- The obtained results of BOD and COD are also high as compared to NEQs permissible limits (i.e. 80mg/l for BOD and 150mg/l for COD) due to the presence of high algal growth.
- The salts such as; Calcium, Magnesium, Potassium, Sodium, Sulphates, Carbonates, Bicarbonates and

- *Water quality analyses show that the ground and surface water of Soon Valley is good and within the permissible limits as prescribed by WHO & Pak-NEQ's*
- *The presence of calcium, magnesium and chlorides in the soil makes its fertile for cultivation.*

Chlorides are present in high concentration in the Lakes. It is primarily due to fertile soil erosion, agricultural runoff, geological basin of the area, dilutions due to precipitation.

- The majority of selected project sites are free from noise pollution and the measured parameters are in permissible limits of Pak-NEQs.
- The physicochemical parameters (i.e. CO, NO, NO2, SOx, H2S, PM) measured at project sites are in permissible limits of WHO and Pak-NEQs and the air quality of the villages and the adjacent sides of lakes were observed healthy.
- Similarly, soil analysis carried out at 8 different sites within the project area reveals that the physicochemical parameters (i.e. pH, Texture, Organic matter, saturation, potassium, phosphorous, CaCO3, Sodium, Ca + Mg, Electrical conductivity) are in permissible limits of WHO and Pak-NEQs.
- Environmental sensitivity analysis reveals that there are 5 protected areas within the project area i.e. 4 Wildlife Sanctuaries, 1 Game Reserves. In total, there are 3 lakes and 44 water ponds in the entire Soon Valley.
- Uchhali and Khabekki Lakes provide a core habitat to several endemic species such as Punjab Urial
- The spatio-temporal analysis carried out for Jahlar, Khabekki and Uchhali Lakes reveals that the areas of lakes depict huge variations during the year 1971 to 2015 i.e. areas of all these lakes decreased to an alarming point in year 2005 but afterwards increased to a comparative size up to year 2015 and this primarily owes to less precipitation due to global climate change phenomenon.
- Deforestation is a common phenomenon observed within this area. There are many factors, which has contributed in large-scale deforestation.

- *Soon Valley possess good air & soil quality. As analyses reveals that the physiochemical parameters associated with air & soil are within the permissible limits as prescribed by WHO & Pak-NEQ's. Moreover, the noise level is also acceptable*

- *Environmental Sensitive Analysis identifies the location of ecologically significant areas within Soon Valley and highlights certain related concerns associated with environment.*
- *All lakes within Soon Valley experience huge variations within the Soon Valley primarily due to extensive drought during 1997-2002*

- The primary cause of forest destruction is the frequent forest fires. In the summer of 1994, there were 27 incidents of forest fires in just 45 days. Most of the fires were deliberately ignited by the local herdsmen to produce more fodder for the cattle and sheep of the local people after the rains. Normally such fires are self-extinguished, after a day or two. Kao tree contains an oily substance, which is highly inflammable. Hence, it burns like a torch, and is reduced to ashes in a matter of minutes. In this respect the *Kao tree* is unlike other same altitude trees as in them the fire only destroys the dead cells forming the bark, and the living cells remain unscathed.
- Wood cutting for fuel is a dilemma of developing countries. Poverty stricken people are dependent on forest for their livelihood and fuel/energy requirements. Each day wood weighing tons is collected from the forest of the Soon Valley.
- Cutting of *Kao* Branches for making walking sticks. *Kao* branches are quite in demand in the local markets. These branches are treated and finished into fancy walking sticks, which are sold in the markets of big cities.
- The most important factor that causes deforestation comes from illegal logging, trade and extensive agricultural activities
- Changes in forest cover are often the result of anthropogenic pressure (e.g. population growth) and natural factors such as variability in climate. Forests are regarded as a national treasure in Soon Valley and in addition to timber; these forests provide such resources as grazing land for animals, wildlife habitat, water resources, tourism and outdoor recreation areas. They are also important for preserving biodiversity, as they provide a habitat for certain specialized forest-related species.



*Figure 90: Wood: A Source of Energy for Natives*

*Source: Field Survey Conducted by the Urban Unit Team, 2016*



*The extensive deforestation will lead to climate change & other associated issues within Soon Valley*

- The untreated mixing of liquid waste with the lake (especially at Khabekki & Uchhali Lake) water is destroying the environmental beauty of these Lakes.

### 5.2.8. Environmental SWOT Analysis

**Strengths**




- Enriched natural beauty due to presence of lakes, fertile plains, pleasant climate, scenic valleys, waterfalls, streams, shrines, rest house etc. in this area
- Uchhali Wetlands Complex possess significant International importance under the Ramsar Convention.
- The distinctive geological patterns of Soon valley i.e. mountains, hills and mineral resources is responsible for providing it a unique landscape.
- Rich biodiversity enhances its environmental significance
- Unique environment attracts tourists all over the area
- Conditions to grow herbs, forest fruit and mushrooms
- A considerable land resource of highly fertile soil

**Weaknesses**

- Wetland loss and degradation
- Lack of effective policies and inadequate management
- Weak law enforcement
- Lack of field equipment and technical skills of the relevant authorities & field staff
- Shortage of comprehensive and scientific studies and literature about various aspects of the environment and resources of this area
- The management authorities such as: Punjab Wildlife Department lacks financial resources to manage the touristic sites in the project area
- Pollution due to organic and inorganic pollutants and unsustainable use of wetlands, e.g. extraction of more water than their refilling capacity.
- Off-site activities causing physical and chemical changes in wetlands e.g. addition of polluted water draining into wetlands from upstream agricultural, industrial or other activities
- Discharge of untreated domestic effluents and solid waste into fields and open areas

- *This highlighted a set of strengths, weaknesses, opportunities and threats with respect to the Valley.*
- *Rich biodiversity, scenic beauty, presence of wetlands and fertile soil area marked under the strengths of the area.*
- *Absence of effective policies, wetland degradation, pollution and poor solid waste management are counted under the area's weaknesses.*

- *Development potential for recreational activities in the valley is seen high.*
- *Opportunities are also seen through government collaboration and effective policy making.*
- *A high opportunity also exists in terms of conserving and preserving the natural landscape and resources.*
- *High threat is expected to endemic species of flora and fauna.*
- *Land encroachment and ecological degradation is also seen as a threat to the project area.*

## Opportunities

- Developing, conserving and protecting the wetlands under Ramsar Guidelines
- Devising policies and allocating funds for development of the project area
- Offers huge opportunities to conserve the globally significant and unique biodiversity especially the endemic Punjab Urial (Ovis vignei punjabiensis), globally threatened White-headed Duck (Oxyura leucocephala) and other endangered waterfowls and significant migratory birds.
- Recreational potential of natural beauty in terms of wetlands, lakes, gardens, waterfalls can be used.
- Open dumping of waste materials in fields and near lakes can be stopped
- Mixing of liquid waste in Uchhali and Khabekki lakes can be prevented
- Collaboration with government concerning environmental issues can be improved

## Threats

- Illegal hunting of waterfowls and large mammals in the catchment areas of lakes
- Increased pressure on all kind of environmental resources due to rapid augmentation of population and intensification of human activities
- Introduction of exotic fish species
- Pollution entering into the lakes originating from a broad range of human activities from the adjoining areas
- Illegal cutting of terrestrial and aquatic vegetation by adjacent communities
- Land encroachment and clearing of agricultural land for construction purposes in the catchment areas of the lakes
- Degradation of the ecological integrity of the Complex

- Pumping of water for irrigation and drinking purposed
- Deforestation of reserves and shamilat forests due to fuel wood collection, honey collection, forest fires and mining activities
- Use of chemical fertilizers
- Increased trend of cultivation of cash crops such as Cauli flower, potato and onions.
- Open grazing
- Changes occurring in water flow system due to rapid expansion of population
- Over-use and misuse of wetland resources by the people and physical alterations in wetland eco-systems
- Health hazard to the tourists and the locals due to contaminated water, waste left by the tourists, waste dump sites, other forms of pollution




*Land Suitability Analysis for the project area have been studied under the enlisted aspects*

## 5.2.9. Land Suitability Analysis

### 5.2.9.1. Site suitability Criteria

The effective criteria in site suitability analysis for urban development are briefly given below along with their individual importance.

**Ecological Sensitive Area**

An ecological assessment study has been conducted to highlight ecological sensitive areas which requires management attention. Sites needs to be preserved are protected areas, wetland areas, historical places, natural resources and Endemic species (Punjab Urial) territory .These sites are also highly unsuitable because of flash floods and dense forest area which is reserved forest. However, low sensitive areas are considered highly suitable for future development.

**Slope**

Slope is an important criterion in hilly terrain for finding suitable sites for urban development. Steep slopes are disadvantageous for construction. Steeper slopes increase construction costs, limit maximum floor areas and contribute

- *There is a growing need to analyze natural resource suitability which is efficient and accurate. Land suitability is one of the efficient methods in this regard*
- *Land use suitability analysis is the process of deciding the suitability of a watershed area for a certain type of use and the level of suitability.*
- *A set of criteria have been developed which includes: ecological sensitive area, slope, road proximity, land use/cover & aspect*

- ***Slope:*** *a major criteria for land suitability. Steep slope is considered to be as unsuitable for future development. Slope greater than 10 degree has been classified as unsuitable for this analysis*
- *To analyze the* ***road proximity****, buffer zones have been created by taking 50 meter distance from the existing road. As the effort is to locate the site nearer to any existing road if possible*

to erosion during construction and subsequent use. Slope < 10 degree is considered gentle slope having the highest intensity of importance .Slope greater than 10 degree has been classified as unsuitable because it increases the construction cost

**Road Proximity**

Road is also an important criterion in site suitability because of the need to transport raw products and finished materials. Construction of new road is expensive in hilly regions. Therefore, effort is made to locate the site nearer to any existing road if possible. Moreover, in order to find out better accessibility to the existing road, buffer zones have been created by taking 50 meter distance from the road. Table below show the buffer zones and their intensity of importance for road proximity criteria.

**Land use/cover**

Land use/cover map of Soon Valley area has been categorized as follows: built-up, sparse vegetation, bushes and grassland, agricultural land and dense forest cover. In this study, built up area is not suitable for the future development because once a building is constructed, it remains there for minimum of 100 years. Thus sparse vegetative land with grassland & bushes is considered suitable for the development.

- *As far as* ***land use/cover*** *is concerned, built up area is not suitable for the future development. So, according to our criteria, sparse vegetative land with grassland & bushes is considered suitable for the development.*
- ***Aspect****: In hilly areas people prefer building their houses on the sunny faced slopes. So, southern facing slopes have higher intensity of importance.*

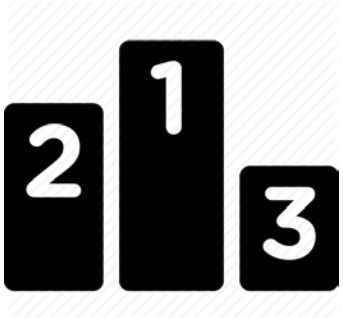
**Aspect**

Aspect generally refers to the horizontal direction to which a mountain slope faces. In the Northern hemisphere north facing slopes receive very little heat from the sun in mid-winter. Conversely, south facing slopes receive much more heat. Therefore, south facing slopes tend to be warmer than the northern ones. In hilly areas, people prefer building their houses on the sunny faced slopes. Thus, southern facing slopes have higher intensity of importance. East facing slopes catch sun only in the morning when temperatures are colder while west facing slopes catch the sun

in the warm afternoon. Consequently, east facing slopes are colder than west facing slopes.

### 5.2.9.2. Suitability Ranking and scoring

| *Intensity of Importance* | *Slope* | *Ecological Sensitivity* | *Road proximity (Meters)* | *Land use /Cover* | *Aspect* |
|---|---|---|---|---|---|
| *9 ( Highest)* | 0-10 | Low sensitive area | 0-50 | Bushes & Grassland | South |
| *8 ( Very high)* | .. | .. | 50-100 | Sparse Vegetation | South-West |
| *7 ( High)* | .. | .. | 100-150 | .. | South-East |
| *6 (Moderate high)* | 10-20 | .. | 150-200 | .. | West |
| *5 (Moderate)* | 20-30 | .. | 200-250 | .. | East |
| *4 (Moderate low)* | 30-40 | .. | 250-300 | .. | North-West |
| *3 (Low)* | 40-50 | .. | 300-350 | .. | North-East |
| *2 (Very low)* | 50-60 | .. | 350-400 | Agriculture land | North |
| *1 (Lowest)* | >60 | .. | >400 | Dense Forest | .. |




*Ranking of Sites*

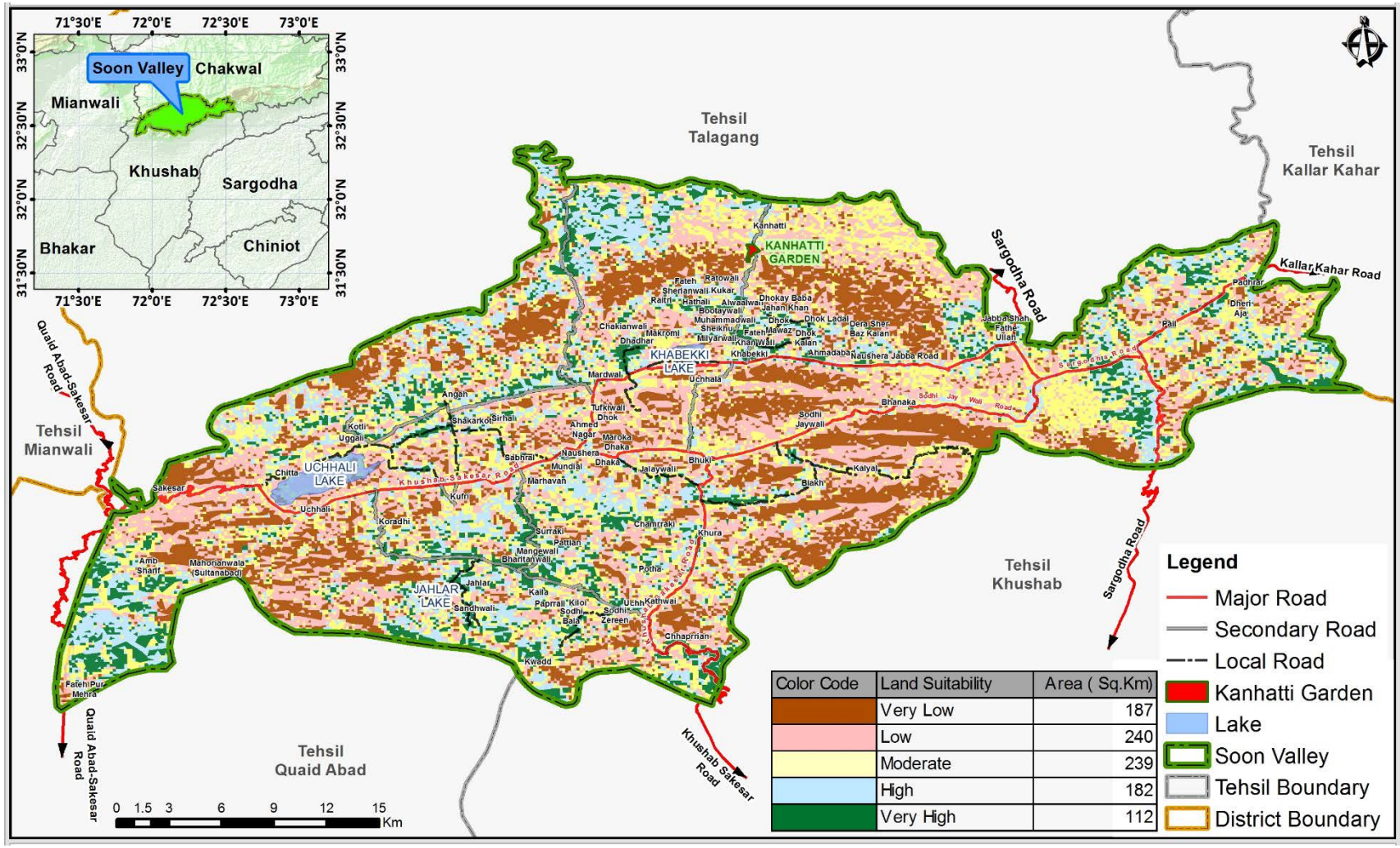
- *Based on the selected indicators, the criteria for land suitability has been derived.*
- *'9' shows the intensity of highest importance while '1' as the lowest*
- *Keeping in view the decided criteria, the land suitability map is prepared for the Soon Valley*

### 5.2.9.3. Preparation of land suitability map

All five criteria maps have been converted into raster format, so that for each pixel, a score can be determined. All the criteria maps are integrated and overlaid and the final site suitability map is prepared by the following formula:

Suitability map= Σ [criteria map * weight]

The expected site suitability map (fig below) for the study area will be divided into five different suitability categories. At the end area under very low, low, moderate, high and very high suitable lands will be calculated.




| Color Code | Land Suitability | Area ( Sq.Km) |
|---|---|---|
| | Very Low | 187 |
| | Low | 240 |
| | Moderate | 239 |
| | High | 182 |
| | Very High | 112 |

*Figure 91: Land Suitability Map of Soon Valley*
*Source: The Urban Unit, 2016*

## 5.3. Livelihood Analysis



Livelihood analysis can be used in assessing the capacity of the target community that what kind of skill set they currently have and what needs to be done further to enable them to be part of the mainstream economy within the study area. Livelihood analysis can further be used in the process of targeting project interventions to help determine who will engage in, and benefit from, the different activities to be undertaken. This analysis would help to understand the poverty dynamics and livelihoods of target groups so that actions can be formulated accordingly. Keeping in view this importance, the livelihood patterns within Soon Valley are explored. The human, natural, financial and physical capital of this region is explored to elaborate the real picture of livelihood framework. The major observations and challenges in this regard are summarized as;

### 5.3.1. Human Capital

- Majority (39%) of the people are self-employed while another major chunk i.e. 37% are associated with agricultural & livestock activities. In-addition, 16% and 8% of the respondents are involved in government employment and private business respectively.
- Majority of their income is coming from agriculture sector while 32% of income is associated with other activities including daily wages/laboring. Livestock and small business support 14% and 22% of the residents' income respectively.
- It is interesting to see that the younger age group (18-45) is 40%, while middle age population (45-60) shares 11% of the population. These two groups combined constitute the entire workforce of the valley at 51% and 49% of the total population are dependent on the breadwinner. Among these, 32% of the workforce is unemployed that reveals that the labor force is readily available.

- *37% of the people are associated with agricultural and livestock activities*
- *Younger age group (18-45) and middle age population constitute 51% and 49% of the total population.*

- *43% of the households have monthly income ranging from 10,001-15,000.*
- *Due to low income, people are not able to ensure monthly saving*
- *Women are primarily involved in animal grazing, farming, collecting wood, water fetching etc. thus support the household income generation.*

- The number of educational facilities are available up to secondary level, so the education level of this area is comparatively high (72%) as compared to the region. However, the area lacks certain higher educational infrastructure, which acts as a negative factor local people tend to work and engage in livelihood opportunities, which do not require higher skillsets such as agriculture, livestock and general labor. However, the local community within the study area possess certain skills or knowledge base that favor their potential to be equally part of the market economy.
- The status of women within the Soon Valley is classified as low class but it observed that the females are also engaged in different activities i.e. perform household activities as well as work in fields. Women are primarily involved in animal grazing, farming, collecting wood, water fetching etc. thus support the household income generation.

### 5.3.2. Financial Capital

- 43% of the households have monthly income ranging from Rs.10001-15000 and 35% of the households have monthly income ranging from 5,001-10,000. It reveals that the majority of the households do not have sufficient resources and are only able to meet their daily needs.
- Majority of the households are unable to save from their monthly incomes.
- The area lacks industrial and commercial activities. Thus, there is a huge dependency on agriculture, which yields less revenue to the people. As a result, the economic condition of overall valley is not so strong.

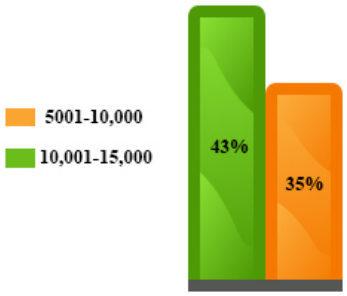



*Figure 92: The monthly household income in the project area varies in between 5000 to 15000*

*Source: Field Studies by The Urban Unit Team, 2015-16.*

### 5.3.3. Natural Capital

- Soon Valley holds a considerable land resource of highly fertile soil and provides suitable conditions to grow different vegetables, herbs, fruits and mushrooms. It is one of the reasons that the agriculture and livestock activities are very common and emerging phenomena. The land

cover change analysis reveals that the agricultural area have increased from 176 sq.km in 1990 to 253 sq.km in 2015. Such phenomenon is posing serious threats to the environmental quality of the region i.e. extensive water use due to the emerging agricultural activities have resulted in the decline of water table by 20-70 since 2005.

- Water resources are very limited as people are mainly dependent on ground water supply via municipal water tanks, personal water borings, hand pumps and streams. As result of decline in water quality from the municipal water tanks, the emerging trend in usage of personal boring water is observed which have further reduced the water table up to a certain extent.
- Soon Valley is enriched with dense and sparse forests which provide a soothing environment to the region. The lack of availability of energy or fueling sources has resulted in deforestation i.e. wood is primarily used for the fueling purposes, thus posing serious threats to the region.

### 5.3.4. Physical Capital

- The major chunk of population is associated with the daily waging (laborers) and commute to nearby towns and cities (Naushera, Khushab, Jauhrabad, Pail etc.) to carry out such purposes. However, due to poor infrastructure, especially the quality of network and availability of public transport, the commuters face serious mobility issues. Ultimately, this poor connectivity is directly affecting their employment and livelihood activities.
- As livestock, activities produce income for 14% of the total population, so they hold assets such as cow, goat, camel etc. It is observed that on the average, 4 out of 10 households carry out these assets. Ultimately, the overgrazing reduces plant leaf areas, which reduces interception of sunlight and plant growth.

- *Due to low water quality of municipal water tanks, trend of personal water boring is taking place.*
- *The lack of availability of energy or fueling sources has resulted in deforestation*
- *Commuters face serious mobility issues due to poor quality of transportation system*
- *Livestock, activities produce income for 14% of the total population, so they hold assets such as cow, goat, camel etc.*



## 5.4 Transportation Infrastructure, Connectivity and Accessibility

Transportation infrastructure plays a fundamental role in shaping the physical, social and economic landscape of any area. The main aim of transportation infrastructure is to improve the accessibility and connectivity within and outside the region by providing the most efficient ways and means to commute to different destinations, communities and places to boost social and economic wellbeing of the communities across the region. It also provides street designs that facilitates different modes of transportation, reduce congestion and create livable and sustainable neighborhoods.

Keeping in view the scenic capital of the Valley, the transportation infrastructure was critically analyzed using the on-field observations and the structured interviews with the residents, tourists, travelers and concerned official staff of the project area.

The most significant transportation challenges and opportunities envisaged in the area are summarized as;

- The public transport modes currently available within the project area include buses, wagons, and rickshaws/chingchis. These essentially provides means to connect different settlements within the valley and other major cities like Khushab, Sargodha, Mianwali, kalar Kahar, Lahore and Islamabad. The local transport especially rickshaws are easily available at different locations and accessible within the project area, however the quality of these vehicles is major concern.
- Soon valley being a potential tourism site still offers immense potential for tourism and this tourism eventually needs better communication network and quality service vehicles so it still has a big potential for private sector to invest in the transportation sector eventually raise employment base as well as more business opportunities At present, the valley is well connected with rest of the towns and cities of Punjab by roads linking valley to



*Figure 93: Bus Operated for Uchhali from Naushera*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 94: Intra-city Transport operated in Naushera Town*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 95: Condition of Uchhali Bus Terminal*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 96: Bus Stop near Khura Village*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

Sargodha, Khushab, Mianwali and Kalar kahar M2 interchange but quality of road infrastructure still possess a great challenge to the sustainable development of the Valley.

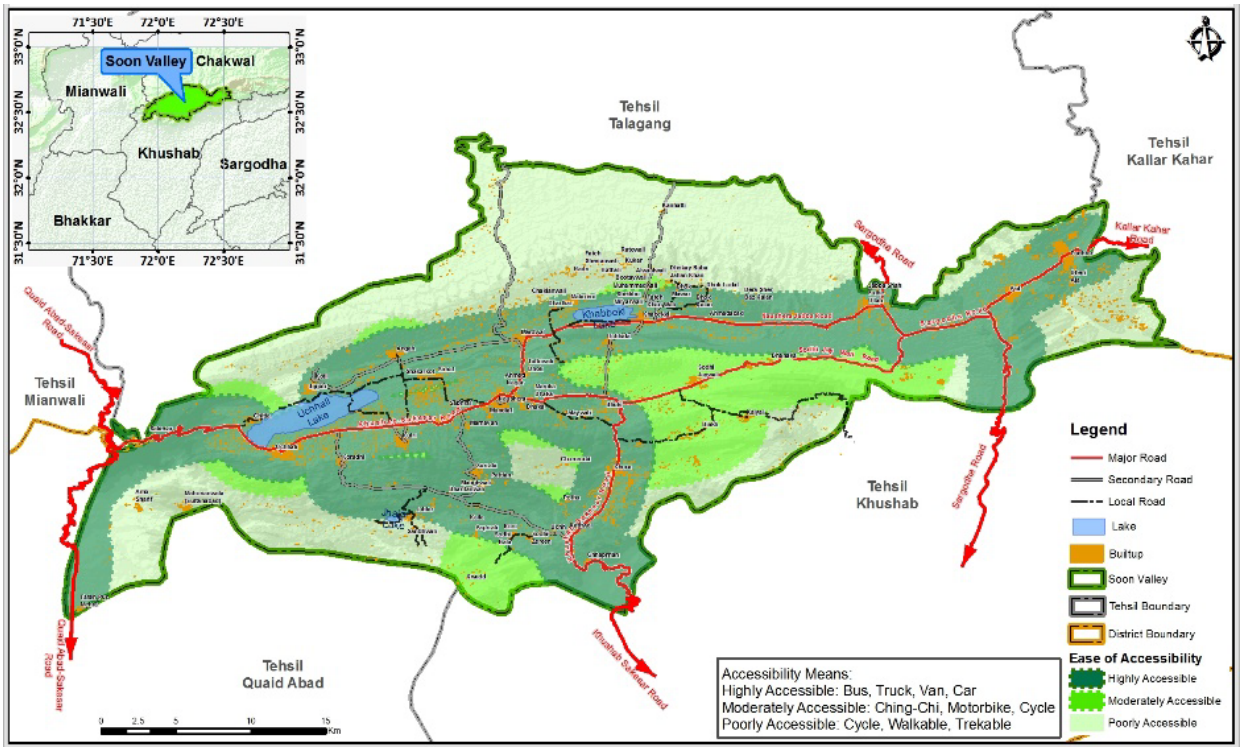



*Figure 97: Connectivity Map*
*Source: The Urban Unit, 2016*

- *Naushera being the major settlement of Soon Valley attracts the people from all over the valley*
- *Major routes of intercity traffic originates from this town connecting valley with nearby cities*

- Naushera, being the prime town and tehsil headquarter of the Soon Valley attracts majority of the tourists for different facilities like hotels, shopping, food places and other hospitality infrastructure. So major transport facilities are available in this town. Major routes of inter-city traffic originate from this town connecting valley with nearby cities such as Jauharabad, Khushab, Pail, Uchhali, Padhrar, Kalar Kahar, Chakwal, Talagang etc. But unfortunately there is no planned bus terminal and other allied facilities provided here.
- With respect to the availability of the above mentioned public transport facilities, residents generally showed their satisfaction over accessibility to nearby villages and towns of the project area but the quality of service and road

condition is their primary concern and that also remains a primary concern of tourists visiting the area.

- The access to different touristic sites is limited and difficult though while using existing public transport modes and the tourists have to use their own vehicles to access those spots. During the studies, it is also observed that some of the tourists coming from nearby towns or villages use motorbikes to traverse the area whereas tourists coming from far off places come on their own vehicles primarily cars. Difficult terrain and dirt tracks still discourage tourists at large.
- Rental cars, available at different points in Naushera such as Takbeer Chowk and Uchhali main bus stop, offers transport services 24 hours a day. These private rental car operators offer services to major tourist sites such as Khabekki Lake, Uchhali Lake and Kanhatti Garden while charging a relatively high fares ranging from Rs.1500 to 2000 for a single visit. In-addition, these private rental car service is also used for emergency medical and social services by local community in absence of other reliable public transport and ambulance services in the area.
- The road network provides access to all main villages, settlements and lakes present in the project area. The access roads to tourist sites such as Khabekki Lake and Uchhali Lake are satisfactory and are useable in all seasons but the roads leading to Jahlar Lake and Kanhatti Garden are not in good condition and become slippery in rainy season. According to a teacher of a Primary School in Kanhatti, the road leading to Kanhatti is very dangerous and have led to number of deaths during the recent past. In-addition, the roads leading to other important sites including; Angah Fort, Maai Wali Dheri, Ambh Sharif, Akrand Fort, Daip Sharif, Kachiyaan wala Faqir, Tulaajha Fort, Nurshing Phowaar, Neeli Dhann, Sodhi Rest House, Tulhaah Fort and Phulwari Rest House are also in very bad condition and become slippery during rainy season. It is observed that the

- *Difficult terrain and absence of transport services affects the visitation to the tourists' sites.*
- *Private rental cars operators offer services to major tourists' sites like Khabekki, Uchhali Lake and Kanhatti Garden and charge a relatively high fares ranging from 1500-2000 rupees for single visit.*
- *the roads leading to other important sites including; Angah Fort, Maai Wali Dheri, Ambh Sharif, Akrand Fort, Daip Sharif, Kachiyaan wala Faqir, Tulaajha Fort, Nurshing Phowaar, Neeli Dhann, Sodhi Rest House, Tulhaah Fort and Phulwari Rest House are also in very bad condition and become slippery during rainy season*


Accessibility to various settlements

accessibility to some of the prime sites is only possible by using four-wheel drive cars/jeep.

- Commuting pattern shows that the majority of people residing in Soon Valley mainly use motorbike, bicycle and public bus for daily commuting to their work place and other activities. Around 44% use motorbike, 17% use bicycle, 14% use public transport while only 8% walk to their destinations.
- The majority of people residing in settlements and villages such as Kufri, Anga, Jahlar, Uchhali and Khabekki commute to Naushera primarily for their work and education purposes. While a very limited portion commutes to Jauharabad and Khushab for work related activities. Almost 62% of the people commute for their employment while 22% and 11% commute for education and social activities respectively so commute for livelihood remains on top among daily commuting trips and also accounts for major share of their monthly spendings
- With respect to the income level of the residents, the monthly expenditure on availing the public transport facilities is relatively high as depicted in the analysis i.e. 76% of the travelers spend 2,000 to 4,000 rupees that almost accounts for 25-30% of their monthly incomes. Regardless of the huge monthly expenditure on public transportation, the community experience huge dissatisfaction with respect to the quality of public transport infrastructure and services thus leaving behind a great room for improvement.
- The segment who travels via public transportation appears high as compared with travelling by owned vehicle. About 77% of people travel daily while 11% travels at least 4 to 5 times a day. It emerged that the majority of these people don't have sufficient resources to own or opt for some better personal mode of transportation so public vehicles remains the only available choice for them to do their livelihood and other commuting so investing in this sector either by public or

- *Around 44% use motorbike, 17% use bicycle, 14% use public transport and only 8% walk to their destination.*
- *Most of the residents spend about 25%-30% of their income on transport*
- *About 77% of people travel daily while 11% travels at least 4 to 5 times a day.*



*Figure 98: Narrow Street in Naushera Town*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 99: Poor Road Condition at Uchhali*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

private sector can bring about a significant change to the socio-economic structure of the region. Thus, transport sector still offers a great opportunity for investors.

- The bus stops are located at far from majority of the settlements and villages. As per study findings, among the commuters, 47% were of the view that they have to travel 3-5 km while 30% of traveler have to travel up to 8 km to reach the bus stops. Majority of these travelers find it very difficult to reach bus stops and avail the public transport. Moreover, condition of these bus stops is very poor as there are no facilities such as; signage and information. Sign boards erected on different roads are in shabby condition and as majority of road signs and traffic mirrors are not directing rightly.
- During field studies, it was observed that people residing in Sodhi face severe transport problem as only 1-2 buses pass by the town in 24 hours. Schedule of these buses is also not fixed. In case of emergency, people have to manage on their own.
- During field studies, following road sections were identified in poor condition and not really found favorable for driving.
    i. Sodhi to Naushera
    ii. Naushera to Khushab Road
    iii. Naushera to Sakesar Road
    iv. Naushera to Jahlar Road
    v. Links road to Kufri, Angah, Uchala and other settlements.
- Poor transport network and inadequate provision of buses result in adding to the grievances of for students, elderly and patients at large. It is informed by the residents that due to dilapidated road condition, it becomes very difficult to manage for patients in critical condition. Students are unable to reach schools on time due to no schedule of buses and clumsy road condition. As buses are less in numbers, due to which these buses are overloaded during morning, evening, and result into accidents.

- *Majority of the travelers find it very difficult to reach bus stops and avail the public transport.*
- *People residing in Sodhi face severe transport problem as only 1-2 buses pass by the town in 24 hours.*



*Figure 100: Bus Stop at Naushera-Sakesar Road*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 101: People Sitting on Roof due to Inadequate Transport System*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Connectivity to Settlements: Assessing the SWOT*

- *SWOT analysis for the transportation sector revealed that the area is well connected to nearby settlements with good road network*
- *However, the project area does not have a rail connectivity.*
- *Moreover, poor tourist accessibility is found in the area with high fares of public transport.*
- *No bus terminal exists.*
- *Some of the roads are worn out and have drainage issues.*

- The inadequate surface as well as sub-surface drainage of roads in the events of rains and subsequent flash flooding cause grave problems. The absence of quick drainage of rainwater has caused defects like potholing, raveling, cracking and even deformation.

### 5.4.1. SWOT Analysis of Transportation

**Strengths**

- Connected with other settlements through road network
- No noise pollution due to less dependency on automobiles like cars, motorbikes etc.
- Less air pollution
- Less traffic accidents

**Weaknesses**

- There is no planned bus terminal and other allied facilities in project area.
- Existing bus terminals are in clumsy condition with no waiting areas for passengers
- The project area is not connected to rail network
- Main roads are in deteriorated condition
- The access to different touristic sites is limited and difficult though while using existing public transport modes and the tourists have to use their own vehicles to access those spots.
- High fares ranging from 1500-2000 are charged by private car rentals for a single visit to tourist sites
- Bus stops, traffic signs and traffic mirrors are in deteriorated condition and do not serve the purpose at all
- No buses are available in some areas like Chanbal, Sodhi etc.
- Roads leading to some sites like Kanhatti, Jahlar, Sodhi etc are narrow and worn out thus causing accidents
- Absence of quick drainage of rainwater has caused defects like potholing, raveling, cracking and even deformation.

**Opportunities**

- To attract investments for road infrastructure rehabilitation
- Linking Soon Valley with with CPEC corridor can lead to tourism promotion and other developments.
- Labour is readily available for transportation improvement projects
- Political will to initiate development projects in the area

**Threats**

- Insufficient administrative capacity to prepare manage the transportation system of the project area
- Increased road deterioration can cause rise in accidents
- Transportation issues can decrease visitation rate of visitors

- *For allowing for tourist inflow to the area, the valley could be linked to the China Pakistan Economic Corridor for strengthened economy and relations.*
- *Large number of labor force is present in the area that could be involved into several development projects.*
- *However, excessive road deterioration can lead towards more road accidents.*
- *With poor transportation facilities the inflow of tourists could see a decline.*

## 5.5 Physical Infrastructure

Inadequate physical infrastructure is a key issue related to the unjust social and economic development of Soon Valley. It is evident that a minimum quality and standard of living owes to the availability of, and accessibility to basic infrastructure facilities viz. water, sewerage, drainage and solid waste management. These facilities are under severe dearth in Soon Valley and have significant quality issues. Critical need of advance action and management is required for the adequate provision of physical infrastructure. For each component, a broad augmentation plan is essential to meet the needs.

### 5.5.1. Solid Waste Management

- Surveys revealed that solid waste collection, transfer and disposal system is non-existent in the entire Soon Valley. The phenomenon of open dumping of solid waste is very common as people use to throw garbage in nearby water ponds and streams due to lack of proper waste collection system and this eventually cause spread of water-borne diseases as these water sources are also used for culinary purposes



*Figure 102: Open Dumping of Solid Waste in Soon Valley*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

*Table 49: Solid Waste Generation*

| | |
|---|---|
| *Average Household Waste Generated* | *1.84 kg/day* |
| *Total Waste Generated* | 34,293 kg |
| *Organic Waste* | 59% |

*Source: Field Studies by the Urban Unit Team, 2015-16*

- The open dumping practice not only affects the aesthetics of the area with respect to tourism but also a source of grave contamination.
- According to the field studies conducted by The Urban Unit Team, reveal that a household on average generates 1.84 Kg solid waste in a day. According to an estimate, total waste generated in study areas is around 34,293 Kg. At some places in Kufri, Angah, and Chitta, people were using the organic waste to generate manure. All the organic and inorganic waste is found scattered around even in the freshwater streams, Lakes and thus creating bacterial contamination, foul odor, visual and aesthetic pollution, and serious threats to local environment. No waste collection is observed by scavengers in the entire study area. Residents of Naushera and Uchhali revealed that no efforts are being made by the local administration as people are suffering from various infectious diseases. Composition of domestic waste determined through surveys is given below

*Table 50: Domestic Waste Composition*

| ***Type of Waste*** | ***Percentage*** |
|---|---|
| *Organic* | 59% |
| *Plastic* | 16% |
| *Paper* | 9% |
| *Glass* | 3% |
| *Metal* | 2% |
| *Other* | 11% |

*Source: Field Studies by The Urban Unit Team, 2015-16*



*Figure 103: Waste Disposed and Burnt near Uchhali Lake*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

- It is also observed that some of the residents residing near Uchhali Lake usually dispose solid waste near lake that has affected the beauty of lake. People are forced to dispose solid waste in open areas due to the absence of community waste network and leaving it to be mixed in streams / springs thus affecting their quality to harmful extents and further making it less worthy to the population in downstream areas.

- Serious threats of water and soil pollution from indiscriminate littering (The most serious negative impact of solid waste mismanagement is on already stressed water and soil resources of the area. It causes pollution of increased soil erosion and disturbance of the hydrology of the area leading to land sliding and soil erosion).



*Figure 104: Sewerage and Drainage Condition at Uchhali*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*



*Figure 105: Sewerage Condition at Naushera*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

### 5.5.2. Sewerage & Drainage

- Community and trunk sewerage networks constitute the core elements of physical infrastructure that determines the quality of environmental in any city/town or settlement and requires minute planning, development and management. Development of appropriate sewerage system with efficient sewage treatment is vital to facilitate balanced and harmonized development.
- Sewage and drainage disposal is being observed as a major problem within the project area as condition of sewerage and drainage system is poor.
- Entire project area lacks proper sewerage and drainage system. Open sewerage and drainage system is laid mostly. Even the Naushera Town lacks such facilities and almost all the liquid wastes are being disposed off in the surrounding open areas, fields and even on streets causing and major threat to the quality of life of local inhabitants.
- Due to poor quality of water, people suffer from various water borne diseases like hepatitis, typhoid, malaria and skin infection. Among these, majority (80%) of the patients suffer from hepatitis and malaria
- There is no wastewater treatment facility in the area.

*Project area lacks proper sewerage and drainage system. Open sewerage and drainage system is laid mostly.*

*There is no wastewater treatment facility in the area.*

### 5.5.3. Water Supply

- The water supply is very poor with frequent incidents of

- *Municipal water tanks, personal water borings, hand pumps and streams are the major sources of water*
- *Depth of water table in most of the areas in Soon Valley is considerable very low*
- *Quantity and quality of water supply schemes in the form of water tanks are not satisfying and clean drinking water*
- *Drinking water usage per household is around 15 gallons*

shortage of water for houses and tourist related services.

- Another serious issue is the wasteful practices of water use in domestic and commercial enterprises sectors. During the surveys, it is observed that water sources in Soon Valley are very limited as Municipal water tanks, personal water borings, hand pumps and streams are the major sources of water
- Depth of water table in most of the areas in Soon Valley is considerable very low. Studies show that depth of water table has increased in past few years to due to regular boring of water.

*Table 51: Water Table Depths in 2005 and 2016*

| *Sr. No.* | *Villages* | *Approximate Water Table Depth (2016)* | *Water Table Depth (2005)*[25] |
|---|---|---|---|
| *9.* | Kufri | 200 ft. | 85-123 ft. |
| *10.* | Jahlar | 150 ft. | 70-104 ft. |
| *11.* | Anga | 300 ft. | 110-183 ft. |
| *12.* | Sodhi Wali | 300 ft. | 130-201 ft. |
| *13.* | Uchhali | 150 ft. | 70-109 ft. |
| *14.* | Khabekki | 170 ft. | 75-113 ft. |
| *15.* | Padhrar | 300 ft. | 119-190 ft. |
| *16.* | Naushera | 230 ft. | 114-187 ft. |

*Source: Field Studies by The Urban Unit Team, 2015-16*

- Quantity and quality of water supply schemes in the form of water tanks are not satisfying and clean drinking water is one of main priority of the residents of Soon Valley. According to Drought Mitigation & Preparedness Program Soon Valley Project, 2006-2008, drinking water usage per household was around 10 gallons, which has increased to 15 gallons per household per day. This increase is primary because more people are using boring water instead of municipal water supply, which had a



*Figure 106: Municipal Water Tank Installed at Uchhali*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

[25] Assessment of Outcomes, Drought Mitigation & Preparedness Program Soon Valley Project, 2006-2008

limited water supply.

- At some locations, water pipelines pass through the solid waste dumps and sewage ponds in open, which enhances the possibility of mixing of sewage and drainage water with the drinking water.
- Most of the people have managed their own boring due to low quality water supply from government. Water boring is expensive as it costs PKR 120,000 approximately. If this unchecked and uncontrolled ongoing discharge continues, it will eventually deplete the sub-soil fresh water aquifers in the long run. Quality of bored water is quite satisfactory as compared to municipal water supply.
- People with low-income levels use communal hand pumps for their domestic usage. These hand pumps are observed in Sodhi Jay Wali, Uchhali and at some locations of Kufri Village.
- During the field studies, it is revealed by the residents that the monthly charges for these community water supply schemes is considerably very high i.e. ranges from PKR 600 to 2,500 per month, which remains is unaffordable for the residents especially low income groups. Therefore, majority of people are now shifting from such water facility to personal water borings and eventually threatens sustainability of water-cycle in the Valley.
- According to EIA of Soon Valley conducted by The Urban Unit in 2015, the water in Uchhali and Khabekki Lake is alkaline in nature and slightly above the permissible limits defined as per NEQS (i.e. 6-9) due to the dissolution of various salt content (i.e. carbonates, bicarbonates etc.)
- Environmental Impact Assessment of Soon Valley shows that the drinking water obtained by hand pumps or motor pumps is in permissible limits of WHO and Pak-NEQs. However physiochemical analysis, microbiological analysis (i.e. Total Coliform and E.coli) depicted that

- *Water boring is expensive as it costs PKR 120,000 approximately Depth of water table in most of the areas in Soon Valley is considerable very low*
- *the water in Uchhali and Khabekki Lake is alkaline in nature and slightly above the permissible limits defined as per NEQS (i.e. 6-9) due to the dissolution of various salt content (i.e. carbonates, bicarbonates etc.) Drinking water usage per household is around 15 gallons*
- *Drinking water obtained by hand pumps or motor pumps is in permissible limits of WHO and Pak-NEQs.*

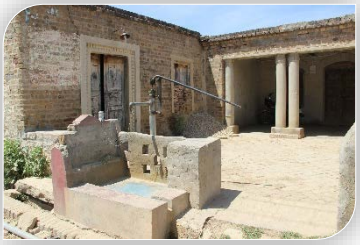


*Figure 107: Hand Pump Installed at Sodhi*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

- *Wood is mostly used for domestic purposes*
- *Some of the people also use Biogas for their domestic purposes*
- *Electricity is available in around 92% of the area except few of the places.*
- *Average monthly bill is around 1,500-2,000*

drinking water quality of ground water sources of Uchhali, Chitta, Ugali, Khabeki, Uchala, Kotli villages is not in compliance with WHO and Pak-NEQs

### 5.5.4. Source of Energy i.e. Gas, Biogas, Wood etc.

- While inquiring about the availability of gas facilities, it was found that there are no piped gas facility within this area.
- People primarily use wood, cow-dung and coal for their domestics use while very limited use of biogas (from different biogas plants installed in the region) has been found. In case of commercial use, people use LPG gas cylinders to meet their needs. Cost of LPG for one cylinder and one bar of wood costs Rs.1200 and Rs.500 respectively. It is estimated that one bar of wood used mainly for cooking purposes lasts for 2 weeks and it is around 6% of household's monthly income.

### 5.5.5. Electricity

- It emerged from the findings that electricity is available in around 92% of the area except few of the places. Average monthly bill is around 1,500-2,000 despite the fact these areas face severe load shedding lasting for 15-18 hours in 24 hours. 20-30% of the income of each household is spent on electricity charges. Electricity is used mostly for pumping water, pressing clothes

### 5.5.6. Satisfaction Level towards Infrastructural Facilities

Keeping in view the responses regarding the availability and existing scenario of different infrastructural facilities, the satisfaction level is enquired from the residents towards these facilities. It emerged that majority of respondents are dissatisfied with the current facilities available in the region. The following chart elaborates the summary of the residents' satisfaction level regarding these facilities.



*Figure 108: Wood Being Used for Domestic Purposes*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

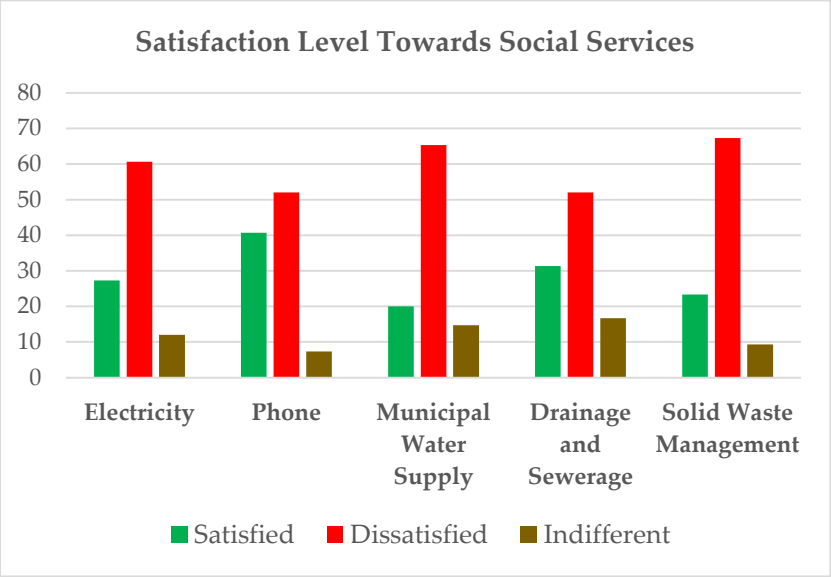



*Figure 109: Satisfaction Level of Residents towards Infrastructural Facilities*
*Source: Constructed by the Consultant based on Field Studies, 2015/16*

## 5.6 Social Infrastructure

### 5.6.1. Health Facilities

Health related infrastructure in Soon Valley is quite inadequate to deal with the ever-increasing demand for such facilities. Quantity and quality of the BHU is posing serious threats to the quality of life of local community. Analysis shows that health facilities are not evenly distributed in the Soon Valley. According to the standard, one BHU is required for a population ranging from 5000-10000 but only Uchhali and Kufri and Khura are meeting the standard. In Uchhali, Kufri and Khura, there are 3, 2 and 4 BHUs present respectively which comply with the standards given in the National Reference Manual. No BHU is present in UC Padhrar while Khabekki & Angah have one BHU each that is below standards.

Following are the projections done for number of BHU required for plan period of 2016-2021 and 2021-2040.

- *Water boring is expensive as it costs PKR 120,000 approximately Depth of water table in most of the areas in Soon Valley is considerable very low*
- *the water in Uchhali and Khabekki Lake is alkaline in nature and slightly above the permissible limits defined as per NEQS (i.e. 6-9) due to the dissolution of various salt content (i.e. carbonates, bicarbonates etc.) Drinking water usage per household is around 15 gallons*
- *Drinking water obtained by hand pumps or motor pumps is in permissible limits of WHO and Pak-NEQs.*

*Table 52: BHU Required for Short Term Plan 2016-2021*

BHU Required for Short Term Plan 2016-2021

| Union Council | *Population (2016)* | *Population (2021)* | *Existing BHU (2016)* | *Required BHU (2021)* | *Net Required (2021)* |
|---|---|---|---|---|---|
| Angah | 21409 | 22691 | 1 | 2 | 1 |
| Khabekki | 19857 | 21046 | 1 | 2 | 1 |
| Padhrar | 23316 | 24712 | 0 | 2 | 2 |
| Uchhali | 17386 | 18427 | 3 | 2 | *Not Required* |
| Kufri | 22384 | 23724 | 2 | 2 | *Not Required* |
| Khura | 19789 | 20974 | 4 | 2 | *Not Required* |

*Source: Constructed by The Urban Unit on the Basis of Field Studies*

- *BHUs generally lack skilled human resource to deal with patients*
- *Poor road infrastructure makes the health facilities inaccessible*
- *There is uneven spatial distribution of health facilities as Uchhali and Khabekki have 3,4 BHUs respectively and Padhrar has no BHU facility*

*Table 53: BHU Required for Long Term Plan 2021-2040*

BHU Required for Long Term Plan (2021-2040)

| Union Council | *Population (2021)* | *Population (2040)* | *BHU (2021)* | *Required BHU (2040)* | *Net Required (2040)* |
|---|---|---|---|---|---|
| Anga | 22691 | 28304 | 1 | 3 | 2 |
| Khabbeki | 21046 | 26251 | 1 | 3 | 2 |
| Padhrar | 24712 | 30825 | 2 | 3 | 1 |
| Kufri | 23724 | 29592 | 3 | 3 | *Not Required* |
| Uchali | 18427 | 22985 | 2 | 2 | *Not Required* |
| Khura | 20974 | 26162 | 2 | 3 | 1 |

*Source: Constructed by The Urban Unit on the Basis of Field Studies*

Following were the main gaps and problem areas identified in health sector of in Soon Valley;

- BHUs generally lack skilled human resource to deal with patients. In Naushera THQ, 50% of the seats are vacant and there is no male doctor available. In Uchhali, there is no doctor available to treat patients and people are on the mercy of quacks.
- Due to poor road infrastructure, people are not able to reach these health facilities quickly. For routine checkups, they have to cover long distances. In-addition, the field analyses reveals that 58% of the residents/respondents do not have access and availability to health facilities and that

is quite a matter of concern. Local inhabitants are generally of the view that doctors being posted here do not prefer to live here because of low quality residential and other facilities.

- Buildings of health facilities are in dilapidated condition.
- These BHUs do not even have minimum medical equipment required like X -ray machines or other equipment prescribed in their own policies. They do not have ambulance facilities to take patients requiring emergency treatment to a hospital.
- Non-availability of medical advice and medicines to the poor from these BHUs has led to rise in mortality rates as well as increase in incidence of diseases.
- In Naushera Tehsil Headquarter Hospital, no male doctor is present except Medical Superintendent (MS) and hospital lacks some important machinery for trauma and anesthesia patients.
- According to the Medical Superintendent (MS) of Tehsil Headquarter Hospital Naushera, 50% of the seats are vacant.
- Because of poor solid waste, sewerage and drainage system, people suffer from various waster borne diseases like typhoid, malaria, skin diseases and infection. Most of the medicals stores are located in Naushera and some dispensaries are found in small villages.
- According to the Medical Superintendent Naushera Tehsil Headquarter Hospital, there is no doctor available in both of RHCs in Padhrar and Khabekki. During pregnancy, people face many problems due to absence of lady doctor in their vicinity and they have to move to THQ Naushera. Studies show that Infant mortality rate (per 1,000 births) is 86, which is higher than Khushab District. This rate is expected to increase and health facilities have to be improved to avoid in the future.

*Doctors being posted here do not prefer to live here because of low quality residential and other facilities.*

*BHUs do not even have minimum medical equipment required like X -ray machines or other equipment prescribed in their own policies.*

*No male doctor is present in Naushera Tehsil Headquarter Hospital except Medical Superintendent (MS) and hospital lacks some important machinery for trauma and anesthesia patients.*

*No doctor is available in RHCs of Padhrar and Khabekki.*

*Doctors being posted here do not prefer to live here because of low quality residential and other facilities.*

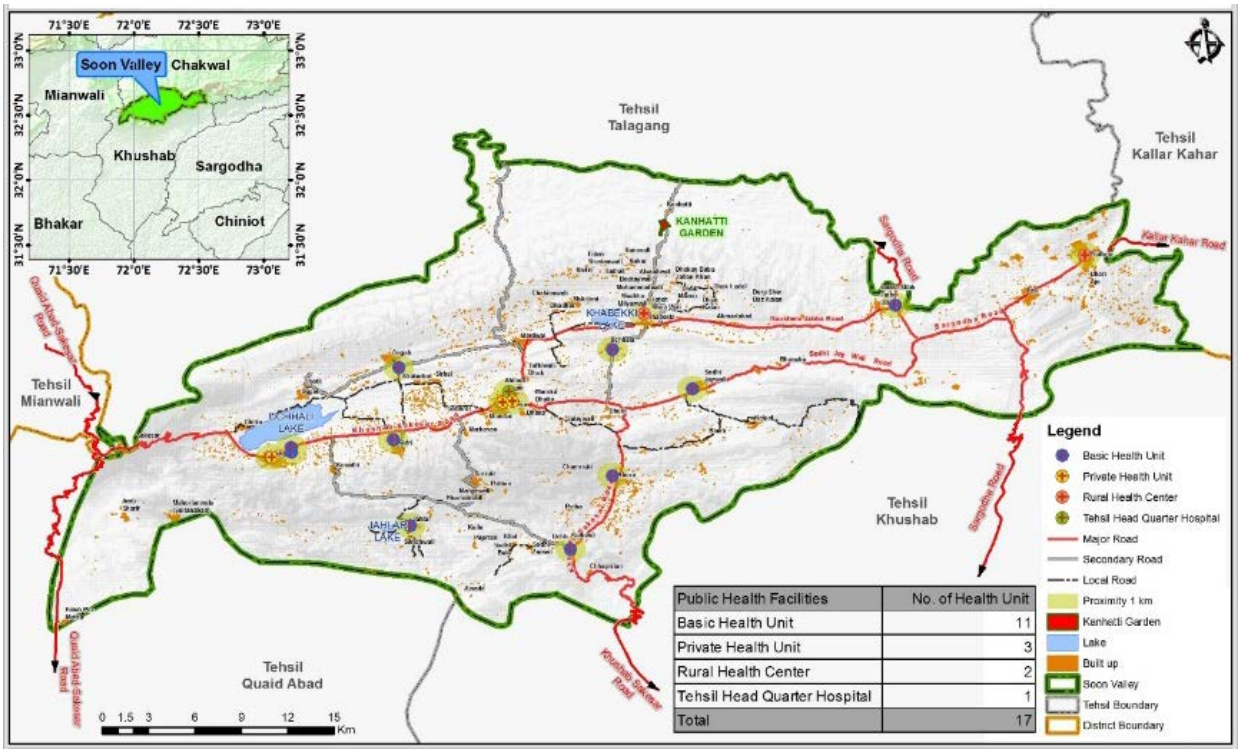



*Figure 110: Buffer Analysis of Health Facilities within Soon Valley*
*Source: The Urban Unit, 2016*

## 5.6.2. Education

Educational facilities define the level and quality of development and human resource in an area, as they are critical for growth of any settlement in terms of literacy rate, skill up gradation and improving quality of human lives. Higher level of education facilities have been considered vital for economic growth and development of any community or nation, besides improving the quality of life of human beings. Education is found to be a major determinant and promoter of growth and development of any settlement and nation. Accordingly, providing appropriate level of education facilities is extremely important.

The observations and challenges in this regard are summarized as:

- According to the studies conducted by The Urban Unit Team, it is revealed that literacy level of people is relatively better than other areas of Khushab and it has improved from 55% in year 2006 to 72% in 2016.

- *Education is found to be a major determinant and promoter of growth and development of any settlement and nation.*
- *In some areas of the Soon Valley we find a comparatively good quality of education.*
- *Whereas, in others there is a need to upgrade the educational infrastructure.*
- *People are found literate in most parts of the area.*

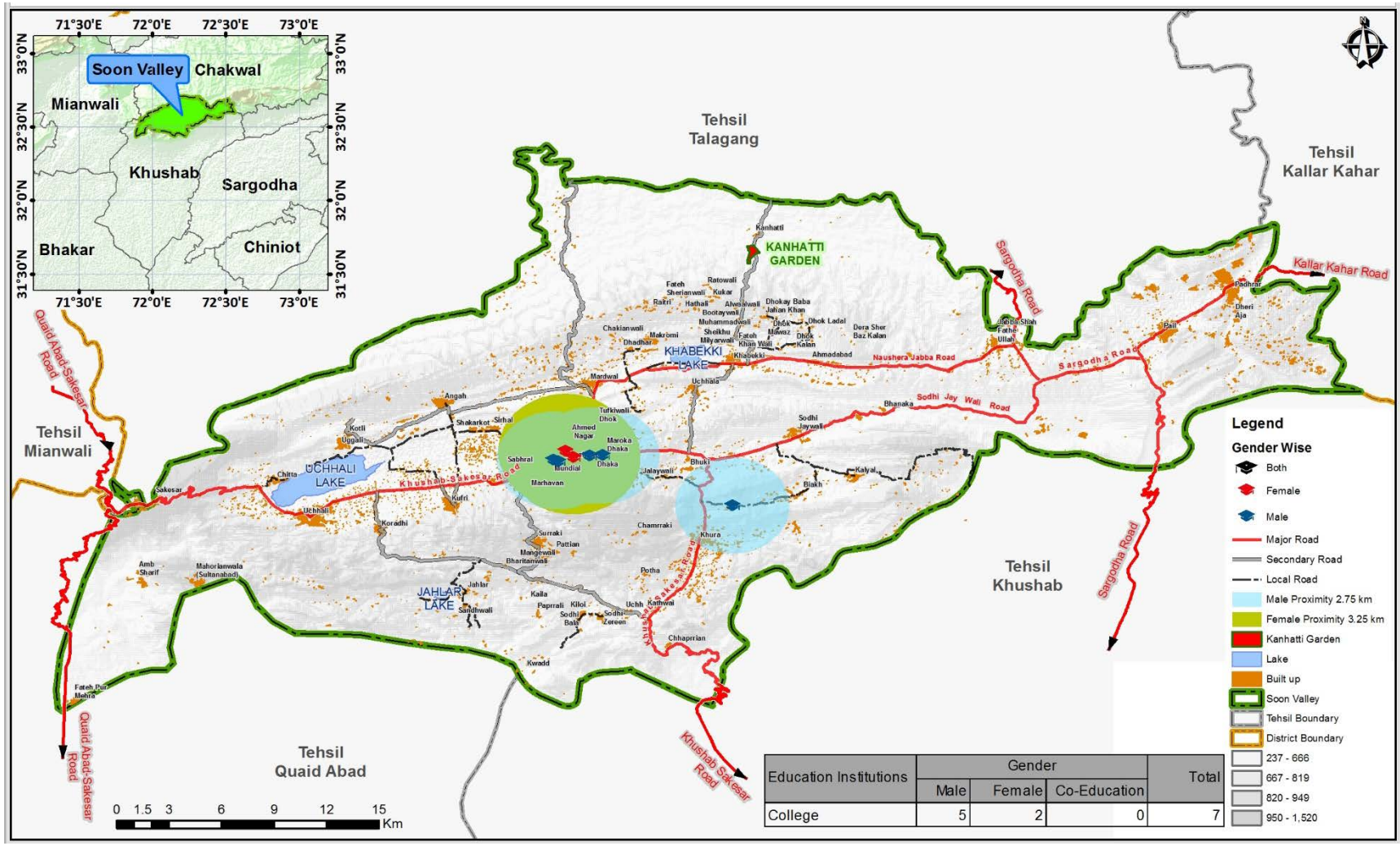


*Figure 111: Government Girls Model Higher Secondary School Naushera*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

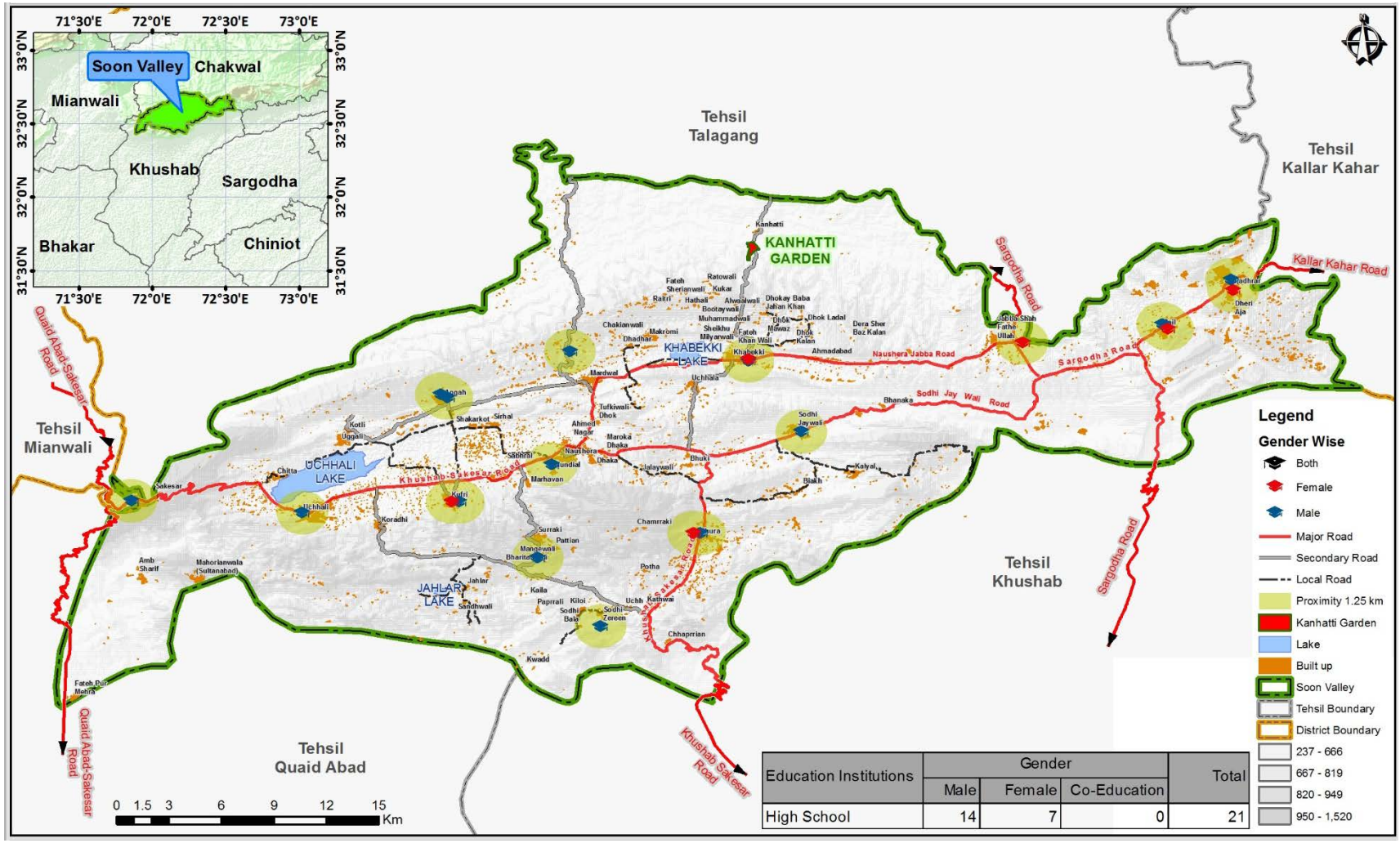
- *Literacy rate is better than entire district*
- *Educational facilities are not distributed evenly as they are located along main corridor and people face accessibility issues due to weak transportation system.*
- *The educational institutes are lacking proper infrastructure like play grounds, library etc.*
- *Quality of education in areas other than Naushera are not up to the mark and people have to travel to Naushera.*

- Surveys reveal that 50% of the literate population is male and 28% of the literate population is female. The rate of primary level education is higher for females as compared to males, while in higher education the share of females is lower than their male counterparts. Overall level of educational attainment of population living in the valley is higher than the corresponding level nationwide.
- During studies, it is observed that educational facilities are spread unevenly in the area. Mainly, these are located along the main roads and people coming from other parts of Union Councils face problems due to weak transportation structure. Moreover, visit to primary school in Khura revealed that schools are lacking required number of teacher sanctioned as per policy.
- These schools are also lacking proper infrastructure like play grounds, reading rooms, chairs etc. According to the students interviewed in Naushera, quality of education in Khabekki, Uchhali, Jabba, and Kufri, is not up to the mark and they have to travel to Naushera for obtaining quality education.
- Soon Valley is lacking in terms of new coaching centers and vocational institutes for specialized education. Due to inadequate infrastructure facilities and deteriorating quality of education in Government institutes, private institutes like Punjab College, Dar-e-Arqam have also opened



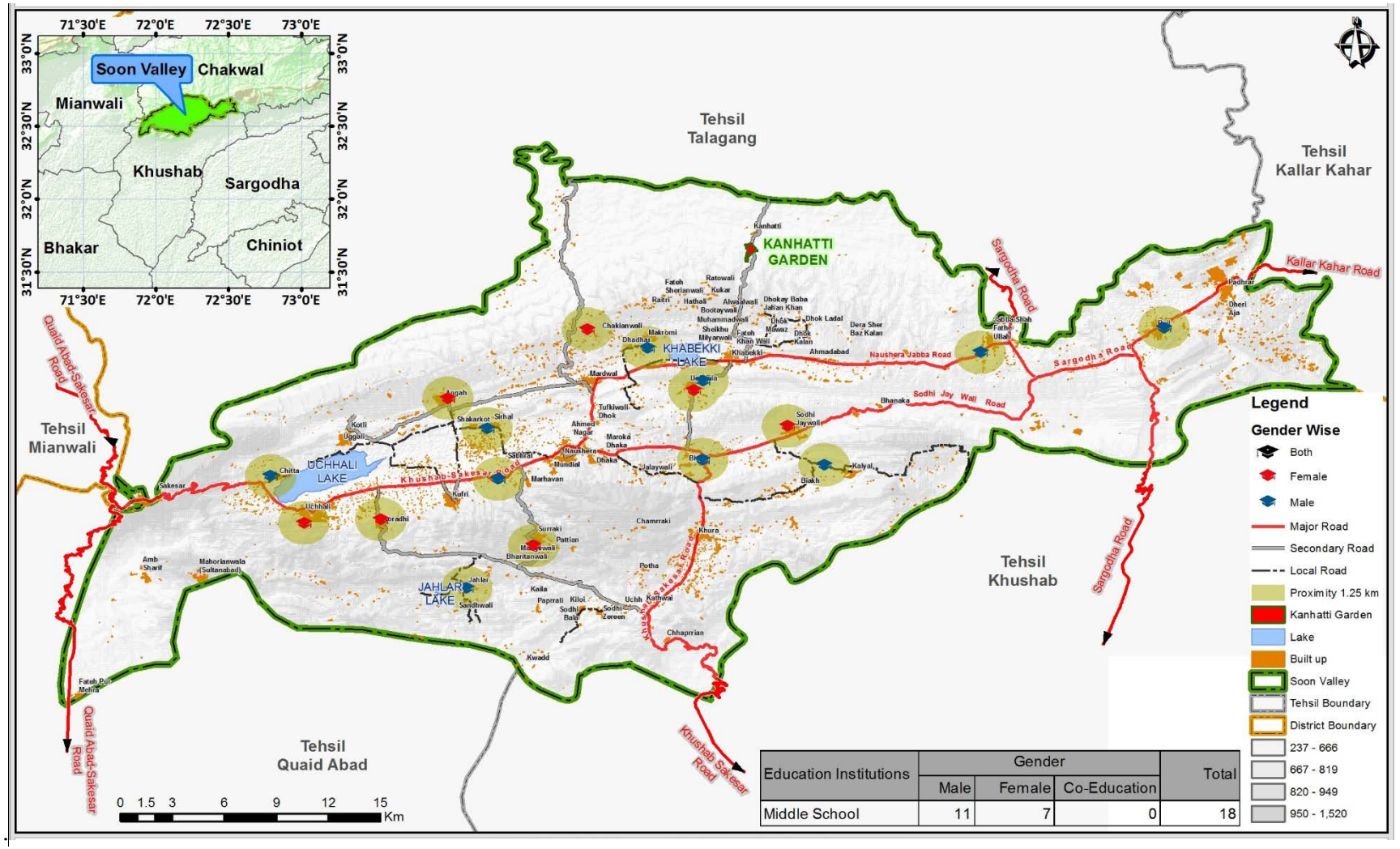

| Education Institutions | Gender | | | Total |
|---|---|---|---|---|
| | Male | Female | Co-Education | |
| College | 5 | 2 | 0 | 7 |

*Figure 112: Spatial Distribution of Colleges within Soon Valley*
*Source: The Urban Unit, 2016*



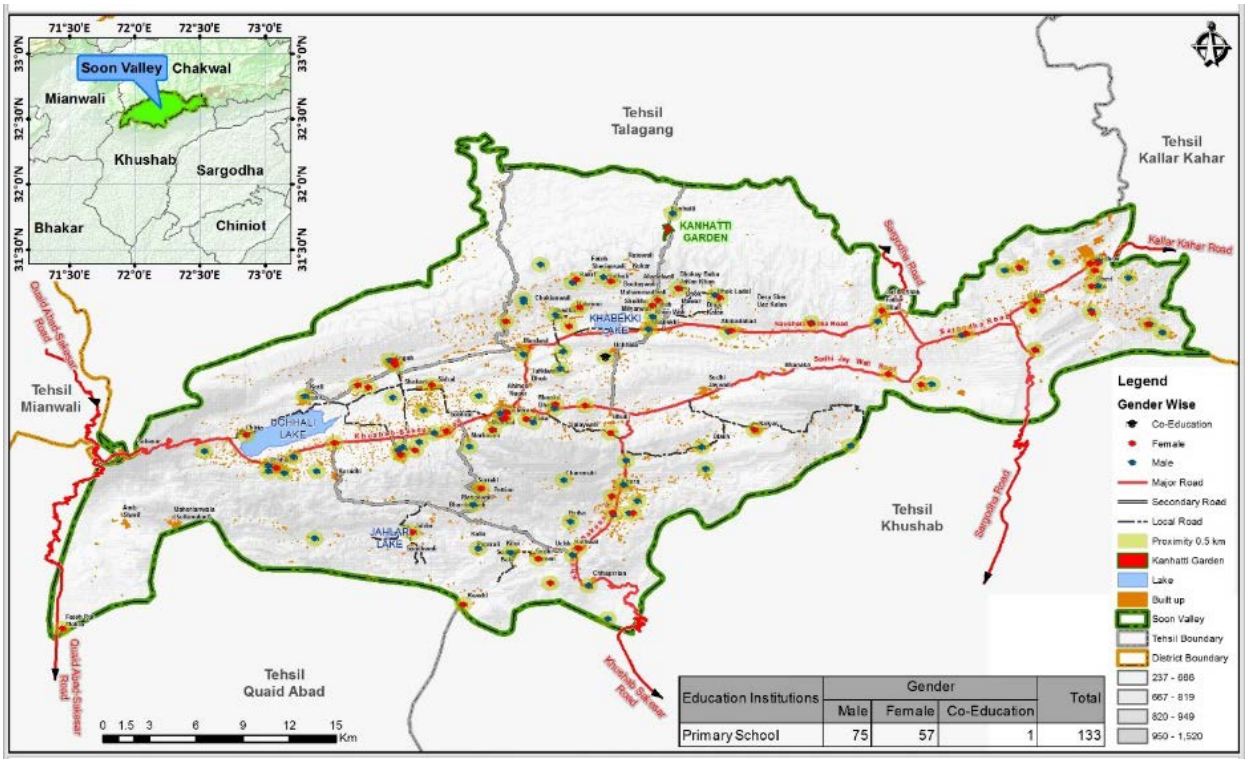

| Education Institutions | Gender | | | Total |
|---|---|---|---|---|
| | Male | Female | Co-Education | |
| High School | 14 | 7 | 0 | 21 |

*Figure 113: Spatial Distribution of High Schools within Soon Valley*
*Source: The Urban Unit, 2016*




| Education Institutions | Gender | | | Total |
|---|---|---|---|---|
| | Male | Female | Co-Education | |
| Middle School | 11 | 7 | 0 | 18 |

*Figure 114: Spatial Distribution of Middle Schools within Soon Valley*
*Source: The Urban Unit, 2016*




| Education Institutions | Gender | | | Total |
|---|---|---|---|---|
| | Male | Female | Co-Education | |
| Primary School | 75 | 57 | 1 | 133 |

*Figure 115: Spatial Distribution of Primary Schools within Soon Valley*
*Source: The Urban Unit, 2016*

## 5.6.3. Communication Facilities

- Communication facilities include post offices, telegraph, telephone, mobile phone and both wired and wifi internet services. In Soon Valley, these facilities are not adequate to meet the demand of entire population.
- PTCL is a recent intervention by the Government and has limited coverage in the project area. Now, PTCL is only functional in Naushera and Khabekki, so people from other areas like Uchhali, Kufri, Anga, and Sodhi have to come to Naushera. The post offices are distributed evenly in whole project area. Data from the Pakistan Post Department reveals that this facility is available at Municipal Committee and union council level. Therefore, the post offices are available in Angah, Dhahdar, Jahlar, Khabekki, Khura, Kufri, Mardwal and Naushehra.
- Field studies show that post offices are available to 90% of population while this facility is inaccessible to

- *As part of the telecommunication, PTCL service is found present only in Naushera and Khabekki.*
- *People from other areas have to travel to these for getting access to the telecommunication.*



*Figure 116: Communication Tower at Naushera Town*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

- *By the year 2005, mobile coverage was found to be limited to only few major settlements including Naushera.*
- *However, with recent advancement, this coverage has increased to 80% within the project area.*

only 10% of the population.

- In 2005, mobile coverage was limited to few major settlements like Naushera Town, Uchhali and Khabekki. With the recent advancement in Information Technology, the coverage of mobile services have increased and cover 80% of the project area. Signals are distorted in some of the areas like Sureki and Jahlar etc. According to the local residents, Telenor, Ufone and Mobilink are the main service providers in this area.

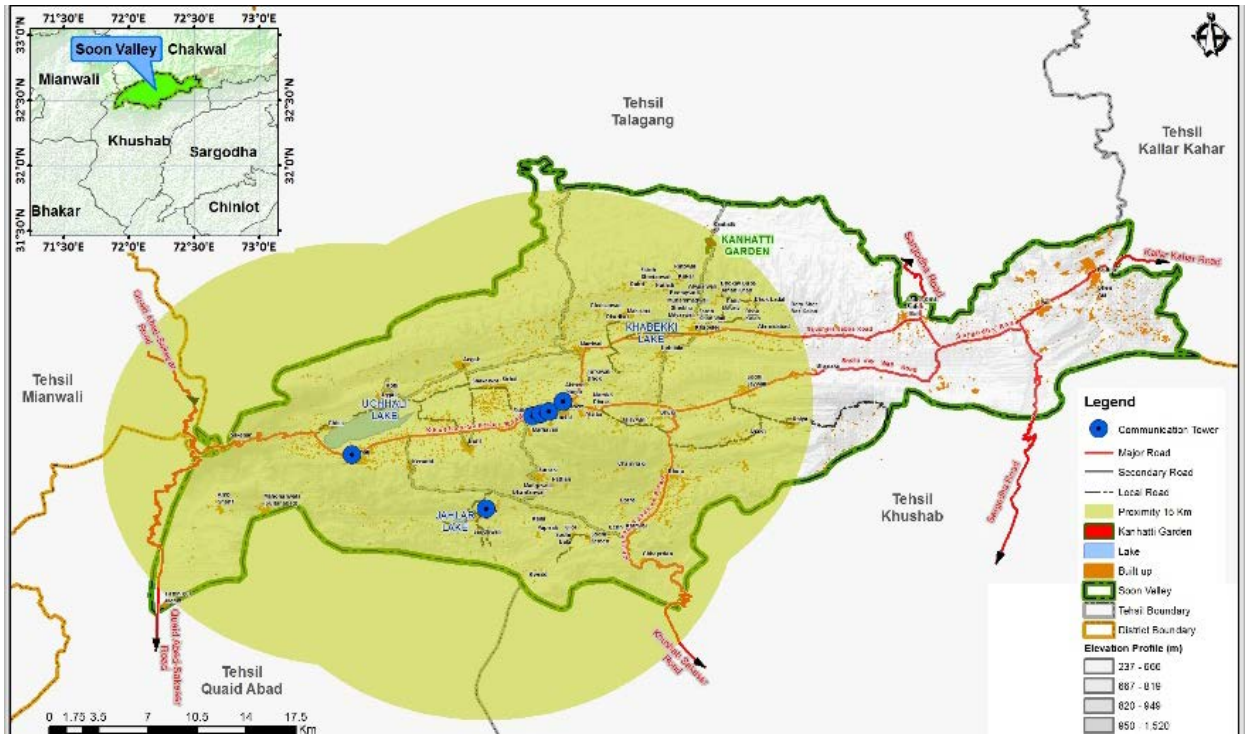



*Figure 117: Map showing telecommunication Coverage*

*Source: The Urban Unit, 2016*

- *Although, Soon Valley is known for its scenic beauty and tourist attractions, but no proper recreational parks exist here.*
- *Locals are also deprived of playgrounds and parks in their settlements.*

### 5.6.4. Parks, Open Spaces and Play Areas

- Despite a number of recreational and touristic sites within the project area, it was observed during the field studies that there is no proper playground in the area, where people can enjoy the specific sports and recreational facilities.
- According to National Reference Manual Standard, following are the requirement for parks and open spaces:

*Table 54: Open Space Requirement for 2040*

| *Union Council* | *Area (Acres)* | *Open Spaces/Park Requirement (Acres)* |
|---|---|---|
| *Uchhali* | 21,093 | 21 |
| *Anga* | 12,531 | 13 |
| *Kufri* | 23,816 | 24 |
| *Khabekki* | 59,720 | 60 |
| *Khura* | 36,228 | 36 |

*Source: Constructed by the Urban Unit Team on the Basis of Field Studies*




## 5.6.5. Accessibility of Social Infrastructure

To analyze the accessibility of the social infrastructural facilities, the average distance of the certain facility from houses of dwellers was calculated. Accessibility analyses were carried out for the police station, primary schools, dispensary and the post offices located within the project area. The following discussion summarizes the major findings and challenges in this regard:

- Police station is only located in Naushera Town and people residing in other UCs face accessibility problems in case of any crime. Police stations is in the range of 1-3 km for only 12% of population. Similarly, for 42% of the population it is located within the distance of 5.1 to 10 km.
- As there are number of primary schools within the project area, so according to our analysis and respondents' point of view, these facilities are quite accessible for the residents. For 42.7% of the population, it is available within the distance of 3 km while for 32.7% these facilities were present within a vicinity of 3.1 to 5 km.
- The analyses reveal that the availability of basic health facilities within the project area are also found to be quite satisfactory. For 62% of the population, BHUs are present distance of 5 km from their residence.
- The secondary data obtained from the website of Pakistan Post reveals that one post office is available in each union council of the area. This data has been verified using the

*Police station is only located in Naushera and people face problems in case of crime.*

*For 62% of the population, BHUs were present distance of 5 km from their residence*

*Post office is available in each union council of project area.*

*Police station is only located in Naushera and people face problems in case of crime.*

primary data from the respondents and it reveals that the majority of residence are satisfactory with the availability and locations of post offices i.e. 76% of the population has easy access to the post office. The following chart shows the summarized form of these analyses.

- *SWOT for social and physical infrastructure reveal that the area has a literacy rate than the overall Khushab District.*
- *There is a large availability of land in the area that could be developed for physical infrastructure.*
- *Community is found willing to participate in the development works.*
- *However, health infrastructure is inadequate and there is a need to upgrade this.*

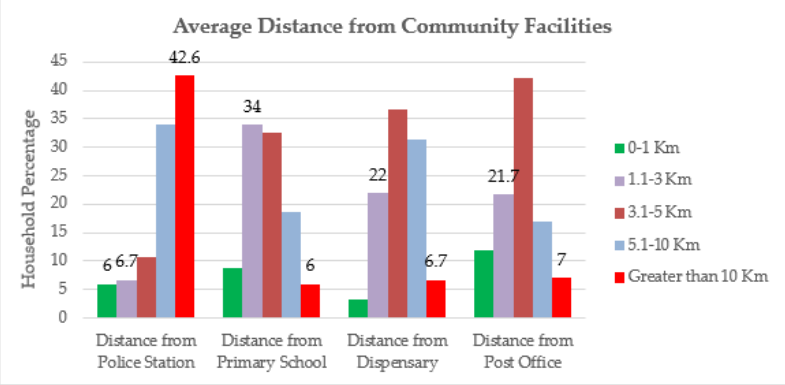



*Figure 118: Average Distance from Community Facilities*

*Source: Constructed by the Urban Unit Team on the Basis of Field Studies*

### 5.6.6. SWOT Analysis: Social Infrastructure & Physical Infrastructure

**Strengths**

- Relatively high literacy rate than Khushab District
- Extensive open space available for development of important health, education and other institutes.
- Sites available for proper dumping of solid waste consisting of organic and inorganic substances
- Willingness on the part of community to participate in development works

**Weaknesses**

- Health infrastructure is inadequate as BHUs, RHCs and THQ are lacking important equipments like X-ray machines and equipment for trauma and anesthesia patients



- Male and female doctors are not present in most of the BHUs, RHCs and THQ. In THQ Naushera, there are 50% seats vacant and no male doctor is working there.
- Poor road infrastructure causing problems for patients in critical condition, as they have to travel long distances to reach hospital
- Staff appointed at various hospitals do not prefer to live because of low quality residential and other facilities.
- Uneven spatial distribution of health and education facilities
- Lack of quality education in other settlements forcing the people to enroll their children in Naushera educational institutes thus putting a lot of burden on infrastructure of Naushera.
- Absence of coaching centers and vocational institutes in entire project area
- Internet service is only limited to Naushera and Khabekki
- Poor mobile coverage in some of the settlements like Sodhi, Sureki, Jahlar, Angah, Kanhatti etc.
- Extreme shortage of recreational and open spaces
- Lack of alternate sources of energy
- No proper sewerage, drainage and solid waste management
- Low quality municipal water resulting in increased water boring of ground water
- Tourists sites are not provided with infrastructure facilities like waste bins, medical facilities in case of emergency etc

**Opportunities**

- Allocation of funds for provision of infrastructure facilities can increase the beauty of area
- Community can be involved to participate in development projects


- *In THQ Naushera, there are 50% seats vacant and no male doctor is working there.*
- *Uneven spatial distribution of health and education facilities*
- *Lack of quality education in other settlements as compared to Naushera*
- *Extreme shortage of recreational and open spaces*
- *Tourism promotion can lead to increase in aesthetics of overall area*




*Figure 119: Open dumping of Solid Waste in Kufri*

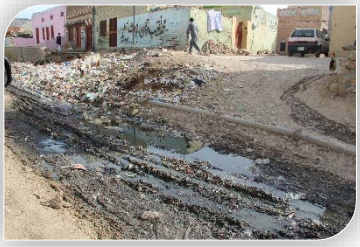


*Figure 120: Municipal Water Supply Passing Through Open Drains in Naushera*

*Source: Field Survey Conducted by Urban Unit Team, 2015-16*

- *There is a threat to the forest area in the Soon Valley.*
- *Locals, are largely dependent on natural forests for their domestic needs.*
- *The poor solid waste management hampers the aesthetics in the area.*
- *Continued water contamination would result into an unhygienic environment.*

- Tourism promotion can lead to increase in aesthetics of overall area

**Threats**

- Huge dependency of local people on the natural forests for their domestics and other needs can cause deforestation
- Absence of solid waste, sewerage and drainage system can expose people to various diseases and deteriorate the aesthetics of the area
- Absence of medical equipment, male and female doctors at health facilities can lead to increased deaths and other problems.
- Excessive boring of ground water can cause increase in depth of water table
- Absence of coaching centers and vocational institutes will result in decreased professional skills.
- Uneven spatial distribution of health and education facilities can result in decreased fitness and literacy rate of the area.
- Poor financial condition of local administration
- Contamination of water due to absence of solid waste, sewerage and drainage system



*Travel & Tour*

## 5.7 Tourism Analysis

Tourism has become an important sector that has an impact on development of country economy. The main benefits of tourism are income creation and generation of jobs. For many regions and countries it is the most important source of welfare. The proper management and planning of tourism plays a key role in this regard. Keeping in view of this, the best tourism management practices of wetlands around the world are explored which gives a baseline to analyze the tourism practices and management in Soon Valley.

### 5.7.1. Tourism Management in Wetlands: Some Best Practices

#### a) Seychelles - Port Launay Wetlands



*Figure 121: A View of Port Lunay Wetland*

*Source: www.ramsar.org*

The Port Launay Wetlands cover an area of 120.6 hectares on the western coast of Mahé, the main island in the Seychelles. The wetlands are one of the highest-diversity mangrove areas in the Seychelles, having all the seven species of mangroves. Port Launay and Port Glaud wetlands have beautiful beachfronts, and these and their dense mangrove forests are the main attractions of the sites for tourists. Viewing sunsets at these sites is especially popular. There are also some tourism activities, which are led by local guides who are organized by local hotels for their guests, local tour operators, or the National Sports Council. These activities include canoeing, walks and sightseeing.

- *Port Lunay- Wetlands- one of the highest-diversity mangrove areas in the Seychelles covering an area of 120.6 hectares on the western coast of Mahé, the main island in the Seychelles.*
- *Seychelles receive around 125,000 overseas tourists per year on average*

**Visitors Statistics & Income Generation**

The Seychelles receive around 125,000 overseas tourists per year on average, and with a resident population of fewer than 100,000 people, tourism is a vital part of the islands' economy. Most overseas tourists come from Western Europe, but a growing number now also come from Japan, South Africa, China and Russia. The Port Launay Wetlands, nearby Port Launay and the Port Glaud wetlands are together visited by an average of 4,000 visitors each year, including both local residents and overseas tourists.

There are some economic benefits for local people from the sale of crafts, souvenirs, fruits and vegetables, foods and snacks. However, as the number of tourists visiting the site is relatively low, the revenues generated from sales to tourists are also quite low. No income is generated directly through tourism to support conservation of the site, though the Ephelia Resort does undertake awareness raising activities.

**Tourism Management**

- Tourism to the site is provided by 10-12 local tour operators, who employ trained guides to provide interpretation and guidance in the wetlands to visitors. The Ephelia Resort also provides guides for their guests as a complimentary service. No entrance fee is charged for visiting the site.
- Primarily, the Port Launay Wetlands are jointly managed by the Constance Ephelia Resort, a five-star hotel that was opened adjacent to the wetlands in 2010, and the NGO "Sustainability for Seychelles" under an arrangement with the Seychelles National Parks Authority (SNPA) and the Seychelles Department of Environment, the official management authority for the site.
- In June 2011, these two organizations were awarded a grant of worth US$40,000 by UNDP-GEF/SGP to support their work on the Port Launay Wetlands. Under this project, following interventions were done:
  - Production of an educational video for clients and staff, a brochure for clients highlighting all of the environmental features of the resort, tips for having an ecofriendly holiday, and interpretive signboards to raise awareness of the importance of various habitats in the area.
  - Hosting a series of mangrove planting events involving the community and staff, focusing on regenerating degraded areas.
  - Arranging a community workshop at the resort to

- *Tourism management in Seychelles is taken up by 10-12 local operators.*
- *These local operators have their own guides who direct and assit the coming tourists.*
- *The Port Launay Wetlands in Seychelles, are managed by a five star hotel and an NGO named Sustainability for Seychelles.*
- *These two organizations effectively manage tourism in the area.*



*Managing Tourism*

involve all stakeholders in the development of a plan for better co-management of the mangrove swamp, which falls partly within the resort boundaries.

- Workshops for staff were also planned to help them become environmental ambassadors for the resort and the community.
- Plans to develop boardwalks inside the mangrove area for visitors and locals to get in and see the beauty of the vegetation, the tidal fluctuations, and the various life forms.



*Figure 122: Different Views of Lake Nakuru, Kenya*

*Source: www.ramsar.org*

### b) Kenya – Lake Nakuru

Lake Nakuru is one of the Kenya's 'Premium Parks' – i.e., it has iconic sites that draw international tourists to visit Kenya, and is part of the country's tourism brand. The Lake was declared a Ramsar Site in 1990, in 2009 as an Important Bird Area and in 2011 as part of the 'Kenya Lake System in the Great Rift Valley' World Heritage site. The lake is renowned for the large flocks of flamingos which feed there, though hydrological changes in the recent past has seen intermittent migrations and fewer congregations at Lake Nakuru.

Lake Nakuru National Park and its catchment have a high tourism potential. Tourist attractions include the dense flocks of flamingos already mentioned – which can exceed 1 million birds – which feed on the lake, and the picturesque landscapes of woods and grassland around the lake. Features like Baboon Cliff, Honeymoon Hill, Lion Hill, Hyrax Hill, Makalia Falls, Menengai Crater and prehistoric sites and caves are also great attractions for tourists, as are the Park's other wildlife.

**Visitors Statistics & Income Generation**

Lake Nakuru National Park receives around 245,000 visitors each year – including 149,512 international tourists and 95,518 domestic visitors. As a 'Premium Park', international tourists are charged an entrance fee of USD 80, while domestic visitors must pay 1,000 Kenyan shillings (USD 11). Entrance fees and concession fees from the lodges generated revenues of nearly

800 million Kenya shillings in 2010, which helped to pay for the costs of park management, with Kenya shillings 4 million each month being used for conservation activities within the Park.

There are two privately-run lodges in the Park, providing a total of 240 beds. They are leased as concessions from the Kenya Wildlife Service (KWS) which runs the Park, and they provide revenues of around 17 million Kenyan shillings for the Park each year.



*Figure 123: Lake Nakuru National Park & Menengai Crater trip*

*Source: Nature Kenya, the East Africa Natural African Society*

**Major Issues**

- Despite its worldwide recognition and importance for Kenya's tourism, Lake Nakuru National Park faces critical challenges in protecting itself from growing pressures around the Park, in managing tourism within the Park, and in ensuring that tourism is used to its full potential.
- The lake is situated in a shallow basin in the Great East African Rift Valley. It is unusual in that it has no outflow and only loses water by evapotranspiration from its surface. It is fed by seasonal rivers and the permanent springs.
- As the lake has no outflow, it accumulates all that the rivers bring into the lake. Over the centuries, this has led to the development of strongly alkaline conditions in the lake, creating harsh conditions that limits the range of species that can inhabit the site.
- Among the inflows is partially-treated sewage and industrial effluents from the nearby Nakuru Town – a major commercial and industrial centre and Kenya's fourth largest town. A study in 1994-95 linked pollution to massive deaths of flamingos mainly due to heavy metals and nutrients that promote the growth of toxic cyanobacteria.
- The expansion of agriculture has also resulted in loss of forests on the slopes around the lake, combined with increased erosion, fertilizers and other agro-chemicals leading to more silt being carried into the lake.

- *In Kenya, Lake Nakuru offers an attractive tourist spot but encounters a number of challenges.*
- *Because the lake is situated in a shallow basin, it has no outflow to the water present.*
- *As a result of this, the river bring gets accumulated in the lake making it highly alkaline.*
- *This alkaline nature, creates harsh conditions for the water species.*
- *As part of the inflow to the lake, sewage and industrial effluents are carried to this creating unhealthy condition.*

- *In Kenya, the Nakuru town is a home to many wildlife species*
- *Tourism is managed quite effectively in the area*
- *Visitors coming to the area are provided with the information about the site*
- *Extensive signage and trained guides makes it easy for the tourists to visit the place.*
- *Security and protection measures are also well adopted in the area.*




*Figure 124: An aerial view of Lake Nekuru, Kenya*
*Source: NASA Visible Earth*

Combating these threats to the Park is a long-term challenge that is linked to demonstrating the value of the Park for the region and nationally for Kenya, and to increasing understanding and awareness about the lake and its wildlife amongst the local communities and the residents of Nakuru Town.

**Tourism Management**

- The Park's impressive array of wildlife has been built up by careful management for over 50 years since it was gazetted as a national park in 1968. In 1974, Rothschild's giraffes were introduced to the site, and following efforts to increase its rhinoceros population with introductions of black and white rhino from elsewhere in Kenya and from South Africa, the Park was declared a rhino sanctuary in 1987. Lions and leopards have also been introduced from other areas.
- The Park's visitor management strategy includes: information about the site and the importance of conservation; extensive signage and interpretation; use of trained guides; monitoring by park rangers; and zonation to protect its wildlife and fragile habitats. The Park is divided into four zones: tourists are not allowed in the most fragile zones, and their access to the other zones is managed to ensure that negative impacts from tourism – such as disturbance of wildlife, physical damage, or littering – are kept to a minimum. The Park's network of roads and trails and its visitor infrastructure have been developed in accordance with the zoning system. Well planned siting also helps to minimize negative impacts from tourism.
- The Park also runs a major awareness raising and residents. This includes two education centers for school visits and tailor-made training, which are managed by Kenya Wildlife Service and Wildlife Clubs of Kenya, and these receive more than 100,000 students every year. It also operates a bus to provide low-priced guided tours to the

Park for Nakuru residents, enabling them to experience the Park's exceptional wildlife.

### c) Tunisia - Lake Ichkeul

It is one of the most important wetlands in the Mediterranean region. It is a major stopover point for hundreds of thousands of migrating birds, such as ducks, geese, storks and pink flamingoes, who come to feed and nest there. The lake supports a rich fish fauna including eels, mullet, sole, sea bass, barbel, and seahorses. In addition to its ecological importance, the lake is a popular site for tourism and recreation; the lake itself covers 8,500 hectares (85 km2), and the Park also includes a further 2,740 ha (27.4 km2) of marshes and a mountain area of 13.6 km2 that includes the Djebel Ichkeul. It is a National Park, a Ramsar Site, a Biosphere Reserve (MAB), and a UNESCO World Heritage Site.



*Figure 125: Beautiful view of the lake Ichekeul in Tunisia*

*Source: Tour Du Valat, Research Center for Conservation of Mediterranean Wetlands*

**Tourist Arrival**

Lake Ichkeul National Park now receives around 50,000 visitors each year, double the number in 2005 when the park's ecosystems were still recovering. The majority of visitors are Tunisians, who also visit and stay in neighboring towns. The Park offers many attractions for tourists, including nature trails and guided excursions, a museum, sightseeing in the douars (tented camps) and local villages, birdwatching, mountain biking, caving, hiking and sports trekking on Djebel Ichkeul, which rises 500 meters above the lake and offers panoramic views of the marshes. The park also includes Roman remains and natural hot springs close to the lake, which feed traditional Hammams (hot baths). Some longer horse or camel trekking excursions around the edges of the lake are also available, with visitors camping overnight by the lakeshore.

- *Lake Ichukeul is another renowned tourist site located in Tunisia.*
- *Every year it receives a large number of tourists.*
- *The attractions for tourists include sightseeing, museums, mountain biking, hiking sports trekking etc.*
- *The park located here holds traditional significance as well.*
- *Besides, horse or camel trekking excursions is also found present in the area which attracts a large inflow of tourists and visitors.*

**Planning and Management Strategies**

- The Park authorities actively promote tourism to Lake Ichkeul and its surrounding areas through tour operators, travel agents, and the Tunisian National Tourist Organization. It is included in travel guides and

- *The planning & management strategies for promoting tourism in Tunisia comprise of the tour operators and travel agents.*
- *The Tunisian National Tourist Organization is also working hard for harnessing appealing tourisim in the area.*
- *The Ichkeul National Park Management Committee also exists with representatives from local inhabitants.*
- *Various community outreach activities targeted at both the local population and the wider public*

brochures, and has been the subject of several television programmes, which have also helped to encourage tourists to visit the Park.

- Measurements are made so that local people frequently organize open days to sell the agricultural produce from the surrounding areas.
- Between 2003 and 2008, funding was obtained through the Global Environment Facility (GEF) to prepare and start to implement a Development and Management Plan (DMP) and a Community Development Plan (CDP) for Lake Ichkeul National Park. These plans were approved by all parties in 2007. The main features of these plans are as follows:
  - Progressive establishment of an autonomous management structure with clear decision-making processes for the Park; development of zoning within the Park; management of water resources through consultation with the authorities responsible for the dams and through use of mathematical models; participatory management with local communities; and generation of income from the Park through sustainable tourism.
- The Ichkeul National Park Management Committee has also been formed with representatives from local inhabitants, the Ichkeul Agricultural Development Group (an association of local farmers and inhabitants), government departments, and other stakeholders.
- Various community outreach activities targeted at both the local population and the wider public have also been The Park now has a program of support, including basic training and credit schemes, to increase the involvement of local businesses and communities in tourism activities, in order to expand local employment and economic benefits from tourism.



*Figure 126: Lake Ichkeul being home to a number of birds*
*Source: Birds & Ichkeul National Park Tunisia*

## d) Brazil - Abrolhos Marine National Park

It is situated around 70 km from the southern coast of the state of Bahia, Brazil, and is part of the Abrolhos Reef Complex, the largest known reef in the South Atlantic. It encompasses large areas of coral reefs, as well as the Abrolhos archipelago and the nearby Timbebas Reef.



*Figure 127: The Abrolhos Wetland in Brazil: Picturesquing an aesthetic view*
*Source: Abrolhos Marine National Park*

Abrolhos is Brazil's first marine park and covers just over 910 km2 (91,000 hectares). The National Park is under the jurisdiction of the Chico Mendes Institute of Biodiversity Conservation (ICMBio) and has been listed as a Ramsar Wetland of International Importance since February 2010.

**Tourist Arrival**

- In recent years, numbers of tourists visiting Abrolhos National Park have fallen from an average of 12,900 between 1998-2001 to 3,500 in 2011. This decline is attributed to a lack of innovation in the tourism products offered, the precarious conditions of roads and the closing of the airport of Caravelas city. To address this, the ICMBio is implementing a concession system under which tour and boat operators will tender for concessions to bring tourists into the Park.

**Planning and Management Strategies**

- In planning and decision-making for management of the Park, it focuses on four main areas: education, communication and culture, research and public use.
- In addition to Council members, the committee on public use also includes tourism service providers, particularly boat owners and scuba diving guides, representatives of public institutions and civil society organizations. This committee discusses and proposes actions related to tourism in the Park.
- Overall management of the Park takes place within the Park's Management Plan and zoning, first established in 1991. A Public Use Plan was approved in 2003; it defines the guidelines for visitors, including diving and whale and bird observation activities, and it is now part of the

- *Likewise in Kenya and Tunisia, Brazil is also making efforts in promoting tourism.*
- *The Abrolhos marine park is its first national park that is a ceneter of tourist attraction.*
- *The overall management of the park takes place with the Park's Management Plan and Zoning.*
- *Its management focuses on the four broad areas which include education, communication and culture, research and public use.*

- *Most of the park area is designated as protected.*
- *And tourism activities are mostly confined to designated sites.*
- *There is a tourist limitation that prevails in the park for protecting it from excessive impacts.*
- *On a daily, 225 visitors are allowed to visit this.*
- *The Park's management also caters the ecosystems and sensitive environment.*

Management Plan.

- Most of the Park is designated as a total protection zone (IUCN class Ia) where no human activities or alterations are permitted. This zone includes nesting areas and the majority of the reefs.
- Tourism and leisure activities are confined to designated dive sites and a 0.8 km nature trail on the island of Siriba to enjoy the scenery and do bird watching.
- To protect the Park from excessive impacts from tourism, the Park's regulations set a limit of 225 visitors per day – this is based on a carrying capacity assessment of the Park with the dual purposes of protecting the Park's environment and fragile habitats and ensuring a high quality experience for visitors and a sense of the remoteness and uniqueness of the Park and its dive sites. Only vessels that are accredited by the Park authorities are permitted in the Park. Each vessel is required to meet specifications set by the Brazilian Navy for safety and other operating equipment, and to have waste collection and storage tanks large enough to collect all wastes produced by passengers and crew.

### e) Colombia – Humedal La Conejera

It is located in the village of Suba, to the northwest of the city of Bogotá. It is one of the few wetlands that has survived the massive destruction of this type of ecosystem caused by population growth and increasing economic activities in the region. Currently, this wetland is one of the best-conserved ecosystems in the Capital District. Humedal La Conejera is a 58.9-hectare Natural Reserve that has been declared as a District Ecological Park. Its main use is biodiversity conservation, and secondary uses include scientific research, environmental education and passive recreation, as provided in the Land Use Plan for the city.

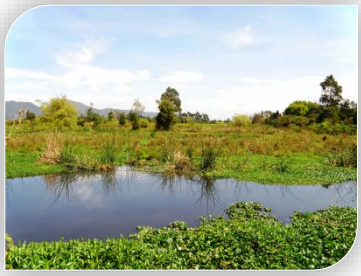


*Figure 128: The Lake Humedal La Conejera in Columbia hold immense beauty for tourist attraction*
*Source: Wetland Tourism: Colombia – Humedal La Conejera*

**Tourist Arrival**

Each year this wetland receives 16,000 visitors who are attracted by the natural beauty of the place, its participative environmental management process and the associated biodiversity, especially birds.

**Planning and Management Strategies**

- This wetland includes 2,200 m of ecological interpretive trails, an ecological bus with informal lectures for visitors, and lavatories.
- In neighborhoods adjacent to the wetland, visitors can find restaurants and cafés, which is an activity that favors the owners of these premises, who benefit financially from selling snacks, food and communication services.
- Environmental Management Plan (prepared for this wetland) established an ecological zoning for the wetland, which provides for strict conservation areas, ecological restoration areas, and areas for environmental education and passive recreation.
- A manual named as (Manual of coexistence for the sustainability of the wetland) has been prepared by participatory approach and that has been accepted and put into practice by visitors. The implementation of this manual has been reflected in the behavior of visitors who do not leave rubbish inside the wetland, walk quietly so as not to affect wildlife, do not collect plants, and in general show a deep respect for the ecosystem.
- In 2004, a consultation process was started with the management of the Capital District, which led to the collective formulation of the new District Policy on Wetlands (Alcaldía Mayor de Bogotá, 2006), oriented towards the ecological restoration of wetlands and the definition of biodiversity conservation as the main use of wetlands, with scientific research, environmental education and passive recreation as secondary uses, following the model established by FHLC in Humedal La Conejera since 1993.

- *Humedal La Conejera is a natural reserve in Colombia that has been declared as a District Ecological Park.*
- *Its main use is biodiversity conservation, and secondary uses include scientific research, environmental education and passive recreation.*
- *This wetland receives 16,000 visitors annually.*
- *Environmental Management Plan has been prepared that defines ecological zoning for this wetland.*




*Strategizing means for effective Tourism Management*




*Planning with the aim of effective preservation*

- *A Wetland Committee has also been developed for preserving this area.*
- *For facilitating the visitors, a service center has been designed that offers eco-stores service to the tourists.*
- *District Institute of Tourism of Bogotá (IDT) is promoting Humedal La Conejera as a destination for national and international tourists through its web site.*
- *An effective wetland protection management is taken up as per the Environmental Management Plan for the area.*

- Wetland committee was formulated which is a corporate body and that includes a representative of the community for each neighborhood of the city where there are wetlands and two members of wetland of Network.
- A visitor service center is designed in the area adjacent to the wetland. This service center includes a conference room. Lavatories, a cafeteria and an eco-store for souvenirs.
- Access to the wetland is regulated following the recommendations contained in its Environmental Management Plan, so as not to exceed the carrying capacity established per day.
- District Institute of Tourism of Bogotá (IDT) is promoting Humedal La Conejera as a destination for national and international tourists through its web site and the different tourist information points located in the city.
- In the process of protection, recovery and wise use of Humedal La Conejera, 25 schools located in the river micro-basin of the wetland are involved through environmental school projects (PRAES) and/or social service.

### 5.7.1.1. Learning Tips

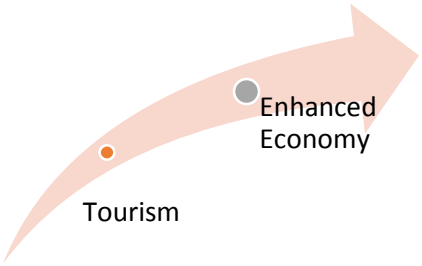
The above mentioned case studies best describes the tourism management of wetlands. The number of strategies and interventions have been followed to manage and enhance tourism on these sites. The major findings or lessons learnt as summarized as:

- Establishment of an ecological zoning for the wetland, which provides for strict conservation areas, ecological restoration areas, and areas for environmental education and passive recreation.
- Provision of extensive signage and interpretation for the tourist sites
- Ensuring special monitoring set-up i.e. a goal should be to protect and conserve from the harmful activities of human

- Proper zonation to protect the native wildlife and fragile habitats.
- Proper zoning and development and its visitor infrastructure have been developed in accordance with the zoning system.
- Awareness raising and conservation education program for schools and local residents.
- Promoting tourism to the tourism sites and its surrounding areas through tour operators, travel agents, and any recognized tourist organization.
- Basic training and credit schemes, to increase the involvement of local businesses and communities in tourism activities, in order to expand local employment and economic benefits from tourism.
- Preparation of the management plan that includes the detailed guidelines for visitors.
- To protect the tourism sites from excessive impacts from tourism, the regulations should be formulated that can set a limit of certain visitors per day – this should be based on a carrying capacity assessment on a particular site
- Preparation of educational videos and brochure, for clients and staff managing the wetlands, highlighting all of the environmental features of the sites.
- Trained guides to provide interpretation and guidance in the wetlands to visitors. Arranging a community workshop at different tourist sites within the region to attract and raising awareness regarding the environmental and tourism significances of the sites.
- Last but not the least, involve all stakeholders while devising strategies and tourism management plans

### 5.7.2. Tourism in Soon Valley

The tourism industry is considered as a significant part of the many economies across the world and Pakistan is also expected to capitalize on this dividend. The recent devolution to the provinces in Pakistan provided an opportunity to the respective entities to exploit the immense potential of tourism industry to get its benefits to optimum level. Punjab being the most populous province is blessed with several touristic wonders like Murree, Salt Range, Kallar Kahar and Soon Sakesar region. The current tourists draw in the province is mainly oriented to Murree (a major competitive touristic destination within Punjab). However, Soon Valley, being located in almost within two hours' drive from the federal and provincial capitals, and other major cities, makes its position up in the table while offering natural wilderness, centuries old fossils and remnants , exotic landscape, salt-water lakes, rendezvous with migratory birds, built-heritage and most warm and welcoming community.




This rendezvous and bewildered Valley can easily be regarded as one of the Pakistan's best places to visit in terms of its environment, cultural diversity and natural beauty, which makes it all season attractive to visitors. Soon Valley has tremendous strengths in terms of its natural assets that support tourism, including wonderful lakes, waterfalls, springs, gardens, orchards and serene landscape.

#### 5.7.2.1. Current Challenges of Tourism Promotion

The major challenges that affect the tourism promotion and development within the Soon Valley are summarized as;

***a. Governmental Patronage:***

– From an organizational, development management and funding perspective, Soon Valley has experienced a long

- *Tourism industry is faced by a number of challenges that need to be catered for its promotion.*
- *Government plays the foremost role in uplifting the status of tourism in any area.*
- *For Soon Valley as well, there is need of a strong and prolong commitment by the Government for making it a center of tourist attraction.*
- *Since long, the area has been neglected from development and improvement.*

- *Fluctuations in funding and less government patronage in the past marginalized the valley in terms of tourist influx.*
- *Lack of connectivity is a major hindrance for the promotion of tourism.*
- *Dilapidated road condition, poor quality water supply and solid waste management pose a bad experience to tourists*

spelled neglect and fluctuations in funding over the past several decades. The Valley completely and severely lacks supportive touristic infrastructure in terms of both accessibility and quality of services.

– Lesser governmental patronage in the past marginalized the valley in terms of tourist draw.

– Community is highly under privileged, almost living just above the poverty line and mostly dependent on natural capital to make their livelihood, so unable to invest in tourism sector as an active contributor and gainer.

**b. Barriers to *International* Tourism**

– The scope of international tourism is limited as the Valley lacks air, rail connectivity and thus remains a hidden gem within competing tourist destinations in Punjab. Further, the Valley lacks high-end tourism with higher revenue potential; the quality of tourism infrastructure and tourism activities of international quality are non-existent.

***c. Inadequate Infrastructure:***

- Except road connectivity from M2 Motorway Kallar Kahar Interchange, the Valley is off from rail network. Thus, lack of connectivity is a major hindrance for the promotion of tourism.
- The road conditions within the Soon Valley are categorized poor.
- The inadequate parking and water supply are major constraints faced by the tourism service providers in attracting tourists
- The poor reception and network coverage of telephonic services, refuse, solid waste disposal along lakes and Internet service within the Valley, pose a bad experience



*Overcoming the Barriers*

- Valley also generally lacks hospitality infrastructure that also puts its tourism potential to position that is more disadvantageous.
- Besides the physical infrastructure, the Valley seriously lacks tourism infrastructure including canteens, restaurants, lodging facilities including rest houses and hotels, proper sitting places (benches) on touristic sites, children play areas and proper signage and sign posts at various places for proper guidance and accessibility of tourists to different tourist spots within the Valley.



*Strategizing ways with collaborative effort*

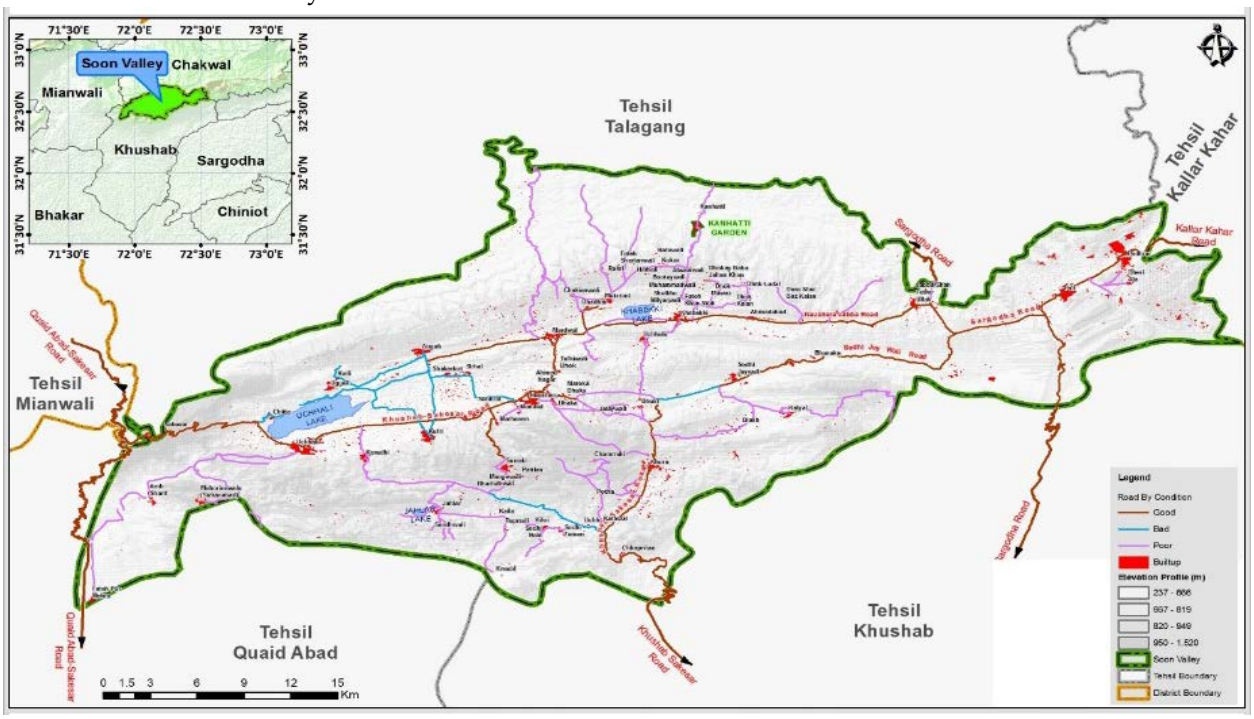



*Figure 129: Existing Road Network by Condition*

*Source: Constructed by the Consultant on the Basis of Primary & Secondary Data*

### *c. Origin of Tourists*

Soon Valley acts as a weekend tourism destination with bag packers adding stress to existing strained infrastructure without contributing much to the economy. The Travel Information Survey conducted by the Consultants indicates that 33% tourist originate from neighboring city Khushab, 20% Lahore, 16% Islamabad, 9% Sargodha, 7%Jhelum, 6% Chakwal, 5% Mianwali, 2% Faisalabad and 2% from other cities.

- *The inadequacy of infrastructure is also a great challenge for promoting tourism in the Valley.*
- *The Valley has quite a number of tourist inflow with 33% coming from the neighboring city Khushab.*

- The above data shows that Soon Valley is not a choice for tourists from other provinces within Pakistan. Thus to position itself better in the favorite tourist abodes of the country, Soon Valley has to be highly competitive in terms of services and value-addition.

### *d. Longevity of Stay*

- Presently, the duration of stay is very low as compared to other touristic destinations in Pakistan. Most of the tourist are day-trippers (52%) followed by 35% of visitors who wish to stay for 01-02 days in the Valley if there were adequate lodging facilities. This is due to lack of enough tourism activities/options for various category of tourists and accessibility problems within the Valley.
- Field surveys depict that the tourists who wish to stay in the Valley are mostly armature adventurous tourists who wish to enjoy the wilderness of the Valley and like to camp at Kanhatti Garden mostly

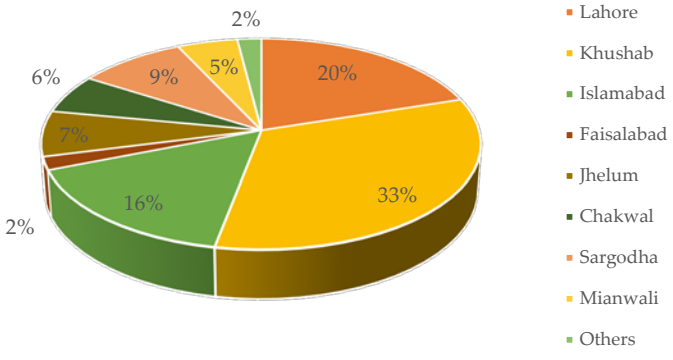



*Figure 130: Tourists Origin for Soon Valley*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

- *It serves as an important weekend tourism destination, who make their way to the valley to feast themselves.*
- *There is a need to upgrade the area for facilitating the inflow of people to the area.*

- *Most of the visitors originate from Khushab, Lahore and Islamabad.*
- *Soon Valley has to be highly competitive in terms of services and value-addition in order to attract tourists from other provinces of Punjab.*
- *52% of the tourists are day-trippers and 35% of visitors wish to stay for 1-2 days given that adequate facilities are provided.*

- *Locating public toilets was the major hassle besides finding parking facility for vehicles in the touristic points.*
- *88% of tourists use personal vehicles including bikes and cars and encounter hardships in finding directions, drinking water, public toilets and parking facilities.*
- *Camping is mostly done at Kanhatti Garden*
- *Locating public toilets was the major hassle besides finding parking facility for vehicles in the touristic points.*



*Studies show that there is good scope of activities like boating, climbing and tracking*

### *e. Connectivity and Accessibility*

- About 88% of the tourists coming to the Valley use personal vehicles including bikes and cars and encounter hardships in finding directions, drinking water, public toilets and parking facilities. While, only 8% of the tourists use public transport to reach Soon Valley from thereupon they use other means of access to reach tourist spots in the valley. However, 4% of the tourists access tourist sites in the Valley on motorbikes who are adventurous and mostly belong to neighboring towns and settlements but somehow put their lives at risk due to difficult to traverse terrain.
- The survey conducted with tourists indicated that the locating public toilets was the major hassle besides finding parking facility for vehicles in the touristic points.

### *f. Scope of Tourist Activities*

- They Valley is unique in offering various opportunities of leisure and tourist activities which include; camping, cycling, boating/jetties, tracking and rock climbing. The field survey conducted by the Consultants shows that the tourists perceive a good scope of these activities especially boating, climbing and tracking while they recognize less scope of cycling and camping within the project area.

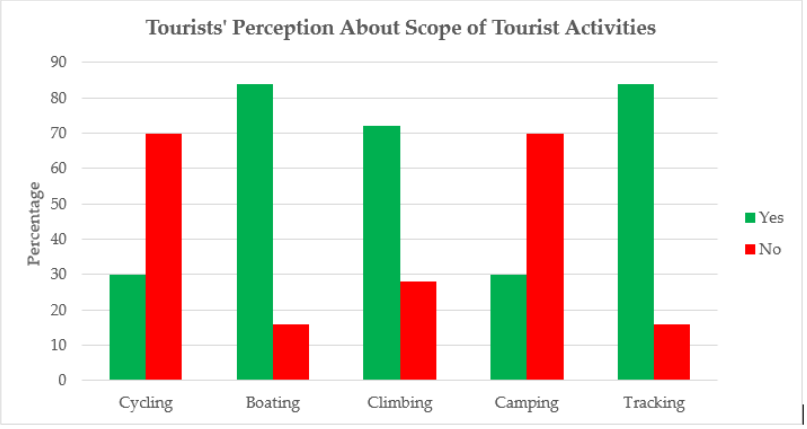



*Figure 131: Tourists' Perception about Scope of Tourist Activities*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

However, very little facilities are available in this connection. For-example, only Kanhatti Garden is safe for overnight camping as the site is within a walled-boundary and being guarded too. Whereas, the scope of camping is lesser on other sites until an enabling environment is provided by the government or tour operators.

### *g. Lack of Tourism Information Services:*

The tourism and travel industry relies heavily on the knowledge economy. To be a successful and thriving tourist destination, the Soon Valley has to be widely recognized and promoted as an alternate tourist abode within Punjab. The current influx of tourists in the Valley are largely dependent on the "word of mouth" recommendations. The results of field surveys depict that 81% of tourists visit Soon Valley on recommendation of a friend/acquaintance, 4% on the recommendation of travel agents, 14% are inspired by the photographic/visual materials available online on the Internet; whereas a 1% of tourists are actually inspired by the marketing and promotion campaigns of the Tourism Development Corporation of Punjab.

- *Tourists perceive a good scope of tourist activities especially boating, climbing and tracking*
- *The current influx of tourists in the Valley are largely dependent on the "word of mouth" recommendation*


- *Tourists perceive a good scope of tourist activities especially boating, climbing and tracking*
- *The current influx of tourists in the Valley are largely dependent on the "word of mouth" recommendations*

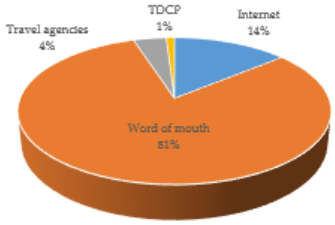



*Figure 132: Source of Information to Visit Soon Valley*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

The results also show that a significant portion of tourists is now using the Internet to make travel arrangements.

- The nearest Tourism Information Center of the TDCP is located at Kallar Kahar about 59 km away from the Soon Valley. Thus the tourists experience inconvenience in accessing the site, direction seeking and knowing exactly what to do and where to go when they enter the Soon Valley.
- However, since in absence of the patronage of the government (public sector facilitation for the online travel sales) and uncoordinated effort of the travel and tourism industry within Pakistan, a very lesser trend is available in the country to make travel-related purchases online.
- Random online searches by consultants appeared in no-results for any online booking, facilitation or visits to be arranged by the TDCP or any other private sector tour operator

- *Due to distant location of Tourist Information Center of TDCP, tourists experience problems in assessing the site, direction seeking and know exactly what to do.*
- *No trend is available in the project area to make travel-related purchases online*

***Absence of Tourist Guides:***

- The Valley virtually does not have any trained guides placed in important places of tourist attraction who can promote history, culture, heritage and touristic value of the Valley.
- Consequently, as the tourists arrive at such a place there is hardly anyone to satisfy the inquisitiveness of the tourists. Lack of trained tourist guides in the area also makes Soon Valley a less tourist attraction destination.

***h. Quality of Stay and Availability of Services:***

- Lesser and poor quality accommodation facilities within the valley, makes it difficult for overnight-tourists to enjoy a quality stay. These facilities are only available in Naushera town.
- During the field studies, it is found that majority of the tourists are dissatisfied with the availability and quality of tourist services. Hence, the visitors have to face a lot of difficulties in enjoying the touristic spots in Soon Valley a quality stay. These facilities are only available in Naushera town.
- During the field studies, it is found that majority of the tourists are dissatisfied with the availability and quality of tourist services. Hence, the visitors have to face a lot of difficulties in enjoying the touristic spots in Soon Valley.

***i. Under-developed Human Capital***

- The human capital associated with tour operators, hoteliers, transporters, tourist guides etc. are not trained enough to provide detailed information to the tourists regarding the Valley which obviously is a barrier in the path of development of tourism sector. The majority of tourists visit Soon Valley on the recommendation of

*Lack of trained tourist guides in the area makes soon valley a less tourist attraction place*

*Lesser and poor quality accommodation facilities within the valley, makes it difficult for overnight-tourists to enjoy a quality stay*

*As hospitality services are only available in Naushera so tourists face a lot of problems*

*Lack of trained tourist guides in the area makes soon valley a less tourist attraction place*




*Under-developed human capital has greatly affected the tourism influx in the area*

friends or through trips organized by educational institutes or office establishments. Thus despite abundance of religious places, cultural and historical places; the tourist influx to the Valley has been marginal for the reasons of the lack of infrastructural and other related facilities in various tourist spots.

### *j. Labor Market within Tourism Sector*

- *Local population is mostly engaged in agricultural sector and only 1% is involved in tourism sector services.*
- *Most of the labor is tourism employment is associated within the transport, food, beverage and accommodation sector.*
- *Given the proper in investment is done in tourism sector, people are willing to participate in tourism related opportunities*


- *Local population is mostly engaged in agricultural sector and only 1% is involved in tourism sector services.*
- *Most of the labor is tourism employment is associated within the transport, food, beverage and accommodation sector.*


- The survey results show that the local population is mostly engaged in agriculture sector (37%), whereas 39% of population is self-employed, 16% is engaged in government employment and 8% are engaged in private sector jobs. Approximately, 1% of self-employed population is involved in tourism sector services.
- As currently, the tourism economy in the Valley is highly characterized as a seasonal, fragmented, multi-faceted service industry. Where most of the labor in tourism employment is associated within the transport, food and beverage, and accommodation sectors. However, their skill-set is a question of quality and level of service is currently poor.
- Further, the seasonal nature of the tourism industry is contributing to the development of dual labor markets, comprised of core workers and peripheral ones. While discussing the economic impacts of tourism with the residents of the project area, it is observed that people are optimistic about the huge potential of improvement in livelihood, enhancement in economic benefits, and creation of more jobs with the implementation of tourism plans and policies

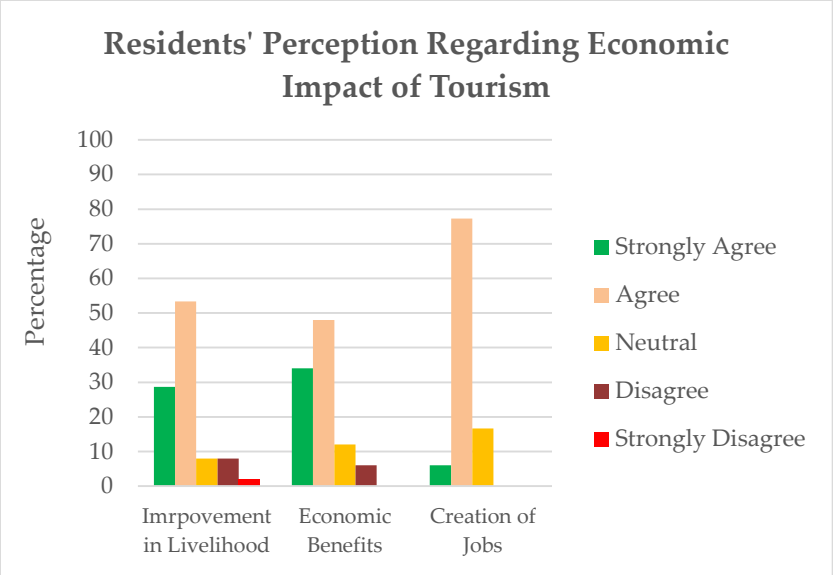



*Figure 133: Residents' Perception Regarding Economic Impact of Tourism in the Project Area*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015/16*

### *k. Unsustainable Tourism Practices*

- During the field visits, it is observed that the current behavior of most of tourists is irresponsible towards the sensitive environment of the Soon Valley which in return contributes in the environmental degradation and low quality of tourism services. The general behavior of throwing rubbish irresponsibly, vandalism of public and touristic infrastructure – all contribute to the unsustainable tourism practices. A concentrated effort is required to enhance and preserve the natural and cultural heritage of the Soon Valley that in return shall improve quality of life and tourism development within the Valley.

The project area is enriched with the aesthetic beauty and possess number of touristic sites. Therefore, the residents are also of the view that improvement is tourism can support and help in conservation of natural resources but other hand the increase in tourism would result in air and noise pollution within the project area

- *Soon Valley is observed to be on the verge of environmental degradation.*
- *This degradation is largely being done by the locals who have a common practice of throwing garbage open to the sky.*
- *The unsustainable tourist activities further aggravates the condition.*
- *Excessive deforestation is also degrading the natural landscape and vegetation.*
- *There is, thus, need to protect the natural environment with facilitating tourism.*



*Unsustainable practices like using the lake for residents own uses were observed*



*Tourism exploited efficiently can lead to increased economic growth*

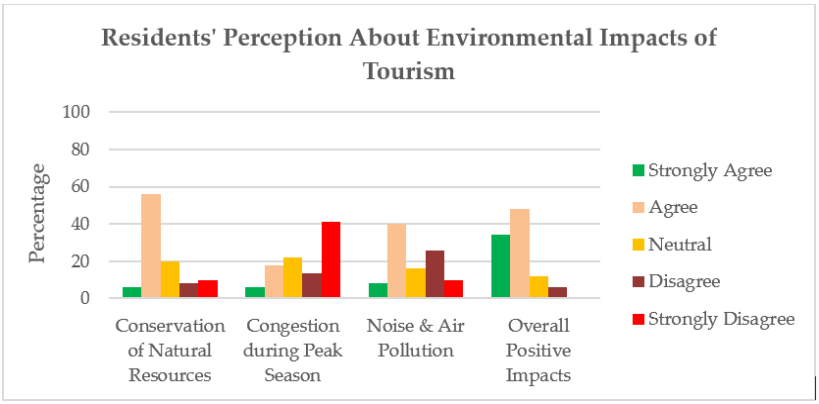



*Figure 134: Residents' Perception about Environmental Impacts of Tourism in the Project Area*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015/16*

> *There are marvelous chances that the Soon Valley could act as the shortest route to link the two alignments of China Pakistan Economic Corridor.*

### *k. Tourism and Economic Growth;*

A keen relationship exists between the tourism development and economic growth. The recent bilateral agreement of Pakistan with China on the development of China Pakistan Economic Corridor (CPEC) offers high opportunities for tourism sector as well. Soon Valley being located in between growth led through tourism development. There are marvelous chances that the Soon Valley could act as the shortest route to link the two alignments. The following map depicts the Soon Valley overlaid on the corridor of opportunity

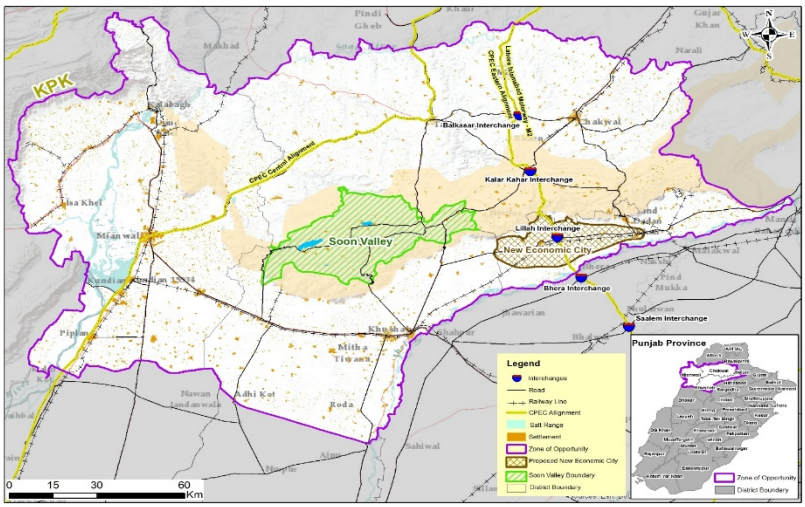



*Figure 135: Soon Valley in the Context of China Pakistan Economic Corridor (CPEC)*

*Source: The Urban Unit, 2016*

### 5.7.2.2. Estimating Economic Potential of Tourism in Soon Valley

The economic potential of tourism can be calculated as:

(i) A powerful economic force providing employment, foreign exchange and tax revenue;

(ii) Visitors are generators of economic impact for a country, a region, a city or a destination area: directly from their spending and indirectly from the tourism multiplier effect.



*Seeking economic vitality from tourism*

Economic impact of tourism is measured in terms of its effect on income; employment; investment and development; and balance of payment[26].

### 5.7.2.3. Income Generation from Tourism

The income in a tourist economy is generated from: wages and salaries; interests; rents; and profits. In a labor intensive industry such as tourism, the greater proportion of income is likely to be derived from wages and salaries paid to those working in jobs either directly serving the needs of tourists or benefitting indirectly from tourists' spending. Since, detailed and exact data regarding tourist draw in the Soon Valley is not available from any authentic source, a rough estimation of tourists coming in the valley is calculated by the Consultants which is given below:

*Table 55: Income Generation from Tourism*

| *Location* | *Type of Tourist* | *Avg. Daily Tourist Draw* |
|---|---|---|
| ***Khabekki*** | Resident | |
| | Day-Tripper | 80 |
| | ***Sub-Total*** | *80* |
| ***Ucchali*** | Resident | |
| | Day-Tripper | 150 |
| | ***Sub-Total*** | *150* |

- *The Soon Valley has immense potential in terms of income generation as a result of tourism.*
- *The development of tourism in the area, can give rise to a number of employment opportunities for the locals.*
- *This will of help in improving the quality of life.*
- *Economy is expected to boost with the coming of more visitors and by generating revenue.*

[26] Fateme Tohidy Ardahaey. Economic Impacts of Tourism Industry. International Journal of Business and Management Vol. 6, No. 8; August 2011



*Catering the bulk inflow of tourists*

| | | |
|---|---|---|
| ***Jahlar*** | *Resident* | |
| | Day-Tripper | 30 |
| | ***Sub-Total*** | *30* |
| ***Kanhatti Garden*** | Resident | 10 |
| | Day-Tripper | 150 |
| | ***Sub-Total*** | *160* |
| ***Other Places**** | Resident | 50 |
| | Day-Tripper | 350 |
| | ***Sub-Total*** | *400* |
| ***Total*** | | **820** |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

Other places include visitation to relatives, marriage travels. Based on the tourist draw within the Valley, the daily average spending of the tourists is calculated which is given below:

*Table 56: Daily Average Spending by Visitors in Soon Valley*

| ***Spending by Type*** | ***Daily Average Spending (PKR)*** | | ***Total (PKR)*** |
|---|---|---|---|
| | **Resident** | **Day-Tripper** | |
| *Accommodation* | 1200 | | |
| *Retail Shopping* | 250 | 200 | |
| *Food and Beverage* | 1000 | 500 | |
| *Entertainment* | 200 | 200 | |
| *Travelling* | 1500 | 1000 | |
| *Tickets and Taxes* | 600 | 200 | |
| ***Total*** | **4750** | **2100** | **6850** |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

- *With the development of tourist facilities in the area, the visitors are likely to spend on accommodation, retail shopping, food, entertainment, travelling and ticketing.*
- *This benefits the locals in terms of income generation.*
- *It is observed that the highest amount of spending is made on the accommodation by the visitor.*
- *Therefore, a quality accommodation is expected to bring a significant increase to this.*

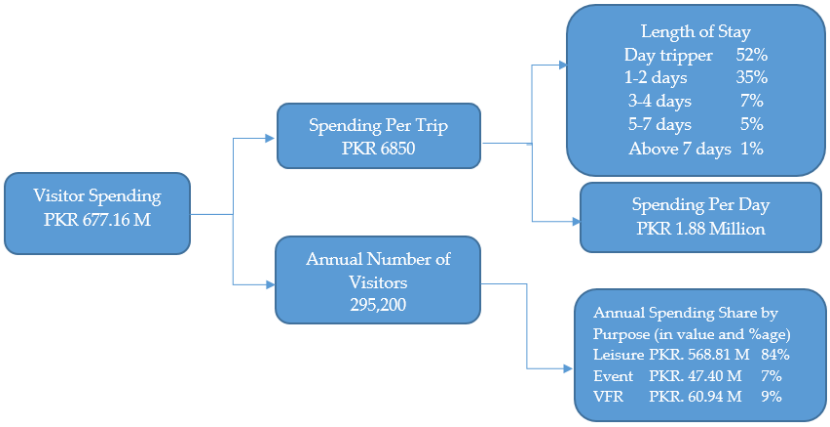
Since, the tourism economics is complex and income estimation is quite complex too. A rough estimate of the tourism businesses average daily, monthly and annual tourism expenditure is estimated which is actually the tourism receipts that floats in the economy. This could include, for example, rent paid for lodging, parking fees, taxation on tourism activities, such as value added tax, hotel bills, fuel expenses, recreational expenses, food and beverages etc.

*Table 57: Average Tourist Expense in Soon Valley*

| Location | Type of Tourist | Avg. Daily Tourist Draw | Avg. Tourist Expense (PKR) | | |
|---|---|---|---|---|---|
| | | | Per Day | Monthly | Annual |
| *Khabekki* | Resident | | - | - | - |
| | Day-Tripper | 80 | 168,000 | 5,040,000 | 60,480,000 |
| | ***Sub-Total*** | *80* | *168,000* | *5,040,000* | *60,480,000* |
| *Ucchali* | Resident | | | - | - |
| | Day-Tripper | 150 | 315,000 | 9,450,000 | 113,400,000 |
| | ***Sub-Total*** | *150* | *315,000* | *9,450,000* | *113,400,000* |
| *Jahlar* | Resident | | - | - | - |
| | Day-Tripper | 30 | 63,000 | 1,890,000 | 22,680,000 |
| | ***Sub-Total*** | *30* | *63,000* | *1,890,000* | *22,680,000* |
| *Kanhatti Garden* | Resident | 10 | 47,500 | 1,425,000 | 17,100,000 |
| | Day-Tripper | 150 | 315,000 | 9,450,000 | 113,400,000 |
| | ***Sub-Total*** | *160* | *362,500* | *10,875,000* | *130,500,000* |
| *Other Places* | Resident | 50 | 237,500 | 7,125,000 | 85,500,000 |
| | Day-Tripper | 350 | 735,000 | 22,050,000 | 264,600,000 |
| | ***Sub-Total*** | *400* | *972,500* | *29,175,000* | *350,100,000* |
| ***Total*** | | **820** | **1,881,000** | **56,430,000** | **677,160,000** |
| | | **PKR (in Million)** | **1.88** | **56.43** | **677.16** |

- *Khabekki, Uchhali, Jhalar and Kanhatti Gardens receive a significant inflow of tourists annually.*
- *Day trippers are found more than the residential tourists.*
- *A large amount of expenditure is made by the tourists on different activities.*

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*



### 5.7.2.4. Tourist Forecasting for Soon Valley

The consultants assume that the Soon Valley will not be following normal trends of tourism which is mostly static in nature. With the introduction of current and future projects, the tourist draw in the valley is likely to increase manifold. Following assumptions illustrate this increase:

- *With the introduction of current and future projects, the tourist draw in the valley is likely to increase manifold*
- *The project is likely to draw an increase of 2% in tourist inflow.*
- *A cumulative of 15% tourist increase in the Valley is expected to occur within the estimated plan period i.e. till 2040.*
- *This could ultimately boost up the overall country's economy and development.*

1. Current tourism development projects by the TDCP will not help much in tourist draw. However, it will attract maximum of 2% increase of tourist in Soon Valley.
2. If the links between neighboring towns are upgraded, the tourist draw can be significantly higher up to 3.5%.
3. If the links between CPEC's Eastern (M2) and Central alignment (Indus Highway) is improved, the Valley will act as a bridge between the two highways enabling nearby towns to put their freight movement and resulting in higher incremental growth of tourist for Soon Valley.
4. The regional dynamics of investment in infrastructure development projects in the Salt Range.
5. If the New Economic City proposed at/around Lillah Interchange on Lahore-Islamabad Motorway (M2) is established by year 2025, the Valley can experience tremendous boom in tourism.
6. Within the plan period of 25 years (2016-2040), the Soon Valley will attract a cumulative of 15% tourist increase. Which means that the Valley will be a hotspot of tourists within Punjab.

*Table 58: Tourist Forecast for Soon Valley*

| *Year* | *Annual Tourist Draw* | *Annual % Increase of Tourists* |
|---|---|---|
| *2016* | 295,200 | |
| *2017* | 298,152 | 1.0% |
| *2018* | 302,624 | 1.5% |
| *2019* | 307,164 | 1.5% |
| *2020* | 313,307 | 2.0% |
| *2021* | 321,140 | 2.5% |
| *2022* | 329,971 | 2.8% |
| *2023* | 339,870 | 3.0% |
| *2024* | 351,766 | 3.5% |
| *2025* | 364,077 | 3.5% |
| *2026* | 377,730 | 3.8% |
| *2027* | 392,839 | 4.0% |
| *2028* | 410,517 | 4.5% |
| *2029* | 431,043 | 5.0% |
| *2030* | 454,750 | 5.5% |
| *2031* | 482,035 | 6.0% |
| *2032* | 515,778 | 7.0% |
| *2033* | 557,040 | 8.0% |
| *2034* | 607,174 | 9.0% |
| *2035* | 667,891 | 10.0% |
| *2036* | 748,038 | 12.0% |
| *2037* | 841,543 | 12.5% |
| *2038* | 955,151 | 13.5% |
| *2039* | 1,088,872 | 14.0% |
| *2040* | 1,252,203 | 15.0% |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

- *Tourist forecast for the Soon Valley appears to follow a rising trend with the effective implementation of the project.*
- *The annual increase is expected to touch the figure of 15% from the present existing value.*

### 5.7.2.5. Tourist Spending for Soon Valley

With the current pace of tourism development projects, the Valley will be attracting over a million tourists in the plan period. Accordingly, the spending pattern will also be increasing with the induction of quality services and new forms of active and passive tourism within the Soon Valley. It is estimated that the Annual Tourist Spending will increase cumulatively 1314% from base year of 2016 to 2040. The Valley with current tourist influx of 295,200 tourists has economic contribution of PKR. 677,160,000 which with the estimated influx of 1,252,203 tourists is expected to contribute PKR. 2,863,938,841 (PKR. 2.86 Billion) approximately.

- *The Valley will be attracting over a million tourists in the plan period.*
- *The spending pattern will also be increased with the induction of quality services and new forms of active and passive tourism within the Soon Valley.*
- *Annual Tourist Spending will increase cumulatively 1314% from base year of 2016 to 2040*

*Table 59: Tourist Spending for Soon Valley*

| *Year* | *Annual Tourist Spending (in PKR)* | *% Increase of Tourists Spending Forecast* |
|---|---|---|
| *2016* | 677,160,000 | 24% |
| *2017* | 728,454,870 | 25% |
| *2018* | 780,519,163 | 27% |
| *2019* | 833,364,420 | 29% |
| *2020* | 887,266,583 | 31% |
| *2021* | 942,516,300 | 33% |
| *2022* | 999,285,384 | 35% |
| *2023* | 1,057,757,540 | 37% |
| *2024* | 1,118,276,222 | 39% |
| *2025* | 1,180,913,058 | 41% |
| *2026* | 1,245,898,775 | 44% |
| *2027* | 1,313,483,920 | 46% |
| *2028* | 1,384,110,398 | 48% |
| *2029* | 1,458,268,199 | 51% |
| *2030* | 1,536,504,679 | 54% |
| *2031* | 1,619,435,348 | 57% |
| *2032* | 1,708,171,164 | 60% |
| *2033* | 1,804,005,845 | 63% |
| *2034* | 1,908,465,648 | 67% |

| | | |
|---|---|---|
| *2035* | *2,023,371,430* | *71%* |
| *2036* | 2,152,065,907 | 75% |
| *2037* | 2,296,847,193 | 80% |
| *2038* | 2,461,173,953 | 86% |
| *2039* | 2,648,506,459 | 92% |
| *2040* | 2,863,938,841 | 100% |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

### 5.7.2.6. Calculations for 2016 Seasonality

The following matrix explains the trend of seasonality and accordingly tourist draw in the base year.

*Table 60: Tend of Tourist Draw in the Base Year*

| ***2011*** | ***Monthly %age of Total Tourist Draw*** | ***Monthly Tourist Draw*** | ***Cumulative % Season-wise*** | ***Remarks for Seasonality Factors*** | ***Seasons*** |
|---|---|---|---|---|---|
| *Jan* | 1.50% | 4,428.00 | 5.50% | Start of New Year + Lower School Attendance | Dec, Jan, Feb |
| *Feb* | 1.50% | 4,428.00 | | Low Tourist Draw as Many Schools are taking annual examinations | |
| *Mar* | 1.00% | 2,952.00 | 19.50% | Extremely Low Tourist Draw as Many Schools are taking annual examinations | Mar, Apr, May, Sep, Oct, Nov |
| *Apr* | 6.50% | 19,188.00 | | Start of New Academic Years, Families are relatively busy | |

| | | | | | |
|---|---|---|---|---|---|
| *May* | *12.00%* | *35,424.00* | | *Tending to be free* | |
| *Jun* | 20.00% | 59,040.00 | 60.50% | School Summer Vacations Start | Jun, Jul, Aug |
| *Jul* | 22.00% | 64,944.00 | | School Summer Vacations | |
| *Aug* | 18.50% | 54,612.00 | | School Summer Vacations | |
| *Sep* | 8.00% | 23,616.00 | 14.50% | Academic Sessions starting | |
| *Oct* | 4.50% | 13,284.00 | | Mid-year Exams in Schools taking place | |
| *Nov* | 2.00% | 5,904.00 | | Mid-year Exams in Schools taking place | |
| *Dec* | 2.50% | 7,380.00 | | Winter Vacations Start, relatively high influx of tourists in winter season | |
| *Total* | | **295,200** | **100%** | | |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*




*Tourism promotion can cause significant increase in employment generation*

### 5.7.2.7. Tourism Employment

The concept of tourism employment, in accordance with the International Recommendations for Tourism Statistics 2008 (IRTS 2008), refers to "employment strictly related to the goods and services acquired by visitors and produced by either tourism industries or other industries"[27]. Hence, tourism employment is a measure of the number of jobs direct

[27] International Recommendations for Tourism Statistics 2008, Department of Economic and Social Affairs, Statistics Division, United Nations, 2010.

attributable to tourism demand in tourism and non-tourism industries, held by employees, self-employed and contributing family workers. Tourism employment can be measured as direct tourism employment and as direct tourism employment in the tourism industries. While the former measures jobs in tourism industries that can be attributable to tourism spending plus jobs in non-tourism industries that can be directly attributed to tourism spending, the latter refers to jobs that can be attributed to tourism spending in tourism industries.

Based on such assumptions and current tourism development projects by the TDCP, direct tourism employment in near future for Soon Valley is calculated which is given below:

*Table 61: Estimated Tourism Employment in Soon Valley*

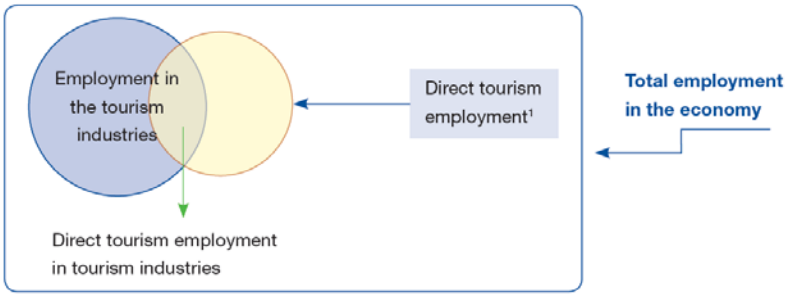
| *Category* | *Estimated Numbers* | *Est. Employment per Outlet* | *Total Estimated Employment* |
|---|---|---|---|
| ***Rest House at Kanhatti Garden*** | 1 | 10 | 10 |
| ***Rest House at Khabekki Lake*** | 1 | 10 | 10 |
| ***Restaurant*** | 5 | 12 | 60 |
| ***Shops at Tourist Places*** | 25 | 2 | 50 |
| ***Tour Operators*** | 5 | 4 | 20 |
| ***City Shops*** | 100 | 2 | 200 |
| ***Wayside Restaurants*** | 5 | 6 | 30 |
| ***Transport*** | 50 | 2 | 100 |
| ***Services*** | 20 | 4 | 80 |
| ***Total Estimated Employees*** | | | **560** |

*Source: Constructed by the Consultant on the Basis of Field Studies, 2015-16*

- *Tourism employment can be measured as direct tourism employment and as direct tourism employment in the tourism industries.*
- *The TDCP project for the Soon Valley is likely to generate a number of employment opportunities for the locals.*
- *The total employment in tourism for the Valley will be over 2000 persons in its initial phase.*

Besides it is estimated that a significant increase in the total employment in the economy will also be boosted over the period as a multiplier effect. As per the estimates, the IRTS suggest that a direct employment in tourism creates at least 4 indirect jobs. Thus at the initial phase of tourism development (base year 2016) in the Soon Valley the total employment in tourism (persons directly employed in tourism sector) will be over 2000 persons.

The consultants assume that with the advent of future tourism development projects especially in the context of CPEC and New City at M2, the job creation in tourism sector will be manifold.



# Annexures

## Socio Economic Questionnaire for Soon Valley Master Plan, District Khushab

**Personal Information**

Respondent's Name _____
Respondent's Address _____
Respondent's Gender _____
Respondent's Cell No. _____

**Socio-Economic Information**

1. **Type of the Family.**
   a) Single
   b) Nucleus
   c) Joint
2. **House Ownership.**
   a) Owned
   b) Rented
   c) Leased
   d) Other
3. **What is the household size?** _____
4. **What is your caste? (Optional)** _____
5. **Since when you are living here?**
   a) 1-10 years
   b) 11-20 years
   c) 21-30 years
   d) >30 years
6. **Are you a native?**
   a) Yes
   b) No
7. **Number of household members with respect to their age**

| Age Group | Male | Female |
|---|---|---|
| 0-15 | | |
| 16-30 | | |
| 31-45 | | |
| 46-60 | | |
| 61 & above | | |
| TOTAL | | |

8. **Level of education of the members of the household.**

| Education Level | Male | Female |
|---|---|---|
| Illiterate | | |
| Primary | | |
| Secondary | | |
| Intermediate | | |

| | | |
|---|---|---|
| Diploma holder | | |
| Graduate and Above | | |
| **TOTAL** | | |

## Livelihood Information

**9. What is Your Main Source of Income?**

a) Agriculture (specify crop)
b) Livestock (specify animal)
c) Shop/small business
d) Employment in urban area (institution; shop, etc.)
e) Other

**10. Have any of the members acquired some skills that help in generating income?**

a) Yes
b) No

If yes, please specify _____

**11. Occupation of the earning members of the household with their respective incomes.**

| Sr. No. | Occupation | Status of Workplace | Position | Employment Type | Period of Employment (years) | Income |
|---|---|---|---|---|---|---|
| | | Government/ Private/ Self-Employed/ Agriculture/Tourist Guide/ Other | Regular/ Seasonal/ Own Job/ Unpaid | Fulltime/ Part time | Less than 1/ 1-5/ 5- 10/ More than 10 | |
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |

**12. Assets to support your livelihood**

| Assets | Quantification |
|---|---|
| Agricultural Land | Area: |
| Land (Other than Agriculture) | Area: |
| Livestock | No.: |
| Poultry | No.: |
| Vehicle Rental | No.: |
| Property Rented out | |
| Other (Specify) | |

**13. Do you work alone or acquire some support from workers?**

a) Alone
b) Unpaid family members
c) Employees / Workers

**14. Monthly Saving**

a. Below Rs. 1000
b. Rs. 1001 – Rs. 3000
c. Rs. 3001 – Rs. 5000
d. Above 5000

## Transport and Infrastructure

**15. Mode of daily commuting.**

a) Bicycle (Owned) _____
b) Motor bike (Owned) _____
c) Car (Owned) _____
d) Pick up (Public) _____
e) Bus (Public) _____
f) Motorcycle Rickshaw / Rickshaw (Public) _____
g) Taxi (Public) _____
h) Walking _____

**16. Availability of infrastructural facilities.**

| Services | Yes | No | If no, then specify alternate arrangements | If yes | | |
|---|---|---|---|---|---|---|
| | | | | Satisfied | Dissatisfied | Indifferent |
| Electricity | | | | | | |
| Gas | | | | | | |
| Phone | | | | | | |
| Municipal Water Supply | | | | | | |
| Sewerage and Drainage System | | | | | | |
| Solid Waste Management | | | | | | |

## Community Facilities

**17. Do these facilities exist in your community? If yes, what is your satisfaction level against them?**

| Service | Existence | | Distance from your house |
|---|---|---|---|
| | Yes | No | |
| Police Station | | | |
| Technical Education | | | |
| Primary School | | | |
| Dispensary | | | |

| | | | |
|---|---|---|---|
| Post Office | | | |
| Play Ground | | | |

**18. Source of energy for cooking?**

a) Wood
b) Kerosene oil
c) LPG
d) Coal

**Tourism Asset Assessment and Residents Perception towards Tourism**

**19. Do you in any way provide services or products to tourists?**

a) Yes
b) No

If yes name the service

a) Accommodation (Rental)
b) Guide
c) Restaurant
d) Cooking
e) Transport
f) Other_____

**20. Do you have direct contact with tourists?**

a) Yes
b) No

**21. Can tourism provide support to local handicrafts and culture?**

a) Yes
b) No

**22. Are you involved in handicraft type?**

a. Yes
**b.** No

**23. Do you think that there is a scope of following activities in Soon Valley?**

| Activities | Yes | No |
|---|---|---|
| Camping | | |
| Cycling | | |
| Boating/Jetties | | |
| Tracking | | |
| Rock Climbing | | |
| Other (please specify) | | |

**24. The following question consists of statements. Please indicate to which level you agree or disagree with the statements by circling the appropriate number.**

1= strongly disagree
2= Disagree
3= neither disagree nor agree
4= Agree
5= strongly agree

| Economic Impact of Tourism | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Does tourism improve your livelihood? | | | | | |
| Does tourism bring economic benefits to small group of people? | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Does Tourism create more jobs for local people? | | | | | |

| **Environmental impacts of Tourism** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| Does tourism conserve natural resources? | | | | | |
| Does tourism result in congestion during peak season? | | | | | |
| Does tourism add to noise and pollution? | | | | | |
| Does tourism bring more positive than negative effects in environment? | | | | | |

| **Socio Cultural Impacts of Tourism** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| Does tourism increase recreational facilities? | | | | | |
| Does tourism change the traditions and culture of community? | | | | | |
| Does tourism produce security and crime problems? | | | | | |
| Does tourism bring more positive than negative effects in local society and culture? | | | | | |

**25. What are the significant spots in Soon Valley which can be attractive for tourists? (Pl mention its location)**

_____

_____

_____

**26. In which area you would like to invest?**

a) Canteens/Restaurants
b) Rest Houses/Hotels
c) Provision of Camping Equipment
d) Other _____

**27. Birds and Animals attraction for tourists in Soon Valley?**

a) _____ d) _____
b) _____ e) _____
c) _____

**28. Do you have any final questions or remarks?**

_____

_____

**Thanks a lot for your anticipation**

## Visitor Perception Questionnaire for Soon Valley Master Plan District Khushab

Respondent's Name _____
Respondent's Address _____
Respondent's Gender _____
Respondent's Cell No. _____
Neighborhood/Mohallah/Locality name _____

**1. Is it your first visit?**

a) Yes b) No

**If no, when was your last visit?**

_____

**2. Primary reason for your visit?**

a) Leisure
b) Event
c) Business
d) Health
e) Family/friends
f) Others ----------

**3. What is your occupation?**

a) Primary Sector (Public) _____
b) Primary Sector (Private) _____
c) Entrepreneur _____
d) Armed Services _____
e) Unemployed_____
f) Agriculture_____
g) Expatriate Pakistani _____
h) Other _____

**4. How did you learn about the destination of Soon Valley?**

a) Internet
b) Word of mouth
c) Travel agencies
d) Other----------

**5. What are the number of days/nights you intend to stay:_____**

**6. Means of access to this destination? (One or more)**

a) bus
b) coach
c) Car
d) Motor bike
e) Other _____

**7. Means of transport in destination (One or more)**

a) bus
b) coach
c) Car
d) Motor bike
e) Other _____

**8. Accommodation**

a) Commercial accommodation
b) Secondary homes
c) Family/friends
d) Other_____

**9. Is attitude of Tourism staff (human resource at destinations) fair with you?**

a) Yes b) No

**10. Have you found adequate information about the following aspects? (Please tick)**

| **Aspects** | **Yes** | **No** |
|---|---|---|
| Attractions and activities | | |
| Tourist services | | |
| Health and safety conditions | | |
| Local customs and social norms | | |
| General conditions (temperature, weather etc.) | | |
| Emergency assistance | | |

**11. Do you think that there is a scope of following activities in Soon Valley?**

| Activities | Yes | No |
|---|---|---|
| Camping | | |
| Cycling | | |
| Boating/Jetties | | |
| Tracking | | |
| Rock Climbing | | |
| Other (plz specify) | | |

**12. The following question consists of statements. Please indicate to which level you satisfy or dissatisfy with the statements by circling the appropriate number.**

1= Highly Dissatisfied
2= Dissatisfied
3= Neutral
4= Highly Satisfied
5= Satisfied

| **Indicators** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| Quality of Welcome | | | | | |
| Safety and Security | | | | | |
| Ambient Air Quality | | | | | |
| Local Environmental Quality | | | | | |
| Pre-Arrival Communication | | | | | |
| Accessibility | | | | | |
| Transport | | | | | |
| Accommodation | | | | | |
| Information | | | | | |
| Eating and Drinking | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Activities | | | | | |
| Bathing Water Quality | | | | | |
| Value for Money | | | | | |

**13. What are the significant spots in Soon Valley which can be attractive for tourists?**

_____

_____

**14. Infrastructure required promoting tourism in Soon Valley. (Select multiple)**

a) Canteens/Restaurants
b) Rest Houses/Hotels
c) Benches
d) Play Areas (including slides, swings etc.)
e) Map Displays

**15. Birds and Animals attraction for tourists in Soon Valley?**

a) _____
b) _____
c) _____
d) _____

**16. Are you satisfied with the quality of service in the Soon Valley?**

a) Yes
b) No

**If no, what do you suggest to ensure quality of service?**

_____

_____

_____

**17. What could be done to improve visitors experience in destination?**

_____

_____

_____

**18. What are the main concerns of the Soon Valley?**

_____

_____

**19. Would you come back?**

a) Yes
b) No

**20. Would you recommend it to someone else?**

c) Yes
d) No

**21. Do you have any question or final remarks?**

_____

_____

**<u>Thanks a lot for your anticipation</u>**

# Travel Information Survey

Respondent Name _____

Respondent Address _____

Respondent Cell No. _____

Respondent Age _____

Name & location of Bus Stop_____

Trip Origin _____

Trip Destination _____

**1. What is your occupation?**

a. Employed full-time
b. Employed part-time
c. Full-time student
d. Part-time student
e. Unemployed
f. Household duties/caring for children
g. Retired
h. Other (please specify) _____

**2. How often do you travel on this public transport?**

a. Daily
b. 4 to 5 days a week
c. 1 to 3 days a week
d. Once in a fortnight
e. At least one day a month

**3. What is the main purpose of trip?**

a. Travel between work & home
b. Work-related business
c. Education
d. Shopping
e. Recreation or entertainment
f. Social or family visits
g. Medical
h. Others (please specify) _____

**4. How did you get to the bus stop for this trip?**

a. Own Vehicle
b. Walked only
c. Public transport (specify) _____

**5. Type of public transport available in your area?**

a) Bus
b) Wagon
c) Rickshaw
d) Others (please specify) _____

**6. Distance traveled to reach at the stop from house?**

a. Less than 1 km
b. 1 to 2 km

c. 3 to 5 km
d. 6 to 8 km
e. More than 8 km

**7. How easy do you think it is to make journeys using public transport, in your local area?**

a. Not easy
b. Very easy

**8. Monthly expenditure (PKR) on use of public transport**

a. Less than 2,000
b. 2,000 to 4,000
c. 4,001 to 6,000
d. 6,001 to 8,000
e. More than 8,000

**9. What is your satisfaction level regarding following indicators? (please tick)**

| Indicators | | Very Dissatisfied | Dissatisfied | Neither | Satisfied | Very Satisfied |
|---|---|---|---|---|---|---|
| Accessibility | Ability to catch the bus you intended to | | | | | |
| | Ease of boarding the bus | | | | | |
| Timelines | Frequency of Bus Service | | | | | |
| | Bus Being on time | | | | | |
| | Travel time considering the distance you travel | | | | | |
| Information | Availability of timetable information at bus stop | | | | | |
| | Ability to understand signage | | | | | |
| | Being informed of service changes (e.g. delays) | | | | | |
| Comfor | Comfort at bus stop (shelter & seating) | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Seat availability on the bus stop | | | | | |
| | Seat comfort on the bus | | | | | |
| | Temperature level on the bus | | | | | |
| | Bus journey comfort | | | | | |
| Safety | Feeling safe at bus stop | | | | | |
| | Feeling safe while on the bus | | | | | |
| Convenience | Ease of passenger drop-off near your bus stop | | | | | |
| | Ease of connection with other public transport | | | | | |
| Overall Satisfaction with this trip | | | | | | |

**10. What should be the potential locations of new bus stops?**

_____

_____

**11. Please mention any other issues that are important to you in relation to using this public transport facility.**

_____

_____

**12. Any other suggestions and comments to improve the quality of public transport in this area?**

_____

_____

**Thanks a lot for your anticipation**